

**THE INFLUENCE OF TRANSACTION COSTS AND POWER
ON CONTRACT DESIGN DECISIONS**

by

Young Woon Kim

John Glenn School of Public Affairs
The Ohio State University
Columbus, OH 43210

Paper prepared for the 10th Public Management Research Association Conference,
Columbus, Ohio, October 1-3, 2009

This is a draft and should not be cited without author's permission.

THE INFLUENCE OF TRANSACTION COSTS AND POWER ON CONTRACT DESIGN DECISIONS

ABSTRACT

Once the decision to contract for services has been made, a compelling decision confronting governments is choosing contract designs. Governments can provide vendors with long-term contracts or short-term contracts for recurrent services. They can provide vendors with fixed-price contracts or cost-reimbursement contracts. In this paper, I apply a transaction cost framework complemented with resource dependence theory to examine governments' contract design decisions. The analyses of contract actions during FY 2007 - 2008 drawn from the Federal Procurement Data System shows both how governments design contracts to balance the transaction costs against benefits inherent in different types of contract designs and how their contract design decisions are influenced by vendors when contracting for certain types of services that give rise to their dependence on vendors.

Federal contract managers are charged with the responsibility to ensure that contracts deliver high quality products, on-time and within budget (GAO-07-1098T). One of the ways that federal contract managers can influence contract performance is through contract design – the type of contract used to govern the relationship between the government and vendor. For the successful contract performance, contract managers must not only select the design that motivates the contractors to provide services at appropriate cost and quality but also allow themselves to effectively manage the contracts. Owing to a variety of service types that create numerous contracting circumstances, however, it is not a simple task for contract managers to identify such an “ideal” list of contract design. Even if they manage to find out the ideal list, the contract design they actually choose may be different from the ideal one on the list. Given the array of contract design possibilities available to governments, why governments elect to use one type of contract design in one instance and a different design in another? This study uses a transaction costs framework to argue that governments select contract designs in part to minimize transaction cost risks associated with delivering services through contract. These risks mainly derive from the types of service being contracted. This study also uses a resource dependence perspective to significantly complement the transaction costs framework that have difficulties to effectively explain the possible impact of vendors with superior bargaining power on governments’ contract design decisions. In applying these perspectives, this study further takes into account the institutional context, namely the rules and regulations that govern contract design decisions; at the federal level, the Federal Acquisition Regulation (FAR hereafter) governs most contract decisions.

In this paper, I examine (i) how public managers select cost-reimbursement type contract rather than fixed-price type contract (i.e., compensation mechanism decision), and (ii) how public managers choose long-term contract rather than short-term contract in governments (i.e., contract duration decision). Most contracting studies have explored so-called “make-or-buy” choice (i.e., feasibility assessment of contracting), drawing mainly upon a rational approach using transaction costs economics or agency theory. The conceptual approach of this study is an advance over prior research both because it goes beyond the popular efficiency approach and because it expands the theoretical focus to the next contract management decisions followed by the “make-or-buy” choice. Further, most of studies have tended to analyze contract management decisions for only a limited set of services (e.g., refuse collection) and at state and local level. This study analyzes how federal agencies design contracts, across a wide range of services, by using the largest dataset of contract actions at the federal level – the Federal Procurement Data System (FPDS-NG). It investigates the effects of transaction costs risk factors and resource dependence factors on contract design decisions through analyses of data from the FPDS-NG for an agency with a high degree of discretion (the Department of Defense, DoD hereafter) and for an agency with a low degree of discretion (the Department of Veteran Affairs, DVA hereafter).

The analyses reveal that my theory has much more applicability for DoD that enjoys greater degrees of discretion in contract design decisions. DVA that strictly follow federal rules and regulations has low degrees of discretion in contract designing, so that the effects of both transaction costs risk factors and power factors on their contract design decisions are less significant and consistent in the agency. By contrast, the analyses of contract design decisions in DoD support most theoretical arguments of this study. First, the results show that when DoD contracts for asset-specific services, those that tend to monopolize service markets, the agency chooses the contract designs that lower the risk of opportunistic behavior in the future contract design negotiation – by selecting a long-term and fixed-price contract. Similarly, when services are difficult to specify and monitor, DoD chooses contract designs that not only lower the production cost risks it has to carry but also reduce the management costs – by selecting a short-term and fixed-price contract.

Beside such transaction costs risk factors, the analyses demonstrate the impact of resource dependence factors on DoD's contract design decisions in certain industries where the governments and vendors are mutually dependent on each other. The analyses present that when the percentage of governments' purchase in an industry is high, DoD chooses the contract designs they usually do not prefer, a long-term and cost-reimbursement contract. Supporting an argument of resource dependence theory in this study, analyses also reveal that DoD chooses such undesirable contract designs when it contracts with private firms that are more prone to opportunism but willing to more aggressively influence governments, unlike the expectation of transaction costs economics. The theoretical and empirical inquiry of this study indicates some complementarity between transaction costs economics and resource dependence theory and further suggests that future research might benefit from joining these approaches rather than treating them as competitors.

I have divided this paper into five sections. In the first section I lay out the theoretical argument linking transaction costs to contract design decisions in governments and derive a series of hypotheses based on a framework synthesizing two theoretical perspectives. In the second section, I explore bargaining power explanations for contract design decisions in governments. In the third section, I discuss how institutional contexts can influence public agencies differently to make contract design decisions. In the fourth section, I specify the research methods of this study and describe the dependent and independent variables. In the fifth section I report and discuss the results of analyses. Finally, I conclude by identifying possible avenues for future research.

