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Assessing the Effectiveness of Performance-Based Acquisitions in Federal Agencies

12 July 2017

Dr. Amanda M. Girth, Associate Professor

John Glenn College of Public Affairs

The Ohio State University

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Executive Summary

Approximately 40% of eligible federal service contracts (and 50% of service contracts among DOD agencies) are performance-based acquisitions (PBAs). Despite the significant volume of federal contracts PBAs represent, little empirical research exists on PBA use or effectiveness. This study focuses on the dyadic contract between government and contractor to examine contract attributes of PBA and non-PBA contracts. The study aims to determine whether PBAs are linked to stronger performance on cost, schedule, and technical performance. Through the analysis, the study explores how contract attributes differ amongst PBA and non-PBA contracts and the factors that contribute to (or hinder) effective implementation of performance-based contracts.

To address the study's objectives, contracts data derived from FPDS-NG is analyzed. Contracts are selected from 22 service areas and studied over a 15-year period (2000-2014). Multivariate techniques are used to compare PBA and non-PBA contracts from these service areas. Semi-structured interviews with federal acquisitions professionals and private contractors are also collected to add context to the findings from the multivariate analysis.

The results of the exploratory analysis show that PBAs are associated with higher costs and longer contract lengths compared to non-PBA contracts. PBAs are also associated with incentive contracts over other contract types, when compared to non-PBA contracts. PBAs are associated with higher number of bidders and set aside contracts, compared to non-PBA contracts. The results presented in the study are descriptive and do not indicate casual relationships.

This exploratory study examines PBA design and implementation, contributing to the body of knowledge relevant to the research and practice of procurement. Yet, additional research is needed to test causal relationships and investigate the associations explored in this study. Future study should include more robust primary data analysis in order to explore contract attributes beyond the measures available in FPDS-NG. A more comprehensive understanding of the



dynamics of performance-based contracts and performance incentives more broadly, can help to improve procurement practices in order to maximize contract performance.



Background

Performance-based systems are designed to foster high quality outcomes and promote effective contracting (Cohen & Eimecke, 2008; Heinrich, 2007; Kelman, 2002). From the construction of global industrial assets to securing the homeland (Bakshi & Gans, 2010; Bubshait, 2003), performance incentives are shown to have varying degrees of success in achieving desired outcomes. This study examines one performance tool – performance-based acquisitions (PBAs)¹ of services – to test theories of contract design and explore dynamics of contract implementation.

PBAs are designed to link measurable performance to customer requirements, describing the results intended from the contract, rather than prescribing how the contract work should be completed. According to the Federal Acquisition Regulation (FAR) Subpart 37.6, PBAs are unique in that they include a Performance Work Statement (PWS)². PBA contracts must have measurable performance standards and establish process for evaluating contractor performance. PBAs can also utilize financial incentives when appropriate.

In addition to the FAR and supplementary agency policy on PBAs (e.g., Defense Federal Acquisitions Regulation Supplement), interagency guidance on PBAs provides instructions on designing and implementing PBAs. The focus of PBAs, according to the “Seven Steps to Performance-Based Acquisitions,” is to change the traditional acquisition mindset to “...one of collaborative, performance-oriented teamwork with a focus on program performance, improvement, and innovation, not simply contract compliance” (Seven Steps to Performance-Based Acquisition, n.d.). The “Seven Steps” guidance also states that performance-based contracts provide a number of benefits, including reduced risk, greater mission alignment, stronger performance, contractor flexibility, and meaningful surveillance, among others.

¹ Also known as performance-based service acquisitions (PBSA).

² A statement of work (SOW) defines contract requirements. A performance work statement (PWS) is a SOW for PBAs describing required results with measurable outcomes. A statement of objectives (SOO) is used in solicitations to encourage offerors to propose innovative approaches to meet broad performance objectives specified by the government.



The importance and magnitude of PBAs is not a subtle matter. Approximately 40% of all federal service contracts (and 50% of service contracts among DOD agencies) are PBAs. Through numerous studies, the U.S. Government Accountability Office (GAO) has identified a series of issues with the design and implementation of PBAs, underscoring management, training, and oversight failures. As early as 2002, GAO documented inadequate training and guidance on PBAs (GAO, 2003, GAO, 2002). GAO reported DOD and DHS findings on inadequate oversight, and insufficient staffing to adequately manage the outcome-oriented PBA contracts (GAO, 2008, 2005). GAO warned Congress that PBAs were not being appropriately or fully implemented. GAO reported that agencies were a) not clearly defining requirements for PBAs, b) ineffectively managing PBAs, and c) not identifying meaningful incentives or quality measures in PBA contracts (GAO, 2008).

