

Measuring and Managing Ex Ante Transaction Costs in Public Sector Contracting

Paper for presentation at the Public Management Research Conference 2018, Singapore, 30 May – 2 June 2018, Panel 4b: Performance Management, Contracting, Attitudes, and Outcomes.

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Abstract: Transaction costs factors, such as the complexity of the product being purchased, increase the risk that government contracts will fail. Indeed, when transaction cost factors are particularly strong, a common prescription is to avoid contracting altogether, or if unavoidable, to spend additional resources on management activities like writing more detailed contracts. We present evidence on the size and variability of governments' ex ante transaction cost spending, using original data from 72 contracts issued by 47 Danish local governments. Ex ante transaction cost averages 2.7 percent per contract. More importantly, governments' expenditures are higher for more complex services, and lower when governments have more contracting experience and contracts are larger. Our analyses suggest the importance of distinguishing between transaction cost factors and governments' choices to spend resources in response to them. Effective management spending in the face of transaction costs can help governments more effectively capture value from contracting.

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Introduction

Governments often look to reduce costs by purchasing products and services instead of making them themselves, under the idea that market competition among suppliers drives down prices (Sclar 2000; Van Slyke 2003; Bel, Fageda, and Warner 2010). Of course, price is not the only cost of buying. There are also the costs of finding and selecting vendors, negotiating contract terms, monitoring vendor performance, and ensuring that the delivered product meets specifications, items that collectively are referred to as transaction costs (Williamson 1996; Melese et al. 2007). At first glance, spending motivated by transaction costs can seem wasteful – the expenditures appear to raise costs without directly increasing the amount or quality of the purchased product. On closer scrutiny, however, transaction cost spending can be essential to mitigating risk and ensuring that contracts produce value. For instance, without proper care in writing and monitoring a refuse collection contract, the vendor may fail to pick up garbage on a regular schedule or return bins to their proper locations. Getting the right contract terms may be even more important for products that are more complex, such as eldercare programs or information technology systems (Brown, Potoski, and Van Slyke 2010).

When it comes to managing the contracting process, much of the advice provided to government practitioners focuses on securing the best purchase price, such as identifying whether markets are competitive and negotiating purchase terms (Brown and Potoski 2004; Girth, et al. 2012). Effective contracting also requires optimizing spending to manage transaction cost factors, but this can be particularly challenging for several reasons. First, unlike purchasing costs, where prices tend to be negotiated and posted, transaction costs and the factors that create them are more difficult to observe and

measure. The spending tends to be dispersed across budget categories and involve less tangible resources like time, effort, and expertise. Second, transaction cost spending can be highly variable across products and circumstances; they may be lower for simple products that are commonly bought and sold in robust markets and they are higher for complex products that need to be designed and produced for the purchaser's unique needs. Finally, spending on some transaction cost items is inevitable, such as specifying a refuse collection schedule, while other transaction cost spending can be managed, and perhaps even reduced in some circumstances, without sacrificing value. Effective contract management targets transaction cost spending to where it can produce the most value.

When academics study transaction costs in buying and selling, they tend to focus on the factors that raise and lower the amount buyers and sellers *should* spend to execute the exchange, such as difficult to measure services, market competition, and specialized investments (Levin and Tadelis 2010; Hefetz and Warner 2011). A number of studies also draw on the transaction cost framework to assess the relative efficiency of public and private delivery of services across products with varying asset specificity and contracting difficulty (Bel, Fageda and Warner 2010; Petersen, Hjelmar and Vrangbæk 2018). But these analyses generally fail to identify how much governments actually spend on transaction costs.¹A government may purchase a complex service, one that would ideally require additional spending to write a detailed contract and evaluate the service after delivery, without spending the money for writing an effective contract and evaluating the service. Further knowledge of governments' actual transaction cost spending, and the factors affecting these costs, will assist public managers in organizing and managing

contracting processes in ways that elevate benefits to users, taxpayers and society at large (Melese et al. 2007).

In this article, we draw on social science research and theory, coupled with original contract expenditure data, to understand and provide guidance on how public managers can identify and manage transaction cost spending. In the first section after this introduction, we identify the product and market characteristics that make contracting challenging, the risks associated with not addressing these characteristics, and the management instruments and activities that can mitigate these risks. Implementing management instruments to address these risks requires expenditures, the transaction cost spending. We present a conceptual framework that identifies circumstances, which are likely to lead to higher or lower transaction cost expenditures, even when the underlying transaction cost factors are the same. Governments' transaction cost expenditures are likely to be higher when contracting for complex products and when they have robust management and fiscal capacity. Transaction cost expenditures are likely to be lower when governments have experience with contracting for the product. In the second section, we present original data on the monetary value of transaction cost spending across a range of commonly purchased services in Denmark, providing a rare perspective on their financial cost. Because of the nature of the data, we focus on expenses that occur prior to the sale, expenses that we call "ex ante transaction cost expenditures," which are costs that are exclusive to the contracting process in addition to the costs of production. In the third section, we present the results of our analysis. The fourth section concludes the article with a discussion of what governments can do to manage ex ante transaction cost expenditures, particularly by spending more when the risk of negative outcomes is

high (e.g. when products are complex) and by harnessing efficiencies that come from experience and economies of scale.