CONTRACT DESIGN DECISIONS AND TRANSACTION COSTS

The initial contract management decision confronting contracting governments is choosing whether to produce services internally or externally (i.e., "make-or-buy" choice). Regarding the make-or-buy choice, transaction costs economics (TCE hereafter) suggests that the choice reflects the relative levels of production costs and transaction costs under the two alternative production mechanisms (Williamson, 1981: 552-553). Then it argues that since two service-specific characteristics – asset specificity and difficulty of measurement – mainly determine the relative levels of transaction costs under alternatives, the mechanism choice is driven by these two transaction costs risk factors inherent in a service type (Williamson, 1981). Asset specificity which refers to whether specialized investment is required to produce a service raises an entry barrier for later vendor by creating an advantage to the first winning vendor in the future bargaining (Brown & Potoski, 2003: 444). Difficulty of measurement which refers to how difficult it is for the contracting organization to measure outcomes, to monitor vendor activities, or both of these, exposes contracting organizations to unseen vendors' opportunistic behaviors (Brown & Potoski, 2003: 444-445). By the nature of these two service-specific characteristics, efficiency-seeking organizations produce asset-specific services and hard-to-measure services internally; they buy lowly asset-specific services and easy-to-measure services through contract. According to TCE logic, governments contract mainly for highly asset-specific services or hard-to-measure services because such services impose greater transaction costs on them.

Owing to a range of important factors other than these transaction costs risk factors, including political forces, fiscal pressures, bureaucratic routines, and growth demands (Ferris, 1986; Carver, 1989; Hirsch, 1991; Benton and Menzel, 1992), governments do often contract even for highly asset-specific services and hard-to-measure services. Given this reality, are they just doomed to suffer escalated transaction costs? What would TCE suggest for how governments design contracts once the decision to contract has been made?

TCE suggests that when governments fail to choose to “make” for highly risky services, they safeguard the contracts and reduce transaction costs as much as possible. First, governments are more likely to select long-term contract rather than short-term contract when they contract for asset-specific services. For repetitive transactions, high levels of asset specificity increase “mutual dependency” between governments and vendors because both parties can enjoy benefits from keeping the exchange relationship in the next rounds of contract once the specialized investments have been made in the initial round of contract. In fact, however, high levels of asset specificity tend to advantage the vendor more than the contracting government because asset specific investment is likely to decrease the number of potential service providers more than the number of potential service buyers in the marketplace, constraining the negotiation power of the government more in the future. Therefore, when governments recognize they must continuously rely on a particular service vendor in future rounds of contract (i.e., when they contract for asset-specific services), they are more likely to choose long-term contract in order to securely obtain the specialized services and, at the same time, avoid the transaction costs to be caused by frequently negotiating with the powerful vendor (H1). Further, governments’ dependence on the first-winning vendor is exacerbated when there are scarce alternative resource providers in current marketplace. This suggests that the likelihood of governments choosing long-term contract will be higher because highly asset-specific services tend to have few providers in current marketplace and thus governments recognize they will be hardly able to turn elsewhere in the future (i.e., asset specificity and scarce providers tend to come together) (Brown & Potoski, 2005: 329).

H1: As with high levels of asset specificity, long-term contract is more likely.

On the other hand, in compensation mechanism decision, asset specificity forces governments to select a fixed-price contract rather than a cost-a reimbursement contract (H2). Given the expected long-term relationship with a particular vendor, it is highly risky for governments to provide vendors cost-reimbursement contracts because governments have to carry all the cost risks for long period time under the compensation mechanism. Cost-reimbursement contracts do not provide any incentive to the vendor to reduce costs, so that the production costs are more likely to continuously increase in the subsequent rounds of contracting. When vendors recognize that they will recurrently deliver a service and having a higher base value of the service contract (i.e., final production cost in current contract) will provide them more benefits in the following rounds of the contract, the production cost of recurrent contracts is more likely to continuously increase under the cost-reimbursement contract. Knowing this, governments are less likely to choose cost-reimbursement contracts. Further, it would not be difficult for government to persuade vendors discard a prize (e.g., cost reimburse contract) when they provide them another prize (e.g., long-term contract) in contract design negotiation. Yet it would be difficult for vendors to strongly insist a cost-reimbursement contract in contract design negotiation because they also expect their long-run dependence on governments and recognize the importance of the government contracts in the asset-specific relationship.

H2: As with high levels of asset specificity, a fixed-price contract is more likely.

Second, governments are more likely to select fixed-price contracts rather than cost-reimbursement contracts when they contract for hard-to-measure services. Basically, high levels of difficulty of measurement (DM hereafter) decrease the visibility of vendor outcomes and activities to the governments, increasing the contract management costs. High levels of DM (i.e., hard-to-measure services) open up significant scope for negotiation but, by the nature of

information asymmetry inherent in the contractual relationship, advantage the vendors more in contract design negotiations. Under the condition, because governments have to rely on vendors in obtaining information for contract specification and monitoring, they are exposed to the risk of unseen vendor nonperformance and negligence (Praeger, 1994; Brown & Potoski, 2003: 444-445). Given high levels of uncertainty about vendor performance, governments are less likely to choose long-term contract because they must risk vendor opportunism for longer period of time by doing so. In addition, they are even more likely to choose short-term contracts for hard-to-measure services because they recognize that experience of the same or similar service contracts provide a basis for firmer pricing in the future (H3).

H3: As with hard-to-measure services, short-term contract is more likely.

In the similar vein, as with hard-to-measure services, governments are less likely to select cost-reimbursement contracts because they have to carry all cost risks under the type of contract. They are more likely to choose a fixed-price contract, recognizing that they must pay great amount of monitoring costs not to waste resources if they choose cost-reimbursement contract. Unlike in the contract duration decision, however, there is also an incentive for contract managers to choose cost-reimbursement contract for hard-to-measure services. If they are to use a fixed-price contract for hard-to-measure services, which requires the clear specification of contract by FAR regulation, they have to either rely on the vendors' information or pay substantial amount of costs for contract specification. When services are difficult to measure, fixed-price contracts decrease monitoring costs but increase contract specification costs (H4₀); by contrast, cost-reimbursement contracts reduce the specification costs but increase monitoring costs (H4₁). Governments' compensation mechanism choice under this situation largely represents a tradeoff between reducing specification costs and reducing monitoring costs.