Despite the importance of examining the effectiveness of performance-based contracts, there is little scholarly research on the use of PBAs in federal procurement. In public management research, studies have predominantly focused on contract design (Kim & Brown, 2012). Some studies have examined performance incentives as a monitoring tool (Lambright, 2009; Marvel & Marvel, 2009; Van Slyke, 2007), while others have addressed the complex nature of performance-based contracts in intergovernmental structures (Heinrich, 2002; Heinrich & Choi, 2007). This study focuses on the dyadic contract between government and contractor to examine PBA attributes in federal contracts. It is designed to determine whether PBAs are linked to stronger performance on cost, schedule, and technical performance. Through the analysis, the study explores how contract attributes differ amongst PBA and non-PBA contracts and the factors that contribute to (or hinder) effective implementation of performance-based contracts. This exploratory study examines PBA design and implementation, contributing to the body of knowledge relevant to the research and practice of procurement.



Literature Review: Performance-Based Contracts

Although contracting is not new, the shift toward performance-based contracting in government represents a new paradigm for acquisitions professionals and policymakers (Behn & Kant, 1999). New Public Management (NPM) reforms emphasize performance and the application of private sector practices, including contracting and use of performance incentives (Hodge, 2000). The promise with NPM reforms, such as performance-based contracting, is that applying market discipline and relying on market competition promotes efficient use of resources (Hood, 1991). Thus, the purpose of performance systems in contracting regimes is to foster better service quality, both within and across organizations (Behn, 2001; Cohen & Eimecke, 2008; Heinrich, 2007; Kelman, 2002).

A recent study by Selviaridis and Wynstra (2014) creates a conceptual framework of the key dimensions of performance-based contracts by comprehensively reviewing academic studies across disciplines and sectors. The authors draw from agency theory, management control theory, and transaction cost economics and propose three classifications of performance-based contract design and implementation: performance, incentives, and risk. The Selviaridis and Wynstra framework, found in figure 1, is used in this study to examine performance-based contracting and develop exploratory hypotheses.

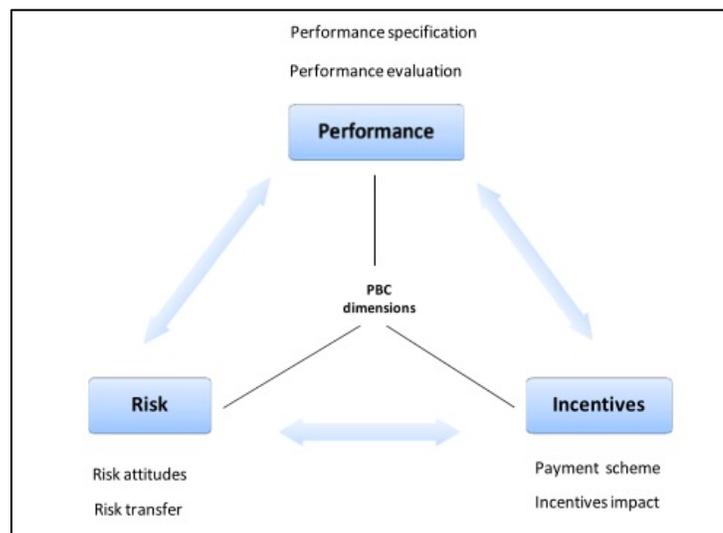


Figure 1: Selviaridis and Wynstra (2014): A stylized model of performance-based contracting (PBC)

Performance

The performance dimension of the framework captures performance outputs and processes for measuring performance. Performance-based contracts are dependent upon the effective specification of performance measures, to include inputs, outputs, and outcomes. Effective metrics are contingent on the measurability of performance (Heinrich & Choi, 2007). Finding appropriate measures, particularly outcome measures, can be difficult in public procurement (Behn & Kant, 1999). In essence, performance standards might be easily described, but it does not mean they are easy to implement in practice (Brown, Potoski, & Van Slyke, 2013).

Appropriate evaluation and measurement are a critical dimension of effective performance-based contracting. Significant investment is often required to design and implement systems to evaluate performance-based contracts (McBeath & Meezan, 2010). Performance measures drive contractor behavior and if not appropriately designed (and with contractor and government input), the wrong measures can be emphasized and performance can suffer (Cohen & Eimicke, 2008). Further, flexibility and adjustment in measures as the contract progresses can be integral to effective implementation (Lane, 2005). Indeed, because of the dynamic nature of service contracting, it can be "...impossible and even unwise to try to fix specifications of service quality at the outset of contract performance..." (Edwards & Nash, 2007, 356).

