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Designing Quasi-Markets: The Dynamics of Competition and Consumer Choice in Danish Eldercare*

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Abstract

Quasi-markets, where publicly funded services may be provided by private firms, are increasingly prevalent across various sectors in Western countries. This paper focuses on the quasi-market for eldercare in Denmark, exploring two contrasting quasi market models: the tendering model, where local governments control provider selection through competitive bidding, and the approval model, which allows any qualified firm to enter the market. Exploiting institutional variation across municipalities, we analyze how these models impact market competition, consumer choice, and inequality. The analysis shows that the tendering model favors larger firms, reduces the number of suppliers, decreases competition, and leads to an increased reliance on public providers. Unlike the approval model, however, the tendering model introduces price competition in the selection of providers. Higher-educated and higher-income individuals prefer private providers relatively more under both models, but the tendering model causes those with lower education and income to shift disproportionately to public providers, exacerbating socioeconomic inequalities and influencing consumer behavior.

1 Introduction

Quasi-markets are increasingly common in Western countries. Quasi-markets function by having a service provided by the private sector, while being publicly funded, Le Grand (1991); Lowery (1998). Their design varies widely in terms of financing, regulation, ownership, and the information available to consumers. Examples include school choice, where private schools deliver publicly funded education, and healthcare, where private hospitals provide government-subsidized care, as seen in the UK's NHS and U.S. Medicare. Employment activation programs in Australia, France, and Germany follow a similar model, with private firms assisting the unemployed under public funding. A growing and highly significant quasi-market is eldercare, the case in this paper. In OECD countries, the 65+ population is projected to rise from 18 % in 2022 to 27 % by 2050, OECD (2023), increasing demand and straining public finances. In Denmark, public eldercare spending exceeds 47 billion DKK annually—more than double that for unemployment services, Statistics Denmark (2022). Yet despite their widespread adoption, we know remarkably little about how to organize quasi-markets effectively. This raises key questions: To what extent does market design affect consumer choice behavior, competitive dynamics among providers, and inequality in access to care?

This paper uses the quasi-market for eldercare to examine how different models of market organization affect consumer choice, competition, and inequality. We show that the actual design of quasi-markets matters greatly for consumer choice, competition, and inequality.

Using the quasi-market for eldercare as a case study, we analyze two models for organizing the market: the tendering model and the approval model. In the tendering model, municipalities pre-select a limited set of providers via competitive bidding before consumers make choices—analogous to Diamond's group-level competition or "first-stage" selection, originally formalized in the influential Econometrica article by Diamond (1992). In contrast, the approval model allows any certified provider to enter the market, giving users broad choice, and aligns with Enthoven's voucher-based model, where individuals choose freely among regulated options, McGuire and van Kleef (2018). We believe, these two opposing models are central to longstanding questions about how to balance regulation and competition in publicly funded service markets. For example, the Clinton administration's 1990s Health Security Act proposed a regulated competition model, where public authorities selected among approved insurers on behalf of consumers—mirroring Diamond's idea of group-level competition McGuire and van Kleef (2018). Our study centers on the Danish eldercare market,

which we use as a test case for two reasons. First, we have access to comprehensive register data covering the full population of elderly Danes over more than a decade, including over 10 million monthly observations on all types of eldercare service choices. These data allow us to track provider changes, identify suppliers, document care types, and measure the exact minutes delivered. To our knowledge, no previous study has used data of comparable richness and granularity. Second, a 2013 reform in the Danish eldercare market introduced the tendering model as an alternative to the existing approval model, creating a natural experiment that enables empirical analysis of the shift between two pillar models from the literature: the Enthoven-style and the Diamond-style quasi-market designs. We exploit variation across municipalities in whether and when they adopted the tendering model. The Danish case thus provides causal evidence for the ongoing debate on how to balance regulation and competition in publicly funded service markets. To our knowledge, it is the first study to causally assess how alternative quasi-market designs shape consumer choice, provider dynamics, and market structure.

Our analysis reveals that municipalities adopting the tendering model, relative to the approval model, see a reduction in the number of firms operating in the market. To quantify the effects on competition, we develop a market competition index. The results show a clear trend: markets under the tendering model become less competitive, with the public provider increasingly monopolistic. In contrast, markets under the approval model exhibit higher levels of competition and a less monopolistic public provider. This difference may arise because the bidding process favors larger firms that can meet the scale requirements of tenders, Warner (2006). As a result, smaller providers, which are more prevalent under the approval model, are less likely to operate in markets governed by the tendering model. In effect, the tendering process creates market barriers, preventing smaller firms from entering or operating in the market. This dynamic aligns with principles of economic theory, as Phelps (1985) emphasizes that, alongside declining marginal costs and control over key resources, market barriers are one of the three critical factors that can lead to monopoly and higher market concentration—a phenomenon demonstrated in this study with the tendering model. To analyze the decision-making process among the elderly, we examine the observed choices between public and private providers. Using detailed administrative data, we assess how changes in market structure—specifically the reduction in private providers under the tendering model—affect the likelihood of individuals opting for private help. Our findings indicate a clear pattern: as the number of private providers decreases, fewer individuals choose private help. This suggests that the tendering model, by reducing competition, limits the attractiveness of private options and reinforces the dominance of the public provider.

Our analysis also examines how the effects of quasi-market models differ across socioeconomic and demographic groups. We find that individuals with higher education and income are more likely to choose private providers, and that this is the case in both municipalities operating under the tendering model and the approval model. However, when municipalities switch from the approval to the tendering model and private options diminish, a higher fraction of individuals with no education and low income switch to public providers. Similarly, younger elderly are more likely to continue opting for private providers when municipalities switch from the approval model to the tendering model. These heterogeneous effects highlight how quasi-market structures can reinforce existing socioeconomic inequalities, shaping both consumer behavior and market dynamics.

While a substantial literature has explored how quasi-markets function, most studies are descriptive and rely on observational data, offering limited causal insight into how different models affect on market competition and consumer behavior. In particular, the literature has largely focused on voucher-based quasi-markets. Studies have particularly examined the impact of voucher systems in education Epple and Romano (1998); Levin (1998); Sandström and Bergström (2005); Card et al. (2010); Gaynor et al. (2013); Böhlmark and Lindahl (2015); Figlio and Hart (2014); Lee et al. (2021). Beyond education, voucher systems have also been studied in other public services, including child care Warner and Gradus (2011); Hjelmar et al. (2018), hospitals Cooper et al. (2011); Kjær (2019), job training Struyven and Steurs (2004); Hipp and Warner (2008), primary care, Glenngård (2016), nursing homes, Petersen and Hjelmar (2013); Hjelmar et al. (2018); Broms et al. (2020) and elderly home care, Moberg et al. (2016); Bergman et al. (2018,?); Foged and Houlberg (2023). In general, the findings from this body of research present a nuanced picture, with both positive and negative consequences linked to voucher markets. On the positive side, studies highlight improvements in service quality, increased consumer demand, and growth in service supply, Epple and Romano (1998); Sandström and Bergström (2005); Cooper et al. (2011); Warner and Gradus (2011); Gaynor et al. (2013); Böhlmark and Lindahl (2015); Bergman et al. (2018). Conversely, negative outcomes associated with voucher markets include the phenomena of creaming, socioeconomic segregation, declines in service quality, higher costs, and unequal geographic distribution of services, Epple and Romano (1998); Levin (1998); Hipp and Warner (2008); Warner and Gradus (2011); Böhlmark and Lindahl (2015); Foged and Houlberg (2023).

While the aforementioned literature primarily provides valuable insights into how quasi-markets influence consumer choice and market dynamics compared to a non-marketized setting, our paper contributes by identifying and comparing the effects of two widely used

quasi-market models: the approval model, which resembles Enthoven's vision of regulated competition with broad consumer choice, and the tendering model, which aligns more closely with Diamond's group-based selection mechanism. Quasi-markets often experience market failures, and different types of quasi-markets—with varying configurations of regulation, financing, and ownership structures—are therefore likely to shape consumer choice and market dynamics in substantially different ways Lowery (1998); Struyven and Steurs (2004).

Finally, we address a key limitation of prior research: the risk of selection bias. As noted by Guul et al. (2021), quasi-markets may give rise to user sorting (where advantaged users exploit choice) and cream-skimming (where providers target easier-to-serve clients). These dynamics can distort outcome comparisons across models. Our empirical strategy allows us to isolate the causal effects of market design while accounting for these endogenous responses.

The paper proceeds as follows: Section 2 provides an overview of the institutional setting, detailing the legislative changes that introduced quasi-markets in Danish eldercare. Section 3 describes the data and variables used in the analysis, while Section 4 outlines the identification strategy. Section 5 presents the results, divided into firm behavior and consumer behavior, with a focus on heterogeneous effects. Finally, Section 6 concludes with a discussion of the broader implications for competition, consumer choice, and inequality in quasi-markets.

2 Institutional Setting

In Denmark, eldercare is a universal welfare service, available to citizens with special needs and financed through general taxation. There are no user fees for receiving either practical or personal care, and access does not depend on income or wealth. Instead, eligibility is determined by the municipality through an individual assessment—typically carried out in the citizen's home by a municipal care assessor (visitator) to assess what type of support is needed—based on the person's functional limitations or specific social needs. While the service is not age-restricted and may also be granted to individuals with disabilities or special needs, nearly six out of seven recipients are over the age of 65 in practice, making the service effectively targeted toward the elderly.

The free choice of provider in eldercare was formally introduced in 2003 with changes to the Social Services Act (Serviceloven), aimed at enhancing citizens' options within the eldercare sector. Prior to this, eldercare was primarily provided by the municipalities themselves. The

legislative change granted elderly citizens the right to choose freely between municipal and private providers of both personal and practical help, where practical help includes help with household tasks like cleaning, cooking, and shopping, and personal help includes assistance with bathing, dressing, and hygiene.

The purpose of the 2003 reform was to foster competition and offer citizens greater flexibility in selecting the provider that best suited their needs. This transition to a quasi-market structure has been observed in many Western economies, reflecting broader trends in public sector modernization and privatization (see, for instance, Le Grand (1991)). As in Denmark, these reforms aim to increase citizens' rights to choose between public and private services while maintaining government oversight of quality and cost.

As a result of these changes, the structure of the eldercare market in Denmark functions as a quasi-market, blending government regulation with market mechanisms. In this system, municipalities fund eldercare services, but individuals retain the freedom to choose between public and private providers.

Until 2013, almost every municipality in Denmark operated under the approval model. In this model, local municipalities establish predefined criteria related to quality and pricing, which private providers must meet to gain approval. The pricing is set by the municipality and is based on the municipality's own long-term average costs of service provision, including both direct and indirect expenses. Providers must also comply with municipal quality standards that define, for example, the required frequency and scope of cleaning, and the type of personal care to be delivered, such as bathing, dressing, and toilet assistance. These service levels are determined by local political decision-making. Once providers are approved, they are included in a list from which citizens can freely choose their eldercare provider, offering a wider selection of services that meet the municipality's standards. The municipality subsequently pays the provider for the services delivered.

In 2013, the legislation was changed. Afterward, municipalities were given the option to replace the approval model with the so-called tendering model, meaning that each municipality could choose to implement either one or the other. The tendering model is based on a competitive bidding process initiated by the municipality. In this model, private service providers submit proposals outlining how, and to what price, they will meet the municipality's predetermined quality standards. Contracts are awarded to the providers that best meet these requirements. Notably, existing providers are not automatically retained under the tendering model; all firms—including those already operating in the market— must

compete for a contract. According to Foged and Houlberg (2024), who analyzed municipal tenders conducted between 2012 and 2019, price was included as an award criterion in 96 % of cases, while quality was explicitly mentioned in 72 %. Other criteria—such as cooperation and development (43 %) and staffing or delivery reliability (17 %)—were also used. Once the contracts are secured, citizens can choose from the selected providers for their eldercare services. As in the approval model, the municipality subsequently pays the provider for the services delivered.

Interestingly, the shift towards the tendering model closely mirrors the Clinton administration's 1993 Health Security Act, which proposed a model of regulated competition in which public authorities (Health Alliances) would select among approved private insurance providers on behalf of consumers. This model resembled a tendering system, where competition takes place primarily at the initial selection stage McGuire and van Kleef (2018). This corresponds to Diamond's idea of group-level competition, where competition takes place at an initial stage—before consumers make choices—because a public authority, such as a municipality, selects a limited set of providers through procurement, see Diamond (1992). Our institutional setting allows us to empirically analyse the transition to such a model.

Below, we present the changes in the use of model for practical help in Denmark from Foged et al. (2024). The table shows changes in the use of the model for practical help in Denmark between 2013 and 2019, following the legislative reform that allowed municipalities to shift from the approval model to the tendering mode. In the period from 2013 to 2016, 52 municipalities made no changes and continued using the approval model, while 40 municipalities transitioned from the approval model to the tendering model. None of the municipalities switched from the tendering model back to the approval model during this period. From 2017 to 2019, 80 municipalities maintained their existing model, while only 6 switched from the approval model to the tendering model, and an additional 6 switched from the tendering model back to the approval model.

Table 1: Changes in the use of voucher model for Practical Help, 2013–2019.

	2013–2016	**2017–2019**
No change	52	80
From approval model to tendering model	40	6
From tendering model to approval model	0	6
Total	92	92

The 2013 reform will serve as a source of variation across local governments. In the next section, we will describe the data used in the analysis.