H4₀: As with high levels of difficulty of measurement, a fixed-price type contract is more likely in public agencies that give priority to reducing monitoring costs.

H4₁: As with high levels of difficulty of measurement, a cost-reimbursement type contract is more likely in public agencies that give priority to reducing specification costs.

CONTRACT DESIGN DECISIONS AND BARGAINING POWER

According to resource dependence theory (RDT hereafter), the power imbalance between exchange parties places the lower-power party in the risky position of being controlled by higher-power party (Pfeffer and Salancik, 2003). Two factors – resource scarcity and resource importance – negatively affect the relative bargaining power of an organization to influence the other organization in contractual relationships. Resource scarcity refers to the need for resources to a focal organization while resource importance refers to the availability of alternative resource providers in marketplace (Pfeffer and Salancik, 2003). Then RDT suggests that considering the power differences in exchange relations, organizations deploy a variety of strategies not only to use their power to create favorable dependence relationships but also to avoid or restructure unfavorable dependence relationships (Pfeffer and Salancik, 2003).

According to this logic, a contract for scarce and important resource represents a risky contract for governments. As potential service provider scarcity in marketplace increases, so does the government's dependence on the service vendors. Similarly, as the importance of a service for governments increases, so does the governments' dependence on service vendors. Thus, it would be better strategy for governments to contract mainly for the resources that are neither important nor scarce in order to avoid the probable influence of vendors; governments

place themselves in better bargaining position in the contractual relationship by doing so. As RDT basically assumes, however, one of main reasons why governments exchange with external service providers is because they do not possess all the resources needed to achieve their goals. Governments must often contract for scarce services and functionally important services even when their financial resources are not scarce and important for vendors, thus risking vendors' influence on them. Once the decisions to contract for such risky services have been made, governments may be destined to be influenced by vendors that have stronger bargaining power in contractual relationship. Nevertheless, even when governments contract for such services, it is unlikely for vendors to influence governments' contract design decisions if vendors are more highly dependent on governments. Since not only governments' dependence on vendors but also vendors' dependence on governments affects the relative bargaining power of contracting governments, if vendors are heavily dependent on the government in obtaining financial resources, vendors are less likely to have a strong bargaining position. According to this RDT logic, in general, when the government contracts for scarce or important services, the contract designs the vendor prefer – long-term contracts and cost-reimbursement contracts – are more likely to be chosen (H5₀). As the importance of a contract to a vendor increases, long-term and cost-reimbursement type contract is less likely even under the situation where the government heavily rely on the vendor (H5₀).

H5₀: A long-term and cost-reimbursement contract is more likely when a government contracts for scarce or important services, while it is less likely when a contract is financially important for a vendor.

H5₁: The effect of both service scarcity and functional service importance to a government on contract design decisions is mixed (i.e., counter-argument of H5₀)

Important to mention here is that the government as a gigantic financial resource provider typically enjoys stronger bargaining power than the vendor. The government is a substantial resource provider to vendors but not vice versa in a number of industries; the government's dependence on the vendor is much weaker than the vendor's dependence on the government (Pfeffer and Salancik, 2003: xiii). As long as there are multiple, potential providers, the different levels of service provider scarcity may not influence governments' contract design decisions because there are multiple providers in most service markets; they can still turn elsewhere. Thus, the impact of service provider scarcity on contract design decisions may be minimal in most of contractual relationships. Further, the importance of financial resource governments provide for vendors is usually greater than the importance of resource vendors provide for governments; vendors may perish without government resources whereas governments never perish without vendor resources. This implies that the government is rarely dependent on a single vendor. As long as there is a minimal competition in the service market, the impact of functional service importance for the government on contract design decisions would be negligible in times. Consequently, the effect of both service scarcity and functional service importance to the government on contract design decisions may be mixed (H5₁). However, governments sometimes become dependent on a service industry as a whole, so that it can be harder for them to turn elsewhere. As the percentage of governments' purchase in a service industry significantly increases, for example, governments become dependent on the industry itself rather than on a particular vendor, so that the power balance in the contractual relationship does not advantage governments any more. As the government's dependence on a service industry increase, the bargaining power of vendors in the industry substantially increases (Kettl, 1993). Moreover, because vendors also rely largely on the government funding in such industries, vendors are more likely to attempt to aggressively influence governments in order to obtain what

they desire, by using a variety of tactics such as lobbying and partnership building. Consequently, under such a mutual dependence situation, a long-term and cost-reimbursement contract is more likely (H6).

H6: When governments are dependent on a service industry, a long-term and cost-reimbursement contract is more likely.

Meanwhile, contracting literature indicates the probable influence of goal incongruence on contract design decisions. Private organizations are more prone to opportunism than mission-driven organizations (Brown and Potoski, 2003; Light, 2000; Rainey 1991; Wise, 1990). TCE suggest that governments are less willing to provide private vendors with a cost-reimbursement contract because private vendors may deliver lower-quality services to reduce their costs and increase profits. Similarly, governments are more likely to prefer short-term rather than long-term when contracting with private firms, unless they contracts for asset-specific services (H7₀). However, RDT suggest different expectation of contract design decisions under the condition of goal incongruence. Unlike nonprofit vendors and other governments, private vendors are more likely to aggressively influence governments in order to obtain better contract designs for them, particularly when they enjoy strong bargaining power. Thus, governments are more likely to provide cost-reimbursement contracts and long-term contracts when contracting with private firms. Nevertheless, the impact of goal incongruence would be greater on compensation decisions rather than on duration decisions because profit and nonprofit vendors all concern the contract duration to securely obtain financial resource while profit vendors concern the compensation type more than nonprofit vendors do (H7₁).