Performance is defined in FAR Subpart 1.102 as achieving customer satisfaction "...in terms of cost, quality, and timeliness of the delivered product or service." The promise of PBAs is to enhance performance across these dimensions for eligible service contracts, as noted in FAR Subpart 37.6 and the "Seven Steps" guidance. Drawing from federal procurement policy and extant literature, the following hypotheses related to performance are proposed.

H1a: PBAs are likely to be associated with lower cost compared to non-PBA contracts.

H1b: PBAs are likely to be associated with shorter schedule compared to non-PBA contracts.



H1c: PBAs are likely to be associated with superior technical performance compared to non-PBA contracts.

Incentives

Incentives capture financial and non-financial rewards and penalties. Penalties for underperformance and rewards for meeting or exceeding performance metrics motivate contractors (Goldsmith & Eggers, 2004). Financial payments are tied to results, which in turn drives contractor behavior and incentivizes performance. Performance incentives are designed to mitigate principal-agent problems found in contracting relationships (Alchian & Demsetz, 1972; Heinrich, 1999; Sappington, 1991). Three such problems can present in contracts related to conflicting goals between the principal and agent (Dixit, 2002; Laffont & Martimort, 2002; Van Slyke, 2007). First, when one party acts opportunistically in the absence of shared goals, moral hazard results. Second, adverse selection results from information asymmetries; that is, when one party knows more about the good/service under contract than the other party. Finally, when the principal must audit the agent's work to observe quality, costly verification can result.

There is some evidence that use of incentives in public procurement is less effective than the private sector (Besley & Ghatak, 2003; Frant 1996; Jensen & Stonecash, 2005; Prager, 1994). This is, in part, due to the difficulty of developing meaningful incentives to motivate contractor performance (Courty & Marschke, 2007). Evidence from local government research illustrates this point. Financial rewards are less common because of political or fiscal constraints, not because of contract requirements or suitability. Similarly, despite designing contract sanctions, they are rarely executed in practice because of onerous processes (Girth, 2014).

There are two basic types of federal contracts designed with financial incentives: fixed-price incentive or award fee, and cost-reimbursement incentive or award fee. In both cases, contractors are allowed to earn additional revenue based on their performance. Award fee contracts are executed when performance is subjective, whereas incentive fee contracts utilize formulas to make profit adjustments. According the FAR Subpart 16.4, incentive contracts should be utilized



when services can be acquired at a lower cost, or with improved schedule, or technical performance. Incentives are ... “designed to (i) motivate contractor efforts that might not otherwise be emphasized; and (ii) discourage contractor inefficiency and waste.” Drawing from federal procurement policy and extant literature, the following hypothesis related to financial incentives is proposed.

H2: PBAs are likely to be associated with incentive/award fee contracts compared to non-PBA contracts.

Risk

The risk dimension specifies risk attitudes among parties and risk management. Performance-based contracts facilitate risk sharing between the government principal and contractor agent. The contractor bears risk of penalties (or forgone incentives) if performance requirements are not satisfactorily met, and the government bears risk for paying more than minimally required for production.

The complexity of service acquisition can influence the appropriateness of performance incentives. For example, federal guidance suggests incentive contracts are less suitable for more complex acquisitions (U.S. Office of the Under Secretary of Defense for Acquisition, Technology and Logistics, 2014; see also Brown, et al., 2013). Difficulty of defining performance measures (Brown, et al., 2013; U.S. Office of the Under Secretary of Defense for Acquisition, Technology and Logistics) and risk of opportunism is greater among highly complex service questions (Lewis & Bajari, 2014). With simpler service acquisitions the concern for quality shirking is lower (Lewis & Bajari, 2014). Furthermore, as the technical complexity of delivery increases, so too might the number subcontractors, and each additional relationship complicates the supply chain (Eriksson, 2015).

Risk is also a function of market factors, such as the number of qualified suppliers in the market (Zsidisin, 2003). Amongst procurements with high asset specificity, this can be compounded as there might be fewer suppliers in the market, thus limiting choice and increasing risk (Brown, Potoski, & Van Slyke, 2006; Girth, Hefetz, Johnston & Warner, 2012). These types of markets, with weak external markets and unclear outcomes, may be less suitable for performance-based



contracts (Doerr, Lewis, & Eaton, 2005). Drawing from federal procurement policy and extant literature, the following hypotheses related to risk are proposed.

H3a: PBAs are likely to be associated with less complex service acquisitions compared to non-PBA contracts.

