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Contracting out local road and park services: Economic effects and their strategic, contractual, and competitive conditions

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Abstract: The economic rationale for contracting out local services is increasingly contested by empirical research. This article aims to contribute to this literature, first, by scrutinising the economic effects of contracting out in local road and park services, and, second, by exploring how characteristics such as markets, contracts, municipal strategies, and contracting history influence these outcomes. Drawing on original survey data from Danish municipalities, we find that competitive tendering has on average reduced costs. Further analysis shows that savings are not associated with lower quality, thus indicating that ‘quality shading’ was not taking place. Another finding is that municipalities that repeatedly contract the services experience smaller savings, suggesting that competitive tendering is subject to declining marginal returns. Finally, we find that larger municipalities and those emphasising expenditure cuts realise larger savings, whereas the characteristics of markets and contracts do not seem to explain variations in cost savings.

Keywords: Contracting out, competitive tendering, economic effects, municipalities, roads, parks

Introduction

A major impact of the last four decades of New Public Management (NPM) reform has been the increased involvement of private providers in public service delivery (Alonso, Clifton, and Díaz-Fuentes 2015; Pollitt and Bouckaert 2011). This trend has been particularly pronounced in the local government sector, where many services have been made subject to contracting out (Schoute, Budding, and Gradus 2017). From an economic perspective, which is our focus in this study, contracting out is characterised by the establishment of ex-ante price competition by putting out services for tender in auction-like processes, whereby competing organisations are invited to submit bids for contracts with public clients (Domberger and Jensen 1997). By way of invoking the competition mechanism of the private market, governments should thus be able to provide services at low(er) costs to taxpayers (Boyne 1998; Petersen and Houlberg 2016).

Contracting out has been widely debated over the years, and numerous meta-studies have examined the evidence available (Boyne 1998; Domberger and Jensen 1997; Hodge 2000). Empirical studies published in the 1970s–90s generally confirmed the achievement of cost savings in ‘technical’ services (e.g., refuse collection and cleaning), while recent analyses, including asset-specific tasks and difficult-to-measure ‘social’ services, reach mixed conclusions (Bel, Fageda, and Warner 2010; Petersen, Hjelmar, and Vrangbæk 2017). Recent assessments of contracting and public spending levels in several countries find no association between the two (Alonso, Clifton, and Díaz-Fuentes 2017). Other studies indicate that contracting is subject to declining returns over time, which could be due to shrinking competition and/or public efficiency improvements resulting from the tendering process (Bel and Costas 2006; Gradus, Dijkgraaf, and Schoute 2016). While public organisations at the local, regional, and national levels continue to externalise services as part of their overall cost-containment strategies, recent studies emphasise the need for further empirical exploration of contracting outcomes and their determining factors.

This article aims to contribute to this literature by examining the experience with contracting out in the empirical context of local road and park services in Danish municipalities. The study builds on original survey data from mid-level managers in road and park departments. The Danish local road and park area has features that render it a suitable setting for scrutinising contracting outcomes. The services are characterised by medium asset specificity due to investments in machinery and equipment, and ease of measurability due to standardised quality measurement systems (Brown and Potoski 2003; Hefetz and Warner 2012). Announcing a tender thus enables a sufficient number of competitors to submit bids for the contracts, which increases the likelihood of cost savings (Blom-Hansen 2003). Conversely, the relative ease of measurability enables public organisations to monitor service quality at a tolerable cost, thus reducing the information asymmetry in the principal–agent relationship. Moreover, significant municipal variations in the organisation of road and park services have developed over the past 30 years, including variations in the organisation, strategies, contracts, and historic experience with contracting out (Lindholm, Hansen, and Petersen 2016). The existence of private providers in nearly all municipalities in combination with long-standing contracting experience and variations in the public/private setup makes it a suitable empirical setting for cross-sectoral analysis of contracting outcomes and the factors contributing to their variation. The study addresses the following research questions:

- Is contracting (through competitive tendering) associated with lower costs of providing local road and park services?
- Do changes in the costs of providing the service sustain a control for managers' satisfaction with quality?
- Which conditions account for variations in cost changes across municipalities?

