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QoG THE QUALITY OF GOVERNMENT INSTITUTE
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University of Gothenburg
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Provider Ownership and Service Quality: Evidence from Swedish Residential Care Homes *

Rasmus Broms[†] Carl Dahlström[‡] Marina Nistotskaya[§]

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Abstract

The provision of social services by private providers is widespread in OECD countries, but the jury is still out on whether marketization has improved service quality. This paper seeks to nuance existing debate by examining difference in service quality between different types of private providers. We argue that different forms of private ownership are associated with varying intensity of incentives for profit maximization, ultimately affecting the quality of service provision. Using residential elder care homes in Sweden as our universe of cases, we leverage novel panel data capturing the ownership of the providers that operate nursing homes against a set of indicators pertaining to the facility-level service quality. The results suggest that providers with high-powered incentives to make profit, such as those owned by private equity firms and publicly traded companies, consistently deliver lower-quality care, compared with ordinary private companies and non-profit organizations.

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[†]University of Gothenburg, rasmus.broms@pol.gu.se

[‡]University of Gothenburg, carl.dahlstrom@pol.gu.se

[§]University of Gothenburg, marina.nistotskaya@gu.se

1 Introduction

The quality of complex social services — e.g. elder care, child care or education — is vital for individuals and societies. In almost all OECD countries such services are delivered by public as well as private providers, operating in quasi-markets (Gingrich, 2011). Since social services performance is a central social and political issue, it is a common concern for scholars and practitioners to understand if there are systematic differences in the service quality delivered by different types of organizations and, if so, why this is the case (Amirkhanyan et al., 2018; Broms et al., 2020). So far, most of the literature in the field has dealt with the public-private dichotomy. This is understandable since up to a few decades ago private for-profit organizations had almost no part in social service delivery, especially in the northern European welfare states (Armstrong & Armstrong, 2019; Blix & Jordahl, 2021; Brennan et al., 2012; Busemeyer et al., 2020).[1] Therefore, the marketization of social services was a significant change in the history of the modern welfare state, requiring a systematic examination of its effects. As a contribution to this quest, this paper seeks to nuance existing scholarship by studying differences in service quality between different *types* of private providers.

The pros and cons of marketization have been much discussed in academic and policy circles for many years (Blank, 2000; Brennan et al., 2012; Gilbert et al., 2002). Advocates of marketization usually build on the classic argument that private ownership and competition drive prices down and improve service quality (Shleifer, 1998). Critics point to various deficiencies associated with market provision of social services, such as incomplete markets (quasi-markets) and contracts or low measurably of quality of complex serves (Brown et al., 2016; Gingrich, 2011; Hart et al., 1997). Consequently, most of the literature has focused on the public-private dichotomy, which may come at the expense of overlooking important differences within a broad category of private providers. A failure to recognize that the heterogeneity in performance could be driven by the organizational differences among private organizations may have contributed to the inconclusive results of the empirical literature (Bergman et al., 2016; Broms et al., 2020; Forder & Allan, 2014).

This paper investigates the quality effects of the types of ownership of private providers of social services. Building on Hart et al. (1997) that under contractual incompleteness profit-making incentives

[1] Social service delivery by non-profit organizations has a longer history, see Ansell & Lindvall (2021).

of private service providers push them to sideline quality concerns in the pursuit of cost reduction, we extend this argument by arguing that the strength of profit-maximizing incentives vary between different types of private providers depending on the type of ownership. We theorize that the intensity of profit-maximization incentives is particularly high in private equity ownership, as well as in companies where ownership is organized via shares of stock, which are traded on a stock exchange (publicly traded companies), but lower in companies owned by a relatively small number of shareholders, who do not offer their company shares to the general public and are not backed up by private equity investment (private limited companies). At the same time, due to the non-distribution constraint on residual earnings faced by nonprofits, the quality concerns are unlikely to be overridden by the cost-cutting considerations, therefore, nonprofits shall outperform all private providers of social services on quality. We therefore expect systematic variation in the service quality provided by private organizations, depending on the intensity of their incentives to make profit.

Using residential elder care[2] in Sweden as our universe of cases, we leverage novel panel data capturing the ownership forms of the providers that operate nursing homes, against a set of indicators pertaining to the facility-level quality of service: staff density and education, as well as client satisfaction. Our results reveals strikingly heterogeneous quality performance among private providers of residential elder care. First, non-profit organizations consistently outperform all for-profit organizations. Second, looking closer at the for-profit category, we find that nursing homes owned by private equity firms, as well as those owned by publicly traded companies consistently end up at the lower end of the scale of our service quality indicators, compared to private limited companies. These empirical observations are consistent with the idea that the intensity of profit-maximization incentives affect the quality of social services. High-powered profit incentives seem to increase risks for quality-shading.

2 Literature Review

The literature on the quality effects of different types of social services providers has so far focused on the difference between public and private organizations, and no clear consensus emerged in the

[2]We use the terms residential elder care and nursing homes interchangeably.

light of conflicting empirical evidence. Thus, some studies found private providers be associated with higher service quality (Bergman et al., 2016; Blix & Jordahl, 2021; Castle et al., 2007; Holum, 2018; Stolt et al., 2011), but not others (Dahlström et al., 2018; Forder & Allan, 2014); and the third group found mixed results (Broms et al., 2020; Winblad et al., 2017). However, there has also been a growing interest in the performance of private providers: nonprofits and different types of for-profit organizations. There are two separate strands of literature that inform this paper's ambition to examine the quality effects of the forms of ownership of service providers.

The first scholarly discussion of interest focuses on the variability of quality between different types of for-profit providers. Within this literature, the increased presence of providers linked with private equity investment has generated a scholarly and public debate about the role of private equity firms in the provision of social services in such diverse settings as the U.S., UK, and Sweden (Duhigg, 2007; Garside, 2017; Gupta et al., 2021; Palm, 2008; Plimmer, 2019; RadioSweden, 2011; Winblad et al., 2017). The private equity business model, described in detail in Gompers et al. (2016) and Kaplan & Stromberg (2009), is centered around leveraged buyouts of mature businesses[3] with the goal of selling them at a profit within a relatively short time frame. Private equity ownership is deemed to be associated with exceptionally high-powered incentives to maximize company value, which may be either beneficial or detrimental to service quality. On the one hand, private equity firms focus on improving management practices of target firm and access to credit may boost quality. For example, Bernstein & Sheen (2016) report a positive impact of private equity buyouts in the restaurant industry, as restaurants become cleaner, safer and better maintained. However, the private equity firms focus on cost cutting measures, their relative short-term horizons and weak relationships with target firm stakeholders (Kaplan & Stromberg, 2009) could also adversely affect quality. Eaton et al. (2020) argues that quality deterioration after private equity buyout is more likely in sectors with extensive government subsidy and difficult to fully specify quality, such as the social services sector. Given this theoretical ambiguity, there is a surprising paucity of empirical research on the quality effects of private equity investments in the social services sector. Existing literature is small, limited in time

[3]Leveraged buyout is a type of investment where a target firm is acquired through debt financing (which is placed on the purchased firm's balance sheet), using funds of institutional investors. Unlike venture capital firms that invest in emerging or young companies and do not obtain majority control in the purchased asset, private equity firms invest in mature businesses and obtain majority control, thus making the purchased firm a private asset, free from restrictive public company regulation.

and scope and has yielded mixed results (Gupta et al., 2021; Harrington et al., 2012; Stevenson & Grabowski, 2008; Winblad et al., 2017). Empirical research using high-resolution data from diverse empirical settings and rigorous methods is much needed to adjudicate the arguments about the quality effects of private equity ownership.

The second strand of literature discussing heterogeneity of private service providers is mainly interested in non-profit organizations. This literature presents a rather strong case for the quality advantage of nonprofits, compared to for-profit organizations. The argument is predominantly rooted in Hansmann (1980)'s idea that since nonprofits may not lawfully distribute profits to those in control of the organization (*non-distribution constraint*), they are less likely to behave opportunistically to sacrifice quality to profit. Therefore, nonprofits are more likely than for-profits to deliver higher service quality where quality is particularly difficult to fully specify: in the domain of complex services, such as education or elder care. Another potential source of quality advantage by nonprofits lies in the alignment of the preferences of principals and agents derived from the mission-oriented nature of nonprofits (Besley & Ghatak, 2005). Employees working in nonprofits are often driven by the organizational mission and values to a greater extent than those working for for-profit and even public organizations, which has positive consequences for service quality.

Most of studies that have examined the impact of the provider nonprofit status on quality of care in nursing homes support what might be called the quality advantage hypothesis (Amirkhanyan et al., 2008; Ben-Ner et al., 2012; Chou, 2002; Grabowski et al., 2013; Harrington et al., 2001; O'Neill et al., 2003), but see Amirkhanyan et al. (2018) for mixed evidence. This empirical consensus should, however, be treated with a pinch of salt as, similar to the literature on PE investments, the overwhelming majority of these studies are based on cross-sectional data from the U.S., often focusing on regional markets, which limits the generalizability of their findings.

We aim to contribute to these literatures by arguing that there is a common mechanism for explaining the service quality by all private providers, ranging from private equity-owned to nonprofits. This mechanism is the *intensity* of incentives to maximize profit: such incentives are particularly high in private equity-owned and publicly traded companies compared to private limited companies, and particularly low in nonprofits.

3 Theory

The argument about the quality-improving effects of market provision of social services rests on the idea that private owners are the residual claimants of any profit, which incentivizes them to "innovate and become efficient" (Shleifer, 1998, p.135-137). In other words, profit-maximization — the primary incentive of entrepreneurs — pushes private providers to improve quality and reduce costs. However, a powerful counter argument was laid down by the cost-quality trade-off framework (Hart et al., 1997). Having started from the observation that "the quality of service the government wants often cannot be fully specified" in a contract, Hart and colleagues formally showed that contractual incompleteness enables "significant opportunities for cost reduction that do not violate the contracts, but... can substantially reduce quality"(Hart et al., 1997, p. 1128,1152). In other words, because service quality cannot be unambiguously described in a contract and comprehensively evaluated upon delivery, private providers are more likely to focus too much on the pursuit of cost reduction, sidelining the quality (Brown et al., 2016; Hart et al., 1997). Governments at all levels buy goods and services "whose attributes and performance requirements are hard to define"(Brown et al., 2018, p. 739). Quality of social services, such as elder care, is challenging to specify for at least two reasons. First, it has a large share of intangible aspects — for example, relational features — that are difficult to fully specify and monitor. Second, the sheer number of relevant aspects of high quality care, makes it almost impossible to put everything into the contract, even when it is viable in principle. Government procurement of elder care on the market therefore inevitably leaves the buyer with an incomplete contract and the provider with ample opportunities for quality-shading.