Transaction Costs and Public Sector Contracting

Contracts do not always deliver on their promise: sometimes the products governments buy are more expensive than anticipated, are delayed in arrival, or do not work in the ways intended (Sclar 2000; Milward and Provan 2003; Van Slyke 2003).² For buyers, one source of risk is making sure the products targeted for purchase provide the best value. It is not enough to simply open the phone book and call the first provider on the list. In most cases, buyers need to do some comparison shopping to find the best value product for their needs. In the U.S. and Europe, contracting processes are regulated by procurement procedures that specify how governments must manage their purchasing processes, and (even unintentional) breaches of these procedures may lead to costly legal disputes (Albano and Sparro 2010).

Another risk arises when the government and vendor have different motivations for entering into an exchange (which they often have): one party may pursue its own interests, knowingly or unknowingly, at greater expense to the other party. A losing outcome for the purchasing government means receiving less in product value than what was anticipated given the price paid, while a losing outcome for the vendor means receiving less in compensation than the costs to produce and deliver the product.

Transaction cost factors influence contracting risks (Williamson 1979, 1991). Certain product characteristics – notably difficulty in specifying the product’s attributes and performance requirements, and the degree to which unique investments are required

to produce the product – create the conditions where it is easier for one party to take advantage of the other. Similarly, the potential for exploitation is higher in markets with few buyers or sellers because the aggrieved party has limited exit options in the exchange (Johnston and Girth 2012).

Both the purchaser and the vendor can take steps to mitigate contracting risks.³ They can specify the contract more precisely, detailing the product and delivery terms across a range of contingencies. They can coordinate their investments and allocate costs to ensure the contract delivers the greatest mutual gains. A transaction cost expense is the actual cost that one or both parties spend to mitigate a transaction cost risk. While a transaction cost factor may increase contracting risk – and hence the prospects of receiving less value in the exchange – a transaction cost expenditure only sits on the purchasing government's balance sheet if it expends funds to mitigate the transaction cost risk.

An example can help illustrate the differences among transaction cost factors, risks and expenditures. Imagine that a government wanted to buy a relatively unique product, like a highly customized information technology system. Such purchases have several transaction cost factors: uncertainty about product attributes and highly specialized investments to customize the product to the purchasing government's needs. These transaction cost factors can favor the vendor since the purchasing government has limited ability to evaluate the product's quality, and once the exchange begins, the specialized investments may lock the government into purchasing from just one vendor. Such transaction cost factors increase the risk that the purchasing government would be unable to respond should the seller cut corners or raise prices.

A common strategy for reducing the risk of a negative contract outcome in such circumstances is to screen potential vendors to identify those with a reputation for delivering value. Such research is a transaction cost expenditure because the government is spending money for its staff's time and effort. However, we can consider another scenario in which the government entered the contract without performing the extra background research on the vendors. While forgoing such research may seem ill-advised (Barthélemy 2001), one can imagine at least hypothetical circumstances in which it might make sense. The government might have a higher risk tolerance for the contract, it might not have the resources to conduct a more complete search, or perhaps it did not have much confidence that its research efforts would turn up much useful information. If the government chose this path, it would incur no transaction cost expenditures, but the transaction cost factors and their accompanying contracting risks would remain. Facing transaction cost risk factors, governments can choose to invest time and monetary resources to mitigate the risk or just live with it.⁴

Total Contracting Costs: Price and Ex Ante and Ex Post Transaction Cost Expenditures

The total costs governments incur when contracting include the price they pay to the vendor for the production, assembly and delivery of the product, and the transaction cost expenditures they spend to prepare, negotiate, execute, and manage the exchange (Clemons, Reddi, and Row 1993; Domberger and Jensen 1997; Cheung 1998). Ex ante transaction cost expenditures are incurred before the sale is executed, and include the expense of activities like searching for products and suppliers, preparing requirement

specifications, evaluating bidders' offerings, and negotiating contract terms (Coase 1937; Williamson 1996; Marsh 1998; Barthélemy and Quélin 2006; Melese et al. 2007). In other words, ex ante costs are incurred to “discover who it is that one wishes to deal with, to inform people that one wishes to deal and on what terms, to conduct negotiations leading up to a bargain, to draw up the contract...” (Coase 1960: 15).

Ex post transaction cost expenditures are incurred after the sale is executed, and include expenses for monitoring and enforcing contract terms, evaluating the product or service after it has been delivered, and re-negotiating the contract when circumstances require different terms. In other words, ex post transaction cost expenditures are incurred “to undertake the inspection needed to make sure that the terms of the contract are being observed, and so on” (Coase 1960: 15). Table 1 provides examples of managing, planning and coordinating activities and instruments that constitute ex ante and ex post transaction cost expenditures in government contracting.

