

Additional public procurements in health services: Lessons from Finnish physiotherapy markets^{*,**}

Visa Pitkänen¹ and Milla Hägg²

Abstract

Private firms are often acquired to provide publicly financed health services through public procurements. The number of contracted providers and their capacity may turn out to be deficient during the contract period. Typically, the purchasers then organize additional procurements or negotiate directly with available uncontracted providers to acquire more capacity. In this study, we examine an unusual additional public procurement in Finnish physiotherapy markets, in which incumbent providers with an existing contract were also eligible to participate. In practice, these contracted providers did not bear any risk when they submitted their bids in the additional procurement. We compare contracted and uncontracted providers' prices to free market prices using a difference-in-differences approach. The results show that contracted providers increased their prices on average by 9%, while the originally uncontracted providers decreased their prices by 8% compared to the development of free market prices. Our calculations show that the additional procurement led to a waste of public funds by around 1.5 million euros over the contract period. We also present a simple theoretical framework for providers' behaviour in additional public procurements.

Keywords: *Public procurement, Competitive bidding, Health care, Prices, Capacity*

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¹ Ministry of Social Affairs and Health, Meritullinkatu 8, PL 33, 00023 Valtioneuvosto, visa.pitkanen@gov.fi

² Dept. of Economics, University of Helsinki; Helsinki Graduate School of Economics, milla.hagg@helsinki.fi

1 Introduction

Public procurements account for more than 14% of the GDP in the EU, and improving efficiency in the procurements could bring large potential savings (European Commission 2022). Even though their importance to the economy is widely recognized, the procurements often suffer from two commonly known problems. First, it is known that a successful public procurement requires a sufficient level of competition to obtain high-quality services at reasonable prices (Bajari et al. 2008; Bulow & Klemperer 1996; Wilson 1977). However, public procurements often attract only a very small number of bidders (Jääskeläinen & Tukiainen 2019). Second, empirical research has shown that inefficient practices, such as discretion, corruption and lack of competence are often present in public procurements (Bandiera et al 2009; Bucciol et al. 2020; Coviello et al. 2018; Decarolis et al. 2020; Hyytinen et al. 2018). For example, when procurements are organized in a repeated manner, as they are often in health services, it is important to consider whether to reward incumbent firms from their prior experience with the procurer. Such rewards may reduce the willingness of new bidders to enter the procurement and offer an unfair advantage for the incumbent firms (Butler et al. 2020; Dranove et al. 2009).

Many publicly financed health services are acquired from private providers through repeatedly organized public procurements, where the purchasers often contract multiple providers for a certain contract period in a geographical area (Barros et al. 2016). However, the number of contracted providers and their capacity may turn out to be deficient during the contract period, for example if several providers exit the market or demand suddenly increases during the contract period. Typically, the purchasers then organize additional procurements or negotiate directly with available uncontracted providers to acquire more capacity. The public purchaser often has its back against the wall in such situations: The purchaser needs to contract more providers and acquire more capacity, but most providers may already be contracted, and the remaining providers are most likely aware of their advantageous position in the additional procurement. Therefore, additional procurements may lack competitive pressure, and it is important that they are organized in an efficient manner.

In this study, we examine repeated public procurements by the largest public physiotherapy purchaser in Finland. In particular, we study an unusual additional competitive bidding, in which incumbent providers with an existing contract were also eligible to participate. The additional procurement was organized during the contract period in 2019 and targeted the service specifically for patients under the age of 18, whereas the initial procurement in 2018 was for physiotherapy provided to all patients regardless of their age. The procurement was not organized because of unfulfilled capacity requirements, but because of public outcry from patients and providers stating the continuity of treatment for some patients may be compromised. In practice, incumbent providers that had received a contract already in 2018 did not bear any risk, in terms of risk related to not being included in the pool of providers, when they submitted their bids in the additional procurement of 2019. Thus, these contracted providers had a natural incentive to increase their prices, whereas for initially uncontracted providers the additional procurement offered a second chance to receive a contract for the ongoing contract period.

To our knowledge, this is the first theoretical or empirical study that concerns additional public procurements in health or other services, even though purchasing additional work from the incumbent firms is a common practice, for example, in ICT-services and in construction industry. Our empirical part consists of the following four analyses: First, we compare contracted and uncontracted providers' prices in the additional procurement with each other. Second, we compare their prices to free private market prices using a difference-in-differences approach. Third, we show that providers reacted by changing their prices in the additional procurement, because there was only very little time to make any quality adjustments. Fourth, we calculate how much, if any, public money was wasted in the additional procurement, and what the costs would have been if all uncontracted providers had simply been given direct contracts. After the empirical findings, we present a simple theoretical framework for providers' behaviour in additional public procurements. Our focus is on explaining providers' behaviour in this particular additional procurement in 2019, but some of the findings can be generalized also to other more traditional additional procurements where incumbent providers are not eligible to participate.

The additional procurement of 2019 brought only small benefits with respect to service availability, because half of the providers who received a contract were contracted already in the initial procurement of 2018. The descriptive evidence

shows that as expected, practically all contracted providers increased their prices, whereas most uncontracted providers decreased their prices in the additional procurement. The regression results show that compared to the development of free market prices, contracted providers increased their prices on average by 9%, while the originally uncontracted providers decreased their prices by 8%. Our simple back-of-the-envelope calculations show that this inefficiently organized additional procurement led to a waste of public funds by around 1.5 million euros over the entire four-year contract period. We also show that the additional procurement resulted in similar costs as a counterfactual scenario, where the procurer would have increased capacity by directly contracting providers that were not contracted in the initial procurement.

2 Institutional setting

We examine public procurements for intensive medical physiotherapy service financed by the Social Insurance Institution of Finland (Kela), which is the largest single organizer and financier of physiotherapy services in Finland. The service is intended for severely disabled persons under 65 years of age who face problems managing daily activities and fulfil the eligibility criteria set by law (Kela 2021). Patients typically receive the service once or twice a week. The service is provided free of charge to all patients, and many patients receive the service for several years. In 2019, Kela organized the service for 16 053 patients with costs of 67.7 million euros (SVT 2020).