The cost-quality trade-off framework (Hart et al., 1997) suggests that incentives to engage in cost reduction at the expense of service quality is strong for *all* for-profit contractors. In contrast, we argue that the strength of quality-shading incentives is not equal for all private providers, but depends on the form of their ownership. While it is up for discussion how many forms of private ownership are out there and how exactly to delimit them, four types of organizations usually operate on the elder care markets: private equity (thereafter *PE*), publicly traded (thereafter *PT*), private limited firms[4] (thereafter *PL*) and non-profit organizations (thereafter *NP*). Our basic assumption is that

[4]This form of ownership can take on different legal forms, such as sole proprietorships, ordinary partnerships, companies.

profit-maximization incentives have at least two dimensions: the preferred margin of profit and the preferred time when profit occurs. Each of the ownership forms can be roughly categorized on these dimensions. For example, if PE ownership is associated high margins of profit at a short time and PTs with short-term profits, then PLs may prefer profit that is realized not immediately, but over a long period of time. Based on this, we argue that PE and PT providers have a particularly high intensity of profit-maximizing and, consequently, quality-shading incentives. On the other hand, PL providers have a systematically lower intensity of quality-shading incentives than the previous two types of ownership. Furthermore, because of the non-distribution constraint (Hansmann, 1980), NP providers are situated at the very bottom of the hierarchy of intensity of quality-shading incentives, last of all private entities. Below, we discuss this argument in more detail for each of the four types of ownership.

PE firms typically acquire full control of a mature business with the single aim to increase the asset's market value and sell at profit (Barber & Goold, 2007; Jensen, 1989; Kaplan & Stromberg, 2009). The "buy to sell" business philosophy of PEs, which is behind this form of ownership, defines their underlying incentive — to maximally increase the asset's value between the time of the buyout and an exit. PE firms apply a range of financial, governance and operational engineering tools[5], most of which are aimed at cost control. Because PEs operate with borrowed moneys[6] on a relatively short terms — typically ten years (Kaplan & Stromberg, 2009, p. 123) — the seek to exit their investment within this period. Thus, PE ownership is associated with aggressive profit-maximization in terms of both the size and pace of profit realization, which in the context of the provision of complex social services, is likely to give rise to quality-shading incentives (Eaton et al., 2020; Hart et al., 1997).

Publicly traded (PT) companies have a similar profit-maximization profile, but for different reasons. PTs have typically a diverse ownership structure, with institutional investors often being the largest shareholders. Shareholders evaluate the efficiency of their investments, based on the returns on their investment, resulting in capital movements on the stock market to the most profitable companies. While capital movements from less to more profitable companies is a normal feature of

[5]These tools include, but not limited to: aggressive use of debt, which provides financing and tax advantages; changes to the compensation, benefits and composition of the management team of the acquired asset; organizational restructuring, including lay-offs; adopting new technology, including information technology; re-branding; expanding to new markets (Barber & Goold, 2007; Kaplan & Stromberg, 2009).

[6]PEs raise capital from large institutional investors, such as pension funds, sovereign wealth funds and endowments.

well-functioning financial markets, a trend of increasingly shorter time-horizons of investors and their demand for quicker return on investment have been observed over recent decades (Sampson & Shi, 2020).[7]

This short-termism is associated with a change in the practice of financial reporting by PTs from annual to quarterly that saw light in the 1990s. Statements about revenue and spending — quarterly earning reports — have very large influence on share prices,[8] thereby incentivizing PTs' managers to pursue strategies of short-term profit-maximization. Daniel Vasella, former chairman and CEO of Novartis AG, described these short-term pressures and their implications for firm's behavior (Vasella, 2002): "Once you get under the domination of making the quarter — even unwittingly — you start to compromise in the gray areas of your business, that wide swath of terrain between the top and bottom lines. Perhaps you'll begin to sacrifice things (such as funding a promising research-and-development project, incremental improvements to your products, customer service, employee training, expansion into new markets, and yes, community outreach) that are important and that may be vital for your company over the long term". Thus, bowing to the pressures of *quarterly capitalism* (Barton, 2011),[9] PTs are left with very little to invest in productive capabilities or quality-improvements.

When it comes to private limited firms (PL), the intensity of their incentives for profit maximization is, arguably, the lowest among all for-profit companies. Since such companies are subject neither to "buy to sell" PE business philosophy, nor to the pressures of quarterly capitalism, their profit-maximization profile are likely to be different to those of PE and PT. Although profit is usually considered to be the main motivation for business creation, many small business owners are motivated to start a business on the basis of non-financial factors, such as personal or lifestyle considerations (Walker & Brown, 2004). As a typical PL business is a small business[10], it is likely that for many PL owners profit-maximization is not the main driver. Even if we assume that the PL owner desires as high profit

[7]Marc Andreessen, a prominent Silicon Valley venture capitalists, describes the situation as public companies being pressured by their activist shareholders and investors "to give back huge amounts of cash instead of investing it in their business." (Primack, 2015). Between 2003 and 2012, PTs from the SP 500 index used more than 90% of their earnings either to buyback their own shares from the open market or pay dividends (Lazonick, 2014, p. 46).

[8]For example, on July 23, 2015 Amazon released the second quarter's earnings report that showed that the company performed better than the Wall Street's estimates. Within a matter of hours Amazon's shares increased in value by a staggering 18% (Pramuk, 2015).

[9]Dominic Barton used the term long before it was made popular by Hillary Clinton in her speech at NYU's Stern Business School on July 24, 2015.

[10]For example, as of September 1, 2021 47% of all private limited businesses in Sweden were single-owner firms (Statistics Sweden, 2021).

margins as PE or PT owners, her expectations in terms of the timing of profit realization are likely to be different. A traditional owner runs the business as a longer-term operation and, therefore, may prefer lower, but more stable profits, occurring over a long period of time.

Furthermore, PL companies are more likely to care about quality more than other for-profits because their usually small size puts them in a greater financial jeopardy in case of a loss of an important customer. For example, on a quasi-market of public service provision like Sweden, the financial health of many PL providers depends on whether they manage to satisfy the quality requirements of the purchasing public authority. Similarly, within, for example, a voucher system, where customers respond to the deterioration in quality by "voting with their feet", PLs bear a higher financial risk than PEs or PTs. Taken these reasons together, we argue that the intensity of quality-shading incentives is the lowest in PLs, compared to PEs and PTs.

Finally, nonprofits are the least aggressive profit-maximizers of all private owners. While both for-profit and non-profit organizations may — and do in practice — lawfully earn profits, there is also a fundamental difference between the two as to the freedom they have with regard to the utilization of profit. While the former may, and routinely do, forward profits to the company's owners/shareholders, the latter is barred from distributing any profits it earns to people who exercise control over the organization, but have to reinvest it into activities furthering the organization's mission (Hansmann, 2000, p.228). As a result of such a nondistribution constraint on residual earnings, nonprofits lack actors who have a share in both control of the organization and its residual earnings. Consequently, as predicted by Hansmann (2000, 1980) and formally shown by Glaeser & Shleifer (2001), founders/directors/trustees of nonprofits have weak incentives to maximize profits and to engage in *ex post* expropriations of customers, such as to decrease the quality of the products/services after the purchasing agreement is concluded.

Furthermore, unlike for-profits, nonprofits are entities that are neither formed nor organized in order to generate profit, but are "dedicated to pursuing mission-oriented goals through the collective actions of citizens" (Irvin, Renee, 2014). Such organizations are more likely to attract individuals who value their organizational missions and therefore have an extra source of motivation — intrinsic motivation — to work hard to achieve organizational goals (Park & Word, 2012). In the language of principal-

agent theory, there is a greater alignment of the preferences between founders/directors of nonprofits and their rank-and-file personnel than in for-profit organizations. In the parlance of organizational studies, nonprofits may have higher mission valences, generating higher staff motivation (Rainey & Steinbauer, 1999) and its greater cohesion (Boyd & Nowell, 2017; Kim, 2004). For these reasons, a nonprofit that, for example, posits good quality care to elder people as its organizational goal, is more likely to better attend to less tangible, relational features of care, than to cut down on care quality in order to achieve other goals than a for-profit company.

Based on these considerations, our hypotheses are:

H1: Non-profit providers of elder care perform better on quality-related outcomes than for-profit private providers.

H2: PL providers perform better on quality-related outcomes than PE/PT providers.

4 The Case: Residential Care Homes in Sweden

For most of the post-war period, Sweden has been the model case of a social democratic welfare state, in which social services as well as education were almost exclusively funded and provided by the state (Esping-Andersen, 1990; Gingrich, 2011). Although still mostly publicly financed, the provision of social services and education became open to non-public organizations following a series of reforms in the 1990s. As of today, quasi-markets have been established in central welfare sub-sectors like primary and secondary education, health care, and elder care (Blix & Jordahl, 2021; Blomqvist, 2004). As Svallfors & Tyllström (2018) note, since breaking with the monopoly of public service provision, marketization of social services and education in Sweden has gone faster, and reached further, than in comparable countries (see also Sivesind 2017). Compared to neighboring Norway, for example, elder care provided by for-profit organizations are about three times more common in Sweden (Ågotnes et al., 2020). However, the majority of elder care is still provided by public facilities, which is a sharp contrast to, for example, the United States where public nursing homes care for less than ten percent of all residents in such facilities (Amirkhanyan, 2008). As in other

Scandinavian countries, non-profit sector plays a small role in elder care in Sweden (Blomqvist & Winblad, 2019, p. 513).

According to the Swedish Social Services Act (*Socialtjänstlagen* 2001:453), elder care is the responsibility of Sweden's 290 municipalities, and has been so since a comprehensive reform in 1992 (in Swedish: *Ädelreformen*) (prop. 1990/91:14; SOU 2017:21) that significantly extended the social responsibilities of municipalities. Today, elder care accounts for about half of municipalities' social service budgets (Socialstyrelsen, 2020). The service is provided either in the recipient's home (*hemtjänst*) or in residential care homes (*särskilt boende*). The budget for residential care homes make up about 60 percent of the total budget for municipal elder care. In this paper, we use residential elder care homes as our universe of cases.

Residential care homes provide service and care for elder people who live in the municipality and need more care than can be provided through assistance in their own homes. Their needs are individually assessed by a designated municipal officer (*biståndshandläggare*) and only those deemed in need of residential care are granted access to the residential care service. In 2019, before the COVID-19 crisis, residential care homes across the country housed 108,500 individuals at some time during the year (Socialstyrelsen, 2020).

Once access is granted, costs for service and care are heavily subsidised from municipal budget. The so-called "care fee" is means-tested, but the maximum fee remains at a very low level; in 2021 the cap is 2,139 SEK per month (about 250 USD a month, corresponding to half of the national average in rent cost for a studio apartment), independent of municipality or ownership status of the nursing home. Individuals admitted to care homes thus only pay a small fraction of the actual costs for their care (Ågotnes et al., 2020). In addition to this fee residents pay a regulated rent and for their meals.

In line with the generally extensive level of autonomy enjoyed by Swedish municipalities, the Swedish Local Government Act (*Kommunallagen* 1991:900) and the Swedish Social Services Act (*Socialtjänstlagen* 2001:453) allow municipalities to provide residential elder care in-house — i.e. staffing and managing care homes by themselves — or to buy it on the market. Swedish municipalities may contract out residential elder care in two different ways: either through direct procurement, according to the Public Procurement Act (*Lagen om offentlig upphandling* 2016:1145) or by way of a publicly funded

choice system, according to the Free Choice Act (*Lagen om valfrihet* 2008:962). Under the former regime, which is by far the most common, municipalities invite private companies to submit offers in an open bidding process and then decide who gets the contract based on the specified criteria (usually either price exclusively or price and quality combined). Under the choice system, the municipality sets the price and specifies some quality requirements, and the municipal residents choose a provider, according to their preferences, from an authorized list of providers that have met the municipality's criteria (Erlandsson et al., 2013). Even though the Free Choice Act has been in force since 2009, in 2019 only 22 out of 290 municipalities, most of which located around Stockholm, utilized it for the provision of residential elder care.[11]

Nationally, the ratio of care home residents living in publicly-funded but privately-run facilities is about one in five (Socialstyrelsen, 2020). Furthermore, private organizations delivering residential care services are unevenly distributed across municipalities and regions (Jordahl & Öhrvall, 2013). Private organizations operate in about a third of the municipalities and their share of the local market varies from zero, often in sparsely populated and rural municipalities, to a majority, often in the municipalities of the country's metropolitan areas (Broms et al., 2020).