[Table 1 here]

For governments that opt to contract, an important question is which investments are likely to generate the best value, or what is the most efficient allocation of transaction cost expenditures relative to the price and the projected return (for an overview see Bel, Fageda, and Warner 2010).⁵ Governments are more inclined to purchase when they are able to write contracts that specify deliverables in an exact manner, when vendor compliance is relatively easy to monitor, and markets are thick with buyers and sellers (Brown, Potoski, and Van Slyke 2010; Levin and Tadelis 2010; Hefetz and Warner

2011). This greater likelihood to contract is in part due to lower prices stemming from market competition, as well as lower transaction cost expenditures needed to mitigate contracting risks.

Contracting and contract management decisions become more complicated when the opposite conditions hold – products are difficult to specify, vendors are difficult to monitor, and markets are thin. Contracting when the transaction cost risks are high is less likely to deliver value (Petersen, Hjelmar, and Vrangbæk 2018). Viewed through the lens of transaction costs analyses, contract value does not mean simply minimizing the price paid for a product. Greater value comes from reducing the total purchasing costs, where total costs are a function of the price, the ex ante and ex post transaction cost expenditures, and the remaining contracting risk (Clemons, Reddi, and Row 1993: 14; Cheung 1998; Melese et al. 2007).⁶

To illustrate the scale and diversity of how much money governments are spending on transaction costs, figure 1 presents data on the ex-ante transaction costs government spending for 72 contracts. We focus here on ex-ante transaction costs, as we believe they provide an important first step for understanding transaction cost spending. The data in Figure 1 are from a database of contracts from Local Governments Denmark - a non-profit organization owned by the 98 municipalities in the country - and the Danish central government (see appendix 1 for a description of the data, collection procedures). When registering a contract in the database, local Danish government officials also provided information about the contract and contracting process, including the exact amount of salary and external expenses their government spending to prepare the tender, identify vendors, negotiate terms, and sign the final contract.

To measure ex ante transaction cost expenditures, we total all the pre-contract award expenditures identified in the entries in the Local Governments Denmark database for each contract record. This method produced a data set of governments' ex ante transaction cost expenditures, which to the best of our knowledge represents the first internationally published analysis of the actual transaction costs expenditure across a broad portfolio of products and services that governments commonly purchase.

We calculate the percentage that ex ante transaction costs comprised of total spending for each contract, following the approach of Whittington (2008) and Li et al. (2013). By using a percentage of the total contract value, we obtain a standardized measure of transaction cost expenditure relative to contract size that allows us to examine transaction costs across contracts with variable total awards. For example, ex ante transaction cost spending of \$50,000 for a contract where the government spent \$1,000,000 thus represents transaction cost spending equal to 5 percent of the contract. This expenditure is in addition to the price paid to the vendor, and are costs associated with purchasing from external providers (the "buy" option). Importantly, this measure includes both internal and external spending, thereby providing a comprehensive picture of governments' ex ante transaction cost expenditure for the sample of contracts.

The figure 1 columns represent the governments' spending on ex ante transaction costs as a percentage of total contract value from 72 contracts across 22 product categories ranging from purchasing of standardized services like refuse collection to customized products such as information technology systems.

[Figure 1 here]

Factors that Influence Transaction Cost Expenditures

Figure 1 shows that ex ante transaction cost spending varies considerably across the service categories, from a low of 0.21 percent for dental care services (for which a highly standardized private market already exists) to a high of 7.59 percent for information technology programs. The average level of ex ante transaction cost spending was 2.66 percent of the total contract value. Clearly, in some circumstances, ex ante transaction cost spending can have a big impact on governments' budgets. Of course, transaction cost spending may vary across and within these service types, often in ways that reflect the different types of underlying transaction cost factors that stem from the nature of the exchange. The remainder of this section explores these arguments in more detail and presents testable hypotheses.

Product Complexity: Contract management practices need to reflect the product being purchased. Some products are inherently more difficult to describe in advance of purchase and require upfront, specialized investments to tailor them to client specifications, as in the information technology system example described previously. These complex products are often offered in markets with few buyers and sellers. In addition, their contracting risks are higher, which encourages transaction cost spending. All in all, such products are complex. Other products, like office supplies, are easy to describe in detail or are available in more standardized and commoditized forms. Such products are simple.

Returning to figure 1, we can see that governments' ex ante spending tends to be higher when the services' underlying transaction costs factors suggest more spending is warranted. Services with lower transaction cost factors, such as refuse collection and driving/transportation, have lower ex ante transaction cost spending. Markets for such products are typically more robust, with many buyers and sellers making frequent exchanges for different versions of similar products. These product and market characteristics tend to lower the need to incur in transaction cost expenditures since the risk of negative outcomes is lower. Taken together, this argument leads to our first hypothesis.