H3b: PBAs are likely to be associated with more competitive procurement environments compared to non-PBA contracts.



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Methodology

This study is exploratory, descriptively analyzing the differences between service contracts that are PBAs and those that are not PBAs. Differences are assessed by examining dimensions of performance-based contracts: performance standards, risk, and incentives. First, the data used for the study is described. Next, measures for the multivariate analysis are defined. Finally, the methodological approach to analyzing the data are specified.

Data

Data is derived from two sources. Contracts data is gathered from the Federal Procurement Data System-Next Generation (FPDS-NG), a comprehensive source of unclassified federal contracts. The unit of analysis in this study is the contract. Because FPDS-NG captures all contract actions, including when the contract is initiated and subsequent modifications, contract actions are aggregated and reported at the contract level.

The dataset includes 268,089 contracts from 22 service areas. Federal agencies purchase goods and services using two industry categorizations: North American Industry Classification System (NAICS) and the Product Services Code (PSC). Appendix 1 contains the contracts included in this analysis and their corresponding NAICS and PSC classification. The sample includes all completed unclassified contracts for these PSC/NAICS, which are service procurements, over a 15-year period from fiscal year 2000-2014.³

Second, 10 semi-structured interviews were conducted. Interview respondents were federal acquisitions professionals (current or former) and contractors (current or former). Respondent attributes are found in appendix 2. Expertise was mixed based on area of service (DOD or civilian agency expertise). The purpose of the interviews is to glean insights from practice on perceptions of the

³ These criteria initially resulted in 274,440 contracts in FPDS-NG from over 70 cabinet-level agencies and independent agencies. The number of contracts by agency during this time period ranged from 1 to 138,141. Agencies with less than 1,000 contracts during this 15-year time period for the 22 services selected were eliminated, resulting in a sample size of 268,089 contracts.



use and effectiveness of PBAs to help add context to the multivariate analysis addressed in the discussion.

Measures

The following measures are used to complete the quantitative analysis of the use of PBAs in federal contracts. Measures are derived from FPDS-NG. The dependent variable, *performance-based acquisition*, is a binary variable that is coded 1 (86,092) if the contract is a PBA or 0 (152,874) if the contract is not a PBA.

Variables of interest are derived from performance indicators in the FAR, including schedule, cost and quality or technical performance to assess the performance dimension. *Cost* is the logged value of total dollars obligated to the contract. The cost of the contract is calculated in real dollars with 2014 as the base year. *Contract length* is the measure of schedule, and is the total length of the contract in years. FPDS-NG does not contain quality measures per se, however this analysis uses contract modifications as an indicator of quality/technical performance. *Technical performance* is the logged value of the total number of modifications associated with a contract. Modifications can be a signal of potential performance problems with the contract. For example, the GAO routinely assesses modification activity as part of their evaluative process (see GAO, 2016, GAO, 2015). This is an imperfect measure of technical performance; however, it is the best measure available given the measures available in FPDS-NG.

The incentives dimension is measured by contract pricing type. Contract pricing type dummy variables correspond to the contract pricing type: *fixed price*, *incentive/award fee*, *cost reimbursement*, and *time and materials/labor hours*. Incentive/award fee is the comparison category as hypothesis 2 relates to associations between incentive/award fee contracts for PBA contracts.

The risk dimension is measured by two constructs: service complexity and market competition. Complex service acquisitions might be less suited to measurable performance standards. Defining performance measures can be more difficult in complex acquisitions (Brown, et al., 2013). *Service complexity* is a



complexity score developed by Kim, Roberts and Brown (2016). Their measure was developed from a survey of federal acquisition professionals as reported in their 2016 study, to determine their assessment of ease of measurement and specialized investment ratings. They then combine these factors into a product/service complexity rating as reported in Appendix 1.⁴

Competition is captured with three distinct measures: *number of bidders*, *set aside*, and *extent competed*. *Number of bidders* is the logged value of the total number of offers received for the contract recorded in FPDS-NG. *Set aside* is coded 1 if the contract is a set aside (e.g., small business, economically disadvantaged business owned by women or veterans, disabled veteran owned, and HUB zone) or 0 if the contract was not designated as a set aside contract. *Extent competed* is coded 1 if unrestricted (e.g., full and open) and 0 if restricted. The most common type of restricted solicitation is one that is sole sourced. The competitive environment might influence whether PBAs are preferred (e.g., there may be fewer suppliers in highly asset specific procurements (Brown, et al., 2006)). Risk increases as competition is constrained.