The group of private organizations that operate the Swedish residential care facilities is heterogeneous. First distinction can be made between for-profits and nonprofits.

a. **NP** (nonprofits) are the smallest group of providers, and their presence is geographically concentrated with 20% of residential care homes in Stockholm and 12% in Gothenburg being run by nonprofits (SOU2017:21, 2017). Although many of these organizations operate one or a few facilities, a number of larger nonprofits operate multiple facilities. Nonprofits most often take on such legal forms as foundations or cooperatives with a strong mission, identity and values. For example, *Bräcke Diakoni* is a foundation started in 1923 with the mission of achieving a more benevolent society. Another example is *Stora Sköndal*, which is a relatively large nonprofit, whose aim is to enable people to grow and develop, based on their unique conditions. It provides a range of social services, including residential elder care in and around Stockholm.

[11] The choice system is more common for the home care (service is provided in the individual home where the client is living). By 2019 it was adopted by 159 municipalities (SKR, 2019; Winblad et al., 2017).

The for-profit category, dominating the market (Ågotnes et al., 2020; Erlandsson et al., 2013), contains ample variation within, and can be classified into three groups:

b. **PL** (private limited) ownership ranges from sole proprietorships, partnerships or limited companies, running one or a few facilities, to larger entities like Norwegian-owned *Norlandia* and Danish-owned *Förenade Care*, two of relatively few foreign actors on the market.

b. **PE** (private equity) is a type of ownership that largely disappeared from the Swedish residential elder care market in a wave of initial public offerings (IPOs) during the 2010s. Before that, it was a substantial category, dominated by a handful of companies —*Attendo*, *Humana*, and *Vardaga* (previously *Carema Care*) — that controlled a large share of the private residential elder care market (Ågotnes et al., 2020).

b. **PT** (publicly traded) ownership consists of the former PE-owned entities went public, alongside the noted Swedish investment company *Investor*, which for a long period was a majority shareholder in one of the largest providers — *Aleris*.[12]

5 Data

To obtain a viable sample of Swedish residential elder care facilities and information about service quality in these facilities, we rely on data from two interconnected surveys, carried out by the Swedish National Board of Health and Welfare (*Socialstyrelsen*). Our primary source is the facility survey (*Enhetsundersökningen*), which documents characteristics of individual facilities, such as size, profile,[13] public/private ownership, as well as a number of quality-related attributes, particularly pertaining to staffing matters. Aided by the municipal authorities, this survey is sent out to all residential care homes in the country on an annual basis, except for the year 2013.[14] As the facility survey was interrupted by the COVID-19 pandemic in 2020, the resulting dataset spans for seven years from 2012

[12] Aleris exited the market in 2019 by selling its facilities to Vardaga.

[13] For example, general care, short-term care or care for elderly with dementia.

[14] Due to this gap and because of the change in the timing of surveying (from the fall to the spring) in 2014, we treat the 2012 wave as 2013.

to 2019.[15] The second data source is a survey that measures residents satisfaction with services at their facilities *Vad Tycker Äldre om Äldreomsorgen?*, available from 2014 onwards. We employ an item capturing the overall level of satisfaction. The resulting dataset consists of 14,613 observations of 2,641 distinct facilities for seven years between 2012 and 2019 (mean coverage is 5.5 years).

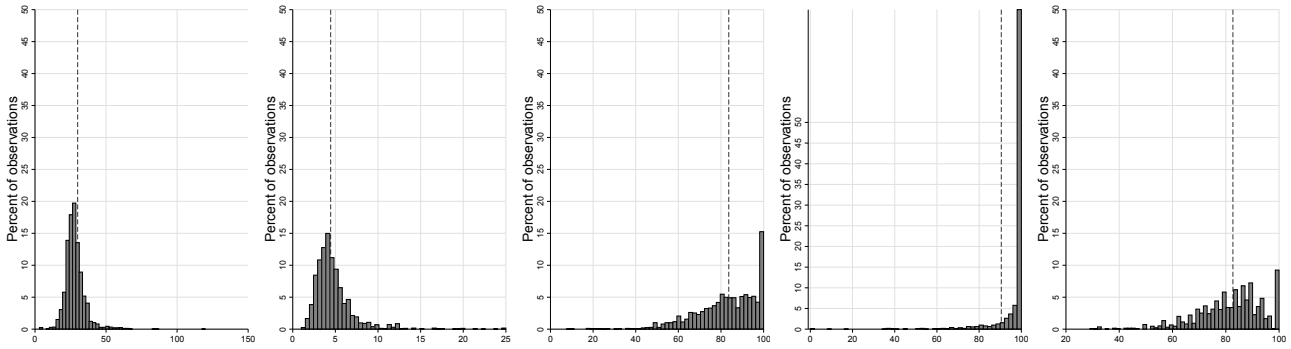
To ensure comparability between surveys and years, we conducted extensive quality control[16], and created a numeric cross-year identifier for each facility.

5.1 Measuring Service Quality

Given the difficulties with which one may observe "true" quality in complex social services, we employ several quality indicators as an effort to triangulate, informed by Donabedian's input-process-outcome framework (for more detail see Broms et al. 2020). We use five variables: four from the facility survey and one from the residents survey. The first three, capturing input-related factors, are: a) *Staff density*, b) *Nurse density*, and c) *Staff education*. The focus on staffing is rationalized by existing consensus that there is "a proven association between higher total staffing levels (especially licensed staff) and improved quality of care" (Bostick et al., 2006, p.366). For process-related quality indicators, we employ d) share of residents with an updated action plan *Updated plan*, with data from the facility survey. The final measure is a question from the user survey about residents general e) *Satisfaction* with their care, capturing output-quality. Figure 1 depicts the distribution of these variables.

[15] Although *Socialstyrelsen* maintains that the annual surveys are largely comparable starting with the 2012 wave, a number of facilities in 2014 offer only short-term care — something that is not observed in the surveys before or after. To avoid unbalancing the sample, such facilities are excluded. Although in the 2012 data there are no facilities that are reported to offer only short-term care, a number of the facilities that are identified as only-short-term for 2014 is present in the 2012 data as well. Due to the likelihood that they actually offer only short-term, these observations are also excluded for 2012.

[16] For example, we took great care to distinguish "unique" facilities from sub-divisions of a single operator and sometimes the opposite, clusters of facilities listed as one.



(a) Staff density (b) Nurse density (c) Staff Education (d) Updated Plan (e) Satisfaction

Figure 1: Distribution of Service Quality Indicators

Note: Distributions are from the full sample of privately-run facilities. Dashed line indicates mean value.

5.2 Measuring Provider Ownership

To capture private providers' ownership status, we matched any facility coded as private in the facility survey at any time point with information from several sources.[17] First, using standardized organization numbers,[18] we identified non-profit facilities[19]. Second, the business registry contains an indicator for PT companies, which we used to measure this category. Finally, to identify PE ownership we utilized the *Capital IQ* database, by replicating a search strategy by Strömberg (2008) and enlisting the *Capital IQ*'s customer service help. The residual category of private provider make up the final group of PL ownership.

Although the bulk of this classification was automatic, we manually cross-checked observations with missing ownership information for a given year, as well as observations with deviating information on ownership in the facility survey and the Business Register data.[20] Table A1 of the Appendix reports a full list of the privately-owned operators in the sample.

The overwhelming majority of care homes (N = 11,956 observations; n = 2,205 facilities) are run

[17]The matching was carried out using standardized workplace codes (CFAR), manually collected using the *Retriever* business database and with the help of the Business Register.

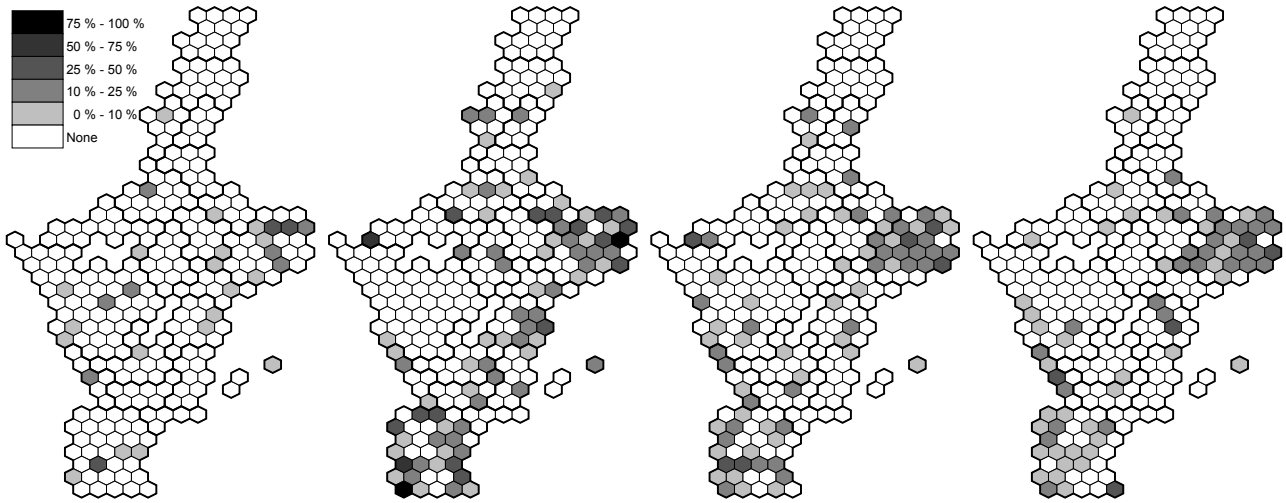
[18]First digit(s) 7, 8, or 25.

[19]Either the organization directly running the facility or its registered parent company

[20]Along with a number of apparent miscategorizations in either source, such deviations mainly stem from the fact that the facility survey is fielded in the spring time (except for 2012), while the annual records in the Business Register are reported for the month of November.

by the municipalities. This makes for a 82% share, lining up with the previously reported data from Socialstyrelsen (2020). The rest is operated by privately-owned providers, including for-profit (N = 2,283; n = 470) and non-profit (N = 374; n = 77) organizations. Among the facilities run by for-profit providers, PL-owned (N = 938; n = 227) slightly outnumber those owned by PE firms (N = 703; n = 237) and PT companies (N = 642; n = 230).

Figure 2 underscores, the previously noted (Broms et al., 2020; Jordahl & Öhrvall, 2013), visibly uneven spatial distribution of private facilities across the country. While private facilities constitute the majority (56%) of care homes in Stockholm county — the country's most populous, they make up around a third (Uppsala, Östergötland, Gotland) or a quarter (Skåne, Halland) of all care homes in several other densely populated counties.



(a) NP (b) PL (c) PE (d) PT

Figure 2: Geographic distribution of facilities, by provider ownership

Note: Each hexagon represents one of Sweden's 290 municipalities. Data from 2012-2019.

6 Model and Estimation Strategy

The structure and nature of our data present both opportunities and challenges for the task of properly estimating the hypothesized links between ownership type and service quality. On the one hand, a sample approaching the true population over a seven year period enables an empirically comprehensive analysis, poised to generate generalizable claims for the realm of modern Swedish elder care.