More specifically, the article aims to add to the previous literature in four ways. First, by shedding further light on the empirical experience with contracting in two local services for which many municipalities worldwide are responsible but which only few previous studies scrutinised, the study adds to the limited empirical literature in the area (Blom-Hansen 2003; Lindholst 2017). Second, while the empirical findings indicate that contracting is associated with cost savings, the study tries to take the discussion a step further by examining whether cost savings sustain a control for service quality. We thus include a control for the satisfaction of municipal managers with service quality and find that ‘quality shading’ (Domberger and Jensen 1997) did not seem to take place. Third, by using municipalities’ procurement history, we offer insights into whether the past use of contracting influences present outcomes (see also Bel and Costas 2006; Gradus, Dijkgraaf, and Schoute 2016). The analysis indicates that cost savings are greater when services are first tendered, whereas frequent contracting is associated with declining marginal returns. Finally, in order to further explore factors that contribute to cost savings from contracting out, we include some variables from the literature on contracting determinants (Bel and Fageda 2007; Schoute, Budding, and Gradus 2017) and find that large municipalities and those that emphasise spending cuts realise the largest gains, whereas the characteristics of markets and the contracts do not seem to explain variations in costs.

The remainder of the article is organised as follows. First, we present the theoretical background, review previous literature and formulate our hypotheses. We then present the data, define the variables, and address the common source bias in the survey analysis. Subsequently, we present the findings of our empirical analysis. Finally, the last section discusses and concludes on the findings.

Theory, literature, and hypotheses

The theoretical starting point of this study is the literature on contracting for public services, which frames the importance of political motives, institutional context, contractual arrangements, and service markets for contracting decisions and outcomes (Amirkhanyan, Kim, and Lambright 2010; Brown, Potoski, and van Slyke 2016; Entwistle and Martin 2005; Hart, Shleifer, and Vishny 1997; Hefetz and Warner 2012). Several public service contracting models have been discussed in the literature, including models based on competitive tendering, negotiations, and cooperation (Dehoog 1990; Schoute, Budding, and Gradus 2017). As mentioned in the introduction above, our focus here is limited to the former, which involves the award of public contracts through formal rounds of tendering among the providers in the private market. Public choice and property rights theory forms part of the theoretical background for contemporary contracting literature and therefore warrants consideration. Public choice theory proponents argue that public monopolistic production is suffering from bureaucratic rent-seeking, which result in inefficiencies and the oversupply of services (Boyne 1998). Exposing public organisations to the competitive forces of private markets will reduce inefficiencies and result in cost reductions (the competition argument). Property rights theory, on the other hand, emphasises that private organisations unlike their public counterparts are exposed to a bankruptcy threat, meaning that private providers are incentivised to develop more cost-efficient solutions (the ownership argument) (Alonso, Clifton, and Díaz-Fuentes 2015; Bel and Fageda 2007; Blom-Hansen 2003).

Although public choice theory and property rights theory place different emphasis on competition and ownership as sources of greater private efficiency, both theories forecast that externalisation will reduce costs to taxpayers. It is important to note, however, that the basic argument mainly applies to the level of operational costs and not overall public expenditure (Boyne 1998). The basic economic assumption is that public services resemble a perfect market setup,

where cost, quality, and quantities are fully transparent for exchange partners. Yet public services markets seldom comply with these idealised market conditions, as competition can be limited (e.g., due to collusion or natural monopolies), services can be difficult to measure, and contracts are oftentimes incomplete (Brown, Potoski, and Van Slyke 2016; Dixit 1997). Furthermore, studies based on transaction cost theory (Williamson 1979) emphasise that the comparative cost-efficiency of market transactions (vis-à-vis vertical integration) is moderated by the level asset specificity arising from, for example, investments in specialised equipment and training as well as the ease of measurability, which makes some services more suitable for contracting than others (Brown and Potoski 2003; Hefetz and Warner 2012).

Services within the municipal road sector (road maintenance, snow removal, street cleaning) and park sector (planting, maintenance of parks, squares, green spaces) are generally characterised by a low-to-medium asset specificity and a relatively high degree of measurability, which, according a transaction cost perspective, render them relatively well-suited for contracting out (Hefetz and Warner 2012; Petersen and Houlberg 2016). The few previous empirical evaluations of contracting outcomes in road services find that private delivery is associated with significantly lower costs (Blom-Hansen 2003; Petersen and Houlberg 2016). Previous research in park services also suggests that, in most cases, competitive tendering and contracting out have reduced service provision costs (Lindholm 2017). The theoretical characterisation of roads and parks as suitable for contracting in combination with the findings of previous empirical research leads to the formulating of our first hypothesis:

H₁: Contracting of local road and park services is associated with decreased service provision costs.

While the abovementioned hypothesis concerns the effect of introducing competition by switching delivery mode (i.e., a shift from public monopolistic organisation to competition-based provision), the repeated use of service contracting involves a different theoretical logic. The procurement directive regulating public purchases within the European Union requires that public service contracts above a minimum threshold value are awarded in formal rounds of tendering. The duration of contracts is relatively short (commonly 3–4 years in road and park services), after which the contract is again put out for tender. Assuming that market competition for the contract was initially sufficient to attract bids from several competitors, we would thus expect that additional cost savings from repeatedly putting out the contract for tender are associated with small additional cost savings. This mechanism, which may be seen as a manifestation of ‘diminishing returns to competition’ (Boyne 1998, 182–3), suggests that contracting out is characterised by declining marginal gains when public services are made subject to repeated tendering (Bel and Costas 2006). We thus formulate our second hypothesis as follows:

H₂: Municipalities experience the largest cost savings when services are first tendered, whereas repeated contracting is associated with diminishing marginal savings.