3 Data

This study leverages panel data from administrative records provided by Statistics Denmark, covering the entire Danish population aged 67 and older from 2009 to 2017. The dataset is extensive, capturing information on both the dependent variable—eldercare provision—and independent variables such as income, education, and demographic attributes, all linked to unique individual IDs. Data on eldercare choices are collected by Danish municipalities and stored by Statistics Denmark. For each individual, the dataset records every instance of eldercare received, including details on the type of service, hours provided, whether the provider is public or private, timestamps, and firm IDs. At the monthly level, we can track the provider and identify any changes over time. For the independent variables, income data comes from precise tax records, with annual information on earnings, including wages and income transfers like the state pension. Educational data, which contains information on the highest level of education achieved annually, is sourced from the Ministry of Higher Education and Science. Demographic details, including yearly observations on age, ethnicity, marital status, and gender, are obtained from the Danish Population Register.

In our analysis, we focus specifically on practical help, which includes tasks such as cleaning, cooking, and shopping. Practical help is relatively homogeneous compared to other eldercare services, such as personal care, which often require specialized skills and are tailored to individual needs. Its relative homogeneity makes it well-suited for drawing more general conclusions. Additionally, practical help is one of the most competition-exposed areas of eldercare, as it requires relatively few initial investments and is relatively easy to specify in a contract, Brown (2003). Municipalities often rely on private providers to deliver these services, making it a prime example for analyzing the effects of quasi-market reforms.

To examine the models outlined in the previous section, we divide the dataset into a control group and a treatment group. The control group consists of municipalities that used the approval model from 2009 to 2017, while the treatment group includes municipalities that transitioned to the tendering model after 2013. We restrict our analysis to data up to 2017 because some municipalities reverted from the tendering model back to the approval model after that year, resulting in a switch from the treatment group to the control group. To avoid

complications in the econometric analysis arising from such transitions, we have chosen not to include data beyond 2017

Table 2 describes summary statistics for the control and treatment groups in the dataset. The average yearly income in the control group is 197,179 DKK (€26,400), compared to a slightly higher average of 207,421 DKK (€27,800) in the treatment group. The average age in both groups is similar, with 81.90 years in the control group and 81.73 years in the treatment group. The proportion of males is slightly higher in the control group at 27.6 %, compared to 25.8 % in the treatment group. The proportion of individuals of Danish origin is high in both groups but slightly higher in the control group, with 97.1 % compared to 95.5 % in the treatment group. Similarly, the proportion of individuals with a partner is marginally higher in the control group at 16.9 %, compared to 15.3 % in the treatment group. Regarding education, a larger share of individuals in the control group (68.9 %) has no formal education, compared to 62.5 % in the treatment group.

Clearly, there are some observed differences between the two samples; in particular, the treatment group is slightly more socioeconomically advantaged than the control group (more educations and higher income). Our analysis accounts for this by exploiting a difference-in-differences setup.

In terms of sample size, the control group consists of 172,177 individuals with a total of 5,509,524 observations, while the treatment group comprises 171,131 individuals with 5,594,383 observations. These numbers reflect the panel structure of the data, with one observation of eldercare per individual per month.

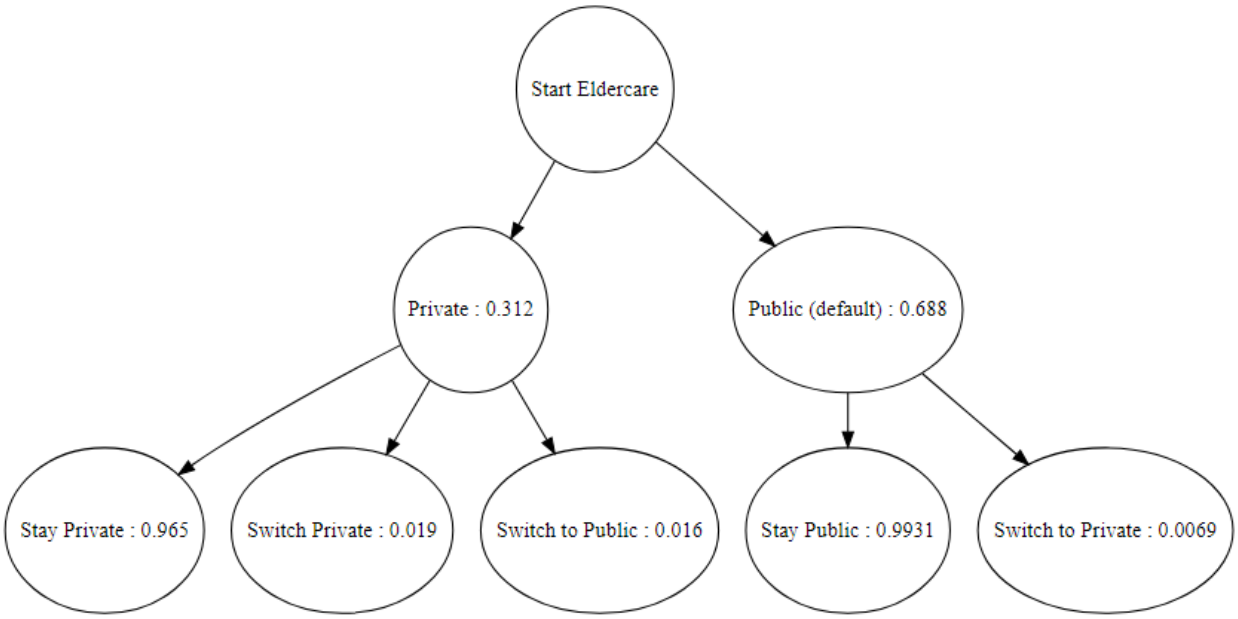
Table 2: Summary Statistics by Group

Variable	**Control Group**	**Treatment Group**
Income	197,179	207,421
Age	81.90	81.73
Male	0.276	0.258
Danish	0.971	0.955
Partner	0.169	0.153
No Education	0.689	0.625
Additional Information:		
Number of Individuals	172,177	171,131
Number of Observations	5,509,520	5,594,383

3.1 Eldercare Provider Choice Dynamics

To better understand the provision of eldercare, Figure 1 illustrates the decision-making process that elders face when they begin utilizing eldercare services. Upon enrollment, individuals must choose between a public (default) or private care provider. In 2017, about two-thirds chose a public provider, while one-third chose a private provider of practical help. Following this initial decision, if the elder selects a private provider, they can choose to switch to a public provider (Switch to Public), switch to a different private provider (Switch Private), or remain with their current private provider (Stay Private). As depicted in the figure, conditional on choosing a private provider, the probability of staying with that provider each month is 96.5 percent, while the likelihood of switching to another private provider is only 1.9 percent, and switching to a public provider is 1.6 percent. Conversely, if the elder selects a public provider, their subsequent options include switching to a private provider (Switch to Private) or continuing with the public provider (Stay Public). Conditional on having chosen the default option of a public provider, the probability of staying with that provider is almost guaranteed, with a monthly probability of 99.3 percent. Thus, there is very little switching once the elder has enrolled into eldercare. This limited switching suggests that many users simply remain with their initial provider—especially the default public option—rather than making an active choice to switch, even when alternatives are available

Figure 1: Decision tree for eldercare provider choices



We focus on the choice between private and public provider. In the next section, we will focus on the evolution of eldercare in Denmark.

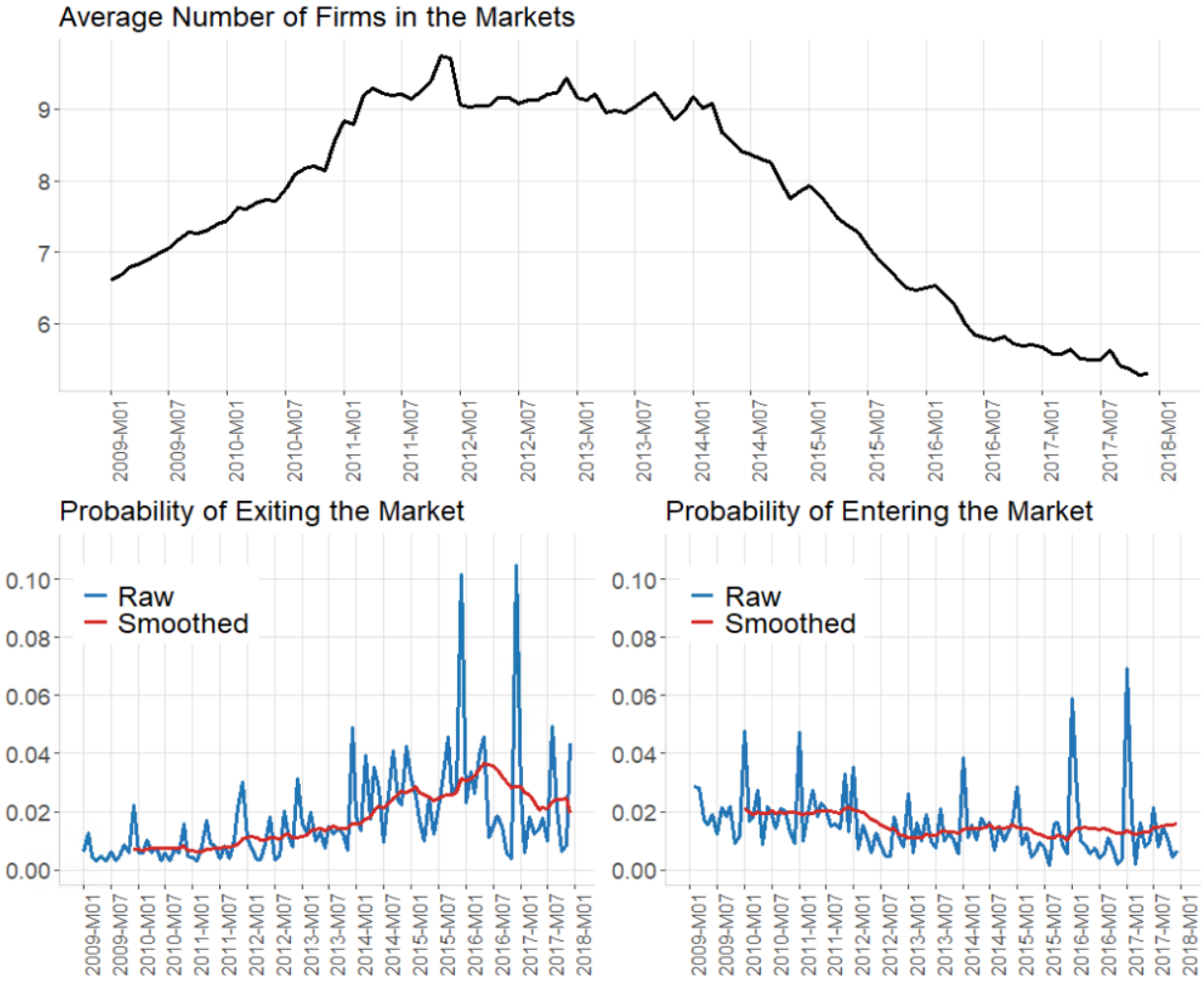
3.2 The Evolution of Eldercare in Denmark

The top panel in Figure 2 shows the expansion and subsequent contraction of firms operating in Denmark's municipal eldercare markets. The number of firms is calculated as the unique firm IDs operating in each month for each municipality, which are then averaged across municipalities. The number of firms grew steadily until 2011, reaching an average of 10 providers. After this peak, the number of firms began to decline, stabilizing at around 5 suppliers in 2017, which is roughly half of the 2011 level.

The bottom panels highlight the dynamics of firm entry and exit over time. Between 2009 and 2011, the market saw a higher probability of firms entering than exiting, leading to growth. However, after 2013, there was a noticeable shift, with a significant number of firms

exiting the market in 2014. Fewer new firms entered the market during this period. The bottom panels also reveal an increase in market instability, with fluctuating rates of firm exits and entries, contributing to volatility in the eldercare market over time.

Figure 2: Changes in the number of providers and entry/exit probabilities in Danish eldercare markets from 2009 to 2017.



Clearly, the number of firms has decreased in recent years. In the next section, we will explore how competition in the market has evolved.

