Designing For Success: Managerial Influence

On Federal Contractor Performance

by

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(Under the Direction of Laurence J. O'Toole, Jr.)

ABSTRACT

This dissertation assesses how public contract managers can design contracts to influence contractor performance. Public officials control whether contracts are competitively sourced, the financial structures used on contracts, and occasionally wield even greater discretion over contract design. These steps occur early in the contracting cycle, when public officials develop work requirements and the overall plan for implementing the contract. Using data on complex definitive contracts from the Federal Procurement Data System – Next Generation, this research assesses how contract design elements are used and how these design elements affect performance. The dissertation introduces a new measure of contractor performance based on the way contracts end. Findings indicate that competitively sourced contracts are more likely to terminate early, suggesting that competition is not the silver bullet that many believe it to be. Experienced contractors are much less likely to have their contracts terminated, implying that relationships between government and contractor are important. Findings also show that contracting officials select financial structures based on the presence of transaction costs, indicating an understanding and application of economic theory in practice. Cost-reimbursement contracts, which provide little financial incentive for good performance, are much more likely to terminate early than other types of contracts. Contracts completed using simplified acquisition

procedures, which grant public managers wide discretion over contract design, are less likely to terminate early than other contracts, providing evidence that managers are able to use their expertise to design better performing contracts. However, these contracts may not be meeting equity goals as expressed in the Federal Acquisition Regulation, perhaps showing a preference for efficient performance over other objectives. Taken together, this research indicates that steps taken early in the contracting cycle can influence contractor performance. As in other areas of public administration, these findings are further evidence that managerial actions are important for the outputs and outcomes of governance initiatives.

INDEX WORDS: Public Administration, Public Management, Public Policy, Federal, Contracting, Competition, Transaction Cost Economics, Public Finance, Discretion, Bureaucracy

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Contents

Chapter 1: Introduction

This dissertation investigates how public contract managers can design contracts to improve contractor performance given their contextual constraints and authorities. This research tests the notion that the decisions that public managers make early in the contracting process have a significant and substantive effect on how contractors ultimately perform. In particular, I analyze what effect competition, contract payment structure, and managerial discretion have on contractor performance. Competition refers to the bidding process used to advertise and negotiate contracts in the marketplace. Throughout the document, this process is referred to as either competition or competitive sourcing. Financial payment structure is tied to the type of contract used: fixed-price, cost-reimbursement, or time/labor-hours, which alters the dispersion of transaction costs and risk across parties to the contract. Throughout this document, these contract types are conceptualized as financial structure and payment structure. At the federal level, contract managers wield great discretion over a subset of contracts through simplified acquisition procedures (SAP), which remove many procurement regulations for contracts valued at less than $150,000. SAP provides federal contract managers with managerial discretion over much of contract design.

Though elements of contract design may seem like fairly narrow decisions, each relates directly to larger bodies of research in public administration, in particular to literatures on competition, public/private differences, motivation, transaction costs, risk, principal-agent relationships, and bureaucratic discretion and control. The current research links these theories directly to the practical actions of federal contract managers. On balance, this research tests some

of the bigger public management theories in the context of contract management and oversight, and provides actionable recommendations for contract managers.

In recent years there has been widespread acknowledgment of the growing importance of complex structures for public administration. With the rise of wicked problems, resource scarcities, and siloed expertise, it is rare that single organizations possess the resources to address all of the problems that confront them (Churchman 1967, O'Toole 1997, Milward and Provan 2003). Public managers are commonly dependent on organizations outside the traditional hierarchy to provide goods and services essential for the day-to-day operation of government (Milward and Provan 2000, Agranoff and McGuire 2003). Contracting is one method that has been increasingly used to augment government capacity. Though government contracting is not new, it has become more important as the public sector is pressured to become more businesslike.

Contracts are "business arrangements between a government agency and a private entity, in which the private entity promises, in exchange for money, to deliver certain products or services to the government agency or others on the government's behalf" (Salamon, 2002, p. 282). Contracts date to the nation's earliest days, when private businesses supplied George Washington's Continental Army. In recent decades, political interest in possible market benefits associated with privatization has spurred the use of contracting as a tool for public service delivery. In particular, market competition is believed to drive down prices, encourage innovation, and increase accountability (Savas and Schubert 1987). Simultaneously, it is widely believed that governments can cut administrative costs through contracting, particularly expenditures associated with personnel management, salaries, and pensions (Osborne and Gaebler 1992, Bingman and Pitsvada 1997).

Given the promise of increased performance at lower cost, it is no surprise that governments frequently use contracts. Since 2005, the number of federal contract actions per year has nearly doubled, going from 8.1 million in 2005 to 15.8 million in 2014 (see figure 1.1). The reason for this increase is an almost four-fold increase in defense contract actions, likely the result of drawdowns in Afghanistan and Iraq. Over that same period, contracts have accounted for a large portion of federal discretionary spending, ranging from 47.7 percent in 2008 to 37.7 percent in 2014.

Figure 1.1 demonstrates that, despite being just one of many policy implementation tools, contracting is an important part of public administration (Salamon 2002). Public managers operate in a system in which contracting is common, if not inevitable. Ideological arguments against contracting ignore the practical realities of the management challenges that public officials face. Whether contracts are desirable or not, they are here to stay. As a result, managers need information to help successfully design and manage contracts. And despite specific guidelines in the Federal Acquisition Regulation (FAR) about ways to structure contracts, federal managers retain much discretion over contract design due to the wide variation in work requirements, market strength, and resources available for managers (Cooper 1980, Kelman 1990, Curry 2010). The decisions that these managers make can be expected to affect contractor performance.

The following section introduces the public administration literature on contracting, including bringing in major theories from political science and economics. The subsequent section provides the reader with a foundation of knowledge about the processes and rules of federal contracting. The introduction closes with a brief discussion of the subsequent chapters.

Contracting in Public Administration

The public administration literature on contracting has focused on three main areas: describing the nature of government contracts, reducing costs associated with multi-actor arrangements, and managing contractor performance. This section provides some background on the state of the literature on contracting in public administration. In addition to identifying the major areas of research, I also highlight some of the weaknesses in these bodies of literature.

Descriptive studies seek to identify trends in the nature of contracting activity, including how much contracting is being done, what types of organizations are hired as contractors, and what kind of work is being contracted out. In general, these studies have shown that contracting is becoming more common for services (Peters and Pierre 1998, Box 1999), that extreme models of government contracting (such as in Weston, FL, where all but three administrative positions have been contracted out) may be possible given the right circumstances (Prager 2008), and that the kind of work and sector of the contractor are important considerations for managers (Van Slyke and Roch 2004, Van Slyke 2007, Suárez 2010). Many descriptive analyses also focus on perceived values of contracts. These include ideologically-based claims of efficiency gains (Savas 1989, Bingman and Pitsvada 1997) as well as indignation over perceived threats to constitutional and legal frameworks (Moe 1987, Moe and Gilmour 1995, Rosenbloom and Piotrowski 2005). This line of research tends to illustrate what is happening with regard to contracts or provides advocacy for or against contracting based on predetermined preferences. While interesting and intellectually stimulating, these studies do little to identify or explain characteristics of successful contractual arrangements. While these researchers describe what is happening and debate whether it should be happening at all, public managers manage more contracts each day.

Second, there are studies that focus on identifying and aligning specific types of costs associated with exchanges in multi-institutional arrangements: transaction costs. Williamson argues that success in complex environments is contingent upon reducing the costs associated with transferring goods or services between individuals or organizations (Williamson 1979, Williamson 1981). Transaction costs can be thought of much like friction between rotating gears or the drag of water on a boat. These forces have small but cumulatively important effects on the performance of the machinery and can ultimately determine its effectiveness. As goods and services are transferred between people or organizations (transacted), similar small, seemingly negligible costs accumulate, particularly related to the exchange of information and the development of mutual understanding. Williamson holds that transaction costs have three primary dimensions: uncertainty between partners, the frequency of the exchanges between partners, and the investments required to enter the partnership (Williamson 1981). Each of these dimensions influences the resources that partners will need to dedicate to a shared project. In particular, entering into contractual relationships is very risky if potential bidders are required to invest in technology, infrastructure, or human capital with limited applicability to other markets or buyers. Such "asset specific" investments may reduce market competitiveness but may also create relationships based on dependence and mutuality between contracting partners.

Many studies in the public administration literature have adopted a transaction cost approach to assessing contracts, especially the initial decision to use a contractor (the make or buy decision). Studies have dealt with ensuring shared values between partners to reduce costs (Brown and Potoski 2003, Brown, Potoski and Van Slyke 2006, Van Slyke 2007, Hefetz and Warner 2011), making the decision to contract out (Ferris 1986, Preker, Harding and Travis 2000, Tadelis 2002), properly scoping government and its contracts (Hart, Shleifer and Vishny

1996), contracting back into government (Hefetz and Warner 2004, Chen 2009), assessing market competitiveness (MacManus 1991, Warner and Hefetz 2008), and attempting to identify lessons from the private sector for public managers (Prager 2008).This approach is particularly useful as it focuses on the contract as the unit of analysis and attempts to highlight the importance of organizational characteristics, markets, and unseen costs for managers. However, this line of research largely ignores the political and legal realities of the public sector. Unlike their private counterparts, public managers are severely constrained in the methods they can use to manage contracts. Political variables regularly influence make or buy decisions, establish frequency of competition, and affect the degree of uncertainty between partners. As a result, many of the assumptions in this body of literature about the efficiency of markets and the ability of contract managers to influence outcomes may be overly optimistic.

Finally, there are agency theory studies which focus on improving contractor performance. Agency theory describes relationships in which a principal tasks an agent with the performance of a duty. In the context of contracting, public managers serve as the principals while contractors are the agents. In such arrangements there are inherent problems associated with information availability, and as a result principals have difficulty controlling the agents (Ross 1973). In particular, the agent knows more about the details of the task than the principal, often has broad discretion, and can take advantage of the information asymmetry by overcharging, underworking, or both (Jensen and Meckling 1979). To address such problems, principals must work to reduce the information asymmetry by requesting information and actively overseeing progress (Weimer and Vining 2005). Alternatively, principals can work to find agents with more altruistic motives who might be less likely to exploit the information asymmetry for individual gains (Downs 1967). Legal studies of contracting have tended to focus

on agency theory, particularly how to share the risk of legal costs between principal and agent (Choi and Triantis 2010, Choi and Triantis 2012), ensure good faith effort from agents (Summers 1968), and manage agents in thin markets (Choi and Triantis 2013). In the public administration contracting literature, such studies have focused primarily on improving performance measurement techniques (Page 2004, Amirkhanyan 2010, Terman and Yang 2010, Amirkhanyan 2011), establishing roles and responsibilities (Cooper 1980, Cooper 2003, Yang, Hsieh and Li 2009), increasing accountability (Milward and Provan 1998, Johnston and Romzek 1999, Johnston, Romzek and Wood 2004, Van Slyke and Roch 2004, Girth et al. 2012, Girth 2014), and building collaborative relationships (Ring and Van de Ven 1994, Milward and Provan 2003, Amirkhanyan 2009, Gazley 2010).

There is some overlap between agency theory and transaction cost economics. Both emphasize the role of uncertainty and the importance of information exchange. However, where economists focus on reducing costs, agency theorists tend to mobilize power and legal authority arguments, particularly in the form of top-down controls. From the perspective of transaction costs, oversight mechanisms are additional transaction costs that could make relationships more burdensome. Also, while principal-agent arguments acknowledge the importance of the political variables, they often fail to account for the practical problems associated with external oversight, which may just be costly, ineffective lip-service to the protection of public values (Friedrich 1940, Hjern 1982). Control is important, but focusing so much attention on the implementation of the contract neglects the role that administrators can play in the early stages of contract design. Instead of being overly optimistic about the role of public administrators during contract design, agency theory research defines the areas of influence too narrowly.

Federal Contracting: Some Key Concepts

The current research analyzes how contract design elements affect federal contractor performance. As a result, some background in federal contracting is necessary. Federal agencies adhere to a relatively standardized contracting cycle, largely established in the Federal Acquisition Regulation (FAR). The contracting process (see figure 1.2) consists of six steps: pre-solicitation planning, solicitation, proposal evaluation, contract award, contract administration, and contract closeout (Curry 2010). This cycle is designed to ensure that contracts are carefully planned, appropriately solicited, and effectively managed. In addition, the FAR (and thus the contracting process) is designed to preserve accountability for administrators and contractors, select contractors based on both efficiency and equity criteria, and allow for specialized management and oversight of contracts (Federal Acquisition Regulation 2014).

The contracting cycle begins with the pre-solicitation phase, in which requirements are formalized, the decision to contract out is made, and the contract is designed. Requirements are the list or description of goods and services needed, along with the timeline and cost of the contract. Clear requirements reduce uncertainty and facilitate improved contract management (Cooper 1980). Once requirements are understood, the government must decide whether to generate the product with governmental resources or procure goods or services from the private sector. Known as the "make or buy decision," this choice should, in theory, be based on the level of transaction costs (Williamson 1979). In particular, contracting officials should be concerned with reducing uncertainty, information asymmetry, and transaction costs (Williamson 1979, Brown and Potoski 2003, Brown, Potoski and Van Slyke 2006). Uncertainty occurs when requirements are poorly understood. That is, the government struggles to define its needs, the project work processes, the timeline, and/or the cost. Information asymmetry increases when the

contractor has greater expertise in the area of work than the government. In such instances, there are increased chances for opportunism (Brown, Potoski and Van Slyke 2007). For some contracts, government is the only purchaser. There is no existing private marketplace for the good or service provided. This can require potential contractors to invest in project-specific assets for which there is no other market. Asset specific investments increase the risk to private bidders, meaning that competition over the project could potentially be lower. Governments may be forced to add incentives to contracts to convince firms to submit bids (Shenson 1990, Kim and Brown 2012).

Despite the wide acknowledgement of the importance of these factors when deciding to make or buy, many public contracts have high transaction costs. This is due to the type of work that government performs and political influence on contracting decisions (Kelman 1990, Brown, Potoski and Van Slyke 2006). From an economic standpoint, the primary role of government is to address market failures (Weimer and Vining 2005). This suggests that there are already weak markets for the many of goods and services that government must procure. In some cases, such as defense and intelligence, government is a monopsony consumer. This is not to say that governments do not need to procure market goods, as they obviously do. Standard commodities ranging from pencils to automobiles are necessary for public administration. In addition, the government procures services that have private markets, such as construction and maintenance. However, governments also procure many complex products for which there is a limited private market. As a result, asset specificity problems are likely. In addition, politics often influences what work is contracted out (Kelman 1990, Cohen and Eimicke 2008). In particular, earmarks that dedicate funding for particular projects can force contracts onto administrators (Savage 2009, Witko 2011).

Regardless of these influences, public officials retain some discretion over contract design during the planning phase. They must decide whether contracts will be competitively sourced, what solicitation procedures will be used, what payment structure will be used, and how to market the contract to potential bidders (Curry 2010). These efforts often involve administrators from multiple parts within a single organization or even groups from multiple federal agencies (Cohen and Eimicke 2008). These decisions are meaningful, as they are likely to influence contractor performance (Kim and Brown 2012).

After planning is complete, the contract solicitation is released. During this phase public officials implement their marketing plan (including posting the contract to FedBizOpps.gov, where the federal government advertises its procurement opportunities) and wait to receive proposals. Once the solicitation period closes, government officials review proposals and award the contract based on a combination of technical and financial considerations (FAR, 15.305-308, 2014). Then the contract is administered by the contracting official (CO) and the contracting official's representative (COR). The CO is charged with the ultimate financial and legal responsibility for the contract and is usually a procurement expert. The COR is charged with the day-to-day contract management, and is usually an issue expert in the area of work being done on the contract.

Once the period of performance ends, the contract is evaluated. For many public sector contracts, the contract ends with closeout. In these cases, evaluations are used to train inexperienced employees, adjust processes for other ongoing or future contracts, and report on performance within the administrative hierarchy. However, there are other projects where the need for contractual support is recurring. For example, local refuse collection contracts may be regularly re-competed to take advantage of market forces. In instances where the work continues,

findings from evaluation can be applied to the design, solicitation, and management of the ongoing project.

This dissertation focuses on the effect that the design of the contract (undertaken during the pre-solicitation phase) has on the contractor's performance. It is during this phase that contracting officials conduct advance planning activities, including assessing the competitiveness of relevant markets, identifying possible contractors, developing guidelines for the request for proposals (RFP), and creating evaluation criteria. This planning phase may be critical for the overall success of contract administration, as many important elements of the contract are established here, including the requirements (which outline what the government needs), the performance criteria, marketing and outreach strategies, competition and solicitation procedures, the financial structure of the contract (which heavily influences management), and the exemptions to regulations that may be applicable. The following discussion outlines some key terms that will be regularly used in this document and situates them firmly in the Federal Acquisition Regulation to provide some insight into how design elements of competition and financial structure differ and may affect the management of federal contracts.

Contract Design

Public managers have important, though constrained, authority over the design of contracts, including the solicitation procedures used, the contract vehicle selected, and the financial structure of the agreement. These design elements influence the way that the source (or contractor) is selected, how (and how much) information is exchanged, and the type of relationship that is formed. These factors are very important for both transaction costs and performance controls, yet they are rarely mentioned in either body of literature. The following is

a brief discussion of the literature on contract design and then a summary of the gap that this research fills in the broader contracting literature.

Cooper initially described a three step contracting process of selection, operation, and separation (Cooper 1980). Agency theory literature has focused on the operation and separation phases. Transaction cost literature has focused on selection, but primarily from the make or buy perspective. There has been little attention paid to the relationship between the phases, and in particular, the nuances of the design and selection process. De Hoog specifically charges the field with conducting more research on the importance of processes and procedures, yet little has been done since (DeHoog 1990). Shetterly assesses the impact of design on performance of trash collection in 41 localities around the U.S. and finds evidence that the type of bidding process used influences the cost of services (Shetterly 2000). Romzek and Johnston attempt to develop a model of contract implementation and management based on competition procedures, resource availability, human capital capacity, and performance measurement techniques (Romzek and Johnston 2002). They examine five contracts in Kansas and find evidence that these design factors influence management effectiveness, as do political variables, the number of subcontractors, and risk sharing between principal and agent. Malatesta and Smith examine 175 Environmental Protection Agency (EPA) contracts to determine if dependence between principal and agent influences contract design and how market strength influences the financial structure of contracts (Malatesta and Smith 2011). They conclude that relationships (largely ignored in the transaction cost literature) affect contract design, and that public managers alter the financial structure (a design element) based on the market that they encounter. Finally, Kim and Brown look at contracts from three federal departments over a five year period to assess descriptive patterns in the financial structure, length, and funded value for complex contracts (Kim and

Brown 2012). They find that short-term, fixed price designs are the most frequently used, potentially allowing for greater competition and public sector risk reduction.

The current literature on contract design is limited in terms of explanatory power and scope of analysis. Two of the studies analyze a relatively small number of observations, limiting external validity (Shetterly 2000, Romzek and Johnston 2002). The other two articles describe trends in the use of particular designs but do not link them to performance outcomes (Malatesta and Smith 2011, Kim and Brown 2012). For public managers, contract design is important if it has an influence on performance. Otherwise, design decisions can proceed according to legal requirements designed to preserve accountability and equity in contracting. There is currently no large *n* study on the ways that specific elements of contract design may affect contractor performance. This research is designed to fill that gap. In addition, this research adds contextual elements that studies of contracts as principal-agent relationships and transaction costs have ignored, including the practical constraints which restrict managerial action with regard to source selection and contract financial structure. Each of the three empirical chapters adopts an analytic approach founded in existing theory in the public administration literature. The third chapter, on the effect of competition, tests the applicability of micro-economic theories of competition that have been cited as rationales for privatization during the recent new public management and public choice movements (Ostrom 1990, Osborne and Gaebler 1992, Weimer and Vining 2005). The fourth chapter, addressing the use of different financial payment structures, rests firmly in theories of transaction cost economics, primarily those related to information asymmetry, asset specificity, and task complexity (Williamson 1979, Williamson 1981, Brown, Potoski and Van Slyke 2006). The fifth chapter, focused on the use and effect of simplified acquisition procedures, provides further evidence in one of the longstanding debates in public administration

over the balance between political controls and bureaucratic discretion (Finer 1941, McCubbins, Noll and Weingast 1987, Meier and O'Toole 2006). Federal managers are responsible for determining whether to competitively source a contract and which financial structure to use for each contract. And, under certain conditions, managers are granted much broader discretion over contract design. Each empirical chapter assesses how management decisions related to the design of contracts affect contractor performance. All three chapters include a detailed discussion of the specific theoretical underpinnings for each analysis.

Overarching Research Question: How Design Influences Performance

Many recent studies have shown that the actions of public managers have significant and substantive effects on policy implementation, service delivery, and program design (Boyne et al. 2005, Moynihan and Pandey 2005, Riccucci 2005, Meier and O'Toole Jr 2007). Continuing in the tradition of this "management matters" approach, this research seeks to place public contract managers in their practical context and assess what steps they can realistically take to better design and manage contracts. Doing so requires exploring both the legal and financial frameworks within which public managers operate. In addition, it requires measuring contractor performance based on outputs and outcomes instead of inputs. Many previous studies of contracts have used the cost of the contract as evidence of performance (Savas 1977, Savas 2002), while others have used perceptual measures of performance (Yang, Hsieh and Li 2009, Johnston and Girth 2012). The resources expended are an input to the contracting process and not necessarily evidence of performance. These studies implicitly assert that cost is the only element of performance that matters. Similarly, *ex post facto* questioning about contractor performance is an unreliable method of assessing true performance, as it suffers from many of the traditional problems associated with perceptual measures, including memory problems and

cognition biases (Ketokivi and Schroeder 2004). As Hodge establishes, there are many other possible measures of performance, including the social, political, and legal impact of the contract (Hodge 1998). This dissertation introduces a new measure of contractor performance using contract modifications as an indicator of contract status. Modifications are changes made to a contract over its period of performance and are used to obligate or deobligate funds, append additional work, alter management and financial structures, and to conclude the contractual agreement. Contract modifications allow this research to track the specific changes made to each contract, including how the contract begins, is changed, and is concluded. These modifications are described in greater detail in chapter 2, which introduces the data and analytic methods used in the present research. For the present analysis, contracts which closeout normally are believed to be of adequate performance. Terminations and other forms of premature cancellation are evidence of poor performance. Change orders and the exercise of options are assessed based on the financial action taken. Specifically, change orders and options that add resources to existing contracts are evidence of good performance midway through a contract. When funds are deobligated, either by change order or option, this is seen as evidence of poor performance. Though this is an imperfect measure of what constitutes good performance, it is a better method than previously used cost-based measures which only look at inputs. This concept of performance is discussed in greater depth in chapter 2.

Specifically, this research attempts to determine what impact contract design has on contractor performance and what public managers can do to influence design in the earliest stages of the contracting process. In particular, I will examine the effects of competition, accountability, discretion, and collaboration on federal contractor performance. To do so, I focus on the competitive bidding process, the financial structure of each contract, and specific contract

designs that offer much discretion to administrators (simplified acquisition procedures). The public manager's control over these design elements is largely dependent on the context, as described previously in the primer on the contracting process. However, in some instances, the manager has only limited control over these design elements. When a manager does not, he or she is usually constrained by either the FAR (which is predisposed to particular design approaches) or by the market for the good or service sought. As a result, this research can add to the literature on the impact of management, as well as to our understanding of the role that market and regulatory elements play in this process. This research will demonstrate that managers have an impact on contractor performance when they are given control over these factors, but that this control is constrained by political and legal forces. Despite these constraints, managers are frequently blamed for performance problems with contracts. As a result, public managers (and public management scholars) need more information on how better to design contracts given these systemic constraints. This research recognizes the contributions of transaction cost economics and principal-agent theory to the study of contract management, but adds the contextual considerations that these theories so often gloss over without much discussion, particularly with regard to the regulatory constraints placed on managers in the FAR. Focusing on those things that managers can control will help sharpen existing theories while also opening the door to new perspectives based on empirical observation.

Overview of Dissertation

This dissertation consists of six chapters. This chapter has introduced the overarching research question, the contracting literature in public administration, the federal contracting process, and the importance of contract design. It defined some of the terms that are used throughout and provided a foundation of knowledge in government contracting.

The second chapter introduces the data used. This dissertation analyzes federal definitive contracts that concluded between 2005 – 2014. The data used come from the Federal Procurement Data System – Next Generation, which defines definitive contracts as "mutually binding legal relationship[s] obligating the seller to furnish the supplies or services (including construction) and the buyer to pay for them" (FPDS-NG User Manual, p. 4). This category of contracts excludes purchase orders, blanket purchase agreement (BPA) calls, and other methods used to procure fairly simple goods and services or which leverage indefinite delivery contract vehicles. The second chapter includes a detailed discussion of the variable of interest, contractor performance, including how it is measured and indications of distribution throughout the federal government. Contractor performance is the variable of interest in the following three chapters, so discussing it at length once limits the need to revisit the topic multiple times. In addition, the explanatory variables are presented, including measures of competition, financial structure, and discretion. Control variables, which are designed to account for variation in contracts, government agencies, contractors, and market conditions, are also presented.

The third chapter investigates whether competition improves contractor performance. One of the leading rationales for contracting out is to gain efficiency through competitive market forces (Weimer and Vining 2005, Brown, Potoski and Van Slyke 2006). However, there is disagreement across the social science literature over the effect of competition on performance. Social psychologists and sociologists have found evidence that competition may reduce various types of workplace performance (Blau 1954, Tauer and Harackiewicz 2004, Stapel and Koomen 2005, Kilduff, Elfenbein and Staw 2010). Management scholars have shown that the context of the competition is important (Simonetti and Boseman 1975, Beersma et al. 2003, Polidoro, Ahuja and Mitchell 2011). Despite these findings, the contract literature proceeds using primarily

economic theory as a basis for justifying competitive mechanisms. But, given the constraints imposed on managers in the FAR and by markets and political actors, it is uncertain if competition can have the same effect in the public sector as it does in private markets. The working hypothesis for this chapter is that the use of competitive sourcing procedures will result in better contractor performance. This hypothesis is consistent with economic conceptualizations of the role that competition can play in improving performance. My findings indicate that competition may not be the silver bullet that many suppose that it can be. Instead, relationships and context seem to matter a great deal.

The fourth chapter assesses the effect of financial payment structure (or contract type) on contractor performance. Financial oversight of a contract is one of the primary ways that governments attempt to control contractors (Brown, Potoski and Van Slyke 2006, Malatesta and Smith 2011, Kim and Brown 2012). Varying payment structures distribute risk and costs differently across the contractual relationship. The most commonly used method is the fixed-price contract, which establishes a set amount of funding available for the contract. This structure places much of the risk associated with the contract on the contractor, as they agree to provide the service for a pre-determined amount that may not cover unknown impediments or other overruns. It also reduces transaction costs associated with oversight, as the contracting officer does not have to review labor or time statements. However, this format also gives much discretion to the contractor and could induce shirking. Similarly, the principal has access to less information about the day-to-day management of the contract so top-down accountability might be reduced as well. Other financial structures include cost-reimbursement contracts which guarantee the coverage of contractor costs plus a fee as a performance incentive, and time/labor contracts which make payments on the basis of the activities of the contractors. Cost-

reimbursement structures place more risk on the government, as they are responsible for the full cost of the project plus an additional payment. However, the inclusion of the bonus may incentivize better performance. Time/labor contracts increase oversight costs dramatically but may improve accountability. Given the uncertain balance between risk, transparency, and transaction costs, it is difficult to determine which of these methods might engender the best contractor performance. First, I assess whether contracting officials use financial structures in accordance with recommendations from the FAR. Then, I hypothesize that fixed-price contracts, which shift risk to the private sector and limit government oversight, will be associated with better performance because they effectively leverage market forces and incentivize efficiency. My findings indicate that contracting officials use the financial structures in accordance with the FAR and the presence of transaction costs. Fixed-price contracts outperform cost-reimbursement contracts, but are not measurably better than time/labor contracts. This indicates that federal contracting officials are able to use a combination of financial structure, monetary incentives, and performance information to address transaction costs and effectively manage contracts.

The fifth chapter analyzes how public managers use their discretion, and if the use of discretion in design can influence contractor performance. In the FAR, simplified acquisition procedures (SAP) give managers the discretion to choose design elements more freely for contracts worth less than $150,000. Instead of prescribing the procedures to be used, the manager is able to apply professional expertise to design the best contract based on the circumstances and contract requirements. This approach is consistent with Friedrich's call to rely on internal norms driven by professional training and norms (Friedrich 1940). Other scholars have suggested that the nation may be embracing centralized authority over technical expertise (Kaufman 1956). But there is evidence that discretion is important in the implementation of policies (Meier and

O'Toole 2006, Hupe and Hill 2007) and in the representation of interests (Sowa and Selden 2003). Through SAP, the FAR specifically grants contract managers a wide lane of discretionary activity. Considering that contract oversight has traditionally been dominated by a top-down control approach of both contracting officers and contractors, this subset of about 4,500 contracts (or 15 percent of the total sample) provides an interesting contrast. I hypothesize that SAP contracts will be more likely to use contextually-based design elements, that SAP will increase access to government contracts for disadvantaged businesses, and that SAP contractors will perform better than non-SAP contractors. My findings indicate that contract managers use their discretion to choose contract designs that reduce their workload, that SAP contracts are less likely to go to disadvantaged businesses, and the SAP contracts are less likely to terminate early.

The final chapter of the dissertation brings together the findings of the preceding chapters, assesses the effectiveness of existing theory in explaining findings, sketches out the initial skeleton of a budding theory of contract design, identifies next steps for research on contract design, and makes recommendations for managers about how to improve contract design. In particular, this chapter focuses on the importance of context and the role for public managers in improving contractor performance.

Chapter 2: Data and Methods

Introduction

This chapter presents the data, measures, and methods used in the current research. The three empirical chapters, which immediately follow this chapter, assess the impact of contract design elements on contractor performance using very similar data and measures, and a consistent analytical approach. To avoid the need to present the same information on data and methods repetitively, this chapter provides an overarching discussion of where data were gathered, how specific concepts are measured, and the statistical methods used to assess my hypotheses. Each empirical chapter contains a short description of the main variables used for the analysis, as well as any additional measures or methods used that are unique to that particular analysis. This chapter begins with a discussion of how these data were gathered. Then, it presents information on the dependent variable – contractor performance – including how this variable is operationalized and descriptive statistics. Based on this variable of interest, the overarching analytical method, multinomial logistic regression, is introduced, explained, and justified. Then, the chapter presents the primary explanatory variables for each empirical analysis. The chapter concludes with a discussion of the many control variables used, including the data sources and how controls are operationalized. Though each empirical chapter contains a brief methodological explanation, particularly for any unique techniques used and an in-depth assessment of the explanatory variables, this chapter serves as the primary place to find information on the majority of independent variables and the overarching statistical method used.

Data: The Federal Procurement Data System – Next Generation

To assess the effect of contract design elements on contractor performance, I use data from the Federal Procurement Data System – Next Generation (FPDS – NG). Created in 2004, the Office of Federal Procurement Policy (OFPP) operates FPDS-NG to increase the transparency of federal procurement activities. Section 4.6 of the Federal Acquisition Regulation (FAR) requires departments and agencies to input data on all unclassified procurement actions into FPDS-NG, though it is impossible to determine if this requirement is strictly followed (Federal Acquisition Regulation 2014). FPDS-NG provides information on the vast majority of federal contracts annually and may describe the full population of contracts for civilian agencies. Each contract is assigned a unique identification number. Then, contracting officials enter information on the agency responsible for the contract, the amount of funding for the contract (including options), the type of good or service sought, the length, the procedures used to select the source, information about the contractor (including physical location, industry, and ownership demographics), the financial structure of the contract, and much more. Subcontracts are not included in these data.

FPDS-NG tracks each modification made to federal contracts. As a result, each contract can be envisioned as a series of managerial actions. Contract initiation is the first action taken on every contract. After initiation, any alteration to the contract requires a modification. Some contracts do not require modifications, but most do. There are many different types of modification, including change orders, exercising options, supplemental agreements within the scope of the contract, and funding only actions, among many others. FPDS-NG tracks all of these modifications, including the date of the modification and any associated financial transaction. The final modification of a contract ends the arrangement between the contractor and

the government. Since I am interested in contractor performance, only completed contracts are included in the dataset.

Using the "ad hoc" query function of FPDS-NG, I extracted complete modification data for all civilian federal definitive contracts that ended in the years spanning federal fiscal years 2005 – 2014. Definitive contracts are "a mutually binding legal relationship obligating the seller to furnish the supplies or services (including construction) and the buyer to pay for them. It includes all types of commitments that obligate the Government to an expenditure of appropriated funds…in writing."[1] Definitive contracts are stand-alone agreements between the government and a contractor for a particular product or service. I exclude other types of contractual vehicles, as they are often for relatively simple goods or services that do not require an ongoing relationship between the provider and the government (such as purchase orders) or because they create endogenous relationships between contracts which are impossible to track with the level of data provided in FPDS-NG (such as indefinite delivery vehicles). I am primarily interested in contracts that involve complex transactions between the government and the contractor, requiring management. Accordingly, I eliminated contracts that (a) had a period of performance that was fewer than 21 days and (b) had a total value of less than $2,000.00. The resulting dataset includes 24,396 civilian agency definitive contracts that concluded in the ten year period (2005-2014) studied. I exclude the Department of Defense (DoD) from this analysis due to the non-random security classification of a high percentage of defense contracts (which makes access to unbiased data impossible) and differences in the contract management techniques that DoD uses to oversee contractors and incentivize performance (Williamson 1967, Temple 1994, DeRouen and Heo 2000).

[1] From the FPDS-NG user help menu describing how to input definitive contracts. For more information on definitive contracts and record keeping, visit https://www.fpds.gov/help/Create_a_Stand_Alone_Contract.htm

Contractor Performance: The Primary Variable of Interest

The variable of interest for this research is contractor performance. Many existing studies on contracting have focused on cost as a measure of performance, primarily those concerned with the decision to make or buy. In these types of studies, cost may be a reasonable measure of performance, as the primary concern is determining which sector or organization can deliver services for the lowest investment. However, cost is a problematic measure of performance because it only accounts for inputs, ignoring outputs and outcomes. This dissertation introduces a new measure of contractor performance, based on how contracts come to an end. What follows is a detailed introduction to these contract-ending modifications and their relationship to contractor performance.

- *Closeout*: The normal conclusion of a contract is closeout. Once the terms of the contract have been met in a satisfactory manner for the contracting agency and the period of performance ends, the contract is closed out. This is an indicator of acceptable performance. Within this category, there is doubtless much variation. As a result, it is necessary to further stratify the closeouts to distinguish between higher and lower performing closeouts. Since FPDS-NG allows insight into every modification on the contract, I am able to determine both the total amount that the government spends on the contract (or obligates) as well as the total amount that that the government takes back (or deobligates) from the contractor. When contractors perform poorly, it is the responsibility of the contracting agency to take back obligated funds (Cooper 2003). Other recent studies have shown than financial actions, particularly the de-obligation of funds, are good indicators of poor performance (Brown, Potoski and Van Slyke 2013,

Hefetz, Warner and Vigoda-Gadot 2014). In keeping with these findings, I stratify closed out contracts into three categories based on the financial actions taken.

- *Low Performing Closeouts*: Contracts where more than 50 percent of the total allocated expenditure was ultimately deobligated. On these contracts, government took back more than half of the total money that was obligated over the period of performance. In their study of a series of complex, relational U.S. Coast Guard contracts, Brown, Potoski, and Van Slyke find evidence that government takes back money when contractors are performing poorly to limit public risk, to discipline service providers, and to provide financial incentives to work harder (Brown, Potoski, and Van Slyke 2013). Thus, high levels of deobligation indicate poor performance, even when contracts are ultimately closed out normally.
- *High Performing Closeouts*: Contracts where no funds were ever deobligated over the course of the contract. If contract managers attempt to use financial transactions to influence contractor performance, as previously discussed, contracts without deobligations are evidence of better performance.
- *Normal Closeouts*: All other closeouts. Contracts where some money was taken back, amounting to less than 50 percent of the total value initially obligated.

- *Termination for Convenience*: The government's unilateral contractual right to terminate a contract when acting in "good faith" without being required to pay damages, despite full contractor compliance with its contractual obligations. "Good faith" ensures that federal officials must have some reason to terminate the contract, but gives government wide discretion. This amounts to the exercise of the government's right to completely or partially terminate performance of work under a contract when it is in the government's

interest, and has no parallel in private sector contracting. Though government is not required to pay damages, in some instances, the contractor and government negotiate some form of payment to account for the lost opportunity for profit (Cibinic, Nash, and Nagle, 2006). There is some evidence that federal officials have used terminations for convenience to preserve relationships with trusted contractors despite performance problems on individual contracts (Hadden vs. United States, 131 Ct. Cl. 326, 130 F. Supp. 610, 1955). The court upheld the use of terminations for convenience to help contractors "save face," but made it clear that in doing so contractors relinquish the right to sue for damages. As such, termination for convenience is evidence of poor performance (Cibinic, Nash and Nagle 2006). This measure of contractor performance is slightly weaker than the two that follow, as it could also indicate a change in governmental priorities. However, even when political priorities shift, there is evidence that essential work continues (Meyers 1997). At best, contracts terminated for convenience can be considered non-essential. For contractors providing complex services, this alone may be evidence that performance was not optimal. At worst, terminations for convenience are evidence of poor performance where the government is willing to allow the vendor to preserve their reputation for future engagements.

- *Termination for Default*: The termination of a contract for commercial goods and services due to the contractor's actual or anticipated failure to perform its contractual obligations (FPDS-NG Data Dictionary, 2014, p. 20).[2] Commercial goods are those for which there are other purchasers. Examples in these data include guard services, construction and renovation projects, designing fire protection technologies, snow removal, and janitorial services. Termination for default is evidence of poor performance.

[2] FPDS Data Dictionary is available here: https://www.**fpds**.gov/downloads/.../**FPDS**NG_**DataDictionary**_V1.4.pdf

- *Termination for Cause*: The termination of a contract for non-commercial goods and services resulting from the contractor's actual or anticipated failure to perform its contractual obligations (FPDS-NG Data Dictionary, 2014, p. 20). Non-commercial goods are those for which the government is the sole purchaser. Examples in these data include education programs, program management and advice, smoke jumpers, tailored information technology products, and satellite communication systems. Though the words "default" and "cause" imply that different reasons exist for termination, this is not the case. Rather, both indicate the same performance failures, just for different types of goods and services. As such, termination for cause is evidence of poor performance.

Table 2.1 shows the frequency of each of these outcomes in these data. On aggregate, terminations comprise 12.40 percent of these data. Terminations for convenience account for just over 10 percent, while terminations for cause and default are much less common. Closeouts comprise 87.60 percent of these data, dominated by normal closeouts, which make up 48.46 percent of these data, and high performing contracts, which account for 32.68 percent. Low performing normally closed contracts account for approximately 6.5 percent of the full dataset.

Using these modifications as indicators of performance is a different approach than has been taken in the contracting literature in public administration. The measure allows this research to do something that previous research has not done: compare large numbers of contracts for widely varying goods and services in a meaningful way. This is possible because the measure leaves the performance assessment up to the contracting official who ends the contract. In this way, I am able to rely on the expertise of the person who intimately knew the details of the contract to provide an indication of how they believe the contractor performed – acceptably or otherwise. It is clear that this measure allows insight into the worst performers. Doubtless, early

terminations are evidence of poor performance. By stratifying the normal closeouts (i.e., those contracts where performance was acceptable) based on financial transactions, I can get some idea of variation within the category of acceptable performance. However, I am able to make stronger assessments of poor performance, as termination is the legally established method of addressing extremely negligent work. As a result, I focus most of my analysis on what influences the early termination of contracts. This is a potentially valuable new measure of performance that could allow the study of contracting to take on much larger studies of contracts, moving beyond simply comparing seemingly similar contracts, as has been long advocated in the field (Johnston, Romzek and Wood 2004).

One way to examine the appropriateness of this measure is to look at whether the final modifications are used similarly in federal agencies. Tables 2.2 – 2.4 show the relative frequencies of contract outcomes based on the quarter that the contract was completed, whether a good or a service was procured, and the contract length. In each of the three tables, the distribution of the variable of interest is relatively consistent. That is, contracts conclude in similar ways regardless of length, what is purchased, and what quarter the contract is signed in. This indicates that there is some consistency in how contracting officials apply these outcomes.

This measure is not without problems. First, suboptimal performance may not lead to termination, as ending a contract can be costly to agencies in various ways. For example, the contracting agency might look bad if too many contracts are terminated. Or contracting officials may be willing to continue to rely on a poorly performing contractor to avoid the red tape associated with public procurement or the costs associated with re-competition (Rainey and Bozeman 2000). I try to address this limitation by stratifying the closeouts according to financial

actions taken, a step which allows greater insight into the contracts that show signs of poor performance despite resulting in normal closeout.

Second, government has the unilateral right to walk away from all of its contracts – the termination for convenience. These contracts may be terminated for reasons unrelated to contractor performance. In many instances, the federal government may have changed priorities, lost available funding, or been subjected to external political forces focused on other priorities. Case law on termination for convenience indicates that the procedure exists to protect government from unnecessary expenditure when there is a "cardinal change" in contract requirements or circumstances (Krygoski Construction vs. United States, 520 U.S. 1210, 1997). Cardinal changes are primarily related to large shifts in the work to be performed, the presentation of unexpected costs that require additional competitive bidding, or evidence that the contractor cannot perform the work required (Krygoski Construction vs. United States, 520 U.S. 1210, 1997). However, given the administrative costs associated with termination, especially in comparison to the relatively lower costs of modification, termination for convenience only occurs when the federal contracting official recognizes a need for a change. This is reinforced by the courts, which give contractors who believe that they have been unfairly terminated for convenience recourse against the government via lawsuit. Thus, despite its comparatively common use, terminations for convenience are also indicative of problems with the contract. At best, terminations for convenience indicate poor planning or political shifts within the government. At worst, they indicate the government's desire to walk away from a contract due to issues with contractor performance, but without assigning blame to the contractor (Cibinic, Nash and Nagle 2006). Indeed, terminations for convenience can be more palatable to a contractor who is underperforming, and as a result may be used frequently to terminate contracts for poor

performance without risking legal action or damaging the relationship between the government and a commonly used contractor (Cibinic, Nash and Nagle, 2006). The FAR even goes so far as to allow contract managers to change the reason for termination to "convenience" instead of "default" or "cause" should post-hoc assessments reveal that termination might be contested (FAR, 52.249-8). This suggests that the federal government is sometimes willing to assign no blame even for poorly performing contractors. The use of terminations for convenience is a fertile area for future research. For the purposes of this dissertation, such contracts will be conceptualized as evidence of performance problems, consistent with the general approach in the public sector contracting literature (Cooper 1980, Kelman 1990, Cooper 2003, Cibinic, Nash and Nagle 2006).

Finally, the context of a contract is incredibly important for determining the meaning of its outcome. The context includes the requirements of the contract, the agency overseeing the contract, the macro-level conditions surrounding the procurement, and the characteristics of the contractor. Though addressing the every element of context statistically is nearly impossible, recent efforts have been made to attempt to build some theory around how context influences management variables. These initiatives have found that the political, environmental, and organizational context of management are primary areas that influence managers (O'Toole and Meier 2015). To account for these contextual differences, I include a multitude of control variables which are described at length below. In addition, by limiting these data to definitive contracts that span more than three weeks and involve substantial expenditures, some of the inherent differences between contract types are avoided. The present dataset consists of complex definitive contracts that involve a meaningful exchange of resources over an extended period of time. However, they are not complicated by the ability to make multiple task orders for various

marginally related products or services, as can be the case with indefinite delivery vehicles (IDVs). Eliminating IDV contracts reduces the number of contextual variables, particularly concerning relationships between task orders, which affect contract management. Similarly, simple procurements, such as the purchase of office supplies, which involve lower stakes and fewer management decisions, are also eliminated. By limiting the contracts to similar types and including many contextual controls, this research attempts to draw conclusions for a set of contracts that, though for diverse products and services, are similar in the types of management challenges that they pose for public contracting officials.

Using conclusory status to assess performance has the potential to vastly improve on studies which have focused on government inputs as a measure of performance instead of any output or outcome. One of the primary rationales for the scientific study of physical and social processes is to identify truths which undergird or motivate systemic relationships (Kuhn 2012). The current approach to contracting research has focused largely on case studies (for examples, see Romzek and Johnston, 1999; Brown, Potoski, and Van Slyke, 2013). While case study research is acknowledged to allow detailed insight into problems, promulgate new ideas, and perhaps lead to inductive theory generation, case studies suffer from various problems, including limited external validity, difficulty in sorting out cause and effect, and the application of unscientific selection and assessment methodologies (Singleton Jr, Straits and Straits 1993). Many of the more recent advances in the study of public administration and policy have come from efforts to move away from research driven by case studies. This research has tended to be of two primary types, both designed to maximize research validity. The first approach has been experimental research, which attempts to control the context of the observation, thus maximizing the internal validity of the findings. Though commonly used in other fields, experiments are still

relatively new and under-explored in the public administration literature. The second approach has been to use large numbers of observations in an effort to maximize the external validity of research. The primary analytic method used in this line of research has been statistical modelling, primarily through regression techniques.

