

## CONTRACTING FOR GOVERNMENT SERVICES: THEORY AND EVIDENCE FROM U.S. CITIES\*

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Local governments can provide services with their own employees or by contracting with private or public sector providers. We develop a model of this ‘make-or-buy’ choice that highlights the trade-off between productive efficiency and the costs of contract administration. We construct a dataset of service provision choices by U.S. cities and identify a range of service and city characteristics as significant determinants of contracting decisions. Our analysis suggests an important role for economic efficiency concerns, as well as politics, in contracting for government services.

### I. INTRODUCTION

THE LAST TWENTY-FIVE YEARS HAVE SEEN INTENSE DEBATE about whether the private sector can provide a variety of public services more effectively than the government. The debate has touched on services ranging from education, healthcare and transportation to trash collection and street repair. In addition to the normative question of what role government should assume in providing services, it has also raised the positive question of what determines government privatization decisions in practice.

There are at least two accounts of government privatization decisions. One view, which focuses on transaction costs, looks by analogy to private sector ‘make or buy’ decisions (e.g. Williamson [1985], Hart, Shleifer and Vishny [1997]). In this account, privatization is dictated by efficiency considerations. An alternative view, advanced by Boycko, Shleifer and

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Vishny [1996] among others, emphasizes the private benefits to politicians of keeping service provision inside the government. This view holds that privatization tends to occur only in response to external pressure such as citizen discontent or tight budgets. An analogous account of the private sector would emphasize the private benefits of control that accrue to managers, and the role of shareholders in disciplining managers.

In this paper, we study the determinants of privatization at the level of U.S. city government. City government is a useful level at which to study privatization for several reasons. First, we observe many cities making decisions about service provision in parallel; in this sense cities are a useful laboratory for making statistical comparisons. Second, cities provide a wide range of services: from mundane services such as street repair and trash collection to complex services such as law enforcement and education. Third, cities differ in a variety of interesting ways – by size, location, economic conditions and form of government. Finally, local government service provision is important from both an economic and public policy standpoint. Local government spending (counties and cities) equals about one per cent of GDP in the United States.

We start with a simple model of procurement in which a government must arrange delivery of a service from an agent. The government can write a contract that specifies the time the agent must spend on the job and a set of performance requirements. Assume that specifying and enforcing a time requirement has minimal cost, but there are non-trivial costs to establishing and maintaining a set of performance requirements. Provided the government cares only about what is actually delivered, we show that an optimal contract must take one of two forms. The government either pays the agent for meeting a minimal time requirement or for meeting a performance requirement, but not both. These forms of contracting capture, in a rough way, the two most common ways that governments provide services: inhouse provision using salaried city employees and performance requirements contracts with private sector firms.

In our model, inhouse provision suffers from productive inefficiency due to the weak incentives of employees, but enjoys low contracting costs. In contrast, the productive efficiency of performance contracts comes at the cost of specifying and implementing performance requirements. This leads to predictions about how privatization decisions will vary across services. Services for which it is harder to write, monitor or adjust performance standards are more likely to be provided inhouse. The same will be true of services for which city administrators are more sensitive to the ultimate quality provided.

These trade-offs may play out differently across cities. For instance, cities may need to be a certain size to produce a given service inhouse with any sort of efficiency, leading to different choices across different sized cities. Moreover, if the relevant city administrator is more politically motivated, he or she may place more emphasis on the benefits provided by supplying a

service in a certain way (e.g., from higher quality service or from satisfying the demands of a union) and less on the costs of service provision. This will lead to less privatization.

We use the theoretical model to motivate an empirical analysis of privatization by U.S. cities. For obvious reasons, we cannot approximate a large-scale randomized research design that would allow us to quantify precisely how changes in contracting costs or city characteristics affect contracting practices. Rather what we can do is document broad patterns in contracting practices and relate them to our model and other ideas proposed in the theoretical literature. We take this as the goal of the empirical work.

Our analysis makes use of survey data collected by the International City/County Management Association (ICMA). The data documents how a set of just over a thousand U.S. cities provide a range of services, from public works and transportation (road construction, street cleaning, residential and commercial waste collection), to safety (fire, police, emergency services), health and human services, parks and recreation, cultural programs and administrative support functions. Over eighty per cent of services are provided either inhouse or through contracts with private sector firms. A smaller but still significant set of services is provided through contracts with other public agencies. We view public contracts as somewhere between the inhouse and private contract extremes – for instance, a substitute for inhouse provision for a city that is too small to provide a certain service effectively, or alternatively, a way to contract for a service while still retaining somewhat more control over production than may be the case with a private provider.

We complement the data on service provision with data from U.S. Census and other sources that describe city demographics, form of governance, political leanings, and so forth. Of course, a central prediction of efficiency-based theories is that difficulties in specifying and administering performance requirements are likely to reduce privatization. To quantify these difficulties, we surveyed a set of city administrators, asking them to assess twenty-nine city services along a number of salient dimensions.<sup>1</sup> We use this data to construct a measure of performance contracting difficulty.<sup>2</sup>

Our main empirical findings can be summarized as follows. First, services for which it is harder to write and administer performance contracts are less likely to be privatized. The effect is substantial. A one standard deviation

<sup>1</sup> Our first version of the survey included thirty-two services. We dropped two to reduce the survey length, and a typographical error resulted in the name of one of the other thirty services being switched, leaving us with complete and accurate data on twenty-nine services.

<sup>2</sup> Our implicit assumption is that dimensions of contracting difficulty are largely related to service characteristics, rather than being highly idiosyncratic to a given city-service pair. As we discuss below, this view is supported by a tight correlation between the survey responses of different city managers. We also supplement this survey with another survey to provide some 'external validity' as discussed in section IV.

change in contracting difficulty is associated with a change in the probability of being privatized of eight percentage points – that is, a forty percent reduction in the likelihood of privatization. The relationship is more pronounced for larger cities. One explanation is that these cities have the resources to use inhouse provision and perhaps also a more readily available pool of external providers. Newer cities also appear to be more sensitive to contracting difficulty, consistent with a view that governance in these cities is less political, perhaps due to a smaller public union presence, and more focused on economic trade-offs. We also find that services ranking lower in terms of resident sensitivity to quality are more likely to be privatized. One interpretation suggested by our model is that city administrators focus more on the costs of providing these services than on the benefits, and so opt for a less expensive service level.

In addition to the variation *across services*, our data reveal substantial variation in privatization patterns *across cities*. For instance, cities in the western states are considerably more likely to contract for service provision, both to the private and to the public sector. A similar pattern is observed for newer cities. We also find a striking pattern in city size. The smallest cities are the most likely to contract with other public agencies, perhaps to take advantage of economies of scale. At the same time, large cities make the greatest use of privatization, and are the least likely to provide services inhouse. As noted above, we also find evidence of political effects. Cities run by an appointed manager, rather than an elected mayor, are more likely to contract for service provision, although the effect is relatively modest.

The bulk of our analysis focuses on identifying city and service characteristics that are associated with privatization. In the final section, we provide some suggestive evidence on the relationship between privatization and city expenditures. We document that, controlling for the mix of services that cities provide, cities that do more private sector contracting spend notably less per capita. Though it is difficult to infer causality given the available data, the result is consistent with our modeling approach and suggests possibilities for future research.

Overall, our results indicate that a transaction cost view of privatization provides a useful framework for explaining local government contracting patterns. Notably, however, our results do not allow us to distinguish very clearly between the distinct sources of transaction costs that have been suggested in the theoretical literature. When we try to separate out problems with performance measurement, the potential for holdup, and the desire for control and flexibility, we find our survey measures of these problems to be so highly correlated across services as to be essentially impossible to disentangle. In light of this, our view is that decomposing specific sources of transaction costs is likely to require more detailed data, most likely on contracting outcomes as well as choices.

This paper relates to both the economics literature on contracting and integration decisions and the public administration literature on city

practices.<sup>3</sup> In particular, our modeling approach draws on Williamson [1975, 1985] and Holmstrom and Milgrom [1991].<sup>4</sup> More broadly, we follow Sclar (2000) and Warner and Hebdon [2001], among others, in taking a transaction cost-based view of local government privatization decisions. In this line of work, the papers most closely related to this one are by Brown and Potoski [2003a, b], who also collect an original survey with an emphasis on contracting difficulties. We discuss the relationship between our results and theirs later in the paper.

In terms of studying political variation across local government, Lopez-de-Silanes, Shleifer and Vishny [1997] use U.S. Census data to relate contracting patterns to government characteristics at the level of U.S. counties. They emphasize that state laws restricting political hiring or imposing budget constraints on local governments might affect contracting choices. To relate our empirical findings to theirs, we perform a similar exercise using cross-state variation in state laws at the level of city contracting. We defer a detailed comparison until Section VI.

## II. LOCAL GOVERNMENT SERVICE PROVISION: AN OVERVIEW

A typical city in the U.S. provides about forty distinct services, ranging from public works (street repair and garbage collection), to public safety (police and fire), to animal control and maintenance of public recreation areas. Many city services are relatively labor intensive. Capital equipment required to provide services (e.g., police cars, fire trucks) tends not to be highly specialized to a particular city, although there are exceptions, such as municipal libraries, hospitals or sewage treatment facilities.

City services are provided by a combination of city employees and private and government contractors. Exactly what services a city government is responsible for providing often depends on a variety of historical and institutional factors.<sup>5</sup> Once provision is decided, however, city administrators have some flexibility in determining how best to provide a given service. The city managers to whom we have talked all emphasize that both economic and political factors go into their decisions.

There is variation across cities in the form of governance. The two most common forms for city government are Council-Manager and Mayor-Council (other forms of governance such as town meetings and direct ballot

<sup>3</sup>Our paper also relates to the broader and extensive literature on privatization, much of which has focused on privatization at the level of national governments. The collection edited by Bailey and Pack [1995] is one entry point to this research.

<sup>4</sup>There is some recent empirical work that studies the relationship between multi-task problems and make-or-buy decisions in the private sector. See, e.g., Baker and Hubbard (2003).