Other factors might influence whether the government executes a PBA contract. These observable factors are controlled with the following measures:

- *Department of Defense (DOD)* is coded 1 if the contract agency is DOD and 0 otherwise. Control for DOD contracts because DOD has a higher goal for PBA service actions (50%) than civilian agencies (40%).
- *Year dummy variables* correspond to the fiscal year the earliest contract action associated with each contract (2000-2014). This control accounts for unobserved policy and/or political changes that might affect PBA use.

⁴ Kim, Roberts, and Brown (2016) surveyed members of the National Contract Management Association. Respondents rated service complexity by assessing ease of measurement on 5-point scale, specialized investment on a 5-point scale (5=high, 1=low). The combined mean of these two measures constructs the service complexity score.



Descriptive statistics for each of the independent variables is found in table 1.⁵

Table 1: Descriptive Statistics

Variables	Obs	Mean	Std. Dev.	Min	Max
Cost (logged)	238,966	8.30	4.76	0	21.38
Contract length	238,966	1.83	1.64	1	16.00
Technical performance (logged)	238,966	0.66	0.81	0	6.27
Cost reimbursement	238,966	0.11	0.31	0	1.00
Award/incentive fee	238,966	0.01	0.08	0	1.00
Time materials/labor hours	238,966	0.10	0.29	0	1.00
Fixed price	238,966	0.79	0.41	0	1.00
Service complexity	238,966	4.49	1.52	3.08	8.66
Number of bidders (logged)	238,966	1.16	0.73	0	6.91
Set aside	238,966	0.33	0.47	0	1.00
Extent competed	238,966	0.70	0.46	0	1.00
DOD	238,966	0.56	0.50	0	1.00

Method

Descriptive analysis is the appropriate technique to explore distinctive features of PBAs. Associations are examined but causal relationships are not tested. Logistic regression is used for the quantitative analysis and odds ratios and robust standard errors are reported. Standard errors are clustered at the broader independent delivery vehicle (IDV) level (or the unique contract level if the contract is not part of an IDV). As numerous delivery or task orders, each a unique contract, fall under one broader IDV (e.g. blanket purchase agreement), this technique accounts for the similarities amongst these unique, but associated contracts.

To supplement the multivariate analysis, interviews were conducted using a semi-structured protocol aimed at understanding government and contractor perceptions of PBAs and performance incentives more broadly. Interviews averaged one hour in length and were collected in-person and via telephone. Interviews were recorded and later transcribed for analysis. Respondents were assured

⁵ Approximately 1% of contracts in the sample were missing PBA identification in FPDS-NG and 10% of contracts were missing set aside designation in FPDS-NG. As a result, the final sample size of the data analyzed is 238,966 contracts.



confidentiality in the interview process. Identifying numbers appear in Appendix 2 and are used to attribute respondent perspectives.



Multivariate Results

The results of the analysis, which is reported in table 2, shows that there are differences between PBA and non-PBA contracts. Assessing the performance dimension, cost and contract length are higher for PBA contracts compared to non-PBA service contracts. The odds of PBA is 1.06 times higher as a) the log of contract cost increases one unit, and b) as the contract length increases by one year. Technical performance, measured by contract modifications, does not reach statistical significance. Because the directional effect was the opposite of hypotheses 1a and 1b, none of the performance hypotheses are substantiated.

Associations examined within the incentive dimension reveal that contract pricing type is statistically significant and negative across contract types, indicating incentive/award fee contracts are associated with PBAs compared to non-PBA service contracts. The odds of PBA for cost reimbursement contracts is 36% less than the odds of incentive/award fee contracts. The odds of PBA for fixed price contracts is 35% less than the odds of incentive/award fee contracts, and the odds of PBA for time/labor contracts is 44% less than the odds of incentive/award fee contracts. Hypothesis 2 is supported.

Evidence is mixed in assessing the risk dimension. Service complexity is not associated with PBA contracts, indicating no preference of PBAs based on the complexity of acquisitions. Hypothesis 3a is not substantiated. Two competition measures are statistically significant. The odds of PBA is 1.26 times higher as the log of the number of bidders increases one unit. The odds of PBA for set aside contracts is 1.3 times the odds of contracts that are not set asides. This illustrates that PBA contracts tend to have higher levels of competition, but that they are more often let in a constrained competitive environment. Hypothesis 3b is partially substantiated.

The odds of PBA for DOD contracts is 6 times the odds of civilian agency contracts, which shows that DOD is more likely to utilize PBAs than civilian agencies.