Kela acquires the services from private markets using a competitive bidding arranged every four years and is the largest single purchaser of physiotherapy services in Finland. The physiotherapy markets are one of the most competitive health care markets in Finland, and Kela's service accounts for around 25% of the markets' overall revenue (Pitkänen et al. 2020). Other large physiotherapy purchasers are municipalities, hospital districts and various insurance companies. Municipalities also purchase physiotherapy services for their residents using frequently organized procurements. Naturally, individuals may also purchase physiotherapy services by themselves. When individuals receive physiotherapy that is referred by a private or public physician, they were previously entitled to a small reimbursement paid by Kela from the Finnish National Health Insurance scheme. The reimbursement was 8 euros per visit prior to 2016. In 2016 it was decreased to 6 euros and removed completely in 2023.

Kela's insurance districts organize the procurements as scoring auctions, where providers meeting the minimum criteria are evaluated and ranked based on their price and quality. Providers' quality is evaluated based on their experience, education and investments in facilities and equipment. Each district decides a contract threshold, which is based on the estimated demand for the service and the announced capacity of the ranked providers. Kela offers a contract to providers above the threshold to join a framework agreement. Selection into the framework agreement does not guarantee any number of patients for providers, as patients have free choice of providers among those that have joined the framework. This study covers the following three procurements: the initial procurements organized in spring 2014 and 2018 for contract periods 2015–18 and 2019–22, and the additional procurement in winter 2019 for the remainder of the 2019–22 contract period.

In practice, Kela's insurance districts offered a contract to all bidders in the procurements that were organized prior to 2018. A previous study by Pitkänen et al. (2020) showed that this inefficient practice led to significant increases in prices and total costs. Kela reformed the procurement practice and introduced the following three changes prior to the 2018 procurement. First, ranked providers were offered a contract based on their capacity and the local target capacity. Second, quality weight was decreased from 50% to 20%, and price weight increased correspondingly. Third, Kela centralized the procurement procedure from its insurance districts to its central administration, aiming to increase competence and decrease discretion related to the procurement practices. The purpose of the reform was to increase price competition by increasing providers' risk of not receiving a contract. Pitkänen (2022) showed that the reform slowed down the rapid increase of prices especially in the most competitive areas.

The procurements have a direct influence on patients' everyday life because a vast majority receive the service for several years and often establish close relationships with their usual provider. Prior to 2018, most patients were able to continue

their physiotherapy with their usual provider because nearly all incumbent providers were offered a new contract in the procurements. For example, as much as 98% of bidders received a contract in 2014. As a result of the procurement reform, Kela contracted only 892 providers (around 75% of bidders) with a total capacity for 39 026 patients in 2018. The service was received by 16 200 patients in 2018, while the target capacity in the procurement was for 16 100 patients. Thus, the contracted capacity was more than twofold compared to the target capacity or the number of patients. Nevertheless, many patients were facing a forced switch from the usual provider, which caused negative feedback especially from parents of young patients. Many of the uncontracted providers also made an official complaint to Kela.

Even though the contracted providers had a sufficient capacity for the contract period, the negative feedback and political pressure forced Kela to organize an additional procurement, which targeted physiotherapy to patients under 18 years. The additional procurement was organized in winter 2019, shortly after the beginning of the 2019–22 contract period. Quality and price were weighted at 50% each, and the focus of the minimum criteria and the quality scores was on providers' experience and education relevant to children's physiotherapy. Service description, which describes the content of the physiotherapy service that patients receive, remained the same between the 2018 and 2019 procurements. Providers that did not receive a contract in the 2018 procurement were given direct contracts, at the 2014 procurement prices, to continue with patients under 18 years until new contracts under the additional procurement would become effective.

Importantly, all physiotherapy providers were able to participate in the additional procurement of 2019. This also includes providers that already received a contract in the initial procurement of 2018. In practice, if their bid was above the contract threshold and thus accepted in the additional procurement, they would receive a new price for the remainder of the contract period to provide the service to under 18-year-old patients. Thus, these contracted providers were able to participate in the procurement without the normal risk of losing their place in the pool of providers. Even though they had strong incentives to increase their prices, they also had incentives to participate in the additional procurement and try to prevent the entry of providers who were initially left without a contract by offering a low enough price that would lead to a contract. Meanwhile, for the initially uncontracted providers the additional procurement was an important opportunity to keep at least some of the patients funded by Kela.

3 Data and methods

3.1 Data

The data for this study comes from two main sources. The first source are the quality-price rank lists collected from Kela's insurance districts on the initial physiotherapy procurements of 2010, 2014 and 2018, and the additional procurement of 2019. These lists include providers' price bids for a 45-minute service, quality points, quality-price scores and annual capacity for the service. The second data source consists of the free market prices of Finnish physiotherapy firms in 2014, 2018 and 2019. These free market prices are based on private 45-minute physiotherapy visits, which were partially reimbursed by Kela under the Finnish National Health Insurance scheme. The data includes visits that are paid directly as out-of-pocket payments or covered either by employer-sponsored occupational health care contracts or by private insurances. The data includes visits and prices only for firms that have signed a direct electronic reimbursement agreement with Kela. This means that many visits and prices are not available, especially for the year 2014 when the electronic reimbursement system was not as widely adopted as in more recent years. The prices vary within firms during a year, so the most common price for each firm in each year is used.

Table 1 shows the market characteristics of bidders that fulfilled the minimum criteria and were evaluated based on their price and quality in the studied procurements in 2014, 2018 and 2019. The table shows that a vast majority of bidders in the 2014 and 2018 initial procurements were incumbent providers with an existing contract. The table also illustrates the effects of the 2018 procurement reform: 1265 providers of 1293 bidders were offered a contract in the 2014 procurement, whereas only 892 providers of 1193 bidders received a contract in 2018. Contracted providers' average quality-price scores have been higher than uncontracted providers' scores in all of the studied procurements, especially in 2014 when

only a few providers were not contracted. The table also shows the number of firms and their prices in the free market data, confirming that the number of observations has increased in the free markets as firms have started using the electronic reimbursement system.

Table 1. *Market characteristics.*

Procurements	2014	2018	2019
Bidders	1293	1193	239
Incumbent	1038	901	116
Avg. price (€)	57.9	62.5	65.8
Contracted providers	1265	892	189
Incumbent	1027	713	98
Avg. price (€)	57.6	60.4	65.7
Avg. price change (€)	10.1	3.5	0.4
Avg. quality	37.4	44.8	82.0
Avg. quality–price score	73.4	72.9	73.0
Total capacity	50917	39026	4012
Uncontracted providers	28	301	50
Incumbent	11	188	18
Avg. price (€)	70.4	68.8	66.2
Avg. price change (€)	15.6	5.6	–0.9
Avg. quality	26.6	38.4	69.1
Avg. quality–price score	57.2	65.1	66.1
Total capacity	382	12160	973
Patients	14671	16212	–
Target capacity	–	16100	3400
Free markets	2014	2018	2019
Firms	836	1085	1093
Average price (€)	48.4	55.4	56.3

Quality is not comparable between the procurement rounds because the scores were not calculated in a similar way.