<sup>5</sup>These can be quite idiosyncratic. For instance, the city government of Stanford's neighbor, Menlo Park, California, is not responsible for the city's fire department, which instead is run by an independently elected commission.

referendums are relatively rare). A Council-Manager government consists of an elected city council that is responsible for city policies, and a professional city manager, appointed by the council, who is responsible for administration. The city council is generally prohibited from interfering with the city manager's administration, but can remove the city manager at any time. In contrast, a Mayor-Council government consists of an elected mayor who serves as the city's chief administrative officer and an elected council that forms the city's legislative body. Cities with a mayor may also appoint a professional city manager, but the mayor has authority over city operations. Whether a city government is headed by an appointed manager or an elected mayor, there is typically a hierarchy of department managers responsible for service delivery. Contracting decisions generally are made by the mayor or manager together with the department head who bears responsibility for implementing the decision.

The ICMA surveys provide a snapshot of how city services are provided. The 1,043 cities in our sample provide an average of 39.5 services. Of these, 60% were delivered using only city employees, 20% were provided using at least some private sector contracts, 12% were provided through contracts with another public agency, such as the county or a neighboring city,<sup>6</sup> and 4% were provided by less common channels, such as franchises, vouchers, or volunteers.<sup>7</sup>

The analysis in this paper is purely cross-sectional, but it is worth commenting on general trends in city contracting. Despite popular press stories about public school contracts and other high-profile privatization decisions, data from ICMA surveys performed at five year intervals between 1982 and 2002 show little evidence of any aggregate trend in contracting behavior. Ballard and Warner [2000] and Hefetz and Warner [2004] argue that decisions to contract out services are balanced by decisions to bring contracted services back in-house. So it is possible that the broad pattern of city contracting is roughly stationary, though individual cities are adjusting on the margin.

### III. CONTRACTING FOR SERVICES: THEORY

We model the choice between external contracting and internal service provision as one of contractual form, where we associate external contracting with the use of detailed contracts specifying performance requirements and internal provision with the use of salaried employees. This view seems particularly appropriate for local government service provision; it might also be useful for thinking about private sector make-or-buy decisions.

<sup>6</sup>In some states, cities may also form partnerships to provide services. For instance, in California, two or more public agencies may join together under a joint powers authority (JPA) to provide a service. Fire protection in San Mateo is provided by such an arrangement. We consider this a form of public sector contracting.

<sup>7</sup>These numbers sum to less than one hundred per cent because for about four per cent of city-service pairs the method of provision is not recorded in our data.

The model highlights a trade-off between productive inefficiencies that arise from using salaried employees and the costs of specifying and administering more productive performance contracts. This leads to a clear set of empirical predictions on which to base our empirical analysis.

### III(i). *Technology, Endowments and Preferences*

A city administrator, or principal, wishes to procure one unit of a good or service from an agent. The city administrator cares about service quality and the costs of provision. We interpret quality broadly and say that output is of higher quality if it produces more gross surplus. For example, the quality of street repair is higher if potholes are fixed in a timely manner. Similarly, police services will exhibit higher quality if there is a faster and more adequate response to the various public safety problems that arise.

The value of higher quality can differ across cities and services, and may vary with the engagement of city residents or political constituencies. We let  $s$  denote the administrator's sensitivity to service quality. If the quality provided is  $q$ , the sensitivity is  $s$  and the costs of provision are  $k$ , the principal's net benefit is  $V(q, s) - k$ . We assume that  $V_q(q, s) > 0$  and  $V_{qs}(q, s) > 0$ . The latter condition means that a city administrator with a high value of  $s$  is willing to spend more to secure an increase in quality; that is, she cares more about service benefits relative to costs. To guarantee a unique optimal contract, we also assume that there are decreasing returns to quality, so  $V_{qq}(q, s) < 0$ .

For simplicity, assume that labor is the only variable input relevant for the quality of service that is provided. Specifically, assume that service quality is given by the production function  $q(e, t) = (\rho + e)t$ , where  $t \geq 0$  is time spent on the job,  $\rho > 0$  is baseline productivity and  $e \geq 0$  is the agent's effort intensity (e.g., attention to detail, problem-solving activities or physical exertion).

The agent is endowed with  $T$  units of time that can be allocated between working for the principal and working in an outside competitive labor market. The outside job requires no effort intensity and pays a reservation wage  $r > 0$  per unit of time. The agent has preferences over income and labor costs. If he is paid  $w \geq 0$  and spends  $t$  hours on the job at an effort intensity  $e$ , his utility is  $w + (T - t)r - c(e)t$ , where  $c(e)$  is increasing and convex.

### III(ii). *Contracting on Time and Performance*

Following common practices in procurement, we assume that the principal can write a contract that specifies two requirements: performance and time spent on the job. For instance, if the principal wanted the agent to provide landscaping services, the contract could specify performance requirements such as the frequency for trimming certain trees and bushes, the amount of weeds allowed per square yard, and what composition of fertilizers were to

be used. Alternatively, the contract could specify that the agent spend forty hours a week providing landscaping services as directed by the principal. While time and performance requirements are contractible, however, we assume that labor intensity is not. This implies that the agent will always have some discretion over how hard to work.

A contract therefore is a triple  $(\hat{w}, \hat{q}, \hat{t})$ , where  $\hat{t}$  specifies a minimum amount of time the agent must spend on the job,  $\hat{q}$  specifies a minimum quality standard, and  $\hat{w}$  specifies the amount the principal will pay the agent if the time and performance standards are met.

We make an important, and in our view realistic, assumption that there are costs both to write and enforce contracts. To keep things simple, we assume that the costs of specifying and monitoring compliance with  $\hat{t}$  are almost negligible, but it is costly to specify and verify compliance with a quality standard  $\hat{q}$ . For example, to meet certain quality thresholds several things may need to be described in advance, such as lists of instructions and *ex post* measurement procedures (Bajari and Tadelis [2001], Tadelis [2002]). Furthermore, to verify the delivery of  $\hat{q}$  the principal will often have to rely on a certain monitoring and measurement technology that has its own set-up and operating costs (Barzel [1982]).

We assume that to specify a minimal standard of  $\hat{q}$ , the principal must expend costs equal to  $d(\hat{q}, m)$ . The parameter  $m$  is intended to capture difficulties in contracting, such as the difficulty of describing performance requirements *ex ante* or of adjusting them over time, or the difficulty of measuring and monitoring quality. Accordingly, we assume that  $d_m > 0$ . We also assume that  $d(0, m) = 0$  and  $d_{\hat{q}} > 0$ , so that specifying and monitoring a higher quality standard is more costly, but there is no cost if no standard is specified.

### III(iii). *Optimal Contracts: Employment versus Specific Performance*

Suppose the principal and agent agree to a contract  $(\hat{w}, \hat{q}, \hat{t})$ . If the agent intends to honor the contractual requirements, he faces two constraints. The *employment constraint* states that he must spend at least the specified amount of time on the job,  $t \geq \hat{t}$ ; the *performance constraint* states that he must deliver at least the specified quality,  $q \geq \hat{q}$ . The following result turns out to be very useful.

*Proposition 1.* An optimal contract either specifies a quality standard or a time requirement but never both.

The formal proofs of this and other results are relegated to an appendix. The intuition is as follows. Because contracting is costly, it could only be optimal to specify both requirements if it resulted in both the employment and performance constraints binding for the agent. But if both constraints were to bind, then the agent could deliver the same quality at lower utility cost by substituting effort for time. As the principal cares only about quality and cost, he would do better to drop the time requirement and lower the

wage. Simply put, if the principal specifies the final product  $\hat{q}$ , then telling the agent how to do the job can only increase costs because without this direction the agent has the right incentives for cost minimization.

This result not only simplifies the problem, but adds meaning to the contractual relationship. Namely, an optimal contract  $(\hat{w}, 0, \hat{t})$  that specifies time and not performance looks very much like an *employment relationship* in which the agent agrees to spend a fixed amount of time on the job, does not expend excessive effort, and cares little about what needs to be done. In contrast, an optimal contract  $(\hat{w}, \hat{q}, 0)$  that specifies only performance looks very much like a *contracting relationship* in which the agent has all the discretion over how to allocate his time and effort, and he is bound by the performance specifications of the contract.<sup>8</sup>

### III(iv). *Characterizing Optimal Contracts*

Proposition 1 concludes that only one dimension of contracting will be used. Since quality provision can be accomplished by either kind of contract, it is useful to specify the costs of each contracting mode. The logic of Proposition 1 almost immediately implies the following result:

*Proposition 2.* For any quality level provided, the payment to the agent in an employment contract is higher than in a performance contract.

Because the agent's choice of production inputs is constrained under an employment contract, the labor cost of producing quality  $q$  is lower under a contract that simply specifies a performance requirement. Note that Proposition 2 states that *ignoring contracting costs*, performance contracts will result in more efficient production. That is, fixing a level of quality, the productivity of labor is higher when the principal chooses to use performance contracting.

Accounting for contracting costs, however, implies that a performance contract imposes additional costs above and beyond direct production that are not incurred if an employment contract is used. The optimal contract will weigh the added contractual costs of using performance contracts against the added benefits of the increased labor efficiency and lower labor costs. Hence, we are interested in how the optimal contract varies with the principal's sensitivity to quality  $s$  and the difficulty of specifying and enforcing performance standards  $m$ . Our next result provides a characterization.

*Proposition 3.* (a) If contracting difficulty  $m$  increases, the principal will be more likely to use an employment contract, while the optimal quality may

<sup>8</sup> The view of employment that we adopt here is reminiscent of Holmstrom and Milgrom [1991], who emphasize that employment is characterized by *exclusion*. In our model, a salaried employee is excluded from working in the outside market during the contracted time  $\hat{t}$ , meaning that on the job he will do what is desired, only at a low baseline productivity.

increase or decrease. (b) If in addition  $d_{q\hat{q}} > 0$ , so that increases in performance standards come at increasing cost, then if the importance of quality  $s$  increases, the principal will be more likely to use an employment contract.