H7₀: Cost-reimbursement and long-term type contract is less likely when governments exchange with private firms (TCE hypothesis).

H7₁: Cost-reimbursement and long-term type contract is more likely when governments exchange with private firms (RDT hypothesis).

CONTRACT DESIGN DECISIONS AND INSTITUTIONAL CONTEXTS

At the federal level, FAR as an overarching institutional rule governs most contract decisions. First, regarding the compensation type decision, FAR specifies that cost-reimbursement type contracts should be not considered when (i) there is adequate price competition, (ii) there are reasonable price comparisons with prior purchases of the same or similar services, (iii) available cost or pricing information permits realistic estimates of the probable costs of performance, (iv) the contractor's accounting system is inadequate for determining costs applicable to the contract, and (v) appropriate government surveillance during performance does not provide reasonable assurance that efficient methods and effective cost controls are used (FAR 16.202-2; FAR 16.301-3). Next, FAR notes that a long-term contract is considered to satisfy one or more of the following conditions: (i) lower costs, (ii) enhancement of standardization, (iii) reduction of administrative burden, (iv) substantial continuity of production or performance, avoiding transaction costs, (v) stabilization of contractor work forces, (vi) avoidance of the need for establishing quality contract techniques and procedures each year, (vii) broadening the competitive base, and (viii) providing incentives to contractors to improve productivity through asset investment (FAR 17.105-2).

Federal agencies enjoy different levels of managerial discretion, despite these requirements for the use of cost-reimbursement contracts and long-term contracts. It appears that FAR also recognizes, at least implicitly, the difference in the discretion over contract design

decisions across federal agencies. For instance, FAR provides special conditions and procedures for the use of a multi-year contract for Department of Defense (DoD), NASA, and the Coast Guard (FAR 17.105-2; 17.106-3), perhaps, in order to prevent these agencies from more broadly interpreting the general clauses to discretionally use a multi-year contract. I expect that my hypotheses will have more applicability for those agencies that enjoy greater degrees of discretion. In my analyses, I expect that contract design decisions in DoD align with my hypotheses, while the decisions in DVA essentially follow the FAR requirements (H8).

H8: Contract design decisions in the Department of Defense will align with the transaction costs and bargaining power hypotheses, while contract design decisions in Department of Veterans Affairs will follow the FAR requirements.

DATA AND METHOD

In this section I discuss the variables and methods I use to test the transaction costs and bargaining power hypotheses about governments' contract design decisions. The data are primarily drawn from the Federal Procurement Data System (FPDS-NG hereafter). I randomly select contracts for twenty different types of recurrent services (i.e., twenty service industries by North American Industry Classification System) from the FPDS-NG for an agency with a high degree of discretion (i.e., the Department of Defense) and for an agency with a low degree of discretion (i.e., the Department of Veteran Affairs). Data to compare are two contract design decisions including (i) length of contract, and (ii) compensation mechanism. Since multiple contract actions – for initial agreement, modification, and termination – often exist for a single contract using a same identification number, the data used is based on the initial agreement between the government and vendor. The additional data, Benchmark Input-Output tables from Bureau of Economic Analysis (BEA), are used to measure the mutual dependence between the government and vendor. The primary weakness of the data and the analytic approach of this paper is the absence of direct measures of both two transaction costs risk factors (i.e., asset specificity and difficulty of measurement) and one bargaining power factor (i.e., functional importance of service for government). This forces me to rely on own subjective measures that are based on prior empirical studies and the nature of those factors. Since direct measures of those variables would require careful approaches idiosyncratically tailored to specific federal agencies and circumstances, measuring such variables are very difficult, particularly in large sample studies across multiple services as I conduct here (Brown and Potoski, 2003: 449).

I use binomial logit to examine the effect of a range of independent variables on the likelihood of governments choosing a category relative to the other category in each of two dependence variables separately. The dependent variables are (i) governments' contract duration decision, and (ii) governments' compensation type decision. The correlation between them is lower than 0.1, allowing me to use binomial logit instead of using multinomial logit. The independent variables are transaction costs risk factors, bargaining power factors, and other measures. All estimation was done in SPSS v. 17.0. Table 2 provides the correlation analysis of all variables.

Dependent Variables

Contract managers in federal agencies are asked to report to FPDS-NG on all contract actions using appropriated funds. The analyses of this study focus on two types of contract design decisions in service contracting – contract duration (i.e., short-term vs. long-term contract) and compensation (i.e., fixed-price vs. cost-reimbursement contract). The dependent variables are the contract designs chosen by a public agency for each contract. *Contract duration* is a dummy

variable scored 1 if the contract duration for a contract is equal to or longer than 13 months, else 0.¹ *Compensation* is a dummy variable scored 1 if the compensation type chosen for a contract is cost-reimbursement type contract, else 0 (i.e., for fixed-price type contract).

[Table 1] Measures for asset specificity, difficulty of measurement, and service importance

Service	Asset Specificity	Difficulty of Measurement	Service Importance
Data processing, hosting, and related services	High*	Low*	Low
Engineering services	High*	High*	High
Testing laboratories	Low	Low	Low
Custom computer programming services	High	High	High
Computer systems design services	High	High	High
Computer facilities mgmt services	High	High	High
Administrative management and general management consulting services	Low	High	Low
Human resource consulting services	Low	High	Low
Process, physical distribution, and logistics consulting services	Low	High	High
Environmental consulting services	High	High	High
R&D in the physical, engineering and life sciences	High	High	High
Office administrative services	Low	Low	Low
Facilities (operation) support services	Low*	Low*	High
Document preparation services	Low*	Low*	Low
Security guards and patrol services	High*	High*	Low
Janitorial services	Low*	Low*	Low
Landscaping services	Low*	Low*	Low
Solid waste collection	High*	Low*	Low
Professional and mgmt development training	Low*	High	High
Educational support services	Low*	Low	Low