Altogether 239 providers participated in the additional procurement. Of those, 116 bidders had already received a contract in the initial procurement, 100 bidders were initially uncontracted, and 23 bidders were new market entrants. Eventually, 189 providers were contracted in the additional procurement with total capacity for 4012 patients, which was slightly higher than the target capacity of 3400. Of these contracted providers, as much as 98 were incumbent providers that received new contracts with a new price for the targeted patient group, 77 contracts were made with initially uncontracted providers and 14 with new market entrants.

3.2 Methods

The findings of this study are presented using graphical evidence, regression analysis and simple back-of-the-envelope calculations. First, we present histograms that show distributions of providers' prices and price changes in the procurements and in the free markets. In particular, we analyze the price differences in the additional procurement of 2019 between providers that were either contracted or did not receive a contract in the initial procurement of 2018.

Second, we present more detailed evidence on providers' pricing by analyzing the following difference-in-differences regression model separately for the contracted and uncontracted providers:

$$\ln(P)_{it} = \alpha + \beta \text{After}_i + \theta \text{Treatment}_i + \delta (\text{After} * \text{Treatment})_{it} + \varepsilon_{it}, \quad (1)$$

where $\ln(P)_{it}$ is a natural logarithm of provider i 's price in procurement year t . Variable After_i takes value 1 if the observation is from year 2019 and 0 otherwise. Variable Treatment_i takes value 1 if the provider was contracted or not, and 0 for providers in the free markets, which are considered as a control group in the analysis. The main variable of interest is the DID coefficient δ_{it} , which is an interaction between the After_i and Treatment_i variables.

A simple and naïve comparison between contracted and uncontracted providers would overestimate the effect of either receiving or not receiving a contract. It would also violate the stable unit treatment value because potential outcomes for a given firm should depend only on its own treatment status in econometric modelling (Angrist et al. 1996). Therefore, we use providers' prices in the free private markets as a control group and model the effects separately for contracted and uncontracted providers. It is also possible that the public procurements organized by Kela may have a small influence on free market prices, as Kela is the single largest purchaser of physiotherapy services in Finland. However, this spillover effect is most likely very small especially after 2018, when Kela reformed the procurement practice and prices became more competitive (Pitkänen 2022). Finally, a small number of firms are present both in the data regarding the procurements and free market data. However, because this number is very small, we have not merged the two datasets at firm-level for the analysis.

Third, we analyze quality differences in the procurements and potential quality responses in the additional procurement in 2019. Quality is not included in the main regression analysis, as we do not have information on quality of the firms that operate in the free market. However, there are several reasons why quality may influence our results on prices. Most importantly, the procurements are arranged as scoring auctions, where providers are evaluated based on their quality and price. This means that some of the providers may have reacted not only with price but also with quality in the additional procurement of 2019. In addition, both quality and price were weighted 50% in 2014, but the quality weight was decreased to 20% in 2018 and increased back to 50% in the additional procurement. This means, for example, that contracted high-quality providers may have had greater incentives and the opportunity to raise their prices in 2019. On the other hand, providers had only very limited time to react to the additional procurement, so we believe that there were most likely only minor changes in providers' quality between 2018 and 2019 and therefore assume quality cannot be adjusted in the short-term.

Finally, we present back-of-the-envelope calculations where we calculate the direct costs of the additional procurement of 2019. We also compare the procurement to a counterfactual, in which all uncontracted providers would have received a contract at their initial prices of 2018.

4 Results

4.1 Descriptive evidence

Figure 1 presents histograms for prices in the procurements and in the free markets in years 2014, 2018 and 2019. The figure shows that prices were more dispersed in the initial procurements of 2014 and 2018 compared to the additional procurement of 2019. Price dispersion has been slightly greater and the overall price level a little lower in free markets compared to the procurements. This is natural as the procurements are organized for a service that is targeted for patients with severe disabilities who do not pay any deductibles, whereas free markets reflect regular physiotherapy visits by patients who pay a vast majority of the price out-of-pocket.

Figure 1. Prices in 2014, 2018 and 2019.

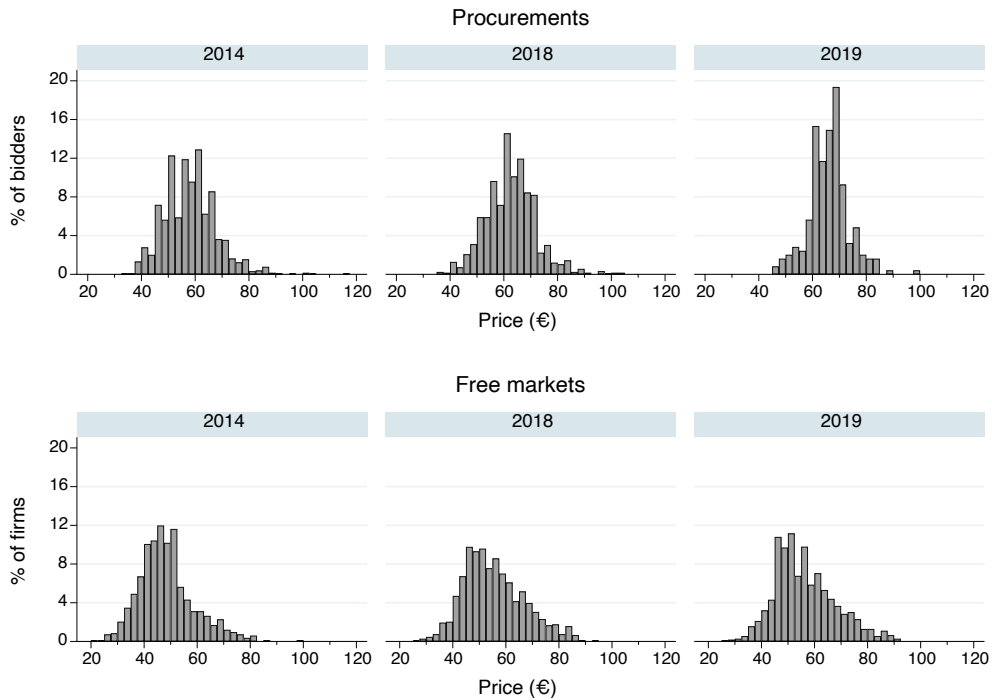


Figure 2 shows similar histograms for price changes in the procurements and in the free markets in 2018 and 2019. A previous study by Pitkänen (2022) found that 2018 was the first procurement round in which several providers decreased their prices as a response to Kela’s procurement practice reform. Figure 2 shows that this number increased in the additional procurement of 2019, as around a third of the bidders decreased their prices. Another third of the bidders offered around the same price as in 2018 and the final third increased their price. The lower histograms show that price changes in the free markets were very similar as in the procurements between 2014 and 2018, but there were only small changes from 2018 to 2019.