The first claim is straightforward: increased costs of specifying performance standards will reduce the use of specific performance contracts. The second claim rests on additional assumptions about how contracting costs increase at higher quality levels, so that employment contracting becomes more efficient at higher quality levels. Bajari and Tadelis [2001] provide a model and some arguments for why our assumptions might be valid, and the idea that contracting is used for low-quality service provision seems to be aligned with common practitioner views. Our empirical results test the underlying assumption by looking at the relationship between contracting and a proxy for resident sensitivity  $s$ . The results support the view that greater sensitivity is associated with less privatization, as is implied by the Proposition.

The model focuses on an economic cost-benefit trade-off, taking as given the preferences of the city administrator. These preferences (and also the process through which decisions are made) may be subject to political forces. Politics might affect the choice of quality or the decision of whether to contract. In particular, we might expect that a politically motivated manager might over-deliver quality on particularly salient services and under-deliver elsewhere. This would reinforce the relationship between resident sensitivity and contracting predicted by the model. Politics might also affect the service delivery decision by driving one away from cost-minimization, and here the situation is more ambiguous. For instance, in some cities, patronage jobs may be very important. In other cities, the ability to reward contracts to campaign donors may be an issue. As a general point, one might expect political issues to dull the relationship between contracting decisions and transaction cost difficulties.

### III(v). *Relating the Model to Data*

In this section, we describe the empirical implications of the model and how some simple extensions generate additional hypotheses that we will consider in our empirical analysis.

Before turning to these predictions, we address one preliminary issue of interpretation. The model focuses on the choice of contractual form, while we have data on the use of contracting versus inhouse provision. Matching the theory to the data therefore requires us to interpret employment, or inhouse provision, as a contract that specifies time on the job and private sector contracts as specifying detailed performance requirements. This seems to be an accurate description of local government practice. In principle, however, one could have ‘employees’ who are paid on performance, or ‘contractors’ who are paid on time. Lawyers, for instance,

often fall into the latter category. We view this as a potentially confounding problem if one were to apply our model in certain settings, but as relatively unproblematic for our current application.

*Basic Predictions:* Our model yields two elementary predictions about how contracting practices will differ across services. First, cities are less likely to privatize services for which it is harder to specify, enforce or adjust performance standards. Second, cities are less likely to privatize services for which sensitivity to quality is high. As city residents are the final consumers of services, and city administrators are ultimately accountable to residents, this suggests that privatization should be less likely for those services where city residents are more likely to react to quality problems.

*City Size:* It is easy to see that cities may differ in how responsive they are to the trade-offs in the model depending on their abilities to supply the service themselves or on the availability of a private sector. Some services may have a relatively large efficient scale, making inhouse production inefficient for a small city. Small cities also may face a thinner market of external providers. This suggests a third prediction, that small cities, being potentially more constrained, may be *less responsive* to contracting difficulties of the type highlighted by our model. In addition, to reach efficient scale within the public sector, it may be more efficient for a small city to contract for employees from another public agency rather than provide a service inhouse.

*Political Economy:* A set of political economy predictions can be derived from the simple trade-offs highlighted in the model. When service quality is particularly salient, i.e., there is a higher value of  $s$ , a city administrator will be more likely to provide the service inhouse. In addition, although not directly predicted by the model, it seems possible that if performance contracts were imperfect, greater resident sensitivity might push administrators toward wanting to have control over services that are more complex, i.e., we might expect particularly few services with high values of  $s$  and  $m$  to be contracted.

A natural conjecture is that elected mayors may have motivations that are more explicitly political than appointed managers. In light of our model, this suggests a fifth ‘level-effects’ prediction: that cities run by mayors may be *less likely* to privatize services as compared to cities run by managers. Moreover, to the extent that political concerns might cause administrators to focus on issues other than the economic trade-offs emphasized in our model, a sixth ‘margins effect’ prediction is that cities run by mayors will also be *less responsive* to differences in contracting difficulties as compared to cities run by managers.

The form of government is an obvious political distinction across cities, but several others may be of interest as well, and give rise to similar hypotheses. For instance, cities that were formed relatively recently may

have less of a political infrastructure and perhaps less public union influence. This suggests they may do more privatization. They also may make decisions that more closely reflect current economic efficiency trade-offs, making newer cities *more responsive* to variation in contracting difficulties across services. Although it is somewhat outside of the scope of our analysis, it is also possible that differences in political ideology (e.g., cities that are primarily democratic or republican) might affect contracting choices.

*Political Economy and City Finances:* A final conjecture that emerges from combining the political view of privatization with our transaction-cost view is that a city's financial condition may matter for its contracting decisions. In particular, the political view would suggest that if cities are very constrained – for instance because they have a great deal of outstanding debt – then they may be more likely to privatize to save costs. Moreover, if financial constraints cause administrators to focus more on economic considerations, our model would then suggest that debt-constrained cities would be *more responsive* to contracting difficulties.

#### IV. SERVICE PROVISION BY U.S. CITIES: DATA

To study the procurement practices of U.S. cities, we compiled information from several sources. Our primary data are the International City/County Management Association's (ICMA's) 1997 and 2002 Service Delivery surveys. This data has been used in several other studies of local government (e.g., Hefetz and Warner [2004] and references therein).

The ICMA sends its survey to roughly 4,000 U.S. cities, with a response rate of about 20–25%.<sup>9</sup> The survey presents city administrators with a list of 64 services. It asks them to identify the services they provide and the method of delivery. These include provision by city employees, contracting out to a private sector firm, contracting out to another public agency, a combination of the above, and other less frequent forms of procurement. After combining the survey responses from 1997 and 2002, and eliminating responses that are substantially incomplete, we have a data on a total of 1,043 cities. For cities that responded in both years, we use the more complete or more recent response.<sup>10</sup>

<sup>9</sup>The ICMA sends the survey to the chief administrative officer in all municipalities with populations over 10,000 and a random sample of one in eight municipalities with populations between 2,500 and 9,999. Therefore smaller cities are under-represented in the sample. The response rate in 2002 was 23.7%. As can be seen in Table 1, cities in the Northeast are under-represented among the respondents.

<sup>10</sup>Note that we treat the two survey years as a single cross-section. The issue here is that the ICMA sample, and particularly the respondents, vary from survey to survey, so using two snapshots greatly expands the sample. The results come out very similarly if we restrict attention to just 1997 or just 2002, so it does not appear that we are missing important time trends by pooling the two years into a single cohort.

For each of these cities, we collected information from the U.S. Census on population, area, county median household income, the ratio of the city's long-term debt to its current revenue, whether or not the city has employee bargaining units, and whether the city is part of a Metropolitan Statistical Area.<sup>11</sup> We classify cities outside an MSA as rural, and those within an MSA as either suburban or urban, with the latter meaning that the city is the main city in the MSA. We searched city web pages to identify the date at which each city was incorporated.

From the ICMA, we obtained each city's form of government – mayor-council, council-manager, or the less common forms of commission and town meeting. In addition, we gathered data on state laws that might constrain city decisions – such as limits on borrowing or restrictions on hiring processes.<sup>12</sup> Finally, as a rough measure of political ideology, we collected county-level voting data from the 2000 presidential election. Table I presents a summary of city characteristics.

While information on city characteristics is readily available, it is substantially more difficult to assemble useful measures of service characteristics. For instance, we are particularly interested in how difficult it is to specify and administer performance requirements for a given service. To assess this, we designed an additional survey of 23 city managers. For this survey, we chose a representative sub-sample of 29 of the ICMA services. The survey is described in Appendix B.

We asked respondents to rank each service along three contracting dimensions: (1) the difficulty of measuring and monitoring the provision of quality; (2) how routine or unpredictable the requirements of the service are; and (3) the difficulty in replacing contractors due to specificity or lack of competition. For each question we standardized the answers of each respondent to have zero mean and unit variance. We then averaged the standardized responses to construct an average response to each question for each service.

There are two concerns with our reliance on survey data to construct measures of contracting difficulty. First, it requires an implicit assumption that the aspects of contracting we are asking about are commonly understood by practitioners and do not differ much across cities. That is, these contracting difficulties primarily reflect the nature of different services and are not highly idiosyncratic to individual city-service pairs. Fortunately,

<sup>11</sup> The population data comes from the 2000 census; the other variables from the 1997 *Census of Governments*. The one exception is the presence of employee bargaining units, which we use as a very crude measure of the importance of public employee unions in a city. This question last appeared in the 1987 *Census of Governments*, so that is what we rely upon.

<sup>12</sup> This data on state laws comes from the U.S. Advisory Commission on Intergovernmental Relations (USACIR [1990, 1993]).

TABLE I  
SUMMARY STATISTICS FOR CITIES (N = 1043)

	Mean	Std. Dev.	Min	Max
<i>City Characteristics</i>				
Population (2000)	59,904	185,683	1,115	3,694,820
Area (sq. miles)	24.71	47.34	1	607
Year Incorporated	1898	47	1699	2000
County Median Income (1997)	38,755	8,578	14,178	68,017
County % Republican (2000 pres. elect.)	51.0	12.3	16.1	82.3
City expenditure per-capita (1997)	1355	1033	23	16003
Long-term debt/Revenue (1997)	0.91	0.78	0	6
Public employees union (1987)	0.43			
Geographic Region	East	Midwest	South	West
	0.05	0.31	0.35	0.30
MSA Status	Urban	Suburban	Rural	
	0.21	0.49	0.30	
Form of Government	Mayor	Manager	Other	
	0.25	0.73	0.02	
<i>Services Provided (all 64 services)</i>				
Number of Services Provided	39.5	9.7	6	64
In-house	23.6	8.1	0	47
Publicly contracted	4.6	5.2	0	35
Privately contracted	7.9	6.2	0	41
Otherwise provided or not reported	3.4	3.3	0	28
<i>Service Provision (29 service subsample)</i>				
Number of Services Provided	19.9	4.5	4	29
In-house	11.4	4.4	0	24
Publicly contracted	2.1	2.4	0	16
Privately contracted	4.3	3.4	0	20
Otherwise provided or not reported	2.1	2.1	0	14

Sources: U.S. Census, ICMA, U.S. Election Atlas, City Web Pages.

the survey responses to each question are highly correlated across respondents, suggesting this assumption is warranted.<sup>13</sup>

Second, there is some possibility of reverse causality if city managers' perceptions of contracting difficulty are influenced by the predominant practices.<sup>14</sup> One way to alleviate this concern is to find a population of people who have private sector knowledge relevant to contracting, but who are unaware of the actual procurement choices made by cities. To this end, we also surveyed a set of MBA students with private sector managerial experience to assess the difficulty of contracting each of our services. The MBA ranking corresponds closely with that of the city managers, with a few departures suggesting that the city managers understand better what the

<sup>13</sup>To convey a rough sense of the alignment of the responses, say that two standardized responses are congruent unless one is above 0.5 and the other is below -0.5. Making pairwise comparisons between responses concerning a given service on a given question, less than 15% were not congruent.