Table 2: Results of Logit Analysis: PBA vs. Non-PBA Contracts

Variables	Odds Ratio	Rob. Std. Err.
Cost	1.058***	0.003
Contract length	1.064***	0.012
Technical performance	0.999	0.022
Cost reimbursement	0.635*	0.180
Fixed price	0.647*	0.178
Time/Labor	0.565**	0.158
Service complexity	0.990	0.014
Number of bidders	1.259***	0.032
Set aside	1.298***	0.055
Extent competed	0.973	0.038
DOD	5.985***	0.250
Constant	0.006***	0.002

N=238,966

Wald Chi² = 3692.21***

Pseudo R² = 0.195

*p<.15 **p<.05 ***p<.01

106,350 clusters at the IDVPIID level

Year dummies not shown



Discussion

The findings from the multivariate analysis are discussed in this section for the performance, incentive, and risk dimensions of performance-based contracts. Interviews with federal acquisitions professionals and private contractors provide context to interpret the associations present in multivariate findings. The limitations of the study are addressed and recommendations for future research on this topic are put forth for consideration.

PBAs for service contracts are promoted as acquisitions tools to improve performance (Seven Steps to Performance-Based Acquisition, n.d.). Yet the descriptive analysis in this study shows cost and schedule to be higher for PBAs compared to non-PBA contracts. The multivariate analysis shows no statistical association between technical performance and PBAs. There is little evidence in this study to suggest that PBAs are preferable on the performance dimension using measures of cost, contract length and technical performance as indicators.

Interviews shed some light on these findings. Respondents differed on their perceptions of the effectiveness of PBAs. “I can’t say I really have noticed a difference” [with performance using PBAs] (1). This might be due to unsystematic implementation or misunderstanding of the purpose of PBAs, as illustrated by the following respondents. “[We] tried to maximize the use of PBAs [and] we took a lot of hits where the PBAs were presumptive and it was the preferred approach....All things equal we would go that route, but it wasn’t the silver bullet. Not the approach for all situations” (7).

They call them performance-based acquisitions but the problem with the field is we still haven't yet [implemented appropriately]. Well, what they'll do is take what was the same amount of work and rip off that title and then put [in] a PWS and call it a performance-based acquisition – without understanding the other parts of the structure where they have to talk about how they're going to measure performance (5).

Developing performance measures is a fundamental component of performance-based contracting. As previously noted, there is scant prescriptive



guidance on the design and implementation of performance incentives and measures. A respondent's experience echoed this "...[I] try to look for good ones [metrics] and best practices...I've searched many times, and there is not much information available out there whatsoever" (8). Similarly, while PBAs enable the government to contract for results rather than specifying requirements, a respondent found that in some cases determining the end result can be challenging. "Now if you were to do the true performance basis...the problem is the government can't...come up with that specific scope to make is really clear what would be needed" (2).

PBAs are meant change the traditional acquisition mindset to "...one of collaborative, performance-oriented teamwork with a focus on program performance, improvement, and innovation, not simply contract compliance" (Seven Steps to Performance-Based Acquisition, n.d.). An alternative explanation for the lack of statistical findings on performance dimensions might be the relational dynamic between government and contractor. A respondent described an example that illustrates a relational tension. "Under the PBA environment there's a built-in alliance there because you're a partnership and that partnership is, I think, what some of the government folks didn't quite understand as well.... We're treating them like 'you're the contractor, you just have to suck it up' and it's like 'no, they're our partner'...(7).

Related to the incentive dimension, the multivariate results show that financial incentives are more often associated with PBA contracts, as incentive/award fee contracts are more highly correlated with PBA contracts than other contract types. The statistical correlation is meaningful, but the practical implication of the finding is questionable given the small number of incentive/award fee contracts in the sample (approximately 1%). FAR guidance on PBAs indicates that financial incentives can be utilized with PBAs when appropriate. Considering the small number of incentive contracts in the sample, it is curious why appropriate use of financial incentives applies to a minute number of contracts.

Most of the interview respondents had experience implementing incentive contracts and award fee contracts. There was consensus that incentive/award fee contracts required specialized expertise and effort, which is likely one reason for



their scant use. “Award fees are kind of niche” (8). “[The award fee formula] is complicated. It’s not easy to figure it out” (5). Another respondent expanded on the complexity of incentive/award fee contracts.

They’re hard to administer. It takes a lot of work. You have to manage the contract. Then you have to manage the award fee process.... You have individuals in the program office who work daily, side by side with the staff. When you create hard feelings among and between those organizations, it makes a difficult working relationship. So, the government trying to do its job right causes a lot of unintended consequences” (10).