Note: *measured on the basis of the ratings by Brown and Potoski (2005)

Independent Variables

The first variables of this study measure two service-specific characteristics that give rise to transaction costs. To measure them, I simply rate each of twenty different services dichotomously, based on both prior empirical results and theoretical criteria to assess it. Basically, I draw upon a study by Brown and Postoki (2005) reporting the average survey ratings

¹ In this study, the contract duration is determined by information about effective date and estimated ultimate completion date on an initial agreement between the government and vendor. In case of estimated ultimate completion date different from completion date on the initial agreement, the former as a part of initial agreement better represents the actual contract duration as an initial decision because the contract with a particular vendor is doomed to be extended to the ultimate completion date as long as the contracting agency is satisfied with the vendor for the first part of contract duration. It is usual for governments to specify not only the optional period but also optional contract value on the initial agreement when they have different ultimate duration from initial duration on initial contact. Further, when governments extend the initial duration to ultimate duration, they always add a modification of the initial agreement under the same contract identification number rather than setting a new contract. As a matter of fact, all contracts with different ultimate duration from initial duration are extended to the ultimate completion date through modifications in my sample, except contracts completed before the ultimate date.

of asset specificity and difficulty of measurement for each of sixty-four services at local level. According to the ratings, ten of twenty services are identified as either highly asset-specific or lowly asset-specific service and as either hard-to-measure or easy-to-measure service. For the other ten different types of services that are not rated in their study, I use three criteria by Erramilli and Rao (1993) to determine whether a service is asset-specific: (i) professional skills, (ii) specialized know-how, and (iii) customization. I also use two criteria by Brown and Potoski (2005) to determine whether a service type is hard to measure or easy-to-measure: (i) identifiable outcome metrics, and (ii) identifiable activities. Asset specificity is a dummy variable scored 1 if the type of service contracted is asset specific, else 0. Difficulty of measurement is a dummy variable scored 1 if the type of service contracted is difficult to measure, else 0. (see Table 1 for the subjective measure of asset specificity and difficulty of measurement).

The next variables measure four bargaining power factors – functional service importance for governments, service provider scarcity for government, financial resource importance for vendor, and mutual dependence – that influence the power balance between governments and vendors. To measure functional service importance to governments, I use a subjective measure to consider whether each type of service is about core or peripheral government function. A core function in government is considered as the one directly related to transforming inputs into outputs while peripheral function as the one to support core functions (see Table 1 for the subjective measure of functional service importance). *Functional Service importance* is a dummy variable scored 1 if the type of service contracted is a functionally core service for governments, else 0. Additionally, for each contract, I measure *service provider non-scarcity* as the actual number of offers that governments received from potential vendors in the solicitation procedure. As a dependence factor on the vendor side, I also measure the *financial resource importance for vendors* as the ratio of contract value to the annual revenue of the vendor awarded. I use the ratio of the amount of government purchases to total amount of outputs in a service industry in order to measure the *mutual dependence* between the government and vendor.

Finally, the analyses include several control variables. First, I included two measures to assess goal incongruence and interaction between goal incongruence and difficulty of measurement. *Goal incongruence* is a dummy variable scored 1 if the vendor awarded is private firm or individual, else 0. Meanwhile, the potential problem of goal incongruence diminishes when governments contract for easy-to-measure services because governments can completely specify contract and measure contract performance. So I included the interaction variable between goal incongruence and difficulty of measurement. I also included a dummy of whether competition procedure is used in the solicitation process. Governments are more likely to provide vendors with long-term and cost-reimbursement contracts under the circumstances where competition is not available, such as urgent contracts and contracts with a monopolistic or unique vendor. FAR also recommends that cost-reimbursement type contracts should be not considered when there is competition (FAR 16.202-2). *Competition procedure* is a dummy variable scored 1 if the competition procedure is used, else 0.

RESULTS

This section reports the results of the empirical analyses. Table 2 reports descriptive statistics and correlations for all variables. Table 3 reports the distribution of contract designs chosen by two federal agencies, DoD and DVA. Tables 4 and 5 report results of the binomial logit analyses of the determinants of contract design decisions. These tables compare the likelihood of governments selecting the base contract designs (listed in the table) relative to the alternative contract designs.

Before turning to the results that inform the hypotheses of this study, it is important to examine Table 3. Short-term and fixed-price contracts are primary contracts both agencies choose. Approximately ninety-two percent of all contracts in the FPDS sample are fixed-price contracts while seventy-six percent of them are short-term contracts. Short-term and fixed-price contracts remain paramount in both agencies. Interestingly, cost-reimbursement contract is not an available compensation option for contract managers in DVA while long-term contract is also less frequently used in DVA than in DoD. This basically shows that DVA very strictly follows the FAR regulations, suggesting lower levels of managerial discretion in the agency.

[Table 2] Descriptive statistics and correlations

- Descriptive statistics

Variable	Dept. of Defense				Dept. of Veterans Affairs			
	Mean	SD	Min	Max	Mean	SD	Min	Max
Dependent Variables								
Compensation	0.190	0.393	0	1	0	0	0	0
Duration	0.260	0.441	0	1	0.22	0.418	0	1
Independent Variables								
Asset specificity	0.450	0.498	0	1	0.44	0.497	0	1
Difficulty of measurement	0.550	0.498	0	1	0.52	0.500	0	1
Service provider scarcity for gov.	4.580	21.345	0	391	2.10	3.696	0	50
Functional service importance for gov.	0.440	0.498	0	1	0.42	0.494	0	1
Mutual dependence	0.081	0.106	0	0.349	0.087	0.110	0	.349
Financial resource importance for vendor	1.889	24.909	0	474.9	4.457	59.626	0	1310
Goal incongruence	0.960	0.198	0	1	0.90	0.304	0	1
Asset specificity *service provider scarcity	3.160	21.383	0	391	0.93	3.208	0	50
Difficulty of measurement *goal incongruence	0.710	0.453	0	1	0.66	0.474	0	1
Competition procedure	0.660	0.475	0	1	0.42	0.494	0	1