Contracting research has used disappointingly little of either approach. In part, this is because of an inability to compare between contracts for different products and services. When using input measures of performance, such as cost, comparability is a real problem. Cross-product comparison is akin to trying to explain the difference between apples and oranges – that is, interpretations would be meaningless as the characteristics are so fundamentally different as to render the comparison useless. As a result, some have even gone so far as to argue that large *n* studies should not be attempted without extensive controls because contracts are so different (Anderson and Dekker 2005). These claims are primarily based on the use of input measures, no other performance measures. Using a combination of financial transactions, managerial actions, and a contract's conclusory status, while controlling for many contextual factors enables the comparison of contracts for wide-ranging goods and services. Throughout the period of performance, contract managers use monetary exchanges to reward good performance and punish shirking. Government officials consistently assess performance, and should the contractor fail to meet requirements, have a responsibility to end the contract (Cooper 2003, Cohen and Eimicke 2008). Upon the conclusion of a contract, the aggregated managerial actions and ending status of the contract contain strong indicators of performance. These managerial techniques do not vary by product or service type, at least not within the subset of stand-alone, relational contracts selected (Brown and Potoski 2003, Anderson and Dekker 2005, Sols, Nowick and Verma 2007). Thus, the measures presented have the potential to change the study of public

sector contracts by enabling the use of regression techniques on large samples. The ability to analyze large numbers of contracts means that existing theories heretofore addressed using only case studies can be tested using advanced statistical methods. The following section describes the primary statistical approach taken in the empirical chapters of this dissertation.

Method: Multinomial Logistic Regression

The variable of interest in this analysis is an unordered, categorical measure of contractor performance. The performance measures used are discrete, qualitative categories. Ordering these categories is difficult because two of the categories indicate the same performance for different types of products (termination for cause and termination for default). As a result, the analysis primarily relies on multinomial logistic regression (MNL), which is expressed as follows:

$$p_{ij} = p(y_i = j \mid \boldsymbol{w}_i') = \frac{exp(\boldsymbol{w}_i'\gamma_j)}{\sum_{k=0}^{m} exp(\boldsymbol{w}_i'\gamma_k)}$$

The model estimates a set of equations that assess the probability of selecting one of the *j* outcome categories given the $\boldsymbol{w}_i'$ characteristics of the decision-maker (Greene 2003). In the expression, *m* is the number of categories from which selections can be made, while *k* refers to the number of choices not made – that is, the unselected options. The equation calculates the probability of category selection by comparing the occurrence of one category against the sum of the occurrence of all of the other categories. The estimated equations provide a complete set of probabilities for the *j*-1 choices available to the decision-maker, meaning that a reference category is used to interpret findings. This research is designed to identify characteristics of contracts that perform well or perform poorly. As a result, the reference category for this analysis is always normally closed out contracts. For this research, y_i refers to the contract outcome and $\boldsymbol{w}_i'$ is the catch-all set of coefficients for the explanatory and control variables.

Since the expression of the MNL model is so broad, it may be useful to think of this model in terms of categories of variables, which allows greater insight into the ways that $\boldsymbol{w}_i'$ controls for contextual elements. Though the actual modeling is not linear, but a form of maximum likelihood estimation, the equation below – a simplified treatment – allows for easier conceptualization. Contractor performance is the variable of interest, while contract design refers to the vectors of primary explanatory variables. The other categories of variables are included to control for important contextual elements, including the work to be done, the economic and political environment surrounding the procurement, and the characteristics of the parties to the contract (Anderson and Dekker 2005, Brown, Potoski and Van Slyke 2006). Control variables are discussed in detail later in this chapter.

Conceptual Model

Pr | Contractor Performance = Contract Design + Contract Requirements + Procurement Conditions + Department Characteristics + Vendor Characteristics

MNL models assume that the categories of the outcome variable (in this case, conclusory status) are exclusive, and that the addition of new options will change the probability of selecting other outcomes. The second assumption is known as the assumption of the *independence of irrelevant alternatives* (IIA) (Kennedy 2008). Multinomial models assume that the different outcome categories must have distinct, contingent probabilities based on the presence of the other options. This means that the addition of any new option must change the probability of selection of the rest of the options. Because of this, the model is appropriate when outcomes are not close substitutes. Since there are strong legal differences between the types of termination, as well as clear differences between the financial actions taken, conceptually the outcome categories of this research are acceptable. Additionally, I conducted Hausman tests for the

presence of an IIA violation. These tests presume that if an option is irrelevant dropping it will not systematically influence the other parameter estimates of the model (Hausman and McFadden 1984). Hausman tests on these data demonstrate that dropping any one of the outcomes changes the other estimates, indicating that there is no IIA violation.

Interpreting the coefficients of multinomial logits is often difficult. This is due to the fact that every subvector of coefficients enters every marginal effect, both through the probabilities and the weighted average of marginal effects. The sign of the marginal effects is not always the same as the sign of the coefficients. To ease interpretation, this research presents relative risk ratios instead of coefficients. Relative risk is the ratio of the probabilities of the outcome occurring in one group versus the other groups. This method allows for a meaningful understanding of the impact of one choice over another. For this dissertation, significance of relative risk is only reported in cases where the regression coefficient is also significant.

Contract Design: Primary Explanatory Variables

This dissertation contains three empirical chapters, each of which examines the effect of one element of contract design on performance. These decisions about contract design serve as the primary explanatory variables for this research. The empirical chapters provide thorough justifications for why these design elements are important. Here, I briefly describe each one, identify the data source and the measure used, and provide some descriptive statistics.

Competition

The first empirical chapter assesses whether competition influences contractor performance. Competitive markets are theorized to drive down prices to an economically efficient level (Weimer and Vining 2005). Firms undersell one another over the short run to gain market advantages, ultimately leading to the elimination of profit in the long run. As a result,

competition forces firms to sell their goods and services for the lowest possible price that they can sustain. In addition, competition maintains a certain level of accountability for products, as other firms are quick to take advantage of quality problems as they arise in the products or services of competitors. As such, competition leads to efficient pricing and increased accountability, both important goals in the public sector.

This theoretical framework serves as a leading rationale for contracting out government work of all types. In practice, public managers have to decide, based on an assessment of market strength and various procurement regulations, whether the contract should be advertised for competitive bid, a process also known as competitive sourcing. Despite this, little empirical work has been done to analyze whether competition improves contractor performance. Instead, previous studies have tended to focus on whether competition reduces initial investment.

FPDS-NG includes information on the extent to which federal contracts are competitively sourced. Contract managers are required to input both the competitiveness and the specific solicitation procedures used. The FPDS-NG "extent competed" data element (10A in the FPDS-NG Data Dictionary) offers the user the seven options shown in table 2.5. Four of these options reflect a competitive bidding process, while three are non-competitive sourcing mechanisms. In these data, just over 62 percent of contracts are competitively sourced.

Competitiveness is operationalized in two models. First, I assess the overall effect of competition using a dichotomous indicator of whether the contract was sourced using competitive solicitation procedures. Three types of solicitation procedures are included in this measure of competitiveness: full and open competition, competition after the exclusion of sources, and competitively sourced SAP. Contracts that were competitively sourced are coded as "1" and noncompetitive contracts are coded as a "0." This allows insight into the overall impact

of competitiveness on performance. Second, I use separate dummy variables for each competitive solicitation procedure to understand the effects of each mechanism individually. This permits insight into differences between how the mechanisms, which allow varying levels of competition, affect performance.

Financial Structure

The second empirical chapter assesses whether the financial structure of the contract influences contractor performance. During the early stages of designing a contract, public officials must determine the payment structure that they will use. Payments are an important way to hold the contractor accountable, gather information about their performance, and incentivize performance. There are three primary types of financial structures used at the federal level: fixed-price contracts, cost-reimbursement contracts, and labor-hours/time-and-materials contracts. Each of these financial structures provides different benefits and drawbacks for public contract managers.

Fixed-price contracts place the burden of performance risk on the contractor, who must accomplish the work for the pre-established price that the government sets (Curry 2010). Such financial incentives also lower the needs for oversight, as the contracting official can rely on the profit motive to help keep the contractor accountable (Shenson 1990). However, fixed price contracts involve less exchange of detailed information. The government receives less information to use for ongoing performance assessments. Such contracts are preferred when contract requirements are clear and where a competitive market exists. Fixed-price contracts are preferred in the FAR, as they theoretically leverage market forces and reduce government expenditures on oversight.

Cost-reimbursement contracts require the contractor to submit detailed reports on expenses incurred over the contract's period of performance (Cooper 2003). Contractors are allowed to make charges up to a certain pre-established level. Cost-reimbursement contracts may not motivate efficiency, as there are strong incentives to charge as much as possible to reach the price ceiling on the contract. Certain incentive packages, such as award fees and performance bonuses, can be built into cost contracts to ensure performance. Such contracts are preferred if requirements are unclear or if there is not an existing market for the good or service. Government bears much of the risk for monitoring performance on these contracts, and as a result, receives very detailed performance information in the form of reimbursement receipts. Reviewing receipts offers great insight into of contractor activities, but can also be very time consuming and costly. Cost-reimbursement contracts may be for projects where private markets are weak or non-existent, though the FAR recommends using them only if other options are not available. Labor-hours and time-and-materials contracts (called time/labor contracts in this research) are very much like cost contracts, but do not necessarily establish an overall price ceiling for the contract unless they are written to a single bidder. These financial structures are used when requirements are very vague and the period of performance is difficult to define.

FPDS-NG includes information on which of these financial structures is used on each contract. Contract managers are required to input the specific financial mechanism used, the "Type of Contract" data element (6A in the FPDS-NG Data Dictionary). I have created dichotomous indicators for cost and labor-hours/time-and-materials contracts, leaving fixed-price contracts as the reference category. As table 2.6 indicates, nearly 79 percent of all contracts in this dataset are fixed-price contracts, confirming broad adherence to the preference for these

contracts in the FAR. Indeed, fixed-price contracts are more common than competitively sourced contracts, suggesting that the procedure is used to offset market competitiveness problems.

Discretion

The final empirical chapter assesses whether public contract managers use the discretion afforded to them and whether their use of discretion influences contractor performance. For contracts valued less than $150,000, the federal government grants contracting officials wide discretion in designing contracts through the simplified acquisition procedures (SAP). SAP loosens recommendations on competitiveness requirements and allows the contracting official to choose the pricing structure freely. Though contracting officials have considerable discretion in the management of all other contracts, their discretion is increased on SAP contracts.

There is debate in the public administration and political science literatures over how much discretion should be afforded to public administrators. Scholars of public administration have made strong arguments that the use of technical expertise is an important way that public administrators can influence the performance of public agencies (Friedrich 1940, Romzek and Dubnick 1987, Meier and O'Toole 2006). Others have suggested that control should be exercised to ensure that democratic values, primarily accountability, equity, and representativeness, are preserved (Finer 1936, McCubbins, Noll and Weingast 1987). Contract management is an area where federal managers have much expertise, in terms of both the contract design and the day-to-day management of the contract (Cooper 2003, Cohen and Eimicke 2008).

FPDS-NG includes information on which of these contracts used simplified acquisition procedures. SAP is referenced in both the “Solicitation Procedures” and “Extent Competed” data elements (10A and 10M, respectively, in the FPDS-NG Data Dictionary). I created a dichotomous dummy variable for SAP contracts, including all contracts that listed SAP as a

solicitation procedure or a competitive mechanism. SAP were used on a subset of 4,195 contracts, or 17 percent of the dataset (see table 2.7).

Control Variables

Even though this research uses a measure of performance that is, at least theoretically, comparable across many types of contracts, it is necessary to include independent variables that control for as many environmental elements as possible. Contracts included in the dataset range from the purchase of complex goods to the management of long-term services. Contracting agencies vary in their priorities and processes. Economic conditions over the period studied (2005 – 2014) were dynamic, as was political influence. Finally, contractors themselves influence the contracting process in ways, particularly at the federal level where preference is given to certain types of contractors. What follows is a brief discussion of the many control variables that are used in this analysis. The discussion is organized based on the conceptual model presented above, with related variables discussed in groups. For each variable, I identify the source of the data, describe how I operationalized the measure, and provide some brief descriptive statistics. Complete descriptive statistics can be found in table 2.8.

Contract Requirements

The first step in creating a new contract is to develop a list of requirements that outline the type of work to be performed and the duration of the contract (Curry 2010). These requirements can vary in complexity, based on factors such as the work to be performed, the length of the contract, and the legal restrictions placed on the contractor and contract manager. As contracts mature, requirements may change, necessitating modifications. Modifications can also be used to incentivize or punish the contractor based on perceived performance. As a result,

requirements related to both the service procured and the management steps taken on a contract can provide insight into the complexity of the work performed.

This category of variables controls for the complexity of the work being performed, as this could influence contract design. Included are variables that account for both the type of work and the duration of the contract. In addition, I control for contracts that may be particularly important due to the impact that they have on work processes and management (Anderson and Dekker, 2005). To augment variables about the initial complexity of work performed, the type and frequency of modifications to contracts serve as indicators of the status of the relationship between the two parties as contract demands change. Control variables for contract requirements included in the current research are:

- **Service**: a dichotomous indicator of whether the contract is for a good or a service. FPDS-NG includes a product/service classification for every contract (8A in the FPDS-NG Data Dictionary). Codes beginning with numbers reference goods, while codes beginning with letters reference services. Nearly 90 percent of contracts in these data were for a service, which makes sense given the focus on complex, relational contracts.
- **Contract length** (in months): a continuous indicator of the duration of the period of performance. This was calculated by subtracting the date signed from the date of the final contract modification. The resulting number of days was then divided by 30. Length is an indicator of the complexity of the contract (Anderson and Dekker 2005), as well as of the duration of the relationship between the parties (Bertelli and Smith 2010).
- **Contract modifications**: a dichotomous indicator of the contracts that had 10 or more modifications, or mods, over the period of performance. The mean contract in this dataset was modified more than five times, although the median contract was only modified three

times. This indicates that heavily modified contracts are relative outliers in these data. Since regression models focus on the means of continuous variables, effects of highly modified contracts on performance can be reduced with such skewed data. Including a dichotomous indicator for contracts that are modified many times instead of a continuous measure provides insight into contracts that were particularly difficult to manage. FPDS-NG tracks all of the modifications made on a contract. I summed the total number of modifications for each contract, resulting in an integer value. Modifications are changes to the contract's management. Generally, more mods suggests greater management complexity and may indicate performance problems (Cooper 1980, Shenson 1990). To capture the effect of high numbers of modifications, I include a dichotomous indicator for all contracts modified ten or more times. In addition, modifications can provide some insight into the relationship dynamics between the department and the contractor. The use of particular types of actions, such as the establishment of new and supplemental work agreements, change orders, funding only actions, and the exercise of options can indicate ongoing performance, especially when looked at in conjunction with the financial actions taken (Cibinic, Nash and Nagle 2006). As a result, I include some related variables, all captured under the "Reason for Modification Code" in the FPDS-NG (12C in the FPDS-NG Data Dictionary):

- *Additional work*: contractor is awarded additional work under a new agreement. Potentially an indicator of good performance, as it is logically unlikely that new work would be awarded to a suspect performer. This is supported by these data, which indicate that contracts modified in this way did not experience deobligations. Coded as an integer value capturing the total number of

modifications for additional work. More than 95 percent contracts in these data were not awarded additional work, though some received as many as 23 such modifications.

- *Supplemental work*: contractor is given supplemental work under the existing agreement. Again, this is proposed as an indicator of stronger performance, and this is supported in these data, which show that contracts granted supplemental work rarely have resources deobligated. Coded as the integer value of the number of supplemental work agreements reached. More than 70 percent of contracts in these data did not receive supplemental work, and fewer than 5 percent received more than 3 such modifications.
- *Change orders*: changes to the contract's requirements, scope of work, or other managerial elements. Change orders are common, but more change orders generally indicates that the contractor is in need of redirection (Kerzner 2013). As such, more change orders may indicate poor performance. Coded as the total number of change orders made to the contract. Approximately 16 percent of contracts were modified by change order.
- *Exercise option*: options allow contracting officials to build in incentives and punishments for performance criteria. Depending on the financial transaction, options can indicate both good and bad performance. Taking away resources indicates bad performance, while adding money is evidence of strong performance. This concept is operationalized as two variables. The first is the integer value of all positive options exercised. The second is the integer value of

all negative options exercised. More than 20 percent of contracts had options exercised.

- *Funding only action*: actions taken to either add to or take away resources from a particular contract. This concept is also separated into positive and negative integer values. Nearly 25 percent of contracts were modified by funding only actions.
- *Other administrative action*: a catch-all category of administrative actions not defined in other categories, this modification is commonly used in FPDS-NG. Once again, my interest here is in the positive and negative financial transactions that occur. More than 35 percent of contracts were modified in this way.

- **Performance-based contract**: contracts that describe the requirements based on the anticipated results instead of how the work should be performed (FAR 37.6). Such contracts use measurable performance standards and include accountability and oversight plans (FAR 42.1). FPDS-NG requires contract managers to record whether contracts use performance-based requirements (6F in FPDS-NG Data Dictionary). These contracts offer insight into the ability of public administrators to effectively identify desired outputs and outcomes during the design phase. Performance-based contracts are coded as "1" while all other contracts are coded as "0." More than 20 percent of the contracts included in this dataset are performance-based contracts.
- **FedBizOpps**: many federal contracts are required to be advertised on FedBizOpps.gov, a website that lists bidding opportunities for potential contractors (FAR 5.2). This data element, 10S in the FPDS-NG Data Dictionary, identifies whether the procurement was officially listed on the government website. Not all contracts are required to be listed, as

there are many exemptions (see FAR 5.202). 34.32 percent of the contracts in this dataset were advertised. The variable allows insight into the effect of transparent advertising of solicitations. Again, I use a dummy variable to indicate which contracts were advertised on FedBizOpps.gov.

- **Indicators of Complex Services**: all of the contracts included in this dataset are fairly complex, involving a long period of performance and a large allocation of resources. However, certain types of procurement initiatives involve higher levels of risk for the contracting agency (Williamson 1979, Anderson and Dekker 2005, Brown, Potoski and Van Slyke 2006). These contracts are for goods or services that change the processes or context of organizational management in important ways. FPDS – NG identifies the product/service code for each contract. Some contracts are for the purchase of complex goods and services that can be classified as having high asset specificity and complexity (Williamson, 1981). Asset specificity means that there is a limited additional market for the service provided. As a result, firms take a high risk in providing such services, as there is no easy way to repurpose the resources expended to generate the product. Complexity is an indication of the shared understanding of the service across the partners to the contract. For each of the five types of products (to be explained shortly), government officials tend to know far less about the product provided than the contractor, and overcoming that gap is virtually impossible (Brown, Potoski and Van Slyke 2006). As a result, public officials are at a permanent information disadvantage for contracts that procure these types of services. This problem is compounded by the fact that these contracts are for services that are integral to organizational management and change – that is, government officials need this type of contractual support but the type of work

creates information asymmetries that make oversight extremely difficult. As such, these are contracts of particular interest when studying design elements that can shift risk, leverage markets, and access public sector contracting expertise. Using the FPDS Product and Service Codes Manual,[3] it is possible to identify the type of good or service procured. For this analysis, I include dichotomous indicators for five types of services which are particularly integral to organizational performance, with "1" indicating the presence of each complex service.

- *Professional Services Contracts*: management consulting and other contracts for administrative and managerial services are integral to organizational management, often involving changes to important processes and procedures that require careful management (Pemer, Werr and Bianchi 2014). Such contracts can influence the day-to-day management of organizations, insert external workers into the public workplace, and juxtapose private-sector values which may run counter to public employee motivation (Perry and Wise 1990, Light 2008, Voelz 2010). As such, professional services contracts may present challenges for public managers attempting to improve their organization while retaining a strong workforce dedicated to public service. The FPDS Product and Service Codes Manual codes all contracts for professional, administrative, and managerial support services beginning with the letter "R." Of the contracts in this dataset, 6,443 contracts (26.41 percent) are for professional services.
- *Information Technology (IT) Contracts*: public organizations increasingly rely on technology to facilitate daily management, such as communication, oversight and

[3] The FPDS Product and Service Codes Manual is available here: https://www.acquisition.gov/sites/default/files/page_file_uploads/PSC%20Manual%20-%20Final%20-%2011%20August%202011.pdf

accountability, and performance reporting (Moon 2002, Behn 2003, Tolbert and Mossberger 2006). However, there are indications that public organizations are not able to use IT with the same flexibility and success as private organizations (Kern and Willcocks 2000, Bretschneider 2003, Goldfinch 2007). Instead of focusing the decision to contract out on institutional need or market capacity, political factors influence public procurement of IT (Ya Ni and Bretschneider 2007). These findings suggest that IT is an area where public organizations may have difficulty matching institutional constraints with the realities of the swiftly moving IT marketplace. IT purchases are coded as "D" within the FPDS Product and Service Code Manual. In addition, I include contracts for IT equipment installation, maintenance, and repairs, and modification which can be classified under "N", "J", and "K" respectively. The variable is a dichotomous indicator of the purchase, installation, maintenance, and modification of IT products and services. 1,015 contracts, or 4.16 percent, are for IT products and services.

- *Education and Training Contracts*: procurement of training and education services may indicate a perceived need to change or improve organizational performance. Education and training programs for managers are integral to the performance of public organizations (Sandwith 1993). However, the use of third party trainers has been shown to have mixed effects in both the public and private sectors (Reichard 1998, Storey 2004). Training tends to be more effective in organizations where management has identified a need, rather than in instances where training is forced on work units or used as a method to spending down remaining budget balances (Storey 2004, Douglas and Franklin 2006). These

findings indicate that the impact of training contracts is dependent on the management of the contractor and the purpose of the training initiative. Training contracts are listed in the FPDS Product and Service Codes Manual as "U." 270 contracts, or 1.11 percent, are for training and education services.

- *Research Contracts*: the federal government has long championed both basic and applied research initiatives. Basic research is the effort to develop new scientific theories for which no market already exists. Such initiatives are generally justified by market failure theories, which hold that there are long-term benefits to such research even though no current market exists (Nelson 1971). Applied research is the effort to turn theoretical findings from basic research into marketable or otherwise useful products and services. Though most of this type of work is now handled by grant programs, which use panels of subject matter experts to review applications and fund those perceived best, contracts are also used to procure this type of work (Meyer 2003). Generally, studies on publicly funded research initiatives have shown that there are both short- and long-term economic benefits to such initiatives (Salter and Martin 2001). However, contracts for research often have poorly identified requirements, imply unknown performance outcomes, and entail a large information asymmetry between the contracting official and the researching contractor (Poyago-Theotoky, Beath and Siegel 2002). As such, management is difficult and the risk taken by government is comparatively high. Research contracts are listed as "A" and "B" in the FPDS Product and Service Codes Manual. In addition, I included all contracts that list "Basic Research" as

the solicitation procedure used. 3,068 contracts in the dataset are for research, or 12.58 percent.

- *Construction Contracts*: construction and maintenance in the office setting can negatively affect employee motivation and performance (Wineman 1982, Maloney 2002). However, if construction efforts are completed in ways that encourage interaction, communication, and comfort, they can improve organizational performance over the long term (Menzies et al. 1997, Bergs 2002). Thus, construction contracts are influential in the workplace. At the same time, there is a strong market for construction services, which limits asset specificity and makes price determination easier than for other products that the public sector routinely purchases (Prager 1994). This means that transaction costs are comparatively low for the contractor, suggesting that construction products are an area where the public sector can achieve great value through private procurement initiatives. Construction provides a nice foil for the previous four types of contracts. Though information asymmetry and the importance of the work remain high, the existence of a thick market to provide services allows the research to test whether the government is able to leverage the competitiveness of this marketplace for performance improvements. Construction contracts are classified as "C," "Y," and "Z" in the FPDS Product and Services Code Manual, capturing engineering services, construction, and maintenance contracts respectively. 5,382 of the contracts in this dataset (23.99 percent) are for construction-related projects.

Department/Agency Variation

Different federal organizations procure a diversity of goods and services and have varying procurement policies and procedures (Martin 2002, Brown, Potoski and Van Slyke 2006, Smith and Fernandez 2010). As a result, there are likely meaningful variations between departments and agencies. In addition, each contract is of differing importance for each organization, sometimes based on the value of the contract but other times as a result of the specific type of work performed (such as strategic planning). This group of variables controls for the impact of department-specific variation.

- **Cabinet Department**: institutional location is indicative of the political preference for the work of an agency, as well as the degree of control that external accountability mechanisms have over a particular federal department (Chun and Rainey 2006, Kettl 2014). Cabinet departments have the most political support and more external oversight than independent agencies. As such, it might be expected that contracts in cabinet-level departments might be more susceptible to more political interference and control than contracts in other agencies. This control variable is coded as a "1" for cabinet-level departments and a "0" for all other agencies. Nearly 88 percent of the contracts in the dataset were written by cabinet departments.
- **Agency Type**: Meier, based on the work of Lowi, asserts that the purpose of an agency influences its management, including the processes it uses to accomplish its goals, the accountability mechanisms in place to ensure its performance, and the support it receives from different political factions (Lowi 1972, Meier 1987). Using their definitions of policy areas, I include dichotomous indicators for the following agency types. Of note,

agencies often have programs of multiple types, so can be classified as one or more of these types.

- *Distributive*: agencies that provide benefits to subgroups, including subsidies, write-offs, and tax benefits. These programs are designed to promote certain policy initiatives. I use Meier's and Bohte's classification of federal distributive agencies (Meier and Bohte 2007). 74.44 percent of the contracts written were for agencies classified as distributive.
- *Redistributive*: agencies that promote equality through the redistribution of wealth from one social group to another. Social welfare programs such as social security and Medicare are examples. Again, I use Meier's and Bohte's classification. 8.31 percent of the contracts written were from departments and agencies classified as redistributive.
- *Constituent Services*: organizations created to serve a particular constituent group, primarily through service provision and issue advocacy. The Department of Veteran's Administration and the Bureau of Indian Affairs are examples. 24.81 percent of contracts studies were written by constituent services agencies.
- *Regulatory*: agencies tasked with the oversight of a particular industry or policy area. Responsibilities include instituting policies to counteract market failures and reduce externalities. I use the Congressional Quarterly's Federal Regulatory Directory to identify agencies that have regulatory responsibilities, as established in Chun and Rainey (2006). Agencies in the directory are coded as a "1" while all other agencies are coded as "0." 59.97 percent of contracts included in the dataset were from regulatory agencies.

- **Policy Problem Complexity**: to address the overall problem complexity that the agency confronts, I use the professional staff ratio (Chun and Rainey, 2006), which is calculated as the percentage of professional employees to total employees in the year of the contract's initiation using data from OPM's FedScope. Professional staff include scientists, engineers, psychologists, and attorneys. Organizations require more professional staff to deal with more complex policy areas (Chun and Rainey, 2006). Professional staff ratios range from a minimum of 2.22 percent (Millenium Challenge Corporation) to a maximum of 70.9 percent (Securities and Exchange Commission). On average, federal agencies have professional staff ratios of 27.24 percent.
- **Department Age**: In years, the age of the department or agency. There is some dispute over how to calculate age, as portions of departments often exist prior to the creation of a new department (Chun and Rainey, 2006). I used the official departmental or agency creation date to calculate the agency age at the time of contract initiation. Even though parts existed prior to the creation of current agencies, management styles and cultures change dramatically with the creation of new organizational structures (Fernandez and Rainey 2006, Wise 2006, Comfort, Waugh and Cigler 2012). Departmental age varies greatly, as some departments have been around since the nation's founding, while other agencies were created during the time studied.
- **Department Size (log)**: The most common measure of organizational size is the number of full time employees (Price and Mueller 1986). Using OPM's FedScope database, I gathered annual employment numbers for all federal departments and agencies included in the study from the year 1999 (when the first contract included in the dataset was

initiated) through 2014 (when the final contract was initiated). Then, to normalize these data, I took the natural logarithm of the total number of employees in the agency.

- **Department Discretionary Budget (millions of dollars)**: Another measure of organizational size is the total discretionary spending of a public agency (Sharkansky 1968, Young 1991, Thompson 1997). The Government Publishing Office (GPO) provides complete annual federal budget data.[4] I used the "Outlays" table on the "Public Budget Database" to determine total discretionary outlays for each department and agency over the period studied. The budget data used are from the year that the contract was initiated. These data are expressed in terms of millions of dollars.
- **Percent of Agency Discretionary Budget**: To assess the importance of the contract to the federal agency, I calculated the percentage of the discretionary budget spent on the contract. To do this, I divided the total spending on the contract by the total discretionary budget over the period of performance. Contracts which account for a higher percentage of total spending are likely to be of greater importance to the agency, as well as to receive greater attention from political actors (Brown, Potoski and Van Slyke 2013). 13 of the 29 departments and agencies included in this study (or 44.83 percent) have definitive contracts during this time frame that accounted for more than 1 percent of the total budget. However, most of the contracts are small in comparison to the overall agency budget. As a result, I adjusted the values by multiplying each by one thousand. This does not change the variable, but alters how it should be interpreted.

[4] GPO budget data for years 1996 – 2017 are available here: https://www.gpo.gov/fdsys/browse/collectionGPO.action?collectionCode=BUDGET

Procurement Conditions

This analysis focuses heavily on the practical context of each contract, particularly the political, economic, and managerial constraints placed on the public manager. Market conditions, particularly the number of bidders, can be an important consideration when contracting out (Girth 2014). There is some evidence that contracts are influenced by political factors, particularly the preferences of powerful political actors and interests (Rich 1989, Kettl 2000, Fernandez, Malatesta and Smith 2013). There is also evidence that the strength of markets and the economic conditions surrounding procurement (such as emergencies) can influence both source selection and performance (Brown, Potoski and Van Slyke 2006, Girth et al. 2012, Sylves 2014). Finally, managers are often constrained by procedural demands, such as the yearly budget cycle. The following controls are included to account for the conditions of the procurement effort, particularly the political, economic, and procedural constraints on the manager.

- **Number of Bids**: The number of bids received is a commonly used measure of market competitiveness (Savas 1977, Girth et al. 2012, Brown, Potoski and Van Slyke 2013). Contracts which receive more bids are leveraging more competitive marketplaces. FPDS-NG includes information on the total number of bids received for each contract. To add granularity to the analysis, I include dichotomous indicators for contracts which receive only one bid (that is, where markets are particularly weak), and for contracts that receive five or more bids (where markets are likely strong). As with modifications, the data on bids is very skewed. Focusing on mean values does not accurately describe the effects that are most interesting. In the case of bids, procurement conditions are better analyzed using indicators of market competitiveness for the good or service procured. Dichotomous indicators of single bids and high numbers of bids enables the comparison

of markets based on their competitiveness. 4,718 contracts in the dataset, or 19.34 percent, received five or more bids. Nearly 52 percent of the contracts in this dataset received only one bid.

- **Organizational Leadership**: A measure of political support between department's chief political appointee and Congressional overseers. This differs from the traditional approach of matching the President's party with the majority party in Congress. My measure is designed to account for relationships between individual political appointees and the Congressional majority. I include measures for both the House and the Senate. This could be particularly important for the transition years between the Bush administration and the Obama administration, during which many Bush appointees remained in important positions due to the recession and ongoing international conflicts. In most cases, this measure will be the same as the traditional measure of political support. However, this measure may differ for departments and agencies involved in particularly important policy areas that required specific types of bipartisan support, a variation that is important to capture when considering the climate surrounding contracting decisions. For most appointees, political party affiliation is obvious due to previous offices held. In instances where affiliation is not as clear, I use political contributions data from www.campaignmoney.com to determine which political party the appointee supported most in the two election national cycles prior to their appointment to the federal government. Agency heads are of the same party as the majority party in the House of Representatives for 58.28 percent of the contracts, and of the same party as the majority in the Senate 69.5 percent of the contracts.

- **Recession Year**: The Great Recession occurred during the period of this study. In response, federal government spending rose in a Keynesian attempt to counteract macro-economic forces stifling American economic growth (Gosling and Eisner 2013). According the Bureau of Labor Statistics, the recession lasted from December 2007 until June 2009.[5] Accordingly, I include a dichotomous indicator for all contracts signed during this time frame. 5,243 contracts in the dataset, or 21.49 percent, were written during this short period of time.
- **Fourth Quarter**: The federal budget cycle runs from 1 October to 30 September each year. Public finance literature suggests that in the final quarter of each year, there is pressure on public managers to spend their remaining budget to ensure similar funding levels in future years, and contracting is thought to be a common method used to do this (Lewis and Hildreth 2011, Rubin 2013). To account for the effect of the public budgeting cycle, I include a dichotomous indicator for all contracts signed in the fourth quarter of the federal fiscal year – July, August, and September. 10,136 contracts, or 41.55 percent, were signed during the fourth quarter.
- **Emergency Procurement**: Some contracts are written in response to emergency conditions. These contracts are not just for emergency response activities, but for other types of emergencies, including repairs and other contingency contracts. Such contracts are not subject to all FAR requirements (FAR 1.602-603, 2014). In emergency conditions, requirements generation and contract planning may be less thorough, relying on contracting officials to make quick decisions using their expertise to preserve public values (Cooper 2003). FPDS-NG identifies emergency contracts in data element 9J,

[5] From Bureau of Labor Statistics report "Spotlight on the Great Recession," 2012, available here: http://www.bls.gov/spotlight/2012/recession/pdf/recession_bls_spotlight.pdf

which describes exemptions from the System for Awards Management. In addition, I identified all contracts that include a specific reference to emergency demands for services in the full contract work description (FPDS Data Dictionary data element 6M). I created a dichotomous indicator for all contracts that were either exempted from SAM for emergency conditions or described emergency conditions in the description of work requirements. 133 contracts, or 0.55 percent, are emergency contracts.

Vendor Characteristics

Characteristics of the contractor are also potentially important for contractor performance (Brown, Potoski and Van Slyke 2006, Smith and Fernandez 2010). Recent work indicates that nonprofit organizations may have goals that are more closely aligned with public organizations, resulting in cultural similarities that could improve performance (Brown, Potoski and Van Slyke 2006, Van Slyke 2007). At the same time, small-, minority-, veteran-, and woman-owned businesses are given preference in the source selection process, potentially influencing performance (Snider, Kidalov and Rendon 2013). To account for these different types of contractors, I employ the dichotomous variables that indicate the following contractor types, all indicated in the socio-economic vendor information captured in data element 9A in FPDS-NG, which automatically populates by linking the DUNS number of the contractor with vendor information in the System for Award Management (SAM):

- **Non-profit organizations (NPOs)**: Includes both "non-profit organization" and "other non-profit organization." 1,250 contracts, or 5.12 percent, are with NPOs.
- **Small Businesses**: Includes all types of federally recognized small businesses, including 8A, HUBZone, disabled-, veteran-, and woman-owned small businesses. 6,781 contracts in this dataset are with small businesses, or 27.8 percent.

- **Woman-Owned Businesses**: Businesses owned by women, both large and small. 3,409 contracts are with woman-owned businesses (13.97 percent).
- **Minority-Owned Businesses**: Businesses owned by all types of minorities, both large and small. 5,633 contracts, or 23.09 percent, are with minority-owned businesses.
- **Veteran-Owned Businesses**: Businesses owned by veterans, both large and small. 2,336 contracts, or 9.58 percent, are with veteran-owned businesses.

In addition to ownership demographics, I include controls to capture the experience level of the contractor and the importance of the contract for the vendor.

- **Previous Contracting Experience**: Federal contracting is a complex process that can favor experienced vendors over new vendors (Cooper 2003). Successfully navigating the acquisition process makes it more likely that that the company will be able to win more business from the government (Cohen and Eimicke 2008). To capture experience, I include a dichotomous indicator of whether the contractor has previous contracts with the same department or agency during the period of the study. The presence of previous work suggests an existing relationship that may ease some of the tensions of contract management for both the vendor and the government. 14,245 contracts, or 58.39 percent, are with vendors that have prior experience with the agency.
- **Percent Company Revenue**: To assess the importance of the contract to the vendor, I calculated the percentage of the company's revenue derived from the contract. To do this, I divided the total spending on the contract by the total company revenue over the period of performance. Contracts which account for a higher percentage of total revenue are likely to be of greater importance to the vendor (Brown, Potoski and Van Slyke 2013). There is great variation here, as some contracts with small businesses are worth huge

percentages of their total income, while others with large businesses amount to very little of their total income.

As with all statistical models, tests are needed to ensure the appropriateness of the variables used. I previously described Hausman tests used to determine whether the dependent variable violated the assumption of the independence of irrelevant alternatives (which indicate that the assumption is not violated). Similar tests must be run on the control variables, or regressors. To perform these tests, I examined all of the control variables. Multicollinearity among regressors is one of the biggest threats to MNL procedures (Hausman and McFadden 1984). Pairwise correlation coefficients and variation inflation factors (VIF) can be used to assess the degree of multicollinearity across a set of variables (Greene 2003). None of the pairwise correlation coefficients between these variables exceeds 0.5. All are well below the 0.7 threshold generally used for multicollinearity (Dormann et al. 2013). The highest VIF is 3.23, also well below the threshold of 10, providing additional evidence that multicollinearity is not a problem in these data (O'Brien 2007). Taken together, these tests indicate that my regressors are appropriate for the model used and that multicollinearity is not a problem in these data.

Summary

The present research analyzes the effect of contract design on contractor performance. This chapter has introduced the data and methods to be used in subsequent chapters. I analyze 24,396 federal contracts that concluded between 2005 and 2014. These contracts, though for very different goods and services, are all definitive contracts with periods of performance more than three weeks where more than $2,000 was spent. This indicates the exchange of complex goods and services between the contractor and the federal agency. My measure of contractor performance is a multinomial indicator of the status of the contract upon its completion. My

primary statistical technique is multinomial logistic regression, a model which allows the comparison of unordered, categorical outcomes such as contract conclusory status. To assess contract design, I include measures of competitiveness, financial payment structure, and the degree of discretion afforded to contract managers. Each of these design elements is the focus of one of the subsequent empirical chapters.

My dependent variable allows me to compare contracts in a way that has not previously been used. This has the potential to change the way that researchers look at contracts, as it allows large *n* analysis of a varied group of contracts. It also requires the use of many control variables to account for the context of each contract. To this end, I include controls for the requirements of the contract, the procurement environment, and agency and vendor characteristics. In this way, I account for many of the contextual differences that can exist between contracts, including their purpose, their complexity, and the environment in which they are written.

Chapter 3: Competitive Sourcing and Federal Contractor Performance

Introduction

One of the key tenets of many major fields of social science research is that competition leads to improved performance. Although in recent years competitive mechanisms have been commonly referenced in public administration scholarship as a core component of "new public management," the power of competition has always been central to the American political system. In *Federalist No. 51* James Madison charges that government must be structured so as to align branches in direct competition against one another, with ambition set to counter ambition (Madison 1788). Madison argues that such a system would fragment authority and reduce the possibility of objectionable concentrations of power. The ideas presented in *The Federalist* led to the constitutional system of checks and balances that undergird American governmental structures. Competitive mechanisms have played an important role in American political culture since the nation's earliest years.

In recent years, some have advocated for making government more businesslike, particularly through competitive, market-based approaches (Osborne and Gaebler 1992). Specific mechanisms have included complete privatization, increased contracting out, and greater competition between government agencies over scarce resources (Savas and Schubert 1987). In theory, making government operate more like business can improve efficiency. Competition is theorized to drive down prices and preserve accountability. This is consonant with the common refrain that governments need to "do more with less" that originated under U.S. Vice President Al Gore's National Performance Review (Gore 1993). Market competition

seemingly provides a silver bullet for one of the long-standing problems in public administration: increasing both efficiency and accountability simultaneously.

Despite this promise, little has been done to assess whether competition in the contracting process actually improves performance. Theoretically, competitive contracts, which are subject to the efficiency and accountability boosting processes of the marketplace, should perform better than non-competitive contracts, which are not. Indeed, earlier research into privatization seemed to suggest that in a wide range of policy areas, market mechanisms seemed to drive service provision costs down (Savas and Schubert 1987, Bingman and Pitsvada 1997). However, there is also increasing evidence that cooperation and collaboration may also be effective ways of improving performance, especially given the complexity of many modern public problems (Denhardt and Denhardt 2000, Agranoff 2005). Scholars who have taken this approach argue that complex relationships between partners with diverging goals require active management, including establishing conditions of dependence, creating processes for management, and building interpersonal trust, norms, and mutuality (Agranoff 2005, Thomson and Perry 2006).

This chapter assesses whether competition leads to improved federal contractor performance. Competitive sourcing, or the process of advertising contracts to potential contractors and receiving and reviewing bids, is believed to leverage market forces, driving down costs and increasing accountability (Savas 1977, Savas 2002). However, no large *n* analysis of the effect of competition has ever been conducted. Instead, previous studies have focused on input measures such as cost, to identify the benefits of contracting. However, input measures that focus solely on cost assume that saving money is the primary purpose of the contract (Savas 1977, Osborne and Gaebler 1992, Prager 1994). There is evidence that focusing exclusively on cost can result in poor contractor performance and ultimately lead to the need to

bring contracted work back into government (Hefetz and Warner 2004). In many cases, federal contractors are performing work that is very important for both citizens and federal workers (Brown, Potoski and Van Slyke 2006, Brown, Potoski and Van Slyke 2009). As such, the quality of the work provided is as important as the initial cost. This chapter provides insights into the effect that competition has on contractor performance and work quality, shifting the focus from cost to important management and output measures.

The section that immediately follows summarizes literature on competition across the social sciences, where findings about the effects of competition vary widely based on contextual characteristics and assumptions about society, organizations, and individuals. The next section introduces competition processes used in federal contracting. The following section details the research question and hypotheses. The chapter concludes with a presentation of the analytic findings and a discussion of their meaning for both scholars and practitioners of public administration. Information on the basics of federal contracting can be found in chapter 1, while a detailed examination of the data used is available in chapter 2.

Literature Review: Competition in the Social Sciences

Competition has long been a focus of scientific study. Conceptually, competition occurs when two or more entities attempt to attain an objective that is either in short supply or indivisible. Competition is essential to many biological and social processes, as available resources are nearly always limited. In the natural world, food is scarce, forcing organisms to compete for survival. In public administration, budgetary restrictions mean that political preferences influence which agencies receive resources and which do not. Organizations compete to ensure that their interests are well represented in order to maximize their influence and budgetary appropriations. However, the effect of competition on people in the workplace is

less well understood. Most studies suggest that the context of the competition is particularly important. Empirical findings indicate that competition can both improve and reduce performance, depending on individual preferences and organizational structures. This section provides an overview of the study of competition in the social sciences to establish the theoretical background for the current analysis of competition and to facilitate the interpretation of analytic findings. To do this, the section presents both theoretical and empirical assessments of the role of competition between people and organizations.

The traditional view of competition comes from economics, where Adam Smith's earliest theories held that the force of competition was the primary motivating factor in markets (Smith 1776). Competitive consumer demand will cause prices to rise when demand is high and goods are scarce. Conversely, when demand is low and a good is plentiful, prices will fall as sellers compete to offload their products. The competition between both buyers and sellers to either acquire or offload goods will lead naturally to an efficient distribution of resources. This distribution results in the lowest possible prices for goods. Over the long run, this means limited profits for suppliers, but there is the possibility of profit through short term innovation, which creates temporary market imbalances as competitors rush to keep up. As a result, competition is the great equalizer. It creates low prices for consumers. It guarantees innovation, as suppliers strive to make short term profits. Consumers hold suppliers accountable for their performance through purchasing power. Competitors hold other suppliers accountable through constant pressure to take market share. In Smith's view, mechanisms that restricted market competition were distortionary, creating circumstances where prices are manipulated in ways which harm consumers, suppliers, or both. In particular, monopolies can manipulate prices to extract the highest possible profits from consumers, resulting in gains for the monopoly but broad losses to

the rest of the market (Weimer and Vining 2005). Governments act like monopolies in many ways, and can affect prices throughout an economy. Economists argue that government intervention in the marketplace should be limited to ensure competition and reduce distortions. Taking this theory a step further, introducing more competition into government might improve its efficiency. If government agencies were more competitive within government, or if they competitively hired firms to carry out the work of government, the forces of competition could improve efficiency and accountability, greatly enhancing performance.

It is worth noting that the economic view of competition is predicated on a few assumptions which have been widely challenged. First, economists often assume free entry to the marketplace. In practice it can be costly to join the simplest of industries and nearly impossible to enter very competitive or specialized markets. Second, economists also assume that consumers possess all information necessary to make the best decision. Many scholars have challenged this model of decision-making, asserting that it is impossible, impractical, or unnecessary for people to have this level of information (Lindblom 1959, Simon 1965). Finally, it is assumed that people are all utility maximizers. That is, people will seek out whatever bundle of goods and services that most satisfies them. This individualistic (or even egocentric) assumption ignores potential constraints on individuals to reach that optimal bundle, as well as the relationships between bundles. Perhaps, instead of maximizing his own bundle, a father working in a cubicle farm is maximizing the family bundle. Despite these problematic assumptions, economics tends to dominate the dialogue surrounding competitive contracting.