3.3 Competition in the Danish Municipalities

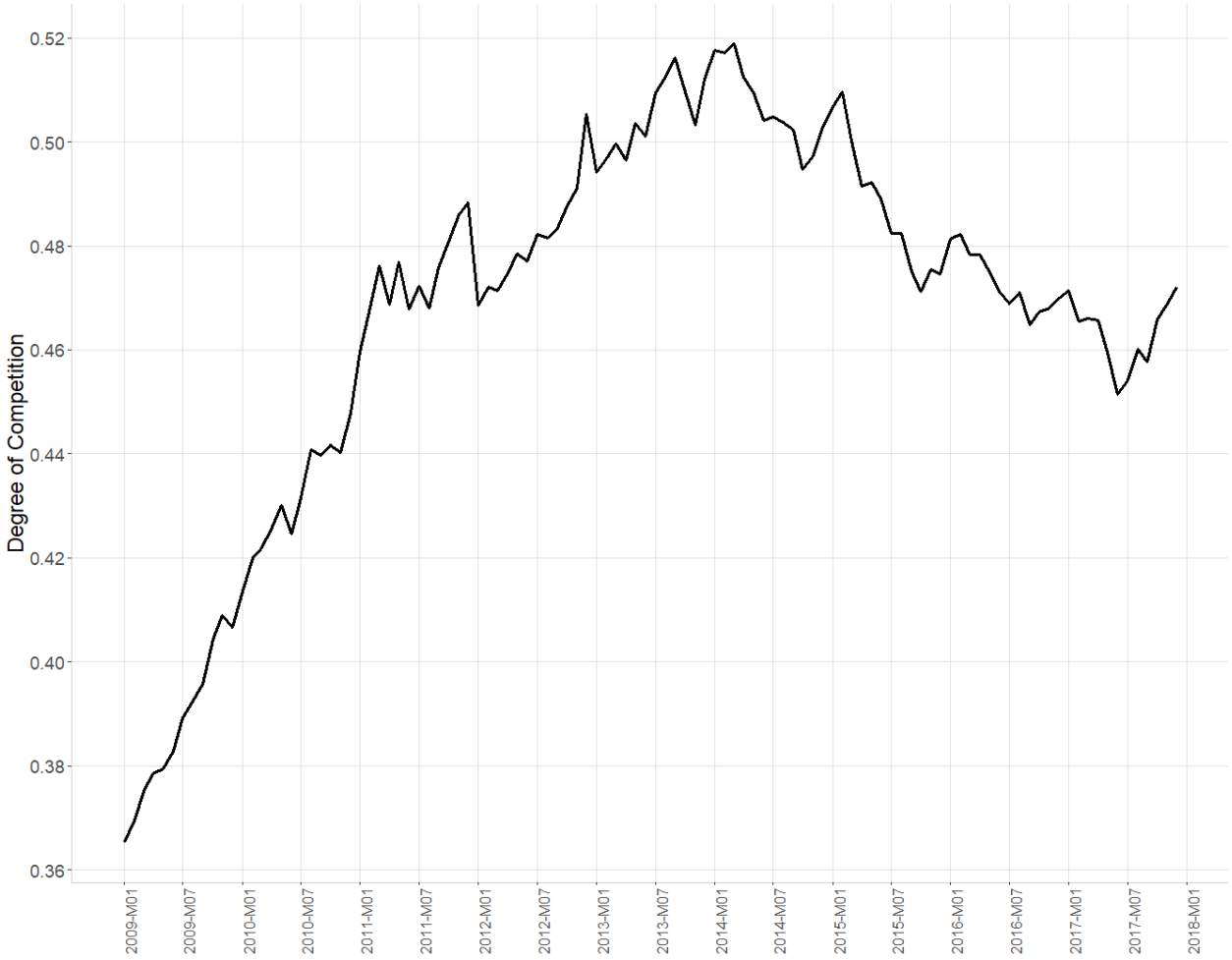
The degree of competition among eldercare service providers in Danish municipalities can be quantified using the Herfindahl-Hirschman Index (HHI), Hirschman (1980). The HHI is a commonly used measure of market concentration and is calculated by summing the squares of the market shares of all firms within the market. Mathematically, the index is defined as follows:

$$HHI = \sum_{i=1}^{N} s_i^2 \tag{1}$$

Here, s_i represents the market share of firm i in the market, and N is the total number of firms. In this context, the market is represented by the municipality, and the share refers to the proportion of all elders receiving eldercare within the municipality who are served by the firm. An HHI closer to 0 indicates a highly competitive market, with each firm holding only a small fraction of the market, while an HHI closer to 1 indicates a monopolistic market.

For ease of exposition, Figure 3 shows the degree of competition for practical help from 2009 to 2017, that is 1 minus the average HHI across municipalities. From 2009 to 2013 we see that competition increases, as more providers entered the market, leading to a wider distribution of market shares. However, from 2014 onwards competition starts to decrease, reflecting increased market concentration, where fewer firms control a larger share of the market. This suggests that fewer providers dominate the market.

Figure 3: Competition in eldercare provision for practical help from 2009 to 2017 average over municipalities.



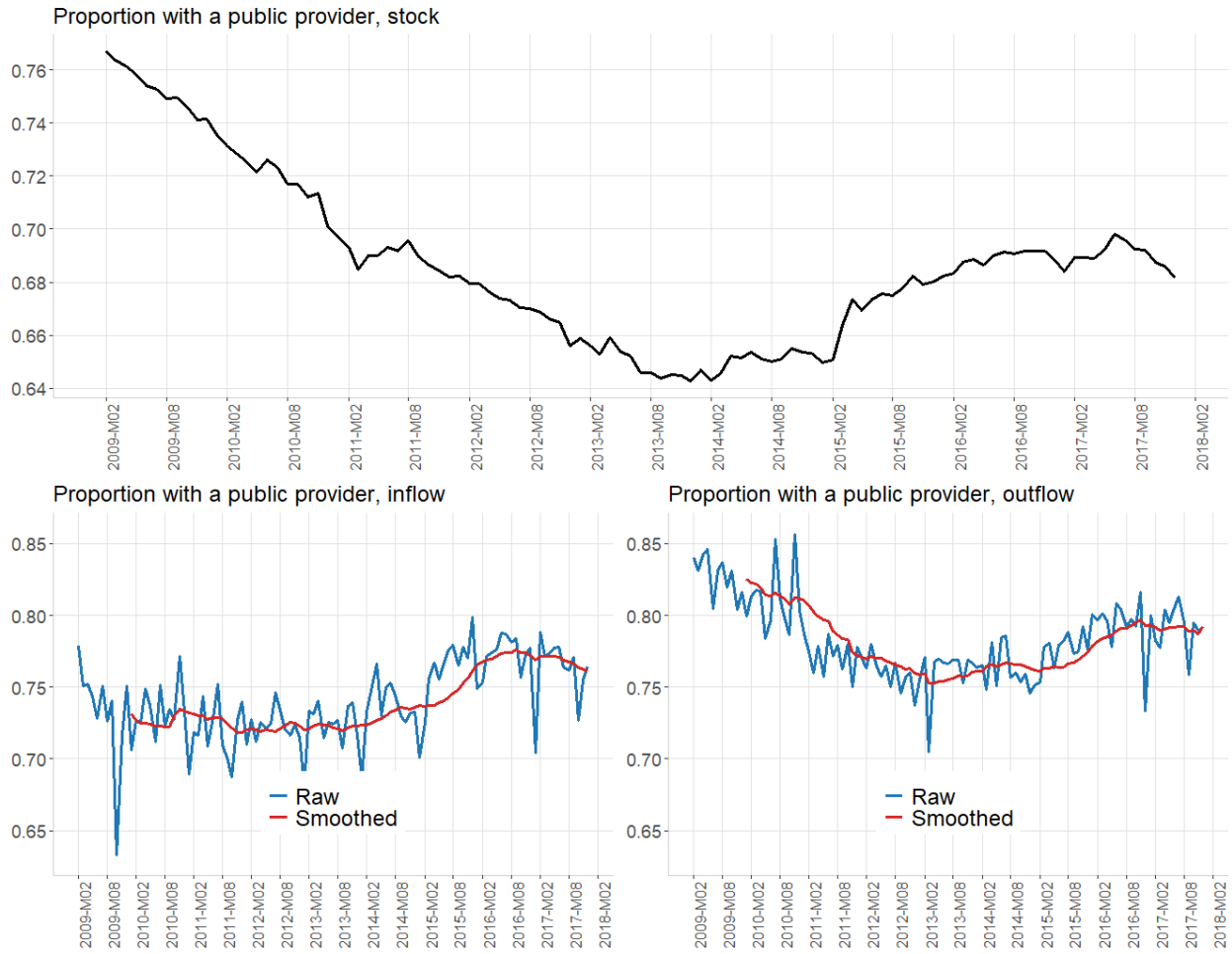
3.4 Opting for Private Eldercare

Figure 4 illustrates the trend in the proportion of individuals receiving practical help from a public provider. Since the public provider is the default option, elderly individuals must make an active decision if they prefer to switch to a private provider. Between 2009 and 2013, the proportion of individuals using a public provider decreased, as more people chose private providers.

From 2014 onwards, the trend shifted, with an increasing share of individuals opting to stay with public providers, while fewer people selected private alternatives.

In the lower panel of figure 4, we show the proportion of individuals selecting public providers among those entering the eldercare system (the inflow population) and those exiting (the outflow population). Between 2009 and 2013, the outflow population had a higher proportion of public provider users, while the inflow population increasingly chose private providers. After 2014, a larger fraction of the inflow population began staying with the default public provider.

Figure 4: Proportion of individuals with a public provider (default option) between 2009 and 2017



4 Identification Strategy

To estimate the causal effect of the tendering model on eldercare outcomes, we employ a difference-in-differences (DiD) approach. In this setup, municipalities operating under the approval model serve as the control group, while those that adopt the tendering model represent the treatment group. The treatment group undergoes the policy change (i.e., the shift to the tendering model), while the control group continues using the approval model.

The key assumption of the DiD framework is that both groups would have followed parallel trends in the absence of the reform, known as the common trend assumption. This implies

that any differences in outcome variables between the treatment and control groups prior to the reform remain consistent over time. Thus, any deviation from this parallel trend following the implementation of the tendering model can be attributed to the reform itself.

We formally define the model as:

$$Y_{it} = \alpha + \gamma_t + \beta D_i + \delta_t(\text{Time}_t \times D_i) + X'_{it}\gamma + \epsilon_{it}$$

In this equation, Y_{it} represents the outcome variable for unit i at time t, where t is in months. The term γ_t captures time fixed effects, while D_i is a dummy variable indicating whether the municipality adopted the tendering model (1 = tendering, 0 = approval). The interaction term $\delta_t(\text{Time}_t \times D_i)$ is the difference-in-differences estimator, capturing the causal effect of the tendering model on the outcome variable. $X'_{it}\gamma$ represents a vector of control variables, and ϵ_{it} is the error term.

We estimate the model at three different levels—municipality, individual, and firm—depending on the outcome of interest.

The common trend assumption is critical for the validity of the difference-in-differences strategy. It ensures that the control group provides a valid counterfactual for what would have happened to the treatment group in the absence of the tendering model. If this assumption holds, the DiD estimate δ captures the true causal impact of the tendering model (relative to the approval model) on the outcomes of interest.

One potential threat to this assumption is if individuals anticipated changes in municipal market models and selectively moved between municipalities based on expected changes in service provision. However, this risk is minimal. Data show that only about 5 % of individuals aged 67 or older move each year, and this figure includes moves within the same municipality, where individuals would still be subject to the same model. In comparison, mobility rates among younger age groups can reach up to 48 % annually. Given the very low mobility of the elderly population, selective migration is unlikely to bias our estimates.

Endogeneity concerns are more relevant for analyses at the municipality level. Municipalities' decisions to adopt the tendering model may have been driven by unobserved factors correlated with market outcomes, such as fiscal constraints, political preferences, or administrative capacity. In this case, the difference-in-differences design relies on the assumption that any such differences between treatment and control municipalities are time-invariant.

Importantly, the DiD framework allows for differences in levels between treatment and control groups, as long as the underlying trends would have been parallel in the absence of the reform. We will demonstrate that the assumption of time-invariant differences is supported by the data.

In contrast, at the individual and firm level, exposure to a particular market model can be regarded as plausibly exogenous. Individuals reside locally and firms operate locally; neither individuals nor firms chose the municipality's market structure. Thus, conditional on municipality characteristics, the assignment to treatment can be treated as effectively random for individuals and firms.

To further support the validity of the common trend assumption, we compare pre-treatment trends in all key outcome variables between the treatment and control groups. We find no significant differences in these trends before the reform, strengthening the credibility of the DiD estimates.

5 Results

We divide the results of the reform into two parts. How firms respond to the tendering model versus the approval model, and how the elderly respond to the change. Finally, we present results showing how firm behavior and the elderly's responses impact the market.

5.1 Firm Behaviour

In this section, we describe the behaviour of the firms. The top panel in Figure 6 illustrates the evolution of firms operating in Denmark's municipal eldercare markets in the treatment group (i.e., those switching to the tendering model after 2013) and the control group (i.e., those that continued with the approval model throughout the time periods). After the introduction of private eldercare in 2003, the markets steadily grew for both the treatment and control groups, reaching an average of 12 suppliers by the end of 2011 for the treatment group and 8 suppliers for the control group. From 2003 to 2013, all municipalities offered free choice through the approval model. In 2013, changes to the law allowed municipalities to adopt the tendering model. The adoption of the tendering model resulted in municipalities selecting a smaller number of providers to offer eldercare. Consequently, the treatment

group went from having close to 12 suppliers in 2013 to only 4 suppliers in 2018. The control group, which maintained the approval model, saw a drop from 8 firms to an average of 6 firms operating in the markets. Both the control and treatment groups depict similar pre-trends, meaning that before 2013, the evolution of the average number of firms was the same.