Similarly, a respondent reported that the “...lack of government resources to administer it [award fee]” contributed to the decline in these types of contracts (8). Consistent with respondent findings on PBAs generally, there is little guidance on designing and implementing incentive contracts. “...There’s just not a lot of guiding direction on how to successfully administer award fee contracts, and I think because the government maybe isn’t as committed or has the resources or bandwidth to administer it...they go to fixed price, because it provides supposedly the least amount of risk to the government” (8).

Managing incentive and award fee contracts are resource intensive, as illustrated by a respondent. “It was heavily subjective, though, when you get into an award fee kind of conversation. Frankly, oftentimes the government did not want to do the work, in having the conversation and then documenting it...” (4). And yet, as another respondent reported, when performance falters and award fees are docked, contractors are more attuned to the contract. “[The contractor] always got 100% of the award. That’s one of the criticisms [of award fee contracts]....[Later] when they didn’t get the max fee....it had a huge effect of the company. I don’t know if it was so much dollars, process, as reputation” (10).

Another likely reason for limited use of incentive and award fee contracts is the strong policy preference for fixed price contracts. “...[T]he government’s preference, of course, is to do anything fixed price. You have to justify why the government cannot do fixed price...then justify why that [award fee] structure [is



preferred]....” (8). There might also be a shifting administrative preference for other types of incentives, such as multi-year contracts with options.

We’ve reduced down the awards and award fee...we’re relying more on the performance and the task performance, which ensures follow on and options period....So the incentives for quality performance is reflected that way and that’s how companies continue [to work with the agency]. The actual performance measure is not about the people, it’s about the job getting done and the way they manage their company. That’s how we reflect on their performance and their performance leads to future contracts with us or future contracts with other agencies because we post [our evaluation] in...the Past Performance Information Retrieval System... (9).

In some cases, despite an interest in using incentive contracts, finding appropriate measures is problematic depending on the type of service that is required.

There’s been a big push to move towards incentive type awards but we can’t figure out what that metric would be. Would it be, ‘Oh well, you write out x number of products?’ Well, then people are going to write up x number of products, but there’s going to be no guarantee of quality....Honestly, we ended up just going, ‘we can’t crack this nut.’ Because any metric that we come up with isn’t appropriate. If you were building something, okay that would make sense (6).

Further, the dynamics of the contract or requirements can change over time, requiring fluidity in measurement, and complicating post-award contract management.

There is a lot of challenges in thinking [through] the incentive part when there are not clearly objective measures. The government needs to make sure that they capture that. In our award fee subjective part, we’ve got a sample of things we may consider as part of that, but...I have these discussions every other week where the [customer’s] priorities are just constantly changing with regards to what is important at that given time, and some things you’ve got to respond to quickly. It is a struggle, and it does increase, I think, the administrative part after award, depending on what the nature of the contract is and what you anticipate (8).



Some respondents noted that their incentive contracts performed better than other types of contracts, in part due to increased communication requirements and responsiveness. “I think they [award fee contracts] performed better because...they made the parties communicate. Because you know at least quarterly, for the award fee board, you’re going to get that report” (5). Another respondent reflected, “They did a good job of staying on top of micromanaging the contractor’s performance, and seeming to affect the company’s behavior through minor changes, up or down, in the fee” (10).

The multivariate findings on risk in PBAs is mixed. PBAs are associated with more competitive acquisitions as the number of bidders on PBA contracts is higher than non-PBA contracts. However, PBA contracts are more highly associated with set aside contracts, which are characteristic of constrained competitive environments. A favorable risk position through risk sharing is one of the benefits of PBAs (Seven Steps to Performance-Based Acquisition, n.d). The complexity of the service area has no statistical relationship in this model, which is also curious. As complexity increases, the ability to hone specified performance measures, outputs and outcomes, becomes more challenging.

Some dimensions of risk have been addressed in the discussion, such as indiscriminant use of PBAs, which might also contribute to the lack of statistically significance associating service complexity with PBAs. As for the competitive measures of risk, one respondent discussed performance-based risk in a competitive environment that grew more competitive over time. “It’s not nearly as popular as it used to be...One, some of the companies would default. [The government] is worse off than they were then before they’d even started. Or, two, you ended up having to cut so many corners to be cost competitive [due to competitive pressure] and to make the bottom line, that it didn’t end up being the panacea that people thought” (3).

The other type of risk that interview respondents described was external exposure beyond the dyadic contract, such as political risk. “That kind of environment makes people in contracting very gun shy. You have IG, you have GAO, you have the press questioning, second guessing your decisions as a contracting officer about awarding so and so’s contract and awarding so much fee,



or spending so much money” (10). Avoiding exposure and limiting risk can influence contract design and management decisions.