On the other hand, non-random spatial (potentially, also along other factors) distribution of the facilities means that there is a high likelihood of selection and omitted variable bias, which needs to be addressed. The utility of the most commonly used approaches to remedy such biases, such as facility-level fixed effects (FE), is limited here because the data contains only limited intra-facility variation in the treatments. There are only 18 changes in the ownership status involving non-profit and for-profit providers, presenting 3.4% of facilities that undergone ownership change, relevant for H1. Variation is slightly larger in data for H2: there are 67 transitions from PE or PT to PL ownership, constituting 14.3% of facilities that undergone ownership change. Therefore, although presenting the facility-FE results below, the main analyses will account for potentially unobserved confounders by including municipal- and year-fixed effects and a number of time-varying covariates at the facility and municipality levels.

Our analysis departs from a pooled OLS model,

$$\text{Service Quality}_{i,m,t} = \beta_0 + \beta_1 \text{Provider Ownership}_{i,t} + \lambda_{i,t} + \theta_{m,t-1} + \eta_m + \gamma_t + \epsilon_{i,t}, \qquad (1)$$

which separately estimates the five measures of service quality in facility$_i$ for year $_t$, as a function of two treatments: not-profit (H1) and PL ownership (H2). Municipal- and year-fixed effects are denoted by (η_m) and (γ_t). Time-varying facility-level covariates ($\lambda_{i,t}$) are dummies for the facility's profile[21] and the (log) number of beds. Time-varying municipal-level covariates ($\theta_{m,t-1}$) are median income, (log) population size, an interaction term between the two, and the share of residents older than 65 and 80 years, measured at t-1,[22] to account for socioeconomic and demographic pressures. Standard errors ($\epsilon_{i,t}$) are clustered by facility.

Table 1 reports the summary statistics for the variables used in the analyses testing the respective hypotheses.

[21] Considering the potentially unreliable information regarding which facilities actually offer short-term care (see footnote 15), we assign all facilities that are recorded as offering short-term care for 2014 *if* said facility has as many or more spaces in other years as in 2014. The logic behind this rule is that it is likely that the unit registered in the survey still contains short-term operations. Conversely, if the unit has fewer spaces in other years, we assume that the short-term operation really has been purged from the survey.

[22] Because with the exception of 2012, the facility survey information is collected in the first half of the year, but municipal-level data comes from the end of year, municipal data from t-1 is more appropriate.

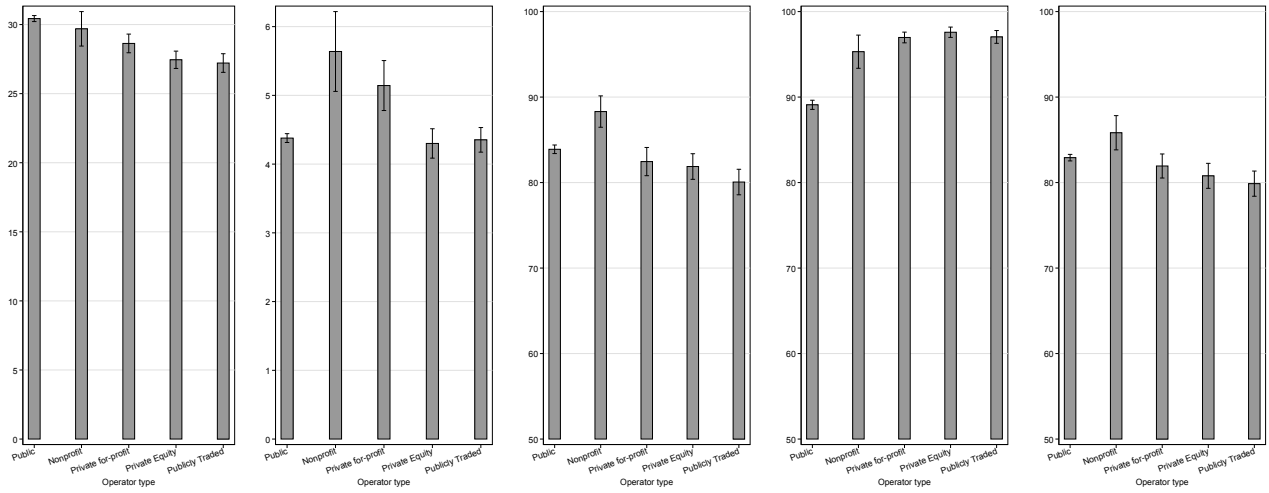
Table 1: Summary statistics

	Sample H1: Nonprofits vs non-profits					Sample H2: PL vs PE/PT				
	Obs	Mean	Std.Dev.	Min	Max	Obs	Mean	Std.Dev.	Min	Max
Operator category										
Non-profit	2657	0.14	0.35	0.0	1.0					
PL						2283	0.41	0.49	0.0	1.0
Outcomes										
Ratio Staff:Residents	2453	28.13	7.18	3.1	119.8	2104	27.87	6.91	3.1	83.3
Ratio Nurses:Residents	2343	4.80	2.46	1.0	25.0	2019	4.66	2.38	1.0	25.0
Share of Staff w/ Appropriate Education	2486	82.54	14.52	7.5	100.0	2136	81.60	14.58	7.5	100.0
Updated action Plan	2534	96.92	8.81	0.0	100.0	2177	97.18	8.03	0.0	100.0
Resident Satisfaction	1947	81.61	12.33	29.0	100.0	1675	80.93	12.49	29.0	100.0
Facility-Level Controls										
General care	2558	0.76	0.43	0.0	1.0	2196	0.76	0.43	0.0	1.0
Dementia care	2558	0.74	0.44	0.0	1.0	2196	0.75	0.43	0.0	1.0
Service flats	2558	0.05	0.21	0.0	1.0	2196	0.04	0.21	0.0	1.0
Short-term accommodation	2657	0.21	0.41	0.0	1.0	2283	0.22	0.42	0.0	1.0
Spaces	2556	47.37	26.16	2.0	208.0	2198	46.91	23.63	6.0	208.0
logspaces	2556	3.71	0.58	0.7	5.3	2198	3.72	0.53	1.8	5.3
Municipal-Level Controls										
Population	2657	235831.96	316488.50	6694.0	962154.0	2283	201671.48	288584.81	6694.0	962154.0
log(Population)	2657	11.56	1.27	8.8	13.8	2283	11.43	1.22	8.8	13.8
Median income	2657	261.04	32.61	183.0	353.5	2283	259.40	32.18	183.0	353.5
Share population 80+	2657	4.82	1.10	2.5	9.0	2283	4.86	1.12	2.5	9.0
Share population 65+	2657	18.56	3.77	12.5	33.4	2283	18.80	3.82	12.5	33.4

7 Results

Figure 3 depicts bivariate relationships between provider ownership and service quality, including public ownership to aid the interpretation of the results pertaining to private providers. Thus, if all types of private providers outperform public ones, the implications would be different than if public facilities consistently fare better than private ones. The former case presents marketization as a positive development for service quality, while the latter — the opposite. Both outcomes would, however, make our more nuanced argument about the difference between private providers less important. However, as figure 3 shows that there are noticeable and frequently statistically significant differences between different private providers. First to note, facilities run by PE/PT companies are near-consistently in the lowest end of the quality continuum. Second, nonprofits consistently score the highest on quality among all private providers, and also higher than the public providers for all measures but staff density. Public facilities are generally found between the private organizations with the highest and the lowest incentives for profit-maximization. The one aspect of quality performance bucking this pattern is the updated action plan indicator, on which PE and PT operators fare

best, public facilities worst, and nonprofits in-between.



(a) Staff density (b) Nurse density (c) Staff education (d) Action plan (e) Satisfaction

Figure 3: Provider Ownership and Service Quality: Bivariate Relations

Note: Point estimates are from bivariate regressions. Capped lines indicate 95% confidence bands from standard errors clustered by facility.

Bivariate analysis provides initial support to H1 and we proceed to its formal testing. Table 2 reports the estimated differences for the five quality indicators between non-profit and for-profit (reference category) facilities. Results for both the input and outcome indicators indicate a clear advantage of nonprofits, which are statistically significant across the board. Contrastingly, the results for the process-related indicator show significant advantage of for-profits. Further, the size of the coefficients indicate that the quality differences associated with the non/for profit distinction are substantive. In terms of relative variance, the difference between the two corresponds to nearly half of a standard deviations for staff education, around three-tenths for staff density and resident satisfaction, and one-fifth for nurse density and updated action plan.

Table 2: Non-profit vs. for-profit Ownership and Service Quality: Main Analysis

	Staff density *input*	Nurse density *input*	Staff education *input*	Action plan *process*	Satisfaction *outcome*
	(1)	(2)	(3)	(4)	(5)
Non-profit	2.17***	0.55*	6.55***	-1.83*	3.60**
	(0.64)	(0.24)	(1.19)	(0.81)	(1.26)
Municipal FEs	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes
R^2	0.21	0.36	0.24	0.13	0.21
N (Observations)	2453	2337	2486	2518	1870
n (Facilities)	513	512	518	518	443

Note: Reference category is for-profit ownership. †p<0.10 *p<0.05 **p<0.01 ***p<0.001. Standard errors, in parentheses, are clustered at the facility level. All regressions include time-varying municipals level covariates and year-fixed effects.

Next, we test H2 that facilities run by PLs have better service quality that those run by PE/PTs. This analysis also garners salient contrasts. Table 3 reports that input quality in PL-operated facilities is statistically significantly higher than in facilities run by PE/PT. The differences are substantively meaningful with the magnitude hovering around one-fifth of a standard deviation on each dependent variable. The coefficients for the process and outcome indicators are statistically not significant, but are signed as in the H1 analysis: negatively for the process quality indicator and positively for the overall satisfaction with care.

Table 3: PL vs PE/PT Ownership and Service Quality: Main Analysis

	Staff density *input*	Nurse density *input*	Staff education *input*	Action plan *process*	Satisfaction *outcome*
	(1)	(2)	(3)	(4)	(5)
PL	1.46**	0.47**	2.65**	-0.43	1.39
	(0.45)	(0.17)	(0.99)	(0.47)	(0.92)
Municipal FEs	Yes	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes	Yes
R^2	0.22	0.34	0.25	0.11	0.21
N (Observations)	2104	2014	2136	2163	1607
n (Facilities)	455	454	460	460	390

Note: Reference category is PE/PT ownership. †p<0.10 *p<0.05 **p<0.01 ***p<0.001. Standard errors, in parentheses, are clustered at the facility level. All regressions include time-varying municipal level covariates and year-fixed effects.

Recognizing the risk of the distortion effect of omitted variable bias on the estimates, we re-run the analysis with the inclusion of facility-level fixed effects. Given the previously discussed limited amount of within-facility variation in the treatment variables, our discussion focuses on the difference in the ownership type within the for-profit group of providers (H2), while the results for H1 can be found in the appendix (Table A2). The results reported in Table 4 suggest a significant quality-advantage of PL providers for staff density and staff education. Notably, the effect sizes for these staffing variables are larger than in the main results (Table 3), employing fixed effects at the municipal level.[23]

Table 4: PL vs PE/PT Ownership and Service Quality: facility-level fixed effects

	Staff density *input*	Nurse density *input*	Staff education *input*	Action plan *process*	Satisfaction *output*
	(1)	(2)	(3)	(4)	(5)
PL	2.40**	0.14	4.08*	1.32	1.24
	(0.76)	(0.20)	(1.66)	(0.83)	(2.31)
N (Observations)	2104	2014	2136	2163	1607
n (Facilities)	455	454	460	460	390

Note: Reference category in PE/PT ownership. †p<0.10 *p<0.05 **p<0.01 ***p<0.001. Standard errors, in parentheses, are clustered at the facility level. All regressions include time-varying facility level covariates and year fixed effects.