In stark contrast to the economic view of competition, sociologists tend to be less sanguine about its prospects to improve efficiency. Sociological studies focus on how people and organizations react to competition. Blau finds that competition in the workplace does not

necessarily lead to improved performance, as blind devotion to competition can neglect important facets of organizational culture resulting in inefficiency (Blau 1954). Instead, the type of activity is important, as some tasks may require cooperation for optimal performance. Related studies suggest that human nature may not be naturally egocentric, but rather cooperative and based on carefully constructed norms (Rokeach 1973, Durkheim 2014). This vein of research directly challenges the concept of the utility maximizer, arguing instead that social norms, including morality, may constrain the pursuit of individual satisfaction.

When confronted with competition, existing organizations can attempt to destroy their competition, withdraw from the battle, try to adapt to the situation, or seek to specialize (Ross 1919). Flexible, well-endowed organizations are more likely to benefit from competition (Carroll and Harrison 1994). In particular, entry to the marketplace seems to matter a great deal, especially organizational capabilities and resources. In societal class competitions, more advantaged classes possess cultural capital which tilts the balance of the competition in their favor (Savage and Egerton 1997, Sullivan 2001). All of this suggests that market entry is not free, and as a result competition may be weighted in favor of advantaged individuals or organizations. The economic concept of perfect competition may be far from what people and organizations experience in practice.

In a sense, competition provides people within organizations an opportunity for change that might not be possible otherwise. Indeed, competition is both a cause and an effect of organizations (Keasbey 1908). That is, organizations only form to make their members more competitive in an area of specialization. And organizations themselves make markets more competitive. However, those same firms come to realize that competition is actually costly for them and attempt to find ways to alter the marketplace in their favor. Firms are intentionally

secretive to try to find a temporary advantage. At the same time, consumers try to make sense of their own priorities and options, which can be costly and difficult to determine. As a result, neither consumers nor firms possess complete information about the market, undermining the economic assumption of rational, informed decision-making.

As is evident, sociological studies tend to identify contextual conditions in which competition functions in ways counter to economic assumptions. People interact and set priorities in different ways than economics theorizes. Competition is rarely fair, with certain privileged groups possessing an edge over others. Nor is information free or widely available. As a result, entry into markets is not free and decision-making is far from perfect. These attacks on economic assumptions highlight the importance of the contextual details of competition. Sociologists do not argue that competition has no place in society, but rather that its place might be more appropriately determined by adding important details to the conversation, including the type of work being performed, the characteristics of the market, and the costs of entry and information exchange. One result of these findings was the development of the transaction cost subfield of economics, which attempts to directly address issues of asset specificity (essentially market entry) and uncertainty (essentially information asymmetry) in the context of inter-organizational transactions (Williamson 1979). Transaction cost economics is given fuller treatment in chapter 4. Despite the appeal of this line of theory, especially for the study of contracting, there is some evidence that, even in the private sector, investment and uncertainty have only a limited effect on make or buy decisions (Walker and Weber 1987).

Social psychologists tend to look at the effect of competition on individuals or groups, particularly with regard to self-opinion or the ability to perform tasks. Researchers have found that competition has both positive and negative effects on individual and group performance.

There is some evidence that individuals are less likely to be competitive than groups, as membership in groups promulgates a search for adversaries (McCallum et al. 1985). However, others find that individuals tend to form their own assessment of self-worth based on a competitive comparison with others around them (Taylor and Lobel 1989, Stapel and Koomen 2005). Comparative behaviors help identify areas for personal improvement, a form of improved individual performance. However, competitive behaviors may also prime differential thought processes and reduce a person's ability to recognize groups and relationships (Stapel and Koomen 2005). Individuals who perform better in competition tend to be active, strategic competitors who are able to perceive themselves as their competitors might (Burns and Vollmeyer 1998, Langevoort 2002). Competition between individuals tends to improve the performance of simple tasks, but is less successful for more difficult work (Goldman, Stockbauer and McAuliffe 1977). It seems that competition is an important part of individual problem solving and has the potential to improve performance.

Competition can occur within a group (intragroup) and between groups (intergroup). Intragroup competition occurs when individuals within a group have divergent or rival interests. For example, consider a group of local public administrators convened to improve water quality. Such a group might consist of representatives from public health, environmental health, transportation, and education. Each of these representatives might have a different approach to the water quality problem based on their organizational priorities, resulting in competition based on divergent objectives. Intragroup competition may be at the root of problems in the management of voluntary networks for intergovernmental policy implementation (Agranoff and McGuire 2001). If two representatives are present from one organization and their performance is measured comparatively based on individual contributions to the group, rivalry arises (Stapel

and Koomen 2005). Goldman, Stockbauer, and McAuliffe (1977) find that for high complexity tasks, intragroup competition reduces performance. For low complexity tasks intragroup competition can spur performance in the presence of intergroup competition. Other studies have also shown that intergroup competition leads to improved performance, but suggest that there are few benefits to intragroup competition (Burton-Chellew, Ross-Gillespie and West 2010). This indicates an interaction effect between intragroup cooperation and intergroup competition which can result in better performance (Tauer and Harackiewicz 2004). However, a meta-analysis of 64 studies of task performance found that cooperation led to better performance than competition (Stanne, Johnson and Johnson 1999), suggesting that competition has contextual benefits but ultimately may not be as productive as working together (Kohn 1992).

Management research on competition tends to be very interdisciplinary, leaning on economics, sociology, and psychology depending on the research question. In general, this literature has focused primarily on people in organizations, competition between organizations, and characteristics of market competition. Research on individual performance tends to echo findings from psychology. There is some evidence that races may react differently to competition. Whites tend to be more competitive while minority groups are more cooperative (Cox, Lobel and McLeod 1991). This is important in government, where there are specific advantages given to minority-owned contractors. In addition, many departments and agencies have high percentages of minority employees, who may react differently to sourcing procedures based on cultural preferences.

Beersma et al. find that competition can improve the speed with which tasks are completed, but that cooperation results in better quality (Beersma et al. 2003). In addition, personality types are incredibly important – extroverted and agreeable people tend to perform

better under cooperative regimes, while introverts and brusque people are more successful competitors. Social structures -- that is, shared ties, previous relationships, and other relational effects -- tend to reduce the power of competition (Polidoro, Ahuja and Mitchell 2011). This pattern echoes findings in psychology that conclude that intragroup competition is less effective than intergroup competition. This is particularly important for contracting, since after winning a contract, many contractors become a part of a working group which may include former competitors. Re-competition of a relational contract has the potential to damage group unity and negatively affect performance (Milward and Provan 2000). However, the decision to put a contract back up for competition is often not controlled by public administrators, but by legislators, courts, and overhead rule enforcers (Curry 2010).

Competition between groups can be affected by group dynamics and the intensity of the competition (Baer et al. 2010). When competition is stiff, adding new members to an organization can result in lower performance. Adding members in less intense competition can spur creativity, resulting in increased performance. Additionally, organizations in close proximity are more likely to be highly competitive than distant competitors (Barnett and Carroll 1987). Relational intensity can also depend on experience and previous interactions (Kilduff, Elfenbein and Staw 2010). Market conditions matter for the effectiveness of competitiveness on performance. Organizational effectiveness in competitive marketplaces can hinge on contextual factors like centralization, control, and external pressures (Simonetti and Boseman 1975, Walker and Weber 1987).

Research on competition spans a number of fields in the social sciences, including psychology, sociology, economics, management, and public administration. Each of these fields studies different aspects of competition. An assessment of the interdisciplinary literature reveals

conflicting recommendations based on contextual differences, level of analysis, and the purpose of the research. Each discipline has its own understanding of competition, including how to measure it and what its effects are. Nonetheless, an exploration of these fields provides a deeper understanding of what we know about competition, as well as helping to identify where more research is needed. In particular, these literatures demonstrate that the level of competitiveness matters, competition can affect performance in different ways, and the context in which the competition occurs is important. The level of competitiveness can change how organizations and individuals function. Highly competitive environments make organizational change difficult and can result in less communication within or between groups. Success can be dependent on external factors, including market centralization, control, and characteristics of competitors. Organizational characteristics, including adaptability and access to resources, affect performance. In addition, the type of competition, inter- or intra-group, can affect behaviors. Intergroup competition seems to improve performance, while intragroup competition does not. The type of work performed also matters. Simpler tasks tend to react better to competitive mechanisms, while more complex projects may require greater cooperation. All of these points combine to indicate that the context of the competition is particularly important. Context is starting to garner greater attention in the public administration literature as well (O'Toole and Meier 2015). It is also evident that competition may not always engender performance improvements – indeed, there are many instances where competition may actually lead to inefficiency or failure to reach full performance potential.

Public administration is, by necessity, an interdisciplinary field. We deal with people and social structure as well as theories of economics and management. Bringing these literatures together allows greater insight into the complex issue of competition and can serve to inform

careful recommendations to practitioners. Similar trends are evident in the public administration literature, particularly regarding the possible performance improvements available through collaboration. There have been few studies focused on competition in public administration. Instead, the literature in the field has tended to adopt assumptions from other fields, primarily traditional microeconomics, transaction cost economics, and psychology. Few studies have tried to link competition with performance, and fewer still have empirically linked competitive mechanisms with contractor performance. There are three main lines of research in the field which come close.

First, there are studies advocating for privatization which use competition as a justification for contracting out or slicing off government programs. Often these studies are concerned with determining how competitive markets are, thus glossing over why competition is important and failing to investigate whether competition actually affects performance (Anderson and Dekker 2005, Brown, Potoski and Van Slyke 2006, Hefetz and Warner 2011, Johnston and Girth 2012, Choi and Triantis 2013). When performance is assessed, it is often in reference to the cost – that is, the initial investment in the contract. Researchers compare the cost of contracting out with the cost of government provision in an effort to show efficiency gains or attempt to link the competitiveness of the market with the cost of the contract (Savas 1977, Savas 1981). Leaving aside issues of hidden costs, this method focuses solely on inputs and does not address contract outcomes. The quality of service provision is largely ignored. Numerous scholars have called attention to problems with this approach and tried to demonstrate that political rhetoric, government capabilities, and market characteristics do not match those proposed to offer such benefits (Johnston and Romzek 1999, Van Slyke 2003). However, little has been done to provide

public administrators empirically-based recommendations on how to better manage contracts under such conditions.

Second, there are articles which attempt to demonstrate that other mechanisms, primarily cooperation and collaboration, result in high levels of performance (Thomson and Perry 2006, Milward et al. 2009, Gazley 2010, McGuire and Silvia 2010). These studies are implicitly comparisons with competitive mechanisms of service delivery, but rarely present direct information about the performance of competitive programs. Instead, collaborative arrangements are compared to all other types of implementation structures, or other methods of implementation are ignored. Collaborative benefits are assumed, and management strategies for collaboration become the focus of the research. The literature on collaboration is important for the study of contracting, as after winning a competitive process contractors may be required to become part of a collaborative implementation effort. The transition from competitor to collaborator deserves greater attention in the field.

Third, there is an emerging literature on contract design. These articles focus on the steps that administrators can take during the early stages of the contracting process to influence contractor performance, including how to competitively source a contract. DeHoog develops a theoretical model for service contracting that includes competition as one of three primary types, along with negotiation and cooperation (DeHoog 1990). She notes that competition can be limited by market competitiveness (or even willingness to bid), resource inadequacies within government, and the uncertainty associated with government funding streams. Romzek and Johnston attempt to develop a model of contract implementation and management based on competition procedures, resource availability, human capital capacity, and performance measurement techniques (Romzek and Johnston 2002). They examine five contracts in Kansas

and find evidence that these design factors influence management effectiveness, as do political variables, the number of subcontractors, and risk sharing between principal and agent. Malatesta and Smith examine 270 monopolistic franchise renewal contracts and find that the threat of competition can result in concessions to government agencies (Malatesta and Smith 2011). While these studies are interesting, none of them actually assesses the effect of competition on contractor performance. In addition, few account for what public managers actually control, which in the case of competitive sourcing is guided by statute. The Federal Acquisition Regulation (FAR) carefully outlines the competitive procedures to be used in many situations. However, managers retain wide discretion.

This review provides insight into both the theoretical and positive effects of competition on organizations and people in organizations. Economic theory assumes that competition can increase efficiency by driving prices down to the lowest possible levels. This perspective has been commonly used to justify contracting as a way to improve the performance of public organizations. However, empirical findings indicate that the effectiveness of competition can change based on context. Intergroup competition may improve performance, while intragroup competition can actually reduce it. For projects focusing on speed, competition can increase productivity, but quality may be lowered. And individual characteristics, such as personal background and social preferences, can influence how effective competition is. All of these are considerations that managers must account for when determining whether to competitively source a contract. For example, managers must consider whether former competitors for a contract may end up having to collaborate during its implementation, as subcontracting is common and interaction between contractors on similar projects may occur. Intergroup competition may affect the ability of the previous competitors to work together cohesively.

Other methods, such as collaboration and cooperation, have been shown to positively influence performance in public organizations, particularly in the delivery of complex programs. Stability, trust, and informal relationships between organizations in complex networks can improve the functionality of these partnerships. Markets for many complex government products are not especially competitive. Complex projects often require long relationships between a contractor and the government. Thus, learning to manage relationships may be as important as consistently pursuing the theoretical benefits of competition.

Clearly, the context of the contract must be considered when determining whether to use competitive sourcing procedures. Managers must assess the quality of the market, the type and complexity of work arrangements to be used on the contract, the background of the potential contractors and government officials, the purpose of the project, the complexity of the work to be performed, and many other factors. Because of all of these considerations, contract management matters. The design of a contract is likely to influence its performance. This study attempts to determine what effect competitive sourcing has on contractor performance while also placing the public manager into context. To accomplish this, it is necessary to first outline the procedures used to competitively source contracts at the federal level.

Competition of Federal Contracts

Part 6 of the Federal Acquisition Regulation (FAR) establishes the procedures used to ensure competitive sourcing of federal contracts (Federal Acquisition Regulation 2014). FAR Part 6 applies to all contracts, with exclusions only for simplified acquisition procedures (SAP), contracts that are statutorily exempted from competition, modifications to existing contracts, and task orders placed against requirements contracts, definite-quantity contracts, or indefinite delivery contracts (FAR 6.001). Definitive contracts, like those studied in this analysis, are

supposed to be competitively sourced unless the contracting official can justify not using competitive procedures. Federal contracts can be openly competed (FAR 6.1, 2014), competed after using exclusionary procedures (FAR 6.2, 2014), or not competed (FAR 6.3, 2014). In all cases, the competitive procedures used are determined by the contracting official. Though the FAR provides guidelines to follow, contracting officials make decisions about the best procedures to follow given the context of the procurement, including the requirements of the contract, the economic and political conditions, and characteristics of the vendor and the agency (FAR 42.3, 2014).

Full and Open Competition

The FAR asserts that "contracting officers shall promote and provide for full and open competition in soliciting offers and awarding Government contracts…through use of the competitive procedure(s) best suited to the circumstances of the contract action and consistent with the need to fulfill the Government's requirements efficiently" (FAR, 6.101 (a)(b), 2014). Federal contracting officials use three primary procedures to fulfill the requirements of full and open competition for definitive contracts:

- **Sealed bids**: The traditional conceptualization of the government contracting process, sealed bidding involves posting contract requirements, soliciting and receiving bids, evaluating bids without discussion, and subsequently awarding the contract (FAR, 14.101, 2014). Strict evaluation standards must be established before contracts can be solicited via sealed bid. Per FAR subpart 6.401(a), sealed bids are best if the contract meets the following criteria:
    - Contract requirements are clearly defined and widely understood
    - There is sufficient time to solicit bids, receive bids, and evaluate bids

- Price, or price-related factors, are of key importance
- Discussions with bidders are not necessary
- There is an expectation that more than one bid will be received

- **Negotiated proposal/quotes**: Competitive acquisitions that attempt to get the best value (as defined in the solicitation) for government using either (1) a tradeoff process that analyzes potential contractors using pre-determined criteria including cost, quality, risk, past performance and technical qualifications according to their relative importance for the project, permitting tradeoffs between cost and other factors or (2) a lowest price technically acceptable source selection process centered solely on the cost of the project, disallowing tradeoffs and any non-price criteria in source selection (FAR, 15.101, 2014). All non-sealed bid contracts are subsets of these negotiation procedures. Per FAR Subpart 6.401(b), competitive proposals are used when:
  - Sealed bids are inappropriate
  - Discussion with contractors is required, which the FAR acknowledges is often the case (FAR 6.401(b)(2), 2014).
- **Combination of competitive procedures**: Also known as a two-step procedure, combined procedures are primarily used when the technical requirements of a contract are not well-specified (FAR 14.501, 2014). The first step in the procedure is to request and evaluate technical proposals, as is done in the negotiated proposal procedure. These proposals are used to allow the government to better understand the technical details of the contract. Once requirements are understood, the government accepts sealed bids from those organizations which presented acceptable proposals in the first step. Per subpart 14.502, two-step sealed bids are appropriate if:

- Specifications or technical requirements are poorly defined
- Evaluation criteria have been established to assess technical proposals
- More than one qualified contractor will submit bids
- There is sufficient time to complete the two step procedure
- A firm-fixed-price or fixed-price with economic adjustment contract is used

Competition after Exclusion of Sources

The federal government will often use competitive procedures after excluding certain types or groups of potential contractors. Exclusion can be used to promote public values, reduce costs, ensure continuity, or satisfy critical needs (FAR, 6.202, 2014). Federal contracting officials have discretion to use exclusionary procedures to favor certain types of contractors, including small businesses, Section 8(A) businesses, HUBZone small business concerns, and woman-, minority-, and veteran-owned small businesses (FAR 6.203-208, 2014).[6] Such contractors are given preference in federal statute to ensure that the federal government promotes equality and representativeness in its procurement initiatives. When contracting officials choose to set aside contracts for these types of organizations, they can exclude all other potential contractors. Once the exclusion is made, the government must use one of the competitive approaches described under full-and-open competition to select a contractor. In cases where exclusion procedures are used to reduce cost, ensure continuity, or satisfy critical needs, the contracting official must prepare a written justification for using the procedure (known as a

[6] Small businesses are granted preference in the Small Business Innovation Research Program, established in Public Law 97-219. Section 8(A) businesses are given preference in the Small Business Act, as amended by Public Law 100-656. HUBZone businesses are granted preference in the HUBZONE Act of 1997 (15 U.S.C. 631). Preference for veteran-owned businesses is established in the Veteran's Benefit Act of 2003 (15. U.S.C. 657f). Woman- and minority-owned businesses receive preference in 15 U.S.C. 637(m). Each of these laws establishes preference for contractors owned by particular demographics, granting contracting officials the ability to only consider such contractors when awarding contracts. In addition, other rules, particularly simplified acquisition procedures (see chapter 5), further prefer these types of contractors over others, relaxing regulations on the need to competitively source contracts with these types of organizations.

"determination and findings" report), and the agency head must approve the exclusion in writing. Using exclusionary procedures to narrow the pool of contractors to one of the preferred ownership groups does not require written justification or agency head sign-off.

In addition, there are procedures in place for the procurement of specific types of goods and services. Contracts for particular types of basic research (FAR 6.102(d)(2), 2014), architecture/engineering design (FAR 6.102(d)(1), 2014), and the use of alternative services for industrial mobilization (FAR 6.202(a)(1), 2014), allow for exclusion of vendors prior to competition. Though competition is still encouraged for these types of contracts, it is not required since markets may be less competitive and requirements may be difficult to generate. These types of contracts are comparatively rare, but do occur in this dataset.

Not Competed

Generally, competition is required for federal contracts. However, there are exceptions which grant the contracting official the ability to avoid a competitive bidding process. Contracts are considered to be sole source if they are "entered into by an agency after soliciting and negotiating with only one source" (FAR, 2.101, p 2.1-13, 2014). Sole sourcing is only justified if:

- there is only one contractor capable of producing the good or service (FAR, 6.302-1, 2014),
- if there is compelling urgency (FAR, 6.302-2, 2014),
- to establish or support a particular emerging or at risk market (FAR, 6.302-3, 2014),
- when there are international agreements that constrain markets or public decision-making (FAR, 6.304-1, 2014),
- if there are specific statutory authorizations for limiting competition (FAR, 6.302-5),

- if competition mechanisms could compromise national security (FAR, 6.302-6, 2014), or
- if competitive sourcing is deemed contrary to the public interest as determined by the appointed leader of the department or agency (FAR, 6.302-7, 2014).

Generally, sole source contracts require public administrators to write a justification delineating which of these seven criteria have been met. Justifications must be posted to FedBizOpps.gov and the agency website for a minimum of 30 days.

Each of these procedures is commonly used at the federal level. Table 1 provides detailed descriptive statistics of the occurrence of these competitive mechanisms. In total, 61.35 percent of the contracts included in this analysis used competitive procedures (either full and open competition or competition after exclusion of sources). Negotiated proposals are used in more than 50 percent of the contracts studied, though nearly a quarter were not competitively sourced, despite using a "competitive" solicitation procedure. This indicates that, though certain procedures may be labelled as competitive, in practice contract managers use them even if the contract is sole sourced. This makes sense for negotiation, which is useful whether competition is present or not (DeHoog 1990). Sealed bids make up just 8 percent of the total, all of which were competitively sourced. The nearly 3,500 sole source contracts account for more than 21 percent of all federal contracts. Of these, 41.20 percent were not made available for competition due to statutory requirements, but the remaining 58.80 percent were not competed at the contracting official's discretion.

Federal contracting officials are charged with assessing the contract requirements and the quality of the private marketplace in order to choose the appropriate solicitation procedure(s). Though the FAR provides guidance on when certain procedures might be best applied, the

contracting official is left the discretion to use competitive procedures as he or she sees fit. Though most are competitively sourced, 38.65 percent of the contracts in this dataset were not. There are many potential reasons to not use competitive procedures, including the cost associated with such procedures (Cooper 2003), the competitiveness of the market available (Johnston and Girth 2012), the speed with which the contract needs to be completed (Curry 2010), the purpose of the contract (Milward and Provan 2000), and the complexity of the requirements (Brown, Potoski and Van Slyke 2013). This research provides the opportunity to assess the comparative performance of these contracts to determine whether competition influences contractor performance. The following section clearly identifies the research question and hypotheses for this analysis.

Research Question and Hypotheses

This research tests the widespread belief that competition can improve outcomes for government. Proponents of public choice theory and "new public management" have asserted that incorporating business practices, such as competition, into government can improve the performance of public sector agencies (Savas and Schubert 1987, Ostrom 1990, Davis and Ostrom 1991, Osborne and Gaebler 1992). Indeed, many recent reforms have operated under the assumption that making government more businesslike can increase the efficiency of the executive branch and reduce costs (Moynihan 2006, Kettl 2014). Other scholars have pushed back, claiming that the nature of much government work requires building relationships and creating collaborative, team-oriented work environments (Agranoff and McGuire 2003, Milward and Provan 2003, Amirkhanyan 2009, Gazley 2010). This line of research holds that competition can harm the quality of the relationships between partners working to solve a complex problem, ultimately undermining the possibility for team-building and project success (Milward and

Provan 2000). Since much of the work of government of government is complex, or even "wicked," the quality of relationships may matter greatly (Churchman 1967, Rainey and Bozeman 2000, Thomson and Perry 2006). In addition, scholars hold that cost is not an accurate predictor of performance, especially for products and services where costs are particularly difficult to determine and the benefits of outputs and outcomes are much harder to quantify (Box 1999). The current analysis is an effort to determine which of these perspectives more accurately describes federal contracts.

This research assesses the impact of competition on federal definitive contracts. Broadly, the research determines what effect competition has on the termination of individual federal contracts. Specifically, the research question is:

- Does competition influence contractor performance?

The measure of contractor performance used in this analysis is the way in which the contract ends. Terminated contracts indicate poor performance, while contracts that end in closeout have performed acceptably. Termination is clearly an indicator of poor performance. Though I segment closeouts by the financial actions taken over the course of the contract to try to gain some insight into better performing contracts, this measure is less certain. Thus, it is possible to make stronger claims about poor performance. As such, my hypotheses revolve around the concept of termination and its relationship to variables of competition, markets, experience, financial management, and organizational type.

In keeping with the conventional economic wisdom described previously, my first hypothesis is that competition leads to fewer contract terminations when compared to contracts that are not offered through the competitive bidding process. Generally, contracts are not terminated before their completion unless the contractor or government agency has

underperformed (Cooper 2003). If theories about competition increasing efficiency are accurate, contracts that are more thoroughly competed should be more likely to perform better than those that are not, as market dynamics will facilitate the selection of the best possible contractor to complete the required work.

$H_{3.1}$: Competitively sourced contracts will be less likely to end in termination than sole-sourced contracts.

However, relationships and experience are also important for complex contracts (Bertelli and Smith 2010, Brown, Potoski and Van Slyke 2013). Contracting involves cooperation between public- and private-sector workforces, which tend to be motivated and incentivized differently (Wright 2001), and also often experience distinct levels of overhead red tape associated with personnel and procurement initiatives (Rainey and Bozeman 2000). As such, integration of workforces can be particularly challenging (Voelz 2010). Firms with a history of federal contracting may have a level of trust which will help boost working relationships between organizations and improve performance, or they may simply be able to lower transaction costs due to experience working inside the system (Brown, Potoski and Van Slyke 2006, Cohen and Eimicke 2008, Getha-Taylor 2012). As such, my second hypothesis is that shared experience between the government agency and contractor will influence performance.

$H_{3.2}$: Contractors with previous relationships with government agencies will be less likely to have contracts with those same agencies terminated ahead of schedule than first time contractors.

While there is evidence that experience matters, other scholars have suggested that the functional context of the contract may be more important. Building on transaction cost economics, much of the most recent literature on government contracting has indicated that the

requirements of the contract are particularly important for the ultimate success or failure of the procurement (Williamson 1979, Brown and Potoski 2003, Van Slyke 2003, Anderson and Dekker 2005, Brown, Potoski and Van Slyke 2013, Girth 2014). These studies point to task complexity, information asymmetry, and asset specificity as the true predictors of success. Of these, asset specificity of the good or service procured can be the hardest to assess empirically. One approach is to use the number of bids as a proxy measure for asset specificity, as more bidders may be indicative of lower perceived risk associated with the contract. Where there are fewer bidders, firms may be responding to perceived risks associated with the contract, particularly the inability to repurpose any upfront investment for profitable alternative purposes. Though much of the previous research has focused on what types of work to contract out, the nature of public sector contracting often requires contracting out for goods and services on a political, rather than technical, basis (Cooper 1980). As such, the nature of the contract requirements, the competitiveness of the marketplace, and the technical expertise resident in government play important roles in contractor performance and contract management (Brown, Potoski and Van Slyke 2006). Thus, I hypothesize that complex contracts, for which there are noncompetitive markets and limited government technical expertise, will be more likely to experience performance problems than contracts for simpler, better understood products with competitive markets.

$H_{3.3A}$: Contracts for services, which are more complicated, will be more likely to end in termination than contracts for goods.

$H_{3.3B}$: Contracts for services where requirements are particularly hard to generate, resulting in an information asymmetry, will be more likely to terminate early than contracts where requirements are easier to generate and understand.

$H_{3.4}$: Contracts which receive few bids, indicating a noncompetitive marketplace and possibly the presence of asset specificity, will be more likely to terminate early than contracts that receive many bids.

In addition, the political and economic context of the contract matters for contractor performance. If contracting officials are rushed and fail to put in sufficient time to generate requirements and set performance standards, it is likely that contracts will fail (Cooper 2003, Curry 2010). This is most likely to occur in the fourth quarter of the fiscal year, when budgetary procedures incentivize spending any remaining resources to maximize allocations in the next fiscal year (Lee, Johnson and Joyce 2012). Similarly, if political actors force contract requirements onto contracting officials, it can be expected that less attention may be paid to the technical details of planning and managing the contract, increasing the chances for poor performance (Nicholson-Crotty 2004, Fernandez, Ryu and Brudney 2008). Effects of political influence may be most likely to occur when statutes forbid the use of competitive mechanisms, which could leverage market forces to at least lower costs and increase accountability. Accordingly, I hypothesize that contracts that show evidence of spending down, and contracts mandated to use sole sourcing procedures may be more likely to terminate early.

$H_{3.5}$: Contracts signed in the fourth quarter, when spending down of public budgets can occur, are more likely to terminate early than other contracts.

$H_{3.6}$: Contracts that are statutorily required to use a sole source are more likely to terminate early than other contracts.

Finally, contractor ownership is an important consideration, as ownership can affect contractor selection due to preferences given in the FAR, which can reduce some of the government's transaction costs associated with procurement initiatives, and the potential

congruence of goals across the sectors (Gazley 2010, Smith and Fernandez 2010, Fernandez, Malatesta and Smith 2013). Goal alignment between the government and nonprofit organizations (NPOs) has been proposed by various scholars (Brown, Potoski and Van Slyke 2006, Van Slyke 2007, Getha-Taylor 2012). Since NPOs have similar, socially motivated goals, they should be more likely to be able to form successful, trusting partnerships with government agencies. Despite some evidence that nonprofit management may be changing as a result of "marketization," it is still reasonable to expect that NPOs may be preferred vendors due to their focus on mission over profit (Eikenberry and Kluver 2004). Conversely, firms owned by preferred demographics, such as small-, woman-, minority, and veteran-owned firms are given a boost in the selection of federal contractors. Not only can contracting officials exclude all other types of businesses if they choose, but such disadvantaged businesses are given preference in simplified acquisition procedures as well. This favoritism exists because such firms are considered disadvantaged and in need government support. However, due to their size and longevity, these types of organizations may not be as prepared to manage contracts and withstand the transaction costs associated with federal contracting (Brown, Potoski and Van Slyke 2006). As a result, contracts with these types of organizations may be risky. Their performance should be lower than other types of organizations.

$H_{3.7}$: Nonprofit organizations, whose social goals align with those of government, will perform better than their private sector counterparts.

$H_{3.8}$: Minority owned organizations, small businesses, and veteran- and women-owned firms, which are given preference in contracting, will be more likely to experience terminations of all types.

Data, Methodology, and Descriptive Statistics

The unit of analysis for this research is the individual contract. The sample consists of the 24,396 federal definitive contracts which terminated between FY2005 and FY2014. These contracts were initiated after 1998 (to ensure the completeness of record keeping) and each lasted for more than 20 days and had federal expenditures totaling more than $2,000 (to ensure a meaningful exchange of resources). The resulting dataset is comprised of complex, relational contracts.

The variable of interest (or dependent variable) for this research is the status of the contract at its conclusion. As discussed above, there are four primary ways contracts end: closeout, termination for convenience, termination for default, and termination for cause. The latter two types of termination have essentially the same meaning, indicating extremely poor performance. The only difference between the two is the type of good or service procured. Termination for cause is used for non-commercial items, while termination for default is used for commercially available goods. Terminations for convenience suggest that government officials saw problems with the contract or decided to change direction. Normal closeout reflects a wide range of performance, all of which are, at worst, acceptable. To address variations within the closeouts, I use financial transactions on the contract to indicate performance. I assume that managers of poorly performing closeouts will reclaim funds for the government – that is, contracting officials opt to deobligate much of the contract's value. I classify low-performing contracts are those where more than half of the total obligations are taken back by the government. High performing contracts, by comparison, do not have any money deobligated. Essentially, the way that the contracting official handles the funding provides some insight into the performance across closeouts.

This variable of interest is a way to measure contractor performance across a variety of contract types, goods, and services. By looking at the official outcome of the contract, along with the spending behavior over the life of the contract, it becomes possible to compare very different contracts in a meaningful way. In essence, I am using the contract manager's decisions as the measure of performance. Where much of the previous research has struggled with measures of cost, which are dependent on a variety of variables (policy area, type of service, location, etc.) to allow comparability, this measure allows greater comparability as it focuses directly on managerial assessment of vendor performance. There is no question that contracts terminated early for convenience, default, or cause represent poorly performing federal contractors. As a result, I am able to make better claims about truly bad performance than I am about what leads to good or exceptional performance. However, I try to gain a better understanding of variation within closeouts to provide some insight into what causes good performance, or at least leads to the full expenditure of allocated funds on a particular contract.

The primary explanatory variable of interest in this study is the competitiveness of the solicitation process. To assess this, I use two statistical models. First, I look at the overall effect of the level of competition, operationalized as a dichotomous indicator of whether the procedure used was competitive. Table 2 provides descriptive statistics. Each competitive contract is scored as a 1" while non-competitively sourced contracts are given a "0." The following competitive procedures are aggregated into this measure:

- Full and open competition
- Full and open competition after exclusion of sources
- Follow-on to full and open competition
- Competitive simplified acquisition

Second, I examine the impact of different competitiveness levels and solicitation procedures on contractor performance. Instead of looking only at competitiveness, I analyze the effect of the specific type of solicitation that was used to market and negotiate the contract. It might be argued that managers select these mechanisms based on their assessment of how contractors might perform on the contract. For example, particularly poorly understood contracts might be competitively sourced as a method to ascertain what methods private firms might use to solve the problems. Then, the government could use all of the proposals to refine requirements and select the proposal that comes closest. If this occurs regularly, then it may create endogeneity, as the choice of solicitation procedure may be influencing performance and the perceived performance might be influencing the choice of the solicitation procedure.

While this may occur, there are two reasons that its influence on this data set is likely low. First, previous research indicates that, whenever possible, contracting officials prefer to shift the burden for performance to contractors (Girth 2014). This means that managers use design elements that shift risk to the contractor, rather than performing detailed pre-contract performance assessments. Findings in chapter 5 support this description of managerial behavior. Second, there is a broad literature suggesting the managers are particularly poor at judging performance (Brewer 2006, Moynihan 2008, Andrews et al. 2010, Meier and O'Toole Jr 2013). Given that managers are unable to accurately assess their own performance, it is unlikely that managers are better at assessing the future performance of other individuals or organizations. As a result, even if they attempt to use predicted performance to select contract design elements, their selection may be close to random due to difficulties determining performance risks.

To assess the impact of competitive solicitation procedures on contractor performance, I include dichotomous indicators for the following procedures:

- Full and open competition
- Full and open competition after exclusion of sources
- Follow-on to full and open competition
- Not competed
- Not available for competition
- Sole source procedures used according to statute
- Sole source procedures used according to managerial discretion
- Sealed bid

I hold that both the presence of competition and the specific managerial action taken to secure that competition are important for performance. This is consistent with recent evidence that actions taken during the earliest stages of contract design (the pre-solicitation phase) are of importance for contract management (Kim and Brown 2012). Including specific solicitation procedures also allows insight into the role of political influence, as contracts that are "not available" for competition are statutorily prohibited from competitive sourcing. Comparing contracts not made available for competition due to legislative constraints with contracts that managers decide to not competitively source based on the context of procurement provides insight into the effectiveness of managerial discretion as well. Sealed bids allow insight into how contracts perform when requirements are particularly well known, as these procedures are only used when the government has a clear understanding of what it needs to purchase and expects a competitive marketplace (FAR, 6.401, 2014). As such, sealed bids are used in fairly idyllic conditions, providing a nice foil for other types of contracts which may not meet this conceptualization of the context of government contracting.

In addition, it is necessary to account for the context of the contract to ensure comparability between procurement initiatives (Anderson and Dekker 2005). In particular, I control for the contract's requirements, the political and economic conditions surrounding the contract, and the characteristics of the government agency and the vendor. Specific variables include a dichotomous indicator of whether the contractor has worked with the agency before (to capture dyadic previous experience), the number of bids received (an indicator for market competitiveness), the type of good or service being procured (an indicator of task complexity), the quarter in which the contract was signed (a potential indicator of planning), the length of the contract (an indicator of task complexity), the ownership characteristics of the contractor (indicating evidence of goal alignment and statutory preference), the percentage of agency contract spending or revenue generated from each contract (indicating the importance of the contract to the parties to the contract), and many others.

I use multinomial logistic regressions to analyze the data. MNL models are appropriate because the variable of interest is a set of categorical, non-ordered values. As with all multinomial logistic regressions, there is the assumption of the independence of irrelevant alternatives (IIA). Hausman tests for IIA violations demonstrate that this assumption is not violated. See chapter 2 for a more detailed discussion of the data and methods used.

Results

Tables 3.3 and 3.4 display the results of the regression models. Table 3.3 shows the result of the regression focusing solely on whether competitive sourcing was used. Table 3.4 presents results by solicitation procedure. Both tables display relative risks to ease interpretation of results, along with the *z* score associated with each coefficient.

Competitively sourced contracts are 25 percent more likely to be terminated for convenience, twice as likely to be terminated for default, and three times more likely to be terminated for cause than non-competitive contracts. Competition is not significantly associated with higher performing closeouts. Competitive solicitation procedures are also associated with higher levels of early termination. Contracts that are solicited through full and open competition are 62 percent more likely to be terminated for convenience, 95 percent more likely to be terminated for default, and nearly three times more likely to be terminated for cause. Competition after exclusion results in similar increased risks of early termination. Both competitive procedures are also significantly associated with lower likelihoods of high closeout. Using competitive solicitation procedures makes it less likely that contracting officials will spend all of the money allocated to the contract. Conversely, non-competitive solicitations are more likely to have all of their funds obligated. Taken in sum, this is consistent, substantial, and significant evidence that competitive sourcing is associated with increased risk of termination and lowers the likelihood of the full obligation of contract expenditures. As such, there is no support for hypothesis 3.1.

The number of bids received, an indication of market competitiveness, demonstrates similar findings. Contracts receiving one bid are much less likely to be terminated early (between 20 and 50 percent), while contracts receiving five or more bids are 30 percent more likely to be terminated for convenience, 82 percent more likely to be terminated for default, and three times as likely to be terminated for cause. This means that contracts for goods or services in more competitive markets are more likely to be terminated early. This may indicate the relative ease of finding substitutes in competitive markets, could demonstrate the government's commitment to contractors taking risks in providing asset specific services, or could indicate that competitive

procedures do not help managers determine which contractor is the best. As a result, there is also no support for hypothesis 3.4.

Follow-on work to competitive contracts is the exception, as these contracts are much less likely to be terminated for default or cause. Follow-on contracts are classified as competitive, though in reality no actual competition occurs during the solicitation, as the contracting official relies on the previous solicitation and performance as justification to keep working with the vendor (FAR, 6.3, 2014). No follow-on contracts were terminated for default or cause despite having expected values of 4 and 1, respectively. Expected values were calculated using chi square procedures. Since I am analyzing the population of federal definitive contracts, deviations between observed and expected values may provide insight into how practical reality deviates from mathematical means. In this case, despite the low number of follow-on contracts in the data set, probability theory would suggest that at least a few of these contracts would be terminate early. They do not. Though the sample size is small (just 236 follow-on contracts are included in this dataset), this is some initial evidence that relationships matter. The effect of experience reinforces this conclusion, demonstrating that contracts with experienced vendors are 8 percent more likely to end in high closeout, but 22 percent less likely to end in termination for convenience, 14 percent less likely to end in termination for default, and half as likely to end in termination for cause. This is strong support for hypothesis 3.2.

Hypotheses 3.3A and 3.3B assert that the complexity of the contract may lead to higher risk of early termination. Service contracts are not significantly associated with termination for convenience or termination for cause, and are half as likely to be terminated for default as contracts for goods. Similarly, contracts for complex services, including professional services, information technology, training, and research, are either not significantly associated with

increased risk of termination or reduce the risk greatly. For example, IT contracts are nearly 90 percent less likely to terminate for default. Particularly complex contracts do not seem to be more likely to terminate early, undermining some of the assertions of transaction cost economics. As a result, there is no support for hypotheses 3.3A and 3.3B.

Hypothesis 3.5 holds that contracts written during the final quarter of the year may be less well planned than contract signed at other times, consistent with the spending down behaviors observed in government agencies. However, there is little evidence that this is the case. Instead, contracts signed in the fourth quarter are not markedly different from other contracts. Fourth quarter contracts are slightly less likely (12 percent) to end in low closeout than other contracts. It would seem that public managers do not spend public coffers as haphazardly in the fourth quarter as is widely believed.

However, there is some evidence of external political influence on contractor performance. Sole source contracts that are made not available for competition by statute are six times more likely to be terminated for cause than other contracts. Sole source contracts designed by federal contracting officials are not significantly associated with early termination of any type. This suggests that when political actors attempt to force contract design elements of public managers, contractor performance is reduced. Thus, hypothesis 3.6 is supported.

These models also provide some evidence that nonprofit organizations may outperform other organizational types, as held in hypothesis 3.7. In particular, NPOs are a tenth as likely to be terminated for default, and no nonprofit was terminated for cause over the period of the study (despite an expected value of 3). This may indicate that goal congruence between NPOs and government agencies can reduce performance problems on complex contracts.

There is strong evidence that minority- and veteran-owned businesses are more likely to be terminated early than other types of organizations. Given preference in the procurement statutes, minority-owned businesses are nearly 20 percent more likely to terminate for convenience, more than twice as likely to terminate for default, and four times as likely to terminate for cause. Veteran-owned businesses are slightly worse, at 64 percent more likely to terminate for convenience and nearly four times as likely to terminate for default. However, small businesses are less likely to terminate early, and woman-owned businesses are not significantly associated with any of the contract outcomes. As a result, there is somewhat mixed support for this chapter's final hypothesis.

Findings related to control variables are fairly consistent across both models. Contract length has little effect on contractor performance. Perhaps this is an area where including dichotomous indicators both for very short and very long contracts could provide more visibility.

Contract modifications seem to influence performance, suggesting that management steps can be effective during the contract management phase to alter contractor performance. Contracts with ten or more modifications are about half as likely to terminate early for convenience or cause as other contracts, but also half as likely to end in high closeout. There is some support for the idea that highly modified contracts are not performing well, as they are unlikely to end in high closeout. However, they are more than 50 percent more likely to end with more than half on the public investment returned to government coffers. Taken together, these findings indicate that managers are using modifications to change performance, ultimately leading to more closeouts and low closeouts.

Unsurprisingly, contracts that are modified to add additional work, invest more resources, or exercise options are more likely to end in high closeout and less likely to be terminated early.

Along the same lines, actions that take away resources via funding action, option, or other action are all associated with more closeouts and have coefficients that suggest early termination might be more likely. This means that managers are rewarding good performers financially by both adding new work to agreements and obligating additional funds, and are preserving public value by reclaiming funds or terminating poorly performing contractors.

Change orders, which alter the requirements or some other element of the contractual agreement, are associated with slightly higher levels of termination for convenience and default. This indicates that, on contracts where work needs to be altered drastically in the middle of contract implementation, problems ensue. This suggests that poorly performing contracts may be able to be identified by the number of change orders made.

Performance-based contracts, where managers attempt to develop evaluation criteria based on desired outcomes, are associated with fewer terminations for default. This means that, when purchasing commercially available goods and services, managers may be able to use performance-based methods to improve contract outcomes. However, performance-based contracts are also 20 percent more likely to have substantial amounts of money reclaimed. Contracts advertised on FedBizOpps, the government's consolidated solicitation announcement website, are 30 percent more likely to terminate early. This may indicate that transparency procedures are not improving access to qualified contractors. Both of these subsets of contracts are worth further investigation, as they are directly linked to the effectiveness of managers and transparency programs.

Agency characteristics influence performance in various ways. Cabinet departments and regulatory agencies are less likely to terminate contracts. Cabinet departments are likely to be the best resourced, with the best trained contracting officer, which may reduce the likelihood of

performance problems. Constituent services agencies and distributive agencies are more likely to terminate contracts early. Contracts in constituent services agencies are ten times as likely to terminate for convenience, more than twice as likely to terminate for default, and more than eight times as likely to terminate for cause. These findings are a strong indicator that contracts in these agencies experience more performance problems than contracts in other agencies. This may be due to the volatile nature of the work of constituent services agencies, which may be charged with providing particularly complex social services to their constituents while simultaneously being exposed to shifting political priorities and issue advocacy. Redistributive agencies are three times more likely to terminate contracts for convenience, which is consistent with the highly political nature of their work and ongoing budgetary uncertainties for many of these agencies and their programs (Weingast and Moran 1983, Meier 2007). Similarly, agencies with high percentages of professional employees, and thus higher overall problem complexity, are much more likely to terminate contracts for convenience and cause. This indicates that agencies dealing with either more political or more technically challenging contracts are more likely to experience performance problems, though commercial contracts may be an exception. Additional analysis is probably necessary to understand these findings more completely.

Discussion

There has long been a belief that inserting business practices into government can lead to better performance (Savas and Schubert 1987, Osborne and Gaebler 1992). Proponents of this approach frequently argue that competitive procedures can reduce costs and improve the efficiency of service provision. Contracting is often suggested as a way to make government more businesses-like (Savas 1977, Prager 1994). Competition between contractors will lower prices, increase accountability, and lead to improved performance. My results provide strong

evidence that the supposed benefit of competition is not occurring. Rather, competitively sourced contracts are much more likely to be terminated than non-competitive contracts, regardless of the solicitation procedures used. Instead of competition, experience and pre-existing relationships between the government and the contractor lead to better performance.