Figure 2. Price changes in 2018 and 2019.

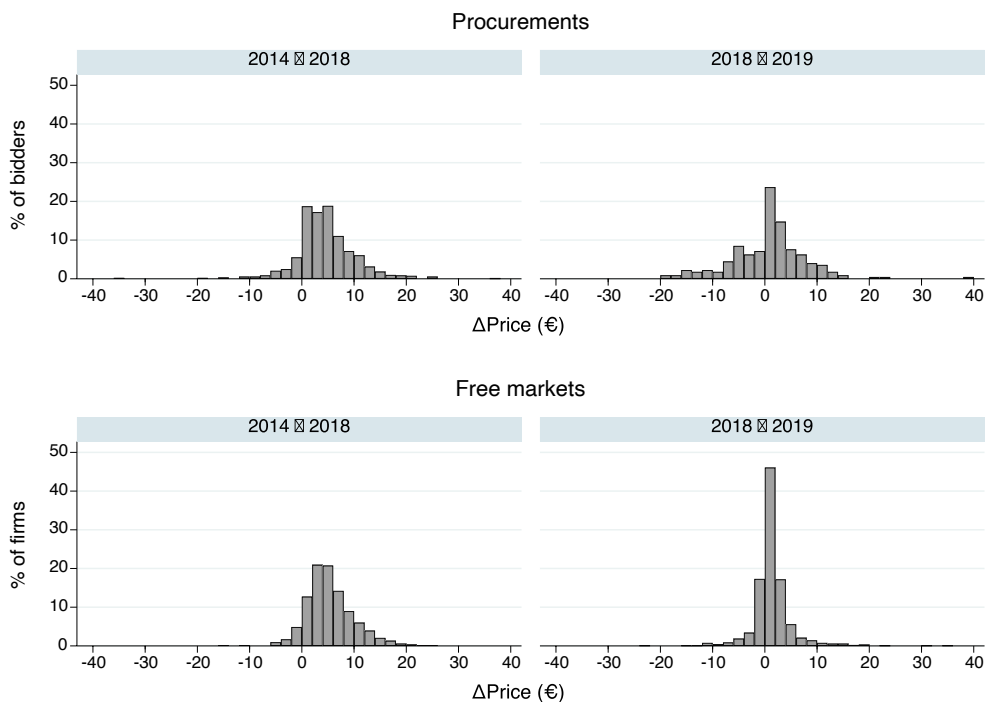
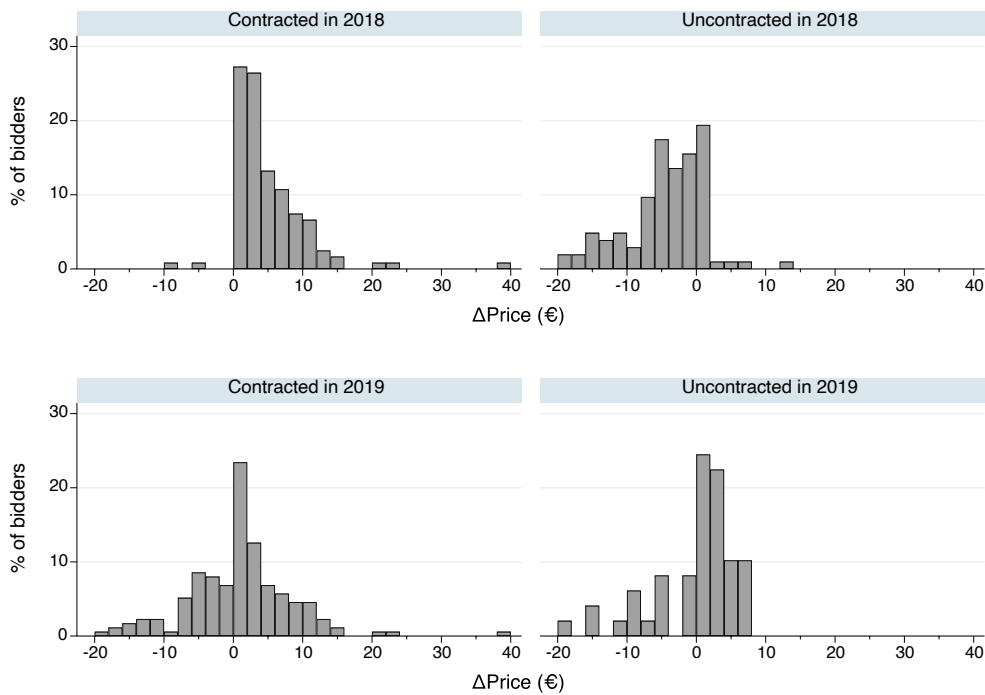


Figure 3. Price changes from 2018 in the 2019 additional procurement.



Figures 3 and 4 present the main findings of this study. The upper histograms in Figure 3 show price changes in the 2019 additional procurement based on contracts in the initial procurement of 2018. Providers that were already contracted had literally no risk when they submitted a bid in the additional procurement of 2019. As expected, practically all of them increased their prices. On the other hand, most of the uncontracted providers decreased their prices in the additional procurement. The lower histograms show price changes based on whether the provider was contracted or not in the additional procurement of 2019. This shows that Kela offered a contract for several providers that decreased their prices but also for several providers that increased their prices. Because the acceptance is based on quality-price ratio, several previously uncontracted providers did not receive a contract even though they decreased their prices.

Figure 4. Average prices and price changes.