To further check the veracity of the results, we conducted a number of robustness and sensitivity checks, by employing different estimation techniques and altering the sample in substantively relevant ways. We begin by expanding on the set of available modeling strategies and estimating techniques. Specifically, in order to more explicitly deal with the non-random distribution of facilities by ownership type (see figure 2), and the potential selection bias such non-randomness may incur, we employ inverse probability weighing (IPWRA), with regression adjustment in order to make the model double robust to mis-specification in either modeling treatment or outcome. While details of this analysis are available in section D of the appendix, figure 4 reports its results, as average treatment effects. These estimates are presented alongside the original coefficients from tables 2 and 3 for reference, as well as corresponding estimates from the commonly employed random effects-estimator

[23]While it would be desirable to delve further into the within-facility dynamics by zooming in on any ownership change, further disaggregation produces even smaller groups of observations and, consequently, unstable estimates. For transparency the results of such analysis are reported in the appendix. They do not upend the results of the main analyses. The closest approximation to a clear pattern is that the staff-relating outcomes improve with a transition from PE/PT (N=41) and deteriorate with a transition in the other way (N=31), while the opposite is true for the Action plan variable.

and the less-often used between effects-estimator, whereby only average between facility-level differences is taken into account. As a whole, these alterations do not substantively change the findings from the main analyses. However, the IPWRA results are slightly but consistently more bullish for the non- vs. for-profit comparison than in the main analysis.

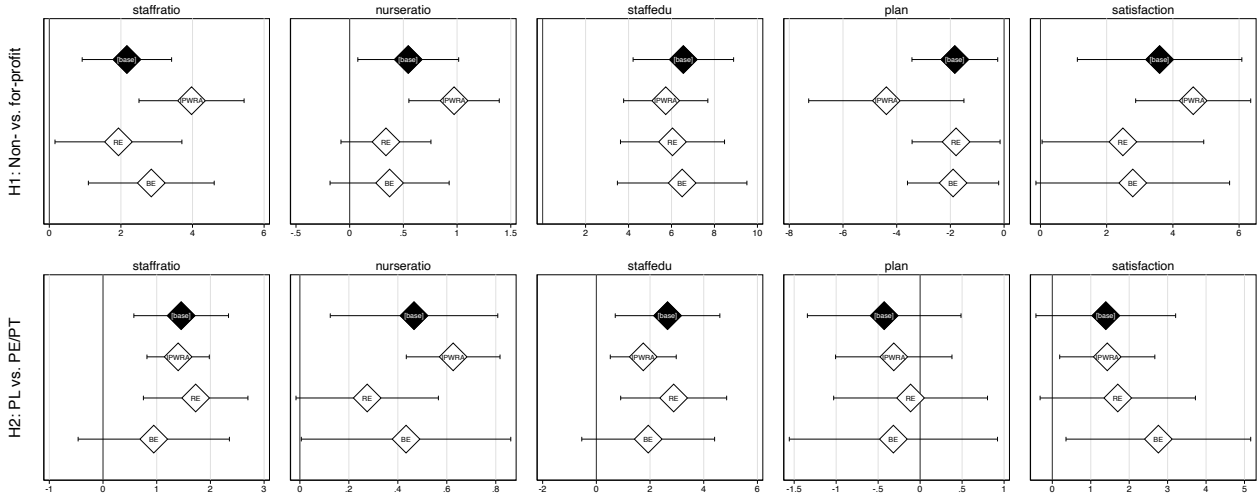


Figure 4: Ownership and Service Quality: Results of Alternate Estimation Techniques

Note: Diamonds display point estimates with 95% confidence bands (robust standard errors, except for the original results). Base = FE estimator; IPWRA = inverse probability weighting with regression adjustment estimator; RE = random effect estimator; BE = between-effects estimator. Covariates are the same as equation 1, without year-FEs in the BE-estimations.

Next, we redefine the sample from which our results are derived. First, we acknowledge some incongruity between the pools of facilities contained in the Socialstyrelsen and Statistics Sweden datasets, which we employ to define our sample. Whereas the latter follows a standardized industry code scheme,[24] including the category "Care in special forms of accommodation for the elderly" (87301), the Socialstyrelsen's dataset contains a small but non-trivial number of facilities (N=305 privately owned), which provide other than 87301 type of services, or for which an SNI code cannot be derived or plausibly inferred.[25] As can be observed in figure 5, the alteration of the sample has not led to any meaningful changes in the original estimates.

[24]SNI, a Swedish classification scheme corresponding to the EU's standardized classification scheme (NACE) including a further level of disaggregation (87301), distinguishing between residential elder care for elderly and care for disabled people.

[25]One potential explanation for this divergence is that individuals who already reside in assisted living facilities that dot not qualify as "the elderly" may be allowed to continue living in these facilities after reaching a certain age, and are thereby included in the Socialstyrelsen's sample. Another potential source of discrepancy lies with a special type of accommodation — service flats — which falls under "home assistance" rather than residential care SNI code.

Second, we recognize that the dominance of privately operated facilities within Stockholm county and the large share of these observations in the nation at-large (40% of private facilities and 38 % of for-profit facilities are located in Stockholm county) may give cause service quality different from the rest of the country. The discussion above about the prevalence of the choice system here is an example of how Stockholm county may be different to the rest of the country. Figure 5 attests that the Stockholm/non-Stockholm division produces some substantively different estimates. However, inter alia and compared to the original estimates, there is no a discernibly systematic pattern to these differences: while in some instances they are driven by non-Stockholm facilities, in others by those within the county.

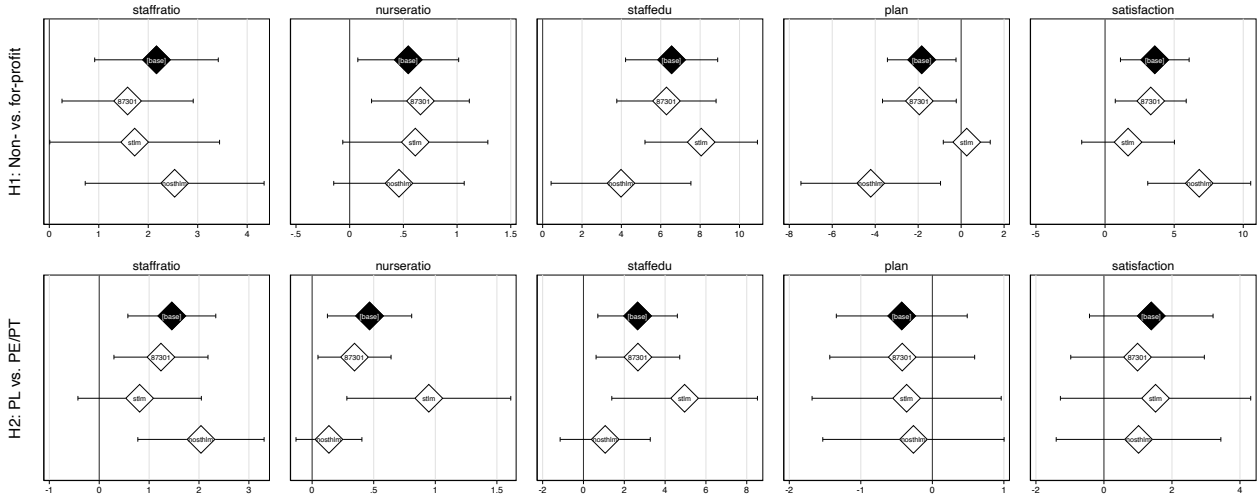


Figure 5: Ownership & Quality Indicators: Alternate samples

Note: Diamonds display point estimates with 95% (cluster-robust) confidence bands. Base = original sample; 87301 = SNI code 87301 only; sthlm = Stockholm county; nosthlm = not Stockholm county.

In sum, despite a number of non-trivial challenges pertaining to the nature of the data, we arrived at a credible estimation strategy that produced results supporting both of our hypotheses. First, Swedish residential elder care facilities operated by nonprofits deliver higher quality of care than for-profits (H1). Second, facilities run by companies of PL ownership deliver higher quality of care than facilities operated by PE/PT companies (H2). A caveat to these findings concerns process quality, where for-profits seem to outperform nonprofits, but the confidence level for this result is lower. A variety of the employed modeling and estimation choices, supplanted by a set of further robustness and sensitivity checks, provides a strong empirical support to both of the hypotheses, at the same time shielding our results from most apparent criticisms regarding omitted variable- and selection bias.

8 Conclusion

Private organizations are today important service providers in such areas as education and elder care, even in countries where public organizations quite recently held a monopoly (Armstrong & Armstrong, 2019; Blix & Jordahl, 2021; Busemeyer et al., 2020). This important shift has spurred both public and scholarly discussions about the organizational performance of public and private organizations (Amirkhanyan et al., 2018). The literature holds both positive and negative theoretical expectations regarding the consequences of marketization for quality of complex services in quasi-markets (Brown et al., 2016; Hart et al., 1997; Schumpeter, 2013; Shleifer, 1998), and the empirical literature shows mixed results when comparing service quality provided by public and private organizations (Broms et al., 2020; Castle et al., 2007; Forder & Allan, 2014).

This paper sheds new light on the debate by looking closer at the heterogeneity within private organizations. In this category we find for-profit organizations, as well as non-profit organizations. Moreover, the for-profit organizations have different types of ownership: some are owned by private equity firms; some are traded publicly on the stock market, and some are held privately by a small group of owners, as family companies.

We theorize that these different forms of ownership entail very different intensity of incentives to make profit at the expense of service quality. Our theoretical framework stipulates that non-profit organizations are likely to provide higher service quality than other private alternatives, because they have strict constraints on how they can spend their profits and are able to attract more motivated personnel (H1). We also suggest that when zooming in on for-profit organizations only, private equity firms and publicly traded companies have higher-powered profit-making incentives than private limited companies, which leads PE/PTs to more extensive quality-shading than PLs. Therefore, we hypothesize that PL providers outperform other for-profits on service quality (H2).

Having analysed the link between the form of ownership and service quality for providers of residential elder care in Sweden over time, we found that residential care homes run by nonprofits have on average higher staff and nurse density well as better educated personnel, and more satisfied residents. For-profits have, however, more often an up-to-date action plan. Furthermore, we found that

facilities run by PE/PT companies underperform on all of the input-related quality indicators (staff density, nurse density, staff education), when they are compared to PL-run facilities. The same comparison reveals, however, no statistically significant differences on the process- and outcome-related indicators (action plan and overall satisfaction, respectively). Taking the results in their totality, we interpret them as being consistent with our hypotheses.