These findings could simply be evidence of substitution. In strong markets where substitution is possible (and competition is high), more terminations are likely because public officials risk less when terminating a contract. Indeed, in a competitive marketplace, a substitute is waiting to take over from poor performers, which could mean that termination is a sign of improvement rather than failure. In this analysis, contracts that receive more than five bids are much more likely to be terminated early than contracts that receive only one bid. This seems like strong evidence for substitution. However, this assessment has three major flaws. First, my measure of competition is based on the sourcing procedures used for the contract, meaning that some assessment of market strength was taken into account by the public contract manager, as required in the FAR. This means that federal officials strategically select competitive procedures for contracts, taking into account the requirements and the context. If substitution were occurring, they would be most likely to occur in competitive markets. As such, it would be reasonable to expect to see some clustering of terminations around goods and services that have particularly competitive markets. However, indicators for both IT services and construction, areas where markets are quite competitive, provide no evidence that termination is more likely.

Second, there is the high cost associated with termination. Though Cooper (2003) points out that it is the responsibility of the contracting official to terminate poorly performing contracts, he acknowledges that doing so is not without cost. Terminated contracts incur opportunity costs associated with documenting performance problems, notifying the vendor of

impending sanctions, and ultimately managing the copious paperwork designed to limit the government's liability. This is time that could be spent doing other, more productive things. In addition, there are the damaged relationships and human capital costs associated with removing vendor employees, as many relational contracts involve the creation and maintenance of cross-sector working groups (Bertelli and Smith 2010, Brown, Potoski and Van Slyke 2013). Finally, there are the costs associated with the new competition. The government occurs opportunity costs while waiting for new bids, and the process itself can be expensive as it requires advertising the opportunity, evaluating bids, and integrating the newly chosen contractor with the project and project team (Voelz 2010). In all, the transaction costs associated with terminating a contract are much higher than zero, making substitution much more expensive than a quick switch from Pepsi to Coke.

Third, if substitution were occurring, it would be reasonable to expect different results for commercial and non-commercial goods. Commercial goods are those for which a private market exists. Government is the monopsony purchaser of non-commercial goods. As such, it might be expected that, if substitution were occurring, commercial goods be at a higher risk of early termination. Recall that terminations for cause are used to end non-commercial contracts, while terminations for default are used to remove commercial vendors. My findings indicate that contracts for non-commercial goods and services are actually more likely to end in termination than contracts for commercially available products. While there are competitive markets for government-only contracts, these markets are widely acknowledged to be less competitive than the markets for commercial goods (Warner and Hefetz 2008, Hefetz and Warner 2011, Girth et al. 2012, Johnston and Girth 2012, Brown, Potoski and Van Slyke 2013). This suggests that something besides substitution is the cause of these terminations.

Milward and Provan, in their decade-long study of mental health networks, found that frequent competition could harm network stability (Milward and Provan 2000, Milward and Provan 2003). Specifically, when conducting work that required great specialization and joint production for success, stable networks were more successful than unstable networks, even if their resources were considerably lower. Instead of competition, establishing longer periods of performance to cement a contractor's property rights increased the chances for high performance on complex contracts. Since the data in this study are complex contracts, Milward's and Provan's explanation may be appropriate. Complex federal contracts may be failing as a result of the competitive procedures that are preferred in the FAR. Indeed, non-competitively sourced contracts are much less likely to end in termination, and are nearly 50 percent more likely to end in high-performing closeout. In addition, contractors that have relationships with the contracting agency are more likely to perform well and much less likely to be terminated early. This is consistent with other findings that suggest that relationships in complex networks and complex contracts are particularly important for lasting success (Gazley 2008, Bertelli and Smith 2010). My findings suggest that competition may have negative effects on the performance of relational federal contracts.

Much of the debate in public administration on contracting has centered on the initial decision to contract out, commonly called the "make or buy decision." Using transaction cost economics, scholars have advised that governments will have the most success with contracts that have low transaction costs (Williamson 1979, Brown, Potoski and Van Slyke 2006). On the government side of the transaction, contracts should have clearly understood requirements managed by a contracting team with sufficient knowledge and skill. This lowers the complexity of the task and reduces information asymmetry as much as possible. From the contractor's

perspective, there should be an additional market for them to sell the product in, limiting their risk. This is known as asset specificity. Products with high asset specificity have fewer buyers. Investing in such products is risky for vendors, as should their effort to win the contract fail, any expended resources will be hard to recover. Recent research has focused on ways to manage markets to attempt to improve the quality of competition to reduce asset specificity problems (Warner and Hefetz 2008, Girth et al. 2012, Johnston and Girth 2012). However, public administrators do not have complete control over the make or buy decision, let alone contract design (Nicholson-Crotty 2004). Many contracts are the result of statutory requirements that dictate which goods or services must be purchased (Curry 2010). Often, legislation can earmark funds in ways that restrict the possible vendors as well (Savage 2009). My findings indicate that contracts where legislature influences contract design are more than twice as likely to be terminated for default and three times as likely to be terminated for cause as other contracts. Terminations for convenience are not significant, likely due to political pressures from external actors to keep contracts going unless performance is truly terrible. This is evidence that a purely transaction cost-driven model of contracting out perhaps glosses over some of the more important practical elements of public sector contracts. Indeed, political influence may be reducing the efficiency of contracting. The effect is particularly stark in comparison to the use of discretion by public administrators. When federal contracting officials choose to sole source contracts, those procurements are much less likely to terminate early and nearly 50 percent more likely to end with high performance. Chapter 5 presents additional evidence on the use of discretion. For now, it is worth noting that public administrators seem to be better able to design and manage contracts than legislators. In addition, there seems to be little evidence of poor

performance due to spending down, further indicating that contracting officials are carefully managing complex contracts, regardless of external pressures.

The effect of ownership and demographic factors is mixed. Nonprofits may be associated with lower risk of termination, but are not more likely to perform better than other types of firms. This may indicate that goal congruence can reduce extreme shirking but cannot motivate excellent performance. Minority-and veteran-owned firms are associated with higher levels of terminations for default and cause. This is consistent with the hypothesis that preference programs may rate values of representativeness and equity more highly than efficiency. Since these different public values are, at least in part, the rationale for these preference programs (Fernandez, Malatesta and Smith 2013), the loss in efficiency may be of little consequence. However, from the perspective of the contract manager, such preference programs also limit the pool of potential contractors. As a result, preference programs can also be seen as further evidence of political influence. In particular, this seems like an instance where Kaufman's representativeness has been deemed more important than the neutral competence of the public administrator (Kaufman 1956).

Conclusion

The present analysis indicates that many of the assumptions about the effect of competition on performance may be flawed. Instead, interpersonal relationships may be more important for success on complex federal contracts. In keeping with findings from sociology, psychology, and management, it seems that the context of competition is important for federal contractor performance. The level of market competitiveness may not be as important as pre-existing relationships. This holds with much of the literature in public administration about the importance of relationships and trust, as well as with possible benefits of collaboration and

cooperation. Even theories of transaction cost economics, which have gotten much traction in the field, may be overshadowed by political influences. Transaction cost concepts are only meaningful if public officials can convince legislators to allow them to design and manage contracts more completely. The comparison of the outputs of administratively and legislatively designed contracts indicates that administrators perform better, perhaps providing valuable practical evidence that can help shape the way that future contracts are designed.

This research also introduces a new way to measure contractor performance – the management decisions that contracting officials make concerning financial transactions and the final status of the contract at its conclusion. Instead of focusing on initial cost, this research attempts to find a way to measure the contract's outputs. Though the individual outcomes for nearly 25,000 contracts cannot be known with certainty, conclusion status is a nice proxy that allows comparison across multiple policy fields and contract types. The measure allows for the analysis of a large sample of contracts for the first time. However, this measure is not without problems. There is always the potential for omitted variable bias, as there are so many contextual considerations that surround a contract as to make it impossible to account for everything. Exhaustive controls have been included to reduce the chances of leaving out important variables, but the possibility remains. In addition, the segmentation of the closeouts could be flawed. The focus of my analysis has been on low-performing contracts, as termination is a clearer indicator of poor performance than spending is of good performance. Indeed, some studies have shown that spending can increase when investing in high value projects, even if performance is poor (Staw and Hoang 1995). For this reason, my analysis is limited to attempting to explain poor performance, not high performance. Still, spending on contracts could indicate poor performance rather than good performance. However, trends in the control variables suggest that this is not

the case. The coefficients of each management action are consistent with the narrative surrounding this variable. Modifications that create new work agreements or add supplemental work are positively correlated with high closeouts, and are not more likely to result in low closeouts or terminations. Modifications that take away funding, exercise negative options, or are other actions that reduce funding each have coefficients greater than one for all types of termination. Though these relationships are not always statistically significant, the magnitude of the relative risk associated with the coefficients suggests that these actions may be used in response to poor performance. This segmentation could doubtless be refined, but early indications suggest that it is measuring what it purports to measure.

This research identifies many areas for further research. Findings about nonprofits, minority- and women-owned businesses and small businesses need to be explored in more detail. Interaction terms might be particularly interesting to study in this context. In addition, more work could be done to link these findings to the growing literature on representative contracting (Smith and Fernandez 2010, Fernandez, Malatesta and Smith 2013). This research also raises questions about political control and discretion. Chapter 5 addresses this to some extent, but additional work could be done to determine what types of contracts political actors are interested in and how they assert managerial control over contract managers in the context of statutory limitations. It might also be interesting to examine situations where competitors are forced to work together on the same contract. This would require insight into either the subcontract level or links between federal contracting programs. However, understanding these contexts could shed light on some of the inter- and intra-group issues raised in the psychology literature. Finally, a more detailed study of the possible impact of substitution is needed. This would

require segmenting contracts by type of product and developing a more detailed assessment of market competitiveness by product.

Despite these constraints, this research presents findings that are practically important for management. First, this is a strong justification for continuing the contracts of high performing contractors without re-competition. Follow-on contracts for high performers comprise just 1 percent of the contracts studied, yet the performance benefits are both statistically and substantively meaningful. Second, despite incentives and political pressures to work with more disadvantaged groups, this research suggests that finding experienced government contractors will lead to better performance. Finally, sole source contracts seem to perform better than those contracts which are competed. This means that for areas where public managers identify a quality sole source, the time taken to write a convincing justification might be worth it, both for the manager and the public.

This research finds that contract design elements may be particularly important for contractor performance. In addition, it calls into question some of the long held assumptions in public administration and other fields about how public contracts should be managed. Though the importance of collaboration and cooperation are well established in this field, other fields tend to still rely on competitive processes to increase performance while also improving accountability. However, competition might not be the silver bullet that many believe it to be.

Chapter 4: The Impact of Financial Payment Structure on Federal Contractor Performance

Introduction

There is a longstanding debate in public administration over the importance of different types of accountability mechanisms and their influence on performance. Many have asserted that controls external to the bureaucracy, such as legislative, executive, and judicial oversight, are critical for ensuring high levels of bureaucratic integrity (Finer 1936). Others see these external accountability procedures as red tape that stands in the way of efficient administration (Friedrich 1935). Opponents of external controls advocate instead for accountability based on professional norms and standards of technical expertise, claiming that public managers will hold one another accountable for their actions based on specialized training and knowledge. In response, proponents of external controls have argued that, despite potential efficiency losses, external controls are necessary to reduce the risk of corruption and to ensure that administrative action is consistent with national (or political) priorities (McCubbins, Noll and Weingast 1987).

There has been much study of these approaches to accountability in government-provided services. However, it is widely acknowledged that public services are increasingly provided through complex networks of public and private actors, including contractors (O'Toole 1997, Milward and Provan 2000, Agranoff and McGuire 2003) . As a result, more research is needed on the effect of different accountability mechanisms in the networked setting (O'Toole 2015).

Government agencies increasingly rely on contracts for the delivery of services. Much of the existing research has focused on describing types and frequency of contracting activity (Ferris and Graddy 1986), determining what should and should not be contracted out through the application of transaction cost economics (Brown, Potoski and Van Slyke 2006), and improving oversight through the application of agency theory to broad contracting challenges (Kelman 1990). However, there has been little attention paid to the specific mechanisms that public administrators use to hold contractors accountable. At the federal level, various types of managerial controls exist to maintain contractor accountability, including competitive selection, the financial structure of the contract, periodic performance reporting, transparency initiatives, and threats or mandates for re-competition (Federal Acquisition Regulation 2014). Despite this array of potential accountability mechanisms, little work has been done to determine the effectiveness of the different options that public managers have available.

This chapter analyzes how financial controls, as established through the financial payment structure, influence federal contractor performance. At the federal level, these payment structures include variants on three primary types of contracts: firm fixed price, cost-reimbursement, and time-and-materials. Each of these payment structures creates different performance incentives for contractors, provides government contract managers with varying levels of information on contractor activities, and alters the dispersion of risk between the partners. In addition, each of the financial structures is generally used in specific contexts, which are defined in the Federal Acquisition Regulation (FAR). As a result, it can be expected that payment structures which differ in context, incentive, and information exchanged might influence contract outcomes. My findings indicate that the financial payment structure of a

contract affects contractor performance in ways that may run counter to the preferences listed in the FAR.

The following section reviews the relevant literature on contracting, agency theory, risk, and performance, thereby identifying the gap in the existing literature. Then, I introduce contract financial structures and how they are used in the federal government. The following section categorizes these contract payment structures using concepts of transaction cost economics. Then, I describe the data and methods used. The chapter concludes with a discussion of my results and identifies the implications of this research for practitioners and future research.

Literature Review

Increasingly, public administration scholars are studying contracting. Within the field, there are three primary types of contracting research. First, descriptive studies identify how frequently contracting occurs (Ferris and Graddy 1986), what types of contracts are used (Prager 2008, Kim and Brown 2012), what kinds of goods and services are being procured (Savas and Savas 2000), and cost comparisons of public vs. private provision (Savas 1977). These studies, while interesting, do not explain why contracting is occurring outside theoretical political or economic explanations associated with efficiency gains.

Second, transaction cost economics have been applied throughout the contract process to attempt to explain the make or buy decision, an analysis of whether to contract out or produce the good/service internally (Walker and Weber 1987, Preker, Harding and Travis 2000, Tadelis 2002, Brown and Potoski 2003); how to recognize asset specificity and manage markets, primarily those associated with particularly complex products (Anderson and Dekker 2005, Hefetz and Warner 2011, Johnston and Girth 2012, Choi and Triantis 2013); and identify ways to address information asymmetries and uncertainty, though this has primarily focused on the initial

decision to make or buy (Agranoff and McGuire 2003, Getha-Taylor 2012, Brown, Potoski and Van Slyke 2013, Girth 2014). These studies tend to downplay external influences (such as politics) on the make or buy decision, and tend to focus on a small number of cases which makes broad generalizability of findings difficult.

Finally, there are agency theory studies, which assess how the principal (the government) can control the agent (the contractor) through the reduction of information asymmetry (Ross 1973, Steel and Long 1998, Verhoest 2005, Lambright 2009). These studies worry less about how the contract came into being, focusing on the immediate management challenges of contractor oversight. As a result, much of the context of the contracts analyzed can be ignored, including its initial purpose, the cost of oversight, and the practical workload of the public contracting officials charged with management.

As previously discussed, transaction cost and agency theory studies both relate to the financial structure of a contract. Within the public administration literature, there is only one study focused on contract payments. Kim and Brown (2012) assess how frequently the Departments of Defense (DOD), Homeland Security (DHS), and Health and Human Services (HHS) use fixed-price and cost-reimbursement contracts and whether these contracts are used as specified in the FAR. They find that more than 70 percent of contracts in each department use the fixed-price payment structure. This adheres to the FAR's preference for fixed-price contracts. Cost-reimbursement contracts are more likely to be used for complex products, such as computer system management or program management. Since these tend to be longer-term, more expensive, and riskier types of contracts, Kim and Brown conclude that, despite using fixed-price contracts for a majority of outsourcing, federal agencies still take on high levels of risk for certain types of contractual work (Kim and Brown 2012). They also link higher numbers of

contract modifications with complex contracts, indicating perhaps less willingness to re-bid complex work on the open market due to high costs (Kim and Brown 2012).

Though interesting, Kim's and Brown's research is fairly preliminary and does not have much of the detail necessary for a close look at the effect of a contract's financial structure. First, their paper does not account for variation within the different types of financial structures. As previously discussed, some contracts provide heavy financial incentives for contractors. Others, such as cost sharing contracts, have no profit motive included and share risk in unexpected ways. Without accounting for these differences, it is difficult to compare between contract types effectively. Second, Kim's and Brown's study does not specify what types of contracts they assess. At the federal level, there are many different kinds of contracts (definitive contracts, indefinite delivery vehicles, purchase orders, BPA calls, etc.), and comparisons between the types can be challenging. Third, they only examine three departments. In a government where millions of contract actions are reported each year, variation between agencies is likely. As a result of these first three problems, we still know little about how financial structures are used and whether they are used as intended in the FAR.

Finally, Kim and Brown do not look at the impact of payment structure on outcome variables. Instead, they assess contract length and contract value. While it is interesting that certain agencies tend to modify and spend more than initially planned, this says little about the performance of the contractor. Instead, high numbers of modifications and overspending may reflect difficult contract requirements, complex work, or possibly even good contractor performance. Thus, we know little about whether these financial structures matter at all to the overall success or failure of the contract. So, many questions about financial structures remain unanswered.

To answer these questions, it is necessary to present some background information on the different financial structures that federal contracting officials can use. The following section explains the different types of contracts used at the federal level.

Federal Contract Payment Structures

During the pre-solicitation phase of the contracting process, public officials choose the financial (or payment) structure of the contract. The federal government uses three overarching financial structures for definitive contracts which alter the risk that the contractor assumes, change the incentive structure of the contract, and provide different accountability mechanisms and oversight procedures (FAR, 16.101, 2014). The guidance in the FAR shows a preference for fixed-price contracts, which shift risk to the contractor (FAR, 16.2, 2014). More than 65 percent of federal contracts are fixed-price (Kim and Brown 2012). However, this means that, despite the preference for this type of contract, administrators are choosing other financial structures based on contextual differences related to contract requirements and oversight mechanisms. In each case, it is up to the contract manager to determine which financial structure best fits the contract, though the FAR does provide guidelines for when each might be appropriate. In all cases, public managers are required to identify approximately how much will be obligated on the contract. Contracting officials generally establish a minimum amount of spending that will be made and estimate a spending ceiling. This approximate value of the contract can be altered through change orders, funding actions, and the exercise of options. As a result, financial actions taken throughout the course of the contract, when compared to this total value, can provide additional insight into contractor performance, particularly if the overarching financial structure is considered.

Fixed-Price Contracts

Fixed-price contracts provide a firm price ceiling for the contract. Fixed-price contracts place the maximum possible risk on the contractor, who is obligated to complete work for the established price (FAR, 16.202-1, 2014). As a result, this structure provides profit motive incentives for efficiency; if the contractor wishes to make a profit, the work will need to be completed for less than the fixed price. As a result, fixed-price contracts reduce administrative oversight costs since the contractor should be motivated to perform efficiently. Fixed-price contracts are most appropriate when there is price competition, when price comparisons are available to make reasonable performance and cost estimates, and when performance uncertainties can be identified and associated risk shifted to the contractor (FAR, 16.202-2, 2014). Generally, fixed-price contracts are preferred in federal contracting as they are seen as efficient vehicles which distribute risk between contractual partners. Within the umbrella of fixed-price contracts are modified financial structures which enable adjustments for economic conditions, performance incentives, or level of effort (FAR, 16.203-206, 2014).

- *Firm-fixed-price* contracts identify the total price that the government will pay for the contract (FAR 16.202). This price is not adjustable. As a result, the contractor is responsible for ensuring that all costs fall within the total price. To make a profit, the contractor is forced to complete required work for less than the total price. In theory, this structure places the risk on the contractor, thereby increasing efficiency. In addition, less oversight is needed, because the contractor is forced through the financial structure to be accountable for the work done to ensure that a profit is made. This conceptualization is only valid if (a) the government performs the initial cost estimation, using market comparisons to determine the appropriate level of effort and associated costs and (b) the

government can accurately estimate the cost of the contract, including some projection of contractor profit and performance uncertainties. Governments cannot rely on contractor estimates to determine appropriate cost, as these are unlikely to accurately reflect market conditions. Instead, contractors can be expected to make an effort to maximize profit. Indeed, there is evidence that consultants who work on fixed-price contracts are able to earn 80 percent more than those who use other pricing mechanisms (Shenson 1990). For governments to accurately assess cost there must be competitive markets so that price comparisons can be made.

- *Fixed-price with economic price adjustment* contracts allow for cost changes based on contingencies established in the contract (FAR, 16.203-1, 2014). This payment structure is used when there are concerns about the reliability of the market or labor conditions, or when specific contextual problems are clearly known and can be quantified rather than estimated as an element of the risk included in a firm-fixed-price contract.
- *Fixed-price incentive* contracts include a payment formula which is designed to encourage contractors to perform efficiently (FAR 16.203, 16-4, 2014). Generally, a ceiling price is established, under which the contractor receives higher profit. Once the ceiling is breached, additional costs are divided between the contractor and the agency, thus reducing contractor profit. In other cases, contractors are provided with bonuses (known as award fees) for high performance at the conclusion of the contract.
- *Fixed-price level of effort* contracts provide a firm payment amount for research and development (R&D) with a specified amount of work over a particular period of time (FAR, 16.207, 2014). Since R&D outcomes are often harder to predict, these structures enable government to establish the amount of time and resources to be expended on the

effort, rather than to identify the final product, which often takes the form of a report or white paper. The contracts cannot be valued at more than $150,000 without special approval.

Despite potential efficiency benefits, fixed-price contracts may limit oversight capabilities of public managers due to the reduced reporting requirements and limited provision of progress information (Müller and Turner 2005). Indeed, fixed-price contracts may even flip the balance of power, making the contractor act more like the principal in the relationship, as they possess greater knowledge of the activity, pricing, and day-to-day performance of the contract (Shenson 1990). However, fixed-price contracts tend to be preferred at the federal level over other types of contracts due to the ability to shift risk to the contractor, to clearly define the overall cost for the effort, to reduce chances of opportunism, and to limit oversight and accountability costs (FAR, 16.2, 2014; Curry, 2010).

Cost-Reimbursement Contracts

Cost-reimbursement contracts allow for payments to the contractor for expenses incurred during work on the contract. These contracts are used if work or product requirements are hard to define or if performance costs are particularly hard to estimate. Cost-reimbursement contracts establish an estimated total cost of the contract, including a ceiling over which contractors cannot make charges without approval from the government (FAR, 16.301, 2014). Contractors run no risk of loss under these contracts, making them more appealing in instances where a contractor's project-specific investments costs are high or when markets are thin. If the government agency fails to reimburse for costs, contractors have no obligation to continue to perform on the project.

These contracts place more financial risk on the government than the contractor, as performance criteria and expectations may be less clear. In addition, contractors may have the

incentive to work slowly to incur higher costs, thus delaying meaningful progress. There are a number of specialized incentive and risk sharing sub-types within the category of cost-reimbursement contracts, all designed to reduce opportunism (FAR, 16.302-306, 2014), including:

- *Cost contracts*: Only the cost is reimbursed; no fee is awarded. Cost contracts, which offer no fee (and thus little opportunity for profit), are not likely to spur efficient performance. As a result, they are most appropriate for contracts for R&D that are not time-sensitive or for projects involving non-profits or educational institutions (FAR, 16.302).
- *Cost-sharing contracts*: The contractor is only reimbursed for part of the cost, sharing part of the total expense of the project with government (FAR, 16.303). Again, there is little expectation of profit for the contractor in such arrangements. Instead, contractors may be seeking (a) shared project goals, such as when non-profits share public-sector outcome priorities, (b) particular skills or knowledge that can be gained through work on the contract, such as the use of new technology or access to information, or (c) reputational benefits associated with holding a particular type of contract (Shenson 1990).
- *Cost-plus-fixed-fee contracts*: Contractors receive payment of a negotiated, set fee at the beginning of the contract (FAR, 16.306). This guaranteed profit incentivizes contractors to work in areas of high risk (where asset specificity is high), but increases government risk as opportunism is more likely. Contractors have little incentive to control costs, as their profit is ensured upon task closeout. Price ceilings can be established to encourage efficiency, but for many of these initiatives, maximum cost can be hard to determine, especially in areas of preliminary exploration or R&D (FAR, 16.306, 2014, Shenson,

1990, Salamon, 2002). As a result, these structures should only be used when requirements are vague and level of effort is unknown.

- *Cost-plus-incentive-fee contracts*: These contracts include an adjustable fee based on the proportion of the total value spent (FAR, 16.304). Lower spending yields larger fees, within maximum and minimum fee limits (which can be negative). This structure is a way to encourage contractors to maintain low costs by offering higher profits in exchange for efficient use of contract resources.
- *Cost-plus-award-fee contracts*: A fee based on a performance appraisal is given to the contractor at the conclusion of the contract (FAR, 16.305). The evaluation can be performed by government officials or a third party, depending on the contract (Shenson 1990). Award fees are used when performance assessment is more difficult, requiring some form of human-led evaluation. As a result, they are appropriate for more complex projects with uncertain objectives or where performance is hard to measure.

All of these different structures are efforts to work around potential opportunism problems inherent in cost-reimbursement contracts. The last two approaches are used to incentivize high levels of performance based on financial payments to contractors. Despite the availability of these sub-types, the FAR views cost-reimbursement structures as undesirable unless unavoidable. Since many federal contracts are for exploratory projects, R&D, or other kinds of technical development, these structures are used more frequently than might be preferred, accounting for slightly less than 15 percent of definitive contracts (see table 4.1). It is worth noting that cost-reimbursement structures give increased visibility into the actions of contractors (as they have to report how costs are incurred), possibly increasing accountability and reducing information asymmetry. In addition, the diversity of sub-types allow government

contracting officials some discretion in determining the best method to incentivize performance when requirements are poorly defined or performance measurement is difficult.

Time-and-Materials and Labor-Hours Contracts

These financial structures do not necessarily establish an overall price for the contract, but rather reimburse the contractor for the labor hours and materials used in the completion of the desired work (FAR, 16.601, 2014). Such contracts are used only when the government cannot accurately assess the length of the contract or the costs of the materials and labor required to complete the work. Due to the uncertain nature of the work and the inability of the government to anticipate costs and duration, contractors may have some incentive to inflate costs. As a result, the use of these types of contracts is discouraged unless unavoidable (FAR, 16.601(d), 2014).To ensure that this does not happen, time-and-materials and labor-hours contracts require intensive government oversight. In addition, spending ceilings, fixed hourly rates, materials handling costs, limitations on general and overhead spending, and detailed guidelines for the transfer of funds between contractors and subcontractors are clearly established in the contract. There are three primary types of contracts that fall into this category:

- *Time-and-materials* contracts establish a ceiling price to be paid for a combination of labor hours (at fixed, pre-determined rates) and materials used directly for the completion of a contract for which the duration and associated costs are difficult to estimate with confidence (FAR, 16.601b (1-2), 2014). Wages, overhead, administrative expenses, handling and acquisition costs for each labor and material category are clearly specified (including profit margins for each category). Such contracts are only used if contracting officers determine that no other type of contract is appropriate. Supervisors must approve each time-and-materials contract (FAR, 16.601(d)(1-2), 2014).

- *Labor-hours* contracts are similar to time-and-materials contracts, but, instead of the contractor purchasing and being reimbursed for materials, the government provides the materials used (FAR, 16.602, 2014). Thus, the primary cost that the government incurs through the contract vehicle is the expenditure of labor hours.
- *Letter* contracts are preliminary agreements that authorize contractors to begin work immediately (FAR, 16.603-1). Binding agreements, letter contracts are used to (a) begin work on a contract that is needed quickly or (b) when contract negotiations are not able to be concluded before work needs to begin (FAR, 16.603-2). Generally, letter contracts need to be formalized (that is, modified into one of the other contract structures) within 180 days or before 40 percent of the work on the contract is completed (FAR, 16.603-2(b)). The maximum value of a letter contract is usually held at no more than half of the total value of the proposed full contract. Letter contracts are temporary engagements, allowing for fulfillment of immediate requirements.

Some have labeled time/labor contracts as versions of fixed-price contracts (Shenson 1990). However, the FAR is very specific that these are not fixed-price contracts (FAR, 16.600, 2014). Instead, they are more like cost-reimbursement contracts where the duration is uncertain and costs are particularly difficult to estimate beforehand. Profit incentives are very limited with these types of contracts, as there are few mechanisms available to control costs or incentivize efficiency. Instead, contractors are simply reimbursed for effort expended. As a result, opportunism is a potentially large problem. Additional constraints, such as profit limitations, are put into place if such contracts are not able to be competitively sourced due to unique requirements (FAR, 16.601(c)(2)(ii), 2014).

Indefinite Delivery Contracts

Indefinite-delivery contracts (IDCs) are contractual vehicles which establish a mechanism for providing goods and services when the exact quantities for delivery are unknown over a defined period of performance (FAR, 16.501-2, 2014). IDCs create a contractual framework that is flexible, allowing for ongoing procurement and reducing transaction costs associated with the frequent competition. Once established, government officials can then place purchase- or delivery orders against the IDC. IDCs involve complex relationships between the government and its suppliers. There can be many types of direct relationships between individual task orders. For example, success on one task order may lead to another task order. Or, failure on one task order may lead to another task order to fix the problems of the first. IDCs are also less costly than other types of contracts, as contracting officials can simply write task orders to the selected firm rather than following the complete contracting process. Relationships between government and contractor officials are highly important on these contracts, as trust and mutual dependence (for better or worse) can be built over time more easily on these types of contracts than on shorter, one-off contracts where immediate performance is crucial (Brown, Potoski and Van Slyke 2009). For IDCs, the government knows they will be working with the contractor for extended periods of time, so preserving the relationship may be just as important as performance on individual task orders (Brown, Potoski and Van Slyke 2013). All of these factors create confounding variables that are difficult to capture in a large dataset, such as interpersonal relationships and previous, related task orders. These in turn create potential causal loops for why the contractor was selected and how they are managed. Thus, endogeneity between task orders on IDCs is likely and particularly difficult to address statistically. These contracts can be used to purchase a wide range of products, from very simple goods, such as

equipment and office supplies through the GSA's multiple awards schedule, to much more complex goods that require an ongoing relationship between the government and the contractor to jointly develop requirements, monitor progress, and measure outcomes (Brown, Potoski and Van Slyke 2013). IDCs are not included in this analysis because of the unique context and purpose of each contract, but are a ripe area for future research.

Use of Financial Structures

As previously mentioned, the FAR indicates a strong preference for fixed-price contracts (FAR 16.2, 2014). This is consistent with much of the work in public administration that emphasizes contracting out should primarily be used for goods and services where transaction costs are low (Brown and Potoski 2003, Brown, Potoski and Van Slyke 2006). However, the federal government contracts out for many things which have high transaction costs, particularly for products that are uncertain, with high asset specificity, and where information is asymmetric. For example, basic research (federally funded exploratory studies) naturally has uncertain outcomes and, since the contractors tend to be leading issue experts, information asymmetry is high. Other types of products, such as defense contracts for advanced weapons, have high asset specificity due to the monopsony that the federal government has on such products.

Because of these types of products, federal contracting officials often engage contracts that use other payment structures than fixed-price. Table 4.1 indicates the frequency of each payment structure discussed above for definitive contracts from 2005 to 2014. Clearly, fixed-price contracts are the most commonly used. However, around 10 percent of federal definitive contracts use cost-reimbursement structures and more than 11 percent use time/labor-hours. This suggests that many federal definitive contracts may be for goods or services with higher transaction costs. It is worth noting that contracts with non-market financial performance

incentives (e.g., incentive and award fees) make up less than two percent of the total. This suggests that contracting officials are not making use of available financial incentives to limit government risk.

Federal officials encounter contracts with diverse requirements. The structures described above are designed to limit government risk, encourage bids, and reduce contractor opportunism depending on the context of contractual requirements. As a result, the payment structure of each contract may be indicative of the circumstances surrounding each contract. Contracting officials have the discretion to decide which of these structures to use on each contract. They make this decision based on the complexity of the contract, the strength of the market, and associated managerial costs (Kim and Brown 2012). In particular, the overarching structure chosen provides insight into how the contracting official perceived the clarity of requirements, a measure of task complexity. Thus, these potential problems (risk, market-making, and opportunism), relate closely to transaction costs. The following section introduces a typology of contract financial payment structures based on transaction costs, ease of oversight, and the balance of contract risk.

Conceptualizing Contract Payment Structures: Transaction Costs, Oversight, and Risk Sharing

One way to categorize these different financial structures is to consider associated transaction costs. Stemming from the work of Coase and Williamson, transaction costs refer to the frequently overlooked expenses associated with economic exchanges (Coase 1960, Williamson 1981). Exchanges are commonly fraught with information asymmetries, uncertainty, and asset specificity (Williamson 1979). When transaction costs are high, exchanges are riskier, increasing the overall cost and possibly leading to the possibility of few market participants. Since requirements for exchanges are based on any number of contingencies, transaction costs

can vary greatly. Ultimately, the balance of transaction costs across parties to a contract can determine where risk is allocated. If the government agency incurs higher transaction costs than the contractor, the risk of opportunism rises. Higher costs for the contractor can create incentives for innovation and efficiency, but may also reduce competition, leading to asset specificity problems.

Contracts, which are legal documents outlining the terms of an exchange, suffer from all three types of transaction costs. Contracts always involve some degree of uncertainty and information asymmetry, though the degree is dependent on the complexity of the good or service to be procured. Uncertainty refers to the incomplete knowledge associated with an exchange, due to both bounded rationality and potential opportunism. Information asymmetry refers to information advantages that parties to the exchange may have over one another. In particular, moral hazard, where behaviors change after the establishment of a contract (such as opportunism), is of particular concern.

Asset specificity refers to the need to invest in infrastructure or other resources for the completion of the contract, but which have limited use beyond the contract itself. Both parties to a contract can incur asset specificity costs; for example, principals may have to develop contract-specific accountability and information exchange procedures, while contractors may be required to invest in infrastructure or production capabilities for which there are limited other markets. That is, one or both parties to the exchange may have to invest heavily in new resources for which there is no other use should the exchange fail. As a result, high asset specificity for a particular contract increases the risk for the party required to make the initial investment, thus making the cost of participation higher and possible markets smaller. As a result, the market for

such contracts may not be as competitive. Contract payment structures are financial tools that can help contract managers counteract these transaction costs.

Table 4.2 summarizes the ideal conditions for using the different financial structures. Though there is variation within each financial structure, the three major categories share important management characteristics. For example, fixed-price contracts place the burden of performance on the contractor, no matter what other incentives are used under the broader structure. Cost-reimbursement contracts and time/labor contracts are used for contracts with poorly defined or unknown requirements. Thus, each broad category of contracts also share similar levels of transaction cost associated with allocating risk.

When contract requirements are clear, uncertainty is low. That is, when the government is able to specify exactly what it wants, make accurate market comparisons, and thus accurately project anticipated costs, uncertainty is low. However, as requirements become more difficult to generate, uncertainty rises. Contracting officials have greater difficulty estimating what outcomes should be, how long contracts should last, or how much they should cost. As a result, uncertainty can then be fairly closely related to the complexity of the exchange. For complex products, generating requirements can be difficult. Complex goods and services are those where cost, quality, and quantity elements cannot be easily determined (Bajari and Tadelis 2001, Brown, Potoski and Van Slyke 2009). Such products generally involve multiple components which must all interact to create a non-decomposable whole (Mitchell and Singh 1996). Despite high levels of uncertainty, the federal government commonly procures complex products through contracts (Salamon 2002, Brown, Potoski and Van Slyke 2009). These types of goods and services naturally increase governmental risk and make contractor opportunism more likely.

Information asymmetry is directly related to the amount of information that is exchanged between parties. Fixed-price contracts, which do not require the same level of detailed reporting on contract spending as other pricing structures, limit the amount of information available to public officials. This is not to say that such contracts do not provide information exchanges, but rather that the information exchanged is less comprehensive. Instead of listing all expenditures and requiring a careful review to confirm eligibility for reimbursement, fixed-price structures more often require reporting of spending in general categories which receive less attention from government officials since it can be assumed that such expenses would not be incurred if the contractor did not deem them necessary for the performance of the contract. Even though fixed-price contracts may be for simpler products, information asymmetry may be high due to limited communication. Cost-reimbursement and time/labor contracts ensure more complete exchange of information, reducing the information asymmetry in an attempt to limit opportunism. However, as more information is exchanged, oversight costs rise as contracting officials are forced to take time to gather and assess information. Gathering more information does not necessarily reduce the overall cost of the exchange.

Finally, contracts for products with competitive markets are more likely to have clear requirements. Such products are relatively well understood, as there are multiple providers who offer many different versions or levels of the necessary good or service. There is little risk associated with the need to develop new products without the prospect of other buyers. As a result, asset specificity should be lower for contracts for which requirements are easier to generate, because there are existing markets. Requirements are easier to generate because there is an active market from which comparisons can be drawn. Since an active market exists, repurposing investments is relatively easy, lowering asset specificity. This reduces the risk for

contractors, who could find other buyers for their services or other uses for their investments. Unclear requirements are indicative of a weak or missing market, meaning that asset specificity is likely to be higher. Since the federal government is often the sole purchaser of particular types of products (for example, Stealth bombers) and services (for example, intelligence analysis), asset specificity problems are common in federal contracting. In addition, the U.S. government serves a market making role, encouraging the development of new technologies or services (such as G.P.S., the internet, and so on) which have high initial investment costs, hard to measure outcomes , and very limited short-term marketability. Since this type of R&D can lead to huge societal advances, such investments are desirable. However, over the short run, these projects have high asset specificity. As asset specificity rises, fixed-price contracts are less appropriate, as government officials may need more information to counteract the possibility for opportunism and to reduce risk of poor performance.

Transaction costs help explain how risk is shared between parties to a contract. The FAR prefers fixed-price contracts because they indicate contracts with less uncertainty, lower oversight costs, and lower asset specificity. When the goals of a project are clear and there is a competitive marketplace, the government is better able to generate requirements and develop accurate cost estimates for desired work. Contractors bidding for this work in a competitive marketplace have to find ways to be efficient to ensure higher levels of profit. If they are not efficient, their profit margins will drop as the total cost for the project is pre-determined. New investments required for the contract can easily be used for other purposes, as a competitive marketplace exists. As a result, the contractor takes on the majority of the performance risk. Risks associated with startup costs are limited. The government does experience higher

information asymmetry, but this is counter-balanced by the efficiency incentives inherent in the fixed-price structure and reduced oversight costs.

However, when contract requirements are not as clear and uncertainty increases, fixed-price contracts are less appropriate, as estimating associated costs and timelines becomes more difficult. If government officials cannot accurately estimate costs or timelines, a fixed-price structure is risky for both government and the contractor. Under fixed-price structures for uncertain products, contractors could stand to make enormous profits, fail to meet government needs, or fall anywhere in between. In addition, when requirements are uncertain, competitive markets are less likely, meaning that comparisons are harder to locate, relevant expertise may be harder to find, and investment costs for interested firms may be high but with few other markets. That is, uncertainty, oversight costs, and asset specificity all rise. Because of this, cost-reimbursement and time/labor contracts increase the likelihood for opportunism. The majority of the risk falls on the government, rather than on the contractor. Variations within cost-reimbursement and time/labor contracts, such as award fees and incentive fees, are designed to enhance information exchange and incentivize high performance.

One way to assess whether this model holds is to look at how the different financial structures are used in federal contracts. The dataset used in this analysis provides insight into the type of good or service procured via contract. Table 4.3 provides a breakdown of how the three major types of contracts (fixed-price, cost-reimbursement, and time/labor) are used across five particular types of services. As expected, contracts for more complex services show more frequent use of cost-reimbursement and time/labor contracts. Contracts for professional services and research account for more than 86 percent of all cost-reimbursement contracts used. Contracts for professional services, research, and information technology account for more than

90 percent of time/labor hours contracts. As described in chapter 2, these are services where requirements can be hard to generate, markets can be less competitive, and more information is necessary to ensure effective oversight. On the other hand, more than 99 percent of contracts for construction, a complex service with clearer requirements and a more competitive marketplace, use fixed-price structures. It appears that federal officials are using these financial structures consistently with the FAR and the tenets of transaction cost economics. However, it is still unclear whether these structures influence contractor performance, as this model of risk allocation would expect.

Research Question and Hypotheses

This research tests whether the financial structure of federal contracts influences contractor performance. Federal contracting officials are charged with selecting the best financial structure for each contract based on their own expertise and assessment of the contract's requirements. The conventional wisdom holds that fixed-price contracts should be used as much as possible to reduce governmental risk and spur more efficient contractor performance (Shenson 1990, Federal Acquisition Regulation 2014). The profit motive associated with a fixed-price contract should hold the contractor accountable for both the timeliness and quality of work to ensure maximum earnings. However, fixed-price contracts also provide government less information about the day-to-day work of the contractor, as there is no review of itemized expenses. Thus, there is an information asymmetry between the government agency and the contractor. Agency theory suggests that the best way to improve a principal-agent relationship is to reduce information asymmetries (Eisenhardt 1989, Shapiro 2005). These two lines of thinking are at odds. It is uncertain what effect profit motives or reduction of information asymmetries have on contractor performance. The current analysis is an effort to determine which of these

perspectives better describes high- and low-performing federal contracts, and to provide some insight to public managers choosing between contract financial structures.

This research assesses the impact of contract financial structure on federal definitive contracts, which are stand-alone agreements for goods and services between a vendor and the government for a particular product or service. Broadly, this research determines what effect the different types of contract structures have on the termination of individual federal contracts. Specifically, the research question is:

- Does the financial payment structure influence contractor performance?

As table 4.2 indicates, contracting officials may use different financial structures based on the perceived risk and transaction costs associated with individual contracts. Though theoretically strong, few assessments have been done to determine whether officials adhere to the conceptual model that transaction cost economics provides, especially in the public sector. Kim and Brown find that fixed-price contracts are used for short-term purchases of simple services, while cost-reimbursement contracts are used for longer contracts involving more complex products (Kim and Brown 2012). However, this is the only study to focus on these payment structures in the public administration literature. Their analysis is limited to descriptive statistics, and provides little insight into the causal mechanism behind the decision to select one contract type over another. As such, the present research begins with an analysis of how contract financial structures are used in federal contracting.

As previously discussed, each financial structure offers particular benefits and drawbacks for public managers. Fixed-price contracts are most appropriate where there is competition, as this allows contracting officials to make accurate price comparisons between vendors to set an appropriate price ceiling for the contract. Generally, fixed-price contracts are best when the good

or service provided is relatively simple, as performance risks can be identified ahead of time. This forces both the agency and the contractor to think through management challenges before the contract is in place, but can be impossible if the requirements are too complex. As a result, fixed-price contracts are most likely to be used when there is a competitive marketplace and when contract requirements are well defined (i.e., when the good or service procured is well understood).

$H_{4.1}$: Competitively sourced contracts are more likely to use fixed-price structures

Many of the goods and services that government procures through contracts do not meet these criteria. In many instances, markets are not competitive, forcing the government to use single vendors (Girth et al. 2012). Under these conditions, asset specificity rises for the contractor as there may be no way to repurpose the investments necessary to work on the contract. As a result, few contractors may be willing to bid on the contract, and the government may need to incentivize interest in some way. One way to do this is by guaranteeing reimbursements for investments of time, labor, and other purchased resources through the financial structure of the contract. Though this approach does not encourage efficiency, as vendors are incentivized to charge for as much reimbursement as possible, it does encourage firms to bid on contracts that may be perceived as riskier. Much economic research demonstrates that fewer vendors bid on contracts as asset specificity rises (Joskow 1988, Lajili et al. 1997, Mithas, Jones and Mitchell 2008). As a result, sole source contracts are evidence of asset specificity, while contracts receiving many bids are evidence of a competitive marketplace where sellers' investments can be repurposed for other buyers.

$H_{4.2}$: Sole source contracts will be more likely to use cost-reimbursement and time/labor financial structures

$H_{4.3}$: Contracts that receive five or mode bids will be less likely to use cost-reimbursement and time/labor financial structures

In other cases, certain aspects of a contract may increase the uncertainty associated with bidding for or managing the contract. In general, contracts for more technical goods and services, contracts with longer durations, and contracts that involve higher total expenditures of funds are considered to have higher levels of uncertainty (Kim and Brown 2012). Often the requirements of a contract are difficult to clearly define in advance, as the project is exploratory or for a relatively rare (or even unique) good or service (Bajari and Tadelis 2001). Uncertainty is pervasive on such contracts for both the government and the contractor. Public contracting officials may have a hard time clearly explaining what is desired and may have more difficulty evaluating performance (Williamson 1979). Vendors may not have a clear idea what the government desires from the project and may be more likely to shirk if quality problems are easy to hide (Romzek and Dubnick 1987). On very technical projects, holding contractors accountable can be particularly difficult as public officials experience extreme information asymmetries (Anton and Yao 1987, Gallini and Wright 1990, Bahli and Rivard 2003). This uncertainty can be in terms of both behavior and process (Walker and Weber 1984, Shelanski and Klein 1995). Behavioral uncertainty refers to the threat of opportunism in market transactions, while process uncertainty refers to a lack of familiarity with the exchange to be made and the systems used to in the management and delivery process. For highly uncertain contracts, financial structures might be used to facilitate greater information exchange between the government and the contractor in an effort to reduce the information asymmetry and facilitate more informed performance evaluation over the duration of the contract. Regular information exchange can help build familiarity between the contractor and the agency, as well as make more transparent the

processes used to both perform and evaluate the work on the contract (Faems et al. 2008). This can reduce both process and behavioral uncertainty.