As briefly discussed, public choice theory is based on the assumption that effective use of contracting out for cost-reduction purposes comes from introducing (a degree of) competition. Competition in public service markets may vary in intensity, however, and submitted bids may be more or less qualified (Domberger and Jensen 1997; Sappington and Stiglitz 1987). A minimum amount of competition may be provided through market testing in cases where only one service provider is around, although competitive tendering normally involves multiple potential providers submitting bids. With too little (limited) competition, the risk is higher that potential providers

(bidders) exploit information asymmetries in the principal–agent relationship to extract additional rents (ex-post) from in-efficient (ex-ante) contract pricing (Thompson 2011). Limited rivalry for contracts thus increases the likelihood of adverse selection problems, whereas greater competition increases the odds that potential providers reveal prices closer to their real production costs, thus reducing the scope for extracting rents. We thus expect cost savings to be associated with levels of market competition, which leads to the formulation of the third hypothesis.

H₃: The cost savings of contracting are positively associated with the level of market competition.

Furthermore, although studies of contracting routinely assume that the main purpose is to reduce service delivery costs, research also shows that the objectives and motives underlying contracting out differ and that cost concerns may be emphasised to a different extent (Leiren et al. 2016; Wassenaar, Groot, and Gradus 2013). Several studies emphasise strategies of contracting out that differ from mere cost concerns. For example, Brown, Potoski, and Van Slyke (2016) highlight how contracting out takes place in environments with multiple, often conflicting values such as effectiveness, accountability and responsiveness, which may frame different strategies and political motivations for contracting out. While emphasising the overriding importance of cost concerns, Hodge argues that the purpose of contracting out is in practice a ‘moving objective’ (2000, 24–25).

Moreover, due to different financial conditions, the need to cut costs also varies among municipalities as well as across services. Within the context of local road and park services, Leiren et al. (2016) find that the overriding purpose for using private contractors is a lack of internal capacity rather than cutting costs. Similarly, Lindholst (2009) shows that the development of contracting practices within the park sector is often spurred by concerns for service development rather than cost savings. Previous research thus highlights how contracting out is implemented for

various political and economic purposes, thus making it appropriate to examine whether cost changes are associated with different government strategies. We focus here on municipal cost containment strategies and formulate our fourth hypothesis, as follows:

H₄: Municipal emphasis on cost containment in service contracting is positively associated with cost savings.

Finally, in addition to the already mentioned perspectives, contracting involves formalised contract relations between public authorities and private contractors, which can be designed differently (Dehoog 1990). Contract designs vary in terms of their degree of ‘completeness’, their specification of exchange conditions (Hart, Shleifer, and Vishny 1997), or they may vary on a continuum from ‘simple’ to ‘complex’, depending on the characteristics of the service in question (Brown, Potoski, and Van Slyke 2016). Contracts may also be intended to support different contracting purposes, ranging from pure cost-minimising concerns to enhanced responsiveness and public deliberation (Vincent-Jones 2007).

The widespread ‘transactional’ approach to contract design – that which Dehoog (1990) denotes the ‘competition model’ – is supposed to align formal contract features in order to drive costs down by maximising price competition. A transactional logic presumes that a public authority can foresee the requirements and conditions of an exchange in advance and specify them in a formal contract (Macneil 1974; Walker and Davis 1999). The level of formal specification and the inclusion of relevant information – or contract completeness – becomes important for reducing uncertainties and minimising the risk of later conflicts among the contracting parties, which are factors that could limit ex-ante competition and hamper bidders’ intelligible pricing of a contract (Brown, Potoski, and Van Slyke 2016; Sappington and Stiglitz 1987).

In addition to standard contract features supporting a transactional logic, contracts can also include formal features supporting a ‘collaborative’ logic, which serves the purpose of enabling a more adaptive, flexible provision of services at the contract implementation stage (Schepker et al. 2014; Vincent-Jones 2000). Since the late 1990s, collaborative approaches emphasising factors such as complementary competences, stakeholder deliberation, service improvement, and transformation have become more common in public service contracting (Donahue and Zeckhauser 2006; Entwistle and Martin 2005). While transactional and collaborative logics are sometimes presented as two ends of a continuum, they are oftentimes mixed and integrated into the formal features of contract designs (Lindholm 2009; Walker and Davis 1999). Lindholm (2009), for example, finds that contract features in park maintenance in addition to transactional features include features supporting a ‘collaborative’ logic to various degrees, such as joint planning and coordination, deliberation with users, flexibility, and the (re-)organisation of service delivery systems. Given that collaborative features can be seen as additional activities for running the contract (i.e., transaction costs; Williamson 1979); potential providers may treat these activities as extra costs when pricing their bids.