Our findings indicate that there are ways to run private organizations without compromising on quality, even when delivering complex services such as residential elder care, as long as the incentives to make profit are not too strong. Our thinking why this is the case is rather straightforward: if the chase for large profit margins at a quick pace creates too strong quality-shading incentives, then reducing the profit-maximizing incentives of the provider should also decrease its incentives for cost-cutting. As Hart et al. (1997) note, the problem with private providers of complex services is not that they lack incentives for quality innovation, but that cost-reduction takes precedence over quality innovation.[26] Private organizations capable of leveling incentives for cost-reduction and quality innovation could thus produce service quality on par with, or even higher, than their public counterparts, also when it comes to complex services. And indeed, while showing that PE/PT-run elder care homes exhibit a high intensity of cost-cutting-quality-shading incentives, the opposite is true for PLs and nonprofits. We also note that the service quality of public facilities is in between the care homes operated by private companies with the highest and the lowest profit-maximization incentives.

The fact that PL ownership fares well in our analyses might be surprising to some. While this paper has explored one mechanism — the intensity of profit-maximizing incentives — there are several interesting additional mechanisms that can be investigated in future research. In line with principal-agent theory, PLs owners may have more knowledge about the actual operation of their businesses than the dispersed owners of the often large publicly traded companies. Another possibility is that such companies have specific management styles. Amirkhanyan et al. (2018) show that certain types of management — what they call "innovative management" — is associated with higher service quality in U.S. nursing homes.

This paper makes important theoretical and empirical contributions to the literature. Theoretically,

[26] As a matter of fact, their model suggests that private providers have stronger incentives for quality innovation than public providers.

we expand the cost-quality trade-off framework by Hart et al. (1997), by arguing that the intensity of such a trade-off is a function of the form of ownership. We make an empirical contribution by introducing a new data on provider ownership over time from a mature welfare state and interrogating it with advanced techniques of quantitative analysis. These empirical qualities of the paper make it a benchmark for future research. The revealed pattern of differing quality performance by different types of private providers may help to explain why the empirical literature on organizational performance in the social services sector has thus far been inconclusive. Most importantly, by highlighting the importance of heterogeneity of private providers of social services, specifically their forms of ownership, our research improves the scientific understanding of and a broader public discourse on the causes of quality of complex services. The existing division into public and private providers is clearly insufficient, as it obscures important differences in organizational performance within the private category, and may bias our comprehension of the role of private organizations in the provision of complex social services.

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Appendices

A Private providers, full list

Table A1

Operator	No. observations (N)	Category	Most recent parent
x xx xxx xxxx xxxxx xxxxxx xxxxxxx xxxxxxxx Andreas Ands Minne, Stiftelsen	7	NP	
Betelhemmet i Jönåker	7	NP	
Betlehemskyrkan Vasahemmet	7	NP	
Bonell, Per	1	NP	
Diakonistiftelsen Samariterhemmet	7	NP	
Ersta Diakoni AB	19	NP	Ideella Föreningen Ersta Diakonisällskap Med Fir
Ersta Diakonisällskap	18	NP	Ideella Föreningen Ersta Diakonisällskap Med Fir
Floragården Ekonomisk Förening	7	NP	
Föreningen Blomsterfonden	20	NP	
Föreningen Edsätras Vänner	7	NP	
Föreningen Fogdaröd Omsorg, Vård & Utbildning Utan Personligt Ansvar	2	NP	Föreningen Fogdaröd Omsorg, Vård & Utbildning Ut
Föreningen Judiska Hemmet	7	NP	
Föreningen Tunabergs Gruppboende	7	NP	
Gotlands Sjukhem	7	NP	
Göteborgs Kyrkliga Stadsmission Bistånd Och Entreprenad AB	7	NP	Stiftelsen Göteborgs Kyrkliga Stadsmission
Hyllie Park Äldreboende Aktiebolag	7	NP	Hyllie Park Kyrkan
Immanuelskyrkans Vård Aktiebolag	7	NP	Immanuelskyrkans Församling
Klöverlyckan Ekonomisk Förening	7	NP	
Lennings Sjukhem/John O Matilda	4	NP	
Neuberghska Ålderdomshemmet - Bambergers Vårdhem	6	NP	
Norrorts Omvårdnad Ek. För.	7	NP	
Omsorgskooperativet Brännagården Ek. För.	3	NP	
Personalkooperativet Gullogården, Ek Förening	7	NP	
Samfundet Birgittasystrarna	2	NP	
Stiftelsen Borgerskaps Enkehus Och Gubbhus	7	NP	
Stiftelsen Broängen	4	NP	
Stiftelsen Bräcke Diakoni	35	NP	
Stiftelsen Danviks Hospital	7	NP	
Stiftelsen Göteborgs Sjukhem	7	NP	
Stiftelsen Josephinahemmet	5	NP	
Stiftelsen Lindåsa	6	NP	
Stiftelsen Neuberghska Ålderdomshemmet	1	NP	
Stiftelsen Otium	9	NP	
Stiftelsen Röda Korshemmet	2	NP	
Stiftelsen Skaraborgs Läns Sjukhem	7	NP	
Stiftelsen Stockholms Sjukhem	6	NP	
Stiftelsen Stora Sköndal	44	NP	
Stiftelsen Torpahemmet-Anna Kjellbergs Minne	6	NP	
Stiftelsen Ålderdomshemmet i Göteborg	6	NP	
Suomikoti	6	NP	
Sällskapet Vänner Till Pauvres Honteux	7	NP	
Tillberga Grannskapsservice Ek Fö	5	NP	
Åkerby Äldreboende Ekonomisk Förening	5	NP	
Bräcke Diakoni Stockholm AB	30	PL→ NP	Bräcke Diakoni AB
Bokebo Vård Aktiebolag	2	PE→ PL	Norlandia Care Group As
Frösunda Omsorg AB	47	PE→ PL	
A & O Ansvar Och Omsorg Aktiebolag	95	PL	A & O i Sverige AB
A&O Temabo AB	59	PL	A & O i Sverige AB
AB Vårdstyrkan i Stockholm	13	PL	Vårdstyrkan i Stockholm AB
Adium Omsorg Aktiebolag	25	PL	Ös Konsult AB
Aktiebolag Sjöstjärnan	7	PL	Forenede A/S
Astagården Aktiebolag	1	PL	Bikärr AB
Attendo Ektorpsgården AB	6	PL	Prime Enterprise Sverige AB
Axeltorps Vårdhem AB	6	PL	Jutas AB
Berzelii Vård Och Omsorg AB	5	PL	
Bruka Äldrevård Aktiebolag	7	PL	Bruka Äldrevård AB
Bäckbacka AB	2	PL	
Bäckbacka Röbäck AB	4	PL	Grethel Moberg AB
Enskilda Sjukhemmet Solliden Aktiebolag	6	PL	Hospitality Invest As
Finskt Seniorboende AB	1	PL	Finskt Seniorboende AB
Förenade Care AB	201	PL	
Gammeluddshemmet Aktiebolag	3	PL	Enestorp AB
Geriacare AB	4	PL	Fyrvakten AB
God Omsorg i Kalmar AB	4	PL	
Gotlands Serviceboende AB	6	PL	Yding Holding AB
Gotlands Serviceboende Aktiebolag	1	PL	Skåningegård Omsorg AB
Haga Göstorp Psykiatri AB	1	PL	Hagagårdens Vårdhem, AB
Hagsunda Aktiebolag	1	PL	
Hammarbygruppen Vård Omsorg AB	4	PL	
Harvik Vård AB	2	PL	Österby Boende Och Omvårdnadsaktiebolag
Hattstugan Vård & Utbildnings Aktiebolag	7	PL	
Hjulebo Omsorg AB	1	PL	
Hopplunda Aktiebolag	1	PL	
Häggenäs Sjukhem Aktiebolag	4	PL	
Kavat Vård AB	60	PL	Svenska Rehabiliterings Sjukhus AB
Kosmo Hagalidsgården AB	4	PL	Norlandia Care As
Kosmo Uppsala B AB	3	PL	Kropp Och Själ Med Omtanke i Helsingborg AB
Kosmo Uppsala F AB	3	PL	Kropp Och Själ Med Omtanke i Helsingborg AB
Kosmo Uppsala Kj/V AB	6	PL	Kropp Och Själ Med Omtanke i Helsingborg AB
Kosmo Uppsala L AB	3	PL	Kropp Och Själ Med Omtanke i Helsingborg AB
Lovisagården Vård Aktiebolag	7	PL	
Lunnagårds Sjukhem Aktiebolag	4	PL	Omsorgsfolket Sverige AB
Långaröds Hemservice Aktiebolag	3	PL	

Note: NP=Non-profit; RFP=Non-Private Equity/Publicly traded for-profit; PE=Private Equity; PTFP=Publicly traded for-profit

Table A1: Continued

Operator	No. observations (N)	Category	Most recent parent
Mimosa Vård & Omsorg AB	1	PL	
Norlandia Care AB	108	PL	Hospitality Invest As
Norlandia Care Kosmo AB	83	PL	Hospitality Invest As
Nytida Ekbacka AB	4	PL	
Nömmeberg Vårdhem Aktiebolag	5	PL	Sydsvenska Hälsogruppen AB
Omsorgshuset Red Tree Care Center AB	2	PL	Omsorgshuset i Stockholm AB
Omvårdnad i Skönvik Aktiebolag	1	PL	Förvaltning i Skönvik AB
Parkgården i Kalmar Aktiebolag	2	PL	
Personstöd Mälardalen AB	1	PL	
Polstjärnan i Sverige AB	1	PL	
Private Nursing Sweden AB	3	PL	Private Nursing Sweden AB
Redolaris AB	7	PL	Consolaris AB
Revalyckans Vård Aktiebolag	2	PL	Bäckagårdens Sjukhem Förvaltning AB
Rosenhill Vård & Omsorg AB	4	PL	Rfm Skog- & Fastighetsförvaltning AB
Rådomsgården Aktiebolag	7	PL	
Sjöberga Gård AB	4	PL	
Smedsgård i Alstermo AB	7	PL	
Solbacken Vård i Nacka Aktiebolag	1	PL	
Solglimman Vård AB	6	PL	Värdig Omsorg i Stockholm AB
Solhaga Vårdhem Aktiebolag	7	PL	A & O i Sverige AB
Stockholms Äldreboende AB	8	PL	Marior AB
Stångberga Omsorg AB	6	PL	
Syster Annas Sjukhem Aktiebolag	1	PL	Dunkersvik AB
Victum Kompetensutveckling AB	3	PL	Victum Kompetensutveckling AB
Victum Omsorg AB	15	PL	Victum Kompetensutveckling AB
Vifolkagården i Mjölby AB	1	PL	Kropp Och Själ Med Omtanke i Helsingborg AB
Vikingens Vårdhem Aktiebolag	2	PL	Asator Vård & Behandling AB
Villa Sjöängen Äldreboende Aktiebolag	1	PL	
Vittsjö Sjukhem Aktiebolag	6	PL	Sydsvenska Hälsogruppen AB
Vård Med Proffs i Norrort AB	6	PL	Vård Med Proffs i Norrort AB
Vårdhemmet Lugnet Aktiebolag	2	PL	Sigtuna Vård Och Omsorg AB
Äldreboendet Vigs Ängar AB	3	PL	Husberg Arkitektkontor AB
Äldreliv i Stockholm AB	6	PL	
Älvstorps Vårdhem Aktiebolag	2	PL	Christinelund Konferenscentrum AB
Humana Hemtjänst AB	5	PE	Humana Investment Holding AB
Vardaga Medihem AB	10	PE	
Backebo Vård & Omsorg AB	7	PL→ PE	Team Olivia Group AB
Wikmansgården Aktiebolag	2	PL→ PE	Humana AB
Vård i Rosstorp AB	9	NP→ PT	
Attendo Individ Och Familj AB	4	PE→ PT	Attendo AB (Publ)
Attendo Lss AB	4	PE→ PT	Attendo AB (Publ)
Attendo Sverige AB	526	PE→ PT	Attendo AB (Publ)
Humana Omsorg AB	68	PE→ PT	Humana AB
Partnergruppen Svenska AB	14	PE→ PT	Humana AB
Vardaga AB	121	PE→ PT	Ambea AB (Publ)
Vardaga Graniten AB	10	PE→ PT	Ambea AB (Publ)
Vardaga Opalen AB	82	PE→ PT	Ambea AB (Publ)
Vardaga Skåneborg AB	3	PE→ PT	Ambea AB (Publ)
Vardaga Äldreomsorg AB	233	PE→ PT	Ambea AB (Publ)
Attendo Björkhaga Kompetens AB	3	PL→ PE→ PT	Attendo AB (Publ)
Norrbärke Sjukhem AB	6	PL→ PE→ PT	Humana AB
Vardaga Agaten AB	7	PL→ PE→ PT	Ambea AB (Publ)
Vardaga Gästhemmet Edsby Slott AB	7	PL→ PE→ PT	Ambea AB (Publ)
Vardaga Silverhemmen AB	26	PL→ PE→ PT	Ambea AB (Publ)
Aleris Vårdpilen AB	6	PL→ PT	Investor AB
Vardaga Fjällmyran AB	9	PL→ PT	
Attendo Hällbogruppen AB	1	PT	Attendo AB (Publ)
Vardaga Nytida Omsorg AB	172	PT	Investor AB