<sup>14</sup>Note that the managers we surveyed were distinct from the decision-makers in the ICMA data, and fairly diverse. About half the managers we surveyed were from California (e.g., Menlo Park, Cupertino, Oakland, Merced, Pasadena and others); the others were from different-sized cities across the nation (e.g., Fort Worth Texas, Lake Forest, Illinois, Chapel Hill, North Carolina, Orlando, Florida, and others).

services are.<sup>15</sup> The details of the second survey and the comparison with the city managers' are described in Appendix C.

Our city manager survey highlights three impediments to successful contracting. Although our model does not separate them out, the existing theoretical literature suggests that each might have an independent influence on contracting decisions. In the next section, we use simple cross-tabulations to document the relationship between private contracting and our three individual measures. As the cross-tabulations will show, however, these characteristics turn out to be so highly correlated across services as to be nearly collinear in multivariate regression analysis. Therefore for the regression analysis we use a principal components approach to identify a single 'contract difficulty' variable. The first principal component explains 84% of the variation in our three survey variables. We call this component, which is very nearly an equally weighted average of the three variables, *contracting difficulty*. This corresponds to  $m$  in our model.

In addition to asking city managers about contracting difficulty, we included a survey question asking the city managers to assess the relative sensitivity of residents to the quality of the thirty different services. Again, we standardized the answers of each response and averaged the standardized responses to obtain a measure of quality sensitivity that we refer to as *sensitivity*. This corresponds to  $s$  in our model.

Table II reports service characteristics and provision patterns of each of the twenty-nine services included in our contracting difficulty survey. The first columns report overall contracting difficulty and quality sensitivity for each service. The next columns report how the managers score each service along the three separate dimensions: difficulty of performance measurement (*measure*), the need for flexibility (*flexibility*) and the potential for holdup (*holdup*).

The relative difficulties of contracting for some services should be apparent to non-specialists. For instance, street cleaning and building and grounds maintenance are two of the easiest services to contract out. These services are routine, relatively easy to measure and monitor, and do not involve a great deal of specialized equipment or knowledge. Police and fire services are two of the most difficult services to contract out. Both require significant flexibility and adaptation; performance is difficult to assess accurately and specialized local knowledge can play an important role.

Other services may be harder for a layperson to evaluate. For instance, the city managers viewed insect and rodent control and water treatment as both being moderately difficult to contract out. They viewed insect and rodent

<sup>15</sup> For instance, MBA's thought delinquent tax collection would be very hard to contract out, possibly because they associated it with tax audits or accounting – non-trivial in the business world. The city managers thought it was one of the easiest, which makes sense once you realize that what is being collected are property taxes which are fixed and not subject to accounting judgments.

TABLE II  
SUMMARY STATISTICS FOR SERVICES

Service	Service Characteristics			Contracting Difficult Components			Method of Provision		
	Difficulty	Sensitivity	Measure	Flexibility	Holdup	Number of Cities Providing	In-house	Public	Private
Operation of parking lots and garages	-1.29	-0.74	-0.55	-0.60	-0.91	411	0.68	0.03	0.19
Utility meter reading	-1.27	-0.67	-0.56	-0.92	-0.46	727	0.78	0.04	0.13
Residential solid waste collection	-1.25	-0.77	-1.09	-0.75	-0.03	750	0.47	0.01	0.33
Commercial solid waste collection	-1.21	-0.22	-0.96	-0.61	-0.28	558	0.32	0.01	0.43
Street/parking lot cleaning	-1.19	-0.18	-0.35	-0.54	-1.03	935	0.72	0.02	0.81
Vehicle towing and storage	-1.16	-0.28	-0.65	-0.37	-0.84	596	0.09	0.02	0.18
Buildings and grounds maintenance	-1.08	-0.38	-0.69	-0.27	-0.79	1003	0.62	0.01	0.30
Building security	-0.98	-0.74	-0.45	-0.36	-0.76	721	0.75	0.02	0.20
Parks landscaping and maintenance	-0.91	0.08	-0.31	-0.62	-0.49	996	0.69	0.05	0.18
Tree trimming/planting on public rights on way	-0.85	0.17	-0.30	-0.20	-0.92	939	0.42	0.02	0.39
Collection of delinquent taxes	-0.72	-0.61	-0.45	-0.41	-0.26	584	0.40	0.39	0.17
Solid waste disposal	-0.40	-0.67	-0.44	-0.50	0.40	565	0.32	0.18	0.35
Street repair	-0.31	0.31	-0.17	0.11	-0.51	1011	0.45	0.02	0.36
Operation/maintenance of recreation facilities	0.22	0.30	0.20	0.04	0.07	974	0.72	0.06	0.10
Water treatment	0.29	0.38	-0.13	0.09	0.53	783	0.78	0.14	0.06
Insect/rodent control	0.32	-0.18	0.47	0.11	-0.14	443	0.42	0.36	0.16
Operation of libraries	0.34	0.42	0.28	-0.07	0.34	632	0.56	0.29	0.03
Sewage collection and treatment	0.35	0.03	0.00	0.03	0.55	868	0.68	0.20	0.08
Operation of museums	0.46	-0.10	0.38	-0.03	0.38	342	0.25	0.16	0.29
Legal services	0.54	-0.85	0.13	0.55	0.09	842	0.34	0.02	0.58
Sanitary inspection	0.60	-0.22	0.40	0.26	0.25	496	0.51	0.40	0.04
Animal control	0.64	0.25	0.20	0.37	0.39	857	0.61	0.21	0.13
Emergency Medical service	0.72	1.02	0.32	0.12	0.73	769	0.54	0.14	0.19
Operation of daycare facilities	0.78	0.53	0.53	0.52	0.09	194	0.24	0.09	0.55
Programs for the elderly	1.16	0.36	0.76	0.61	0.36	582	0.28	0.20	0.19
Fire prevention suppression	1.41	0.77	0.89	0.28	1.08	932	0.82	0.07	0.00
Inspection/code enforcement	1.47	0.24	0.84	0.82	0.56	1013	0.84	0.03	0.08
Drug and alcohol treatment programs	1.64	0.25	0.83	1.12	0.51	201	0.05	0.38	0.39
Crime prevention/patrol	2.08	0.93	1.11	0.99	1.10	1021	0.86	0.07	0.00

Sources: ICMA, Levin-Tadelis City Manager Survey.

control as relatively routine and not involving much potential for holdup, but as a service where it was difficult to accurately measure performance. They viewed water treatment as also being fairly routine and saw measuring performance as not unduly difficult, but felt that the potential for hold-up was substantial. In light of the significant sunk investments to build a water treatment facility, this assessment makes a great deal of sense.

The final columns of Table II report the number of cities in the sample providing the service and the fraction providing the service with their own employees or through public or private contracts. Both the frequency of provision and the method of provision vary dramatically across services. Some services, such as police and code enforcement are provided by city employees in 85% of the cities in our sample. Other services, such as solid waste collection and street repair are privately contracted over 30% of the time, and vehicle towing is privately contracted over 80% of the time.

Even a cursory glance at Table II reveals a correlation between the frequency of private contracting and our transaction cost measure. Of the services that scored below zero on contracting difficulty (i.e., lower transaction costs of contracting), the average fraction of private contracting is 0.31. Of the more difficult services, the average fraction is 0.18. Obviously this rough correlation doesn't control for the different mix of cities providing each service, which we account for in our statistical analysis below.

While the analysis below focuses on the method of service provision, it is worth briefly discussing the question of whether a city provides a service at all. As discussed in Section II, it seems reasonable to view *whether* a city is responsible for providing a given service as predetermined in investigating *how* the service is provided. This assumption seems consistent with information gleaned from interviews with city managers, who generally have to concern themselves with how to provide a specified set of services.

Nevertheless, given variation in the number of cities providing each service, it may be helpful to convey a sense of which services are provided more frequently and which cities provide more services. Table III reports results of a logit regression relating whether or not city  $i$  provides service  $j$  to city and service characteristics. There are a number of regularities. Larger and older cities provide more services, as do cities in the Northeast. Cities in the western U.S. tend to provide fewer services. Services for which contracting difficulties are greater are also provided somewhat less frequently – in particular, a one standard deviation increase in contract difficulty is associated with provision by 6% fewer of the cities.

## V. CONTRACTING PATTERNS: ECONOMIC FACTORS

We now turn to addressing empirically the cross-section of city contracting practices. We divide our analysis into two parts. We look first at economic factors, then turn to political economy considerations. An observation in

TABLE III  
PROVISION OF CITY SERVICES

	Logit Model of Provision of City-Services ( $N = 30,247$ )					
	(1)		(2)		(3)	
	Marg. Eff.	s.e.	Marg. Eff.	s.e.	Marg. Eff.	s.e.
<i>Service Characteristics</i>						
Contracting difficulty	-0.061	(0.003)	-0.066	(0.003)		
Resident sensitivity	0.160	(0.006)	0.172	(0.007)		
<i>City Characteristics</i>						
Population 10–25k	0.044	(0.016)			0.050	(0.018)
Population 25–50k	0.060	(0.017)			0.067	(0.018)
Population >50k	0.074	(0.019)			0.083	(0.021)
Manager	0.016	(0.011)			0.018	(0.013)
Other form of government	-0.011	(0.029)			-0.012	(0.033)
Unions	0.019	(0.011)			0.022	(0.012)
City Debt/Revenue	0.007	(0.007)			0.008	(0.008)
East	0.028	(0.022)			0.031	(0.024)
South	0.023	(0.014)			0.025	(0.016)
West	-0.015	(0.014)			-0.017	(0.016)
Urban	0.006	(0.018)			0.007	(0.020)
Suburban	-0.009	(0.014)			-0.010	(0.016)
Incorporated after 1950	-0.064	(0.014)			-0.075	(0.017)
County med. Income (10k)	-0.013	(0.007)			-0.015	(0.008)
Percent republican	-0.020	(0.048)			-0.023	(0.055)
<i>Additional Controls</i>			City Fixed Effects		Service Fixed Effects	

Note: The reported coefficients are marginal effects from a logit regression where the dependent variable is an indicator for a city providing a given service, and an observation is a city-service pair. The standard errors for the first and third columns are clustered at the city level.

our data is a city-service pair. We focus on city-service pairs for which the city actually provides the given service, and for which the service is provided either in-house or by contract with either a private firm or another public agency.