Based on the arguments above, we hypothesise that greater reliance on formalised transactional contract features are positively associated with reduced costs in public service contracting, whereas greater emphasis on collaborative contract features could result in higher bidding costs and therefore be negatively associated with savings.

H₅: Emphasis on transactional contract features is positively associated with cost savings.

H₆: Emphasis on collaborative contract features is negatively associated with cost savings.

Methods and data

The context of our study is road and park services in Danish municipalities. The 98 municipalities are multipurpose entities averaging approximately 57,000 inhabitants, which have a relatively high degree of autonomy in terms of policy prioritisation, tax levels, and choices between public and private delivery modes. Road and park services are characterised by widespread and enduring private involvement and well-established competitive markets (Lindholst, Hansen, and Petersen 2016). On average, the municipalities spend 36% of park budgets and 46% of road budgets on purchases from private contractors (see Table 1).

Our analysis builds on survey data collected electronically from mid-level municipal managers with responsibility for operational and strategic aspects of road and/or park services. The survey was carried out in the winter of 2014/15 and included questions about cost change from last tender, satisfaction with quality, level of competition, strategic purposes, and tender history as well as broader organisational and managerial aspects. Respondents were identified through municipal websites, official directories for road and park professionals, and direct telephone contact. Because of inter-municipal variations in the organisation of road and park services (e.g., split responsibility), more than one manager was contacted in some municipalities. In case more than one response was returned from a municipality (double entries), one respondent was selected as ‘primary’ based on an assessment of job title, position in hierarchy, and years of employment.

In total, 115 respondents representing 75 municipalities returned the survey, corresponding to 76.5% of the 98 Danish municipalities. Only responses from municipalities that presently use private contractors in either road or park services were included, 82 of whom provided information on the cost change from last tender. In the multivariate analysis, eight cases were excluded due to missing data for one or more of the independent variables, while one case was excluded as an ‘influential outlier’ (Wooldridge 2013). The final dataset thus contains 33 cases for roads and 40 cases for parks, representing 42 municipalities. For the present analysis, we pool the responses for

the two services, thus creating a pooled data set of 73 cases of cost changes from the last tender of either road or park services.

Table 1 provides descriptive statistics for the level of private purchases for the 42 municipalities in our sample and for all 98 municipalities. A drop-out analysis (not shown) indicates no significant difference between responding and non-responding municipalities as regards municipal size, geographical location, and the level of private purchases.

*** insert table 1 around here ***

Description of variables

The statistical analysis includes five independent variables and three control variables. Table A1 in the appendix provides details on the specific wording of survey items, response scales, and variable construction.

The dependent variable *cost change from last tender* measures the change in maintenance costs the last time the service was tendered. Respondents were asked to provide separate estimates of cost changes (or no change) for road and park maintenance in overall operational costs based on a before-and-after comparison. The dependent variable thus measures the difference between ex-ante and ex-post costs in percent of ex-ante costs, with negative values expressing a cost reduction.

Competition level is based on a single item measuring how the managers assess whether the municipality usually receives qualified bids (competition) in tenders of road and/or park services. Competition levels are measured on a scale ranging from ‘not at all’ (0) to ‘very high degree’ (10).

Tender history measures the amount of municipal tenders in road or park services over the last 10 years, ranging from ‘Once’ to ‘4 times or more’. For the statistical analysis, we transform this ordinal-scaled item to a set of dummy variables.

Contracting purpose measures the importance of ‘low maintenance cost’ as the strategic purpose of tendering the services. The variable is measured on a scale ranging from ‘not at all’ (0) to ‘a very high degree’ (10).

Transactional and collaborative contract features are two index variables measuring the emphasis on respectively transactional and collaborative dimensions of the municipality’s contracts with private providers. The two variables are each constructed from an additive index of four equally weighted items (see details in Table A1 in the appendix). In accordance with theoretical assumptions, an explorative factor analysis confirmed that the eight survey items load well on two different dimensions relating to, respectively, a set of transactional and collaborative contract features. Cronbach’s alpha (.870 and .758, respectively) indicates a high level of internal consistency.