Hypothesis 1: Contracting governments are more likely to incur transaction cost expenditures for complex products than simple products, all other factors equal.

Management and Fiscal Capacity: Contract management activities and instruments are required to mitigate the risks of transaction cost factors (Lawther 2002; Joaquin and Greitens 2012). Examples are writing Requests for Proposals, creating a system to evaluate proposals, and monitoring the vendor's performance. Just as governments make investments in managing direct service delivery, governments can likewise invest in their administrative capacity to manage contract service delivery (Brown and Potoski 2003; Romzek and Johnston 2002). This generally means hiring and training administrative, legal, and managerial staff to serve as purchasers, contract drafters, contract specialists, contract managers, and contract enforcers. Governments that have stronger management and fiscal capacity are generally better equipped to incur the transaction cost expenditures

than those with less administrative capacity. In this way, robust management and fiscal capacity create the opportunity to undertake additional expenditures on specific contract management instruments. Absent these core investments in management and fiscal personnel, governments may lack the ability to prepare and complete a tender in a way that maximizes public value. Training and employment of administrative staff contribute to transaction cost expenditures, which leads to our second hypothesis.

Hypothesis 2: Contracting governments with higher management and fiscal capacity are more likely to have higher transaction cost expenditures than governments with lower management and fiscal capacity, all other factors equal.

Contract Management Experience: Purchasing governments may also be able to reduce transaction cost expenditures by harnessing the lessons of past contracting efforts (Langlois 1992; Mayer and Argyres 2004). Experience with contracting can lower transaction cost expenditures in several ways. Experienced managers are more efficient, can more effectively identify where to invest transaction cost spending, and know more about different vendors and their reliability, prices, and product quality. Experience with contracting can lower the cost of writing contracts because the purchasing government can draw on proven approaches, and even contract language, from previous contracts for similar purchases. Experienced managers can even resuscitate flailing markets by recruiting new sellers to ensure sufficient competition and lower overall prices (Girth et al. 2012; Johnston and Girth 2012). The lessons of experience are likely to be more impactful when repeating a purchase for the same product; tacit knowledge and standard

operating procedures are more likely to transfer over time for the same product than across different types of products.⁷ Our third hypothesis focuses on the impact of experience.

Hypothesis 3: Contracting experience lowers transaction cost expenditures, all other factors equal.

Methods and Data

To assess the impact of product complexity, management and fiscal capacity, and governments' contracting experience on transaction cost expenditures we turn again to our sample of public purchases by local governments in Denmark. The data contains information about the monetary value of governments' ex ante transaction in contracts involving a range of commonly purchased services. The limited scope of our sample – 72 public contracts in one country – suggests that the analysis should be seen as illustrative rather than definitive.

We conduct a multi-variate analysis of the impact of key independent variables and controls on transaction cost expenditures, our dependent variable. The multivariate analysis uses fractional response regression with robust standard errors to account for the fact that the dependent variable measures government's ex-ante transaction costs as a percentage of the total contract value (Papke and Wooldridge 1996; Ramalho, Ramalho, and Coelho 2018).⁸ This section describes the data set and specifies how we operationalize the dependent and independent variables in our analysis.

Denmark serves as an informative setting for investigating contracting and transaction cost expenditures because all local governments in Denmark have contracting authority for a broad range of public services like refuse collection, road and park maintenance, cleaning of public buildings, solid waste treatment, job training, care of the elderly, information technology systems and much more (Petersen, Houlberg, and Christensen 2015). Danish municipalities have a high degree of autonomy and can choose to invest resources in procurement expertise, administrative capacity and other skills as they wish. Public purchasing is at the same time subject to a set of standardized European Union (EU) procurement directives, which require that municipalities follow uniform procedures for the purchase of similar products. Differences in transaction costs expenditures are thus likely to depend on contracting experience, management competencies, and product complexity, rather than differences in the formal procedures of public purchasing within and across EU countries.

Dependent Variable

Since our goal is to understand drivers of transaction cost spending, our dependent variable is the *ex ante transaction cost expenditures* reported in figure 1, which is a continuous variable from 0 to 100 percent. The variable is based on exact information about governments' monetary transaction cost expenditure and the value of each contract. The measure includes internal as well as external transaction cost expenditures. Internal expenses are the sum of time spent by internal staff times salaries, whereas external expenses relate to the use of hired consultants such as legal and financial advisors or firms specialized in contracting of specific services. The dependent variable thus

measures the sum of internal and external activities that make up governments' ex ante transaction costs in our sample of 72 local government contracts.

Independent Variables

We measure three categories of independent variables – product complexity, management and fiscal capacity, and contract management experience. We describe the operationalization of each of these constructs below.