#### V(i). Preliminary Evidence

In our survey of city managers, we asked managers to assess each service on the basis of three characteristics: the difficulty of measuring and monitoring quality, the need for flexibility, and the potential for holdup problems due to lock-in. We start with some preliminary evidence on the relationship between private sector contracting and these separate characteristics. Table IV categorizes each service according to whether its score on each of the three contracting dimensions was high (above zero) or low (below zero).<sup>16</sup> Each service, and hence each city-service pair, belongs to one row of Table IV. We then report for each row the number of services that fit the criteria (e.g., low transaction costs on all dimensions) and the fraction of city-service pairs where private contracting in used.

<sup>16</sup> Recall that survey responses are normalized to have mean zero and standard deviation equal to one.

TABLE IV  
 BREAKDOWN OF PRIVATE CONTRACTING BY DISAGGREGATED CONTRACT  
 DIFFICULTY MEASURES

Difficulty of Measurement	Need for Flexibility	Holdup Potential	Number of Services	Fraction Privatized
Low	Low	Low	11	0.29
Low	Low	High	1	0.35
Low	High	Low	1	0.43
High	Low	Low	0	N/A
Low	High	High	1	0.06
High	Low	High	2	0.12
High	High	Low	1	0.16
High	High	High	12	0.15

Note: Each service is characterized by the three survey measures of transaction costs. A service scores Low with respect to a measure if its average score is less than zero, and High if its average score is above zero. A service that the managers scored as 0.5 on measurement difficulty, 0.7 on need for flexibility, and  $-0.1$  on potential for holdup, would in the 'High/High/Low' row of the Table. The fraction privatized is computed by summing up the times we observe the services in a given row privatized and dividing by the number of times we observe these services provided.

Contracting is roughly twice as likely for services that score low on at least two of the three transaction cost dimensions than for services that score low on zero or one dimensions. Table IV also shows the difficulty with separating out the three dimensions of contracting difficulty. Of the twenty-nine services, twenty-three of them score low on none or all of the dimensions. Only one or two services occupy the remaining six cells. This strong correlation also appears when we use continuous versions of the three dimensions. Consequently, we use our single principal component measure of contracting difficulty in the statistical analysis that follows.

It is useful to provide some initial evidence on the relationship between our aggregate measure of contracting difficulty and the method of service provision at the level of individual services. To do this in a way that controls for the fact that each service is provided by a different set of cities and cities may be more or less inclined to privatize for reasons that are city-specific, we separately regressed a dummy variable for each city-service contracting outcome (inhouse provision, public contract, private contract) on city fixed effects and obtained the average residual by service. We plot these residuals against our measure of contracting difficulty in Figure 1.

Figure 1A depicts the negative relationship between contracting difficulty and privatization. It shows, for example, that vehicle towing, waste collection and building maintenance are all relatively easy to contract and often privatized, while the reverse is true of police, fire, emergency medical services and code enforcement. There are two notable outliers: legal services and parking lot operation. The figure shows that it is relatively difficult to write a performance contract for legal services, yet they are frequently contracted out. Of course, while legal services are frequently contracted out, the standard contract for legal services is based on time rather than



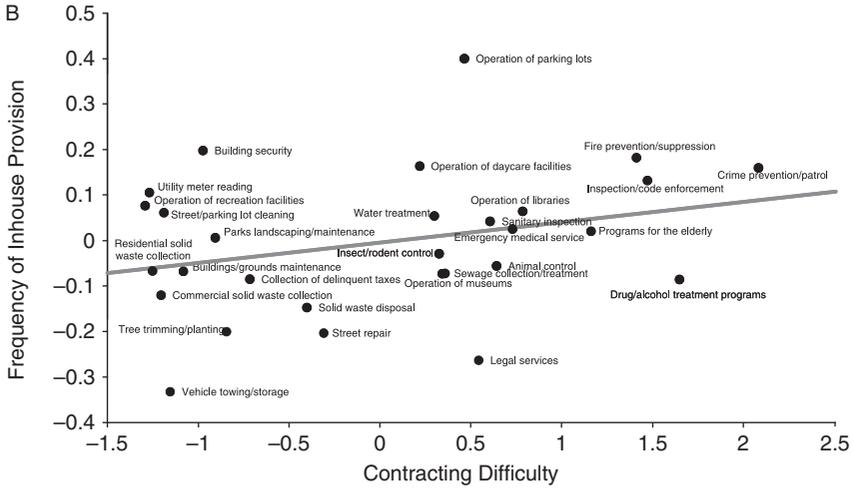


Figure 1B  
Contract Difficulty and In-house Provision

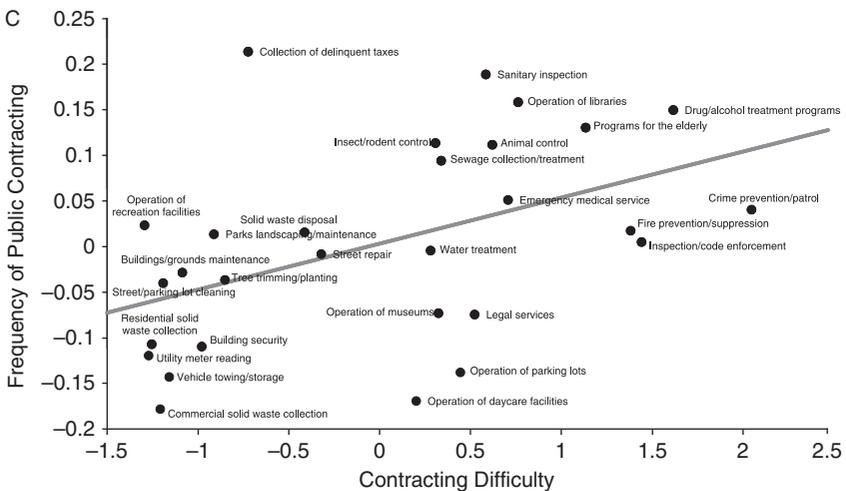


Figure 1C  
Contract Difficulty and Public Contracting

are not sensitive to this substitution. Throughout the paper, rather than reporting hard-to-interpret coefficients from the logit model, we report the marginal effects on the choice probabilities.

Table V reports results from our basic specification that match the two elementary predictions of our theoretical model. Greater contracting difficulty is associated with less private sector contracting and more

TABLE V  
EFFECT OF CITY/SERVICE CHARACTERISTICS ON CONTRACTING

Multinomial Logit Models for Frequency of Private and Public Contracting ( $N = 19,244$ )						
	(1)		(2)		(3)	
	Public	Private	Public	Private	Public	Private
<i>Service Characteristics</i>						
Contracting difficulty	0.051 (0.003)	-0.079 (0.004)	0.072 (0.005)	-0.091 (0.007)		
Resident Sensitivity	-0.052 (0.005)	-0.063 (0.007)	-0.071 (0.008)	-0.078 (0.010)		
<i>City Characteristics</i>						
Population 10–25k	-0.010 (0.008)	0.019 (0.012)			-0.006 (0.006)	0.016 (0.011)
Population 25–50k	-0.017 (0.008)	0.030 (0.014)			-0.011 (0.006)	0.023 (0.012)
Population >50k	-0.023 (0.009)	0.069 (0.016)			-0.017 (0.007)	0.063 (0.015)
Manager	0.016 (0.005)	0.024 (0.007)			0.014 (0.004)	0.026 (0.007)
Other form of government	-0.001 (0.020)	0.007 (0.025)			0.003 (0.015)	0.009 (0.023)
Public Employee Unions	-0.005 (0.005)	-0.014 (0.007)			-0.005 (0.004)	-0.014 (0.006)
City Debt/Revenue	-0.004 (0.003)	0.010 (0.004)			-0.005 (0.002)	0.011 (0.004)
East	-0.050 (0.009)	0.028 (0.016)			-0.042 (0.006)	0.033 (0.015)
South	0.015 (0.007)	-0.019 (0.009)			0.012 (0.005)	-0.023 (0.008)
West	0.026 (0.007)	0.019 (0.009)			0.030 (0.006)	0.014 (0.008)
Urban	-0.003 (0.009)	0.040 (0.012)			0.000 (0.007)	0.036 (0.011)
Suburban	0.034 (0.007)	0.041 (0.010)			0.030 (0.005)	0.036 (0.009)
Incorporated after 1950	0.033 (0.007)	0.053 (0.009)			0.035 (0.006)	0.050 (0.009)
County med. Income (10k)	0.001 (0.003)	0.015 (0.005)			0.003 (0.003)	0.016 (0.004)
Percent republican	-0.112 (0.021)	-0.054 (0.030)			-0.091 (0.017)	-0.044 (0.027)
<i>Additional Controls</i>			City Fixed Effects		Service Fixed Effects	

Note: Reported coefficients are marginal effects on probability of different modes of service provision. In-house provision is the base outcome. Standard errors are clustered at the city level.

in-house provision and public sector contracting. The relationship is substantial. A one standard deviation increase in contracting difficulty (the difference between sanitary inspection which is rather difficult to contract and solid waste disposal which is rather easy) is associated with about forty per cent less private contracting. (Recall that on average about 20 per cent of services are contracted privately and the estimated probability change is between  $-7.9$  and  $-9.1$  percentage points depending on the specification.)