Three control variables are included. *Satisfaction with maintenance quality* is based on a single survey item measuring the levels of satisfaction among municipal road and park managers with the ‘maintenance quality’ of privately delivered services. The variable is measured on a scale ranging from 0 (very unsatisfied) to 10 (very satisfied) and fundamentally expresses the managers’ subjective evaluation of service quality.

Municipal size (measured as number of inhabitants) is included to control for differences in contracting competencies and service markets in municipalities of varying size (Bel and Costas 2006). Finally, a dummy variable for *Sector* (parks = 0; roads = 1) is included to control for possible differences between road and park services.

The variables for contracting purpose, transactional framework, and collaborative features are common for the road and park sector, while the variables for cost change, procurement history, and satisfaction with quality are measured specifically for each service. Table A2 in the appendix provides descriptive statistics for all variables.

Validity issues

In line with other contracting studies that build on survey data (cf. Brown and Potoski 2003; Hefetz and Warner 2012; Schoute, Budding, and Gradus 2017), our data for the study raise two potential validity issues. First, the dependent variable is based on the self-reported and retrospective assessments of cost changes by the respondents. Potentially, this may cause memory bias or social desirability bias. While the exact decimal point of cost savings may not always be memorised, contracting is used on a regular basis and cost savings from tenders are normally reported to administrative and political leaders in the municipalities, thus rendering it more likely that respondents have a fairly precise knowledge of the economic consequences of the last tender. Social desirability bias cannot be ruled out, as the respondents may either over- or underestimate cost changes due to their beliefs and/or organisational interests. However, the anonymity of the survey reduces the likeliness of social desirability affecting the responses, and statistical tests (not shown) show no significant correlation between the managers' general support for contracting out and reported cost changes. To further validate and crosscheck the data, cases with very high or low values on the dependent variable were validated by direct contact to the respondents. Furthermore, even if respondents should have incentives to overestimate cost savings, a potential systematic over-reporting of cost savings will not cause bias in causal inferences (King, Keohane, and Verba 1994: 156).

Second, our reliance on data from a single survey for both the dependent and independent variables (except for municipal size, which came from registers) may raise issues related to common source bias (Meier and O'Toole 2013; Podsakoff et al. 2003). Common source bias may either inflate or attenuate relationships but is usually expected to cause inflation (Richardson, Simmering, and Sturman 2009). We sought to remedy potential issues by constructing variables

based on different types of response scales and by using items focusing on factual information from the respondents. Furthermore, the fact that the respondents are not assessing their own personal or organisational performance reduces the risk of bias. Although we cannot rule out these sources of bias, a number of statistical tests (can be obtained from the authors) suggested by Podsakoff et al. (2003) indicate that common source bias is unlikely to confound our findings significantly.

Empirical results

This section reports the results of the empirical analysis. Table 2 shows the descriptive statistics for respondents' reported changes (in percent) in maintenance costs after the latest round of tendering. The average reported cost change in the pooled data set (right column) for road and park services is 4.7%. A one sample t-test comparing the population mean (-4.7%) with a mean value of 0, indicating the threshold value where no cost savings are achieved, returns a significant result ($t = -4.361$, $df = 72$, $p < .000$) with -6.8% and -2.5% as lower and upper limits in a 95% confidence interval. Competitive tendering thus seems to be associated with lower costs of delivering local road and park services in the Danish context.

*** insert table 2 around here ***

Table 3 shows the result of the OLS regression using cost change from the last tender as the dependent variable. The statistically significant coefficient for tender history indicates that municipalities that tendered the service three times and four times or more experience significantly lower cost savings (a difference of 9–11 percentage points) compared to the reference category of municipalities that have only tendered the service once. Conversely, the estimate for municipalities with two tenders is not significant.

*** Insert table 3 around here ***

Importantly, in contrast to our theoretical expectations, the coefficient for perceived level of competition is insignificant. Increased competition for public services contracts does not appear to be associated with greater cost savings; at least not in road and park services in Danish municipalities. We return to a discussion of this result in the next section.

The coefficient for low cost as contracting purpose is significant and negative, thus suggesting that municipalities emphasising ‘low maintenance costs’ as contracting purpose report higher cost savings from the last tender. This finding indicates that municipalities can in fact realise greater cost savings when cost containment was an explicit purpose of tendering the service.

Finally, the signs of the estimates for contractual features are as expected. Emphasis on transactional contract features seems to be positively associated with cost savings, whereas greater emphasis on the collaborative contract framework is negatively associated with cost savings; however, neither of the two estimates is statistically significant.

Turning to the control variables, the coefficient for sector is insignificant. This supports the result of the descriptive statistics that cost savings in road and park services are not significantly different. Another finding is that the cost change from the last tender is not associated with the levels of satisfaction among municipal road and park managers with service quality. Finally, the coefficient for municipal size is significant and negative, meaning that larger municipalities report larger cost savings than smaller municipalities. Table 4 summarises the key findings related to our six hypotheses.