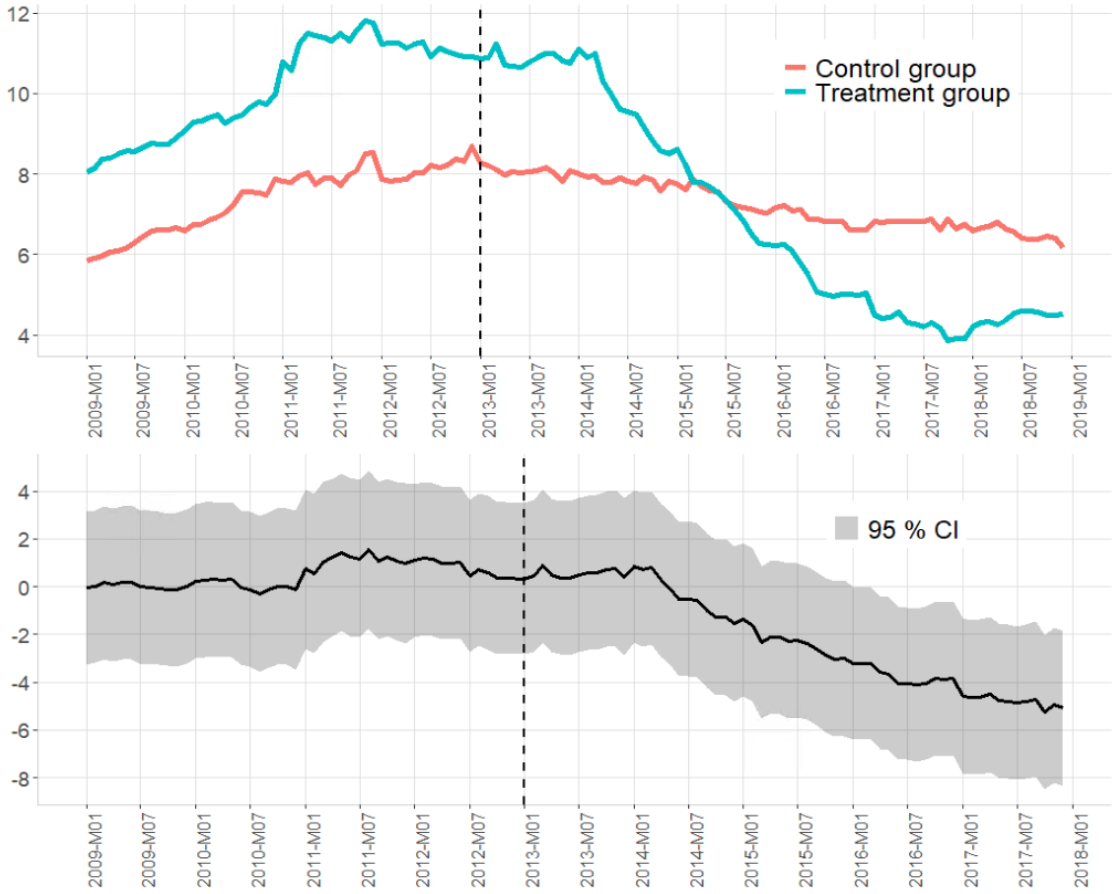
To measure the effects of treatment, we run the following difference-in-differences regression at the municipality level:

$$Y_{kt} = \gamma_t + \beta D_k + \delta_t(\text{Time}_t \times D_k) + \epsilon_{kt} \tag{2}$$

Here t represents the specific year and month, Y_{kt} is the average number of firms operating in municipality k, γ_t denotes time fixed effects, δ_t is the difference-in-differences estimate, and ϵ_{kt} is the idiosyncratic error term. In Table 4 in the appendix, we present the regression results for a more condensed version of the model, where the regression is estimated on a yearly level rather than on a monthly level.

The lower part of the figure shows the difference-in-differences estimates, calculated with monthly coefficients. Assuming the parallel trend assumption holds, we observe that switching to the tendering model leads, on average, to a reduction of 5 firms operating in the individual municipality.

Figure 5: Average Number of Firms Operating in the Market by Treatment and Control Groups (Top) and Difference-in-Differences (Bottom)



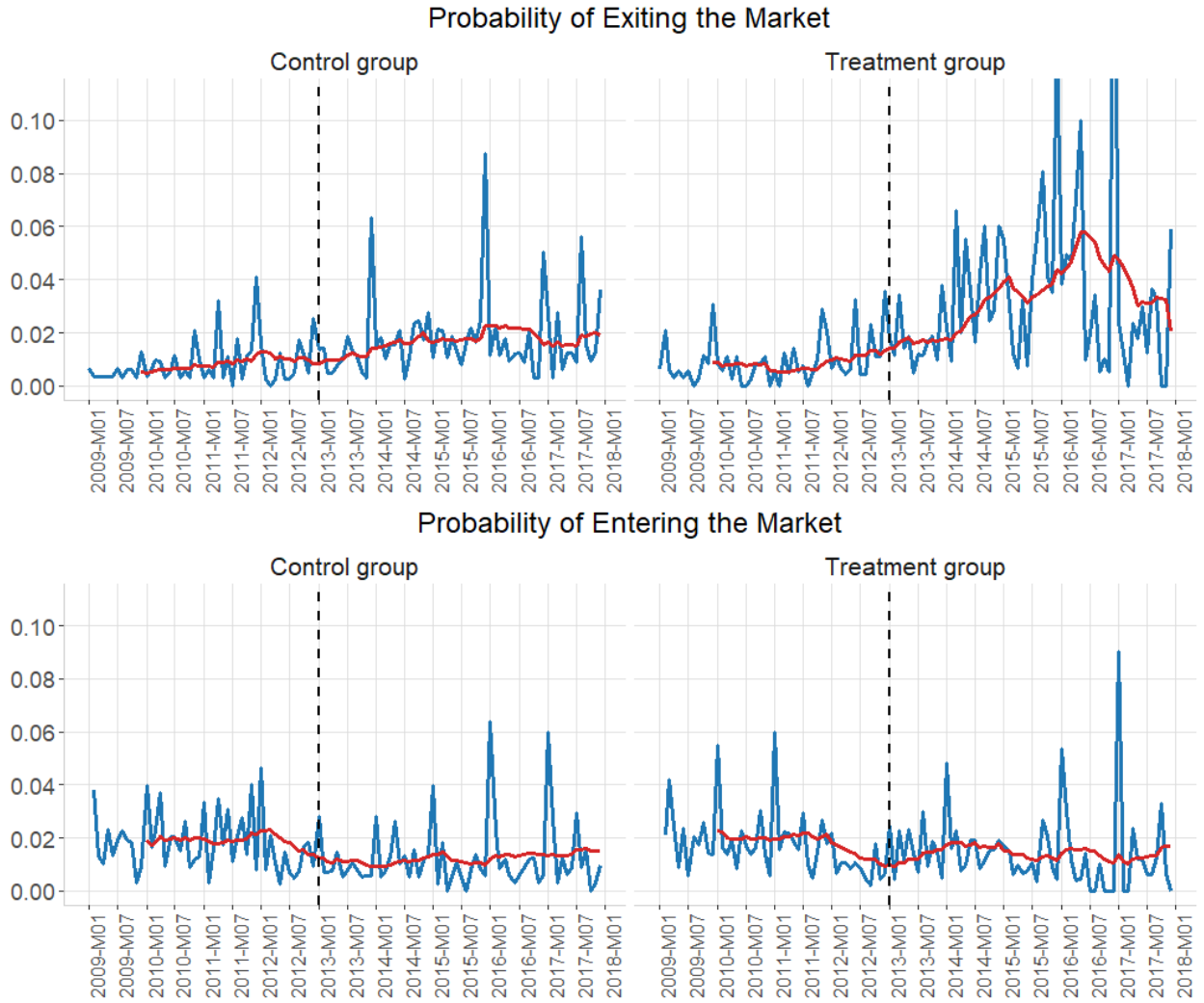
To better understand the decline of the private market in municipalities that switch to the tendering model, Figure 6 presents descriptive figures of the average entry and exit probabilities within these markets. The upper panel specifically highlights the trends in firms exiting the market. Prior to 2013, both the treatment group (municipalities that later adopted the tendering model) and the control group (those maintaining the approval model) displayed similar exit probabilities, averaging around 1 percent per month. However, following the reform in 2013, these trajectories diverge.

Municipalities adopting the tendering model experienced a rise in firm exits, with probabilities surpassing 5 percent per month. Interestingly, the exit probabilities in the treatment group exhibit far greater volatility compared to the control group, where the exit rates remained more stable. This increased fluctuation in the treatment group could be attributed to the nature of the tendering process itself, which likely involves periodic firm selections by municipalities, leading to concentrated periods of high exit rates. In essence, firms in these

municipalities are subject to more volatile and unpredictable market conditions, increasing their risk of being excluded from the market altogether.

In contrast, the lower panel of the analysis focuses on the probability of firms entering the market. While there are some small fluctuations in entry rates, both the treatment and control groups exhibit similar overall trends. This suggests that the tendering model does not significantly affect the likelihood of new firms entering the eldercare market.

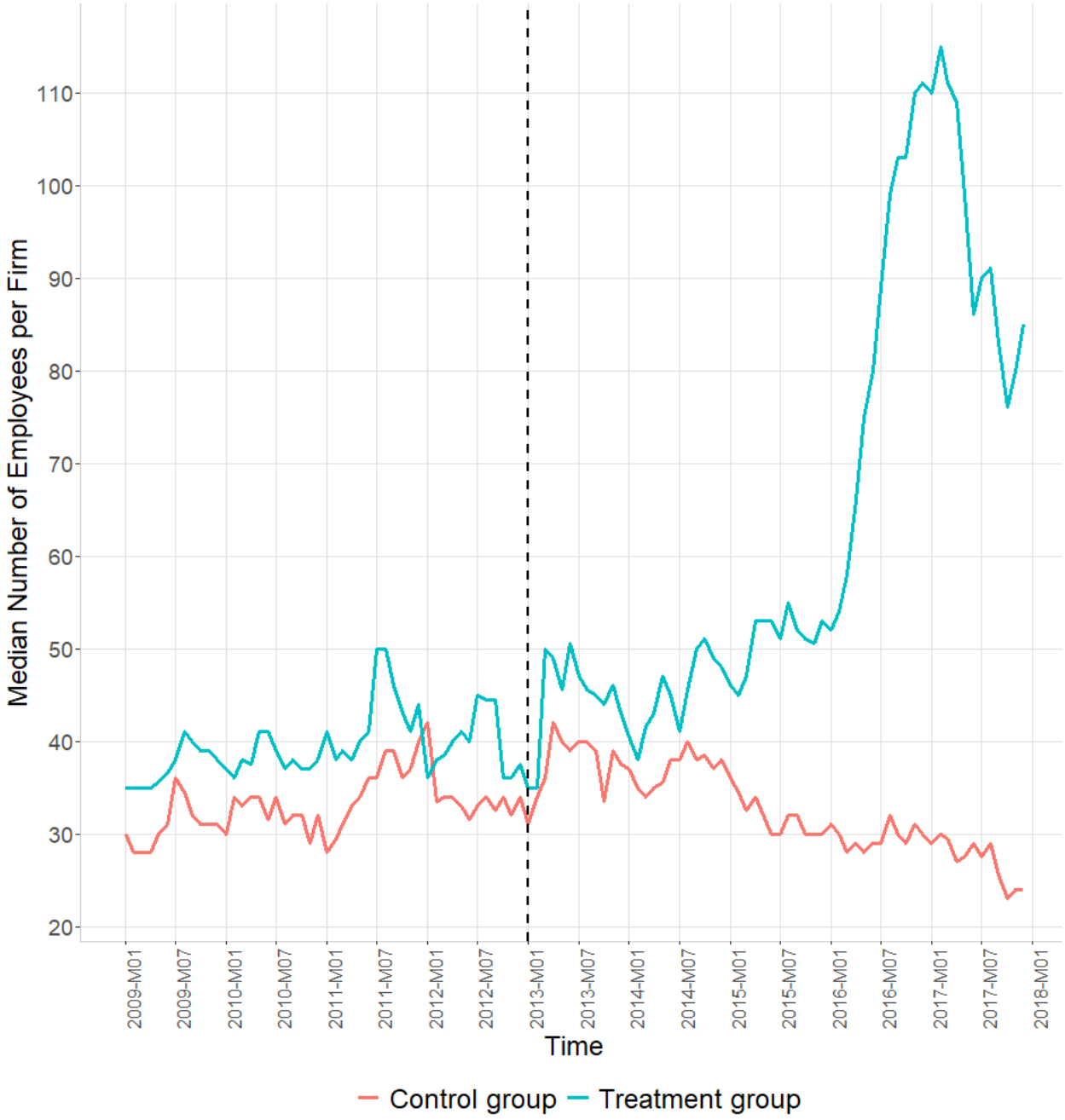
Figure 6: Probability of Firm Exit (upper) and Firm Entry (lower) by Treatment and Control Groups. Smoothed curve (red) and observed curve (blue) are shown.



Interestingly, not only did the number of firms operating in the market change, but the characteristics of firms also changed. Figure 7 shows the median number of employees per

firm in Danish eldercare markets for the control group (municipalities using the approval model) and the treatment group (municipalities that transitioned to the tendering model). Before the reform in 2013, the median firm size remained relatively stable in both groups, with the treatment group consistently having slightly larger firms compared to the control group. After 2013, a significant divergence was observed: in the treatment group, the median number of employees per firm increased substantially, peaking at over 100 employees by 2017. In contrast, the median firm size in the control group declined slightly over the same period. These findings underscore a key consequence of the tendering model: it leads to fewer but larger firms operating in the market compared to those under the approval model.

Figure 7: Median Firm Size by Treatment and Control Groups.



In the next section, we will discuss how consumers respond to the change in the markets.

5.2 Consumer Behavior

This section examines how consumers respond to the reduction in supplier options within markets that operate under the tendering model, compared to those in municipalities following the approval model. We differentiate between the impacts on two groups: existing elderly individuals already receiving eldercare and new entrants to the eldercare market.

Figure 8 illustrates the proportion of new entrants selecting a public provider in both the control group (municipalities with an approval model) and the treatment group (municipalities transitioning to the tendering model). For the control group, the proportion choosing a public provider holds steady around 75 % throughout the observed period, showing only minor fluctuations.

In contrast, the treatment group experiences a marked shift. Prior to the 2013 reform, the proportion opting for public providers declines, suggesting that private providers gained a stronger foothold in the market. However, following the reform in 2013, this trend reverses: an increasing number of new eldercare users begin choosing public providers, while fewer select the private option. This pattern implies that the reduction in the number of private providers is driving new consumers in the eldercare market toward public providers over private ones, reinforcing the public monopoly.