- Correlations

Variable	Dept. of Defense											
	CP	DR	AS	DM	PS	SI	MD	FI	GI	AS*PS	DM*GI	CT
Compensation (CP)	1											
Duration (DR)	.06	1										
Asset specificity (AS)	.31	-.01	1									
Difficulty of measurement (DM)	.28	.01	.42	1								
Provider scarcity (PS)	.00	.07	.10	.07	1							
Functional service importance (SI)	.28	.01	.41	.66	.07	1						
Mutual dependence (MD)	.38	.06	.40	.26	.06	.59	1					
Financial resource importance (FI)	-.03	-.01	-.05	-.06	.00	-.05	-.04	1				
Goal incongruence (GI)	-.08	.12	.10	.01	-.03	.07	.08	.02	1			
AS*PS	.02	.06	.16	.11	.99	.10	.07	-.01	-.03	1		
DM*GI	.15	-.03	.12	.61	.02	.52	.29	-.08	.32	.05	1	
Competition procedure (CT)	.13	.17	.14	-.03	.12	.10	.14	.03	.20	.10	-.05	1

Dept. of Veterans Affairs												
Variable	CP	DR	AS	DM	PS	SI	MD	FI	GI	AS *PS	DM *GI	CT
Compensation (CP)												
Duration (DR)		1										
Asset specificity (AS)		-.01	1									
Difficulty of measurement (DM)		-.11	.46	1								
Provider scarcity (PS)		.28	.00	.02	1							
Functional service importance (SI)		-.17	.41	.59	-.04	1						
Mutual dependence (MD)		-.05	.34	.20	-.08	.64	1					
Financial resource importance (FI)		.11	-.04	-.06	.05	-.06	-.04	1				
Goal incongruence (GI)		-.04	-.06	-.01	.10	-.05	-.20	.03	1			
AS*PS		.16	.33	.20	.78	.12	.05	-.01	.04	1		
DM*GI		-.08	.05	.52	.09	.40	.14	-.06	.47	.10	1	
Competition procedure (CT)		.21	-.10	-.05	.32	-.20	-.14	.09	.19	.14	.05	1

[Table 3] Distribution of contract designs

	DoD	DVA	Total
Duration			
- Short-term	272 (73.7%)	407 (77.5%)	679 (76.0%)
- Long-term (≥ 13 mos.)	97 (26.3%)	118 (22.5%)	215 (24.0%)
Compensation			
- Fixed-price	299 (81.0%)	525 (100%)	824 (92.2%)
- Cost-reimbursement	70 (19.0%)	0 (0.0%)	70 (7.8%)
N (Total Observations)	369	525	894

Overall, the results in Table 4 and Table 5 generally support my theory about how transaction costs risk factors (hypotheses 1-4) as well as bargaining power factors (hypotheses 5-7) influence governments' contract design decisions. Following is a discussion of each set of results.

Transaction Costs (Hypotheses 1 – 4)

The results show that transaction cost risks exert significant influences on governments' contract design decisions. Consistent with hypothesis 1, the results in table 3 indicate that contracting for asset-specific services increases the probability of DoD selecting long-term contracts, relative to selecting short-term contracts, although the impact of asset specificity on contract duration is statistically insignificant in DVA. This suggests the importance of the service characteristic, asset specificity, in contract duration decision, at least for public agencies with greater managerial discretion. Rather than relying on short-term contract, DoD appears to concern about future management costs risks, preferring long-term contract that reduces transaction costs resulting from frequent negotiations with the vendor being monopolized more and more over time. As discussed earlier, it would be ideal for governments not to contract for asset-specific

services, although they do often contract for the services in reality. The result suggest that once the decision to contract for asset-specific services has been made, public agencies with greater discretion attempt to avoid the administrative burden and production cost risks by selecting long-term contract. By contract, public agencies without discretion, which must strictly follow the FAR requirements for the use of long-term contracts, are more likely to suffer from the increased transaction costs resulting from the frequent negotiation with vendors in better bargaining position, selecting short-term contracts for asset-specific services.

Next, the results point out that for asset-specific services, the probability of DoD choosing a cost-reimbursement contract decreases, relative to choosing a fixed-price contract, supporting Hypothesis 2. This suggests that expecting long-term relationship with a particular vendor, DoD appears to be unwilling to carry the cost risks for long period time. Further, when DoD decides to provide vendors with long-term contracts (i.e., the contract type vendors also prefer) for the kind of services, it would be relatively easy for the agency to persuade vendors discard cost-reimbursement contract. In addition, the mutual dependence relationship created by asset specificity may prevent vendors to strongly request the additional prize to governments. Meanwhile, there is no room for negotiation about compensation type in DVA (see Table 5); it appears that it is almost impossible for contract managers to choose cost-reimbursement contracts in the agency.²

Table 4 also presents the difficulty of measurement results. Consistent with Hypothesis 3, the results reveal that when services are difficult to measure, DoD does not choose long-term contracts. As with hard-to-measure services, DoD recognizes it has to rely on vendors' information for contract specification and monitoring, thus choosing short-term contract to minimize the impact of the probable vendor opportunism. It appears that as with hard-to-services, DoD also attempts to take the cost risks as short as possible, waiting its measurement capacity for the services to be improved soon. By the way, the impact of difficulty of measurement on the duration is statistically insignificant in DVA again.