Product Complexity: *Product complexity* measures the degree to which underlying transaction factors are present for a product category. Following the approach of other public sector contracting scholars (Levin and Tadelis 2010; Hefetz and Warner 2011), we surveyed 42 Danish local contract managers (response rate 72.5 per cent) asking them to assess the contracting difficulty of 22 product categories on a five-point scale ranging from “easy” to “difficult” (see Appendix 2 for question wording). Products with ratings closer to 5 are more complex to specify, and those with ratings closer to 1 are less complex. As per Hypothesis 1, the governments will spend more on *ex ante transaction cost expenditures* when *product complexity* is higher.

Management and Fiscal Capacity: We measure the management and fiscal capacity of the contracting government with two variables. *Management capacity* is the number of administrative staff and managers per 1,000 inhabitants in the municipality. *Fiscal capacity* is the total tax base of the municipality in Kroner per inhabitant. As per

Hypothesis 2, the expectation is that governments with more *management capacity* and *fiscal capacity* will spend more on *ex ante transaction cost expenditures*.

Contract Management Experience: Two variables measure government's experience and expertise with contract management. First, *contract management experience* is a dummy variable, scored 1 if the government has contracted for the same product before, and 0 otherwise. Second, *Government contracting percentage* is a continuous variable measuring the local government's overall purchasing from private providers as a proportion of the government's total expenditures on goods and services provided to citizens. This variable measures the degree to which the purchasing government engages in contracting across all products it delivers to citizens. As per Hypothesis 3, the expectation is that governments with greater *contract management experience* will have lower *transaction cost expenditures*.

Controls

Finally, we include two controls in our analysis. *Contract value* measures the total monetary value of the contract in Kroner, and the variable *population* controls for the size of contracting units and is operationalized as the number of residents in the government's jurisdiction. Table 2 provides the descriptive statistics for the dependent and independent and control variables.

[Table 2 here]

Results

Table 3 displays the results of our fractional response regression, with some support for the three hypotheses. Consistent with Hypothesis 1, *ex ante* transaction cost expenditures are higher when products are more complex. To interpret the magnitude of the coefficients in our fractional response regression, we transform the coefficients into average marginal effects.⁹ One unit increase in *product complexity* scale results in a 1.51 percentage point increase in *ex ante transaction cost expenditures*, holding constant the effects of other variables. For a sense of scale, recall that the average *ex* transaction cost spending is 2.66 percent of the purchasing price. Danish local governments significantly increase their spending on contract management to mitigate underlying transaction cost factors for more complex products.

[Table 3 here]

The coefficient for *fiscal capacity per capita* is significant at the 0.05 level. A one thousand Danish Kroner increase in the variable *fiscal capacity* results in a modest 0.05 percentage point increase in *ex ante transaction cost expenditures*, holding constant the effects of other variables (1 US dollar = app. 6 DKK). This suggests that Danish local governments with stronger core management and fiscal capacity are more likely to devote marginal resources to managing transaction cost risks than those local governments with limited or diminished capacity. The coefficient for *management capacity per capita* is not statistically significant, contrary to our hypotheses.

The coefficient for the variable *prior contracting experience* is also positive and significant at the 0.001 level. Danish local governments that have contracted out for the same product in the past spend more than 1.89 percentage points *less* on ex ante transaction cost expenditures than governments that have not contracted for the same product in the past, holding constant the effects of other variables. This suggests that experience generates efficiencies in contract management; transaction cost expenditures are around half the amount when governments have contracted for the same product before.

Among the controls, the coefficient for *contract value* is positive and significant at the 0.001 level. A one million DKK increase in the variable *contract value* results in a 0.03 percentage point decrease in governments' *ex ante transaction cost expenditures*. A plausible interpretation of this finding is that there are economies of scale from investments in contract management capacity; contracts for larger amounts of the same product may only require the same contract management investments as contracts for smaller amounts of that product.

Discussion: Strategies for managing transaction cost expenditures in public contracting

Target Expenditures on Transaction Cost Risks

The empirical analyses, theoretical framework, and the broader contract management literature suggest management strategies for governments to harness the upside of contracting while minimizing the likelihood of negative outcomes. The core characteristics of complex products – difficulty in specifying product attributes and

performance requirements and specialized investments to produce the product – create the conditions for opportunistic vendors to take advantage of unprepared governments. To address this risk, contract managers can spend extra effort to define product terms more precisely, perhaps by working with the product’s end users. As we have seen, some Danish local governments and central government organizations have higher ex ante transaction cost expenditures when contracting for products whose transaction cost factors suggest higher risks. And they have lower ex ante transaction expenditures when contracting for products with whose transaction cost factors suggest low risks. This extra effort cost resources – ex ante transaction cost expenditures – but should result in downstream cost savings as purchasing governments lower the risk of a negative contract outcome, or decrease the need for ex post expenditures on litigation or other means to resolve disputes between the purchasing government and the vendor.