Figure 8: Share of Newly Admitted Elderly Choosing a Public Provider by Treatment and Control Groups

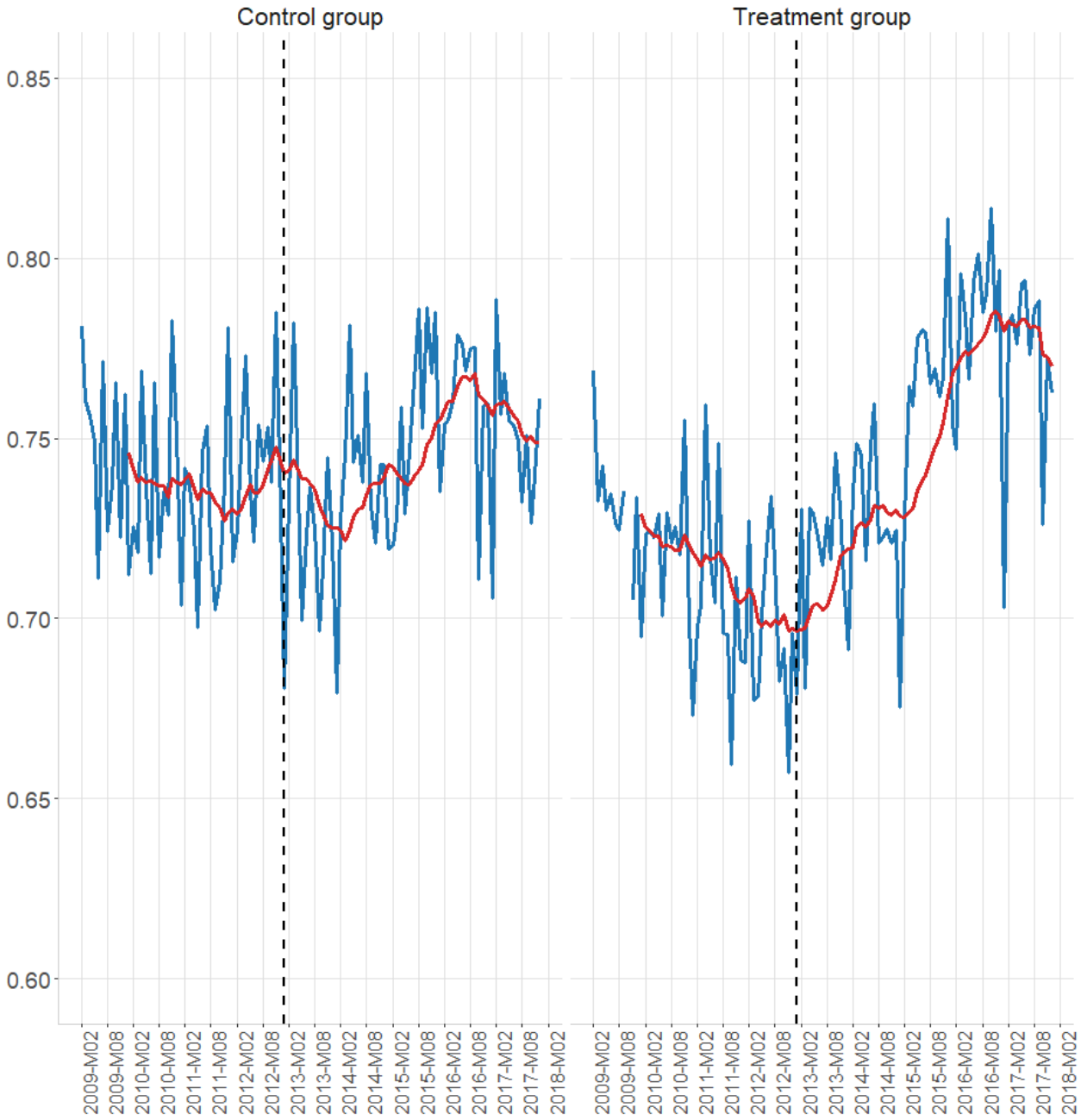


Figure 9 illustrates the probability that an individual already receiving care has switched providers within the past 12 months. We differentiate between "forced" and "non-forced" switches: a "forced" switch occurs when a provider exits the market, while a "non-forced" switch is a voluntary decision by the consumer.

For the control group, between 6 and 8 percent have switched providers in the past year, compared to 9 to 12 percent in the treatment group (blue line). Prior to the reform, most switches in both groups were voluntary (non-forced, green line). However, following the reform, the likelihood of switching providers rises substantially for the treatment group, while the increase for the control group remains modest. For the treatment group, the probability of switching reaches around 20 percent.

Notably, this rise in switching is primarily driven by an increase in forced switches (red line), indicating that more individuals are changing providers because their previous provider left the market. A similar rise in forced exits is not observed in the control group.

Thus, the increased exit of firms, as shown in the previous section, nearly doubles the likelihood that consumers in the treatment group will be forced to change providers. This shift underscores the impact of market instability on consumer choice, as more individuals are compelled to switch due to provider exits rather than changes in personal preferences.

Figure 9: Forced and Non-Forced Exits from Supplier in Control and Treatment Groups

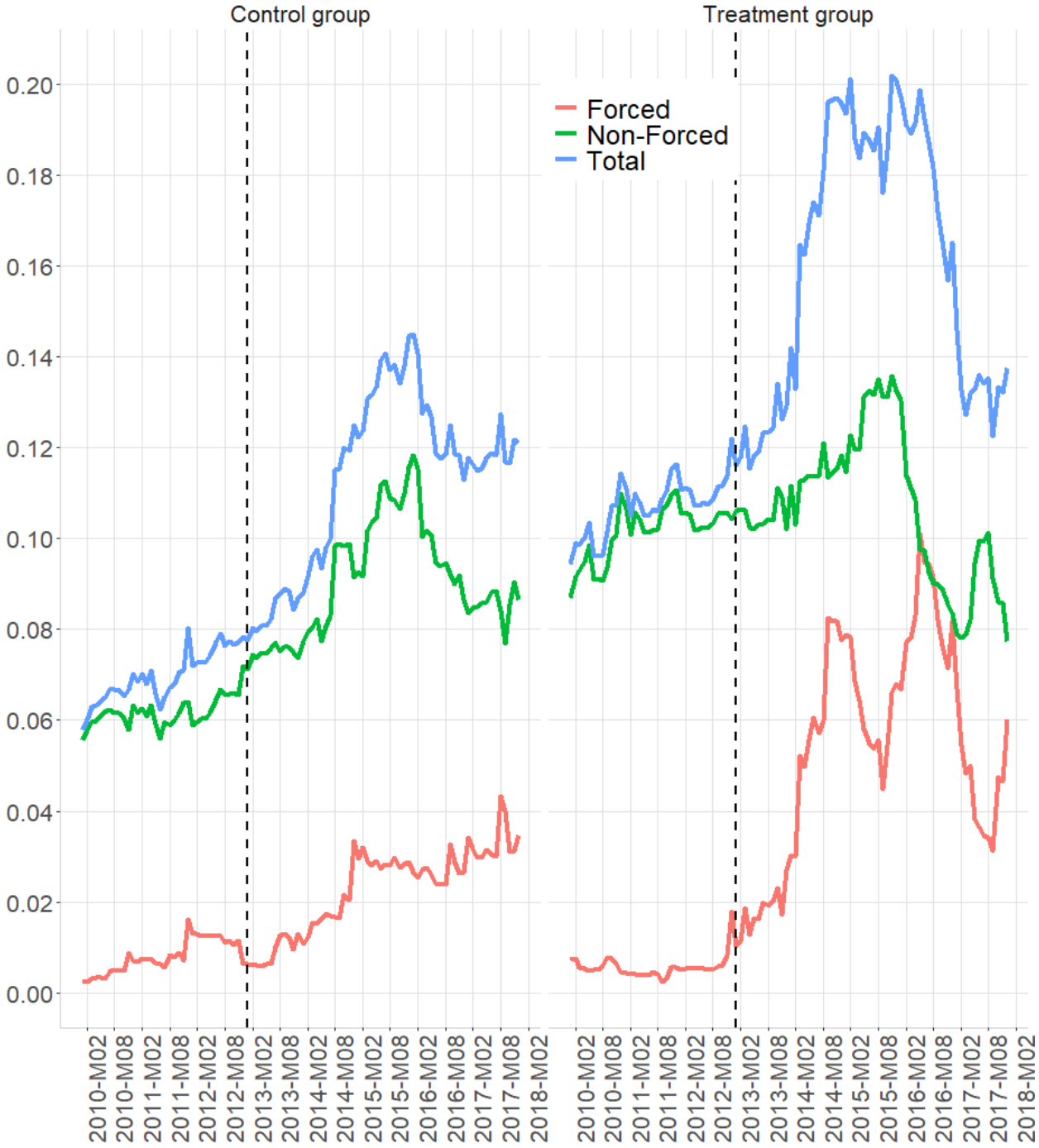


Table 3 outlines the outcomes for elderly individuals following a forced exit from a provider. A forced exit, if it simply leads to a switch to another private provider, does not directly impact the size of the public monopoly. The table reveals that about 4 out of every 5

individuals choose a new private provider after a forced exit, with the remaining 1 in 5 opting for a public provider. This proportion remains consistent across both the treatment and control groups.

However, due to the significantly higher rate of forced exits in the treatment group, the public monopoly expands. The table indicates that more than twice as many individuals in the treatment group experience a forced exit compared to the control group, despite both groups being similarly sized overall. Consequently, this leads to a substantially larger inflow into public providers from the treatment group, further reinforcing the growth of the public monopoly.

Table 3: Decision to switch provider after a forced exit, by group post-reform (2013-2017)

Decision	**Control**	**Treatment**
Switch Private	5,777	12,526
	(81.33%)	(80.01%)
Switch to Public	1,326	3,130
	(18.67%)	(19.99%)
Total	7,103	15,656
	(100.00%)	(100.00%)

Both figure 8 and 9 suggest that the public provider sector will grow in municipalities adopting the tendering model. This outcome is due to both a reduction in inflow to the private market—caused by fewer private providers—and the increased rate of forced switches as firms exit the market in these municipalities.

Figure 10 illustrates the combined impact of these two effects on the overall share served by public providers for the treatment and control groups. The upper panel shows a decline in the share with public from 2009 to the 2013-reform for both the control group and treatment group, but an increase in the fraction with a public provider for the treatment group after the reform, while the control group remains flat.

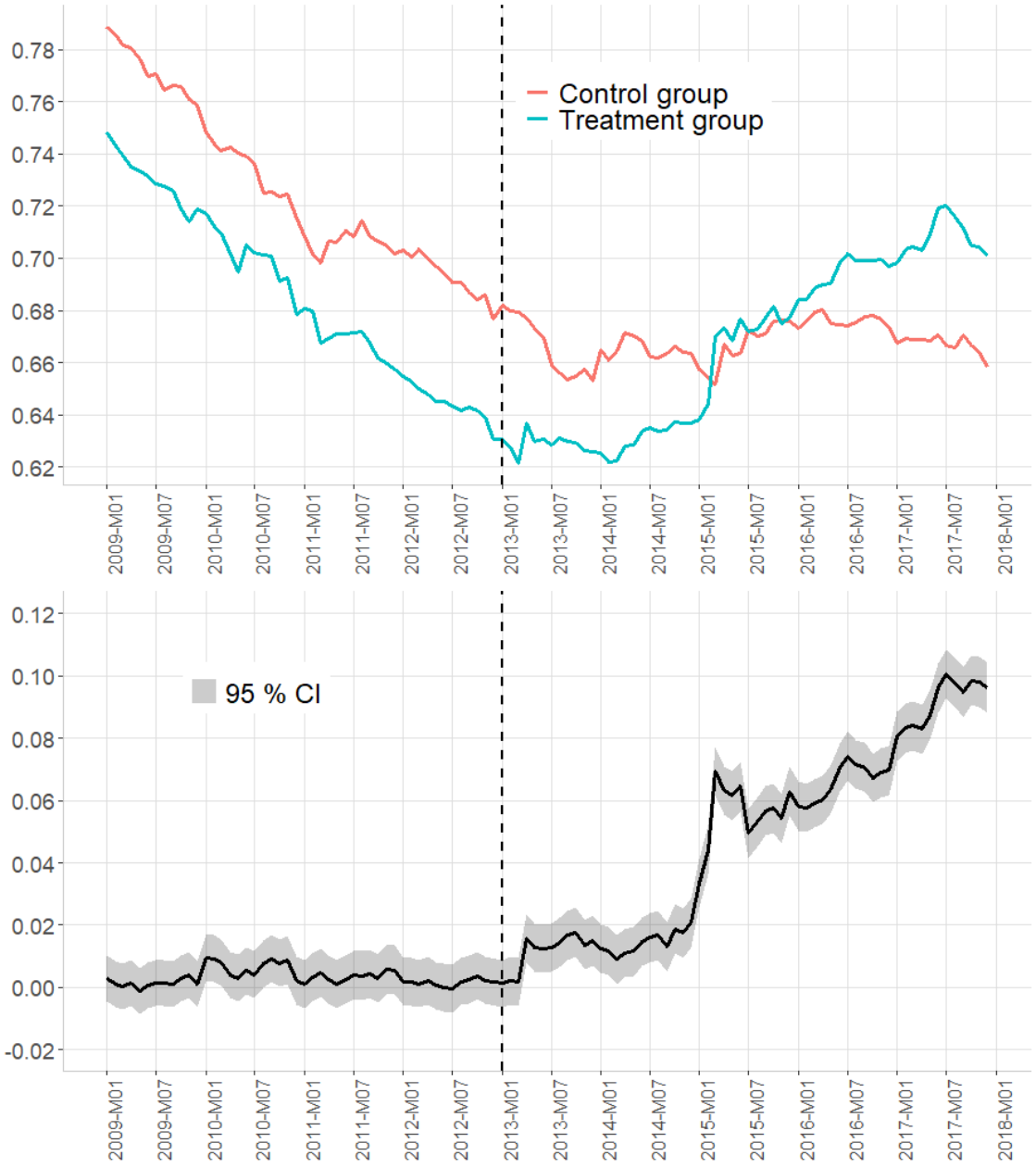
To estimate the exact effect using a difference-in-differences regression, we specify the following model:

$$Y_{it} = \alpha + \lambda_k + \gamma_t + \beta D_i + \delta_t(\text{Time}_t \times D_i) + X'_{it}\gamma + \epsilon_{it} \tag{3}$$

Here t represents the specific year and month, Y_{it} is a dummy variable indicating whether an individual i at time t has a public provider (1 if public, 0 if private), α is a constant term, λ_k represents municipality fixed effects for municipality k, γ_t captures time fixed effects, D_i is a treatment group indicator (1 for treatment, 0 for control), δ_t is the difference-in-differences coefficient measuring the causal effect of the tendering model, X'_{it} is a vector of control variables, and ϵ_{it} is the idiosyncratic error term. In Table 5 in the appendix, we present the regression results for a more condensed version of the model, where the regression is estimated on a yearly level rather than on a monthly level.