There was also consensus among the respondents that the acquisition workforce needed more guidance on designing and implementing performance-based contracts and performance incentives. While this was illustrated throughout the respondent comments reported in this discussion, one respondent summed up the personnel issues echoed by others’ perceptions. “The contracting offices are understaffed and less experienced...I think there's less capacity to do all this government procurement and when it becomes fancy and sexy and complicated, like award fee or performance-based contracting, good luck” (10).

Limitations and Future Research

The study has a number of limitations, primarily related to data quality and availability. To begin, while FPDS-NG data is the only publicly available source of unclassified federal contracts, observable measures are limited. FPDS-NG provides no insight into requirements, technical, or managerial factors, that might influence whether PBAs are used for acquisitions. Related to this point, the measures used from FPDS-NG are imperfect measures of the constructs under consideration despite being the best available data. Only 22 service areas were analyzed in this study, which limits generalizability to the service areas specified in this analysis.

Researchers, administrators, and policymakers would benefit from more robust data collection from acquisitions professionals, specifically in the area of performance-based contracting and use of performance incentives. There is little evidence that PBAs work as intended, nor has it been as successful as policymakers had hoped (Edwards & Nash, 2007). Additional research in this area is recommended. Primary data analysis through in-depth surveys and interviews would provide much needed research into an understudied area of significant importance given the magnitude of PBA usage across the federal government. This requires senior-level support to allow researchers to engage front-line employees on PBA design and implementation in order to gather data required for evaluative analysis.



Conclusion

Federal policy guidance encourages use of performance-based contracts, yet there is little empirical evidence of their effectiveness. This study examines whether PBAs are linked to stronger performance on cost, schedule, and technical performance. Through the analysis, the study also explores how contract attributes differ amongst PBA and non-PBA contracts and the factors that contribute to effective implementation of PBAs. Using a descriptive analytical lens, multivariate results reveal that PBAs are associated with higher costs and longer contract length compared to non-PBA contracts. PBAs are associated with incentive contracts, compared to non-PBA contracts, and other contract types. PBAs are also associated with higher number of bidders and set aside contracts, compared to non-PBA contracts. Although this study does not provide causal evidence, the associations presented here provide a first step in understanding the differences amongst PBA and non-PBA federal contracts.

To that end, additional research is needed on the effectiveness of PBAs and performance incentives. Future study should test causal relationships and explore the associations found in this study. Robust primary data analysis is required to explore contract attributes beyond the measures available in FPDS-NG. A more comprehensive understanding of the performance dynamics at work on PBAs, and contract incentives more broadly, can help to improve procurement practices in order to maximize contract performance. Understanding the conditions under which PBAs and performance incentives are used can support efficient and effective use of public resources, and ultimately enhance public value.



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Appendices

Appendix 1: Product Categories and Complexity Scores

Product Category	PSC	NAICS	Number of Contracts	Service complexity
Solid waste collection	S205	562111	17,804	3.08
Landscaping	S208	561730	37,609	3.16
Laundry and dry cleaning	S209	812320	8,008	3.26
Janitorial service	S201	561720	46,634	3.30
Court reporting	R606	561492	18,914	3.51
Warehousing and storage	S215	493110	2,034	3.61
Security guard and patrol	S206	561612	25,303	3.77
Advertising	R701	541810	5,306	4.43
Auditing	R704	541211	2,149	4.77
Legal service	R418	541110	8,480	4.97
Professional and management training	U008	611430	12,118	5.02
Equipment maintenance and repair	J099	811310	5,924	5.22
Program management and support	R408	541611	11,496	5.62
Logistics support	R706	541614	3,113	5.63
Program review and development	R409	541611	565	5.87
Engineering	R425	541330	55,365	6.76
Computer system development	D302	541512	4,038	7.58
Weapons-basic research	AC51	541710	578	7.60
Defense aircraft - basic research	AC11	541710	880	7.94
Defense aircraft - engineering development	AC14	541330	122	8.46
Weapons - applied R&D	AC52	541710	659	8.60
Defense aircraft - applied R&D	AC12	541710	990	8.66

Derived from: Kim, Roberts, and Brown (2016)



Appendix 2: Interview Respondent Characteristics

ID	DOD expertise	Civilian expertise	Federal employee	Former federal employee	Contractor	Former contractor
1	X		X			X
2	X	X			X	
3	X	X				
4		X			X	
5	X	X		X	X	
6	X		X			
7	X		X			
8	X	X	X			
9	X	X	X			
10		X		X		X



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