

The Role of Buyers' Competence

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Abstract

The competencies of procurement office personnel represent a key asset for both private and public buyers. Policy makers often advocate for greater professionalization of procurement personnel (European Commission, 2017a), but to what extent does the evidence support such claims? A series of recent studies have shed new light on the interaction between the set of competencies of public buyers and the outcomes of public procurement contracts. In this chapter, we first review the evidence from these studies and then discuss their implications for emergency procurement.

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JEL Classification: D44, H11, H57.

1. Introduction

Procurement meets an organization's demand for goods and services. An organization realizes value for money if the acquisition process buys inputs of the right quality, in the right quantity, to the right place, at the right time, and at the right price. Furthermore, procurement can serve as an indirect tool to pursue other goals; in public organizations, for example, it is increasingly instrumental in achieving sustainable and inclusive growth (OECD, 2017).

To achieve these functions, procurers must appropriately handle a multiplicity of tasks, including choosing the tender format, tender specifications, and award criteria, drafting the contract to append to the tender, handling purchasing risks, and monitoring the contract execution. This complex and multifaceted nature of procurement makes the role of the bureaucrats working as procurers pivotal for the organization's functioning and objectives. Indeed, policy makers around the world increasingly recognize the importance of improving procurement efficiency by making use of specialized skills and competencies (OECD, 2019; EC report XX). Consistent with this view, recent results in the economic literature, which we review below, highlight the importance of the buyer's role in explaining procurement outcomes.

2. Recent contributions on the role of buyers' competence

The quantification of the role of buyers' competence as a determinant of procurement outcomes is an elusive research question due to the severe measurement problems that this task involves. Recent work by Decarolis et al. (2020) gives one of the first quantitative assessments of the influence of bureaucratic competence on complex procurements, including public works and services, in a developed country like the United States.

The most common empirical design to measure the buyers' role has traditionally been the usage of a fixed-effects strategy. Some of the studies following this approach include Bandiera, Prat, and Valletti (2009), Best, Hjort,

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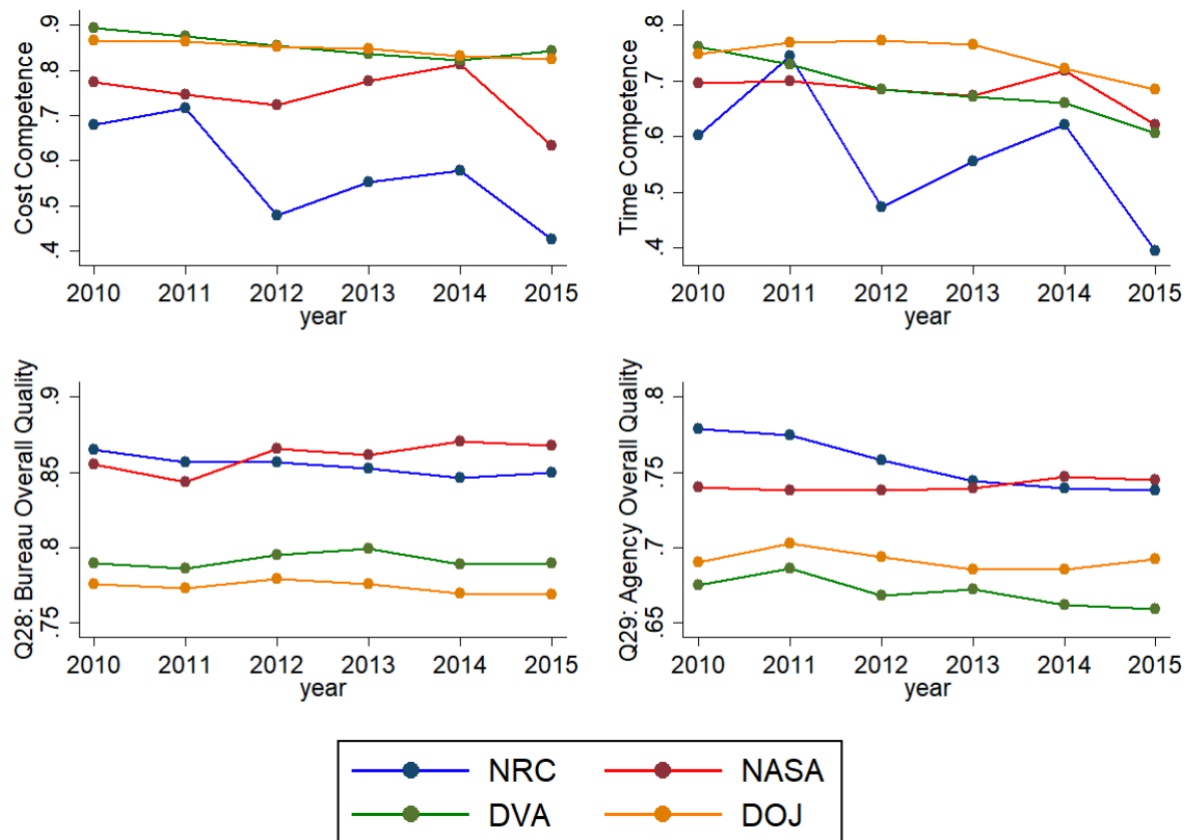
and Szakonyi (2017), and Bucciol, Camboni, and Valbonesi (2020). This approach, however, typically requires some selection in the set of offices analyzed (as it requires sufficient variability in the data) and, even more crucially, it leaves open the question of what exactly the buyer fixed effect captures. The contribution in Decarolis et al. (2020) is precisely that of filling this gap in the literature by showing how extensive survey data on US government employees can be combined with a large contract level dataset to quantify a notion of bureau competence and then tie it to procurement performance.