*** Insert table 4 around here ****

Discussion and conclusion

Our findings concerning the changed costs from contracting out are consistent with previous research in road and park services that found lower costs with private service provision (Blom-Hansen 2003; Lindholst 2017; Petersen and Houlberg 2016). In our study, municipal road and park managers report that the latest tender reduced costs by 4.7% on average – a result statistically significant different from a situation with no cost changes. In line with previous empirical research, we conclude that contracting out local road and park services seems to be associated with reduced costs. Furthermore, in addition to focusing merely on the changes in costs, which several scholars argue could be associated with reduced service quality (cf. Boyne 1998; Domberger and Jensen 1997), we include a control variable measuring respondents' satisfaction with service quality. The coefficient of the variable is statistically insignificant, thus suggesting that cost savings and managerial satisfaction with service quality are unrelated.

We believe that this could be due to several factors. One possible explanation is the relative ease of measurability of road and park services (Brown and Potoski 2003; Hefetz and Warner 2012), which minimises information asymmetries in the principal–agent relationship and makes it less costly to detect and penalise degradations in quality. Another explanation is that the managers' expectations regarding service quality are adjusted to costs, meaning that quality could have changed without changing the level of satisfaction. Unfortunately, no additional data on ex-ante and ex-post quality levels are available, which could help us explore this issue further. However, the few previous analyses in the road and park area, which utilised register data and included a control for quality, find no statistical association (Blom-Hansen 2003; Petersen and Houlberg 2016). We therefore cautiously conclude that indications of 'quality shading' are not present in our study, and we recommend that subsequent research scrutinise this important issue further.

With regard to longitudinal developments in the economic outcomes, the analysis indicates that municipalities that tender road and park services once or twice over the past 10 years achieve on average rather substantial savings. However, average savings are significantly smaller among municipalities with a more extensive tendering history. The finding suggests that the ‘diminishing returns to competition’ effect (Boyne 1998, 182–3) is also characteristic of Danish municipalities’ tendering of road and park services. This is similar to what Bel and Costas (2006) described as ‘public reforms getting rusty’ and is also in line with a recent review of international empirical contracting studies (Petersen, Hjelm, and Vrangbæk 2017). Possible mechanisms driving the diminishing returns may be that the market price (close to true production costs) is already achieved in the first tenders or that in-house provision has become increasingly efficient due to exposure to competitive pressures (Lindholm 2017). The finding highlights an important theoretical and empirical mechanism, which we believe contributes to explaining why current empirical research tends to find smaller and more mixed outcomes than early contracting literature.

Moreover, in contrast to what we hypothesised, we find no association between changes in costs and the level of competition for contracts. When interpreting these findings concerning contracting history and competition, it is important to bear in mind that contracting out in road and park services in Danish municipalities takes place within a context of relatively well-developed markets, which have evolved over the past 20–30 years. This is different from Thompson (2011), and Gradus, Dijkgraaf and Schoute (2016), pointing to a lack of competition in respectively bus services in the US and refuse collection in the Netherlands. Danish municipalities that tender services the first time are thus able to tap into an already competitive marketplace, whereas municipalities with more extensive procurement histories could have benefitted from the competitive mechanisms of the market several years ago. Another point of discussion is that our analysis relies on cross-sectorial data collected at a single point in time and ‘merely’ compares

municipalities with different markets and contracting histories. A more thorough analysis of the underlying mechanisms and accumulated cost savings over time requires longitudinal data and should be a core theme for future research.

Interestingly, we find that municipal emphasis on cost containment as a strategic purpose is, indeed, associated with greater cost reductions. The finding suggests that, at least in the context of road and park services in Danish municipalities, tendering and contracting out is working relatively effectively as a political and/or organisational strategy for reducing the service delivery costs. An important point of notice is that contracting is used for many different (and sometimes competing) political, organisational, and economic reasons (Brown and Potoski 2003; Schoute, Budding, and Gradus 2017). Public organisations may thus focus on cost reductions to a varying extent, which is reflected in the economic results that municipalities obtain from contracting the service. However, the more exact mechanisms through which municipalities realise a cost reduction strategy are not addressed further in this study.

Our findings concerning the characteristics of the contracts indicate that emphasis on transactional and collaborative contract features is not associated with the level of cost change. On the positive side, more collaborative features accommodating a more adaptive and flexible contracting relationship do not seem to come at additional cost, as expected by our theorisation. On the other hand, greater emphasis on transactional features accommodating a more complete contract do not seem to explain cost reductions. Albeit transactional and collaborative contract features are not associated with cost changes in our study, they may still be important for other dimensions of contractual performance or accountability, such as the level of conflict or satisfaction with quality. Furthermore, given that roads and parks are services with relative ease of measurability, the characteristics of contracts may be of less importance compared to more complex services (Brown, Potoski, and Van Slyke 2016). Additional research on this issue is warranted.