$H_{4.4}$: Contracts for goods and services with uncertain requirements are more likely to use cost-reimbursement and time/labor structures than contracts for other goods or services.

$H_{4.5}$: Contracts for goods and services with more clearly defined requirements will be less likely to use cost-reimbursement and time/labor structures than contracts for other goods or services.

$H_{4.6}$: Longer contracts are more likely to use to use cost-reimbursement and time/labor structures than shorter contracts.

$H_{4.7}$: Contracts that involve a high amount of spending are more likely to use to use cost-reimbursement and time/labor structures than other contracts.

Despite challenges associated with transaction costs, contracting offers value to government because it enables public agencies to take advantage of market forces to improve the efficiency of service provision (Savas and Schubert 1987, Kelman 1990, Osborne and Gaebler 1992). As contractors strive to make a profit, they must provide goods and services efficiently to retain market advantages over their competitors. Any reduction in efficiency could result in competitors providing the service at a lower price or of a better quality. Thus, as long as markets are competitive and requirements are clear, firms can be held accountable for high levels of performance through their own profit motive (Williamson 1979, Brown, Potoski and Van Slyke 2006). The contracts most likely to perform well are those where there are competitive markets and with well-understood requirements. Under such conditions, firms have the financial incentive to perform highly and government contracting officials can readily understand the service being provided. Fixed-price contracts are appropriate to use in these conditions, are as a

result are the likely to be used on contracts that perform well. For contracts where requirements are more challenging, or where markets are weaker, financial incentives can be used to incentivize improved performance by introducing elements of profit motive to other types of contract financial structures.

$H_{4.8}$: Fixed-price contracts will be less likely to terminate early than other types of contracts

$H_{4.9}$: Incentive contracts will be less likely to terminate early than other types of contracts

Data and Methods

The unit of analysis for this research is the individual contract. The sample consists of the 24,396 federal definitive contracts which ended between FY2005 and FY2014. Definitive contracts are standalone agreements between the government and contractor for a particular good or service. To ensure completeness of records, the contracts in this dataset began no earlier than 1998. The average contract lasted for more than 27 months and involved the expenditure of nearly $1.9 million. 90 percent of the contracts in the dataset lasted for more than four months and involved expenditures over $15,000. As a result, the dataset is comprised of contracts for complex goods and services.

To assess how financial structures are used and affect performance, I use two multinomial logistic (MNL) regression models. Each is described in detail below, including specifications. Both models use an unordered, categorical variable of interest, which is appropriate for MNL methods. Hausman tests indicate that the assumption of independence of irrelevant alternatives (IIIA) is not violated in either model. For additional information on the overall modeling approach and its applicability in this setting, please refer to chapter 2.

My first model assesses how federal contracting officials use different financial structures to respond to transaction costs and market conditions. I hypothesize that when markets are competitive and contracts involve low levels of asset specificity and uncertainty, contracting officials are more likely to use fixed-price pricing structures that shift the risk of performance to the contractor. When contracts are more complex and transaction costs are higher, contracting officials are more likely to use the other financial structures to incentivize bids and increase the exchange of information to facilitate contract management. To test this, I model the effect of market characteristics, transaction costs, and control variables on the selection of contract financial structures. The model is specified conceptually below:

Model 1: Pr | Contract Financial Structures = Competitive Sourcing + Transaction Costs + Department Characteristics + Contract Importance + Procurement Conditions + e

In this model, the variable of interest is the financial structure used on the contract. Financial structures are operationalized as a “0” for fixed-price contracts, and “1” for cost-reimbursement contracts, and a "2" for time/labor contracts. This dependent variable is unordered and categorical, making MNL procedures appropriate.

My primary explanatory variables are competition and transaction costs (uncertainty and asset specificity). Competitive sourcing is a dichotomous indicator of whether the contract used competitive procedures or not. Competitive mechanisms include full and open competition, competition after exclusion of sources, and competition under simplified acquisition procedures. The use of competitive procedures suggests that the contracting official believed that market forces could improve the efficiency of the contract’s pricing.

I focus on two types of transaction costs: uncertainty and asset specificity. Consistent with literature in economics which finds that buyers are less likely to bid on riskier contracts (Joskow 1988, Lajili et al. 1997, Mithas, Jones and Mitchell 2008), asset specificity is operationalized as two dichotomous indicators based on the number of bids received. Contracts receiving just one bid, or sole source contracts, are indicators of high asset specificity, as market interest in the contract was low. Contracts receiving five or more bids are indicators of low asset specificity, as many bidders were interested in the project. Since previous researchers have found that government contracts are likely to receive approximately three bids, five bids suggests high competitiveness (Girth et al. 2012).

Uncertainty is related to the length of the contract, the complexity of the work performed on the contract, and the resources expended (Kim and Brown 2012). Length is operationalized as a dichotomous indicator for contracts that last more than two years. I use a dichotomous indicator instead of the continuous measure of length for two reasons. First, previous findings have indicated that longer contracts are more likely to use cost-reimbursement and time/labor financial structures (Kim and Brown 2012), so the indicator highlights these contracts. Second, an indicator variable makes interpretation of relative risks much easier, allowing for substantive discussion of my findings. Total expenditure on the contract is operationalized as the natural logarithm of the total amount of funding obligated to the contract over its duration. This measure excludes deobligations, instead focusing on the maximum possible value that the contract could have had. In addition, I include a continuous measure of the total obligation as a percentage of the agency budget, which measures the overall importance of the contract to the government. The natural logarithm is used to normalize the variable. To capture the complexity of contract requirements, I include a dichotomous indicator for all services, which are generally more

complex to deliver than goods. In addition, I include dichotomous indicators for professional services contracts, research contracts, information technology contracts, and training contracts, each of which are acknowledged to be particularly complex types of work (Anderson and Dekker 2005). Contracts for these particular types of products can involve weaker markets, challenging requirements, and difficult evaluation criteria. To provide a foil for these complex services, I include a dichotomous indicator for construction contracts, which has a strong market and established performance measures (Kagioglou, Cooper and Aouad 2001). Further discussion of these variables can be found in chapter 2, including justifications for their usage as indicators of complexity.

To control for other factors that may influence the selection of a particular financial structure, I include variables to account for the characteristics of the agency, the procurement environment, and the relative importance of the contract to the contractor and the agency. These variables account for pre-contract contextual considerations that may influence the design of contract. Certain types of agencies may be predisposed to specific financial structures due to the complexity of the work that they perform. In emergencies, other types of contracts may be appealing due to the speed which they offer. These variables also control for recession years, policy problem complexity, and potential spending down of budgets. For a full discussion of these control variables, again refer to chapter 2 where they are discussed in detail.

The second model analyzes whether the financial structure of a contract influences contractor performance. The variable of interest (or dependent variable) for this model is the status of the contract at its conclusion. As discussed previously, federal contracts can end in closeout, termination for convenience, termination for default, and termination for cause. Termination for cause and termination for default are similar, indicating extremely poor

performance. The distinction between the two relates to the type of good or service procured. Early termination for poor performance is catalogued as "for cause" when non-commercial goods are procured and as "for default" when commercial goods are procured. Terminations for convenience indicate that the contractor was performing poorly or that the government decided to change direction. Normal closeout reflects a wide range of performance, all of which are, at worst, acceptable. To address variations within the closeouts, I use financial transactions on the contract to indicate performance. I assume that managers of poorly performing closeouts will reclaim funds for the government – that is, contracting officials opt to deobligate much of the contract's funding to preserve public value. I classify low-performing contracts as those where more than half of the total obligations were taken back by the government. High performing contracts, by comparison, are identified as those that did not have any money deobligated. Essentially, the way that the contracting official handles the funding provides some insight into the performance across closeouts.

This variable of interest allows the comparison of contracts across a variety of types, purposes, agencies, and durations. Measures of a contract's financial activity and end result rely on the contract manager's decisions. Since the manager makes financial decisions and ends the contract based on the best information immediately available at the moment of the modification, he or she is best suited to judge the contractor's performance. Modifications also have the benefit of carrying legal weight – these are not simply perceptual measures, but rather official determinations about what is necessary for contract management. Much of the previous research on government contracting has struggled to find ways to compare across large numbers of contracts. This measure allows greater comparability as it focuses directly on the manager's documented assessment of vendor performance. There is no question that contracts terminated

early for convenience, default, or cause represent poorly performing federal contractors. As a result, I am able to make better claims about truly bad performance than I am about what leads to good or exceptional performance. However, I try to gain a better understanding of variation within closeouts to provide some insight into what causes good performance, or at least leads to the full expenditure of allocated funds on a particular contract.

The primary explanatory variable of interest in this study is the financial structure of each contract. I include dichotomous indicators for cost-reimbursement and time/labor contracts. Fixed-price contracts are the reference category for the variables of interest in this analysis. In this way, I am able to compare the performance of the less common contract structures with fixed-price contracts. In addition, I include a dichotomous indicator for incentive contracts. These are fixed-price and cost-reimbursement contracts that include award fees or incentive fees to improve performance. To account for the context of each contract, this model includes the full set of control variables described in chapter 2 to address for the overall complexity of the contract, agency and contractor characteristics, and the conditions of the procurement.

Model 2: Pr | Contractor Performance = Financial Structure + Contract Requirements+ Procurement Conditions + Department Characteristics + Vendor Characteristics + e

Descriptive statistics for the explanatory variables used in these models can be found in table 4.4. Of note, cost-reimbursement contracts make up approximately 10 percent of the sample, while time/labor contracts comprise 12 percent. More than 50 percent of contracts received only one bid, though more than 60 percent used competitive sourcing procedures. Only 19 percent of contracts received five or more bids. This indicates that federal managers may be experiencing difficulty finding strong markets for many of their contracts. Given the number of sole source contracts, asset specificity may be high for complex contracts. 45 percent of the

contracts lasted for more than two years, and 50 percent of all of the contracts in the sample were for professional services or construction.

Results

Complete results for my two models are presented in tables 4.5 and 4.6. Table 4.5 has results pertinent to hypotheses 4.1 – 4.7, dealing with the effect of transaction costs on the decision to use risker financial structures. Table 4.6 has results pertinent for $H_{4.8}$ and $H_{4.9}$, addressing the relationship between financial structures and contractor performance.

Contracts that use competitive sourcing procedures are 40 percent less likely to use cost-reimbursement financial structures and nearly 1/3 as likely to use time/labor structures. This indicates that contracting officials prefer to use fixed-price payment structures when they competitively source contracts. In this way, contract managers hope to shift risk for performance to the contractor when possible, benefiting from the presence of competition and the profit motive. Hypothesis 4.1 is supported.

Contracts that receive only one bid are nearly 30 percent more likely to use cost-reimbursement structures and 50 percent more likely to use time/labor payments. This indicates that when markets are weaker, managers are more likely to select financial structures that ensure information sharing to reduce the chances of shirking and facilitate performance evaluation. Contracts that receive five or more bids are approximately 20 percent less likely to use cost-reimbursement or time/labor financial structures, indicating that managers are more willing to let market forces guide performance when markets are competitive. Taken together, these findings indicate that when there are few bidders, contracting officials employ financial structures that are more likely to attract contractor by guaranteeing cost reimbursement at bare minimum. This

supports the idea that the number of bids received can be used to estimate asset specificity. Hypotheses 4.2 and 4.3 are supported.

Across the board, contracts for more complex services are more likely to use cost-reimbursement and time/labor payment structures. Contracts for services are 55 percent more likely to use cost-reimbursement and nearly three times as likely to use time/labor. Professional services contracts are more than six times as likely to adopt cost-reimbursement payments and eight times as likely to employ time/labor structures. Training contracts are three times as likely to use cost-reimbursement methods and 30 percent more likely to use time/labor payments. Research contracts are more than seven times as likely to reimburse costs and more than twice as likely to pay based on time/labor expended. IT contracts are twice as likely to use cost-reimbursement payments and more than four times as likely to make payments based on hours worked or labor expended. This is strong evidence that contracting officials react to uncertainty by employing financial structures that increase the exchange of information to ease oversight. On the other hand, construction contracts, where markets are strong and management procedures are well-established, are 1/5 as likely to employ either cost-reimbursement or time/labor financial structures. This indicates that when contract requirements are well-defined and process uncertainty is low, contracting officials rely on market forces to hold contractors accountable. Hypotheses 4.4 and 4.5 are supported.

Other measures of contract uncertainty include the length of the contract and the amount spent on the contract. Contracts lasting more than two years are twice as likely to use cost-reimbursement payments and 25 percent more likely to use time/labor remuneration. As the value of contracts increases, they are also more likely to use non-fixed-price payment structures. However, the percentage of agency budget spent on individual contracts is not significantly

associated with a greater likelihood of choosing cost-reimbursement or time/labor contracts. This may be due to the relatively small size of most contracts when compared to agency budgets. However, since the overall length and spending on the contract are substantively significant, there is support for hypotheses 4.6 and 4.7.

Taken together, these findings indicate that contract managers use different financial structures in response to market conditions and transaction costs. This is consistent with theoretical work that indicates that this is how these mechanisms should be used (Williamson 1979, Brown, Potoski and Van Slyke 2006). In addition, it augments descriptive work that indicates that contracts with high transaction costs might use financial steps to reduce risk and encourage information sharing (Brown and Potoski 2003, Johnston and Girth 2012, Kim and Brown 2012). These findings demonstrate that contract managers are assessing market conditions and transaction costs prior to designing contracts, and that the decisions that they are making are consistent with the recommendations in public administration and economics.

Other factors also influence which type of financial structure is selected. First, it seems that agencies with more complex work are more likely to use non-fixed-price payments. In particular, cabinet departments, agencies with high professional staff ratios (indicating high problem complexity), and larger agencies are more likely to employ cost-reimbursement and time/labor contracts. This is consistent with the above findings that indicate that task complexity and uncertainty lead to more common usage of financial structures that provide regular reporting.

Regulatory agencies, which often have strong ties to markets, particularly those that they regulate, are less likely to use these pricing structures. This could indicate that there are stronger markets in regulatory policy areas, or that contracting officials in those agencies prefer to avoid contracts that lack financial incentives and could lead to accusations of inefficiency. Constituent

services agencies are slightly more likely to use both cost-reimbursement and time/labor contracts. This could indicate that contractors need to be incentivized to provide these contracts, or that the work being performed has higher transaction costs. Given the politicized nature of the work that constituent services agencies perform, both of these explanations are possibly valid. Additional research is necessary to clarify this finding.

Contracts signed in the fourth quarter of the fiscal year are slightly more likely to employ cost-reimbursement payments. Again, there are a couple possible explanations for this. First, it could indicate that fourth quarter contracts are for goods and services with high transaction costs, and managers are responding to market conditions. If this is the case, managers are using these contract structures to reduce information asymmetries and encourage bidding. Second, it could indicate that, in the fourth quarter when budgets need to be spent, managers have less time to assess market conditions and transaction costs, or to estimate an accurate fixed price. Instead, they put a cost-reimbursement contract in place to spend their remaining budget and make progress over the short run. The financial structure ensures some level of accountability and allows the contracting official to receive sufficient information to evaluate performance, but does not use market forces to incentivize performance. Additional research is necessary to interpret this finding.

In my second model, displayed in table 4.6, I assess the relationship between financial structure and contractor performance. My results indicate that cost-reimbursement contracts are more than 1.5 times as likely to terminate for convenience, more than 2.5 times as likely to terminate for default, and nearly three times as likely to terminate for cause. Cost-reimbursement contracts are also half as likely to result in a high-performing closeout. The first model indicated that cost-reimbursement financial structures are used on complex contracts where markets are

weak and transaction costs are high. Such contracts are longer, involve higher levels of expenditure, and are more difficult to oversee. The financial structure used to reduce these concerns does not seem to improve performance. Instead, cost-reimbursement contracts are much more likely to terminate early, regardless of reason. This is evidence that contracting officials considering cost-reimbursement contracts might want to carefully consider the decision to make or buy, as there is no evidence that such contracts perform well. Fixed-price contracts are much less likely to terminate early than cost-reimbursement contracts. Thus, there is some evidence supporting hypothesis 4.8.

However, time/labor hours contracts are 1/3 as likely to end in termination for default and not significantly different from fixed-price contracts with regard to terminations for convenience and default. This suggests that information exchange may be important for some types of risky contracts. In these data, time/labor contracts are most commonly used for personal services, administrative and management support, technical assistance, and technical services. These broad categories include contracts for expert witnesses, subject matter experts, project managers, and program analysts. For services of this nature, contractors may perform a specific complex task that is related to a particular program or project. In these cases, though the work itself requires great expertise, the contract may blend into the government workforce as a part of a larger team working on the initiative (Voelz 2010). In many cases, the contract is with a single individual or very small organization. Time/labor contracts seem to allow public officials the ability to manage these kinds of relationships better. This provides evidence against hypothesis 4.8, indicating that information sharing can be more effective than market forces in certain conditions.

Contracts that include financial incentives to spur contractor performance, such as award fees and incentive fees, are less likely to end in termination for cause but more likely to end in termination for convenience. Incentive contracts are not significantly different from non-incentive contracts in regards to terminations for default. This suggests that incentives may have some positive effect on performance, as terminations for cause are much less likely. However, the high rate of terminations for convenience indicates that government agencies are more willing to walk away from incentive contracts unilaterally. This could indicate unwillingness on the part of government agencies to pay performance incentive fees. If this is the case, then incentive contracts might be less likely to spur performance than might be expected, particularly if contractors know that government might not adhere to the initial agreement. There is mixed support for hypothesis 4.9.

Taken together, these findings indicate that the financial structure of a contract can affect contractor performance. Financial incentives can reduce the likelihood of early termination for truly poor performance. Cost-reimbursement contracts are much more likely to terminate early than other types of contracts. Since these contracts are for riskier goods and services, this may be an indication that complex contracts with weak markets and high transaction costs are more likely to experience performance problems. However, time/labor hours contracts, which are also for complex goods and services, are less likely to terminate for default and not different from fixed-price contracts for other types of termination. This indicates that information sharing can improve performance on certain types of contracts. These findings may indicate that time/labor contracts are more appropriate for complex contracts than cost-reimbursement contracts, since fewer terminations occur despite similarities between the goods and services procured using these structures. While cost-reimbursement contracts clearly disincentivize financial responsible

behavior, firmer price ceilings in time/labor hours contracts may result in a mixed effect where managers receive more indication and the contractor feels financial pressure to perform at a high level. These results clearly indicate that cost-reimbursement contracts are those most likely to experience performance problems. Contracting officials should carefully consider whether using these structures is appropriate, as there is little evidence that they can improve performance.

Other variables also influence contractor performance in ways consistent with previous findings. Experienced contractors are less likely to terminate early. Contracts for services and complex services are also less likely to terminate early. When considered in light of contracts with non-profit organizations are less likely to terminate early, while contracts with minority- and veteran-owned vendors are more likely to terminate ahead of schedule. Management actions are indicative of ongoing performance. Contracts with more change orders are more likely to terminate early. Modifications that take away financial resources are indicative of performance problems, as contracts that are changed in these ways have a higher probability of ending early. Different agency types are also more likely to have contracts end early. Redistributive and constituent services agencies are more likely to terminate contracts for convenience, suggesting that the political nature of the work that these agencies perform could lead to changes in priorities that affect ongoing contracts. Constituent services agencies are also much more likely to terminate contracts for cause. Most of these terminated contracts were for social and technical services, perhaps indicating political influence on the selection process. Agencies with more complex policy problems, and thus higher professional staff ratios, are also more likely to terminate contracts for convenience and cause, providing further evidence that contract complexity can affect performance. There is no evidence that contracts written in the fourth

quarter are more likely to terminate than other contracts, and recession year contracts are only slightly more likely to terminate early for default.

Discussion

My analysis finds that transaction costs influence both the selection of contract financial structures and contractor performance. Specifically, contracts that have high levels of asset specificity and uncertainty are more likely to employ financial structures that reduce market mechanisms designed to spur performance but facilitate the exchange of information and enable improved oversight. When transaction costs are high, managers select payment structures that either (a) incentivize contractors to bid on risky work or (b) increase the information exchanged between the partners to improve performance assessment. Financial structures are used to overcome problems with asset specificity by guaranteeing the costs will be covered, limiting the risk associated with contract-specific investments. Cost-reimbursement and time/labor contracts are comparatively low risk for contractors, as they know that their investments will be covered. For public managers, these structures require the regular exchange of information on how resources are being spent, making performance assessment easier. For complex contracts where work processes are perhaps unknown and the behavior of contractors might be suspect, regular information exchanges about financial management can reduce uncertainty. Consistent with the risk sharing model presented in table 4.2, my findings indicate that federal contract managers employ cost-reimbursement and time/labor structures in ways that reduce transaction costs and manage risk associated with complex contracts.

Despite efforts to lower transaction costs through financial structure, contracts that employ cost-reimbursement structures are much more likely to terminate early than other kinds of contracts. While this might seem endogenous, time/labor contracts are much less likely to

terminate early. Since the contract mechanisms are so similar – reimbursing contractors for incurred costs – this suggests that something specific to the cost-reimbursement financial structure might actually influence the likelihood of termination. In these data, the major differences between these two financial structures are the sourcing mechanism and the experience of the contractor used. 73 percent of cost-reimbursement contracts were competitively sourced, while just 30 percent of time/labor contracts used competitive mechanisms. 68 percent of contractors working on time/labor contracts had previous experience with the agency, but only 27 percent of cost-reimbursement contracts went to experienced contractors. This indicates that time/labor contracts, though they are used for complex services, tend to rely on experienced contractors via sole sourcing. When sole sourced, time/labor contracts can include profit limitations, a fixed-price-like ceiling mechanism that leverages profit motive to spur performance (FAR, 16.601(c)(2)(ii), 2014). Cost-reimbursement contracts tend to use competitive mechanisms, but receive few bids – more than 42 percent of contracts received only a single bid. In addition, cost-reimbursement contracts tend to use less experienced contractors. Despite attempting to leverage market forces, cost-reimbursement contracts fail to do so. Time/labor contracts leverage financial incentives, information exchange and inter-organizational relationships to reduce transaction costs as much as possible. Cost-reimbursement contracts are not able to leverage the financial structure or the experience of contractors to improve performance, and as a result are likely to terminate early.

Overall, this analysis also finds that market forces seem to work when employed. Fixed-price contracts, which are the preferred financial structure at the federal level, seem to perform fairly well. When markets are competitive and transaction costs are low, fixed-price contracts can improve performance on federal contracts. They might even improve performance when

these conditions are not met, as more than half of the fixed-price contracts in this data set were sole sourced. When possible, fixed price structures seem to be best suited to reducing the chances of poor performance. When transaction costs are particularly high or markets are weak, time/labor contracts are preferred over cost-reimbursement structures.

Taken in sum, this discussion indicates that the financial structure of a contract is important for its performance. Though the structure selected based on the presence of transaction costs, my findings indicate that subtle differences between the structures have meaningful effects on how contracts end. As a result, both the make or buy decision and contract design are particularly important. Existing literature suggests that such an examination should include an assessment of the values relevant to the contract (efficiency, effectiveness, innovation, etc.), the organizational structures that affect the contract, market characteristics, and the contract's design (Brown, Potoski and Van Slyke 2006). Items with high transaction costs should be made internally when possible to avoid problems associated with risk and accountability (Preker, Harding and Travis 2000, Tadelis 2002). My findings indicate that if contracting officials cannot find ways to avoid cost-reimbursement methods, a careful look at the appropriateness of the contract is necessary. It might be less risky to make the good or service internally, instead of hiring a contractor. Market mechanisms, such as profit motive and competitiveness, are able to reduce the likelihood of termination more than processes that reduce information asymmetries. However, for extremely risky projects, melding profit motives with information exchange has the best result, as contractors feel pressure to perform to maximize their bottom line and agencies have sufficient information to hold vendors accountable.

Conclusion

This chapter finds that contract financial structures can be used to hold contractors accountable. Depending on the type of contract, both internal and external accountability mechanisms can be useful for public managers. When markets are strong and transaction costs are low, contracting officials can rely on competitive forces and profit motivation to hold contractors accountable. Fixed-price structures, which shift the burden of performance to the contractor, blend internal and external accountability mechanisms. External organizations, including market competitors and the government agency hold that contractor accountable for their performance. At the same time, internal pressures to complete the work according to professional standards while preserving a wide profit margin motivate performance. This is consistent with findings in public administration that indicate that using a combination of accountability mechanisms is most likely to preserve public value (Rhodes 1997, Gilmour and Jensen 1998, Mulgan 2000).

When markets are not as strong or when transaction costs are high, managers are forced to hold contractors accountable in other ways. When asset specificity is high, managers may need to encourage vendors to bid on contracts through financial guarantees. Cost-reimbursement contracts and time/labor contracts both offer more security to vendors, as any effort or investment made will be covered financially. When contract requirements are unclear or information asymmetries are large, these financial structures provide managers regular reports on contractor activities and expenditures. Under such structures, profit motivation actually encourages shirking and inefficiency, as more charging to the contract results in greater earnings. To make up for this negative incentive, public contracting officials require detailed information about performance. My findings indicate that information exchange has mixed effects. When

regular communication is paired with financial incentives that encourage attentiveness in time/labor contracts, early termination is extremely unlikely. However, when information is exchanged without financial incentives, as occurs in cost-reimbursement contracts, performance suffers. Thus, contractor accountability is best when market forces can be leveraged, or when they can be paired with information exchanges that reduce uncertainty. Information exchange on its own does little to hold contractors accountable.

This research has some obvious strengths. First, I am able to compare contracts with widely varying contextual characteristics. This is possible due to my variable of interest – the ending status of federal contracts – which makes it possible to both measure performance and compare across diverse contracts. Second, the contracts in this analysis are all relatively complex exchanges that involve the transfer of significant resources over an extended period of time. These types of contracts are the hardest for contract managers to oversee, as transaction costs tend to be higher and markets more complex than for simple purchase orders. As a result, I am able to make recommendations about management implications for a variety of complex contracts. Third, I present and then provide evidence supporting a classification of contracts based on risk and transaction costs. This conceptual contribution may help public contract managers as they attempt to determine whether contracting is appropriate and then to design contracts based on contextual clues.

However, there are also shortcomings. First, as with any large *n* analysis, there is the possibility for omitted variable bias. Though I have attempted to control for many aspects of the procurement environment, there are doubtless other variables that influence decisions to select particular financial structures for federal contracts. Second, there may some conceptual endogeneity in this analysis. Transaction costs influence the selection of contract financial

structures, but may also influence the overall performance of the contractor. However, there are stark differences between contractor performance under cost-reimbursement and time/labor contracts. Transaction costs tend to be high for both types of contracts. The difference between the two payment methods indicates that the contract's financial structure may be able to influence contractor performance. Further analysis is needed to parse out this effect more clearly, but it does suggest that, even if endogeneity is present, financial design matters.

There are many possible avenues for additional research. First, more research needs to be done to determine how public managers select between cost-reimbursement and time/labor contracts. The descriptions of these payment mechanisms is so similar in the FAR that it is surprising that performance on these contracts is so divergent. Such an initiative would need to include qualitative data gathering from federal contracting officials, as well as a statistical comparison of the detailed products that each type of contract is used to procure. Second, though my measure of asset specificity is consistent with previous research, it is evident that the number of bids is not necessarily an indicator of this concept, as it gives little insight into the quality of the bids. More research needs to be done to identify market strength for specific types of regularly purchased goods and services, including consulting services, information technology, research and training. Since these types of procurements are both important in the workplace and commonly made, building a greater understanding of these markets would be helpful for both scholars and practitioners. Finally, interaction effects would be a useful addition to this research, especially to identify the relative importance of competition and uncertainty. The initial evidence presented here indicates that these factors can influence performance, but interaction effects will provide greater insight into the relationship between financial structures and these contract management mechanisms.

For practitioners, these findings indicate that contract management, and contract design in particular, influence contractor performance. Financial structures can be used to manage risk, increase accountability, and reduce the likelihood of poor performance. Contracting officials should consider how to apply financial mechanisms that include both information exchange and financial incentives for performance, as these seem to perform best. If this is not possible, allowing market mechanisms to hold contractors accountable is the next best option. Contracts that provide little financial incentive for performance will have the highest chances of early termination, even if more information is exchanged between the government and the vendor. If a cost—reimbursement contract is the only possibility, including financial incentives such as award fees can reduce the likelihood of early termination.

Kim and Brown called on public administration scholars to investigate how contract design affects contractor performance (Kim and Brown 2012). This chapter indicates that financial structures can influence performance in both predicted and unexpected ways. Public managers can use payments to hold contractors accountable, exchange information, and leverage market forces to influence performance. Market mechanisms seem to be more effective methods of ensuring performance than information exchange, but their simultaneous application may be the best way to preserve accountability while getting the best execution from vendors.

Chapter 5: A Rendezvous with Discretion: An Analysis of Federal Simplified Acquisition Procedure Contracts

Introduction

Scholars have long argued about the role of discretion in public administration. For some, bureaucratic organizations are a tool used to implement the policy decisions of democratically elected legislators and executives (Finer 1936, McCubbins, Noll and Weingast 1987). Those who ascribe to this view hold that granting public administrators high levels of discretion can warp or circumvent processes designed to ensure accountability through the system of checks and balances established in the U.S. constitution (Moe and Gilmour 1995). Other scholars have argued that discretion is not only inevitable, but also desirable, as public administrators possess technical expertise that can help solve complex problems and improve the overall efficiency of the system (Friedrich 1935, Bertelli and Lynn 2006). Previous research into the role of administrative discretion has attempted to answer questions about what strategies can be best employed to control the bureaucracy (McCubbins and Schwartz 1984, Gruber 1987, Bawn 1997), how much discretion public administrators should have (Friedrich 1935, Finer 1936, Riley 1987), and how that discretion is used to influence policy implementation and agency performance (Lipsky 1969, Meier and O'Toole 2006).

At the same time, it is also widely acknowledged that the organizational structures used to implement public policy are increasingly complex, as single organizations no longer possess the resources to solve "wicked" problems on their own (Churchman 1967, O'Toole 1997, Agranoff and McGuire 2003). As a result, top-down control of the bureaucracy can be even more

difficult, as it requires oversight of administrators across multiple levels of government as well as contractors, collaborators, grantees, and even citizen groups involved in the coproduction of public services (O'Toole and Meier 2004, May and Winter 2009, Bryson, Crosby and Bloomberg 2014, Poocharoen and Ting 2015). Managing complex relationships between multiple organizations with different goals and objectives may require new skills from public administrators (Cooper 1980, Agranoff 2005). In addition, complex organizational arrangements may necessitate the broader use of administrative discretion to set goals, manage complex interactions, and evaluate performance (Kickert, Klijn and Koppenjan 1997, Peters and Pierre 1998, Agranoff 2006). However, there is little research on how discretion has been used under these conditions and what effect administrative discretion has had on performance.

This chapter assesses how federal contracting officials use their discretion to design contracts and whether their use of discretion improves contractor performance. Contract managers always have some discretion over contract design. It is their ongoing responsibility to assess the context of the contract to determine the best approach to achieve public priorities. However, under certain circumstances, this discretion is broadened. According to Section 13 of the Federal Acquisition Regulation (FAR), simplified acquisition procedures (SAP) reduce many of the procurement rules for federal contracts valued at less than $150,000 (Federal Acquisition Regulation 2014). Under SAP, federal officials are granted more discretion than they have on other contracts, particularly in decisions relating to contract design, as less documentation and reporting are required to justify decisions and interference from hierarchical management is reduced (FAR, Section 13, 2014). SAP are designed to reduce the costs of administering federal contracts while also improving access for disadvantaged firms (FAR, 13.002, 2014). Thus, the two primary rationales for SAP are improvements in efficiency and equity. To accomplish these

goals, the federal government allows great discretion to contracting officials, who are freed from guidelines about competition, financial structure, and various other components of contract design. Comparing the subset of SAP contracts to the other contracts in my dataset allows insight into how discretion is used and whether its use improves equity and efficiency.

The following section introduces the literature on bureaucratic control and discretion, providing a logical rationale for this chapter. The few links with the existing contracting literature are identified and explored in detail. The subsequent section provides the technical information on simplified acquisition procedures necessary for understanding this mechanism. Then, I introduce my research question, hypotheses, data, and analytic methods. The following sections present my results and discuss their meaning in the context of discretion and public values of efficiency and equity. I conclude with remarks about implications for scholars and practitioners.

Literature Review

The American system of government is predicated on establishing accountability throughout tiers and branches of government. Following years of perceived abuses at the hands of the British monarchy, the framers of the U.S. constitution were careful to craft a form of government that was designed to disaggregate power to reduce the possibility for corruption. As Madison states in Federalist 51:

> The great security against a gradual concentration of the several powers in the same department consists in giving to those who administer each department the necessary constitutional means and personal motives to resist encroachments of the others…the constant aim is to divide and arrange the several offices in such a manner as that each

> may be a check on the other -- that the private interest of every individual may be a sentinel over the public rights (Madison 1788).

The result is a government where power is shared across horizontal branches and vertical tiers in the federal system. This design maximizes the representation of personal interests through both professional and jurisdictional motivations. For example, national legislators are sensitive to both national priorities and the demands of their voters, while state and local executives are able to prioritize narrower policy concerns, particularly regarding policy implementation within their city or state. The general public holds these officials accountable for their performance through elections. In turn, these officials oversee the daily management of government. Theoretically, administrative failures will be resolved through the electoral process, as elected officials who fail to oversee effective bureaucracies will be ousted. This top-down, control-oriented approach to managing the bureaucracy focuses on establishing accountability through external mechanisms including hierarchical and legislative oversight. Under such a conceptualization, administration is little more than implementation of law, with little flexibility for interpretation (Finer 1936). Legislators and elected executives are ultimately responsible for overseeing minute details of implementation, while administrators are afforded no discretion.

In practice, the high cost and limited political benefits associated with administrative oversight may reduce the incentives for elected officials to work actively to control the bureaucracy (Gruber 1987, Riley 1987). Some scholars have argued that external actors can hold administrators accountable through intentionally designed structures and processes (McCubbins, Noll and Weingast 1987). However, even these researchers acknowledge that administrators tend to wield great discretion most of the time, with external oversight occurring sporadically in the form of regular performance evaluations, or “police patrols,” and in response to urgent events, or

"fire alarms" (McCubbins and Schwartz 1984). In fact, in the system of checks and balances, the framers created a government in which sources of power are manifold and often weak, forcing administrators to use their own discretion to help set policy and to actively look for popular support for their programs and agencies (Long 1949). This is particularly true for street-level bureaucrats, for whom expectations are unclear, resources are scarce, and overhead authority is often limited (Lipsky 1969, Riccucci 2005). For many street-level bureaucrats, this includes interacting with citizens to generate bottom-up political support and policy input (Hjern 1982, Maynard-Moody and Musheno 2000). Public administrators frequently serve as technical experts for policymakers crafting new legislation (Adams 1984), and policymakers routinely write legislation that leaves much of the implementation detail open for interpretation or the technical determination of the administrative "experts" (Meier and McFarlane 1995, Hill and Hupe 2002).

Accountability is especially hard to preserve when policy implementation involves multiple organizations, as information asymmetry and work motivation problems can arise as authority becomes diffuse (O'Toole Jr and Montjoy 1984, Milward and Provan 1998). Modern public administrators operate in an environment where they are regularly entrusted to wield discretion to implement policies involving actors from multiple tiers of government and across sectors. Complex contracts are one example of this type of arrangement, as they often involve organizations with divergent goals, agencies from multiple levels of government, and the implementation of difficult policies largely free from overhead accountability mechanisms. While some hold that this approach to governing may simply be a way to circumvent checks and balances (Moe and Gilmour 1995), others recognize that the existing top-down, institutional approach is ill equipped to handle this commonly used type of policy implementation, as institutional actors lack the interest or knowledge necessary to be effective (Meier and O'Toole

2006). In such a complex environment, internal mechanisms such as professional standards and technical training may be more effective ways to ensure administrative accountability (Friedrich 1935).

Allowing discretion can be beneficial, as it permits greater flexibility. Management decisions can be based on technical expertise instead of political goals, which can improve efficiency (Girth 2014). In walking the line between legal requirements and the need to provide important public services efficiently, discretion can be used make decisions based on the context and requirements of the situation (Lipsky 1980). Government contracting is an area in which discretion plays an important role in the implementation of public policy (Brown, Potoski and Van Slyke 2006, Vaughn and Otenyo 2007, Girth 2014). Contracting officials generally control decisions related to setting requirements, establishing the period of performance, selecting the solicitation procedures, determining the payment structure and payment schedule, evaluating performance, and providing performance incentives. Contracting is also an area where there is persistent concern over the potential for corruption and lack of accountability (Cohen and Eimicke 2008, Curry 2010). In the case of government contracting, discretion may make this perception worse, as it can make the system seem unpredictable to potential contractors, political overseers, and the general public (Girth 2014). Citizens and policymakers expect contracting officials to tailor contract requirements to the contextual demands of the good or service needed, while also applying consistent evaluation and management criteria when assessing bids and monitoring contractor performance. There is evidence that, when discretion is high, administrators may be more likely to follow legal procedures to justify their actions should a conflict arise (Bardach and Kagan 1982). However, others assert that properly disciplining contractors requires the targeted use of technically informed administrative discretion (Kelman

1990). Thus, contracting officials are expected to use their discretion to both hold contractors accountable and navigate the legal and political environment. Yet little work has been done which directly addresses the role of discretion in government contracting.

Most of the work in public administration that focuses on the link between discretion and contracting analyzes how to hold contractors accountable for their performance. Romzek and Dubnick analyze the Challenger disaster and find that government performance failures were due, at least in part, to an unwillingness of public managers to wield discretion to manage both political expectations and contractor performance (Romzek and Dubnick 1987). External pressures on the agency to change its mission and justify its long-term existence following the conclusion of the space race made the agency reluctant to take political risks associated with delaying the shuttle launch. At the same time, primary contractors were unwilling to admit to safety problems as they feared losing their contracts. In this instance, public officials and contractors both opted to forgo using their technical discretion, instead opting to ignore safety problems to meet externally set deadlines. This supports the idea that institutional models of management for complex contracts may not be appropriate (Meier and O'Toole 2006), but also presents some concerns about how willing administrators are to use their discretion in the face of powerful external forces.

Romzek and Johnston develop a classification of contract accountability alignments based on the complexity of the core task being procured and the focus of its management (Romzek and Johnston 2005). Simpler tasks in which managers focus on monitoring inputs require little discretion, while more complex tasks for which managers must worry about political factors, outputs, and outcomes require greater degrees of discretion. Although this classification of contracts is intended to address contractor discretion, it is also applicable to

contract management. More complex tasks often require greater degrees of expertise to manage, including familiarity with the product or service being purchased, strong personal relationships between contractors and agency representatives, and the clear establishment of rules that are sufficiently flexible to allow for unexpected developments but also well-constructed to establish the necessary conditions for consistent decision-making and communication (Brown, Potoski and Van Slyke 2013). Thus, determining when and how to use discretion is important for the successful management of complex contracts.

Kelman finds that procurement regulations restrict contract managers from using their discretion in ways that could improve contract management. In his study of federal information technology contracts, he finds that red tape hinders public managers when they attempt to develop contract requirements, develop evaluation criteria, and gather information to review bids (Kelman 1990). Laws designed to ensure that government focuses on price, the minimum quality of service acceptable, and promotion of competition further complicate the use of managerial discretion. Review processes that separate technical and cost evaluation also make the selection of the best contractor difficult. Though many statutory changes have been made since Kelman wrote his book, including the passage of the Federal Acquisition Streamlining Act of 1994 that created SAP, many public contracts still focus on price and tie the hands of public administrators (Curry 2010). Kelman argues that giving more discretion to experienced contract managers would improve the procurement of complex goods and services, as they would be better able to apply their expertise in ways that reduce costs and improve contractor performance (Kelman 1990).

Girth's survey of local contracting officials examines the effect of managerial discretion on contracting (Girth 2014). She examines factors that affect contracting officials' use of

performance-related sanctions, including political influence, the difficulty of the sanctions process, trust between contractor and agency, mutual dependence, and the willingness of the contract manager to use discretion. She finds that contracting officials willing to use discretion are less likely to sanction contractors than contract managers not using discretion. Interviews show that, when possible, contract managers tend to use their discretion to be more flexible with contractors. Indeed, contracting officials seem more willing to bargain with poorly performing contractors when given the opportunity to wield discretion rather than to impose sanctions quickly. While this may seem counterintuitive, it is consistent with legalistic conceptualizations of contracting officials as administrators frequently constrained by procurement regulations which force certain actions (Bardach and Kagan 1982, Rainey and Bozeman 2000). When not granted discretion, contracting officials are more likely to follow established procedures, or to use a "by the book" approach. In particular, they are more likely to sanction contractors for poor performance rather than entering into informal negotiations. Girth's findings indicate that, at least in part, rules are followed to provide professional cover for contracting officials. While Girth's results are very interesting, they are the result of a relatively small sample of officials (n=194) and limited by the perceptual nature of the data. No actual contracts were analyzed, which is a problem, particularly when assessing performance (Meier and O'Toole Jr 2013).

Improved performance is just one potential effect of managerial discretion. Other studies indicate that discretion can also influence the equity of public programs. SAP contracts are typically set aside for small or disadvantaged businesses. These set asides may be a form of redistributive policy, allowing the allocation of resources to contractors that historically have had trouble accessing government funds, including minority-, woman-, and veteran-owned firms. Set asides might also be a way to achieve societal goals of equitable access for disadvantaged

businesses. Regardless of the rationale, SAP are designed to increase equity in federal contracting. Proponents of bottom-up policy implementation argue that discretion is necessary to tailor programs to micro-level processes that vary based on policy area, geographic location, and implementation network composition (Hjern 1982, Maynard-Moody and Musheno 2000). These scholars have found evidence that bottom-up implementation can improve inclusiveness and equity (Maynard-Moody, Musheno and Palumbo 1990, Meyers et al. 2007). Federal contracting has long included set-asides for disadvantaged businesses to increase representativeness and to help support nascent, at-risk businesses. Balancing these equity considerations with the efficiency rationale for contracting can be challenging for managers (Brown, Potoski and Van Slyke 2006). Studies of federal contracting have shown that government officials from certain demographic groups are more likely to hire disadvantaged contractors (Smith and Fernandez 2010, Fernandez, Malatesta and Smith 2013). These findings provide some initial evidence that federal contracting officials are aware of the equity consequences of their actions. However, disadvantaged contractors are identified based on ownership characteristics, which may not match the demographics of the workers in each firm. Due to data limitations, going beyond ownership is difficult. However, additional research is necessary to determine how managerial discretion affects equity in the federal contracting process.

A few things are clear about the use of managerial discretion for government contracting. First, contracting officials have wide lanes of discretion in important areas, including many facets of the design, implementation, management, and evaluation of contracts. Second, discretion is primarily used as a way to increase efficiency. However, the use of discretion occurs in a system that is primarily designed to ensure accountability. Accountability, equity, and efficiency are often at odds with one another in logical, predictable ways (Kettl 2014). As a

result, the use of discretion may be viewed as beneficial by some groups but looked at with great suspicion in other quarters. Increasing discretion may be seen as a way to greatly reduce transaction costs, while also increasing the risk of favoritism or corruption. Public contracting officials must carefully balance competing public values in every contract (Brown, Potoski and Van Slyke 2006). Finally, external actors and contextual conditions can affect how discretion is used in the management of contracts. Political pressures, the complexity of the work being performed, and the legal environment surrounding the contract seem to be particularly important.

Clearly, more research is necessary in this area. When afforded the opportunity to use discretion, do public contracting officials take it? How does the use of discretion influence what kinds of contractors are selected? And does discretion influence contractor performance? Before these questions can be answered, it is necessary to provide some background in federal simplified acquisition procedures, which grant federal contracting officials wide discretion.