The authors exploit a large data source on the characteristics of the US federal workforce: the Federal Employee Viewpoint Survey (FEVS). This survey has been administered to nearly all US government agencies for more than ten years with the same questions, eliciting responses from roughly one-fourth of all federal employees each year. The comprehensive nature of competences is captured by the generality of the questions used in the survey.

In the context of public procurement, the complexity of these tasks and the relevance of the buyers' role in performing them is likely more pronounced in the purchase of non-standardized goods, works, or services as their procurement necessitates more specific knowledge from different sectors and multiple players inside the organization. This implies that, while price dispersion can be used to gauge efficiency in the procurement of standardized items, price comparisons are meaningless in the procurement of complex, heterogeneous goods. This poses the question of which performance metric is appropriate. Time and cost renegotiations (i.e., delays in contract execution and cost overruns), along with the overall number of renegotiation episodes, are the three metrics used in Decarolis et al. (2020). They are observable in the US context thanks to an integrated data system like the Federal Procurement Data System (FPDS), which keeps track of every contract action. They also capture well the economic notion of Williamson (1971)'s transaction or "haggling" costs, and, in fact, have also been used in past studies on work contracts (see, among others, Bajari, Houghton, and Tadelis, 2014).

A second issue with measuring competence is the association between more complex contracts and more competent buyers: a buyer's performance may be persistently mediocre merely because it must cope with complex contracts. Because more complicated contracts are inherently more likely to result in renegotiations, an omitted variable problem is expected to skew downward the estimates of the effects of competence. This point is well explained by the following example, which is also graphically illustrated in Figure 1: in terms of both delays and cost overruns, the performance of the two least competent agencies (the Department of Veterans Affairs and the Department of Justice) is superior to that of the two most competent agencies (NASA and the Nuclear Regulatory Commission).

Figure 1 Cost and time competence, overall quality, and bureau and agency level



An instrumental variable strategy is the approach followed by Decarolis et al. (2020) to solve both measurement errors and reverse causality issues. The strategy relies on exogenous changes in bureau competence based on the death of specific sorts of employees:² the 'relevant employees' are those who are likely to occupy managerial positions based on their relative age and salary. The data come from FedScope, which covers detailed, employee-level data from Office of Personnel Management's Enterprise Human Resources Integration-Statistical Data Mart. The assumption underlying the IV strategy is that more competent offices adopt superior managerial practices, routines, and processes that are less reliant on specific individuals and more resilient to hazards, such as the unexpected loss of a key employee. They find that an unexpected loss induces an average reduction in competence of 0.16 standard deviations. When key employees die unexpectedly, more competent offices experience less disturbance, including disruption in procurement performance, than less competent offices.

The IV estimation strategy shows a causal effect of bureau competence on procurement outcomes that is an order of magnitude larger than the corresponding OLS estimate. In particular, an increase in competence of one standard deviation reduces the number of days of delay by 23%, cost overruns by 29%, and renegotiations by half. To explain these magnitudes, they report that if all federal bureaus achieved NASA's bureau "John Glenn Research Center at Lewis Field" high level of competence (corresponding to the top 10% of the competence distribution), contract execution delays would be reduced by 4.8 million days and cost overruns would be reduced by \$14.7 billion across the entire sample studied (841 thousand days and \$2.6 billions, respectively, on a yearly basis). Furthermore, a one-standard-deviation improvement in competence results in 0.5 (40 percent) and 0.8 (71 percent) fewer cost and time renegotiations, for a total of 1.3 (52 percent).

In related work, Decarolis et al. (2021) study the impact of the buyers' role on innovation procurement. When it comes to procuring innovation, public buyers are even more critical to the project's success: they need to conduct internal and market assessments to identify government needs and the state of potential supply,

² This approach is in the spirit of a related study on the effect of public officials' workload by Warren (2014).

translate needs into functional requirements, design complex tenders and award mechanisms, and manage contract execution, which can take months, if not years, after the contract is awarded. Given the trend towards a more strategic role for Innovation Procurement as an instrument to increase competitiveness and growth (see OECD, 2017), measuring and enhancing the role of public buyers is of utter importance.