The difference-in-difference estimates are presented in the lower part of the figure. We observe that the net effect is an 8-9 percentage point reduction in the private market share in municipalities transitioning from the approval model to the tendering model compared to those that remain using the approval model.

Figure 10: Probability of Having a Public Provider by Treatment and Control Groups (Top) and Difference-in-Differences (Bottom)



Before proceeding, we provide further evidence supporting the key assumption of time-invariant differences between treatment and control groups.

5.3 Validation of Time-Invariance Assumption

A key identifying assumption in our difference-in-differences framework is that any differences between treatment and control municipalities are time-invariant. In this subsection, we present evidence supporting the plausibility of this assumption.

Using aggregate data from the Ministry of the Interior and Health of Denmark, Figure 11 illustrates pre-trends in key municipal characteristics for treatment and control groups. The two groups display very similar levels and trends in expenditure needs (a composite measure of expected municipal spending based on demographics and socioeconomics, constructed by the Ministry), total expenditures per resident, and expenditure on elderly and adults with special needs. Treatment municipalities have slightly higher educational attainment, larger populations, and higher rates of reported thefts and burglaries, while control municipalities have a higher share of residents aged 67+. Importantly, the trends are broadly parallel across all variables, supporting the assumption of time-invariant differences. Thus, while there appears to be selection into treatment, the selection is time-invariant and does not pose a threat to the validity of our results.

Figure 11: Trends in key municipal characteristics for treatment and control groups.

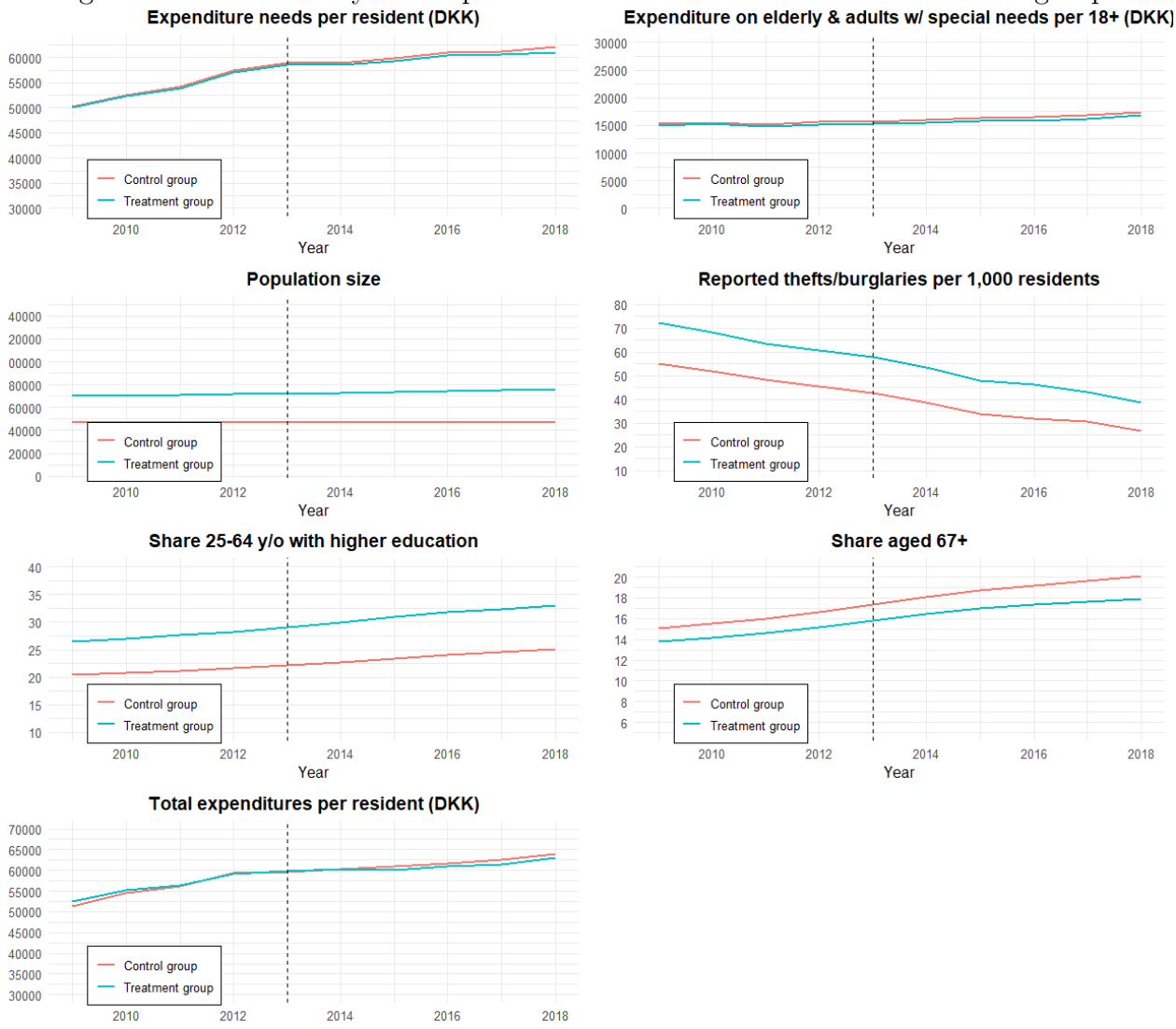


Figure 12: *

Source: Ministry of the Interior and Health of Denmark, De Kommunale Nøgletal, `https://www.noegletal.dk`

After validating the key assumption of time-invariant differences between treatment and control municipalities, we now return to the main analysis. Having established the average effects of the tendering model on market structure and consumer behavior, we next explore whether these effects vary across different demographic and socioeconomic groups.

5.4 Heterogenous Response

Figure 13 breaks down the effects presented in Figure 10 by educational group. Those with no education are the most likely to choose a public provider, followed by those with vocational education, while individuals with higher education are the least likely to opt for a public provider. The dots represent the difference-in-differences estimates, similar to the regression specified in equation 3, but calculated separately for each educational group. These estimates show the effect of transitioning from the approval model to the tendering model and are displayed on the right axis.Importantly, we observe that the parallel trend assumption appears to hold for the subgroups. The figure demonstrates that individuals with higher education are less affected by a shift to the tendering model, meaning they are more likely to stick with a private provider compared to those with no education, while those with vocational education fall between the two groups. Shifting to the tendering model for people with no education causes a shift of 10 percentage points, while this effect is 7 percentage points for people with higher education in 2017. This difference is significant at the 5 percent significance level [1]. Notably, the trend for the control group also increases by a few percentage points for the group with higher education. This is not the case for the group with no education, which might partly explain the higher effect for those with no education.

[1]Notice, the test examines whether the difference-in-difference estimate for the group with no education is statistically different from the estimate for the group with higher education. This is different from simply checking whether the confidence intervals for the two groups overlap in the graph.

Figure 13: Probability of Having a Public Provider by Treatment and Control Groups by Educational Group (left axis) and Difference-in-Differences (right axis)

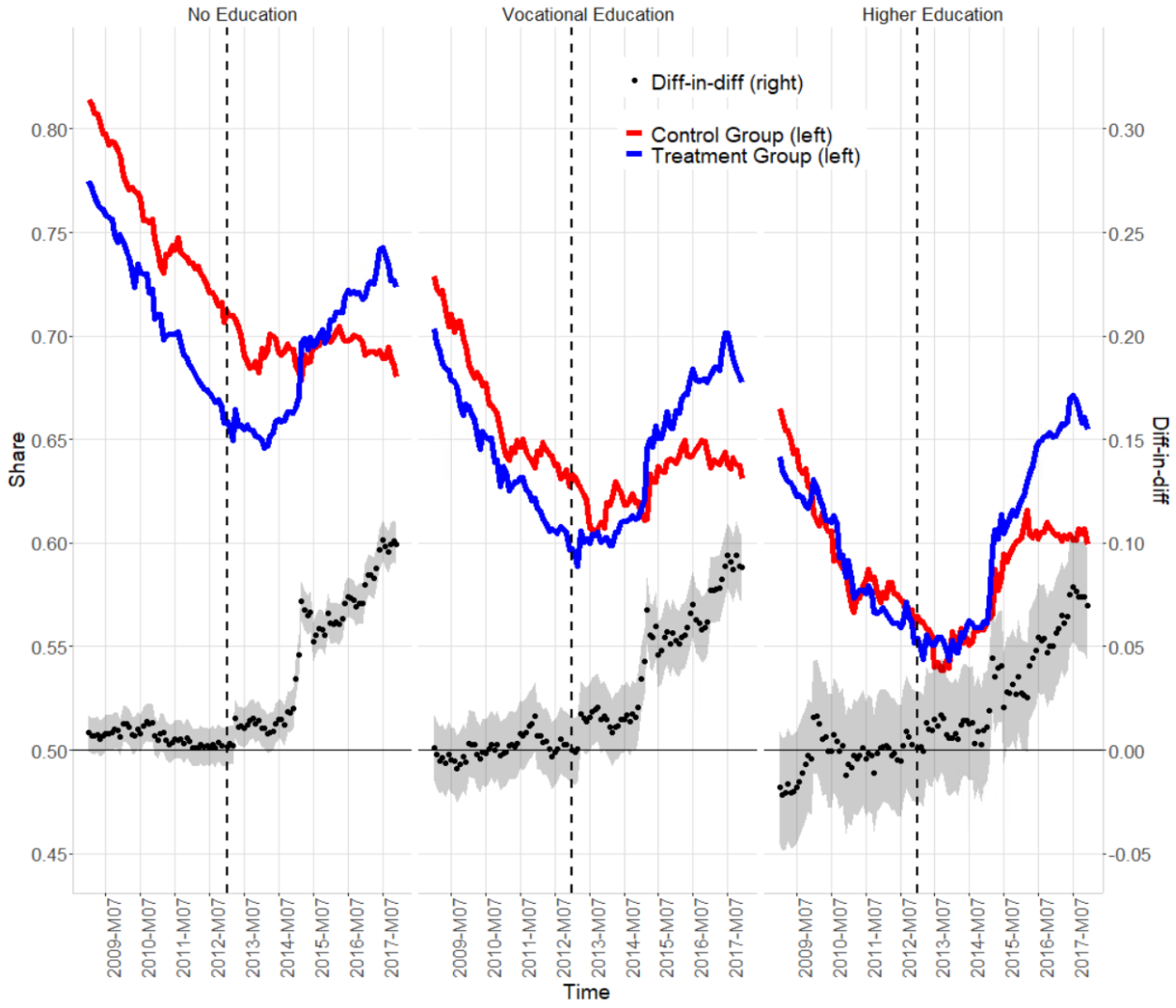


Figure 14 breaks down the effects by maritial status. People with a partner are more likely to use a private provider compared to people without a partner. The right axis shows the difference-in-differences estimates for the two groups. Both groups see a similar effect of transitioning from the approval model to the tendering model. Again, we observe that the parallel trends assumption appears to hold for the subgroups.

Figure 14: Probability of Having a Public Provider by Treatment and Control Groups by Marital Status (left axis) and Difference-in-Differences (right axis)