[Table 4] Binomial Logit Analysis of Determinants of Contract Design Decisions in DoD

Independent Variable	Fixed-Price versus	Short-Term versus
	Cost-Reimbursement	Long-Term
Asset specificity	-1.446*** (0.501)	0.654* (0.355)
Difficulty of measurement	-1.442** (0.618)	-0.896** (0.443)
Service provider non-scarcity for government	0.077 (0.075)	-0.006 (0.052)
Functional service importance for government	0.779 (0.486)	0.285 (0.403)
Mutual dependence	6.904*** (1.726)	2.783* (1.548)
Financial resource importance for vendor	-0.188 (0.214)	-0.003 (0.006)
Goal incongruence	2.979*** (0.952)	-20.858 (10000.644)
Asset specificity*service provider scarcity	-0.114 (0.078)	0.013 (0.052)
Difficulty of measurement*goal incongruence	-0.656 (0.778)	0.977** (0.438)
Competition procedure	-1.072*** (0.404)	-0.752** (0.303)
Constant	-1.125*** (0.379)	-1.383** (0.351)
Chi ²	90.439***	27.328***
Log Likelihood	267.230	396.566
N (observations)	369	369

Note: Standard errors in parentheses.

*P < .10; **<.05; ***p<.01; two-tailed tests.

Meanwhile, the difficulty of measurement results for compensation type decision support Hypothesis 4₀ rather than Hypothesis 4₁. The results indicate that when services are difficult to

² In FY 2008, only 166 of 1,271,368 contract actions (0.01%) are identified as cost-reimbursement type contracts in DVA.

measure, DoD decreases cost-reimbursement contracts. This suggests that as with hard-to-measure services, DoD is wary of increase in monitoring costs more than decrease in specification costs caused by choosing cost-reimbursement contract.

[Table 5] Binomial Logit Analysis of Determinants of Contract Design Decisions in DVA

Independent Variable	Short-Term versus
	Long-Term
Asset specificity	-0.607 (0.389)
Difficulty of measurement	0.252 (0.385)
Service provider non-scarcity for government	0.267*** (0.083)
Functional service importance for government	1.237** (0.522)
Mutual dependence	2.785 (1.921)
Financial resource importance for vendor	0.005 (0.006)
Goal incongruence	0.730 (0.459)
Asset specificity*service provider scarcity	-0.100 (.105)
Difficulty of measurement*goal incongruence	-0.270 (0.370)
Competition procedure	-0.454 (0.285)
Constant	-2.226 (0.553)
Chi ²	58.161***
Log Likelihood	393.408
N (observations)	525

Note: Standard errors in parentheses.

*P < .10; **<.05; ***p<.01; two-tailed tests.

Bargaining Power (Hypotheses 5 – 7)

The results in Table 4 indicate that the impact of three general bargaining power factors – service provider scarcity in marketplace, functional service importance for government, and financial resource importance for vendor – on contract designs are statistically insignificant in DoD, consistent with hypothesis 5₁. As I discussed previously, it appears that DoD typically enjoys superior bargaining power to the vendor, so that different levels of those power factors do not make any significant difference in power balance between DoD and vendor; they do not significantly increase DoD’s dependence on a particular vendor. However, interestingly, the results in Table 5 show that the contract decision decisions in DVA support partially the argument against 5₁, that is, hypothesis 5₀. As service provider non-scarcity increases (in other words, as the number of offers from potential vendors increases), the probability of DVA choosing long-term contracts increases. This result, which is even against H5₀, reflects that DVA strictly follow FAR regulation that a long-term contract should encourage full and open competition (FAR 17.105-1). Nevertheless, the fact that functional importance of service to government increase the probability of DVA choosing long-term contracts, suggests that the bargaining power of DVA decreases when the agency contracts for functionally important services to itself. It appears that the bargaining power of DVA is more vulnerable to functional importance of service than that of DoD.

Meanwhile, the results in Table 4 present that the mutual dependence between DoD and the vendor increases the likelihood of choosing long-term and cost-reimbursement type contract. Consistent with Hypothesis 6, it appears that as the percentage of government’s purchase in an industry significantly increases, the dependence of governments on vendors in the industry increases, the likelihood of vendors attempting to influence governments increases, and the governments’ vulnerability to vendors’ influence does as well.

Consistent with Hypothesis 7₁, the results also show that cost-reimbursement contract is more likely when contracting with private firms. According to TCE, governments should provide private vendors with a fixed-price contract to mitigate the risks of vendor opportunism.

However, unlike the expectation of TCE, they actually provide cost-reimbursement contract to private vendors more than to nonprofits and other governments. It appears that when governments exchange with private vendors, their vulnerability to vendors' influence increases more.

Institutional Context (Hypothesis 8)

The results in Table 4 and Table 5 indicate that DVA follows FAR regulations very strictly whereas DoD enjoys substantial amount of managerial discretion to deploy a variety of contract design strategies. Cost-reimbursement contract is not an available compensation option for contract managers in DVA while long-term contract is also less frequently used in DVA than in DoD. It appears that DVA strictly follows the FAR requirements for the use of cost-reimbursement contracts, so that it is almost impossible for contract managers to choose cost-reimbursement contracts in the agency. The results in Table 5 show that DVA choose long-term contracts when pricing competition is high enough. This also reflects that DVA strictly follow the FAR regulation that a long-term contract should encourage full and open competition (FAR 17.105-1). As a result, transaction cost risks do hardly influence the contract design decisions in DVA. This suggests that contract managers in DVA do not possess the managerial discretion enough to balance transaction costs against benefits when choosing contract designs, placing themselves in the position of not only suffering from heightened transaction costs but also risking poor contract performance. By contrast, the results in Table 4 present that public managers in DoD exert their discretion enough to balance costs against benefits when choosing contract designs. As with high levels of asset specificity, they choose long-term contracts to save negotiation costs while choosing fixed-price contracts to reduce the greater risks of vendor opportunism, expecting the long-lasting exchange with a particular vendor. When they contract for hard-to-measure services, they choose short-term and fixed-price contracts to mitigate the greater risks of vendor opportunism. However, the results also indicate that contract managers in DoD are more vulnerable to vendor influence than contract managers in DVA, particularly when they contract with private firms. This suggests that the managerial discretion allowed for rational decisions for public interests may ironically place contract managers in the place of being influenced by powerful private vendors.