Federal Simplified Acquisition Procedures

Simplified acquisition procedures (SAP) give managers the discretion to choose design elements more freely for contracts valued at less than the simplified acquisition threshold (FAR 2.101, 2014). The SAP threshold is currently $150,000 for most goods and services but can be as high as $7 million for contracts that, based on the expectations of the contracting officer, will exclusively involve the purchase of commercial items (FAR 2.101, 2014; FAR 13.500, 2014). Contracts involving planning for and responding to chemical, biological, radiation, and nuclear threats also have higher thresholds -- $300,000 for domestic contracts, $1,000,000 for international contracts, and $13 million for commercial contracts (FAR 13.500(c)(1-2), 2014). Federal contract managers who use SAP are able to apply professional expertise to design the

contract based on the circumstances and contract requirements. According to section 13.002 of the FAR, SAP are designed to:

- Lower administrative costs associated with contract administration
- Improve access to government contracts for disadvantaged businesses
- Increase the efficiency of the contracting process for smaller contracts
- Reduce costs for contractors

As a result, SAP are an administrative mechanism designed to increase both the efficiency and equity of federal contracting. To improve efficiency, SAP reduce administrative and contractor costs. To increase equity, SAP establish priority for disadvantaged businesses, including those that qualify as 8(a), Historically Underutilized Business Zone (HUBZone), Service Disabled Veteran Owned, and Woman-Owned small businesses (FAR 13.003(b)(2), 2014). Contracts for goods and services valued at less than $150,000 are "reserved exclusively for small business concerns and shall be set aside for small business unless the contracting officer determines there is not a reasonable expectation of obtaining offers from two or more responsible small business concerns that are competitive in terms of market prices, quality, and delivery" (FAR, 19.502(2), 2014). Although SAP are designed to promote equity through contracts to small businesses, the ultimate use of these procedures is based on administrative assessment of the contract requirements and the competitiveness of the marketplace. If contracting officials find that there is no disadvantaged business available to provide the service, they can use SAP when contracting with other firms as well. If SAP is used on contracts with non-disadvantaged businesses, contracting officials must document the reason why. Some disadvantaged businesses may not be officially classified as such under SBA criteria. SAP grant administrators the discretion to determine if businesses meet these criteria, further limiting costs

(FAR, 13.102, 2014). To assess eligibility, businesses first certify that they meet the SBA criteria. Contract administrators review the firm's status to determine if this self-certification is accurate. This discretionary classification of disadvantaged businesses may also improve equity, as SBA processes may be onerous for very small or inexperienced businesses (Cheav 2013).

For contractors, SAP render inapplicable many procurement regulations, including those that cover kickback detection, performance and payment bonds, contract work hours and safety standards, contractor drug testing, contingency fees, access to contractor financial records, subcontracting, and veteran employment requirements (FAR 13.005(a)(1-10), 2014). Removing these requirements lowers many potential costs for contractors, particularly related to workforce management, record keeping, and transparency. This lowers the investment, and associated risk, for contractors bidding on federal work. Asset specificity can also be lowered, as inexperienced contractors without expertise in federal contracting may be better able to bid for federal contracts without investing in the full span of organizational contracting processes usually necessary to win federal business (Holtz 2012). Thus, SAP can be conceptualized as attempting to lower contractor risk by removing procurement red tape and lowering asset specificity.

For federal contracting officials, SAP remove many procurement regulations as well, allowing greater managerial discretion in an effort to reduce administrative costs. While the procedures still explicitly state a preference for competitive bidding (FAR 13.104, 2014), federal officials are granted the freedom to use a single source if they perceive that source to be the best "reasonably available" (FAR 13.106-1(2)(b), 2014). This reduces the administrative burden associated with justifying the use of sole source contracts. SAP grant public managers the ability to assess whether firms meet SBA criteria for small or disadvantaged businesses, increasing the pool of businesses that may be considered. This enables administrators to expand the number of

potential contractors who can be considered to increase equitable access to government contracts. SAP also allow federal officials to use standing price quotations, wherein companies make fixed bids for the provision of particular types of goods and services which are broadly available to contracting officials across government. Using standing price quotations eliminates the need to fully solicit bids for each SAP contract, lowering costs for both the contractor and the agency (FAR 13.103, 2014). Finally, SAP free federal contracting officials to evaluate bids based on the official's discretion (FAR 13.106-2(b), 2014). While they still must review all bids, they are not forced to evaluate them using the somewhat rigid procedures prescribed for the review of sealed bids or negotiated proposals. Many steps, such as formal evaluation plans, competitive ranges, and quotation scoring are not necessary if factors other than price are important for source select (FAR 13.106-2(b)(3), 2014). By removing these requirements, the contracting official can tailor the evaluation criteria and procedures to the purpose of contract, including the desired timeline of the procurement. Taken together, these procedures allow federal contracting officials much greater discretion in contract design in an effort to reduce administrative costs associated with generating new contracts.

As previously mentioned, granting discretion in contract management can raise concerns over the possibility of unethical behavior. To reduce the potential for corruption, SAP specifically disallow solicitations based on personal preference (FAR 13.104(a)(1), 2014), and require that the solicitation be posted to www.fedbizopps.gov, the public-facing listing of all available contract opportunities, unless the process would add cost or run counter to national security. Contracting officials are also strongly advised to attempt to get at least three bids for SAP contracts to promote competition (FAR 13.104 (b)(2), 2014). Though the contracting

officer retains great discretion in the design and solicitation of SAP contracts, some regulations remain in place to ensure responsible management behaviors.

SAP contracts are often used for simple goods and services. From 2005 to 2014, SAP contracts accounted for 28 percent of all new federal contracts.[7] Of these, more than 99 percent were purchase orders, delivery orders, and task orders on existing indefinite delivery contracts. This makes sense, as SAP are meant to facilitate the easy exchange of relatively simple goods and services. The remaining one percent were written as definitive contracts, the focus on the current analysis. It is in these more complex contracts where the use of discretion is most interesting, as complexity makes it difficult to easily determine how to accomplish public goals. The use of administrative discretion relies on technical knowledge and issue-specific expertise to maximize public values in complex policy areas (Potoski 1999, Agranoff and McGuire 2003, Brown, Potoski and Van Slyke 2006). However, little work has been done to explore the effects of managerial discretion on government contracting. The following section introduces my research question and hypotheses.

Research Question and Hypotheses

Simplified acquisition procedures rely on the competence of public employees to design contracts, solicit bids, and select the best contractor. Various procurement regulations are loosened under SAP to increase access to government contract dollars for minority owned contractors and to increase the efficiency with which government can establish low risk (or at least, comparatively low dollar) contracts. Though contracting officials always have control over

[7] These figures come from the Federal Procurement Data System – Next Generation (FPDS-NG), using an "ad hoc query" that searched for the "Number of Records" of new contract awards by "Solicitation Procedure" and "Award or IDV Type." Definitive contracts, the focus on this research, make up less than one percent of all federal contract awards, suggesting that the vast majority of federal procurement is for relatively simple goods and services. However, definitive contracts account for 23.84 percent of the total spending on federal contracts over this time period, indicating their relative complexity and importance to public managers.

important contracting decisions and wield discretion that can influence contract outcomes (Brown, Potoski and Van Slyke 2006), SAP create a subset of contracts where reliance on technical expertise is much greater. This research investigates how this discretion is used and whether it influences contractor performance. Specifically, the overarching research question for this chapter is:

- Do federal contract managers use discretion to improve equity and contractor performance?

Before investigating the impact of discretion, it is necessary to examine how federal contracting officials use SAP to design contracts. Administrative discretion through SAP is only important if public managers choose to use it. There is evidence that government is engaging in contracts without making workforce changes necessary to ensure adequate personnel and expertise for effective contract management (Milward and Provan 2000, Brown, Potoski and Van Slyke 2006). As a result, contracting officials may be overburdened and undertrained (Cohen and Eimicke 2008). In such circumstances, it might be reasonable to expect that contracting officials might be unable to actually use much discretion, instead opting to follow standard operating procedures regarding contract design. Or, as Girth's findings indicate, contract managers might select contract designs that place the burden of performance on the contractor, reducing the need for active oversight (Girth 2014). Contract design elements can be used to limit managerial involvement in contract implementation. Competitive sourcing relies on the market to set the most efficient price for the good or service desired (see chapter 3). Sole sourcing requires justification, an administrative procedure that takes time away from other contracts. Fixed-price financial structures shift performance risk to the contractor (see chapter 4). Cost-reimbursement and time-and-materials contracts require ongoing review of receipts to monitor performance.

Overburdened federal contracting officials may, when given discretion, attempt to use it to reduce their workload and shift risk to contractors. This is not to say that managers are lazy. Rather, public officials seem to use their discretion to leverage market mechanisms to protect public interest when possible.

$H_{5.1a}$: Contracts using SAP will be more likely to use competitive sourcing than other contracts.

$H_{5.1b}$: Contracts using SAP will be more likely to use fixed-price payment structures than other contracts.

Evidence suggests that public managers use discretion, particularly bargaining and collaboration, in ways that are consistent with organizational goals and context (Agranoff and McGuire 2003). One of the primary goals of SAP is to increase access to government contracts for disadvantaged businesses (FAR 13.002, 2014). Previous studies have shown that public managers use discretion to increase representation in government (Sowa and Selden 2003). There is also evidence that contract managers promote representativeness when selecting contractors, as agencies with more minorities are more likely to select minority-owned contractors (Smith and Fernandez 2010, Fernandez, Malatesta and Smith 2013). However, there are goods and services for which markets of disadvantaged businesses are particularly thin. For example, woman-owned businesses are common for personal services, education, and real estate but are rarer for the construction, finance, management consulting, engineering, and accounting sectors (Loscocco and Robinson 1991). Minority-owned businesses show similar trends, though concentrations are dependent on race (Bates 1989, Lowrey 2007). For example, Blacks own more businesses related to healthcare and clerical services, while Asian-owned businesses are more likely to be in retail or professional services (Lowrey 2007). Since the FAR specifically

reserves SAP contracts for disadvantaged groups, these types of organizations should be more heavily represented, though it may depend on the product or service area.

$H_{5.2a}$: Contracts using SAP are more likely to be with minority-owned businesses than other types of contracts

$H_{5.2b}$: Contracts using SAP are more likely to be with woman-owned businesses than other types of contracts

$H_{5.2c}$: Contracts using SAP are more likely to be with veteran-owned businesses than other types of contracts

$H_{5.2d}$: Contracts using SAP are more likely to be with all disadvantaged businesses than other types of contracts

Transparency mechanisms allow access to information that can be used to hold administrators accountable for their actions. Transparency is increasingly used as a way to ensure administrative accountability (Kettl 2014). Studies have shown that transparency can be an effective tool to hold the public sector accountable, particularly since other external mechanisms are often expensive or impractical (McCubbins and Schwartz 1984, Bertot, Jaeger and Grimes 2010). There is some evidence that transparency can improve public trust in government, which is an essential component of government legitimacy (Wise and O'Leary 2003, Tolbert and Mossberger 2006, Porumbescu 2015). As government service delivery has become more complex, preserving legitimacy is critical for public managers (Vinzant, Denhardt and Crothers 1998). Many governments in the U.S. have begun posting information about contracts in online media, allowing public access to information about how much is spent on contract and what products and services and being purchased. Most states and the federal government now require posting announcements for new contracting opportunities online,

making the bidding process more transparent (Federal Acquisition Regulation 2014, Ginter 2015). At the federal level, contracting officers must post all new solicitations to www.fedbizopps.gov, including contract requirements, timelines, and evaluation criteria. To preserve accountability over contracting officials wielding discretion, SAP contracts are also required to be posted, and this requirement is specifically underscored in the procurement regulation (FAR 13.105, 2014). However, since SAP allow the use of standing bids, it is likely that many individual SAP contracts are never advertised, as sources are selected from existing price and performance quotes. Thus, SAP may actually reduce the transparency of federal procurement and run counter to the desire to hold public employees accountable.

$H_{5.3}$: Contracts using SAP are less likely to be advertised on FedBizOpps.com than other contracts

Public administrators are hired for their technical expertise. Contracting officers are experts in the management of public procurement, though they are often constrained by procurement regulations (Kelman 1990, Rainey and Bozeman 2000). Removing constraints reduces transaction costs for both contractors and the government, allowing for a greater focus on efficiency (Brown and Potoski 2003). When freed to make their own decisions about contract design, including competition, source selection, and performance evaluation, there is some evidence that overall performance in the procurement of complex products can improve (Kelman 1990). Though ethical concerns may arise (Finer 1936, Moe 1987), SAP procedures have built in mechanisms designed limit corruption and maximize transparency, thus preserving accountability (FAR 13.104, 2014). As a result, simplified acquisition procedures, which remove many procurement regulations for both government officials and contractors, can be expected to result in higher performing contracts.

$H_{5.4}$: Contracts using SAP are less likely to terminate early than other types of contracts

Data and Methods

The data for this analysis comes from the Federal Procurement System – Next Generation (FPDS – NG). This database, created in 2004, captures information on all unclassified federal contracts. I examine federal definitive contracts – standalone contracts for complex products and services. My sample consists of the 24,396 complex definitive contracts that ended between 2005 and 2014. Of these, 4,195 (17.20 percent) used simplified acquisition procedures. In this chapter, I compare this subset of contracts where managers are granted a great degree of discretion to traditional contracts which are subject to all federal procurement regulations. For a complete description of the data that I use in this analysis, including detailed information about each of the variables used, please refer to chapter 2. Table 5.1 provides descriptive statistics of the dependent variables used in this chapter.

The first part of my analysis in this chapter investigates whether public managers use the discretion that is afforded to them. As discussed in chapters 2 and 3, the FAR prefers the use of competitive, fixed-price contracts. However, these two measures (competitiveness and financial structure) do not correlate well enough to create a unified scale measuring contract design diversity (Cronbach's alpha = 0.11). As a result, I treat each decision separately. Doing so requires ordering the preferences within the FAR about competitive sourcing and financial structure. In the case of competitiveness, full and open competition is desired. When full competition is not possible, the FAR allows for certain exclusions. Only in extreme cases (emergency, unique expertise, high levels of uncertainty about requirements, etc.) should contracts not be competitively sourced. Similarly, fixed price contracts are preferred because they shift financial risk to the contractor. However, they are sometimes not possible as

requirements are uncertain, necessitating the use of cost-reimbursement contracts. Time-and-materials contracts, which theoretically incentivize duration and cost overruns, are least preferred. The result is a pair of ordered preference categories for both the competitiveness of the solicitation and the financial structure of contracts (shown in table 5.2).

I hypothesize that, even though they are given discretion through SAP, public officials are likely to choose contract design elements that are consistent with the guidelines of SAP and leverage market forces to improve price efficiency and shift risk to contractors. Fixed-price contracts and market competition have the convenient side benefits of lowering contracting officials' workload while also providing professional cover should performance problems occur. To analyze this, I use two multinomial logistic regression models to determine the probability of SAP contracts using the various competitive sourcing procedures and financial payment structures:

$$\underline{\text{Model 1}}: Pr \mid \text{Competitive Sourcing Procedures} = \alpha + \text{Discretion} + \text{Complexity of Good/Service} + \text{Agency Characteristics} + \text{Importance of Contract} + \text{Market Characteristics} + e$$

$$\underline{\text{Model 2:}}\ Pr \mid \text{Contract Financial Structures} = \alpha + \text{Discretion} + \text{Complexity of Good/Service} + \text{Agency Characteristics} + \text{Importance of Contract} + \text{Market Characteristics} + e$$

An ordered logit model might be appropriate because the variables of interest (indicators of the ordinal preference of contract competitiveness and financial structure) are categorical with exclusive, ordered categories. However, Brant tests indicate that the parallel regression assumption is violated in both models. These assumptions are also not met in generalized ordered logit models, which relax the parallel regression assumption somewhat (Brant 1990,

Williams 2006). Since the parallel regression assumption is violated in both ordered models, multinomial logit models are appropriate as replacement estimators (Williams 2006). Hausman tests indicate that the assumption of the independent alternatives is not violated (Hausman and McFadden 1984). The primary explanatory variable, discretion, is a dichotomous indicator of SAP contracts. I also include control variables to account for the good or service procured, agency characteristics, market characteristics, and the relative importance of the contract for the agency and contractor. Complexity of the good or service is operationalized as a dichotomous measure of the type of contract being delivered (good or service) as well as dummy variables for construction, research, training, information technology, and professional services contracts. Agency characteristics included in these models are dichotomous indicators of agency type (cabinet department, distributive, redistributive, regulatory, and constituent services), the professional staff ratio, agency size (measured by size of budget and number of employees), and age in years. The contract's importance to the agency is measured as the total contract value as a percentage of the agency budget and of the contractor's annual revenue. Finally, market characteristics are operationalized as the number of bids received and dichotomous indicators for procurements during recession years, the fourth quarter of the fiscal year, and in response to emergencies. For a complete discussion of why these variables are used, please refer to chapter 2. These models test whether SAP lead to greater diversity of contract design structures, controlling for institutional and process factors.

Hypotheses 5.2 and 5.3 hold that SAP contracts are more likely to use disadvantaged businesses and less likely to be advertised on FedBizOpps. To test these hypotheses, I use five logistic regression models, which area shown below. Each model uses a dichotomous indicator of the type of contractor, or the use of FedBizOpps, as the dependent variable. The explanatory

variable in each is a dichotomous indicator of whether the contract used SAP. I employ the same control variables as in the ordered logit models. The models test whether SAP contracts are more likely to use disadvantaged contractors and to be advertised on the primary portal for generating bids and preserving transparency in the federal procurement process.

Model 3: Pr | Selecting a Minority-Owned Contractor = α + Discretion + Complexity of Good/Service + Importance of Contract + Market Characteristics + e

Model 4: Pr | Selecting a Woman-Owned Contractor = α + Discretion + Complexity of Good/Service + Importance of Contract + Market Characteristics + e

Model 5: Pr | Selecting a Veteran-Owned Contractor = α + Discretion + Complexity of Good/Service + Importance of Contract + Market Characteristics + e

Model 6: Pr | Selecting a Small, Disadvantaged Contractor = α + Discretion + Complexity of Good/Service + Importance of Contract + Market Characteristics + e

Model 7: Pr | Using FedBizOpps = α + Discretion + Complexity of Good/Service + Importance of Contract + Market Characteristics + e

To test my final hypothesis, I use a multinomial logistic regression model to determine whether SAP contracts perform better than other kinds of contracts. I expect that SAP contracts will perform better due to the amount of discretion given to the public administrator to establish its design elements based on professional expertise. The regression model as expressed below:

Model 8: Pr | Contractor Performance = α + SAP + Contract Requirements + Procurement Conditions + Department Characteristics + Vendor Characteristics + e

A multinomial model is appropriate because the variable of interest (performance) is categorical with exclusive categories (close out, termination for convenience, termination for cause, and termination for default) that are unordered. The variable of interest (or dependent variable) is contractor performance as indicated by the reason for modification in FPDS-NG. α is the intercept. The primary explanatory variable is a dichotomous indicator of whether the contract used simplified acquisition procedures. This dummy variable is an indicator of the presence of bureaucratic discretion. The model also controls for the complexity of the contract, agency characteristics, conditions during the procurement, and the strength of the market using the same variables used in previous chapters. This includes management variables that were excluded from the previous models in this chapter, such as the management actions taken on the contract, the number of modifications made, the experience of the contractor, and others. These control variables are discussed at length in chapter 2 of this dissertation.

Findings

Tables 5.3, 5.4, and 5.5 display the results of my regression analyses. Table 5.3 presents the results of multinomial logistic regressions associated with $H_{5.1a}$ and $H_{5.1b}$. Table 5.4 shows the results of logit models assessing the effect of SAP on equity programs and transparency procedures related to $H_{5.2a}$, $H_{5.2b}$, $H_{5.2c}$, $H_{5.2d}$, and $H_{5.3}$. Table 5.5 presents results of my analysis of contractor performance, pertinent to H_4. To facilitate the interpretation of regression results, tables 5.3 and 5.5 display relative risks while table 5.4 presents odds ratios.

SAP contracts are more likely to be competitively sourced and to use fixed-price payment structures. As table 5.3 indicates, SAP contracts are much less likely to use other types of payment structure and competitive sourcing procedure. SAP contracts are half as likely to be sole sourced, and half as likely to use exclusionary procedures. Similarly, when using discretion managers are half as likely to choose time/labor contracts, and are extremely unlikely ($1/10^{th}$) to use cost-reimbursement structures. When using discretion, federal contract managers seem to rely on market mechanisms to promote price efficiency and to shift financial risk to contractors. As a result, I find strong support for both H 5.1a and H 5.1b.

Contract work complexity seems to be related to the more frequent use of less preferred contract design elements. This makes sense, as with rising complexity, markets may become weaker and the clear requirements may become more difficult (Shenson 1990, Curry 2010, Brown, Potoski and Van Slyke 2013). Service contracts are twice as likely to be sole sourced, and seventy five percent more likely to use exclusionary procedures. Complex services are more likely to limit competition. Professional services contracts are nearly twice as likely to be sole sourced, and IT contracts are nearly three times as likely to not be competed. Construction contracts, which by comparison are simpler and have robust markets, are less likely to limit competition, suggesting that the decision to compete is made based on an assessment of market competitiveness. Research contracts are significantly less likely to be sole sourced, which may indicate that, despite the complexity of research, there is sufficient competition in this area.

Findings are similar for contract financial structure. Service contracts are much more likely to use less preferred payment structures, and particularly complex tasks are even more likely to do so. Professional services contracts are nearly ten times as likely to use time/labor payments and more than six times as likely to use cost-reimbursement structures. Training,

research, and IT contracts are also more likely to use the less preferred payment mechanisms. However, construction contracts are $1/10^{th}$ as likely to use time/labor approaches and $1/5^{th}$ as likely to use cost-reimbursement payments. This indicates that managers are more likely to shift contract risk when work requirements are clear.

The complexity of agency work also seems to increase the likelihood of deviation from preferred contract design elements. Redistributive and regulatory agencies are much more likely to use procedures that limit or eliminate competition. Specifically, regulatory agencies are more than twice as likely to sole source contracts and 1.5 times as likely to use exclusionary procedures. Redistributive agencies are three times as likely to sole source and 50 percent more likely to exclude some contractors before competition. Regulatory agencies manage complex policy areas despite often lacking political authority, resources, technical expertise and strong leadership (Meier 2007). Redistributive agencies manage complex, controversial programs that are very politicized are frequently under-resourced (Meier 2007). It is likely that a combination of work complexity and political influence results in fewer competitively sourced contracts in these types of agencies. Another measure of work complexity, the professional staff ratio, is highly correlated with use of less preferred design elements. Agencies with high professional staff ratios are much more likely to use time/labor and cost-reimbursement contracts, and are more than twice as likely to write contracts without competition.

Market conditions also influence the decision to use these contract design elements, though the effect is smaller. Contracts signed in the fourth quarter are 13 percent more likely to be sole sourced and less likely use exclusionary methods. This makes sense, particularly if spending in the fourth quarter rises due to spending down. Managers wishing to establish quick contracts may be more willing to side-step competition requirements. Federal contracts written in

the fourth quarter are also 20 percent more likely to use cost-reimbursement financial structures. Since previous findings indicate that cost-reimbursement contracts often perform very poorly, additional research might be conducted to learn more about the reasons for and performance of these fourth quarter cost contracts. Contracts written during recession years are slightly more likely to deviate from preferred contract design elements as well, though cost-reimbursement contracts are less likely to have been written during these years. This is also an area where more research may help explain this effect.

Table 5.4 presents results related to equity programs and transparency. Despite the SAP program's express purpose to allow greater access for disadvantaged businesses, my analyses show that the program is actually less likely to select minority-owned and small business contractors. In addition, there is no significant relationship between SAP and contracting out to veteran-owned businesses. Woman-owned businesses are 25 percent more likely to be selected as contractors under SAP, the only disadvantaged group to experience any benefit from the program. This set of findings is disappointing, as SAP are specifically designed to improve access for such firms, increasing their chances for growth and sustained success. Based on official SBA classifications of disadvantaged businesses, the SAP program does not seem to be meeting its equity goals. Thus, there is no support for hypotheses 5.2a, 5.2c, and 5.2d. While there is support for $H_{5.2b}$, the practical effect is fairly small, as woman-owned business are only 25 percent more likely (or 1.25 times as likely) to receive contracts through SAP.

However, contracting officials are given the authority to classify potential contractors based on their own determination of size and disadvantaged status (FAR 19.202, 2014). Some discretion extends to the classification of disadvantaged firms. This may make it easier for disadvantaged firms to receive federal contracts, and may allow contracting officials with

knowledge of local conditions the ability to engage small businesses based on their understanding of the community and the contract. Results using this measure of small business, instead of just the SBA-established measures, are shown for Model 6a. SAP contracts are 50 percent more likely to be written to businesses that the contracting officer has identified as meeting the SBA criteria for small businesses. This may be some evidence that contracting officers are trying to meet equity goals, though ownership is a poor indicator of the employment demographics inside a firm. More research is needed to fully ascertain whether this dual use of discretion (for both determining contractor type and selecting the source) is meeting equity goals or is being used in some other way.

Other factors also influence whether disadvantaged businesses are selected as contractors, though these factors tend to vary by contractor type. Service and IT contracts are more likely to go to all types of disadvantaged businesses. Minority-owned companies are 20 percent more likely to receive professional services contracts and twice as likely to receive construction contracts, but are 20 percent less likely to receive research contracts. Woman-owned businesses are 50 percent more likely to receive professional services contracts, nearly three times as likely to receive training contracts, and twenty percent more likely to receive construction contracts. Firms headed by veterans are 20 percent less likely to be awarded professional services contracts and half as likely to be selected for research contracts. SBA-classified small businesses are 30 percent more likely to receive professional services contracts and more than three times as likely to receive construction contracts, but are 30 percent less likely to be awarded research contracts. Small businesses, as classified by the contracting official, are less likely to win all types of service contracts, but are 40 percent more likely to win professional service contracts, 20 percent more likely to win research contracts, and more than four times as likely to win construction

contracts. Disadvantaged businesses generally seem more likely to win professional services, IT and construction contracts, but are used less frequently for training and research.

It is worth noting two potential problems with these equity-related findings. First, there is a potential disconnect between the formal classification of businesses and their informal work structures. Most disadvantaged businesses are classified based on ownership. However, having a disadvantaged owner does not necessarily mean that the organization's employees are from disadvantaged groups. Indeed, a woman-owned company could be predominately staffed by white men, as could any other type of other disadvantaged firm. This means that interpreting equity implications can be challenging without more information about the employees of each firm. Second, there are regional variations in market quality for particular goods and services around the country. An example might be IT, where there are some obvious areas where markets might be particularly strong – San Jose, San Francisco, Seattle. In such markets, finding disadvantaged firms might not be particularly challenging for federal contracting officials. However, federal contracts are in place all over the country, and in other areas, markets may be less competitive. IT professionals are much harder to find in rural areas (Flora and Flora 2014), and qualified disadvantaged contractors may be even harder to locate. While my findings indicate that SAP may not be achieving its equity goals in aggregate, additional analysis of individual service markets may be able to shed more light on areas and industries where there are particular problems for small, disadvantaged businesses.

Agencies with higher professional staff ratios are less likely to use nearly every type of small business. The exception is veteran-owned businesses, which are twice as likely to be used by agencies that have high problem complexity. In keeping with their institutional focus on equity, redistributive programs are twice as likely to use minority-owned contracts and 1.6 times

as likely to use small businesses. Contracts signed in the fourth quarter and during recession years are slightly more likely to select disadvantaged businesses.

These findings indicate that, though access to federal funds is improved for certain types of disadvantaged contractors providing specific services, SAP are not meeting the equity goals established in the FAR. Only woman-owned businesses experience relative benefit from the program, with the other types of firms actually seeing a reduction in the odds of winning contracts. This could be due to a mismatch between the skills of disadvantaged businesses and the types of products needed in federal definitive contracts (Smith and Fernandez 2010). For many of the more complex goods that federal managers seek through definitive contracts, markets of disadvantaged contractors might be weak. Regional variations may result in extremely different market qualities for complex goods. The current data do not allow insight into variations in market characteristics in different regions of the country. Despite these shortcomings, my findings could be evidence that managers are using the FAR to make procurement easier, with little regard for the equity goals of SAP. Additional research is needed to parse out the explanation for this finding.

SAP contracts are half as likely to be advertised on FedBizOpps.gov as other contracts. Consistent with hypothesis 5.3, this suggests that contracting officials are using more standing bids or other exclusionary design strategies under SAP. This indicates that SAP, with its focus on equity and efficiency, may unintentionally be reducing some of the transparency in federal contracting. Without an announcement on FedBizOpps, it can be hard for contractors, particularly inexperienced contractors, to find and bid on federal work (Cliff and Steele 2007). This may partly explain why the program has trouble meeting its equity goals – if SAP contracts are not advertised, disadvantaged contractors may (a) have trouble finding information about the

opportunity and (b) be hard for government contracting officials to locate. Though advertising the opportunity adds cost, choosing not to provide broad public notice may actually reduce both equity and transparency in the contracting process.

Table 5.5 presents the results related to contractor performance. Findings indicate that SAP contracts are less likely to be terminated early than other contracts. Specifically, SAP contracts are 20 percent less likely to terminate for convenience and 30 percent less likely to terminate for both default and cause. This is consistent with hypothesis 4. Federal contracting officials seem to be able to use their discretion to improve contractor performance. However, SAP contracts are also 23 percent more likely to end in low-closeout, with the government having to take back more than half of the dedicated resources, and nearly 20 percent less likely to end without taking back any funds. This suggests that while SAP may reduce the likelihood of extremely poor performance, the use of discretion alone may not encourage particularly good performance.

Other factors also influence contractor performance in ways that have been described in previous chapters. Experienced contractors are less likely to be terminated early. Contracts for all services, professional services, IT, training, research, and construction are also less likely to terminate early. Veteran- and minority-owned businesses are more likely to be terminated for default and cause. Market competitiveness seems to affect termination, as sole source contracts are less likely to terminate while contracts receiving more than five bids are more likely to terminate. For a more complete treatment of this finding, see chapter 3. Nonprofit organizations are less likely to be terminated early, perhaps suggesting that goal congruence across the sectors can lead to improved performance. Contracts with more than ten modifications are less likely to terminate for convenience or default, suggesting that active management can influence

performance. However, certain types of contract modifications seem to indicate poor performance. Contracts with more change orders are associated with 25 percent more terminations for convenience and default. Removal of funding through option, funding action, or other action also tends to be associated with higher levels of termination. These findings are evidence that federal contract managers take actions, both managerial and financial, when contractors are performing poorly.

Agency characteristics influence performance in a variety of ways. Cabinet departments and regulatory agencies are less likely to terminate contracts, while constituent services agencies are more likely to terminate contracts early. Redistributive agencies are more likely to terminate for convenience, which makes sense due to the highly politicized nature of their work and recurring budgetary uncertainties in these agencies (Weingast and Moran 1983, Meier 2007). Distributive agencies are three times more likely to terminate contracts for commercial products early, indicating that, despite the relative strength and coherence of these departments, they struggle to ensure high levels of contractor performance. Agencies with complex problems are much more likely to have contracts end in both high performing closeout and in terminations for convenience and cause. However, terminations for default are much less likely in these agencies. This might indicate that agencies working in complex areas have both a well-trained staff, leading to greater chance of good performance, and requirements that can be hard to generate, resulting in more frequent termination of contracts. The reduced likelihood of commercial contract termination seems to support this interpretation, but additional analysis is probably necessary.

In summary, the present analyses indicate that federal contracting officials use their discretion to mainly design fixed-price, competitive contracts. Other types of contracts are

comparatively rare. Hypotheses 5.1a and 5.1b are supported. However, SAP's equity goals are not met, as disadvantaged businesses tend to be less likely to win contracts using the procedures. Woman-owned firms are the exception, as they are slightly more likely to be selected under SAP. Hypotheses 5.2a, 5.2c, and 5.2d are not supported, though hypothesis 5.2b is. SAP contracts are less likely to be advertised on FedBizOpps, reducing costs but also reducing transparency. Hypothesis 5.3 is supported. Finally, SAP contracts are less likely to be terminated early, suggesting that federal contracting officers are able to use their authority to improve contractor performance. Hypothesis 5.4 is supported.

Discussion

There is a longstanding debate over the role of discretion in public administration. Discretion can be used to apply technical expertise to problems that are beyond the knowledge and control of legislators (Meier and O'Toole 2006, Vaughn and Otenyo 2007). However, it also has the potential to weaken accountability in ways that could threaten the American democratic system of popular agenda setting and institutional checks and balances (Finer 1936, Gruber 1987, McCubbins, Noll and Weingast 1987). Previous studies of the use of discretion in contracting have suggested that its application could improve efficiency by reducing transaction costs associated with procurement regulations and by affording experienced managers the chance to influence contract design and management more effectively (Kelman 1990, Girth 2014). My results indicate that efforts to free contract managers from red tape have had mixed effects on efficiency and equity.

Before discussing public values associated with SAP, it is necessary to explore how federal contracting officials choose to use their discretion. Girth found that, when given the chance to wield discretion, public contract managers were less likely to use officially

documented sanctions to influence performance (Girth 2014). Instead, they were more likely to bargain or use informal methods of communication to attempt to improve the contract. Indeed, many contracting officials she interviewed stated that, given discretion over a contract, they were more likely to simply trust the contractor to get the work done effectively. These public managers were highlighting a tendency to shift the burden of contract management from the government to the contractor. My findings are consistent with this interpretation. Under SAP, federal contracting officials are most likely to select contract design elements that specifically transfer responsibility for performance to the contractor. SAP contracts are much more likely to be competitively sourced and to use fixed-price structures than other contracts. Theoretically, competition will drive price down to economically efficient levels, resulting in the most efficient possible pricing (Weimer and Vining 2005). Fixed-price contracts shift the performance risk to the contractor, as profit motivation will encourage the vendor to complete the work on time and under budget to ensure the largest possible earnings (Shenson 1990). In addition to offering these benefits, these contract design elements tend to involve less active oversight from managers. Recent studies have shown that federal contracting officials tend to be overburdened (Copeland 2011). As a result, it is not surprising that given the chance, contract administrators will attempt to design contracts that leverage market benefits while reducing their own workload. As in Girth's study, I find that contracting officials are largely content to place their trust in the markets and in their contractors when they are given discretion. My findings augment Girth's perceptual measures with a comprehensive analysis of a large sample of complex contracts. In addition, I am able to assess the effect of discretion on both equity and efficiency measures.

SAP are designed to improve both the efficiency and equity of contracting. SAP reduce transaction costs associated with transparency, information exchange, and accountability for both

the government and the contractor. As a result, contracts should be less costly and ultimately more efficient. However, cost is just one way to measure efficiency. My measure, contractor performance, assesses what the government receives for their investment instead of just looking at the initial investment. In this instance, performance serves as an indicator of efficiency. Terminations are costly and inefficient – costs ignored by traditional measures of efficiency focused on initial investment. My results show that SAP contracts are significantly and substantially less likely to terminate early than other types of contracts. This indicates that federal managers are able to use their discretion to design and oversee contracts more efficiently.

My findings are consistent with much of the existing literature in public administration that demonstrates that public managers can improve programs and associated outputs in education, law enforcement, social work, and human capital management (Lipsky 1969, Maynard-Moody and Musheno 2003, Riccucci 2005, Meier and O'Toole 2006). In each of these studies, the authors argue that administrative discretion can be used to increase public value, an argument that runs counter to much of the literature on bureaucratic control, which adopts a normative perspective that administrative discretion is anathema to a democratic system of governance (Finer 1941, Riley 1987). The pro-discretion argument springs from conceptualizations of neutral competence and internal accountability that have long been central to public management (Friedrich 1935, Kaufman 1956). Public administrators are hired primarily for their technical expertise in a particular area (Wilson 1887, Christensen, Goerdel and Nicholson-Crotty 2011). This expertise qualifies them to make decisions that influence public policy. Historically, political influences on policy have resulted in efforts to try to separate administrators from politics to ensure that competent decisions are made based on technical expertise instead of passing political fancy (Kaufman 1956). Instead of relying on external

mechanisms alone to hold administrators accountable, professional standards, training, and internal motivation serve to ensure responsible behaviors (Friedrich 1935). The application of neutrally competent expertise can be thought of as a way to ensure that public values are preserved, particularly those related to efficiency and effectiveness, values which legislatures often struggle to achieve (Battaglini and Coate 2005). My analysis indicates that federal contract managers can improve the performance of federal contractors, thus increasing the efficiency of federal procurement. When freed from rules designed to ensure accountability and limit ethical violations, such as posting solicitation announcements to the central government procurement portal, contracting officers design and implement contracts that are between twenty and thirty percent less likely to terminate. This reduces costs associated with both termination and the management of bad contracts (GAO 2008). My findings indicate that contracting officials are have the technical expertise and training to positively influence federal contractor performance and increase the efficiency of federal procurement efforts.

However, there is also a cost associated with granting discretion. SAP have a dual goal of increasing efficiency and equity. My analysis shows that, despite a specific mandate to provide set asides for small, disadvantaged businesses, SAP contracts are less likely to be use these kinds of contractors. In particular, minority-owned businesses, veteran-owned businesses, and SBA-identified small businesses all receive fewer contracts under SAP. There are some specific kinds of contracts where other types of disadvantaged businesses see benefits, particularly IT and construction. This makes sense, as minority-owned firms are uncommon in particular industries (Bates 1989, Lowrey 2007). But on the whole, disadvantaged businesses are not seeing huge benefits from SAP. Even woman-owned businesses, which experience a slight advantage from

the program, are not experiencing large effects. The implication is clear: contract managers are using SAP to accomplish efficiency goals, not equity goals.

There are a number of reasons that this might be happening. First, my sample is of relatively complex contracts – definitive contracts that involve significant investment and long periods of performance. Disadvantaged businesses might not be able to provide many of the services that this type of contract requires, as they lack the resources, expertise, and managerial experience to be competitive. However, the success of woman-owned firms suggests that smaller firms can do almost all of these types of work.

Second, the process to receive an SBA certification as a disadvantaged small business could be onerous, resulting in firms that are truly disadvantaged being unable or unwilling to go through the process. This might mean that markets for disadvantaged businesses are weak, making it hard for federal contracting officials to find and select SBA-certified contractors. As a result, even though officials are attempting to meet equity goals, they are struggling to find qualified firms. However, contracting officials are given the authority to review contractor's self-certification of disadvantaged status, which could broaden the potential pool of contractors. When I use the contracting officer's assessment of disadvantaged business instead of the SBA classification, I find that disadvantaged businesses are 50 percent more likely to receive contracts under SAP, 40 percent more likely to receive professional service contracts, 20 percent more likely to get research contracts, 80 percent more likely to be awarded IT contracts, and more than four times as likely to get construction contracts. This demonstrates that, at very least, federal contracting officials are directing SAP contracts to what they think are disadvantaged businesses. However, this is somewhat endogenous, because discretionary classification of business is being used to explain discretionary selection of sources. More research is needed to assess the meaning

of the discrepancy between the SBA and contracting officials in classifying disadvantaged businesses.

Finally, contract managers could be prioritizing efficiency. SAP grant them the discretion to ultimately select the contractor. Given the choice between a small business that may require handholding through the life of the contract and an experienced contractor who will be able to operate autonomously, thus reducing workload and increasing the chances of higher performance, contracting officials may decide to choose the safer bet. Often, public values must be traded off, as it is difficult to enhance one without reducing another (Stoker 2006, Charles et al. 2008). In a system where resources are very scarce, ensuring the delivery of the final product might take precedence over the equitable inclusion of disadvantaged contractors.

It is worth noting two shortcomings of this analysis. First, one concern often associated with administrative discretion is that it can increase the likelihood of fraud or other ethical violations. FPDS-NG does not include any information on fraudulent behavior, making it impossible to assess whether SAP contracts are associated with more problems of this type. Additional data would be needed to conduct an analysis of this type.

Second, as previously mentioned, I do not include measures of regional or local level market variation. It is well documented that disadvantaged firms are more common in certain industries (Bates 1989, Lowrey 2007). Couple these trends with regional variations in the overall representation of various disadvantaged groups, and it is evident that the present national level analysis may gloss over important differences between markets. This is an area where additional research could help clarify how to encourage the growth of particular kinds of firms based on a more detailed assessment of regional or local conditions.

However, SAP have a stated goal of increasing disadvantaged business access to federal contracts. My findings indicate that SAP contracts are consistently less likely, on aggregate, to go to disadvantaged businesses than non-SAP contracts. This means that when contracting officials are held to the full set of rules in the FAR, they are more likely to select a small business or minority-owned firm. When granted discretion to select the contractor under fewer limitations, fewer disadvantaged businesses are chosen. This is a problem, regardless of varying market conditions across the country.

Conclusion

My analysis establishes that federal contracting officials use their discretion to influence contract design and management. SAP contracts are more likely to use design mechanisms that leverage market forces and reduce oversight demands. Despite purported equity goals, SAP contracts are less likely to go to most types of disadvantaged businesses. However, contract managers are able to effectively use their discretion to reduce terminations, thus improving the efficiency of federal procurement. These findings are consistent with other analyses of discretion in public management. Discretion can be used to increase performance, but may also have unexpected consequences. In this case, efficiency seems to be improved while equity initiatives are weakened.

In a system designed to ensure accountability, this research has mixed implications for practice. The U.S. system is often criticized for being slow moving, with change only occurring incrementally (Lindblom 1959). As a result, getting things done can be very difficult. Contracts are a tool that is increasingly used to get things done more quickly and efficiently (Kelman 1990, Salamon 2002). For this purpose, SAP seem to deliver admirably, increasing competitive sourcing, reducing the need for constant oversight, shifting risk to contractors, and reducing the

likelihood of early termination. However, the program is not increasing access to government contracts for disadvantaged businesses. While this may be due to weaknesses in markets for complex goods and services, the result is the same: at-risk firms are not winning nearly as many contracts as they do under regular procurement conditions, despite having express preference in SAP. Equity goals are not being met. External action may be required to both ensure the development of small businesses capable of providing these services and to encourage federal contracting officials to use such businesses when they are available.

This study is an effort to compare a large number of contracts with varying purposes and originating agencies. As such, it has greater explanatory power than many previous studies on contracting. However, it is also very difficult to account for all of the variables in contracting. Despite including a thorough list of control variables to account for the context of each contract, omitted variable bias is always possible. In addition, this work is exploratory. While many of the findings are interesting, more detailed research needs to be conducted to explain some of the findings. Three immediate follow-on studies are evident. First, this analysis is limited to more complex contracts from within those eligible for SAP. SAP are more commonly used for simple procurement, such as purchase orders and task orders. These other types of contracts could use more disadvantaged contractors, making up for their relative scarcity here. Second, additional research could more carefully classify the strength of disadvantaged firms in particular markets. Having a clearer understanding of what kinds of goods and services these firms are providing could help explain why equity goals are not being met and perhaps provide insight into how to better manage these markets. Finally, SAP are just one way that contracting officials use discretion. Contracting officials have great discretion across the contracting cycle. Future research could look at how contracting officials justify using this discretion and the impact that it

has on contractor selection and performance. For example, contracting officials must write justifications for sole source acquisitions. Analyzing these justifications could provide insight into how discretion is used to influence competition, and ultimately performance.

This study indicates that federal contracting officials use their discretion in ways that influence contract design, equity, and efficiency. This is some initial evidence that discretion matters for the management of public contracts. Consistent with existing literature on discretion, public contract managers can influence public values through the application of their technical expertise. Contractor performance improves under SAP, suggesting that contracting officials retain administrative responsibility despite fewer external mechanisms to ensure accountability. Though efficiency seems to be the preeminent value for SAP, its equity implications deserve further attention from both scholars and practitioners.

Chapter 6: Conclusion

This chapter summarizes the major findings of the previous chapters, highlights contributions to the broader literature in public administration, and identifies next steps for research and practice. The chapter begins with a discussion of the primary variable of interest in this research, including how it can add to the literature on contracting in public administration and management. I then present the main findings of the research related to contract design, including competition, financial structure and discretion, including the impact that these design decisions have on contractor performance. Each section concludes with the initial propositions about how public managers should design contracts based on evidence and contextual considerations. These propositions are based in findings from all three empirical chapters (3, 4, and 5). I conclude with a discussion of next steps. For researchers, I outline both ways to improve the current research as well as additional research that could be conducted to continue this line of inquiry. For practitioners, I identify management activities that could both improve contractor performance and facilitate more careful and comprehensive study of public sector contracting.

Variable of Interest: Contractor Performance

This research uses a new measure of contractor performance that focuses on outputs and outcomes instead of inputs. Traditionally, research into contractor performance has focused on whether contractors can reduce the cost of service provision (Savas 2002). Such studies have generally found that contracting can increase efficiency, particularly for relatively simple services that have competitive markets (Savas 1977, Savas 1981). However, analyzing inputs

does not provide much insight into performance. Studies have shown that augmenting financial data with qualitative data describing outputs and outcomes allows improves insight into organizational performance (Behn and Riley 1999, Behn 2008, Moynihan 2013). Other studies have focused on assessing contracting based on survey results and managerial perceptions of performance (Romzek and Johnston 2002, Johnston and Girth 2012). While these provide important insights into management approaches, managers are known to inflate self-assessments of performance, making it difficult to generate recommendations for management (Meier and O'Toole Jr 2013).

The measure of performance used here, the status of a contract at its conclusion, combines financial information and qualitative output measures. Financial actions are used to identify high and low performing closeouts. Descriptive, legal status at the end of the contract is used to identify contracts where performance suffered. As a result, it is an improvement upon previous measures focusing solely on cost in three primary ways.