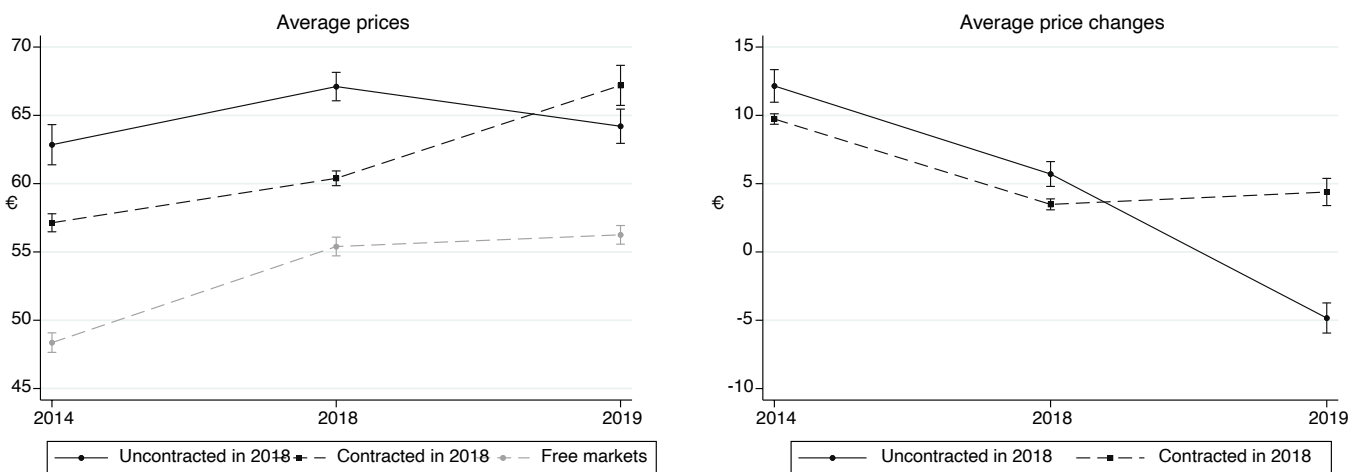


Figure 4 presents the average prices and price changes in 2014, 2018 and 2019 for the contracted and uncontracted providers from the 2018 procurement, as well as average prices in the free markets. The upper figure shows that the uncontracted providers had higher average prices than contracted providers both in the 2014 and 2018 initial procurements. However, this changed in the 2019 additional procurement, in which contracted providers offered higher prices while uncontracted providers decreased their prices as shown in the bottom figure. In addition, the upper figure indicates that prices rose at a slightly faster rate in the free markets than in the procurements in between 2014 to 2018. This common trends assumption is discussed more in the regressions results. The bottom figure shows average price changes in the procurements depending on whether the provider received a contract in 2018. As shown already by Pitkänen (2022), following the procurement reform, providers did not increase their prices in 2018 as much as in previous procurement rounds.

As anticipated, most providers that had already received a contract in the initial procurement increased their prices in the additional procurement. However, several of the contracted providers offered exactly the same price as in the initial procurement, as shown in Figure 3. The reasons for this pricing could be that some providers were not entirely aware of the nature and rules of the additional procurement. As we discuss in the theoretical framework in Chapter 5, some incumbent providers may also have wanted to block other providers from receiving a contract, and therefore offered the same price to receive a new contract and push new providers out of the provider pool. As also anticipated, most providers that had not received a contract in the initial procurement decreased their prices in the additional procurement. Some of these providers decreased their prices rather substantially whereas others only decreased them slightly. These differences are most likely explained by how much of a provider’s revenue comes from Kela’s patients, and by how close a provider was to receiving a contract in the initial procurement. However, these questions are outside the scope of this study. Some uncontracted providers even increased their prices, suggesting they were not heavily reliant on Kela’s patients.

4.2 Regression results

Table 2 shows the results of the regression analysis regarding prices separately for the contracted and uncontracted providers. The main regression results are presented in the first and fourth columns, which show the results for models where the pre-treatment period includes only the initial procurement of 2018. The results show that compared to the price development in the free physiotherapy markets, uncontracted providers decreased their prices by around 8 percent, whereas contracted providers increased their prices by around 9 percent. These results are statistically significant, economically very meaningful and supported by the graphical evidence.

Table 2. Regression results.

	Uncontracted in 2018			Contracted in 2018		
	(1)	(2)	(3)	(4)	(5)	(6)
After	0.016 (0.008)	0.076*** (0.008)	0.137*** (0.009)	0.016* (0.008)	0.076*** (0.007)	0.137*** (0.008)
Treatment	0.232*** (0.013)	0.260*** (0.011)	0.277*** (0.017)	0.098*** (0.008)	0.130*** (0.006)	0.176*** (0.017)
DID	-0.083*** (0.024)	-0.112*** (0.024)	-0.045* (0.021)	0.092*** (0.020)	0.060** (0.020)	-0.078*** (0.012)
Pre-period	2018	2014–18	2014	2018	2014–18	2014
Post-period	2019	2019	2018	2019	2019	2018
N	2579	3568	2375	3186	4803	3594
R ²	0.135	0.160	0.275	0.073	0.156	0.174

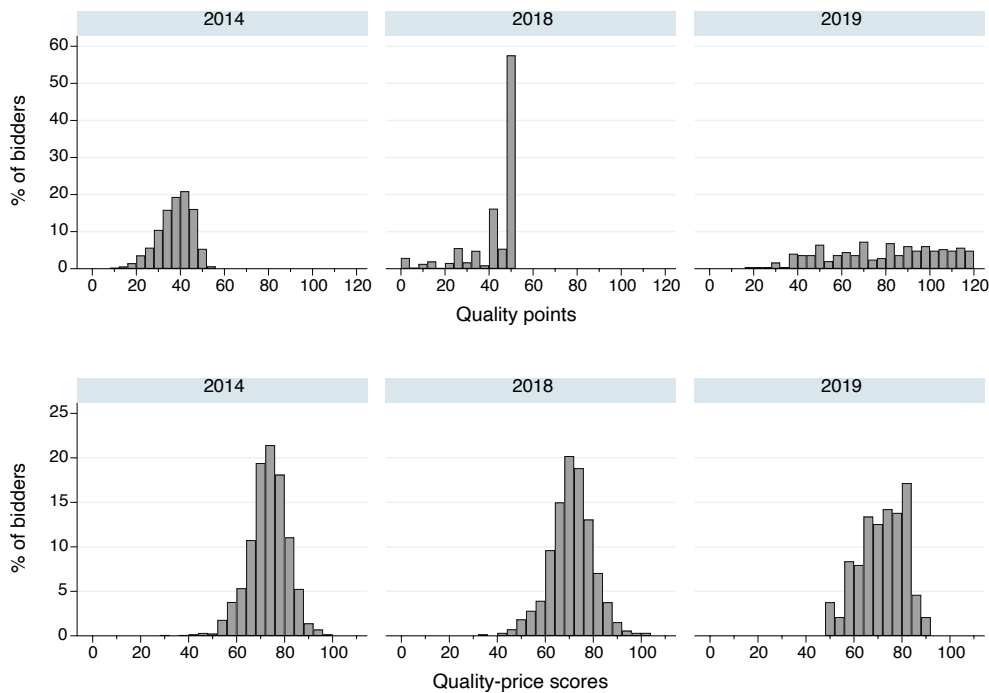
Dependent variable: Ln(Price). *p < 0.05; **p < 0.01; ***p < 0.001. Columns 1 and 4 show our preferred results for a DID regression, where the pre-period includes only the 2018 procurement. Columns 2 and 5 show results for a DID regression, where the pre-period includes both the 2014 and 2018 procurements. Columns 3 and 6 show results for a DID regression, where the treatment occurs between 2014 and 2018.