Note: NP=Non-profit; RFP=Non-Private Equity/Publicly traded for-profit; PE=Private Equity; PTFP=Publicly traded for-profit

B Non-profit vs. for-profit ownership and service quality: facility-level fixed effects

Table A2: Non-profit vs for-profit Ownership and Service Quality: FE estimator

	Staff density *input*	Nurse density *input*	Staff education *input*	Action plan *process*	Satisfaction *outcome*
	(1)	(2)	(3)	(4)	(5)
Non-profit	1.31	-0.15	1.23	-1.20	-2.34
	(2.50)	(0.33)	(3.42)	(1.68)	(2.73)
N (Observations)	2453	2337	2486	2518	1870
n (Facilities)	513	512	518	518	443

Note: Reference category is for-profit ownership. †p<0.10 *p<0.05 **p<0.01 ***p<0.001. Standard errors, in parentheses, are clustered at the facility level. All regressions include time-varying facility-level covariates and year fixed effects.

C Estimated quality before and after within-facility change in ownership

The figures below compare the estimated levels in each of the five quality indicators between the year during which a change in the provider's ownership, and thereby treatment status, took place and the year before it. Due to the often very small number of such events, the results of this analysis should be taken with caution, especially inference derived from the confidence intervals.

In case of missing data on any of the quality indicators for these years, they were imputed with corresponding values for the closest subsequent/previous year with non-missing data. In some cases no such non-missing information existed, creating different amount of observations for each analysis.

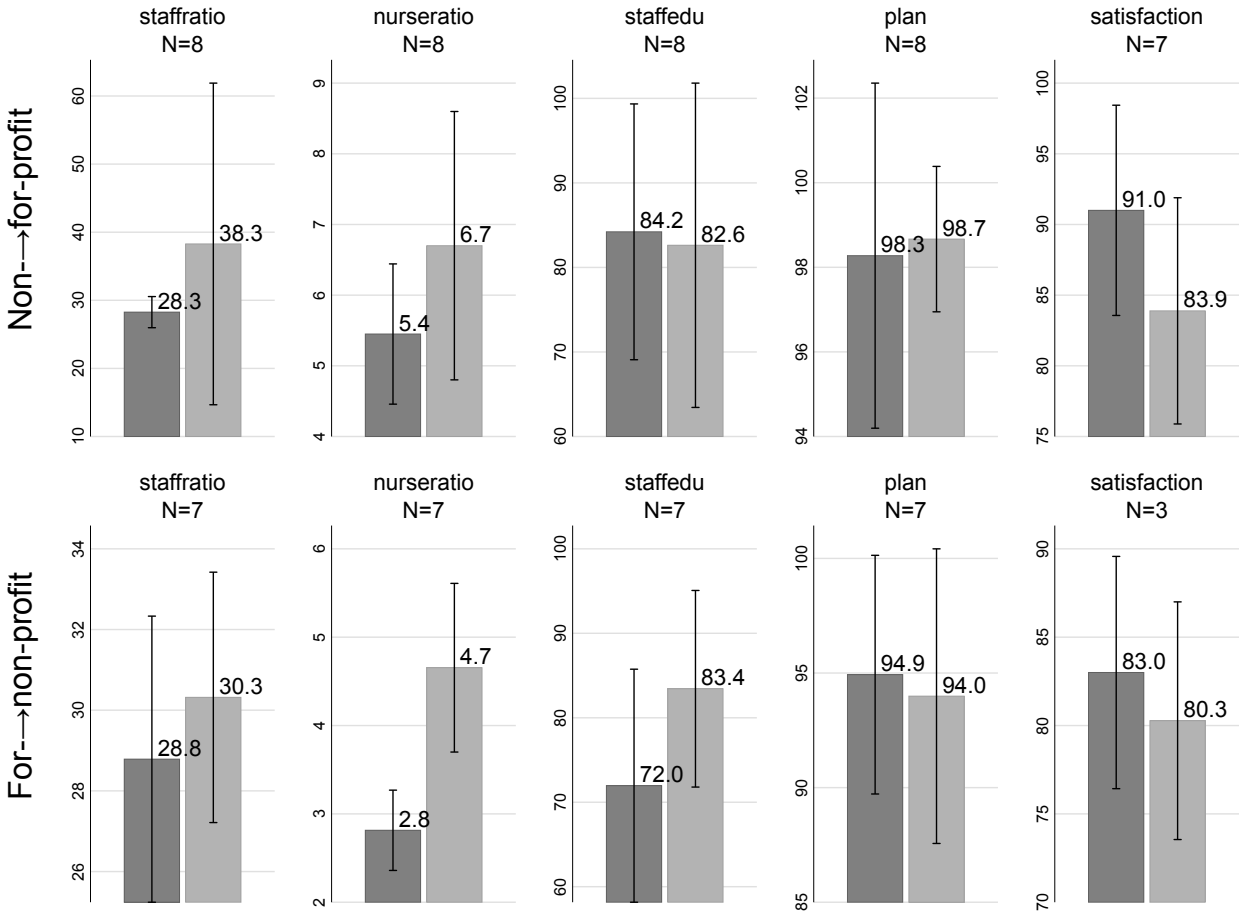


Figure A1: Change in Ownership Status: Non- and for-profits

Note: N = the number of changes in the ownership status with non-missing quality data.

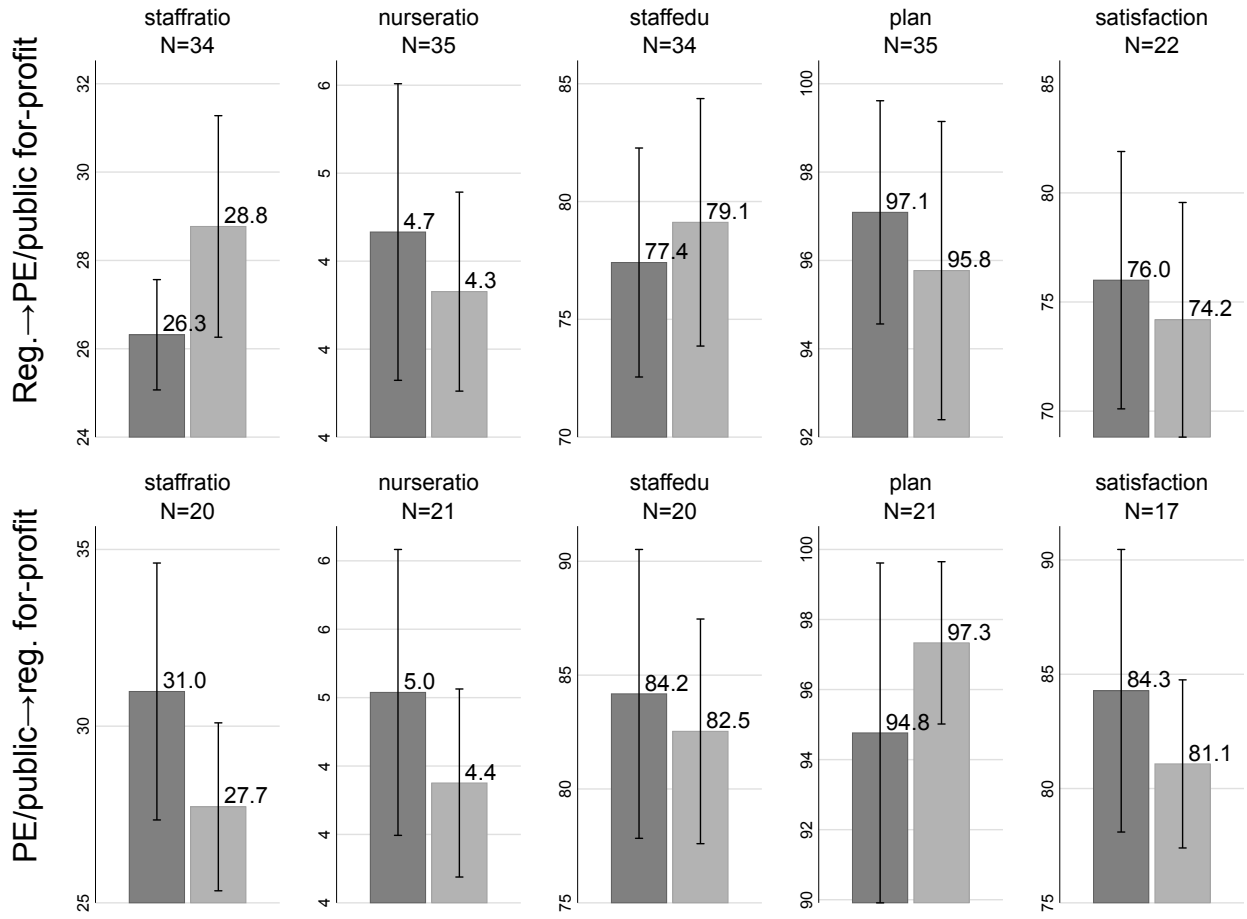


Figure A2: Change in Ownership Status: PL and PE/PT

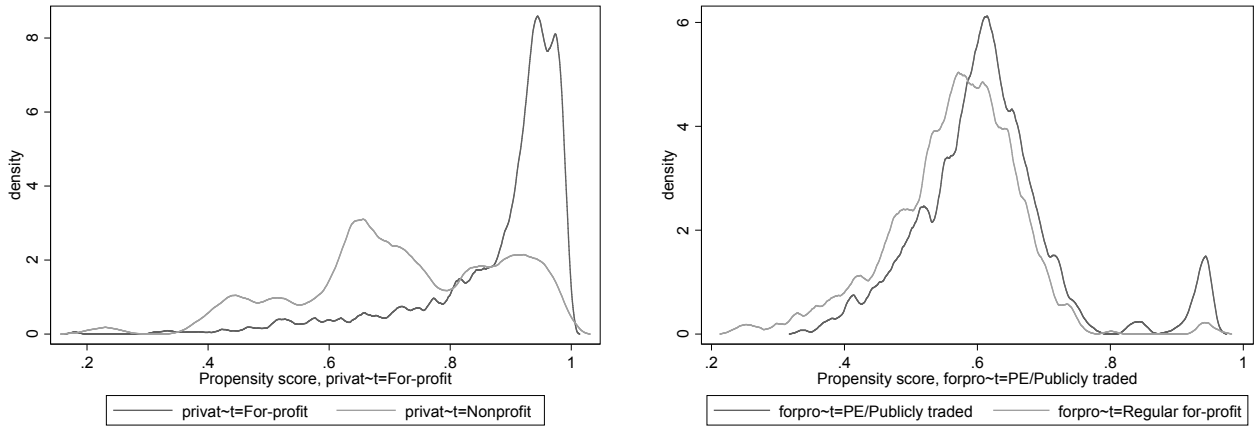
Note: N = the number of changes in the ownership status with non-missing quality data.