This finding is consistent with the results of Brown and Potoski [2003a], who relate contracting decisions to their own survey measures of asset specificity and service measurability using all sixty-four services in the ICMA data. A principal finding of their paper is that private contracting is significantly less likely for services that are hard to measure.<sup>17</sup> They find a somewhat less clear relationship between contracting and their survey measure of asset specificity. One issue with their specificity measure is that a service (such as ambulance service) is defined to be specific if it uses assets that are service-specific, even if those assets may not create a lock-in effect or relationship-specificity.

We also find a significant correlation between privatization and our measure of resident sensitivity to quality. Note that greater sensitivity is associated with less private sector contracting and more inhouse provision, though not more public contracting. This is consistent with the view that cities want control over the services that are more sensitive *vis-à-vis* resident responses. A one standard deviation increase in sensitivity is associated with about one-third less private contracting (the estimated probability change is between  $-3.7$  and  $-3.9$  percentage points).<sup>18</sup>

Above, we discussed a related prediction that a higher level of quality sensitivity might interact with transaction costs difficulties in contracting. In particular, administrators might especially want to keep control of services that are both sensitive and difficult to contract. When we re-run the specifications in Table V and include an interaction between contracting difficulty and resident sensitivity, we indeed find a positive effect. For services with average resident sensitivity (i.e. sensitivity equal to zero), we estimate that a one standard deviation increase in contracting difficulty is associated with a reduction in private contracting of  $-0.05$  percentage points. For services with a standard deviation higher in terms of resident sensitivity, the marginal effect of contracting difficulty is even more negative,  $-0.22$ .

### V(iii). *Economic Factors in Privatization: Scale Economies*

We argued that differences across cities in their ability to deliver services, and in the market conditions surrounding them, will affect their sensitivity to

<sup>17</sup> It is hard to compare the magnitudes of our respective results for several reasons. First, their survey questions are different and they do not adopt a comparable normalization of the survey numbers. Second, their multinomial analysis distinguishes slightly different categories of service provision. In particular, they say that a city privately contracts for a service only if all of the provision is by a private firm, whereas we say there is private contracting if there is some contracting with a private firm. Nevertheless, our qualitative findings are highly consistent.

<sup>18</sup> A related piece of evidence discussed in our working paper (Levin and Tadelis [2007]) is that services that are provided by a broader set of cities are also much more likely to be provided inhouse. One explanation for this given to us by the Palo Alto city manager is that certain services are perceived as being 'core to mission' and hence there is a desire to retain control over their provision.

the basic predictions of our model. As indicated in the lower half of Table V, there is substantially more contracting in larger and more urban cities. Cities that have more than fifty thousand residents contract privately about thirty per cent more than cities with less than ten thousand residents. Similarly, cities in an MSA (urban and suburban cities) contract privately about fifteen to twenty per cent more than rural cities.<sup>19</sup>

Above we suggested that larger cities might not only do more contracting, but exhibit a closer relationship between mode of provision and contracting difficulty, both because they might have better access to private suppliers and because they might be able to utilize economies of scale in inhouse provision. To get at this, we consider an alternative specification where we interact contracting difficulty with city characteristics. Table VI shows that the relationship between contracting difficulty and privatization is indeed stronger for larger cities. For the smallest set of cities, there is no significant association between contracting difficulty and the probability of contracting privately. For cities with populations above twenty-five thousand, we observe the predicted negative relationship between our transaction cost measure and observed private contracting.

The results in Table V and VI are also consistent with the idea that public contracting is a more important substitute for very small cities than it is for large cities. On average, very small cities engage in about twenty per cent more public contracting than large cities. Moreover, for high transaction cost services, large cities appear to substitute from private contracting toward in-house provision and public contracting, whereas small cities increase their public contracting with a decline in in-house provision. These results again indicate that the transaction cost trade-offs illustrated in the model may be most relevant for larger cities that may have a broader set of provision options.

## VI. CONTRACTING PATTERNS: POLITICAL ECONOMY FACTORS

As discussed earlier, our model of privatization decisions suggests a role for political forces in focusing attention on benefits of service quality and away from costs of provision. We have several variables capturing aspects of political economy, including form of government, city age, region of the country, city debt levels and resident voting patterns. There is also variation in state laws that constrain city decision-makers, which Lopez-de-Silanes *et al.* [1997] argue may be important for local government privatization decisions.

<sup>19</sup> Large cities also provide more services, so a related reason why they may do more private contracting is that administrators need experience to become effective procurement managers. A city that provides more services will likely acquire more experience with contracting, potentially making additional contracting easier on the margin. Our working paper, Levin and Tadelis [2007], provides some evidence supporting this conjecture.

TABLE VI  
DETERMINANTS OF CONTRACTING, INTERACTION EFFECTS

<i>Multinomial Logit Model for Private and Public Contracting</i>				
	Public		Private	
<i>Service Characteristics</i>				
Contracting difficulty	0.077	(0.028)	0.016	(0.038)
Resident sensitivity	-0.070	(0.008)	-0.078	(0.010)
<i>Contracting Difficulty x City Characteristics</i>				
Difficulty * Population 10-25k	-0.018	(0.012)	-0.004	(0.017)
Difficulty * Population 25-50k	-0.010	(0.014)	-0.048	(0.019)
Difficulty * Population >50k	-0.026	(0.015)	-0.053	(0.021)
Difficulty * Manager	0.009	(0.009)	-0.001	(0.012)
Difficulty * Other FOG	0.010	(0.028)	0.006	(0.033)
Difficulty * Public Employee Unions	-0.005	(0.008)	0.004	(0.011)
Difficulty * City Debt/Revenue	0.002	(0.004)	0.000	(0.006)
Difficulty * East	0.022	(0.020)	0.019	(0.023)
Difficulty * South	0.011	(0.010)	-0.026	(0.014)
Difficulty * West	0.029	(0.010)	-0.039	(0.013)
Difficulty * Urban	-0.023	(0.013)	0.036	(0.017)
Difficulty * Suburban	-0.005	(0.010)	-0.007	(0.014)
Difficulty * Inc. after 1950	0.004	(0.009)	-0.022	(0.013)
Difficulty * County med. Income (10k)	0.002	(0.005)	-0.017	(0.007)
Difficulty * Percent republican	-0.021	(0.033)	0.009	(0.047)
<i>Additional Controls</i>			City Fixed Effects	

Note: Reported coefficients are marginal effects on probability of different modes of service provision. In-house provision is the base outcome. Standard errors are clustered at the city level.

#### VI(i). *Political Economy Factors in Privatization*

Recall our fifth prediction above that cities run by mayors will be *less likely* to privatize services as compared to cities run by managers. As Table V shows, this prediction is borne out in the data. Cities with an appointed manager are more likely to contract with both the public sector (by 1.6 percentage points, or about 15%) and the private sector (by 2.4 percentage points, or a bit over 10%). Supporting our other political economy 'level effects' predictions, younger cities (incorporated after 1950) privatize about 25% more than older cities, and cities with employee bargaining units privatize about 7% less than cities with no bargaining units.

There is considerable regional variation in levels of contracting. Cities in the West and Northeast appear to behave quite differently from cities in the middle of the country. Cities in the West are more likely to use contracts with both public and private sector providers. At least two explanations have been suggested to us. One western city manager hypothesized that people in the West look less to government to provide jobs and services, and hence are more open to private sector contracting. An alternative explanation is that these cities have weaker public unions, even conditional on our imperfect control for union presence, and hence there is less resistance to contracting.

We argued above that greater political concerns would affect how *responsive* city administrators are to the economic trade-offs identified in the model resulting in a sixth margins hypothesis. This hypothesis is explored in Table VI

where we re-run our main specification interacting contracting difficulty with city characteristics. The results are mixed. The relationship between contracting difficulty and privatization is significantly more negative for newer cities and for cities in the western states. The relationship between contracting difficulty and privatization is essentially the same in cities with managers and mayors, however, and also in cities that do and do not have employee bargaining units.

Our final political economy hypothesis was that cities with higher debt burdens might be more likely to privatize in order to cut costs. Our expenditure results in Section VII below suggest that private sector contracting indeed is associated with lower spending levels. The estimates in Table V show that cities with higher ratios of long-term debt to revenue privatize somewhat more than those with lower levels of debt. The latter finding is consistent with a story that high debt levels constrain political opportunism by city administrators and force them to focus on costs (i.e., in the language of the model, act as if they had a lower value of  $s$ ).

The above results suggest an important role for political economy considerations in privatization decisions. We also looked at whether privatization is associated with voting patterns. The results in Table V show that cities located in counties that voted Republican in the 2000 presidential election do less contracting, although we are hesitant to make much of the association as it seems to be somewhat sensitive to specification, and disappears if we use data from earlier presidential elections instead.

#### VI(ii). *State Laws and Privatization*

Lopez-de-Silanes, Shleifer and Vishny [1997] argue that state laws may have important effects on local government privatization decisions. In their paper, they use U.S. Census data to investigate the contracting decisions of U.S. counties, and find a number of interesting correlations. For studying local government privatization, however, the Census data have several weaknesses. First, they cover only a small sample of services (either twelve or seventeen depending on the year). Second, they do not distinguish between contracts with the private sector and contracts with the public sector. Our results suggest that the distinction is important. For these reasons, it is interesting to re-visit their hypotheses with our richer city-level data.

Table VII reports results from an additional multinomial logit specification where in addition to service fixed effects and our usual city characteristics, we include as controls dummy variables for the presence of a range of state laws. The first column includes only the laws studied by Lopez-de-Silanes *et al.* The second column shows that these results are robust to the inclusion of additional state laws governing financial audits, clean government and collective bargaining practices.