However, when the goal of a contract is innovation, usual measures used in the procurement of standardized items, such as unit prices, or in the procurement of works and services, such as delays and cost overruns, have limited value. To address this problem, Decarolis et al. (2021) combine the procurement data with the 3PFL Database of Federally Funded Patents (3PFL) collected by de Rassenfosse et al. (2019). This database links information on patented inventions (namely, the number of patents, their associated citations and claims) to the U.S. federal procurement contract of R&D that originated it. Although only a small share of contracts involve R&D produce patents (5.34 percent), a few of them (31.7 percent) produce more than one patent. Thus, the number of patents, as well as their citations and claims, are the main outcomes that the authors use to evaluate the role of public buyers, once again by exploiting the information on the public workforce produced by both the Office of Personnel Management.

The empirical strategy in this study is similar to that reviewed above of Decarolis et al. (2020). The main reason is that the variability across bureaus is more limited in the case of the analysis of innovation outcomes: the Department of Defense (DoD) accounts for most of R&D contracting, representing about 85 percent of the procurement cases in the data.³ Nevertheless, at the center of the empirical strategy there is still the variation produced by unexpected death events of 'relevant employees,' as determined by age and salary figures for managerial positions. The analysis indicates that the main source of disruption is associated with death events that occur in the six months leading up to the contract award. These events have a significant, negative impact on the innovation outcome indicators: a 1% increase in relevant employee fatalities results in a 32.3 percent decrease in patents per contract, 20.5% patent citations per contract, and 34.3% patent claims per contract. Unexpected managers' deaths occurring during the contract management phase following the contract's award, on the other hand, have a smaller effect, although still statistically significant. When mortality events occur among individuals who are less likely to cover managerial jobs, no consequences are observed.

These findings show that the death of a manager causes a loss of specialized human capital that is difficult to replace. This interpretation is consistent with practitioners' views that high technical skill is required for project management in the procurement of innovation. When comparing the Army and Air Force to the Navy, for example, the consequences of mortality on innovation results are more relevant. This is in line with the fact that the latter department relies less than the other two on project managers with technical knowledge (Rendon et al. 2012).

A final feature that is noteworthy in both Decarolis et al. (2020) and Decarolis et al. (2021) is that they look into what features qualify a bureau as "competent." By exploiting a series of questions in the FEVS data, they classify three main components of bureau competency that are observable through these survey data: staff cooperation, incentives, and skills. More in details, the data allow the authors to measure features like the self-perceived level of the bureau's talents, incentives, and intra-office cooperation at the bureau-year-State level. For all of the procurement outcomes considered, they find evidence of a relationship between cooperation and improved procurement outcomes, no effects of skills or incentives, either directly or indirectly through their interaction with death events.

The importance of cooperation is in line with the belief that successful procurement involves the ability to effectively manage and coordinate a variety of tasks involving many personnel and offices. These findings suggest that better working environments will not be enough to compensate for the loss of specialized human capital at the workplace. While some of these are likely to be unique to the federal agencies in the sample, the conclusion on the importance of the pre-award period is consistent with the core characteristics of complex procurement.

3. Lessons for Covid procurement

Four main lessons can be derived from the above results and are relevant for procurement in emergency times. First, a competent procurement workforce is a crucial element of a successful procurement. In 1976, the Federal Acquisition Institute (FAI) was established with the goal of supporting the development of the federal acquisition workforce and improving procurement capabilities in the United States. Recent policy

³ See Carril and Duggan (2019) for a recent study of the DoD's procurement practices involving non-R&D outcomes.

initiatives in Europe consider the introduction of qualification systems for public procurers as a required reaction to the increased discretion allowed to them by the Procurement Directives 24 and 25 of 2014. Some European professional organizations had already created optional qualification systems for individual procurers (see, for example, the UK Chartered Institute of Procurement & Supply). Existing certification programs, on the other hand, have mostly aimed at single contracting officers.

Second, managerial capabilities in public procurement offices are of major importance. The findings of the relevance of cooperation for both innovation and non-R&D procurement, as well as those about the lack of relevance of the measures of skills and incentives clearly point to the relevance of managerial capabilities.

Third, building resilience to adverse shocks is important. An emergency situation like that of Covid-19 that hit at a different time the different countries and the different regions within the countries suggests that the ability to move tasks between different individuals and offices can be a crucial asset in times of an emergency to ensure that adequate human resources are available for the procurement activities.

Fourth, a more indirect but still important implication from the studies reviewed above regards the crucial role of having an adequate degree of concentration of both procurement offices and contracts. At the level of procurement offices, some centralization is necessary in order to concentrate resources and offer in a cost-effective way the specialized training discussed in the first of the four policy implications described above.⁴ Similarly, at the level of contracts, larger procurement processes, especially if structured in the form of framework agreements (i.e., indefinite time/quantity contracts) allow for broader ranges of public organizations to benefit from the competence of the specialized workforce that can design and tender off these contracts.

⁴ Both Bandiera, Prat, and Valletti (2009) and Chiappinelli (2019) suggest some degree of centralization to improve procurement efficiency of municipalities and utilities in Italy.

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