Invest in Contract Management Capacity

Among scholars, diminished contract management capacity is cause for concern (Joaquin and Greitens 2012). Indeed, Milward and Provan’s (1993, 2000) “hollow state” illustrates the perils of governments that have neither the ability to produce products themselves nor the capacity to manage contracts with vendors. Other studies that contract management landscape is quite varied, with some governments having robust contract management capacity while others do not. Our study extends this research by demonstrating that those governments that have higher levels of financial and managerial capacity – “solid” governments in Milward and Provan’s (1993, 2000) terms – are better positioned to incur the ex ante transaction cost expenditures that mitigate contracting risks than “hollow”

governments. The lesson for local governments is that contracting may be means to achieve efficiency and ultimately cost savings (Petersen, Hjelmar, and Vrangbæk 2018), but this is in part contingent on investing in core administrative and management capacity. Stronger core management capacity means being a smarter buyer.

Harness Prior Contracting Experience

Local governments that purchased a service in the past are more likely to continue purchasing that product in the future, as well as to use the same delivery mode for similar types of services (Brown, Potoski, and Van Slyke 2015), suggesting that managers learn from practice and apply that knowledge across related domains. Our research in this article provides evidence of additional learning. Danish local governments report lower ex ante transaction cost expenditures for products that they have purchased in the past, suggesting improved contracting efficiency. These local governments may be learning that not all investments are required to improve outcomes or that specific actions are more effective than others. Governments could further harness experience by developing a contract management playbook or a set of standard practices for repeated purchases.

Leverage Fixed Transaction Cost Expenditures

Most governments invest in a set of basic ex ante transaction cost expenditures when they go to the market – writing requests for proposals, soliciting and reviewing bids, and reviewing proposals before negotiating contract terms. Our research shows that the ratio of ex ante transaction cost expenditures to total costs is lower for higher value contracts than for lower value contracts, suggesting that contracting spending offers economies of

scale. One interpretation is that some contract management investments are necessary regardless of the size of the purchase. Another plausible interpretation is that local governments can stretch contract management investments by either bundling similar purchases into one contract or adding extensions and options to an existing contract.

In the first instance, a local government might buy multiple units of the same products. This has the dual benefit of achieving economies of scale in the per unit cost of the product, while also by spreading one-time ex ante transaction cost expenditures across more units. In the second instance, a government may expend more ex ante transaction cost expenditures in purchasing the first unit of the product in order to ferret out any challenges and mitigate risk; once the purchasing government grows comfortable with the product and the vendor, rather than incurring costs to rerun the contract, the government can simply add units to the contract and thereby stretch the ex ante transaction costs over additional purchases.

Conclusion

In this article, we have reviewed key factors that influence actual ex ante transaction costs expenditures incurred by government. Some ex ante expenditures are necessary to enable transactions to occur in the first place. Our analyses further show that ex ante transaction cost expenditures are sensitive to characteristics of the goods and services being purchased and of the purchasing organization itself. Using data from 72 Danish public sector procurement transactions, we have also illustrated how such costs can increase with transactions' complexity, and decrease as public buyers add management capacity and experience. Beyond these factors, we also discuss how transaction cost

expenditures can also be investments to reduce future transaction risks, particularly those related to unforeseen events and potential opportunism on the part of vendors. Purchasing governments can have a choice between spending money early to reduce such risks, or accepting the risks and potentially great transaction costs incurred during the life of their contracts (ex post transaction costs).

Our inquiry into the determinants of transaction cost expenditures suggests some directions for future research. Effective contract management identifies contracting risks and implements the right management instruments to mitigate them effectively and efficiently. The transaction cost framework helps identify different types of contract risk, reasons why contracts may fail to deliver win-win outcomes, such as opportunistic behavior or imprecisely defined contract terms. The framework also categorizes the factors that create those risks, such as difficult to measure products or asset specific investment.

By distinguishing between transaction cost risk factors and transaction cost expenditures, our research raises questions about how to spend money effectively to mitigate risks. On the theoretical front, scholars can contribute to this objective by more clearly mapping how specific management instruments address different types of contracting risks and risk factors. Different types of management instruments may mitigate risks be more or less effective at mitigating risks. On the empirical front, an important next step is to better identify how different management instruments perform in different contexts. For example, some procedures for evaluating vendor proposals may be more relative effective in less competitive markets while others may require market competition. Such research, whether based on case studies or large samples, can then be

translated into the transaction cost framework, so that insights in one setting can inform research and practice in others.