The results yield a mixed comparison. Similar to their analysis, we find that states that prohibit political activity by city employees and states that

TABLE VII  
EFFECT OF STATE LAWS ON CONTRACTING

	(1)		(2)	
	Public	Private	Public	Private
<i>Multinomial Logit for Frequency of Private and Public Contracting (N = 18,588)</i>				
<i>Clean Government Laws</i>				
State requires merit system	-0.035 (0.008)	-0.020 (0.015)	-0.034 (0.009)	-0.022 (0.018)
State sets purchasing standards	0.016 (0.007)	-0.013 (0.015)	0.025 (0.008)	-0.007 (0.018)
State prohibits political activity by city employees	0.020 (0.006)	0.042 (0.012)	0.020 (0.007)	0.029 (0.013)
City officials subject to ethics code			0.003 (0.009)	-0.002 (0.016)
City records open to public			-0.022 (0.015)	0.011 (0.024)
<i>Labor Laws</i>				
State prohibits strikes by public employees	-0.008 (0.018)	-0.096 (0.047)	-0.015 (0.021)	-0.087 (0.047)
City authorized to engage in collective bargaining			0.007 (0.008)	0.037 (0.015)
<i>Budget Constraint Laws</i>				
State law permits short-term borrowing	0.023 (0.008)	-0.013 (0.017)	0.030 (0.010)	-0.001 (0.022)
State imposes city debt limits	-0.014 (0.018)	0.068 (0.028)	-0.004 (0.018)	0.071 (0.031)
State mandates balanced budget	0.019 (0.009)	-0.028 (0.014)	0.027 (0.012)	-0.025 (0.017)
State law authorizes 'take over' of finances	-0.045 (0.009)	0.091 (0.044)	-0.049 (0.010)	0.062 (0.049)
State assesses property tax	0.064 (0.027)	-0.093 (0.019)	0.098 (0.039)	-0.058 (0.028)
<i>Financial Audit Laws</i>				
Law mandates independent audit of local accounts			-0.022 (0.008)	-0.027 (0.014)
Law mandates state audit of local accounts			-0.016 (0.010)	0.001 (0.017)
<i>Additional Controls</i>	City Characteristics, Service FE		City Characteristics, Service FE	

Note: Reported coefficients are marginal effects on probability of different modes of service provision. In-house provision is the base outcome. Standard errors are clustered at the city level.

impose city debt limits have more contracting of local services. Both findings are consistent with political economy arguments. In contrast to their analysis, however, we find that states that require a merit system for hiring, that prohibit strikes by their employees, and that do not permit take-overs of city finances all have less contracting of local services.

Lopez-de-Silanes *et al.* argue that a merit system should make cronyism more difficult and hence increase privatization, contrary to our results. Another possibility is that it simply increases the quality of city employees making in-house provision more attractive. Political economy considerations do not yield a clear prediction about whether prohibiting strikes will increase or decrease privatization, so perhaps it is not surprising that we obtain contrasting results. The fact that the possibility of state take-overs is associated

with more privatization is consistent with the idea that cities that are financially constrained look more to the private sector as a way to keep costs down.

## VII. CONTRACTING AND CITY EXPENDITURES

The empirical analysis above focused on the determinants of city contracting decisions. Ideally we should like to assess the consequences of these decisions as well. Although there are plenty of case studies on individual privatization decisions (see e.g., Sclar [2000] for a number of such studies), there is no systematic data that allows a comparison of service quality and costs of provision across cities that choose different methods of provision, nor is there broad time-series evidence on cities that have changed their modes of provision. One thing we can do, however, is to look at overall levels of city expenditures and at how overall spending relates to the degree of private sector contracting across a broad set of cities.

We use data from the 1997 *Census of Governments* to regress per-capita spending on the fraction of services that are privatized, controlling for city characteristics. The estimates are reported in Table VIII. The first column contains no controls for the set of services that are provided; the second column controls for the number of services that are provided; the third column controls for the mix of services by including a dummy variable for each individual service that is provided. Because our measure of spending

TABLE VIII  
CITY EXPENDITURE AND PRIVATE CONTRACTING

<i>Linear Regression Model of ln(City Expenditure per Capita) (N = 1043)</i>						
	(1)		(2)		(3)	
	Coeff.	s.e.	Coeff.	s.e.	Coeff.	s.e.
<i>Degree of Private Contracting</i>						
Fraction of city services privately contracted	-0.305	(0.122)	-0.387	(0.122)	-0.246	(0.122)
<i>City Characteristics</i>						
Population 10-25k	0.119	(0.059)	0.094	(0.058)	0.059	(0.057)
Population 25-50k	0.058	(0.066)	0.020	(0.066)	-0.060	(0.066)
Population > 50k	0.100	(0.074)	0.051	(0.074)	-0.041	(0.076)
Manager	0.012	(0.041)	0.004	(0.041)	-0.007	(0.039)
Other form of government	0.093	(0.125)	0.108	(0.123)	0.085	(0.117)
Unions	0.047	(0.038)	0.034	(0.038)	0.004	(0.036)
City Debt/Revenue	0.061	(0.022)	0.057	(0.022)	0.094	(0.021)
East	0.316	(0.085)	0.313	(0.084)	0.364	(0.084)
South	0.136	(0.050)	0.134	(0.049)	0.179	(0.052)
West	-0.021	(0.047)	-0.003	(0.047)	0.050	(0.052)
Urban	0.017	(0.064)	0.018	(0.063)	-0.015	(0.060)
Suburban	-0.390	(0.051)	-0.372	(0.051)	-0.261	(0.051)
Incorporated after 1950	-0.291	(0.046)	-0.252	(0.046)	-0.106	(0.046)
County med. Income (10k)	0.131	(0.025)	0.141	(0.025)	0.119	(0.024)
Percent republican	-0.681	(0.162)	-0.687	(0.160)	-0.846	(0.161)
Number of city services provided			0.009	(0.002)		
<i>Additional Controls</i>					Individual service provision dummies	

is an overall city measure, rather than disaggregated by service, each observation in these regressions corresponds to a single city.

The results show a substantial correlation between privatization and per-capita city spending. Cities that privately contract ten per cent more of their services spend about three per cent less per capita. Given that on average cities provide forty services and contract for eight of them, this means that changing one service from inhouse to private contracting is associated with a 0.6% decrease in per capita spending. A causal interpretation is obviously difficult, so we view this evidence as suggestive rather than definitive. It suggests an interesting avenue for future empirical research.

#### VIII. CONCLUSION

This paper has studied privatization of local government services. We develop a simple model that emphasizes what we believe to be a key trade-off between the productive efficiency induced by performance contracts and the low costs of contracting associated with less productive in-house employment. The model explains why contracting difficulties such as problems in monitoring performance, the need for flexibility, or a lack of a competitive market would lead to less use of the private sector. It also explains why greater sensitivity to service quality might push against privatization.

We use this model to interpret our empirical findings about the patterns of privatization across U.S. cities. Using data gathered from a variety of sources, we find that services that are characterized by high transaction costs of contracting and services that are ranked high by city managers in terms of resident sensitivity to quality are privatized less frequently. We also provide evidence that contracting to other public agencies appears to be largely a substitute for in-house provision, rather than an analogue of privatization.

Perhaps most importantly, we find a substantial degree of heterogeneity across cities in terms of their contracting practices. In particular, large cities do more private contracting and their choices exhibit a closer match to the trade-offs identified in our model. We obtain similar results for recently incorporated cities, and also observe more private contracting by cities governed by an appointed city manager rather than by an elected mayor. We also offer suggestive evidence that privatization is associated with lower spending.

Our analysis leaves many questions open. For instance, our empirical analysis is purely cross-sectional; it would be interesting to study the dynamics of privatization decisions – for instance, to study whether economic shocks might drive privatization decisions. This potentially could be done using our data. A more ambitious project would be to try to assess the direct outcomes of privatization decisions in terms of service quality, expenditures and transaction difficulties. This would require much more fine-grained outcomes data, which is one reason why evidence on this front has been limited to case studies.

## APPENDIX A: OMITTED THEORY DETAILS

Given a contract  $(\hat{w}, \hat{q}, \hat{t})$ , the agent chooses  $e$  and  $t$  to solve

$$\begin{aligned} \max_{e,t} \quad & \hat{w} - c(e)t + r(T - t) \\ \text{s.t.} \quad & t \geq \hat{t} \quad (EC) \\ & (\rho + e)t \geq \hat{q} \quad (PC) \end{aligned}$$

where  $(EC)$  is the employment constraint and  $(PC)$  is the performance constraint. Given our assumptions, the agent's problem has a unique solution. It is independent of the wage  $\hat{w}$ , so we can denote the optimal effort and time as  $e^*(\hat{q}, \hat{t})$  and  $t^*(\hat{q}, \hat{t})$ .

The optimal contract from the point of view of the principal solves

$$\begin{aligned} \max_{(\hat{w}, \hat{q}, \hat{t})} \quad & V((p + e)t, s) - \hat{w} - d(\hat{q}, m) \\ \text{s.t.} \quad & (e, t) = (e^*(\hat{q}, \hat{t}), t^*(\hat{q}, \hat{t})) \quad (IC) \\ & \hat{w} - c(e)t + r(T - t) \geq rT \quad (IR) \end{aligned}$$

where the *incentive compatibility* constraint  $(IC)$  states that the agent will allocate his effort and time optimally and the *individual rationality* constraint  $(IR)$  states that the agent prefers to accept and honor the contract rather than not. This second constraint will bind for any optimal contract.

*Proposition 1.* An optimal contract  $(\hat{w}, \hat{q}, \hat{t})$  either has the form  $(\hat{w}, 0, \hat{t})$  or  $(\hat{w}, \hat{q}, 0)$ .