The second and fifth columns show results from models where the pre-treatment period covers both initial procurements in 2014 and 2018. The results indicate that compared to the price development in the free physiotherapy markets, uncontracted providers decreased their prices by 11 percent, whereas contracted providers increased their prices by 6 percent. However, since Kela reformed its procurement practices prior to 2018 by increasing the competitive pressure, providers' pricing behaviour between 2014 and 2018 procurements may differ from the trend in the free market prices. The third and sixth columns confirm this by showing a placebo treatment between 2014 and 2018 procurements. The results show that providers' prices declined around 4 to 8 percentages between 2014 and 2018 compared to free market prices. In practice, the second column shows the effect of the 2018 procurement reform on providers' prices in these two groups, extending the previous research by Pitkänen (2022). These findings regarding the price trends from 2014 to 2018 mean that the crucial parallel trends assumption does not hold if the pre-treatment period consist of both 2014 and 2018 procurement years. Including the procurement reform between 2014 and 2018 would then overestimate the price effects for uncontracted providers and underestimate the price effects for contracted providers in the additional procurement in 2019. Thus, we consider the results of first and fourth columns as the preferred main results of the study.

4.3 Quality

In this section, we examine quality differences in the procurements and evaluate potential quality responses in the additional procurement of 2019. Figure 5 shows quality points and quality-price scores in the 2014, 2018 and 2019 procurements. The upper histograms show that there were clear differences in the ways the quality points were awarded in the three procurements. In 2014, quality points were given between 0 and 55, with the average being 37.2 points. In 2018, maximum quality was 50 and the average was 42.3 points, but more than half of the bidders received the maximum points. In the additional procurement the maximum was increased to 120 and the average was 78.5 points. The figure shows that there was much greater dispersion in quality points among the bidders than in the two previous procurement rounds.

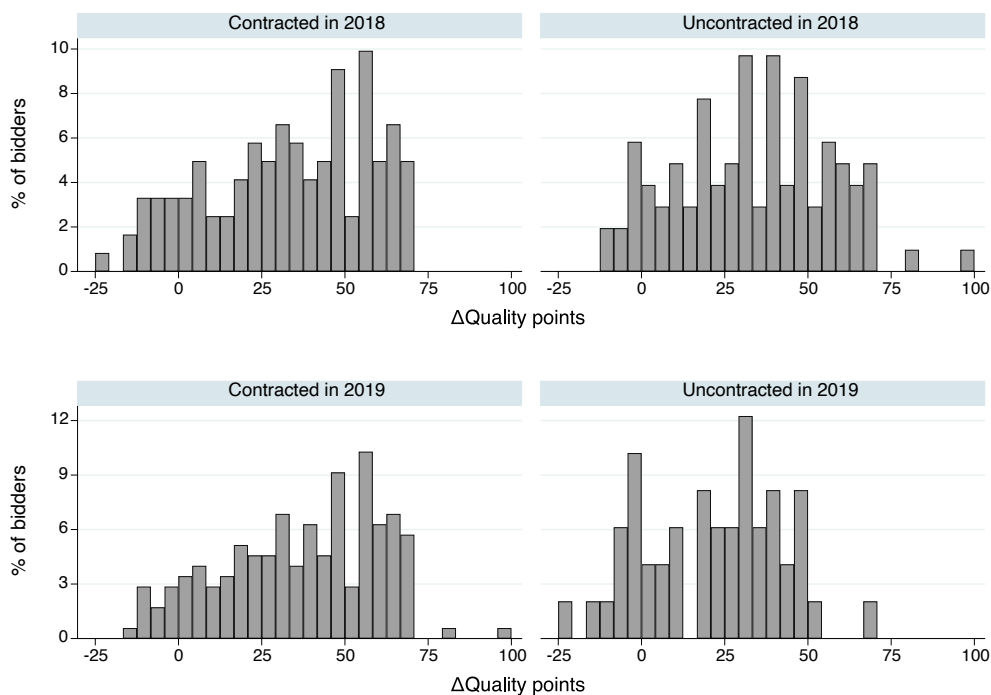
Figure 5. Quality points and quality-price scores in 2014, 2018 and 2019.



The lower histograms of Figure 5 show quality–price scores in the three procurements. The score is the sum of weighted quality and price points. For example, in 2019, bidder with the highest quality received the maximum weighted quality points of 50 and bidder with the lowest price received the maximum weighted price points of 50. The figure shows that the distribution of the quality–price scores was similar in all three procurements. This means that in 2018 most of the variation in quality–price scores were caused by prices, whereas in 2019 prices became more concentrated than quality, as shown previously in Figure 1.

Figure 6 shows similar histograms with respect to changes in providers’ quality as Figure 3 showed for changes in prices. The upper histograms show that the quality points of most initially contracted and uncontracted providers increased between 2018 and 2019. This was caused by the increase in maximum from 50 to 120 points. For some providers the quality points decreased, which indicates that some providers that participated in the additional procurement were not specialized in children’s physiotherapy. Importantly, there are no similar systematic and clearly visible differences between the initially contracted and uncontracted providers’ quality changes as there were regarding their price changes. This suggests that the providers mainly reacted with their prices in the additional procurement of 2019. Finally, the lower histograms show that there was also no large difference between contracted and uncontracted providers of the additional procurement regarding their quality changes.