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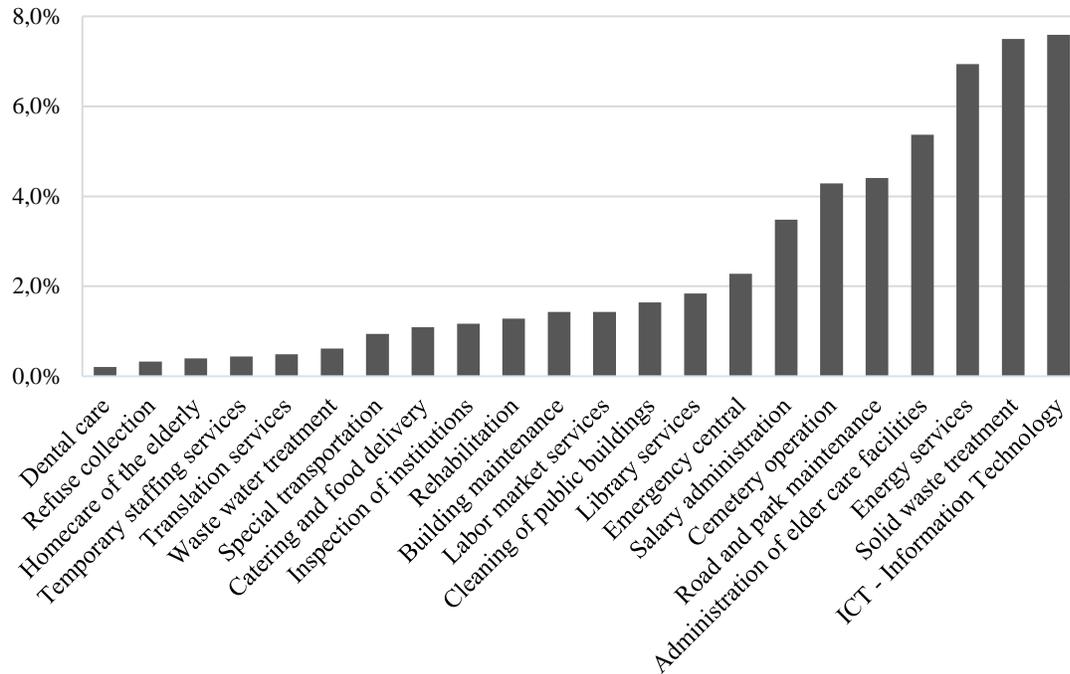
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Table 1 - Examples of Ex Ante and Ex Post Transaction Cost Expenditures

Ex Ante		Ex Post	
<i>Search</i>	<i>Negotiation</i>	<i>Monitoring</i>	<i>Enforcement</i>
<ul style="list-style-type: none"> • Scanning the market for potential vendors • Developing product requirements and specifications • Incentivizing or training potential bidders 	<ul style="list-style-type: none"> • Evaluating formal bids • Conducting reference checks of proposers • Negotiating contract terms (e.g. method of compensation) 	<ul style="list-style-type: none"> • Developing performance metrics • Gathering information from product users and other stakeholders • Assessing deliverables 	<ul style="list-style-type: none"> • Executing contract options or termination • Implementing performance incentives • Resolving disputes (negotiation, arbitration, litigation)

Figure 1 - Ex-ante transaction cost spending as a percentage of contract value for 22 local government services



Source: Sample of 72 contracts issued by 47 Danish local governments for 22 goods and services with varying contracting complexity.

Table 2 - Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
Dependent Variable				
Ex Ante Transaction Cost Expenditure (percent of contract size)	2.66	5.04	0.04	36.00
Independent Variables				
Product Complexity (scale of 1-5, 1=very easy, 5=very difficult)	3.20	0.47	2.62	4.13
Management Capacity (administrative staff/1000 inhabitants)	14.95	1.23	12.20	19.20
Fiscal Capacity (tax base per inhabitant, thousand Danish Kroner)	183.65	27.53	151.42	274.41
Contracting Experience (dummy, 0=service not contracted before, 1=service contracted before)	0.44	0.50	0.00	1.00
Government Contracting Percentage (level of private purchases in % of total service spending)	27.40	3.78	21.10	44.20
Controls				
Contract Value (million Danish Kroner)	31.27	38.55	.24	159.92
Population (thousand inhabitants)	97.25	127.00	14.14	591.48

Note: N = 72.

Table 3 - Fractional Response Regression of Impact of Independent Variables and Controls on Ex Ante Transaction Cost Expenditure Percentage

Variable	Coefficient (Standard Errors)
Independent Variables	
Product Complexity	.604 (0.301)*
Management Capacity	.241 (0.233)
Fiscal Capacity	.022 (0.010)*
Contracting Experience	-.753 (0.245)***
Government Contracting Percentage	-.030 (0.033)
Controls	
Contract Value	-.034 (0.008)***
Population	0.001 (0.001)
Constant	-11.879 (5.727)*
<hr/>	
N	72
Log pseudolikelihood	-6.169827695
Deviance	1.620881611
Pearson	1.798681975

Notes: Robust standard errors in parentheses (clustered at the 22 services).

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Appendix 1: Data sources

These data come from Local Governments Denmark, a non-profit organization owned by the 98 municipalities in the country, and the Danish central government. The database utilizes a standard template that instructs officials how to register contract information and calculate contract costs. The database utilizes includes a written guide that instructs governments about how to register information and calculate contracting costs.