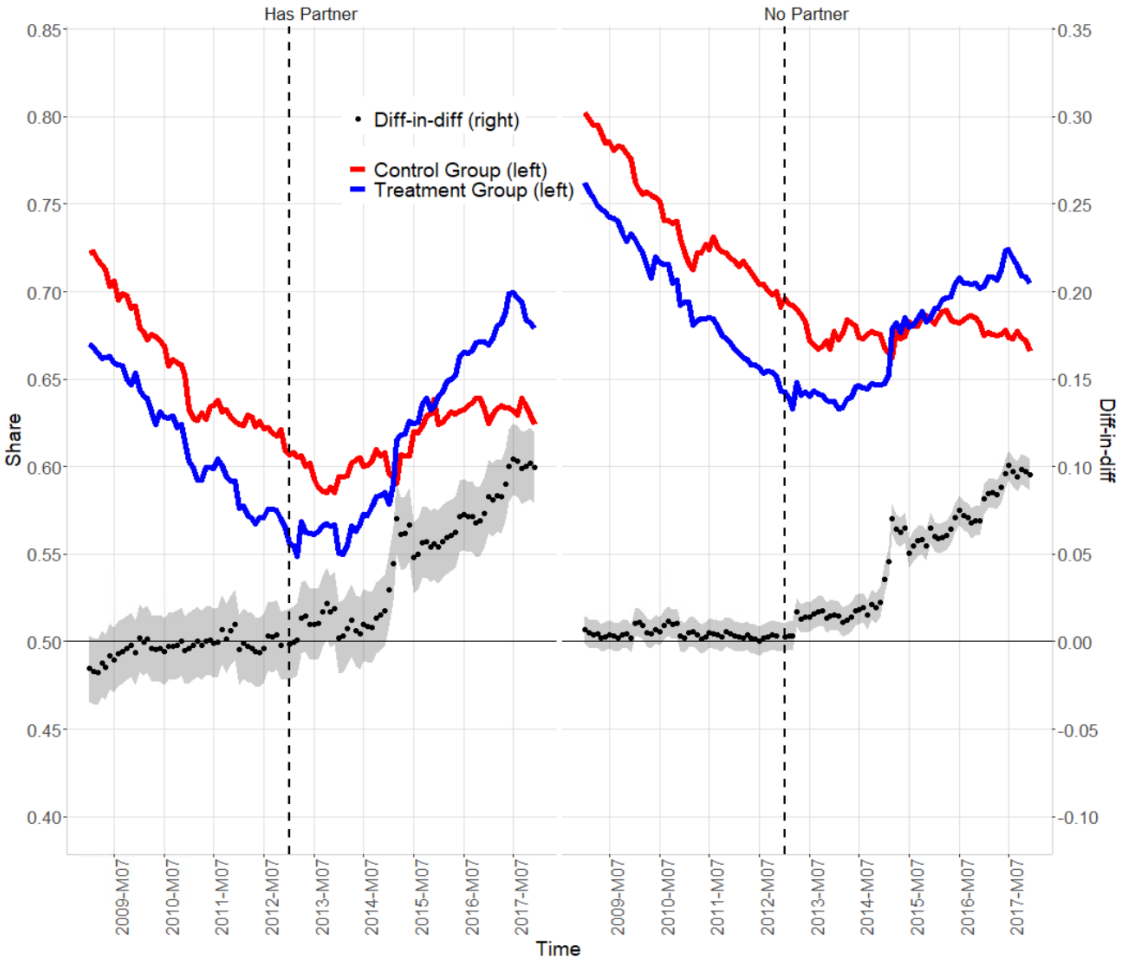


Figure 15 breaks down the effects by age group. Those who are 85 or older are the most likely to choose a public provider, while the age groups under 75 and 75–84 are more likely to pick a private provider. The right axis shows the difference-in-differences estimates for the three groups. The figure demonstrates that older individuals are more affected by the shift to the tendering model, meaning they are less likely to stick with a private provider compared to the younger group. In comparison, the group aged 85 or older experiences a 10 percentage point shift to the public provider, while those under 75 experience a shift of roughly 8 percentage points in 2017, when transitioning to the tendering model. The difference between the two corresponds to a t-value of 1.9, which is borderline insignificant. Once again, the data suggests that the parallel trend assumption is upheld across the subgroups.

Figure 15: Probability of Having a Public Provider by Treatment and Control Groups by Age Group (left axis) and Difference-in-Differences (right axis)

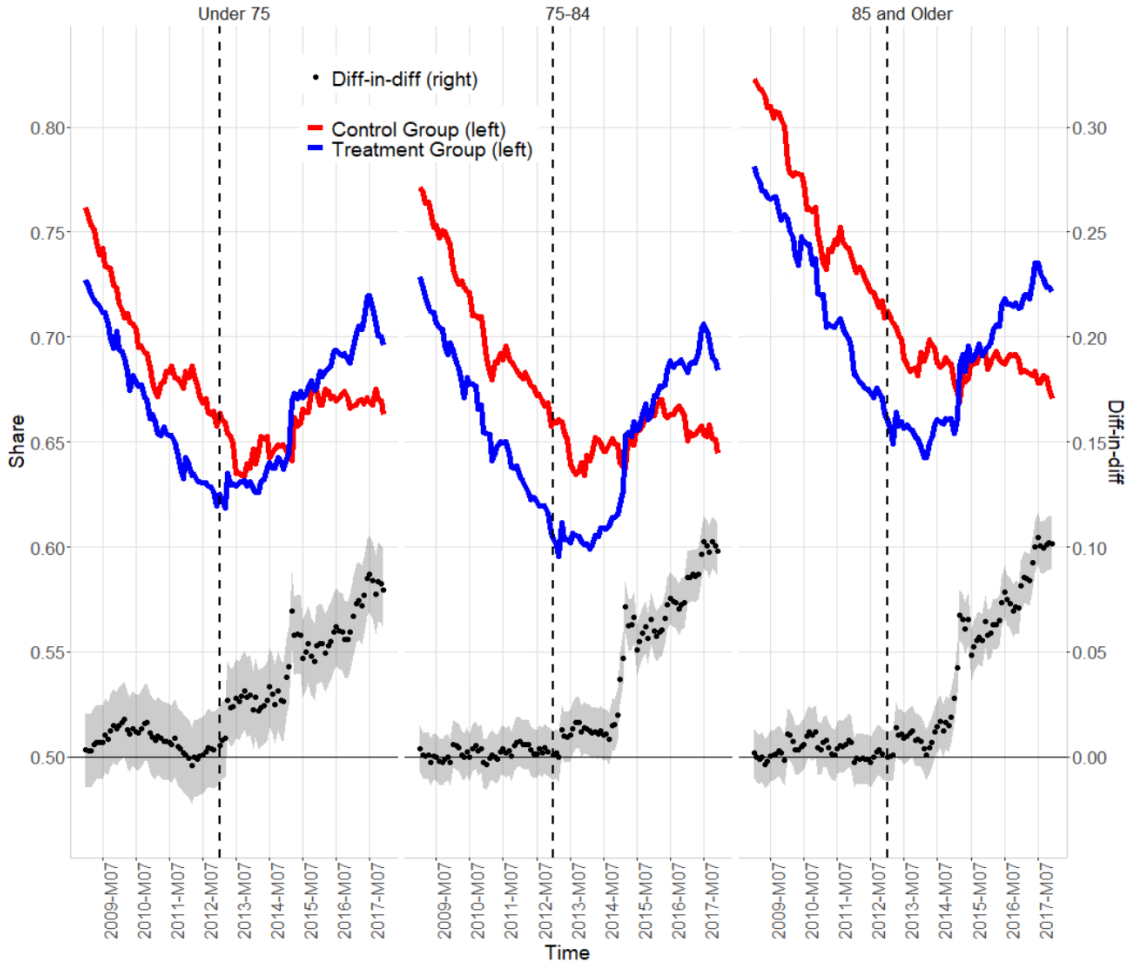


Figure 16 breaks down the effects by gender. Males are less likely to use a private provider compared to females. The right axis shows the difference-in-differences estimates for the two groups. The figure demonstrates that females are more affected by the shift to the tendering model, meaning they are less likely to stick with a private provider. Transitioning to the tendering model causes a shift of 10 percentage points for females compared to an 8 percentage point shift for males. This difference is significant at the 5 percent significance level. The graph supports that the parallel trend assumption holds for the subgroups.

Figure 16: Probability of Having a Public Provider by Treatment and Control Groups by Gender (left axis) and Difference-in-Differences (right axis)

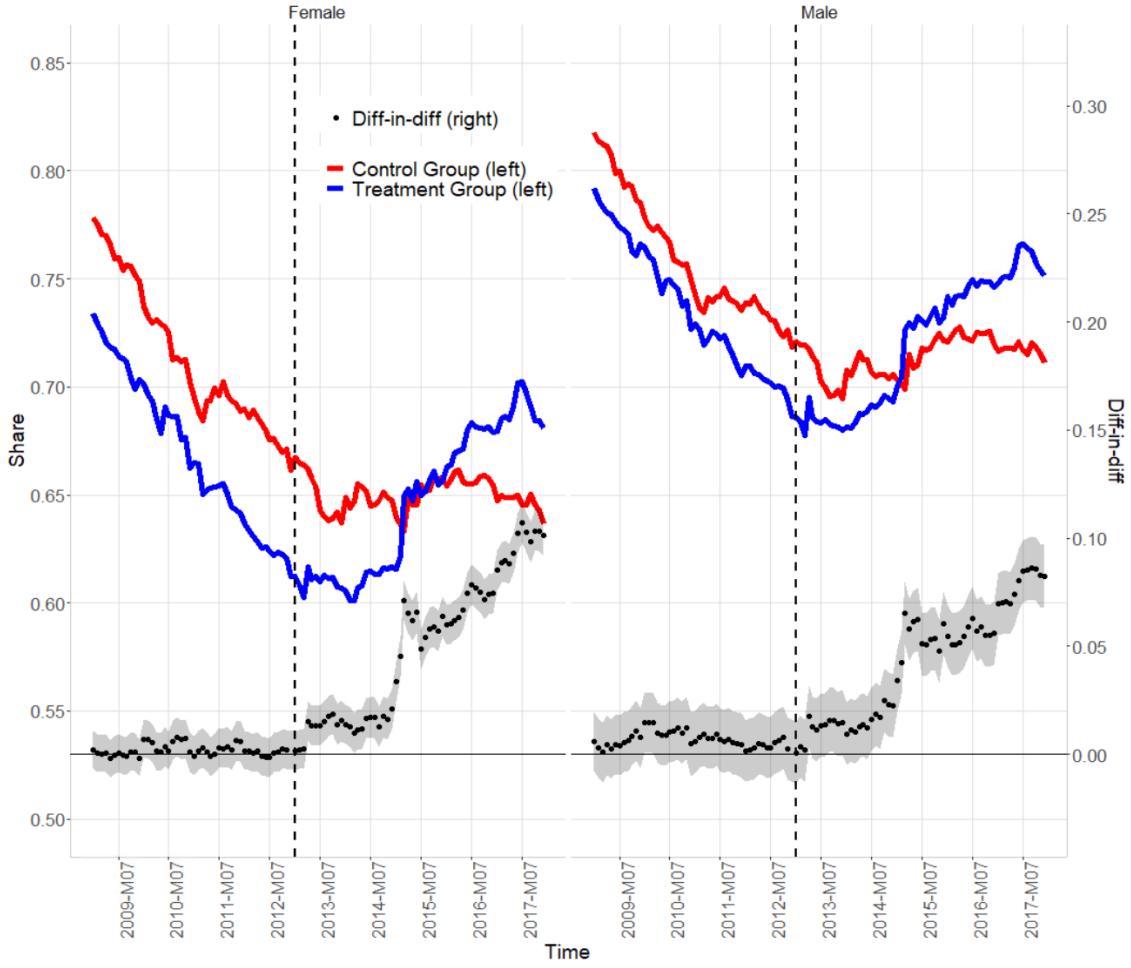
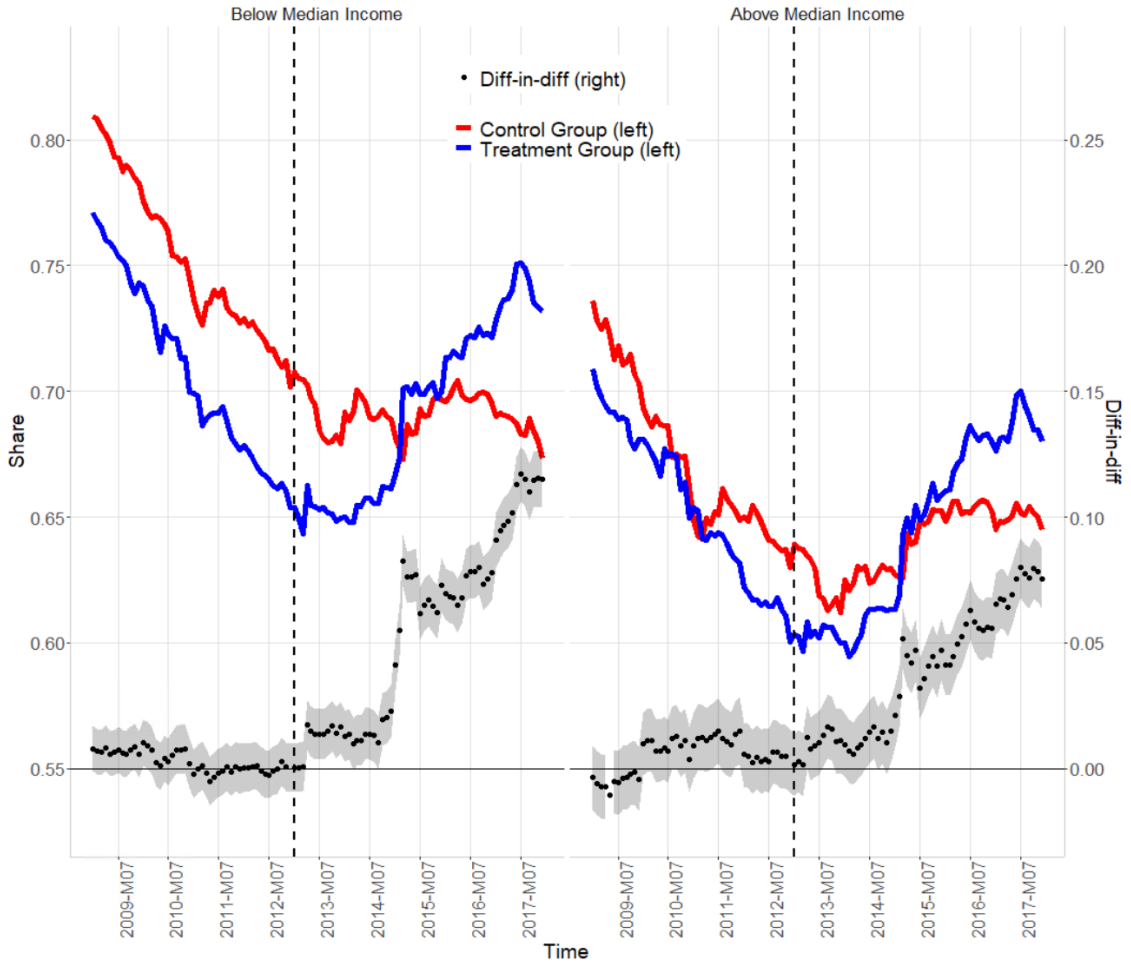


Figure 17 breaks down the effects by income. People above the median income are more likely to use a private provider compared to those below the median income. The right axis shows the difference-in-differences estimates for the two groups. Those below the median experience a 12 percentage point shift when transitioning to the tendering model, while those above the median experience an 8 percentage point shift. This difference is significant at the 5 percent significance level. Similar to Figure 13, there is a slight upward trend for the control group among those with an income above the median, which might partly explain why the effect is somewhat lower. The graph once more confirms that the parallel trend assumption holds for the subgroups.