*Proof.* By way of contradiction, suppose that the optimal contract  $(\hat{w}, \hat{q}, \hat{t})$  has  $\hat{q} > 0$  and  $\hat{t} > 0$ . If  $(PC)$  binds at the solution to the agent's problem, then the contract  $(\hat{w}, \hat{q}, 0)$  will result in the same quality  $\hat{q}$  at marginally lower contracting cost. Alternatively, if  $(PC)$  does not bind at the solution to the agent's problem, then the contract  $(\hat{w}, 0, \hat{t})$  will result in the same quality at lower contracting cost. *Q.E.D.*

To obtain quality  $q$  with an employment contract  $(\hat{w}, 0, \hat{t})$ , the principal must specify  $\hat{t} = q/\rho$  and pay the agent

$$W(q|EC) = \frac{r}{\rho}q.$$

To obtain quality  $q$  with a performance contract  $(\hat{w}, \hat{q}, 0)$ , the principal must specify  $\hat{q} = q$ , and the agent solves

$$\begin{aligned} \max_{e,t} \quad & \hat{w} - c(e)t + r(T - t) \\ \text{s.t.} \quad & (\rho + e)t \geq q. \end{aligned}$$

The optimal effort level solves  $c'(e) \cdot (\rho + e) = c(e) + r$ , which is independent of  $q$ , so we denote it by  $e^*$ . The optimal time allocation is  $t^*(q, 0) = q/(\rho + e^*)$ . To make the contract acceptable, the principal must pay the agent

$$W(q|PC) = \frac{r + c(e^*)}{\rho + e^*}q.$$

*Proposition 2.* For all  $q > 0$ ,  $W(q|PC) < W(q|EC)$  and  $\frac{dW(q|PC)}{dq} < \frac{dW(q|EC)}{dq}$ .

*Proof.* The first inequality follows from revealed preference. The input mix  $e^*$ ,  $t^*(q, 0)$  is the agent's least cost way of producing quality  $q$ , so it must be that  $W(q|PC) < W(q|EC)$ . The second inequality follows directly from the first. *Q.E.D.*

The cost of implementing  $q$  is therefore

$$C(q, m) = \min\{W(q|EC), W(q|PC) + d(q, m)\}.$$

The cost function  $C(q, m)$  is the lower envelope of  $W(q|EC)$  and  $W(q|PC) + d(q, m)$ . A useful observation is that because labor costs are linear, the latter cost function will cross the former at most once, from below, provided that  $d_{qq} > 0$ , i.e., that the costs of contracting are convex. This implies that if an employment contract is the most effective way to implement quality  $q$ , it will be most effective for all higher quality levels. The optimal contract quality is the solution to the problem

$$\max_q V(q, s) - C(q, m).$$

*Proposition 3.* If contracting difficulty  $m$  increases, the principal will be more likely to use an employment contract, while the optimal quality may increase or decrease. If the importance of quality  $s$  increases, and  $d_{qs} > 0$ , the principal will be more likely to use an employment contract, and optimal quality will increase.

*Proof.* Consider an increase from  $m$  to  $m'$ . The costs of implementing any quality  $q$  with an employment contract are unchanged, but the costs of implement any  $q$  with a performance contract are higher for  $m'$  than for  $m$ . Therefore an increase from  $m$  to  $m'$  makes a performance contract less likely to be optimal. The optimal quality could move up or down however. To see this, suppose the optimal contract under  $m$  is a performance contract. If the same is true under  $m'$  and  $d_{qm} > 0$  then it is optimal to reduce quality. On the other hand, if the optimal contract under  $m'$  is now an employment contract, it will involve an increase in quality.

Now consider an increase from  $s$  to  $s'$ . As  $V_{qs} > 0$  and the principal's problem has a unique solution, the optimal quality must increase. The increase in quality could change the form of optimal contract from a performance contract to an employment contract, but not vice-versa. *Q.E.D.*

## APPENDIX B: CITY MANAGER SURVEY

We conducted a survey of 23 city managers, asking them to assess the city services listed in Table II along several dimensions. A complete copy of the survey is available from the authors. Here we re-produce the four questions that we rely upon in this paper.

### *Question A: Measuring and Monitoring Service Quality*

To evaluate performance, it is important to measure and monitor the quality of the service provided. For each service listed below, imagine you were considering contracting out the service. Assess how easy or difficult it would be to measure and monitor the quality of service provision.

*Question B: Need for Flexibility*

For some services there is significant uncertainty about precisely what (or when) things need to be done. Other services are more predictable, making it easier to specify in advance what needs to be done. For services that are less predictable there is a greater need for flexibility and adaptive guidance. For each service below please rank the need for flexibility and adaptive guidance.

*Question C: Provider Scarcity or Lock-in*

For some services it may be hard to find qualified providers or to switch providers once an initial provider is found. This could be due either to specialized expertise, specialized or expensive physical capital, or the lack of a closely related private sector market. For each service below please assess the ease of finding or switching outside providers.

*Question D: Resident Sensitivity and Response*

Problems with service provision may trigger a response from city residents. Residents are more aware of, and more sensitive to problems with some services as compared to others. For each service below, please assess the level of resident sensitivity to problems that might be encountered in the provision of that service.

Following each question was a list of services organized by category: Public Works and Transportation; Public Utilities; Public Safety; Health and Human Services; Parks, Recreation and Culture; and Support Functions. Respondents were asked to rank each service on a scale of 1 to 5. For Question B, for example, a one meant 'no need for flexibility,' a three meant 'moderate need for flexibility,' and a five meant 'strong need for flexibility.' Responses by each manager to each question were standardized to have mean zero and standard deviation one as described in the text.

## APPENDIX C: MBA SURVEY

As a robustness and external validity check on our survey of city managers, we also conducted a second survey of 60 MBA students from U.C. Berkeley. These students were close to completing their first year in the full time MBA program, and generally had several years of private sector experience. They were asked to assess the same city services using the following question:

City managers and administrators face the following decision problem. They are responsible for providing a set of city services to the city residents. They have the option of contracting with private sector firms to provide any given service, which requires writing and managing a contract for service delivery. Alternatively, they can rely on city employees and administrators to provide the service. We are interested in how hard it might be to contract for different services. Below is a list of thirty city services. Please indicate for each service how easy/hard it would be to write and manage a delivery contract. Please try to avoid 'I can't say,' but do use it if you really have no idea.

Of the 60 students polled, 30 responded to the survey that offered three categories: easy, medium and difficult. These were then scored using

APPENDIX TABLE  
COMPARISON OF ALTERNATIVE CONTRACT DIFFICULTY MEASURES

Service	Contracting Difficulty (City Managers)	Contracting Difficulty (MBAs)	Contract Rank (Managers)	Contract Rank (MBAs)	Diff. in Rank < 5 Places	Diff in Rank > 10 Places
Operation of parking lots and garages	-1.29	-1.24	29	29	YES	
Utility meter reading	-1.27	-0.45	28	17		YES
Residential solid waste collection	-1.25	-0.61	27	20		
Commercial solid waste collection	-1.21	-0.37	26	16		
Street/parking lot cleaning	-1.19	-0.84	25	25	YES	
Vehicle towing and storage	-1.16	-1.08	24	27	YES	
Buildings and grounds maintenance	-1.08	-1.24	23	29		
Building security	-0.98	-0.84	22	24	YES	
Parks landscaping and maintenance	-0.91	-0.92	21	26		
Tree trimming/planting on public rights on way	-0.85	-0.53	20	19	YES	
Collection of delinquent taxes	-0.72	1.75	19	2		YES
Solid waste disposal	-0.40	-0.29	18	15	YES	
Street repair	-0.31	0.41	17	11		
Operation/maintenance of recreation facilities	0.22	-0.83	16	22		
Water treatment	0.29	1.04	15	5		
Insect/rodent control	0.32	-1.16	14	28		YES
Operation of libraries	0.34	-0.22	13	14	YES	
Sewage collection and treatment	0.35	1.04	12	6		
Operation of museums	0.46	-0.45	11	17		
Legal services	0.54	0.02	10	13	YES	
Sanitary inspection	0.60	0.88	9	7	YES	
Animal control	0.64	0.18	8	12	YES	
Emergency Medical service	0.72	1.20	7	4	YES	
Operation of daycare facilities	0.78	-0.76	6	21		YES
Programs for the elderly	1.16	0.49	5	10		
Fire prevention suppression	1.41	1.36	4	3	YES	
Inspection/code enforcement	1.47	0.88	3	7	YES	
Drug and alcohol treatment programs	1.64	0.81	2	9		
Crime prevention/patrol	2.08	2.59	1	1	YES	

(-1, 0, +1) for these three categories, and the average service scores were then normalized to have a zero mean and unit variance.

The Appendix Table reports the MBA assessment of contracting difficulty for each service, as well as the assessment of city managers, and also the respective rank orderings. There is a high degree of correlation between the score (*correlation* = 0.67) and service ranking (*correlation* = 0.66). Of the thirteen services that the city managers assessed as having lower transactions costs (difficulty < 0), the MBA score was below zero for eleven. Of the sixteen services the city managers assessed as having higher transaction costs (difficulty > 0), the MBA score was above zero for eleven. Other measures show a similarly high level of concordance.

There are several services where the city managers and MBA students reached different opinions. These disagreements suggest the additional knowledge brought to bear by the city managers. For instance, the text already notes the discrepancy regarding delinquent tax collection, where the collection of a fixed property tax is a relatively routine and easy to measure service as compared to the kinds of complex auditing that MBA students may have in mind. Another example is insect and rodent control. The MBA

expected this would be among the easiest services to privately contract, whereas the city managers felt that measuring performance was difficult, leading to a more intermediate ranking. For a private company with a single building or campus, it seems likely that assessing performance would be easy for this service, but the problem becomes much more difficult when one has to keep track of an entire city.

In addition to simply comparing the city manager and MBA survey results, we also experimented with using the MBA score in place of the city manager score in our regression analysis. Doing this resulted in estimated effects of contracting difficulty that were similar, but somewhat attenuated (i.e., closer to zero), consistent with the idea that there is more noise in the MBA assessment. For example, if one regresses a dummy for private contracting on our city manager measure of contracting difficulty and city characteristics, the estimated coefficient is  $-0.088$  (s.e. 0.003). The same regression using the MBA score in place of the manager score yields an estimated coefficient of  $-0.084$  (s.e.  $-0.003$ ).

Both the direct comparison of the city manager and MBA surveys, and the relationships between these measures and city contracting practices indicate that the correlation between city managers' opinions of transaction cost problems and actual contracting practices is unlikely to be driven by reverse causality. That is, it appears that, as asked, city managers offered an expert assessment of likely transaction costs as opposed to reporting on what cities typically are doing in terms of contracting out.

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