Before a contract is included in the database, procurement staff working in Local Governments Denmark scrutinize the record to check that all information is accurate and in compliance with the template. This helps insure the validity of the data. Each database entry contains information about the contracting government, the product being contracted, the local government's experience with contracting for the product, the monetary value and duration of the contract, along with a brief narrative description.

During the period from which we drew our sample of contracts, the local governments were asked a series of questions about the contract and the contracting process, including the amount their government spent to prepare the tender, identify vendors, negotiate terms, and sign the final contract. This provides the means to calculate ex ante transaction costs. We use all local government cases in the database for which data on ex ante transaction cost expenditure and value of the purchase is available.

Our analysis builds on an original dataset of 72 cases documenting the ex-ante transaction costs of local government contracting. Information for the 72 cases was provided by 47 municipalities out of the 98 Danish municipalities. Assignment to the database was voluntary, meaning that the sample is non-random. The sample of contracts cover 22 different product categories to capture the diversity of goods and services that Danish local governments procure.

Table A1 lists the product categories included in our analysis.

Table A1: Product Categories

Administration of Elder Care Facilities	Inspection of Institutions
Building Maintenance	Labor Market Services
Catering and Food Delivery	Library Services
Cemetery Operations	Refuse Collection
Cleaning of Public Buildings	Rehabilitation Services
Dental Care	Road and Park Maintenance
Driving/Special Transportation	Salary administration
Emergency Services	Temporary Staffing Services
Energy Services	Translation Services
Homecare of the Elderly	Solid Waste Treatment
Information Technology Systems	Waste Water Treatment

Appendix 2: Transaction Cost Survey of Local Danish Municipal Managers

We conducted a survey of 42 local contract managers, asking them to rate the contracting difficulty of the 22 services in our sample of local government contracts on a five-point scale ranging from “easy” to “difficult”. For each of the 22 services, the respondents were asked to rank the service on the five-point scale. Below, we provide a translated version of the question wording [authors’ translation from the Danish].

Introduction text

Some tasks are easier or more difficult to describe than others. How easy or difficult do you think it is for a public contractor to write the product requirements, carry out the tender and write a contract that unambiguously describes how the supplier should solve the task?

Please provide your best estimation for the following products, regardless of whether you have specific experience of procuring the particular product.

Question formulation

How easy or difficult is it for a public contractor to write the product requirements, carry out the tender and write a contract that unambiguously describes how the supplier should solve the task?

22 products listed, please see appendix 1.

¹ Some research has put dollar values on transaction costs in market exchanges among private sector actors. For example, Dyer & Chu (2003) examine the transaction costs of suppliers to large car manufacturers in the US, Japan and South Korea. There are also a few studies on transaction costs in government procurement of construction facilities (Soliño and Santos 2010; De Schepper, Haezendonck, and Doods, 2015) and military acquisitions (Melese et al., 2007). However, we are not aware of any research that measures transaction costs' financial value across a range of services in the public sector, which we remedy in this article.

² We use the generic term “product” to refer to both goods and services.

³ In this article, we focus on transaction cost factors that impact the behavior of the two parties to the exchange and ultimately the transaction cost expenditures required to mitigate the transaction cost risk. There are other transaction cost factors that influence transaction cost expenditures, for example bulk purchasing may lower per unit administrative costs.

⁴ Some costs of planning, coordinating and executing a transaction are essentially unavoidable in some circumstances. For example, we can watch just about any movie we want online, but to get the “big theater experience,” we need to transport ourselves to our local cinema.

⁵ It is important to highlight that our presumption is that a government has chosen to “buy” rather than “make” a product. Internal production can also come with expenditures analogous to transaction costs, such as hiring employees, monitoring their behavior, evaluating their performance. Williamson (1981) call these “governance costs.” In making the decision to make or buy a product, a government can weigh both the production costs and the transaction costs of external versus internal production. Here we focus on the transaction costs associated with government buying, as previous research on this issue has been particularly scarce.

⁶ Here we use risk as a “cost” to mean the probability that a negative event happens multiplied by the value lost should that event happen.

⁷ While we leave this effect aside in the present analysis, another consequence of experience for contractual relationships can be greater trust, which is likely lower transaction costs over time. Experience builds reputations among buyers and sellers. Reputations for trustworthiness can decrease transaction costs on both sides of the transactional relationship (Dyer and Chu 2003), e.g., by reducing demands for guarantees, complex contracts, and detailed monitoring.

⁸ The analyses use the generalized linear model (glm) specification in Stata version 15.1 and specify the family as binomial and link as logit. All models include robust standard errors clustered at the 22 services.

⁹ To implement this specification, we specify our GLM models as explained in the methods section and calculate the marginal effects by using the *margins, dydx(*)* command in Stata 15.1.