The control variable for municipal size shows a strong, negative association with cost changes from last tender, thus indicating that larger municipalities experience larger cost reductions from contracting out than small municipalities. This finding is different from Bel and Costas (2006) and Petersen and Houlberg (2016); the latter finding larger savings in medium-sized Danish municipalities. A possible explanation is the presence of higher contract management competence in larger (compared to smaller) municipalities. Given greater skills and expertise within a larger organisation, it is likely that large municipalities are more professional when organising their contracts and arranging their tenders to match the market. Another theoretical explanation is that competition levels differ as markets could be more attractive in municipalities of greater size. We do, however, include a variable measuring the perceived level of market competition, which is not associated with cost changes. The empirical findings in our study therefore seem to support variations in contracting competencies rather than market conditions as the explanation for cost differences.

As a final remark, we will emphasise that generalisations from our study should be cautious and limited to services displaying similar service characteristics as roads and parks as well as contexts characterised by relatively large municipalities and well-functioning markets. The findings are well in line with those of previous empirical studies that use register data, but contracting outcomes and their determining factors could be different in other services and contexts where asset specificity, measurability, governing institutions, and market context are different. Another point of caution is that our study mainly focuses on cost changes and, as a control variable, satisfaction with service quality. The study has not, however, evaluated broader societal effects, such as externalities, employee outcomes, and transaction costs, or addressed whether competitive tendering leads to reductions in overall public expenditure. These are important issues for future research.

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Table 1. Share of budget spend on private purchases in local road and park maintenance.

	Service area	Mean	S.D.	Min	Max
All Danish municipalities (N = 98)	Roads and parks combined	43%	16%	9%	96%
	Parks	36%	23%	3%	100%
	Roads	46%	19%	0%	100%
Municipalities in sample (N = 42) ^a	Roads and parks combined	48%	18%	19%	96%
	Parks	38%	26%	10%	100%
	Roads	49%	21%	0%	100%

Note: All estimates based on data from municipal accounts for 2014 (source: Statistics Denmark/regk31).

^a The 42 municipalities in the sample include the 33 cases for parks and 40 cases for roads, which form the basis of the multivariate analysis.

Table 2. Cost change resulting from the last tender in road and park services.

	Change in operational costs (negative values = cost reduction)		
	Roads	Parks	Roads and parks combined
Average	-4.1%	-5.4%	-4.7%
Standard deviation	8.4%	10.0%	9.1%
Minimum	-30%	-30%	-30%
Maximum	10%	16%	16%
N	40	33	73

Note: Cost changes in road and park services are not significantly different.

Table 3. OLS-regression of cost changes from the last tender in road and park services.

<i>Independent variables (scales)</i>	Statistics		
	<i>B</i>	SE	P
Competitive tendering history (ref. = 1 tender in last 10 years)			
2 tenders	2.372	3.248	.468
3 tenders	11.365	3.195	.001
4+ tenders	9.766	2.695	.001
Competition level (0–10)	.020	.452	.964
Low cost as contracting purpose (0–10)	-1.516	.495	.003
Transactional contract features (0–10)	-.571	.579	.328
Collaborative contract features (0–10)	.364	.562	.520
<i>Controls</i>			
Sector, dummy (roads = 1, parks = 0)	-.625	1.831	.734
Manager's satisfaction with service quality (0–10)	.354	.608	.563
Municipal size (LN)	-5.941	1.696	.001
<i>Model summary</i>			
Intercept	63.902	19.122	.001
N = 73			
Adj. R ² = .341			
F(1,10) = 4.722, p = .000			
Max VIF = 2.403			

Notes: The highest VIF values relate to the dummy variables for tendering history.

Table 4. Summary of main results.

Hypotheses	Empirically supported?
H ₁ Contracting of local road and park services is associated with decreased costs.	Yes
H ₂ Municipalities experience the largest cost savings when services are first tendered, whereas repeated contracting is associated with diminishing marginal savings.	Yes
H ₃ Cost savings of contracting are positively associated with the level of market competition.	No
H ₄ Municipal emphasis on cost containment in service contracting is positively associated with cost savings.	Yes
H ₅ Emphasis on transactional contract features is positively associated with cost savings.	No
H ₆ Emphasis on collaborative contract features is negatively associated with cost savings.	No

Tabel A1. Description of variables.