Figure 6. *Quality changes from 2018 in the 2019 additional procurement.*



Providers would have benefited from higher quality also due to the simultaneous change in the quality-price scoring rule, which increased the quality weight from 20% in 2018 to 50% in 2019. However, based on our analysis they reacted to the results of the initial procurement in practice mainly by changing their prices. As mentioned earlier, this is because providers had only very limited time to react to the additional procurement: The initial procurement was organized in April 2018 and the acceptance information was published in September. This caused a lot of negative feedback, which is why Kela announced in November that an additional procurement would take place in February 2019. Thus, providers had only three months after the notification to increase their quality by investing into their facilities, equipment, experience, or education of physiotherapists. In practice, the time was so short that the providers did not have the opportunity to influence, for example, their own experience or education regarding children’s physiotherapy.

4.4 Back-of-the-envelope calculations

Our results suggest that the additional procurement offered the initially contracted providers a free lunch. The key question is then the following: How much more public money was spent directly because the incumbent providers were able to increase their prices in the additional procurement? The following simple back-of-the-envelope calculation can be used to find the answer. Patients visit their provider around 50 times per year. In 2019, Kela offered a new contract for 98 providers that already had an existing contract. These providers had 1616 child patients in 2018 and their average price increase was 4.8 euros in the additional procurement in 2019. Thus, on average, these providers earned 3860 euros more annually. Altogether, this amounts to 0.38 million euros per year and additional costs of 1.5 million euros for Kela over the entire four-year contract period.

When providers' capacity turns out to be deficient during the contract period, public purchasers often use direct contracts with providers that are uncontracted but available on the market. Prices of these direct contracts may be based on the initial procurement or negotiations between the procurer and the provider. Therefore, another important question related to the studied case is whether the additional procurement was more beneficial than offering direct contracts to all uncontracted providers at their initial prices in 2018. The following simple calculation illustrates this issue: In 2018, Kela did not offer a contract to 77 providers which were accepted in the additional procurement in 2019. These providers had 1362 child patients and their average price decrease was 5.2 euros. This means that these providers would have earned, on average, an additional 5010 euros per year at their initial prices. This amounts to 0.39 million euros per year and a little over 1.5 million euros for the contract period. This simple calculation shows that the additional procurement resulted in similar costs as directly contracting providers that were not accepted in the initial procurement.

5 Theoretical framework

This simple theoretical framework provides potential explanations for different providers' behavior in additional public procurements. The procurements are arranged as scoring auctions, where firms are evaluated based on their price and quality. First, we consider the canonical model of an additional procurement, in which only uncontracted firms are eligible to participate. Second, we examine the procurement studied in the empirical section, where incumbent firms can participate in the second round. By comparing the two situations, we illustrate the differing incentives of the firms, which may lead to larger scale inefficiencies.

In the game, there is one buyer acting also as the auctioneer and multiple sellers $i=1, \dots, n$ acting as bidders. The game can be thought of as a two-stage game, where the stages are denoted by $t \in \{1, 2\}$. We do not require sequential rationality, because the second stage occurs unexpectedly and neither the procurer nor the firms take its possibility into account in the first stage. For the same reason, the first stage can be modelled as a regular model of a multiunit scoring procurement auction. In the beginning, the buyer announces a target capacity c as well as a scoring rule that is used in the procurement. The scoring rule describes the preferences of the buyer in terms of price and quality, giving weights to both (David et al. 2006). As in Chen's (1993) canonical model, each firm will choose a combination of quality q_i and price p_{it} , that will be dependent on their cost parameters. These cost parameters will vary between firms, resulting in differing bids. We assume that the quality cannot be affected by the firms in the short-run and is thus not time-dependent in the framework. Price and quality form the score s_{it} of a given firm at a given time. Since there are many bidders that will be contracted until a target capacity c is fulfilled, we mark the score threshold for getting a contract in the auction with θ_t . The threshold may change between the rounds, but empirical results indicate these changes are small and firms generally bid according to what they observe in the previous round.

To illustrate a simple example, let us assume there are three firms $i \in \{1, 2, 3\}$, which have differing costs structures and differing cost parameters. In $t=1$, firms 1 and 2 participate in the procurement, where they bid their valuations of a competitive market price. The price component is a major determinant in the score the firms receive. Let's assume the valuations of firms 1 and 2 are such, that firms set their prices so that $p_{11} < p_{21}$. We can also assume the quality components are such that $q_1 > q_2$. These price and quality differences are suggested by the empirical data presented earlier in this study.

With these prices and quality, the overall scores are such that $s_{11} > s_{21}$. The procurer then sets the contract threshold so that $s_{11} > \theta_1 > s_{21}$. Firm 1 gets a contract, but firm 2 does not.

After the first stage, the procurer announces there will be an additional procurement round in $t=2$. The reason could be for example an increase in the target capacity c during the contract period. Between the two stages, the scores s_i and their quality q_i and price p_i components have become common knowledge. Firms 1 and 2 now know each others prices and overall quality at $t=1$. They also know what quantity they have agreed to supply under the contract. However, there is uncertainty of the number of competitors the firms will face in $t=2$. In the empirical data, there are some firms that bid only in the additional procurement. Therefore, firm 3 resembling the new bidder is aware of the score components of firms 1 and 2, but firms 1 and 2 are unaware of those of firm 3.

First, let's consider the case where only uncontracted firms 2 and 3 are able to participate in the additional procurement in $t=2$. Firms 2 and 3 now know the contract threshold θ_1 , and bid according to this information. Since they are unable to change their quality, firm 2 needs to set a price such that $p_{22} < p_{21}$ resulting in a score where $s_{22} > s_{21}$. Therefore, firm 2 has a strong incentive to decrease its price. To get contracted, firm 3 would need to choose a price, that results in a score where $s_{32} > \theta_2$. Our empirical data indicates that new bidders resembled by firm 3 could be firms that were not aware of the first procurement round, were founded recently or had previously specialized in other types of physiotherapy care. On average, their overall quality scores were poor, most likely due to inexperience with demanding patients. Firms with poor quality would need to set a very low price p_{32} to be able to get a contract, which may not be feasible. Approximately half of the firms bidding for the first time in the second round ended up not getting contracted in the empirical data. In general, the outcome of the additional procurement will strongly depend on the competitiveness of the market. If there are only few firms, they may exercise market power and have less incentive to lower their prices.

Now, we can consider the empirical case, where all firms can participate in the additional procurement in $t=2$. All firms have binding cost constraints, which can differ between firms. Firm 1 now has two ways to increase its profits. Firstly, they can bid a higher price and try to increase the profits through that. They are able to do this and still get an additional contract, because their quality is sufficiently high. With this strategy, the scores of firm 1 relative to firm 2 will be $s_{11} > s_{12} > s_{21}$. Secondly, they can maintain or decrease their price to acquire a larger market share by pushing firm 2, and possibly even firm 3, out of getting a contract. Here the score of firm 1 relative to firm 2 will be $s_{12} \geq s_{11} > s_{21}$. Firm 1 will always have an incentive to place some bid, unless they are capacity constrained or not able to cater to specific needs of the second procurement round. We found evidence of both strategies in the empirical data, as most contracted firms increased their prices but many submitted exactly the same price as in the first round.