First, the measure focuses on performance as determined at the end of the contract, based on managerial actions and the official classification of the contract at its conclusion. This accounts for contract management over the course of the period of performance. In addition, it relies on the contract manager's official assessment of performance based on his or her intimate knowledge of the details of the contract. Though outcomes are still difficult to assess, the concluding status of the contract tells us whether the contractor was able to successfully perform the work of the contract or not.

Second, the measure enables the comparison of very different contracts. The diversity of contract types, purposes, and contexts have long been a problem in the study of exchange relationships. Contracts can govern the exchange of products on a continuum of complexity,

ranging from commodity goods to unique services. As a result, comparisons based on price can be meaningless. Indeed, some scholars have even gone so far as to assert that comparison between contracts of different types is fruitless, as there are so many intimate details that affect each one (Anderson and Dekker 2005). However, the termination of a contract, whether it is for a pencil or for an aircraft carrier, indicates performance problems. Since there are many contextual factors that can still influence contracts, I limit my sample to complex definitive contracts. These contracts present management challenges, but are not so diverse in the good or service provided to make comparison meaningless. My measure of performance allows me to make comparisons among a large group of fairly similar contracts. Using this measure large *n* analysis of contracts is possible.

Finally, because I can perform large *n* analysis, I can identify meaningful trends across a large sample of contracts. Because of this, I can provide more persuasive evidence of the impact of market conditions, transaction costs, and management actions on contractor performance. This includes determining how managers select particular contract designs and how these designs influence contractor performance. Because of this ability, I can test hypotheses about performance on non-perceptual measures.

As with any measure, there are also potential issues. My performance indicator provides strong evidence of poor performance, but more work needs to be done to ascertain whether financial transactions on contracts can indicate a different aspect of performance. There is evidence that high performing contracts spend their full budgets (Lichtenberg 1984), but also evidence that indicates managers may be willing to expend unwarranted resources on failed contracts to save face (Staw and Hoang 1995). Additional analysis will be necessary to fully vet my measure of good performance. One possibility might be to include the financial structure of

the contract as part of the consideration, as different financial mechanisms incentivize performance in different ways. Fixed-price contracts that pay out the full amount are indicators of good performance. Cost-reimbursement and time/labor contracts that pay out more than the initial ceiling amount may be indicative of poor performance.

One other potential problem with this measure is the possibility of substitution. Under this argument, terminated contracts might actually be evidence of both bad contractor performance and good management within competitive markets. When there are available substitutes, managers who see performance problems will drop the contractor and find another vendor. My results indicate that terminations are more common for non-commercially available goods, which undermines this theory. In addition, all of the existing literature on public contracts indicates that termination is a last resort due to the high administrative costs associated with ending contracts ahead of schedule (Cooper 2003, Cohen and Eimicke 2008). However, more research is necessary to determine how managers use terminations.

Despite these potential problems, my measure is a new way to measure performance. By focusing on the legally defined contract outcome, I am able to rely on the manager's best interpretation of performance at the moment when they know most about the contract. The measure allows for the broad comparison of many contracts, making large *n* analysis possible. As a result, hypotheses can be empirically tested on non-perceptual measures of contractor performance. There has been a consistent push in the contracting literature to find a better way to measure performance (Sclar 2001, Brown, Potoski and Van Slyke 2009, Kim and Brown 2012), and this variable is a step in that direction.

Summary of Findings

Contracting is commonly used in the public sector both to acquire needed supplies and expertise, and to provide specific kinds service to other organizations and the public (Ferris and Graddy 1986, Curry 2010). The contract itself is a legal document that governs the exchange that is made between the buyer (in this case, the government) and the seller (in this case, the contractor). Public sector contracts are used to satisfy various public values, which may often be at odds (Brown, Potoski and Van Slyke 2006, Rainey 2009). Efficiency is commonly cited as a rationale for contracting, as competition between providers is believed to reduce costs and encourage responsible service delivery (Weimer and Vining 2005). However, other values also matter, as agencies may be interested in fostering innovation, preserving accountability, effectively delivering services, and providing equitable access to government programs and resources. Contracting officials must balance the various values associated with individual contracts with the organizational structures and market characteristics available during procurement (Brown, Potoski and Van Slyke 2006). As a result, the steps that managers take to design contracts can have a profound effect on how the contract is implemented, how relationships form between the buyer and the seller, and how the contractor ultimately performs (Shetterly 2000, Faems et al. 2008). This means that steps that contracting officials take well before transactions are made can have a profound influence on the contract. As a result, planning and design elements are essential for contractor performance.

This dissertation examines how competitive sourcing, financial structure, and managerial discretion influence federal contracts. The following sections summarize the main findings of this research. In addition, I provide links to existing literature, recommendations for practice, and some initial theoretical propositions for future scholarship on contract design.

Competition

Competition is commonly used as a rationale for government contracting. Competition between firms drives down prices to efficient levels as businesses strive to offer the lowest possible price to win the contract (Weimer and Vining 2005). Competition also ensures that other vendors are monitoring the performance of the selected contractor, boosting accountability and encouraging innovation (Johnston, Romzek and Wood 2004). However, many of the products that governments procure do not have competitive markets (Girth et al. 2012). As a result, the effectiveness of competition may be dependent on market characteristics. Ultimately, the decision to competitively source a contract rests with the contracting official, who makes this determination early in the contracting process. This element of contract design may affect contractor performance, as competition is reliant on markets and may influence relationships between buyers and sellers (Shetterly 2000).

My findings in chapter 3 indicate that competitive contracts are more likely to terminate early than non-competitive contracts. Multiple measures of competitiveness support this finding. Contracts that use competitive sourcing mechanisms are more likely to terminate early, as are contracts that receive many bids. While this may be evidence of substitution, competitive contracts for non-commercial products are actually more likely to terminate early than contracts for which there are other markets. Non-competitive contracts are less likely to terminate early, unless they were not competed due to legislative requirements. Political influence on contract design seems to result in performance problems. Thus, sole source contracts made at a manager's discretion are least likely to terminate ahead of schedule. This is consistent with findings in chapter 5 that suggest that managers are able to reduce the likelihood of early termination

through the use of discretion. Broadly, competition is associated with poor performance, not better performance.

It is possible the managers are using competitive sourcing procedures on particularly complex contracts to help clarify requirements and attempt to leverage market forces. However, most of the competitively sourced contracts in this dataset used fixed-price payment structures, suggesting the ability to estimate requirements with some accuracy. When requirements are hard to generate, other financial structures are more appropriate (see table 4.2). Contracts that use these financial structures were less likely to use competitive sourcing than fixed-price contracts. Since the data are dominated by competitive, fixed-price contracts, my finding indicates that competitive procedures are not necessarily improving performance on these contracts, despite strong markets.

I find that contractors with prior experience with the contracting agency are less likely to have contracts terminated. This indicates that the quality of the relationship between the contractor and the agency is perhaps more important than the competitiveness of the marketplace. This finding is consistent with much of the literature in public administration, which suggests that interorganizational processes and procedures are important for performance. Milward and Provan assert that network management requires stability, as it enables partner organizations to clarify expectations, build trust, and carve out portions of a project that align with their organizational priorities and objectives (Milward and Provan 2003). In recent articles, Brown, Potoski, and Van Slyke assert that greater familiarity and repeated interactions between parties to a contract can build trust and increase performance (Brown, Potoski and Van Slyke 2013, Brown, Potoski and Van Slyke 2015). My findings support these assertions – experienced contractors and follow-on contracts are much less likely to terminate early than other contracts.

The quality of the relationship between partners may be more important than competitive procedures. Based on these findings, researchers should further test the following propositions:

Proposition 6.1: Market mechanisms are not sufficient to engender good performance

Proposition 6.2: Better relationships between the agency and the contractor can improve contractor performance.

For practitioners, these findings indicate that a blind devotion to competitive sourcing may be inappropriate. Instead, other factors, such as establishing clear procedures and building trust to foster relationship growth may be more effective when managing complex contracts. This is not to say that competition is all bad – subsequent chapters highlight circumstances when it may be used effectively – but rather that it is not a cure all for woes in contracting. Federal contracting officials might also do well to attempt to limit political influence over contracts, as politically motivated design decisions seem to perform poorly. This could involve interacting with legislators early in the policy process to help ensure that either (a) managerial preferences are known during the legislative process or (b) legislators are informed of the tradeoffs associated with different contract designs (Kelly 1998, Feldman and Khademian 2007).

Clearly, both markets and management influence contractor performance. Single-minded devotion to competition ignores the complexity of many government contracts. An approach based on an assessment of the context and the relationship between the agency and contractor would enable better management. Overall, the discourse surrounding competition in contracting needs to change. While competition is clearly desirable, in many instances other factors may be more important to ensuring contract success. To some extent, the discussion should focus on the values associated with particular contracts. For those focused on efficiency, competition may be appropriate. Contracts where other values hold priority, such as innovation or effectiveness, may

need to use other sourcing mechanisms to help lower transaction costs and build trust and stability from the outset of the contract.

Financial Structure

Contracts are a transaction between two parties – individuals or organizations. Traditional economics long assumed that transaction costs were negligible. Coase and Williamson challenged these views, asserting that costs associated with transactions heavily influence individual behaviors and priorities (Coase 1960, Williamson 1979). In particular, governance mechanisms are necessary to reduce costs associated with perceived risks and information asymmetries in contractual exchanges (Williamson 1981). For complex public sector contracts, costs associated with asset specificity and uncertainty are particularly problematic for managers. For such contracts, markets are weaker, expectations are unclear, and required investments are high. As a result, uncertainty and asset specificity are high. Contractors may not be able to repurpose investments for other markets, increasing risks associated with bidding and losing. Contract requirements may be uncertain, meaning that establishing performance criteria and evaluation processes is difficult. And fewer firms in the marketplace can call into question the motivation of firms that are participating – are they genuinely interested providing the service needed or are just trying to exploit a weak marketplace?

Holding contractors accountable in such conditions can be difficult. Agencies are likely to suffer from information asymmetries, which may be insurmountable (Brown, Potoski and Van Slyke 2013). Firms may need incentives to bid on contracts. One way that managers can address transaction costs is through the financial structure of contracts. Fixed-price structures can be used when requirements are well understood to place the burden of performance on the contractor. These types of contracts financially incentivize performance, as efficient contractors can widen

the profit margin by delivering well under the fixed cap. For other contracts, where markets are weaker or requirements are less well-understood, other financial mechanisms can reduce transaction costs. Cost-reimbursement and time/labor contracts ensure that contractor investments are paid for, lowering asset specificity. In addition, they provide detailed information about how contract resources are expended, reducing information asymmetries. However, both approaches incentivize ongoing billable expenses to maximize profits. Financially contractors are incentivized to charge to the price ceiling to maximize earnings. Contracting officials choose financial structures during the design phase based on complexity of the contract and an assessment of relevant markets.

My findings indicate that financial structures are used according to transaction cost theories. More complex contracts are more likely to use cost-reimbursement and time/labor contracts. Public contracting officials are much less likely to use these financial structures on comparatively simple contracts. Fixed-price contracts are more likely to be competitively sourced and rely on market mechanisms to ensure performance. Chapter 5 indicates that managers seem to prefer these kinds of contracts when granted discretion, as they ease oversight and place the risk on the contractor. This is consistent with other findings in the field that indicate a preference for hands-off management when possible (Johnston and Girth 2012).

Fixed-price contracts and time/labor contracts are less likely to end in early termination. Though this pairing may seem strange, many time/labor contracts are sole source contracts, which enable managers to establish profit limitations. These serve as a fixed-price type mechanism that offers financial incentives for contractors to complete work for certain prices to maximize profit. Contracts that offer financial incentives are also less likely to terminate early than other kinds of contracts, providing further evidence that private firms are motivated by

profit. Cost-reimbursement contracts, where profit motives are very low, are much more likely to terminate early than fixed-price and time/labor contracts.

These findings indicate that both market characteristics and contract management influence contractor performance. When markets are competitive, fixed-price contracts effectively shift risk to contractors and reduce the likelihood of early termination. When markets are not competitive, managers can use financial structure to influence performance. Contracts that offer profit motivation while also increasing access to performance information to reduce uncertainty are less likely to terminate early. Contracts that generate much performance information but provide little profit incentive are likely to struggle. These findings are consistent with the conceptualization of how markets and management can influence contractor performance, and answer recent calls to link financial payments and contract design more clearly to contractor performance (Kim and Brown 2012). Based on these findings, researchers should further test the following propositions:

Proposition 6.3: Contract financial structures can be used to shift risk associated with public sector contracting based on allocation of transaction costs

Proposition 6.4: Financial structures that leverage both market competitiveness and reduce uncertainty will result in the best performance

For practitioners, these findings indicate that the assessment of transaction costs and the selection of financial structures can influence performance. Though managers already seem to be performing market analyses, clearer knowledge about the market for a particular contract will help inform contract design. When markets are strong, fixed-price contracts are best, as they provide a strong profit motivation for the contractor and leverage market forces to ensure accountability. When markets are weaker, the best financial structures will be those that include

both financial incentives and regular information exchange to reduce uncertainty. Contracts that do not include financial incentives should be reassessed and perhaps considered for in-house production.

Discretion

Though contracting managers always have discretion over contract design, certain legal structures allow federal managers greater discretion over a subset of contracts. Simplified acquisition procedures (SAP) were established to eliminate some of the red tape associated with public procurement, particularly related to documentation and design, for contracts valued at less than $150,000. SAP allow managers wide discretion over contract design, including competition, financial structure, proposal evaluation, and performance assessment. Though discretion is pervasive in administration, many scholars hold that too much discretion can detract from the legitimacy of the democratic system (Finer 1936, McCubbins and Schwartz 1984, McCubbins, Noll and Weingast 1987, Moe and Gilmour 1995, Rosenbloom and Piotrowski 2005). Others hold that discretion can be used to improve performance, as public administrators are more technically proficient and better connected with populations served (Lipsky 1980, Kelman 1990, Riccucci 2005, Hupe and Hill 2007). In the contracting literature, there is some limited evidence based on a handful of case studies that contracting officials can use their discretion to improve contractor performance (Kelman 1990). There is perceptual evidence that, when given discretion, contract managers are less likely to use sanctions, instead allowing contractors to manage their own performance (Johnston and Girth 2012). There has been no comprehensive study of the effect of discretion on contractor performance.

My findings indicate that, when given discretion, managers are more likely to use design elements that rely on market forces. Contracts are more likely to be competitively sourced and to

use fixed-price financial structures. Aware of the potential benefits that competitive markets can offer, managers attempt to take advantage of them. Such design elements leverage market forces to encourage efficiency and create internal profit motives for contractors. Market forces are also more likely to provide professional cover for overburdened contracting officials who may have to explain design decisions to managers. As an added benefit, such procedures reduce the workload, as competition procedures are well established and fixed-price contracts require limited oversight. Deviation from these procedures often requires written justification. These findings are consistent with Johnston and Girth, who fine perceptual evidence that contract managers prefer to use discretion to limit the need to actively oversee the daily activities of individual contracts (Johnston and Girth 2012). However, they might also suggest that contracting is enabling the predominance of efficiency-based thinking in government. Other scholars have indicated that there are risks associated with a single-minded focus on efficiency, including reduced legitimacy, accountability, and equity (Moe and Gilmour 1995, Rosenbloom and Piotrowski 2005, Rainey 2009).

SAP have both efficiency and equity goals. By reducing red tape, decisions about contracts can be made more efficiently as managers can apply technical expertise. SAP are designed as set-asides for disadvantaged businesses. The government seeks to support nascent firms owned by veterans, minorities, and women by allowing access to smaller government contracts. This program is designed to increase equity and reward disadvantaged citizens for taking risks in the private market. Contracting officials can use the official SBA classification or apply the criteria themselves to determine if businesses qualify as disadvantaged.

My findings indicate that SAP contracts are less likely than other contracts to terminate early. Apparently, managers wield their discretion effectively to improve contractor

performance. This includes using their technical training to design contracts according to the presence of transaction costs, relying on market forces to set prices and ensure accountability, and using technical expertise to design and implement evaluation procedures. Consistent with Kelman's assessment, contracting officials are able to use discretion to improve results (Kelman 1990). However, SAP contracts are actually less likely to go to most types of disadvantaged businesses than other contracts. This may indicate that contracting officials predominately use SAP to improve efficiency, sacrificing equity concerns. This is interesting, as choosing a non-disadvantaged contractor requires justification. However, this may indicate market weaknesses in certain industries for disadvantaged firms. Surveys of public contracting officials indicate that they often struggle to find minority contractors (Johnston and Girth 2012). More research is necessary to assess market strength of disadvantaged firms in different industries and geographic regions. Based on these findings, researchers should further test the following propositions:

Proposition 6.5: On contracts where managers are freed from procurement rules, they are able to use their discretion to improve contractor performance

For practitioners, these results provide some justification for more managerial independence. SAP are able to reduce the likelihood of contract termination, increasing the overall efficiency of federal contracting. However, this analysis also suggests that more attention needs to be paid to equity goals. Federal agencies may need to work to help "make markets" for specific goods and services where disadvantaged businesses are scarce (Girth et al. 2012). At very least, additional research is necessary to determine why managers are not providing SAP contracts to disadvantaged businesses through the established set aside program.

Again, findings related to administrative discretion indicate that markets and management influence contractor performance. When possible, contracting officials select

design elements that rely on markets to help encourage performance and preserve accountability. This indicates that managers understand the profit motivation that spurs most for profit businesses and attempt to apply theories of transaction cost economics to exchanges. Though previous findings indicate that competitive contracts are more likely to terminate early, for this subset of SAP contracts, competition seems to improve performance. This many indicate that managers are better able to assess market competitiveness and apply competition more strategically when given discretion. Clearly, managers can use their expertise to select better contractors, reducing the likelihood of contract termination. However, equity goals are not met. More work is needed to determine why this might be the case.

Next Steps

As with all research initiatives, new findings generate as many new questions as answers. This section presents the next steps for research and practice. Based on these findings, I identify new research questions, as well as additional data that could sharpen this analysis. For practitioners, I provide a short synopsis of the importance of contract design, suggestions on how to manage the political process, and steps that can be taken to strengthen the ties between researchers and practitioners.

Research

The present research is a large *n* analysis of a sample of diverse, complex federal contracts. This approach is novel, as the many differences between contracts has previously made such research difficult. Hypothesis testing on a large sample enables the assessment of trends and the development of generally applicable recommendations. However, it has been noted that such regression techniques tend to focus on the average result at the expense of outliers (Meier and Keiser 1996). In addition, interpretation of large *n* findings without input

from practitioners can be difficult. In particular, more information is needed about the use of terminations for convenience and my stratification of closeouts based on financial modifications. Thus, the obvious next step for this research is to augment these quantitative findings with qualitative data to ensure that interpretation is correct. To do this, I plan to either interview or survey federal contract managers to get their reactions to my findings and possible explanations. I plan to start by reaching out to professional associations, including the National Contract Management Association and the Procurement Roundtable to generate lists of people to contact for interviews or to disseminate surveys. In addition, the Office of Federal Procurement Policy will serve as a valuable resource. Funding opportunities are available to support this type of work at the Naval Postgraduate School and the IBM Center for the Business of Government, and I plan to pursue both. Qualitative data, while time consuming to acquire, to allow me to ground truth the findings in this analysis with contract managers who design and manage contracts every day. In addition, mixed methods approaches add a richness of contextual information that could help explain the full implications of my findings.

As I conducted this research, a number of other potential research questions surfaced. For the purpose of brevity, I will discuss three that have potential to augment the current findings. First, some study of requirements generation is needed. Research about the effect of transaction costs holds that contract complexity is related to information asymmetry and uncertainty. However, little work has been done to ascertain how requirements are generated on these complex contracts. This initiative could compare similar contracts to determine how requirements differ, could survey public managers regarding the processes they use to generate complex requirements, or could review specific kinds of contracts (say, management consulting contracts) to determine how particular kinds of difficult work is expressed. Second, more

research is needed into proposal evaluation processes. Contracting officials use negotiated proposals most frequently, though other approaches, such as sealed bids, are also used. More insight into the proposal review process would allow insight into what kinds of negotiations are most successful and how well evaluation techniques can predict performance. Such an endeavor would have to account for the primary public values in each procurement initiative – cost, accountability, effectiveness, etc. – and determine if the approach used matches the values that predominate. Finally, additional research is needed on performance-based contracting, where managers purport to establish outcome-related assessment criteria. These criteria need to be evaluated to determine their overall strength and then the relative performance of these contracts needs to be assessed. This will provide insight into the predictive ability of contracting officials and possibly provide advice on when performance based contacts are most appropriate. There are many other lines of inquiry available, including examining the use of terminations for convenience, more clearly establishing measures for high performing contracts (which would be of particular interest to practitioners), assessing different types of contracts (indefinite delivery vehicles, purchase orders, etc.), drilling more deeply into specific findings of this research, and making comparisons between federal, state, and local level governments. In all, contract design is an area ripe for research, with more research questions that there is available data. As more states and localities share this data, and as the federal government becomes more comprehensive in its transparency through FPDS-NG and USASpending.gov, additional research avenues will become available.

Practice

For practitioners, these findings underscore the importance of markets and management. Competitive sourcing is not a silver bullet, but can be used in the right circumstances to improve

performance. Transaction costs influence performance. When they are high, managers should consider contracts designed to reduce them, or spread risk among the parties to the contract. Contracting officials have valuable technical expertise and should wield it to design contracts the improve efficiency without sacrificing other public values.

Perhaps the most important lesson here for practitioners is how important it is to manage the complete contracting cycle. This includes managing expectations about what contracts can accomplish. In part, this involves ensuring that the conversation around government contracting includes an acknowledgment of the many values outside of efficiency that are at play. Innovation, equity, and effectiveness matter too, and should be more clearly tied to the discussion of contract management. Doing so would perhaps make it easier for vendors and the general public to understand why contract management is so challenging. Similar conversations also need to occur with political actors to ensure that they fully grasp the implications of procurement regulations and legislation that otherwise ties the hands of contracting officials. Maintaining connections with legislators throughout the contracting process can improve coordination and ultimately may enable managers to improve contractor performance.

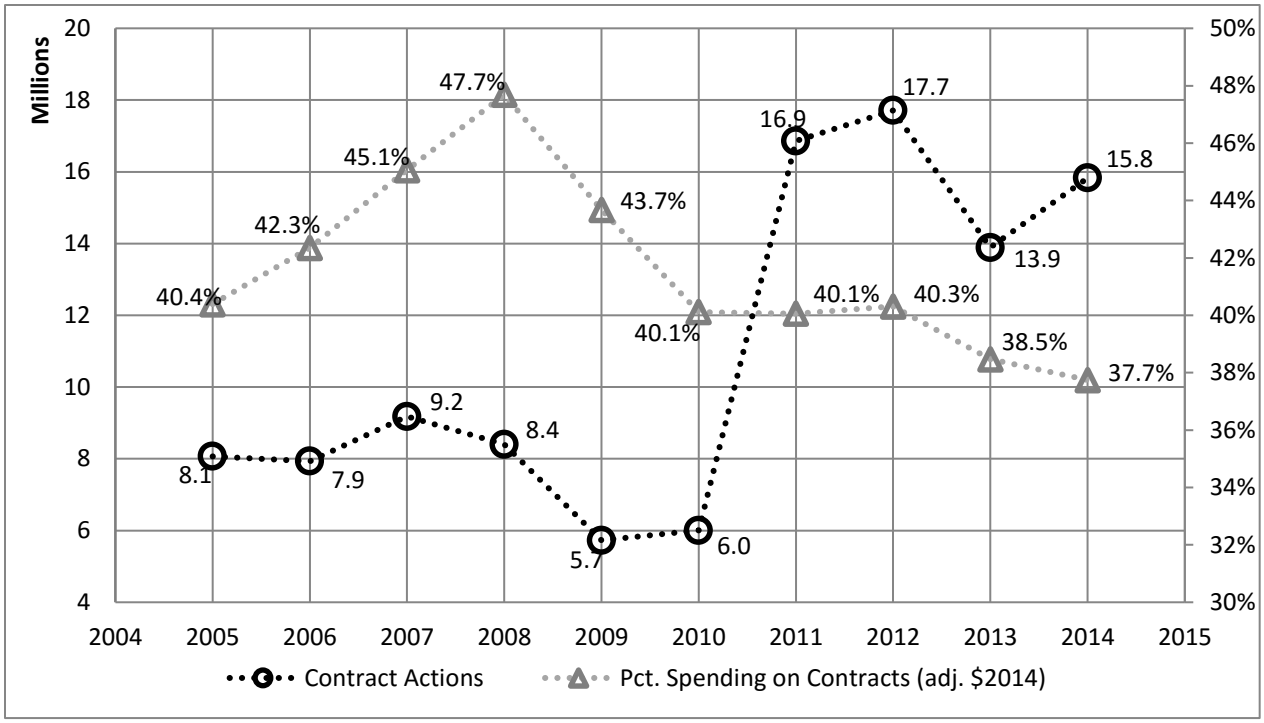
Finally, contracting officials should attempt to stay connected with the scholarship on contract design and management. Scholars are very concerned about making practical contributions for managers. However, it often seems that managers have little interest in academic research. While this is understandable, the fields of management and public management have much important information that could help managers do their jobs. One way to stay connected with academics is to become involved in the research. Government contracting officials at all levels need to improve access to data for research, including information about individual contracts, bids, decision-making processes, and contracting officials. Since some of

this data may be proprietary or sensitive, it is important for the research and practitioner communities to develop sets of standard data that is shared, along with regular communication mechanisms. The federal government is leading the transparency charge, but states in Florida, Texas, Georgia, and New York are not far behind. More states and local governments in particular need to develop procedures by which to share contracting data. Most researchers have accepted that contracting is here to stay – it is now time to work together to determine how to best manage all types of government contracts.

Conclusion

This dissertation demonstrates that contracting officials can influence contractor performance by changing processes established early in the contracting cycle. Competition, long thought to be the best way to conduct public sector procurement, may actually lead to performance problems. Instead, relationships and management strategies to adjust transaction costs seem to matter more. Financial structures can be used to alter the balance of transaction costs through financial incentives and information exchange. Financial structures that do both (provide financial incentives and increase information exchange) are likely to result in better contracts. When managers are able to use their technical expertise to make decisions about contract, contractors perform better. However, discretion may negatively affect equity. Taken together, this research indicates that management and markets affect contracts and how contractors perform. Though additional work remains to be done, this dissertation presents findings that demonstrate that contract managers can influence performance by designing contracts to match contextual, financial, and managerial considerations.

Tables and Figures



Sources: FPDS-NG (contract actions), OMB (discretionary spending)

Figure 1.1: Trends in Federal Contracting, 2005 – 2014

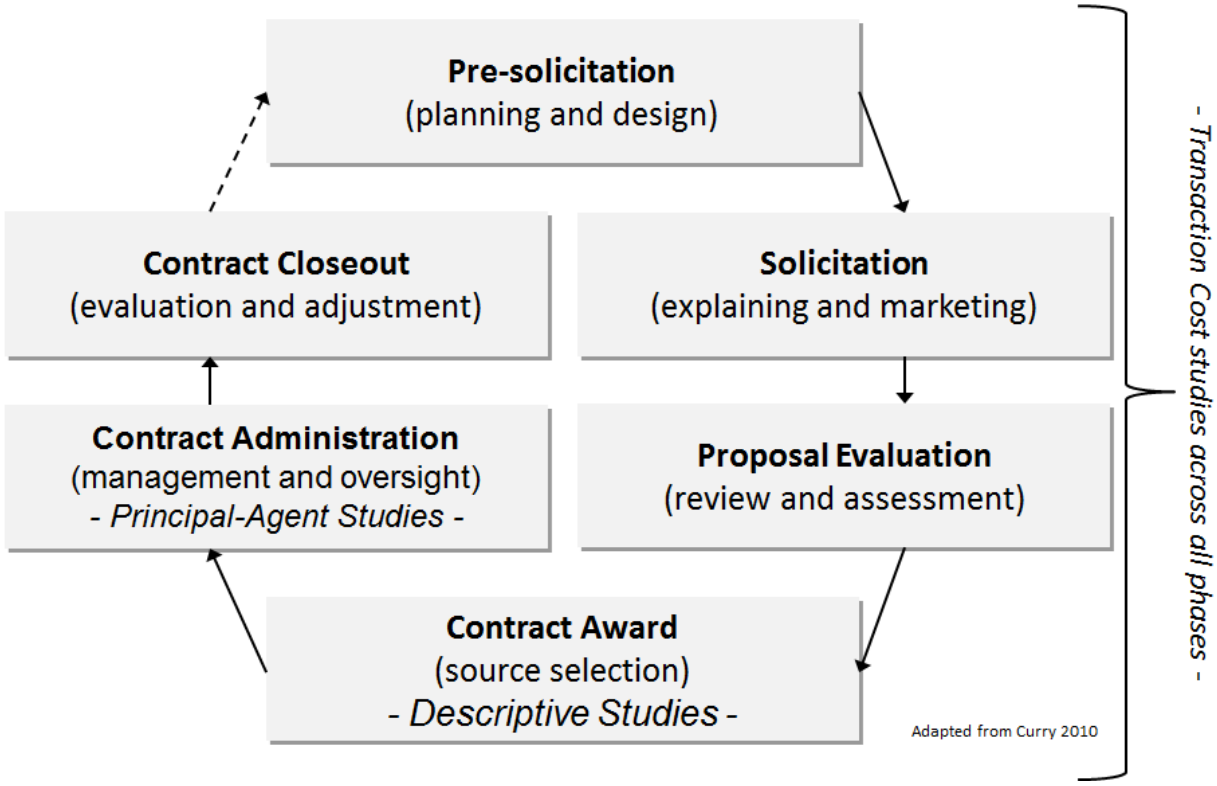


Figure 1.2: The Federal Contracting Cycle

Table 2.1: Frequency of Variable of Interest: Contract Outcomes

Outcome	Description	Frequency	Percent
Normal Closeout	Contract ends with minimal deobligation (under 50 percent of total contract value)	11,822	48.46%
Low Performing Closeout	More than 50 percent of total contract value deobligated over life of contract	1,579	6.47%
High Performing Closeout	No funds deobligated over life of contract	7,972	32.68%
Termination for Convenience	No-fault termination	2,597	10.65%
Termination for Default	Early termination of contracts for commercially available goods/services	378	1.55%
Termination for Cause	Early termination of contracts for non-commercially available goods/services	48	0.20%

Source: FPDS-NG

Table 2.2: Relative Frequency of Contract Outcomes by Quarter

	Q1	Q2	Q3	Q4
Closeout	45.83%	46.63%	49.22%	49.91%
Low closeout	6.57%	7.58%	6.37%	5.98%
High closeout	34.53%	34.03%	31.73%	31.86%
Termination for convenience	11.74%	10.72%	10.11%	10.48%
Termination for default	1.16%	0.79%	2.42%	1.57%
Termination for cause	0.18%	0.26%	0.14%	0.21%

Source: FPDS-NG

Table 2.3: Relative Frequency of Contract Outcomes by Good/Service

	Good	Service
Closeout	44.70%	48.89%
Low closeout	4.09%	6.74%
High closeout	31.26%	32.84%
Termination for convenience	13.61%	12.08%
Termination for default	3.05%	2.26%
Termination for cause	0.28%	0.19%

Source: FPDS-NG

Table 2.4: Relative Frequency of Contract Outcomes by Contract Length

	Less than 1 year	More than 1 year
Closeout	46.16%	49.49%
Low closeout	6.01%	6.68%
High closeout	36.21%	31.09%
Termination for convenience	10.01%	10.93%
Termination for default	1.45%	1.59%
Termination for cause	0.16%	0.21%

Source: FPDS-NG

Table 2.5: Contract Competitiveness

Extent Competed	Explanation	Frequency	Percent	Competitive?
Full and open competition	Open bidding process used without excluding any sources	8,408	34.46%	Yes
Not available for competition	Contract not made available for bids due to regulatory or legal restraint	4,505	18.47%	No
Not competed	Contract not competed due to managerial choice	4,065	16.66%	No
Full and open competition after exclusion of sources	Contract competitively sourced after manager excludes some sources	4,668	19.13%	Yes
Follow on to competed action	Continuation of work that was previously competitively sourced	236	0.97%	Yes
Competed under simplified acquisition procedures (SAP)	Competitive sourcing used for contracts values below the SAP threshold	1,893	7.76%	Yes
Not competed under SAP	Noncompetitive sourcing for contracts valued below the SAP threshold	621	2.55%	No

Source: FPDS-NG

Table 2.6: Contract Financial Payment Structures

Extent Competed	Explanation	Frequency	Percent
Fixed-price	Government provides fixed amount for completion of contract. Financial risk to contractor.	18,996	78.85%
Cost-reimbursement	Government establishes price ceiling, reimburses contractor for incurred costs. Financial risk to government.	2,331	9.55%
Labor-hours / time-and-materials	Government establishes price ceiling, reimburses contractor for incurred costs of labor and time. Financial risk to government.	2,829	11.60%

Source: FPDS-NG

Table 2.7: Use of Simplified Acquisition Procedures (Discretion)

Extent Competed	Explanation	Frequency	Percent
SAP not used	Contract managed under FAR rules	19,573	82.81%
SAP used	Contract manager granted discretion	4,195	17.19%

Source: FPDS-NG

Table 2.8: Descriptive Statistics for Control Variables

Continuous Variables					
Variable	**Category**	**Mean**	**Std. Dev.**	**Min**	**Max**
Contract Length	Contract Requirements	27.78	24.14	0.70	182
Additional Work	Contract Requirements	0.08	0.49	0	23
Supplemental Work	Contract Requirements	0.88	2.60	0	93
Change Order	Contract Requirements	0.36	1.84	0	207
Positive Option	Contract Requirements	0.39	1.01	0	15
Negative Option	Contract Requirements	0.01	0.08	0	3
Positive Funding Action	Contract Requirements	0.74	3.02	0	103
Negative Funding Action	Contract Requirements	0.10	0.54	0	18
Positive Other Admin Action	Contract Requirements	0.12	0.60	0	20
Negative Other Admin Action	Contract Requirements	0.05	0.30	0	13
Professional Staff Ratio	Agency Characteristics	0.27	0.16	0.02	0.71
Department Age	Agency Characteristics	87.41	62.21	0	225
Department Size (log)	Agency Characteristics	10.75	1.36	3.81	12.76
Discretionary Budget	Agency Characteristics	25162.82	21924.07	-1215	155408
% Agency Budget (x1000)	Agency Characteristics	0.40	10.95	-137.72	1206
Number of Bids	Procurement Conditions	13.32	85.15	1	999
Percent Company Revenue	Vendor Characteristics	2.31	6.97	0	30

Dichotomous Variables				
Variable	**Category**	**Mean**	**0**	**1**
Service	Contract Requirements	0.90	2,492	21,904
Ten or More Modifications	Contract Requirements	0.11	21,798	2,598
Performance Based Contract	Contract Requirements	0.20	19,427	4,969
FedBizOpps	Contract Requirements	0.34	16,024	8,372
Professional Service Contract	Contract Requirements	0.26	17,953	6,443
IT Contract	Contract Requirements	0.04	23,381	1,015
Education/Training Contract	Contract Requirements	0.01	24,126	270
Research Contract	Contract Requirements	0.13	21,328	3,068
Construction Contract	Contract Requirements	0.24	18,544	5,852
Cabinet Department	Agency Characteristics	0.87	3,084	21,312
Distributive Agency	Agency Characteristics	0.74	6,236	18,160
Redistributive Agency	Agency Characteristics	0.08	22,368	2,028
Constituent Services Agency	Agency Characteristics	0.25	18,344	6,052
Regulatory Agency	Agency Characteristics	0.60	9,766	14,630
Only One Bid	Procurement Conditions	0.52	12,605	11,791
Five or More Bids	Procurement Conditions	0.19	19,678	4,718
House Appointee Match	Procurement Conditions	0.58	10,179	14,217
Senate Appointee Match	Procurement Conditions	0.69	7,442	16,954
Recession Year	Procurement Conditions	0.21	19,153	5,243
Fourth Quarter	Procurement Conditions	0.42	14,260	10,136
Emergency Procurement	Procurement Conditions	0.01	24,263	133
Non-Profit Organization	Vendor Characteristics	0.05	23,146	1,250
Small Business	Vendor Characteristics	0.28	17,615	6,781

Woman-Owned Business	Vendor Characteristics	0.14	20,987	3,409
Minority-Owned Business	Vendor Characteristics	0.23	18,763	5,633
Veteran-Owned Business	Vendor Characteristics	0.10	22,060	2,336
Previous Experience	Vendor Characteristics	0.58	10,151	14,245

Table 3.1: Frequency of Competitive Procedures, Concluded Federal Contracts, 2005-2014

Competitive Procedure	Occurrences in Dataset	Percent
Full and Open Competition	10,301	42.22
Sealed Bids	1,958	8.03
Negotiated Proposal/Quote	12,471	51.12
Exclusion	4,668	19.13
Sole Source	5,219	21.39
Other (Two-Step, Basic Research, Alternative Sources, and Architect/Engineering)	821	3.37

Source: FPDS-NG

Table 3.2: Descriptive Statistics –Competition and Competitive Solicitation Procedures

Explanatory Variable	Mean	0	1
Competitively Sourced	0.62	9,191	15,205
Full and Open Competition	0.34	15,988	8,408
Competition After Exclusion	0.19	19,728	4,668
Follow-on to Competition	0.01	24,160	236
Not Competed	0.16	20,386	4,010
Not Available for Competition	0.18	19,891	4,505
Sole Source - Discretion	0.09	22,088	2,308
Sole Source - Statute	0.05	23,217	1,179
Sealed Bid	0.08	22,438	1,958

Source: FPDS-NG

Table 3.3: Effect of Competition on Contractor Performance
Reference Category: Normal Closeout

Variable	Low Closeout	High Closeout	Termination for Convenience	Termination for Default	Termination for Cause
	RR (*z*)	RR (*z*)	RR (*z*)	RR (*z*)	RR (*z*)
Competitively Sourced	0.96 (*-0.49*)	1.07 (*1.39*)	1.25 (*2.96*)**	2.01 (*1.99*)*	3.09 (*2.03*)*
Experience	0.86 (*-2.67*)**	1.08 (*2.27*)*	0.77 (*-5.20*)***	0.64 (*-2.44*)**	0.50 (*2.52*)*
Service	2.37 (*6.59*)***	1.05 (*0.71*)	1.08 (*0.84*)	0.46 (*-4.44*)***	0.92 (*-0.16*)
Professional Services	1.29 (*2.92*)**	0.67 (*-6.78*)***	0.92 (*-1.04*)	0.62 (*-2.60*)**	0.90 (*-0.23*)
Information Technology	0.44 (*-4.46*)***	0.68 (*-4.22*)***	0.37 (*-5.98*)***	0.13 (*-2.85*)**	1.01 (*0.01*)
Training	0.89 (*-0.43*)	0.88 (*-0.78*)	0.96 (*-0.17*)	0.00 (*-84.60*)***	0.00 (*-25.40*)***
Research	0.52 (*-4.71*)***	1.18 (*2.65*)**	0.55 (*-4.90*)***	0.39 (*-3.00*)**	0.28 (*-1.31*)
Construction	0.62 (*-4.63*)***	1.32 (*5.41*)***	0.73 (*-3.87*)***	1.04 (*0.21*)	0.25 (*-2.15*)*
Number of Bids	1.00 (*1.20*)	1.00 (*4.09*)***	0.99 (*-1.13*)	0.99 (*-1.33*)	0.99 (*-0.48*)
One Bid Only	1.40 (*3.59*)***	0.99 (*-0.22*)	0.80 (*-2.95*)**	0.62 (*-2.84*)**	0.53 (*-2.22*)*
More than 5 Bids	1.28 (*2.35*)*	0.98 (*-0.48*)	1.30 (*3.94*)***	1.82 (*4.24*)***	2.99 (*3.32*)***
Fourth Quarter	0.88 (*-2.12*)*	0.95 (*-1.58*)	0.99 (*-0.29*)	1.02 (*0.21*)	1.31 (*0.91*)
NPO	0.81 (*-1.55*)	0.88 (*-1.60*)	0.82 (*-1.47*)	0.12 (*-2.08*)*	0.00 (*-53.87*)***
Small Business	0.54 (*-5.62*)***	0.82 (*-3.88*)***	1.03 (*0.42*)	0.53 (*-3.54*)***	0.89 (*-0.22*)
Woman-Owned	1.14 (*1.54*)	1.05 (*1.00*)	0.89 (*-1.48*)	1.10 (*0.55*)	0.74 (*-0.52*)
Minority-Owned	1.09 (*0.84*)	1.18 (*3.17*)**	1.17 (*2.00*)*	2.10 (*4.12*)***	3.96 (*2.79*)**
Veteran-Owned	0.98 (*-0.16*)	1.11 (*1.89*)	1.64 (*6.64*)***	3.83 (*10.97*)***	4.01 (*4.06*)***
Length (months)	1.00 (*4.69*)***	1.00 (*-3.28*)**	1.00 (*1.50*)	1.01 (*2.33*)*	0.99 (*-0.12*)
10 or More Modifications	1.64 (*2.62*)**	0.57 (*-5.52*)***	0.58 (*-2.96*)**	0.52 (*-2.33*)*	0.49 (*-0.90*)
Additional Work (outside scope)	0.67 (*-1.68*)	1.82 (*-3.20*)**	0.82 (*-2.76*)**	0.63 (*-2.56*)*	1.07 (*0.34*)
Supplemental Agreement	0.68 (*-3.79*)***	1.39 (*3.89*)***	0.89 (*-2.25*)*	0.98 (*-0.55*)	0.69 (*-0.98*)
Change Orders	0.79 (*-3.69*)***	1.05 (*0.18*)	1.27 (*2.47*)*	1.30 (*2.23*)*	0.87 (*-0.66*)
Positive Funding Actions	0.47 (*-5.72*)***	1.05 (*2.33*)*	0.98 (*-1.08*)	0.99 (*-0.22*)	0.97 (*-0.36*)
Negative Funding Actions	1.36 (*6.45*)***	0.64 (*-4.71*)***	1.27 (*5.02*)***	1.17 (*1.29*)	1.01 (*0.03*)
Positive Options	0.58 (*-9.34*)***	1.25 (*4.70*)***	0.96 (*-1.05*)	0.79 (*-1.55*)	0.84 (*-0.88*)
Negative Options	1.21 (*0.47*)	1.06 (*0.23*)	1.69 (*0.93*)	0.00 (*-62.28*)***	0.00 (*-21.12*)***
Positive Other Action	0.47 (*-3.65*)***	1.39 (*8.84*)***	1.02 (*0.50*)	1.26 (*3.25*)**	1.25 (*1.39*)

Variable	Low Closeout	High Closeout	Termination for Convenience	Termination for Default	Termination for Cause
	RR (*z*)	RR (*z*)	RR (*z*)	RR (*z*)	RR (*z*)
Negative Other Action	1.41 (*3.15*)**	0.15 (*-10.99*)***	1.92 (*0.59*)	1.84 (*0.77*)	1.44 (*0.79*)
Performance-Based	1.21 (*2.65*)**	1.15 (*3.26*)**	1.04 (*0.55*)	0.70 (*-2.01*)*	1.23 (*0.61*)
FedBizOpps	0.67 (*-5.35*)***	1.07 (*1.84*)	1.29 (*4.63*)***	1.03 (*0.23*)	1.37 (*0.93*)
Cabinet Department	0.90 (*-0.75*)	1.00 (*0.02*)	0.63 (*-4.61*)***	0.26 (*-5.76*)***	1.75 (*0.79*)
Distributive	0.53 (*-8.03*)***	0.92 (*-1.77*)	1.14 (*2.02*)*	3.18 (*6.04*)***	0.95 (*-0.11*)
Redistributive	2.35 (*7.28*)***	1.93 (*8.39*)***	3.10 (*10.82*)***	0.42 (*-2.71*)**	0.00 (*-39.19*)***
Constituent Services	1.06 (*0.54*)	2.11 (*12.53*)***	10.09 (*26.36*)***	2.30 (*4.91*)***	8.11 (*5.19*)***
Regulatory	1.11 (*1.10*)	0.57 (*-10.82*)***	0.74 (*-3.94*)***	0.66 (*-1.87*)	0.66 (*-0.94*)
Professional Staff Ratio	1.27 (*0.89*)	6.11 (*11.70*)***	13.58 (*10.12*)***	0.25 (*-2.18*)*	16.43 (*4.29*)***
Department/Agency Age	0.99 (*-3.12*)**	0.99 (*-26.11*)***	1.00 (*4.21*)***	1.00 (*3.67*)***	0.99 (*-0.11*)
Department/Agency Size (ln)	1.06 (*1.60*)	1.25 (*10.21*)***	1.04 (*1.29*)	0.82 (*-3.16*)*	1.05 (*0.30*)
Agency budget ($ mns)	0.99 (*-1.61*)	0.99 (*-5.84*)***	1.00 (*1.17*)	1.00 (*0.19*)	1.00 (*0.46*)
Percent Agency Budget (1000)	1.00 (*2.00*)*	1.00 (*0.22*)	0.99 (*-0.55*)	1.00 (*0.21*)	0.99 (*-1.27*)
House Leadership Match	0.75 (*-4.01*)***	1.48 (*9.29*)***	0.66 (*-6.71*)***	1.12 (*0.71*)	0.29 (*-3.40*)***
Senate Leadership Match	1.51 (*4.77*)***	0.65 (*-8.92*)***	1.22 (*2.63*)**	2.46 (*4.00*)***	16.15 (*3.52*)***
Recession	0.85 (*-2.15*)*	0.70 (*-8.22*)***	1.07 (*1.19*)	1.37 (*2.58*)**	1.06 (*0.11*)
Emergency Contract	0.83 (*-0.54*)	0.66 (*-1.90*)	0.39 (*-2.02*)*	0.00 (*-94.51*)***	0.00 (*-33.53*)***
Percent Company Revenue	1.01 (*3.31*)***	0.99 (*-4.92*)***	1.03 (*9.69*)***	1.01 (*1.92*)	1.04 (*3.19*)**
Constant	0.19 (*-3.50*)***	0.37 (*-3.77*)***	0.09 (*-5.71****)	0.48 (*-1.07*)	0.00 (*-4.02*)***
n = 24,396	* = p < 0.05, **= p<0.01, ***=p<0.001		pseudo r^2 = 0.16	log pseudo likelihood = -24761.40	