CONCLUSION

This paper has argued that transaction costs risks and bargaining power play a key role in how governments decide contract designs, given institutional contexts. The empirical analyses support this argument. In government contracting, the costs and benefits of different contract designs vary for governments across services, market contexts, and institutional contexts. Governments with managerial discretion balance the costs against the benefits when choosing contract designs. A short-term and fixed-price contract typically saves costs and lowers risks for governments. However, when governments contract for asset-specific services, they are more likely to choose a long-term contract in order to securely obtain the specialized services and, at the same time, avoid the transaction costs to be caused by frequently negotiating with vendors being specialized more and more over time. Under the condition of asset specificity, a fixed-price contract is still preferred because when vendors recognize that they will recurrently deliver a service and having a higher base value of the service contract will give them more benefits in the following rounds of the contract, the production cost of recurrent contracts is more likely to be continuously increased under a cost-reimbursement contract. For hard-to-measure services, short-term and fixed-price contracts are still preferred to avoid the greater risks of vendor opportunism.

Nevertheless, these contract design patterns drawing on transaction costs risks remain unchanged only when governments enjoy superior bargaining power to vendors in contractual relationships. Governments find themselves in better bargaining position than vendors since there are multiple providers in most service industries. Governments are rarely dependent on a particular vendor because they can often turn elsewhere easily. However, when governments' dependence on a service industry increases, their vulnerability to vendors' influence also does. Vendors – particularly private vendors – also attempt to influence governments' contract design choices to balance costs against benefits on their own side. Under the circumstances where governments' dependence on a service industry is high, therefore, governments may reluctantly choose long-term contracts or cost-reimbursement contracts even though they expect more costs and performance risks under the contract designs.

A compelling direction for future research stemming from this study would be to investigate whether governments' contract designs affect contract performance. Are contracts designed to mitigate vendor opportunism more likely to be successful? In addition to the contract design decisions discussed in this paper, governments can respond to the transaction costs risks by providing vendors with performance incentives that motivate them to discard their opportunistic behaviors. They can respond to the bargaining power constraints by contracting with vendors with less bargaining power, such as small firms and emerging firms. Future studies could explore how governments can choose the entire spectrum of contract designs to improve service quality at lower costs.

Another arena for future research would be to address the limitations of this study. As I mentioned earlier, the empirical analyses of this study largely relied on the subjective measures, creating reliability debates. It also measured many independent variables as dummy variables. Additional research may identify more refined measures that can be applied to large sample studies. The other main limitation of this study is that it treats contract design decisions as one-time decisions rather than iterative processes. I have been able to capture the contract design decisions in public agencies, but I sacrifice understandings of how transaction costs factors and bargaining power factors influence the decisions over time. Future research may address this limitation, for example, by using time-series analysis.

Although transaction costs economics provide a useful framework for analyzing governments' contract management, resource dependence theory offers an useful complement. The results of this study suggest that resource dependence influence governments in several ways. This study provides a more complete picture of contract design decisions, by combining two theories that would offer partial explanations of contract design decisions by themselves. Thus, it contributes to the growing body of contracting research that goes beyond the popular efficiency approach. Furthermore, although majority of contracting studies has explored so-called "make-or-buy" choice, this research expands the theoretical focus to include the contract management decisions followed by the stage of a "make-or-buy" choice. An additional contribution of this study is its empirical focus on contract management practices at the federal level. The contracting literature has had a focus on contract management at state and local levels. While being relatively infrequent, federal contracting also deserves more attention.

REFERENCES

Benton, J. Edwin, and Menzel, Donal C. (1992). Contracting and Franchising: County Services in Florida. *Urban Affairs Quarterly*, 27(3): 436-456.

- Brown, Trevor L. and Potoski, Matthew. (2003). Contract-Management Capacity in Municipal and County Governments. *Public Administration Review*, 63(2): 153-164.
- Brown, Trevor L. and Potoski, Matthew. (2005). Transaction Costs and Contracting. *Public Performance and Management Review*, 28: 326-351.
- Carver, Rover H. (1989). Examining the Premises of Contracting Out. *Public Productivity and Management Review*, 8(1): 27-40.
- Ferris, James (1986). The Decision to Contract Out: An Empirical Analysis. *Urban Affairs Quarterly*, 22: 289-311.
- GAO (2007). *Federal Acquisitions and Contracting: Systemic Challenges Need Attention*. GAO-07-1098T, July.
- Hirsch, Werner Z. (1991). *Privatizing Government Services: An Economic Analysis of Contracting Out by Local Governments*. Los Angeles: Institute of Industrial Relations.
- Kettl Donald F. (1993). *Sharing Power. Public Governance and Private Markets*. Washington D.C.: Brookings Institution.
- Light, Paul. (2000). *Making Nonprofits Work: A Report on the Tides of Nonprofit Management Reform*. Washington, D.C.: Brookings Institution Press.
- Pheffer, Jeffrey and Salancik, Gerald R. (2003). *The External Control of Organizations*. California: Stanford University Press.
- Praeger, Jonas. (1994). Contracting Out Government Services: Lessons from the Private Sector. *Public Administration Review*, 54(2): 176-184.
- Rainey, Hal. (2003). *Understanding and Managing Public Organizations*, San Francisco: Jossey-Bass.
- Williamson, O. E. (1981). The Economics of Organization: The Transaction Cost Approach. *American Journal of Sociology* 87: 548-577.
- Wise, Charles R. (1990). Public Service Configurations and Public Organizations: Public Organization Design in the Post-Privatization Era. *Public Administration Review*, 50(2): 141-55.