Figure 17: Probability of Having a Public Provider by Treatment and Control Groups by Income (left axis) and Difference-in-Differences (right axis)



To sum up, elders with higher socioeconomic status in terms of income and education, as well as those in younger age groups, are initially more likely to choose a private provider. In municipalities shifting to a tendering model, these differences become even larger. Individuals with lower socioeconomic status and older individuals are more likely to switch to a public provider when municipalities adopt the tendering model.

In the next section, we will discuss the aggregate effect on market competition.

5.5 Market Competition

The previous subsections highlighted two key outcomes in municipalities adopting the tendering model: a shift in consumer preference toward public providers and a reduction in the number of private firms operating in these markets. Together, these changes contribute to a notable impact on the competition of the eldercare market.

To examine this change in competition, the top graph in Figure 18 presents the evolution of market competition, measured as 1-HHI, for municipalities that retained the approval model (control group) and those that transitioned to the tendering model (treatment group).

Before 2013, both groups experienced a similar upward trend in competition, reflecting the gradual increase in the number of suppliers operating in the municipal eldercare markets. After 2013, however, this trajectory diverged significantly. The control group, continuing with the approval model, maintained its upward trend in competition. Conversely, in municipalities adopting the tendering model, competition started to decline.

To assess the effects of the treatment, we estimate the following difference-in-differences regression at the municipality level:

$$Y_{kt} = \gamma_t + \beta D_k + \delta_t(\text{Time}_t \times D_k) + \epsilon_{kt} \tag{4}$$

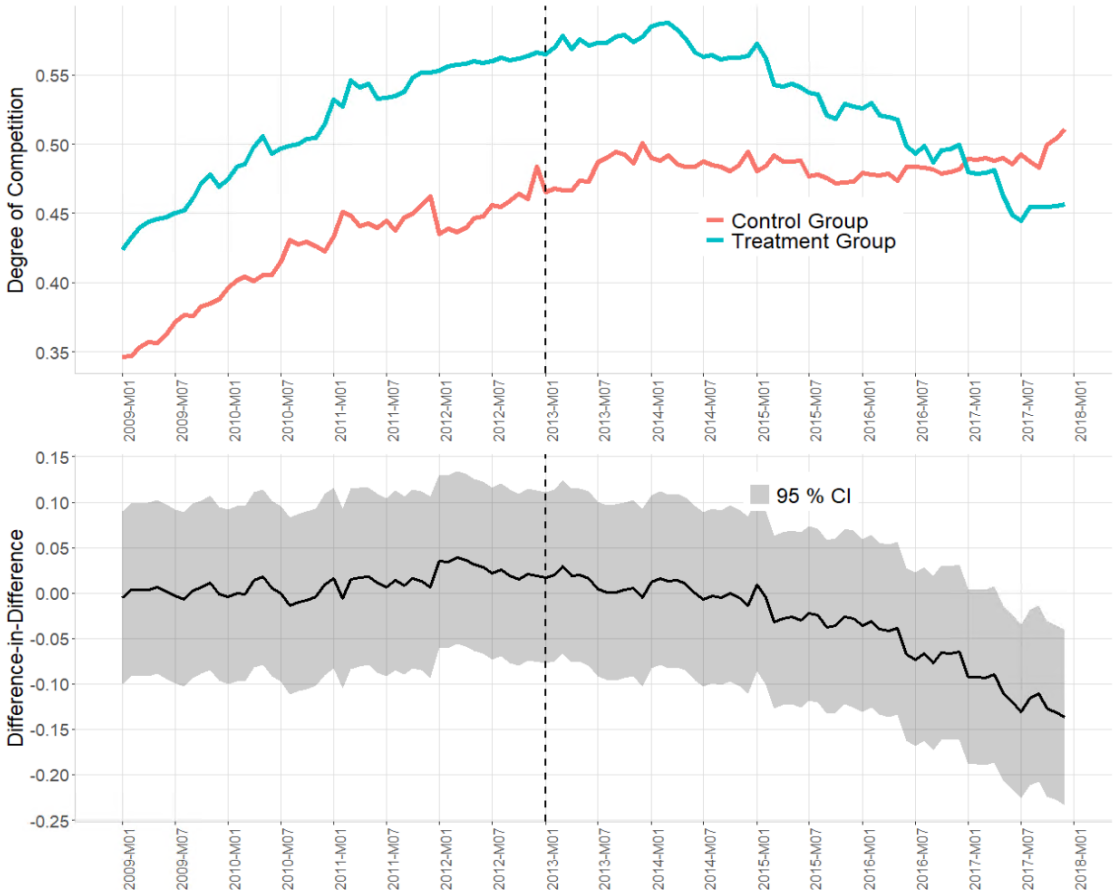
In this equation, t refers to the specific year and month, Y_{kt} represents 1-HHI in municipality k, γ_t captures time fixed effects, δ_t is the difference-in-differences estimate, and ϵ_{kt} is the idiosyncratic error term. Table 6 in the appendix presents the regression results for a simplified version of the model, where the estimation is conducted on a yearly level instead of a monthly level.

The bottom graph in figure 18 shows the difference-in-difference estimates. The graph clearly illustrates that, prior to the reform, both groups followed nearly identical trends, reinforcing the validity of the parallel trend assumption. However, following the reform, the trends begin to diverge. The isolated effect of the reform is that competition for the treatment group is approximately 0.14 units lower than that of the control group by 2017. This reflects an exogenous shift in market competition due to the policy reform.

This shift reflects the tendering model's dual effect on competition: it reduces the number of active private providers, limiting consumer choice, and increases market concentration as

the public sector holds a larger share. In sum, the reform significantly impacts market dynamics by reinforcing the role of public providers while reducing competition among private providers, leading to a more concentrated market structure in municipalities adopting the tendering model.

Figure 18: Market Competition by Treatment and Control Groups (Top) and Difference-in-Differences (Bottom)



6 Conclusion

Quasi-markets can be organized in a variety of ways, especially in terms of regulation, financing, information, and ownership structures, Savas (1987); Foged and Houlberg (2023). There is substantial evidence suggesting that the effects of quasi-markets are highly dependent on how they are structured with respect to these factors. This is largely due to the fact that quasi-markets themselves often experience market failures, such as failure in market formation, preference errors, and preference substitution, Lowery (1998). It can be expected

that different types of quasi-markets may be better suited to address these potential market failures. This study contributes to this knowledge by identifying and comparing the effects of two types of quasi-markets: the approval model and the tendering model. To the best of our knowledge, this study is the first of its kind to causally compare the effects of these two distinct quasi-market types.

The paper explores the dynamics of quasi-markets in the context of eldercare in Denmark, focusing on the contrasting outcomes of two models: the approval model and the tendering model. Using institutional variations across municipalities and a difference-in-differences approach, we provide causal evidence on the impact of these models on market competition, consumer choice, and socioeconomic inequality.

Our findings reveal that the tendering model, while designed to improve efficiency and service quality by selecting high-performing providers, reduces market competition and increases the public provider's market share. This shift results in fewer private providers, leading to fewer private provider options and a higher degree of market concentration, with the public provider holding a larger market share. Additionally, the tendering process may favor larger firms, as they are better equipped to meet the scale and cost-efficiency demands of the bidding process, Warner (2006). Consequently, smaller providers, which are more prevalent under the approval model, are less likely to operate in markets governed by the tendering model.

In contrast, the approval model fosters greater competition by allowing more providers in the market, giving consumers broader options. The analysis also highlights significant socioeconomic disparities. Individuals with lower income, less education, and those in older age groups are more likely to choose public providers, and this tendency is amplified in municipalities adopting the tendering model. Conversely, individuals with higher socioeconomic status are more likely to stick with private providers, even under the tendering model, reflecting differences in how consumers across socioeconomic groups respond to changes in market structure.

Lastly, it is important to note that our analysis examines a transition from the approval model to the tendering model, where consumers move from a larger to a smaller set of providers. This shift has specific implications for firm dynamics and consumer behavior. However, our results do not necessarily predict the effects of a reverse policy shift—from the tendering model to the approval model—where consumers would move from a smaller to a larger set of providers. Such a shift could involve different adjustment dynamics for both

firms and consumers.

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Appendix

Table 4 presents the regression results for equation 2, where the dependent variable is the average number of firms operating in the markets, i.e., the municipalities. The results indicate that none of the difference-in-differences estimates are significant prior to the 2013 reform, supporting the parallel trend assumption. Additionally, after the reform, the difference-in-differences estimates become increasingly significant, suggesting that fewer firms operate in the market over time in municipalities transitioning to the tendering model.

Table 4: Regression Results for the Average Number of Firms in the Markets

Variable	**Coefficient**	**Std. Err.**	***t*-statistic**
Constant	8.12	0.22	36.72
Treatment dummy	2.99	0.33	9.07
Year 2009 dummy	-1.85	0.31	-5.90
Year 2010 dummy	-0.96	0.32	-2.99
Year 2011 dummy	-0.13	0.32	-0.40
Year 2013 dummy	-0.04	0.32	-0.14
Year 2014 dummy	-0.27	0.32	-0.87
Year 2015 dummy	-0.71	0.31	-2.27
Year 2016 dummy	-1.24	0.31	-3.93
Year 2017 dummy	-1.33	0.32	-4.20
Treatment x Year 2009	-0.72	0.47	-1.54
Treatment x Year 2010	-0.67	0.48	-1.41
Treatment x Year 2011	0.37	0.48	0.76
Treatment x Year 2013	-0.21	0.47	-0.44
Treatment x Year 2014	-1.06	0.47	-2.25
Treatment x Year 2015	-3.03	0.47	-6.45
Treatment x Year 2016	-4.45	0.47	-9.51
Treatment x Year 2017	-5.54	0.47	-11.73
Observations		9,338	
R^2		0.10	

Table 5 presents the regression results at the individual level, where the dependent variable indicates whether an elder has a public provider. Prior to the 2013 reform, the difference-in-differences estimates are largely insignificant and close to zero, supporting the parallel trend

assumption. The only exception is the interaction between the treatment and the 2010 year dummy, which is statistically significant. However, the coefficient's negligible magnitude suggests that its significance arises from the large sample size of 11 million observations rather than a violation of the parallel trend assumption. After the reform, the interaction terms become significant and positive, indicating an increasing probability of having a public provider in municipalities transitioning to the tendering model. The regression includes municipality fixed effects, which are not displayed in the table.

Table 5: Regression Results for the Probability of Having a Public Provider

Variable	**Coefficient**	**Std. Err.**	***t*-statistic**
Constant	0.6615	0.0050	130.83
Treatment dummy	-0.2152	0.0048	-44.40
Year 2009 dummy	0.0785	0.0008	102.46
Year 2010 dummy	0.0476	0.0008	60.62
Year 2011 dummy	0.0237	0.0009	-29.25
Year 2013 dummy	-0.0206	0.0008	-25.22
Year 2014 dummy	-0.0246	0.0008	-29.99
Year 2015 dummy	-0.0251	0.0008	-30.83
Year 2016 dummy	-0.0130	0.0008	-15.94
Year 2017 dummy	-0.0222	0.0008	-27.06
Treatment x Year 2009	-0.0001	0.0011	-0.08
Treatment x Year 2010	0.0054	0.0011	4.88
Treatment x Year 2011	0.0020	0.0011	1.79
Treatment x Year 2013	0.0095	0.0011	8.30
Treatment x Year 2014	0.0127	0.0012	11.00
Treatment x Year 2015	0.0538	0.0011	46.83
Treatment x Year 2016	0.0642	0.0011	56.10
Treatment x Year 2017	0.0907	0.0012	77.50
Vocational Education	-0.0608	0.0003	-184.92
Higher Education	-0.0969	0.0005	-200.30
Income	-0.000	0.000	-68.71
Age	0.0025	0.0000	131.10
Male	0.0779	0.0003	252.08
Municipality Fixed Effects	Yes (not shown)		
Observations	11,103,908		
R^2	0.0693		

Table 6 presents the regression results for equation 4, estimated at the municipality level with 1-HHI as the dependent variable. The results show that the difference-in-differences estimates are insignificant and close to zero prior to the 2013 reform, supporting the parallel trend assumption. Following the reform, the difference-in-differences estimates become significant and negative, indicating a decrease in competition in municipalities transitioning to the tendering model.

Table 6: Regression Results for Competition in the Markets

Variable	**Coefficient**	**Std. Err.**	***t*-statistic**
Constant	0.4521	0.0066	68.66
Treatment dummy	0.1077	0.0098	10.99
Year 2009 dummy	-0.0855	0.0094	-9.13
Year 2010 dummy	-0.0384	0.0095	-4.03
Year 2011 dummy	-0.0059	0.0097	-0.62
Year 2013 dummy	0.0275	0.0094	2.93
Year 2014 dummy	0.0345	0.0094	3.68
Year 2015 dummy	0.0285	0.0093	3.06
Year 2016 dummy	0.0279	0.0094	2.97
Year 2017 dummy	0.0402	0.0094	4.28
Treatment x Year 2009	-0.0232	0.0140	-1.66
Treatment x Year 2010	-0.0249	0.0142	-1.76
Treatment x Year 2011	-0.0139	0.0144	-0.96
Treatment x Year 2013	-0.0138	0.0141	-0.99
Treatment x Year 2014	-0.0222	0.0144	-1.58
Treatment x Year 2015	-0.0486	0.0140	-3.47
Treatment x Year 2016	-0.0805	0.0139	-5.78
Treatment x Year 2017	-0.1377	0.0141	-9.78
Observations		9,338	
R^2		0.10	