Table 3.4: Effect of Solicitation Procedures on Contractor Performance, Complete Results
Reference Category: Normal Closeout

Variable	Low Closeout	High Closeout	Termination for Convenience	Termination for Default	Termination for Cause
	RR (*z*)	RR (*z*)	RR (*z*)	RR (*z*)	RR (*z*)
Full and Open Competition	0.89 (*-1.12*)	0.72 (*-3.88*)***	1.62 (5.52)***	1.95 (*2.20*)*	2.74 (*-2.08*)*
Competition After Exclusion	0.80 (*-2.07*)*	0.64 (*-5.63*)***	1.38 (3.39)***	1.86 (*2.03*)*	3.51 (*-2.46*)*
Follow-on to Competition	1.50 (*1.39*)	2.78 (*5.91*)***	1.50 (1.64)	0.00 (*-52.36*)***	0.00 (*-25.79*)***
Not Competed	0.84 (*-1.47*)	1.51 (*5.06*)***	1.04 (0.32)	0.92 (*-0.24*)	0.80 (*-0.21*)
Not Available for Competition	0.84 (*-1.35*)	1.50 (*5.21*)***	1.10 (0.77)	1.24 (*0.64*)	0.00 (*-27.74*)***
Sole Source - Statute	0.77 (*-1.69*)	1.40 (*1.45*)	1.08 (0.56)	2.41 (*2.05*)*	3.09 (*4.13*)***
Sole Source - Discretion	1.20 (*1.67*)	1.55 (*6.51*)***	1.04 (0.30)	1.32 (*0.74*)	0.27 (*-0.98*)
Sealed Bid	0.51 (*-4.01*)***	0.92 (*-1.28*)	0.43 (-6.73)***	0.41 (*-3.75*)***	0.00 (*-37.81*)***
Experience	0.87 (*-2.25*)*	1.08 (*2.13*)*	0.78 (-4.80)***	0.86 (*-2.29*)*	0.52 (*-2.36*)*
Service	2.19 (*6.01*)***	0.96 (*-0.53*)	0.95 (-0.55)	0.44 (*-4.92*)***	0.89 (*-0.24*)
Professional Services	1.24 (*2.55*)*	0.65 (*-7.32*)***	0.87 (-1.84)	0.60 (*-2.84*)**	0.91 (*-0.22*)
Information Technology	0.43 (*-4.55*)***	0.64 (*-4.77*)***	0.36 (-6.07)***	0.13 (*-2.84*)**	1.13 (*0.15*)
Training	0.86 (*-0.58*)	0.87 (*-0.89*)	0.95 (-0.22)	0.00 (*-88.76*)***	0.00 (*-23.41*)***
Research	0.48 (*-5.32*)***	1.06 (*0.94*)	0.49 (-5.77)***	0.36 (*-3.22*)**	0.30 (*-1.27*)
Construction	0.70 (*-3.35*)***	1.24 (*3.99*)***	0.78 (-2.93)**	1.12 (*0.64*)	0.38 (*-1.51*)
Number of Bids	1.00 (*1.24*)	1.00 (*4.03*)***	0.99 (-1.24)	0.99 (*-1.39*)	0.99 (*-0.46*)
One Bid Only	1.37 (*3.60*)***	0.95 (*-1.00*)	-0.76 (-3.75)***	0.60 (*-2.98*)**	0.40 (*-1.98*)*
More than 5 Bids	1.31 (*2.58*)**	0.96 (*-0.71*)	1.32 (3.94)***	1.84 (*4.24*)***	3.17 (*3.45*)**
Fourth Quarter	0.88 (*-2.27*)*	0.95 (*-1.61*)	0.97 (-0.73)	0.99 (*-0.06*)	1.33 (*0.95*)
NPO	0.81 (*-1.57*)	0.87 (*-1.80*)	0.80 (-1.66)	0.13 (*-2.07*)*	0.00 (*-50.93*)***
Small Business	0.56 (*-5.13*)***	0.78 (*-4.95*)***	1.01 (0.16)	0.49 (*-3.73*)***	0.97 (*-0.05*)
Woman-Owned	1.12 (*1.33*)	1.04 (*0.80*)	0.89 (-1.55)	1.09 (*0.52*)	0.72 (*-0.57*)
Minority-Owned	1.08 (*0.77*)	1.14 (*2.56*)*	1.12 (1.46)	2.05 (*3.87*)***	4.01 (*2.82*)**
Veteran-Owned	1.00 (*0.04*)	1.10 (*1.59*)	1.67 (6.76)***	3.80 (*10.70*)***	4.52 (*4.60*)***
Length (months)	1.00 (*2.88*)**	0.99 (*-6.84*)***	0.99 (-1.56)	1.00 (*1.16*)	0.99 (*-0.10*)
More than 10 Modifications	1.65 (*2.63*)**	0.58 (*-6.52*)***	0.58 (-2.92)**	0.51 (*-2.37*)*	0.52 (*-0.55*)
Additional Work (outside scope)	0.67 (*-2.94*)**	1.83 (*-3.12*)**	0.83 (-2.70)**	0.64 (*-2.54*)*	1.07 (*0.27*)

Variable	Low Closeout	High Closeout	Termination for Convenience	Termination for Default	Termination for Cause
	RR (*z*)	RR (*z*)	RR (*z*)	RR (*z*)	RR (*z*)
Supplemental Agreement	0.68 (*-8.16*)***	1.33 (*3.78*)***	0.89 (-2.32)*	0.97 (*-0.93*)	0.72 (*-0.91*)
Change Orders	0.79 (*-3.75*)***	1.00 (*0.15*)	1.33 (2.44)*	1.46 (*2.36*)*	0.89 (*-0.57*)
Positive Funding Actions	0.48 (*-8.31*)***	1.03 (*2.30*)*	0.99 (-1.02)	0.99 (*-0.05*)	0.98 (*-0.49*)
Negative Funding Actions	1.37 (*4.11*)***	0.63 (*-4.70*)***	1.22 (4.52)***	1.13 (*1.26*)	1.00 (*0.01*)
Positive Options	0.58 (*-9.34*)***	0.90 (*-4.92*)***	0.96 (-1.15)	0.74 (*-2.00*)*	0.85 (*-0.85*)
Negative Options	1.20 (*0.45*)	1.00 (*0.01*)	1.69 (0.94)	0.00 (*-63.68*)***	0.00 (*-17.91*)***
Positive Other Action	0.48 (*-4.68*)***	1.30 (*8.75*)***	1.03 (0.51)	1.23 (*3.01*)**	1.29 (*1.53*)
Negative Other Action	1.44 (*3.39*)***	0.13 (*-11.84*)***	1.93 (0.52)	1.85 (*-0.73*)	1.45 (*-0.77*)
Performance-Based	1.21 (*2.73*)**	1.14 (*2.96*)**	1.01 (0.23)	0.67 (*-2.17*)*	1.13 (*0.31*)
FedBizOpps	0.67 (*-5.27*)***	1.03 (*0.74*)	1.25 (3.89)***	0.99 (*-0.10*)	1.50 (*1.17*)
Cabinet Department	0.92 (*-0.53*)	1.00 (*0.02*)	0.63 (-4.56)***	0.27 (*-5.73*)***	1.94 (*0.96*)
Distributive	0.52 (*-8.21*)***	0.87 (*-2.77*)**	1.12 (1.68)	2.96 (*5.72*)***	0.98 (*-0.05*)
Redistributive	2.35 (*7.03*)***	1.88 (*8.05*)***	3.45 (11.45)***	0.53 (*1.91*)	0.00 (*-30.46*)***
Constituent Services	0.96 (*-0.39*)	2.07 (*11.97*)***	9.55 (25.51)***	2.22 (*4.71*)***	7.86 (*4.75*)***
Regulatory	1.12 (*1.29*)	0.61 (*-9.37*)***	0.80 (-2.74)**	0.73 (*-1.39*)	0.64 (*-0.95*)
Professional Staff Ratio	1.22 (*0.73*)	6.31 (*11.56*)***	14.61 (10.30)***	0.31 (*-1.91*)	19.12 (*4.24*)***
Department/Agency Age	0.99 (*-3.30*)***	0.99 (*-25.33*)***	1.00 (4.48)***	1.00 (*3.94*)***	0.99 (*-0.30*)
Department/Agency Size (ln)	1.09 (*2.15*)*	1.24 (*9.75*)***	1.05 (1.46)	0.82 (*-3.22*)**	1.05 (*0.31*)
Agency budget ($ mns)	0.99 (*-1.76*)	0.99 (*-5.30*)***	1.00 (1.53)	1.00 (*0.65*)	1.00 (*0.44*)
Percent Agency Budget (1000)	1.00 (*1.30*)	1.00 (*0.55*)	0.99 (-0.38)	1.00 (*0.49*)	0.99 (*-1.01*)
House Leadership Match	0.80 (*-2.92*)**	1.33 (*6.42*)***	0.62 (-7.18)***	1.04 (*0.22*)	0.31 (*-3.13*)**
Senate Leadership Match	1.41 (*3.84*)***	0.72 (*-6.53*)***	1.25 (2.84)**	2.55 (*4.05*)***	14.30 (*3.25*)**
Recession	0.87 (*-1.93*)	0.69 (*-8.71*)***	1.10 (1.57)	1.42 (*2.84*)**	1.16 (*0.28*)
Emergency Contract	0.79 (*-0.68*)	0.68 (*-1.76*)	0.41 (-1.90)	0.00 (*-94.06*)***	0.00 (*-31.59*)***
Percent Company Revenue	1.01 (*3.40*)***	0.99 (*-4.88*)***	1.02 (9.45)***	1.01 (*1.86*)	1.04 (*3.05*)**
Constant	0.10 (*-5.07*)***	0.17 (*-6.48*)***	0.44 (-7.32)***	0.26 (*-1.97*)*	0.00 (*-3.81*)***
n = 24,396	* = p < 0.05, **= p<0.01, ***=p<0.001		pseudo r^2 = 0.16	log pseudo likelihood = -24747.98	

Table 4.1: Relative Usage of Payment Types for Federal Definitive Contracts (2005-2014)

Financial Structure	Broad Type	Percent of Contracts
Firm-fixed price	Fixed-Price	76.96
Cost	Cost-Reimbursement	5.01
Cost plus award fee	Cost-Reimbursement	0.52
Cost plus fixed fee	Cost-Reimbursement	3.47
Cost plus incentive fee	Cost-Reimbursement	0.27
Cost sharing	Cost-Reimbursement	0.28
Firm-fixed price award fee	Fixed-Price	0.17
Firm-fixed price incentive fee	Fixed-Price	0.27
Firm-fixed price level of effort	Fixed-Price	0.18
Firm-fixed price redetermination	Fixed-Price	0.07
Firm-fixed price economic price adjustment	Fixed-Price	1.19
Labor-hours	Time/Labor	4.46
Time-and-materials	Time/Labor	7.15

Source: FPDS-NG

Table 4.2: Federal Contracts: Allocating Transaction Costs, Oversight Costs, and Risk

Financial Structure	***Requirements***	***Uncertainty***	***Information Asymmetry***	***Oversight Costs***	***Asset Specificity***	***Primary Risk Allocation***
Fixed-Price	Clear	Low	High	Low	Low	Contractor
Cost-Reimbursement	Unclear	Medium	Medium	Medium	Medium to High	Shared
Time/Labor	Very Unclear or Unknown	High	Medium to Low	High	Medium to High	Government

Table 4.3 – Use of Contract Financial Structures by Good/Service Purchased

	Prof. Svcs.	*% of row*	Research	*% of row*	Info. Tech	*% of row*	Training	*% of row*	Constr.	*% of row*	Other	*% of row*	Total
Fixed-Price	**3,216**	*16.72%*	**1,955**	*10.16%*	**719**	*3.74%*	**228**	*1.19%*	**5,784**	*30.07%*	**7,334**	*38.13%*	**19,236**
% of column	*49.91%*		*63.72%*		*70.84%*		*84.44%*		*99.01%*		*94.53%*		*78.85%*
Cost	**1,068**	*45.82%*	**943**	*40.45%*	**68**	*2.92%*	**24**	*1.03%*	**26**	*1.12%*	**202**	*8.67%*	**2,331**
% of column	*16.58%*		*30.74%*		*6.70%*		*8.89%*		*0.45%*		*2.60%*		*9.55%*
Time/Labor	**2,159**	*76.32%*	**170**	*6.01%*	**228**	*8.06%*	**18**	*0.64%*	**32**	*1.13%*	**222**	*7.85%*	**2,829**
% of column	*33.51%*		*5.54%*		*22.46%*		*6.67%*		*0.55%*		*2.86%*		*11.60%*
Total	**6,443**	*26.41%*	**3,068**	*12.58%*	**1,015**	*4.16%*	**270**	*1.11%*	**5,842**	*23.95%*	**7,758**	*31.80%*	**24,396**

Source: FPDS-NG

Table 4.4 Descriptive Statistics: Explanatory Variables

Dichotomous Variables						
Variable	**Model**	**Measuring**	**0**	**1**	**Mean**	
Competed	1	Competition	9,191	15,205	0.62	
Only One Bid	1	Asset Specificity (high)	11,791	12,506	0.52	
Five or More Bids	1	Asset Specificity (low)	19,678	4,718	0.19	
Service	1	Uncertainty (requirements)	2,492	21,904	0.88	
Professional Services	1	Uncertainty (requirements)	17,953	6,443	0.26	
Research	1	Uncertainty (requirements)	21,328	3,068	0.13	
IT	1	Uncertainty (requirements)	23,381	1,015	0.04	
Training	1	Uncertainty (requirements)	24,126	270	0.01	
Construction	1	Uncertainty (requirements)	18,544	5,852	0.24	
Two Years Plus	1	Uncertainty (length)	13,325	11,071	0.45	
Cost-Reimbursement	2	Financial Structure	22,065	2,331	0.10	
Time/Labor	2	Financial Structure	21,567	2,829	0.12	
Incentive Contracts	2	Financial Structure	24,095	301	0.01	
Continuous Variables						
Variable	**Model**		**Mean**	**Std. Dev**	**Min**	**Max**
Value (ln)	1	Uncertainty (spending)	12.14	1.98	-2.30	22.11
% Agency Budget	1	Uncertainty (spending)	0.00	0.02	-0.14	0.84

Table 4.5: Effect of Transaction Costs on Selection of Contract Financial Structure
Reference Category: Fixed-Price Contracts

Variable	Cost-Reimbursement	Time/Labor
	RR *(z)*	RR *(z)*
Competed	0.62 (-3.33)***	0.38 (-12.20)***
Only One Bid	1.27 (2.82)**	1.46 (4.02)***
5 or More Bids	0.80 (-9.72)***	0.74 (-2.67)**
Service	1.55 (2.42)*	2.85 (5.63)***
Professional Services	6.12 (17.57)***	7.99 (23.33)***
Research	7.33 (18.54)***	2.11 (6.50)***
Training	2.94 (3.91)***	1.27 (0.88)
IT	1.97 (4.06)***	4.30 (12.13)***
Construction	0.18 (-8.29)***	0.15 (-9.54)***
Value (ln)	1.40 (19.47)***	1.11 (5.91)***
Two Years or More	1.90 (9.65)***	1.25 (3.78)***
Cabinet Department	6.63 (15.99)***	11.10 (15.77)***
Distributive	0.98 (-0.29)	0.42 (-12.96)***
Redistributive	0.25 (-8.25)***	0.89 (-1.13)
Regulatory	0.25 (-16.72)***	0.83 (-2.43)*
Constituent Services	1.62 (5.31)***	1.29 (2.51)*
Professional Staff Ratio	10.46 (9.04)***	2.97 (4.40)***
Age	1.00 (1.65)	1.00 (5.42)***
Size (ln)	1.10 (3.37)***	0.83 (-5.07)***
Budget ($ mns)	0.99 (-1.92)	0.99 (-6.03)***
Pct. Agency Budget	4.03 (0.83)	0.02 (-0.39)
Pct. Firm Revenue	1.00 (-1.07)	1.00 (-1.53)
Fourth Quarter	1.18 (3.03)**	1.04 (0.80)
Recession	0.65 (-5.81)***	1.51 (7.18)***
Emergency	0.50 (-0.67)	1.16 (0.23)
Constant	0.00 (-25.78)***	0.01 (-10.50)***
n = 24,396		*Ps. R^2 = 0.37*

Table 4.6: Effect of Contract Financial Structure on Contractor Performance
Reference Category: Normal Closeout

Variable	Low Closeout	High Closeout	Termination for Convenience	Termination for Default	Termination for Cause
	RR (*z*)	RR (*z*)	RR (*z*)	RR (*z*)	RR (*z*)
Cost Contracts	0.89 (*-0.82*)	0.59 (*-7.96*)***	1.53 (*4.69*)***	2.67 (*4.80*)***	2.95 (*2.89*)**
Time/Labor Contracts	1.57 (*5.17*)***	0.41 (*-12.99*)***	1.03 (*0.32*)	0.35 (*-2.77*)**	0.65 (*-0.67*)
Incentive Contracts	0.69 (*-0.75*)	2.23 (*4.64*)***	1.97 (*3.09*)**	0.52 (*-0.80*)	0.00 (*14.59*)***
Experience	0.85 (*-2.85*)**	1.10 (*2.84*)**	0.75 (*-5.63*)***	0.81 (*-2.46*)**	0.46 (*-2.82*)**
Service	2.17 (*6.17*)***	0.98 (*-0.26*)	1.00 (*0.03*)	0.47 (*-4.46*)***	0.87 (*-0.28*)
Professional Services	1.13 (*2.62*)**	0.78 (*-3.96*)***	0.84 (*-2.10*)*	0.55 (*-3.22*)**	0.76 (*-0.56*)
Information Technology	0.44 (*-4.83*)***	0.74 (*-3.16*)**	0.34 (*-6.22*)***	0.13 (*-2.84*)**	0.90 (*0.11*)
Training	0.89 (*-0.47*)	0.88 (*-0.78*)	0.92 (*-0.38*)	0.00 (*-82.63*)***	0.00 (*-24.33*)***
Research	0.49 (*-5.33*)***	1.24 (*3.47*)***	0.48 (*5.89*)***	0.30 (*-3.65*)***	0.28 (*-1.31*)
Construction	0.61 (*-4.87*)***	1.26 (*4.59*)***	0.70 (*-4.21*)***	0.97 (*0.21*)	0.24 (*-2.25*)*
Number of Bids	1.00 (*1.25*)	1.00 (*4.06*)***	0.99 (*-1.18*)	0.99 (*-1.47*)	0.99 (*-0.63*)
One Bid Only	1.37 (*4.05*)***	0.97 (*-0.84*)	0.68 (*-6.52*)***	0.53 (*-4.65*)***	0.28 (*-2.82*)**
More than 5 Bids	1.28 (*2.37*)*	1.01 (*0.19*)	1.27 (*3.47*)***	1.79 (*3.99*)***	2.84 (*3.03*)**
Fourth Quarter	0.88 (*-2.10*)*	0.96 (*-1.33*)	0.99 (*-0.28*)	1.03 (*0.24*)	1.33 (*0.96*)
NPO	0.86 (*-1.08*)	0.88 (*-1.62*)	0.77 (*-1.99*)*	0.10 (*-2.29*)*	0.00 (*-45.72*)***
Small Business	0.55 (*-5.53*)***	0.79 (*-4.76*)***	0.99 (*0.03*)	0.50 (*-3.73*)***	0.84 (*-0.30*)
Woman-Owned	1.14 (*1.54*)	1.02 (*0.44*)	0.89 (*-1.44*)	1.12 (*0.66*)	0.81 (*-0.38*)
Minority-Owned	1.08 (*0.75*)	1.14 (*2.61*)***	1.14 (*1.72*)	2.09 (*4.03*)***	3.94 (*2.67*)**
Veteran-Owned	0.98 (*-0.06*)	1.11 (*1.75*)	1.68 (*6.89*)***	3.98 (*11.24*)***	4.21 (*4.26*)***
Length (months)	1.00 (*3.13*)**	0.99 (*-5.03*)***	0.99 (*1.05*)	1.01 (*1.21*)	0.99 (*-0.35*)
10 or More Modifications	1.64 (*2.62*)**	0.58 (*-6.38*)***	0.57 (*-3.01*)**	0.53 (*-2.36*)*	0.45 (*-0.68*)
Additional Work (outside scope)	0.64 (*-3.95*)***	1.82 (*2.89*)**	0.84 (*-2.60*)**	0.67 (*-2.27*)*	1.20 (*0.92*)
Supplemental Agreement	0.68 (*-9.83*)***	1.51 (*4.08*)***	0.89 (*-2.29*)*	0.97 (*-1.00*)	0.70 (*-0.96*)
Change Orders	0.78 (*-5.70*)***	0.99 (*-0.02*)	1.31 (*2.12*)*	1.27 (*2.31*)*	0.90 (*-0.54*)
Positive Funding Actions	0.48 (*-11.43*)***	1.03 (*3.05*)**	0.98 (*-1.20*)	0.99 (*-0.40*)	0.97 (*-0.67*)
Negative Funding Actions	1.38 (*4.29*)***	0.63 (*-4.83*)***	1.24 (*4.98*)***	1.15 (*1.25*)	1.09 (*0.25*)

Variable	Low Closeout	High Closeout	Termination for Convenience	Termination for Default	Termination for Cause
	RR (*z*)	RR (*z*)	RR (*z*)	RR (*z*)	RR (*z*)
Positive Options	0.59 (*-9.66*)***	1.18 (*5.59*)***	0.96 (*-0.91*)	0.74 (*-2.00*)*	0.85 (*-0.85*)
Negative Options	1.34 (*0.78*)	1.06 (*0.23*)	1.63 (*-1.14*)	0.00 (*-57.68*)***	0.00 (*-20.00*)***
Positive Other Action	0.48 (*-4.78*)***	1.31 (*8.61*)***	1.03 (*0.44*)	1.24 (*2.97*)**	1.25 (*1.27*)
Negative Other Action	1.40 (*3.08*)**	0.14 (*-11.74*)***	1.87 (*-0.56*)	1.82 (*-0.83*)	1.48 (*-0.75*)
Performance-Based	1.20 (*2.52*)*	1.16 (*3.40*)***	1.01 (*0.22*)	0.66 (*-2.30*)*	1.25 (*0.54*)
FedBizOpps	0.69 (*-4.86*)***	1.02 (*0.68*)	1.27 (*4.15*)***	0.97 (*-0.23*)	1.35 (*0.85*)
Cabinet Department	0.81 (*-1.44*)	1.20 (*2.43*)*	0.60 (*-4.95*)***	0.26 (*-5.63*)***	1.63 (*0.65*)
Distributive	0.59 (*-6.63*)***	0.83 (*-3.81*)***	1.13 (*1.76*)	2.81 (*5.36*)***	0.90 (*-0.23*)
Redistributive	2.01 (*5.87*)***	1.77 (*7.05*)***	2.97 (*10.72*)***	0.44 (*-2.56*)*	0.00 (*-38.10*)***
Constituent Services	1.04 (*0.39*)	2.13 (*12.48*)***	9.75 (*25.97*)***	2.20 (*4.37*)***	8.06 (*4.69*)***
Regulatory	1.08 (*0.94*)	0.58 (*-10.18*)***	0.79 (*-3.05*)**	0.82 (*-0.82*)	0.89 (*-0.22*)
Professional Staff Ratio	1.16 (*0.58*)	8.01 (*12.78*)***	12.91 (*9.84*)***	0.23 (*-2.24*)*	15.97 (*3.82*)***
Department/Agency Age	0.99 (*-3.04*)**	0.99 (*-26.07*)***	1.00 (*4.63*)***	1.00 (*3.93*)***	1.00 (*-0.07*)
Department/Agency Size (ln)	1.07 (*1.96*)*	1.24 (*9.45*)***	1.04 (*1.17*)	0.78 (*-3.60*)***	1.03 (*0.18*)
Agency budget ($ mns)	0.99 (*-1.16*)	0.99 (*-5.85*)***	1.00 (*1.46*)	1.00 (*0.60*)	1.00 (*0.50*)
Percent Agency Budget (1000)	1.00 (*0.77*)	1.00 (*0.48*)	0.99 (*-0.32*)	1.00 (*0.54*)	0.98 (*-1.37*)
House Leadership Match	0.75 (*-4.17*)***	1.51 (*9.82*)***	0.68 (*-6.31*)***	1.20 (*1.10*)	0.32 (*-3.30*)***
Senate Leadership Match	1.51 (*4.78*)***	0.64 (*-9.29*)***	1.18 (*2.21*)*	2.32 (*3.75*)***	14.20 (*3.39*)***
Recession	0.83 (*-2.45*)*	0.70 (*-8.31*)***	1.07 (*1.15*)	1.37 (*2.58*)***	1.12 (*0.20*)
Emergency Contract	0.84 (*-0.49*)	0.66 (*-1.94*)	0.40 (*-1.96*)*	0.00 (*-96.14****)	0.00 (*-34.08*)***
Percent Company Revenue	1.01 (*3.03*)**	0.99 (*-4.26*)***	1.02 (*8.94*)***	1.01 (*1.42*)	1.04 (*2.99*)**
Constant	0.10 (*-5.52*)***	0.20 (*-5.92*)***	0.07 (*-6.47*)***	0.73 (*-0.42*)	0.00 (*-3.52*)***
n = 24,396	* = p < 0.05, **=p<0.01, ***=p<0.001		pseudo r^2 = 0.16		log pseudo likelihood = -24699.20

Table 5.1: Descriptive Statistics: Variables of Interest, Models 2-8

Variable	Model	0	1	Mean
SAP	all	20,201	4,195	17.20
Minority-Owned	3	18,763	5,633	23.09
Woman-Owned	4	20,987	3,409	13.97
Veteran-Owned	5	22,060	2,336	9.58
Small Business	6	17,615	6,781	27.80
Contracting Officer SBA	6a	7,834	16,562	67.89
FedBizOpps	7	16,024	8,732	34.32

Table 5.2: Descriptive Statistics: Occurrences of Ordinal Preference of Competition and Financial Structure (Models 1 and 2)

Competition				Financial Structure			
Mechanism	*Preference*	*Count*	*Pct.*	*Mechanism*	*Preference*	*Count*	*Pct.*
Full and Open	Most Preferred	10,301	42.22	Fixed-Price	Most Preferred	19,236	78.85
Exclusions	Less Preferred	4,904	20.10	Cost-Reimbursement	Less Preferred	2,331	9.55
Not Competed	Least Preferred	9,191	37.67	Time-and-Materials	Least Preferred	2,829	11.60

Table 5.3: Effect of SAP on Selection of Contract Design Elements

Variable	Type	**Model 1:** Preference of Competitiveness Procedures		**Model 2:** Preference of Financial Structures	
		Reference Category: Full and Open Competition		*Reference Category: Firm-Fixed Price Contracts*	
		Not Competed	Exclusion	Time/Labor	Cost
		RR *(z)*	RR *(z)*	RR *(z)*	RR *(z)*
SAP	Explanatory	0.43 (-19.73)***	0.53 (-12.86)***	0.51 (-9.06)***	0.12 (-13.78)***
Service	Complexity	2.11 (12.19)***	1.76 (8.28)***	3.13 (6.27)***	1.63 (2.78)**
Professional Services	Complexity	1.74 (10.85)***	0.68 (-5.87)***	9.61 (26.03)***	6.09 (18.17)***
Research	Complexity	0.59 (-8.58)***	1.08 (1.23)	2.20 (6.83)***	7.57 (20.06)***
Training	Complexity	1.13 (0.88)	0.59 (-2.52)*	1.37 (1.16)	3.15 (4.71)***
IT	Complexity	2.72 (11.74)***	0.95 (-0.44)	5.94 (15.75)***	2.36 (5.46)***
Construction	Complexity	0.78 (-5.25)***	0.88 (-2.50)*	0.14 (-10.14)***	0.20 (-8.38)***
Cabinet Department	Agency	0.72 (-4.99)***	0.47 (-9.11)***	8.19 (14.97)***	4.79 (13.44)***
Distributive	Agency	0.38 (-22.63)***	1.31 (4.40)***	0.38 (-15.57)***	1.17 (2.17)*
Redistributive	Agency	3.14 (16.80)***	1.61 (5.61)***	1.26 (2.42)*	0.32 (-8.45)***
Regulatory	Agency	2.08 (15.65)***	1.53 (6.61)***	0.88 (-1.85)	0.19 (-21.51)***
Constituent Services	Agency	1.15 (2.69)**	0.82 (3.12)**	1.05 (0.65)	1.21 (1.95)
Professional Staff Ratio	Agency	2.57 (6.52)***	1.06 (0.31)	4.80 (7.28)***	12.86 (9.87)***
Age	Agency	0.99 (-13.82)***	0.99 (-0.90)	1.00 (3.86)***	1.00 (0.39)
Size (ln)	Agency	1.12 (5.64)***	1.23 (7.79)***	0.90 (-3.60)***	1.16 (4.25)***
Budget ($ mns)	Agency	1.00 (6.36)***	1.00 (3.01)**	0.99 (-6.53)***	0.99 (-2.37)*
Pct. Agency Budget	Importance	0.99 (-2.46)**	0.97 (-2.76)**	-0.99 (-0.10)	1.00 (2.86)**
Pct. Firm Revenue	Importance	0.99 (-3.50)***	1.01 (4.08)***	1.03 (8.32)***	1.03 (7.81)***
Bids Received	Market	0.99 (-4.21)	0.99 (-3.35)	0.98 (-8.82)***	0.99 (-5.15)***
Fourth Quarter	Market	1.13 (3.91)***	0.92 (-2.14)*	1.07 (1.40)	1.21 (3.61)***
Recession	Market	1.26 (6.06)***	1.67 (11.81)***	1.54 (7.51)***	0.66 (-5.55)***
Emergency	Market	1.52 (2.15)*	0.54 (-2.19)*	1.24 (0.40)	0.44 (-0.81)
Constant		0.21 (-6.84)***	0.04 (-10.89)***	0.01 (11.53)***	0.00 (-14.69)***
		Ps. R^2 = 0.16		*Ps. R^2 = 0.34*	
n = 24,396		* = p < 0.05, **=p<0.01, ***=p<0.001			

Table 5.4: Effect of SAP on Equity and Transparency Procedures

Variable	**Type**	**Model 3:** Minority-Owned	**Model 4:** Woman-Owned	**Model 5:** Veteran-Owned	**Model 6:** Small Business	**Model 6a:** CO Sm. Business	**Model 7:** FedBizOpps.gov
		OR (z)	*OR (z)*	*OR (z)*	*OR (z)*	*OR (z)*	*OR (z)*
SAP	Explanatory	0.81 (-4.47)***	1.27 (4.80)***	0.98 (-0.36)	0.79 (-5.32)***	1.50 (9.67)***	0.53 (-15.15)***
Service	Complexity	1.24 (3.25)**	1.24 (2.72)**	1.30 (3.91)***	1.03 (0.44)	0.84 (-3.31)***	0.83 (-3.45)***
Professional Services	Complexity	1.20 (3.08)**	1.46 (6.07)***	0.81 (-2.88)**	1.29 (4.85)***	1.37 (6.44)***	0.54 (-12.67)***
Research	Complexity	0.83 (-2.86)**	0.99 (-0.05)	0.44 (-8.26)***	0.69 (-5.50)***	1.17 (2.92)**	0.89 (-2.27)*
Training	Complexity	0.80 (-1.38)	2.61 (6.60)***	0.65 (-1.76)	1.01 (0.05)	0.94 (-0.49)	0.83 (-1.28)
IT	Complexity	2.66 (12.77)***	1.43 (3.79)***	1.26 (2.18)*	2.81 (13.57)***	1.81 (7.51)***	0.49 (-8.42)***
Construction	Complexity	2.01 (14.40)***	1.20 (3.16)**	1.09 (1.39)	3.36 (26.32)***	4.30 (28.48)***	1.09 (1.96)*
Cabinet Department	Agency	0.47 (-11.37)***	0.43 (-10.35)***	0.54 (-6.05)***	0.40 (-13.44)***	0.28 (-19.65)***	0.88 (-1.87)
Distributive	Agency	0.75 (-6.17)***	1.01 (0.16)	0.83 (2.76)**	0.99 (-0.24)	1.04 (0.92)	1.48 (9.11)***
Redistributive	Agency	2.07 (11.03)***	1.07 (0.80)	1.16 (1.48)	1.56 (6.86)***	1.06 (0.79)	0.85 (-2.52)*
Regulatory	Agency	0.94 (-1.23)	0.97 (-0.60)	1.05 (0.61)	0.99 (-0.30)	1.28 (5.65)***	0.79 (-5.27)***
Constituent Services	Agency	0.99 (-0.01)	0.52 (-10.07)***	0.89 (-1.35)	0.73 (-6.16)***	0.37 (-19.77)***	0.54 (-12.01)***
Professional Staff Ratio	Agency	0.32 (-7.64)***	0.15 (-10.58)***	2.12 (3.39)***	0.11 (-14.48)***	0.09 (-18.06)***	1.57 (3.25)**
Age	Agency	0.99 (-8.66)***	0.99 (-1.69)	0.99 (-1.09)	0.99 (-9.07)***	1.00 (3.12)**	1.00 (1.47)
Size (ln)	Agency	1.09 (4.09)***	1.03 (1.33)	1.48 (11.65)***	1.07 (3.36)***	1.18 (9.09)***	1.22 (10.20)***
Budget ($ mns)	Agency	1.00 (4.31)***	1.00 (3.36)***	1.00 (1.45)	1.00 (2.71)**	0.99 (-2.50)**	1.00 (5.43)***
Pct. Agency Budget	Importance	0.99 (-1.85)	0.99 (-1.09)	0.99 (-0.63)	0.99 (-2.21)*	1.00 (-3.82)***	1.01 (2.55)*
Pct. Company Revenue	Importance	0.98 (-5.66)***	0.99 (-2.83)**	1.00 (0.86)	0.97 (10.65)***	0.99 (-0.73)	1.01 (6.43)***
Bids Received	Market	0.99 (-4.20)***	0.99 (-1.86)	0.99 (-0.39)	0.99 (-4.18)***	1.00 (6.64)***	1.00 (6.76)***
Fourth Quarter	Market	1.22 (6.20)***	1.04 (0.99)	1.11 (2.34)*	1.37 (10.13)***	1.12 (3.67)***	1.07 (2.18)*

Variable	**Type**	**Model 3:** Minority-Owned	**Model 4:** Woman-Owned	**Model 5:** Veteran-Owned	**Model 6:** Small Business	**Model 6a:** CO Sm. Business	**Model 7:** FedBizOpps.gov
		OR (z)	*OR (z)*	*OR (z)*	*OR (z)*	*OR (z)*	*OR (z)*
Recession	Market	1.26 (6.14)***	0.97 (-0.68)	1.20 (3.47)***	1.23 (5.54)***	1.17 (4.23)***	0.48 (-18.87)***
Emergency	Market	0.66 (-1.77)	0.77 (-0.93)	0.48 (-2.09)*	0.58 (-2.53)*	0.70 (-1.75)	0.52 (-3.26)**
Constant		0.27 (-5.66)***	0.30 (-4.51)***	0.00 (-16.66)***	0.56 (-2.53)*	1.56 (2.08)*	0.08 (-11.14)***
		Ps. R^2 = 0.07	*Ps. R^2 = 0.02*	*Ps. R^2 = 0.04*	*Ps. R^2 = 0.11*	*Ps. R^2 = 0.12*	*Ps. R^2 = 0.08*
n = 24,396 * = p < 0.05, **=p<0.01, ***=p<0.001							

Table 5.5: Effect of Discretion on Contractor Performance
Reference Category: Normal Closeout

Variable	Low Closeout	High Closeout	Termination for Convenience	Termination for Default	Termination for Cause
	RR *(z)*	RR *(z)*	RR *(z)*	RR *(z)*	RR *(z)*
SAP Contracts	1.23 *(2.87)***	0.83 *(-4.04)****	0.78 *(-3.71)****	0.69 *(-2.65)***	0.71 *(2.27)**
Experience	0.85 *(2.54)**	1.07 *(1.90)*	0.76 *(-5.45)****	0.82 *(-2.56)***	0.50 *(-2.54)**
Service	2.27 *(6.33 *****	0.97 *(-0.43)*	0.99 *(0.05)*	0.45 *(-4.68)****	0.88 *(-0.25)*
Professional Services	1.29 *(2.89)***	0.64 *(-7.45)****	0.86 *(-1.98)**	0.59 *(-2.93)***	0.88 *(-0.28)*
Information Technology	0.44 *(-4.46)****	0.66 *(-4.57)****	0.35 *(-6.18)****	0.12 *(-2.96)***	1.02 *(0.02)*
Training	0.88 *(-0.48)*	0.86 *(-0.92)*	0.94 *(-0.26)*	0.00 *(-82.80)****	0.00 *(-22.58)****
Research	0.49 *(-5.19)****	1.09 *(1.35)*	0.50 *(5.63)****	0.36 *(-3.25)***	0.30 *(-1.26)*
Construction	0.63 *(-4.36)****	1.24 *(4.07)****	0.67 *(-4.66)****	0.94 *(0.33)*	0.25 *(-2.08)**
Number of Bids	1.00 *(1.32)*	1.00 *(4.16)****	0.99 *(-1.21)*	0.99 *(-1.36)*	0.99 *(-0.46)*
One Bid Only	1.49 *(5.24)****	0.91 *(-2.21)**	0.67 *(-6.82)****	0.50 *(-4.96)****	0.29 *(-2.78)***
More than 5 Bids	1.32 *(2.62)***	0.97 *(-0.70)*	1.29 *(3.76)****	1.81 *(4.15)****	3.05 (*3.42)****
Fourth Quarter	0.88 *(-2.13)**	0.95 *(-1.58)*	0.98 *(-0.33)*	1.02 *(0.22)*	1.34 *(0.98)*
NPO	0.80 *(-1.61)*	0.86 *(-2.01)**	0.78 *(-1.99)**	0.12 *(-2.12)**	0.00 *(-49.55)****
Small Business	0.54 *(-5.74)****	0.79 *(-4.66)****	0.98 *(0.22)*	0.50 *(-3.80)****	0.84 *(-0.31)*
Woman-Owned	1.12 *(1.30)*	1.04 *(0.85)*	0.89 *(-1.47)*	1.12 *(0.64)*	0.74 *(-0.53)*
Minority-Owned	1.07 *(0.65)*	1.14 *(2.75)***	1.13 *(1.52)*	2.03 *(3.90)****	3.87 *(2.73)***
Veteran-Owned	0.99 *(-0.09)*	1.12 *(2.00)**	1.66 *(6.70)****	3.85 *(11.07)****	4.26 *(4.28)****
Length (months)	1.00 *(3.33)****	0.99 *(-6.55)****	0.99 *(0.85)*	1.00 *(1.52)*	0.99 *(-0.01)*
10 or More Modifications	1.64 *(2.59)***	0.57 *(-6.57)****	0.57 *(-3.01)***	0.52 *(-2.39)****	0.50 *(-0.58)*
Additional Work (outside scope)	0.67 *(-2.97)***	1.83 *(3.20)***	0.83 *(-2.66)***	0.63 *(-2.55)****	1.08 *(0.31)*
Supplemental Agreement	0.69 *(-8.11)****	1.53 *(3.82)****	0.89 *(-2.27)**	0.97 *(-1.04)*	0.70 *(-0.97)*
Change Orders	0.80 *(-3.62)****	1.00 *(-0.10)*	1.24 *(2.64)***	1.22 *(2.65)****	0.89 *(-0.55)*
Positive Funding Actions	0.48 *(-8.35)****	1.02 *(2.30)**	0.98 *(-1.07)*	0.99 *(-0.11)*	0.98 *(-0.37)*
Negative Funding Actions	1.36 *(3.96)****	0.63 *(-4.73)****	1.24 *(4.73)****	1.15 *(1.35)*	1.03 *(0.08)*

Variable	Low Closeout	High Closeout	Termination for Convenience	Termination for Default	Termination for Cause
	RR *(z)*	RR *(z)*	RR *(z)*	RR *(z)*	RR *(z)*
Positive Options	0.59 *(-9.30)****	1.10 *(4.74)****	0.96 *(-1.03)*	0.75 *(-1.96)**	0.85 *(-0.89)*
Negative Options	1.23 *(0.52)*	0.97 *(0.11)*	1.68 *(-0.96)*	0.00 *(-58.82)****	0.00 *(-18.41)****
Positive Other Action	0.47 *(-4.70)****	1.31 *(8.79)****	1.02 *(0.50)*	1.22 *(2.95)***	1.27 *(1.45)*
Negative Other Action	1.42 *(3.22)***	0.14 *(-11.87)****	1.92 *(-0.63)*	1.83 *(-0.81)*	1.46 *(-0.77)*
Performance-Based	1.23 *(2.87)***	1.16 *(3.31)****	1.03 *(0.50)*	0.69 *(-2.03)**	1.19 *(0.43)*
FedBizOpps	0.66 *(-5.42)****	1.03 *(0.83)*	1.25 *(3.89)****	0.98 *(-0.17)*	1.59 *(1.27)*
Cabinet Department	0.97 *(-0.24)*	0.99 *(-0.15)*	0.62 *(-4.79)****	0.25 *(-6.03)****	1.95 *(0.97)*
Distributive	0.52 *(-8.37)****	0.91 *(-2.05)**	1.13 *(1.92)*	3.07 *(5.94)****	1.01 *(-0.03)*
Redistributive	2.31 *(7.07)****	1.84 *(7.87)****	2.79 *(9.90)****	0.39 *(-2.97)***	0.00 *(-36.14)****
Constituent Services	1.04 *(0.32)*	2.10 *(12.42)****	9.69 *(26.04)****	2.25 *(4.81)****	8.45 *(5.16)****
Regulatory	1.12 *(1.25)*	0.59 *(-10.13)****	0.75 *(-3.71)****	0.69 *(-1.73)*	0.61 *(-1.19)*
Professional Staff Ratio	1.38 *(1.17)*	5.94 *(11.36)****	12.34 *(9.77)****	0.23 *(-2.38)**	17.26 *(4.23)****
Department/Agency Age	0.99 *(-3.16)***	0.99 *(-25.42)****	1.00 *(4.50)****	1.00 *(4.05)****	0.99 *(-0.20)*
Department/Agency Size (ln)	1.07 *(1.75)*	1.26 *(10.49)****	1.05 *(1.42)*	0.82 *(-3.16)***	1.05 *(0.26)*
Agency budget ($ mns)	0.99 *(-1.76)*	0.99 *(-5.34)****	1.00 *(1.52)*	1.00 *(0.62)*	1.00 *(0.51)*
Percent Agency Budget (1000)	1.00 *(1.36)*	1.00 *(0.55)*	0.99 *(-0.33)*	1.00 *(0.52)*	0.99 *(-1.23)*
House Leadership Match	0.79 *(-3.40)****	1.45 *(8.80)****	0.65 *(-6.85)****	1.08 *(0.51)*	0.31 *(-3.26)***
Senate Leadership Match	1.47 *(4.41)****	0.66 *(-8.57)****	1.23 *(2.78)***	2.54 *(4.14)****	15.32 *(3.48)****
Recession	0.84 *(-2.34)**	0.70 *(-8.40)****	1.06 *(1.03)*	1.34 *(2.41)**	1.05 *(0.08)*
Emergency Contract	0.81 *(-0.61)*	0.68 *(-1.79)*	0.40 *(-1.96)**	0.00 *(-96.81)****	0.00 *(-31.08)****
Percent Company Revenue	1.01 *(3.32)****	0.99 *(-5.04)****	1.03 *(9.38)****	1.01 *(1.89)*	1.04 *(3.04)***
Constant	0.08 *(-5.46)****	0.21 *(-5.96)****	0.07 *(-6.45)****	0.49 *(-1.10)*	0.00 *(-4.08)****
n = 24,396	* = p < 0.05, **=p<0.01, ***=p<0.001		pseudo r^2 = 0.16		log pseudo likelihood = -24531.14

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