VARIABLE	SURVEY ITEMS ^a AND CONSTRUCTS	RESPONSE SCALE/ CATEGORIES	VARIABLE CONSTRUCTION
Cost change from last tender^d	To what degree do you estimate that the tendered services have become cheaper or more costly since the last time they were tendered? (Consider changes in the total estimated operational costs before and after the tender.)	<ul style="list-style-type: none"> • ___% more costly • ___% cheaper • ___ neither more expensive nor cheaper • ___ don't know 	Continuous variable (change in %)
Sector	Which service? <ul style="list-style-type: none"> • Roads • Parks 	Yes/no	Binary variable (0 = parks, 1 = roads)
Competitive tendering history^d	How many times have maintenance services that your department is responsible for been tendered (open competition) in the last 10 years?	<ul style="list-style-type: none"> • Once • Twice • 3 times • 4 times or more 	Dummy variables (1 = yes, 0 = no)
Competition level	Specify on a scale of 0–10 the degree to which you find the following statements describe the 'market situation' for maintenance services you tender: <ul style="list-style-type: none"> • Do you usually receive sufficient qualified bids (competition) for services you tender? 	<ul style="list-style-type: none"> • Once • Twice • 3 times • 4 times or more 	Dummy variables, (1 = yes, 0 = no)
Low cost as contracting purpose	Specify on a scale from 0–10 the degree to which you find that the following purposes are a key part of the municipality's considerations for using private contractors for the services for which your department is responsible: <ul style="list-style-type: none"> • The purpose is to ensure cheap (cost-effective) maintenance: 	Unipolar 11-point scale with end anchors ^b	Continuous variable (0–10)
Transactional contract features	Specify on a scale of 0–10 the degree to which the following content is central in your relation with private contractor(s) for maintaining parks and green spaces and/or roads: <ul style="list-style-type: none"> • Formalised and written legal clauses (e.g., a signed contract). • Performance specifications – describing overall goals, functionality, and guidelines for operation and development. • Prescriptive specifications – based on quantities, instructions, and performance measures. • Formal sanctions (e.g., financial penalties) for noncompliance. 	Unipolar 11-point scale with end anchors ^b	Continuous, weighted additive index variable based on four items. (0–10) Cronbach's Alpha = 0.870
Collaborative contract features	Specify on a scale from 0–10 the degree to which the following content is central in your relation with private contractor(s) for maintaining parks and green spaces and/or roads: <ul style="list-style-type: none"> • Agreement on close collaboration and joint planning of operations and development. • Agreement for contractors to involve/liase directly with citizens and users. • Agreement on extended economic framework with incentives for investments, optimisations, or improvements. • Competence requirements (e.g., professional affiliation or qualification). 	Unipolar 11-point scale with end anchors ^b	Continuous, weighted additive index variable based on four items. (0–10) Cronbach's Alpha = 0.758
Manager's satisfaction with service quality^d	Specify on a scale of 0–10 how satisfied or unsatisfied you are with the job (the) private contractor(s) carry out for your department in relation to: <ul style="list-style-type: none"> • Overall quality of maintenance operations. 	Bipolar 11-point scale with end anchors ^c	Continuous variable

Municipal size	Source: Statistics Denmark	Number of inhabitants (year 2014)	Continuous variable Logarithmic scale (natural)
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^a All items translated from Danish.

^b Response categories are based on an 11-point scale with end anchors, where 0 = not at all, 10 = to a very high degree.

^c Response categories are based on an 11-point scale with end anchors, where 0 = very unsatisfied, 10 = very satisfied.

^d The question is formulated respectively for roads and parks.

Table A2. Descriptive statistics for variables used in OLS regression.

Variables ^a	Descriptives			
	Scale	Mean	Std. Deviation	Min–Max value
Cost change from last tender ^b	Percent	–4.66	9.13	–30–16
Competition level	0–10	7.47	2.05	2–10
Competitive tendering history				
One tender (1 = yes)	0–1 (dummy)	.16	.37	0–1
Two tenders	0–1 (dummy)	.15	.36	0–1
Three tenders	0–1 (dummy)	.15	.36	0–1
Four or more tenders	0–1 (dummy)	.53	.50	0–1
Low cost as contracting purpose	0–10	7.49	2.02	0–10
Transactional contract features (index)	0–10	7.65	2.02	2.00–10.00
Collaborative contract features (index)	0–10	5.14	2.08	.75–10.00
Sector (park = 0, roads = 1)	0–1 (binary)	.55	.50	0–1
Manager's satisfaction with service quality	0–10	7.51	1.6	2–10
Municipal size	LN	10.85	.58	9.94–13.26

N = 73.

^a See appendix Table A1 for details on variable constructs.

^b Negative signs indicate cost savings.