To obtain a contract in the additional procurement, firm 2 will again have a strong incentive to bid so that $s_{22} > s_{21}$, given that the price p_{22} is still profitable. This can be achieved by lowering the price in the second round, which is what our empirical findings clearly showed. Because of the different cost parameters, the price of firm 2 will not be lower than the price of firm 1. Finally, firm 3 will choose to bid according to the information they have received from the first round. In the second round, firm 3 knows scores s_{11} and s_{21} as well as the threshold θ_1 . They will choose to bid, if their expected score is above the θ_1 . In practice, firm 3 aims to receive a score that is better than firm 2 had in the first round, noted as $s_{32} > s_{21}$.

The two possibilities of arranging the additional stage $t=2$ clearly indicate the following. If the required capacity can be met with uncontracted firms, the rationale for allowing bids from firm 1 is weak. Allowing firm 1 to bid is very likely to increase the average price in the second round as opposed to only allowing firms 2 and 3 to bid, when the threshold θ_1 is common knowledge and is not expected to change drastically in the second round.

In the empirical case of the additional procurement auction, the components of the threshold θ_i changed between first and second stages, and the price component had less weight in the second stage. It is therefore possible the score of firm 2 in the additional procurement is lower than firm 1's in the first round, namely so that $s_{22} > s_{21}$. The change could in some cases decrease the incentives of uncontracted firms to lower their price. For contracted firms it should, however, strongly increase the incentive to bid so that $p_{12} > p_{11}$. Our empirical data indicates that firm 1 already has on average higher quality

than firm 2. Thus, if the price component has less weight than previously, firm 1 can increase its price even more and still get a score $s_{12} > \theta_2$ and get contracted also in the second round.

6 Discussion

This study provides evidence from an unusual additional procurement, in which providers with an existing contract were also eligible to participate. In practice, these incumbent providers did not bear any risk when they submitted their bids in the additional procurement. As expected, most incumbent providers increased their prices, whereas most uncontracted providers decreased their prices in the additional procurement of 2019 compared to the initial procurement of 2018. The incumbent providers increased their prices on average by 9%, while the initially uncontracted providers decreased their prices by 8%, compared to the development of free market prices. These results show that the additional procurement was organized inefficiently, as incumbent providers were also invited to participate and were in a more favourable position than other bidders.

The contracted capacity in the initial procurement of 2018 was more than twofold compared to the target capacity or the number of patients who receive the physiotherapy service annually. Thus, there was no real need to organize the additional procurement in 2019. The decision to organize the additional procurement was purely political as a result of the negative feedback that Kela received regarding the initial procurement in 2018. A simple back-of-the-envelope calculation shows that the additional procurement wasted around 1.5 million euros for the entire 4-year contract period. In addition, the additional procurement brought only small benefits for patients regarding the service availability. Around half of the providers who received a contract were contracted already in the initial procurement of 2018. The procurement benefited the small number of patients whose incumbent provider had not received a contract in the initial procurement round but received a contract in the additional procurement. This suggests that additional procurement may be harmful when there is no need for extra service capacity.

The results of our study are limited by at least two potential weaknesses in the empirical setting. First, there was a simultaneous change in the scoring rule from 2018 to 2019, as quality weight was increased from 20% to 50%. However, providers had only a few months to react to the announcement of the additional procurement and the change in scoring rule. Our analysis shows that contracted and uncontracted providers had a systematic reaction via price changes in the additional procurement, but a similar systematic reaction was not present in their quality scores. This suggests that providers reacted mainly by altering their prices. Second, the additional procurement of 2019 concerned only physiotherapy for under 18-year-olds, which means that previous procurements as the reference point are not entirely similar. However, the service description remained the same, which means that the service or its minimum requirements did not go through a change. Nevertheless, these two issues may have had a minor influence in the behaviour of some providers in the additional procurements that our setting does not capture.

Our findings offer important lessons for many organizations that procure other publicly financed services through similar processes. Additional procurements are typically organized to acquire more providers and capacity if the initial capacity turns out to be deficient during a contract period. They provide an opportunity for new and initially uncontracted firms to enter the market and improve service availability by increasing the capacity to the required level. However, establishing the required competitive pressure can be difficult, especially if most firms in the market have already been contracted in the initial procurement, and because participating firms are aware of their advantageous position in the additional procurement. Therefore, it is important that the additional procurement is organized in an efficient manner to foster price competition among yet uncontracted providers.

Potential way to organize the additional procurement in a more efficient way would be to allow only initially uncontracted firms to participate. With the assumption of non-adjustable quality in the short-term, uncontracted firms would be incentivized to decrease prices. It should be noted, that with limited competition this may however lead to the capacity not being filled entirely. There are also alternative ways to increase the service capacity in framework agreements after the initial round of procurement. For example, the procurer could have set quality and price thresholds in accordance with what

was observed in the first round. Uncontracted firms fulfilling the quality criterion could have decided whether they are able to sell their services at the price determined by the procurer, which would eliminate the process of having to bid again based on beliefs from the first procurement round. In addition, contracted providers could be asked about their willingness to increase capacity at their current prices. Finally, narrowing the length of contract periods that reduces the risk of market exits and decrease of capacity, or contracting sufficient additional capacity already in the initial procurement could reduce the need for additional procurements in the first place.

Kela's physiotherapy procurements are small in value, but the Finnish public sector procures goods and services annually even by 47 billion euros from the private sector (Merisalo et al. 2021). In more economically significant markets, poorly designed additional procurements could induce larger redundant costs. Purchasing additional work from the incumbent firms is a common practice, for example, in ICT-services and construction industry. Thus, there is a need for further research on the prevalence and effects of additional procurements in different industries. Optimal ways to design an additional procurement also offers interesting avenues for further theoretical and empirical research. Studying firm incentives in more flexible situations where firms are for example able to adjust their quality or when competition is scarce, and firms can exert market power may be of interest. Kela has also organized additional public procurements for speech therapy and psychotherapy, and studying additional procurements of such services may also shed light on whether the empirical phenomenon observed in this paper persists more generally in additional public procurements.

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