D IPWRA: Background and Diagnostics

This section presents details and diagnostic tests for the IPWRA regressions, as reported in figure 4. In summary, the diagnostics indicate that the weighting approach perform relatively well, but also present a few potential issues to be raised, specifically pertaining to the estimation comparing non- and for-profits.

As reported in figure 4, the outcome model is identically specified as the main model written in 1, except in place of the municipal fixed effects, it models geographic- and spatial factors in part continuously and in part using higher-order dummies by including (log) area of municipality as well as a set of region dummies (Norrland, Eastern Svealand, Western Svealand, Eastern Götaland, Western Götaland, Southern Götaland).

First, figure A3 shows consistent, if uneven, overlap between non-profit and for-profit facilities and between PL and PE/PT-run facilities, throughout the respective distributions. Most notably, the propensity of for-profits belonging to their actual category is generally high, but non-total. Further, given the fact that also non-profit facilities display high or moderate modeled probabilities for inclusion in this category, the result is a considerable amount of overlap between the two propensity scores. Meanwhile, overlap is near total for the intra-for-profit categories.



(a) Private sample (H1)

(b) For-profit sample (H2)

Figure A3: Overlap

Second, covariate balance presents some flags for the non-profit vs. for-profit comparisons, while displaying highly desirable properties for the within for-profit comparison. Beginning with the former, an overidentification test of this model, displays an acceptable level of imbalance (p=0.372), although some individual covariates display weighted standardized differences exceeding 0.1. In particular, General care, which unstandardized differences is negligible, increases to 0.2 (which is the highest value for any covariate) when standardized.

Table A3: Covariate balance: non-profit and for-profit providers

	balance_size			
	Raw	Weighted		
Number of obs	2518	2518		
Treated obs	355	1250.221		
Control obs	2163	1267.779		
	balance_stats			
	std_diff:foreign	std_diff:alpha	ratio:_cons	ratio:hej
general	.0474465	-.2014951	.9446884	1.206352
dementia	-.1032695	.0475881	1.119582	.9441702
service	.0622123	.1003761	1.289734	1.449328
shortterm	-.23723	.0737715	.6748089	1.099217
logspaces	-.1264621	.0317249	2.189142	2.332047
logscb_pop	.6972922	.0039817	1.237609	.930232
scb_medinc	.3528905	.0189505	1.084366	1.124908
logscb_pop_x_scb_medinc	.6781671	.0120856	1.23274	1.027755
scb_popshare80plus	-.3106828	-.1028244	.6357723	.9006489
scb_popshare65plus	-.4872394	-.0791441	.6569099	.7357371
cc2	-.1725627	-.0073832	.6868285	.9858416
cc3	-.4399698	.0696194	.4046999	1.095315
cc4	.437313	.0050411	3.899824	1.019502
cc5	-.1360492	-.1444496	.6022102	.5606393
cc6	-.2369731	-.1664129	.1869246	.3513712
yr2	-.007842	.0215871	.987116	1.041988
yr3	.0693268	.0288698	1.15031	1.059493
yr4	.0298301	-.0053762	1.06198	.9893711
yr5	-.0099192	-.0860903	.9818944	.8230929
yr6	-.0436548	-.0552896	.9110864	.8828835
yr7	-.0528509	-.0588394	.8902615	.8738359

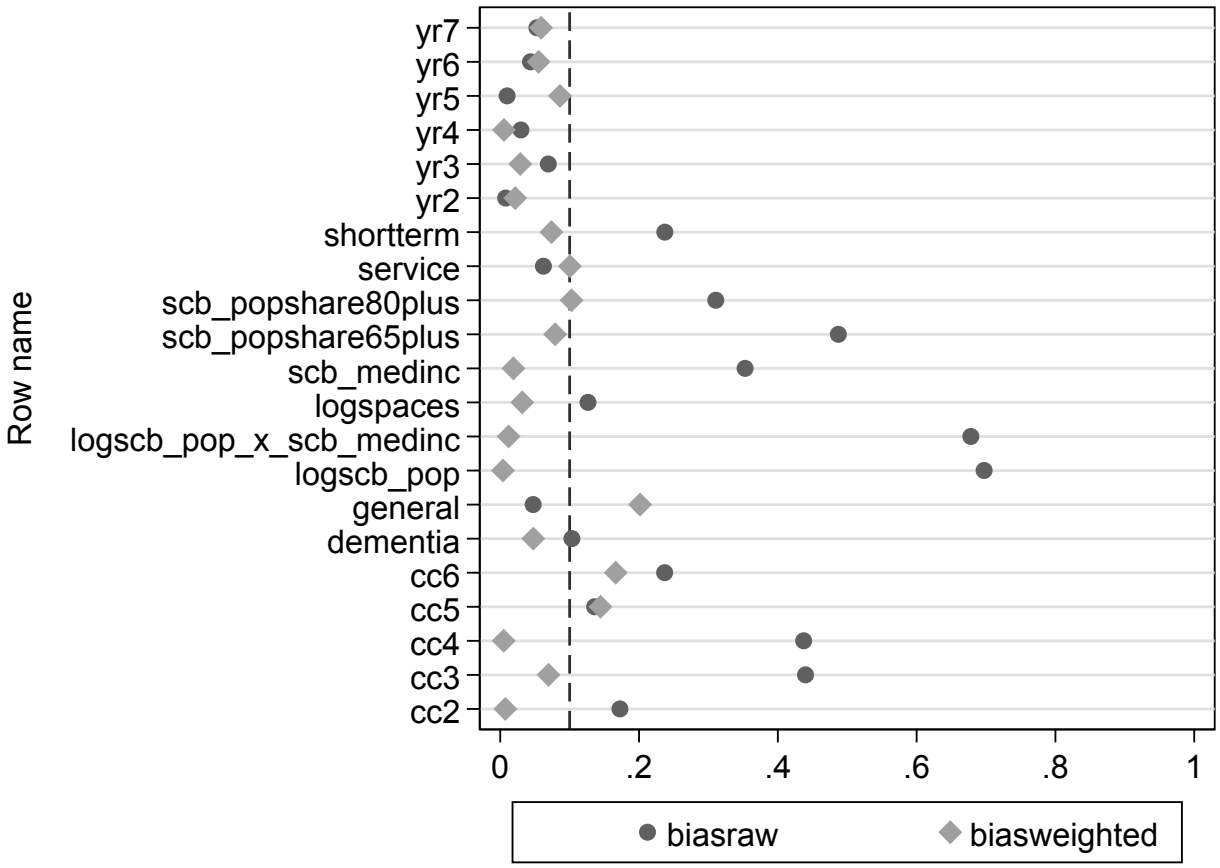


Figure A4: Covariate balance: non-profit and for-profit providers (graphical comparison)

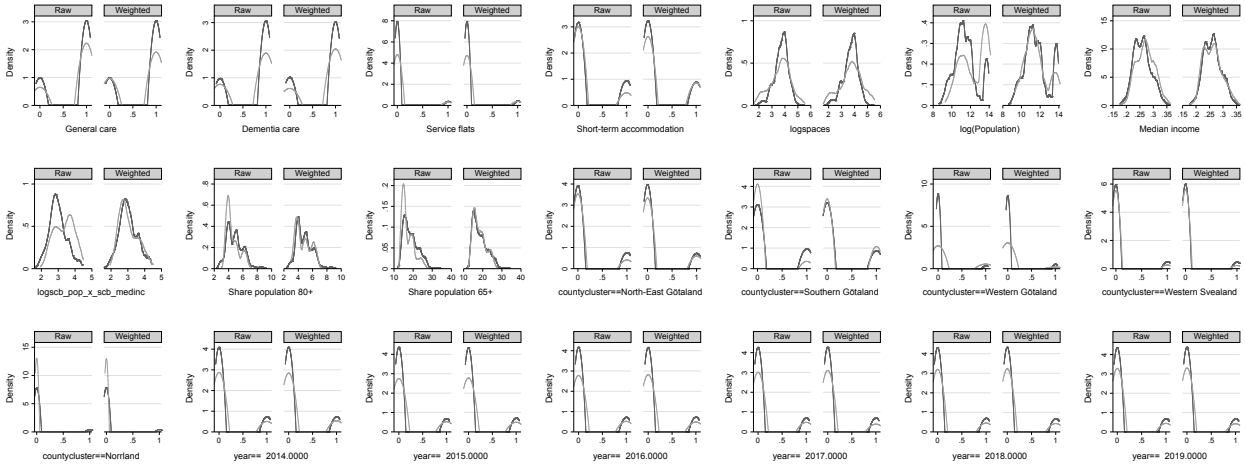


Figure A5: Overlap: privately-run facilities

For the within for-profit comparison, the unweighted imbalance, which is notably smaller than when comparing non- with for-profits, diminishes to below 0.1 for all covariates when standardized. Again, the overidentification test turns out negative, although by a small margin (p=0.106).

Table A4: Covariate balance: within for-profit providers

	balance_size			
	Raw	Weighted		
Number of obs	2163	2163		
Treated obs	878	1091.181		
Control obs	1285	1071.819		
	balance_stats			
	std_diff:foreign	std_diff:alpha	ratio:_cons	ratio:hej
general	-.0198268	-.0151749	1.024008	1.017607
dementia	-.0656031	.0155767	1.081665	.9808196
service	-.0071968	-.0157445	.9692998	.9321087
shortterm	.0394101	-.0114059	1.052055	.9851176
logspaces	-.207153	.0173246	1.203986	1.165568
logscb_pop	-.1443164	.0144006	1.413952	1.359128
scb_medinc	-.0780927	.0162403	.9310344	.9651978
logscb_pop_x_scb_medinc	-.1313561	.0184672	1.20203	1.071176
scb_popshare80plus	.1496569	-.0211402	1.146879	.8652267
scb_popshare65plus	.1970857	-.0342608	1.195824	.9233076
cc2	.0471509	-.0098912	1.089669	.981602
cc3	-.0027656	-.0154384	.9969111	.9806752
cc4	-.2903581	.0700219	.1251025	1.366854
cc5	.0271406	-.0021666	1.089403	.9931495
cc6	-.0586011	-.0069064	.774725	.9705112
yr2	.0343306	-.0017038	1.068774	.9966772
yr3	.0092745	.0193662	1.020245	1.040954
yr4	-.0004428	-.0170863	.9994779	.9659077
yr5	-.0509128	-.0179011	.8997995	.963118
yr6	-.0154108	.009872	.9685346	1.020722
yr7	.0315533	.0037398	1.06937	1.007928

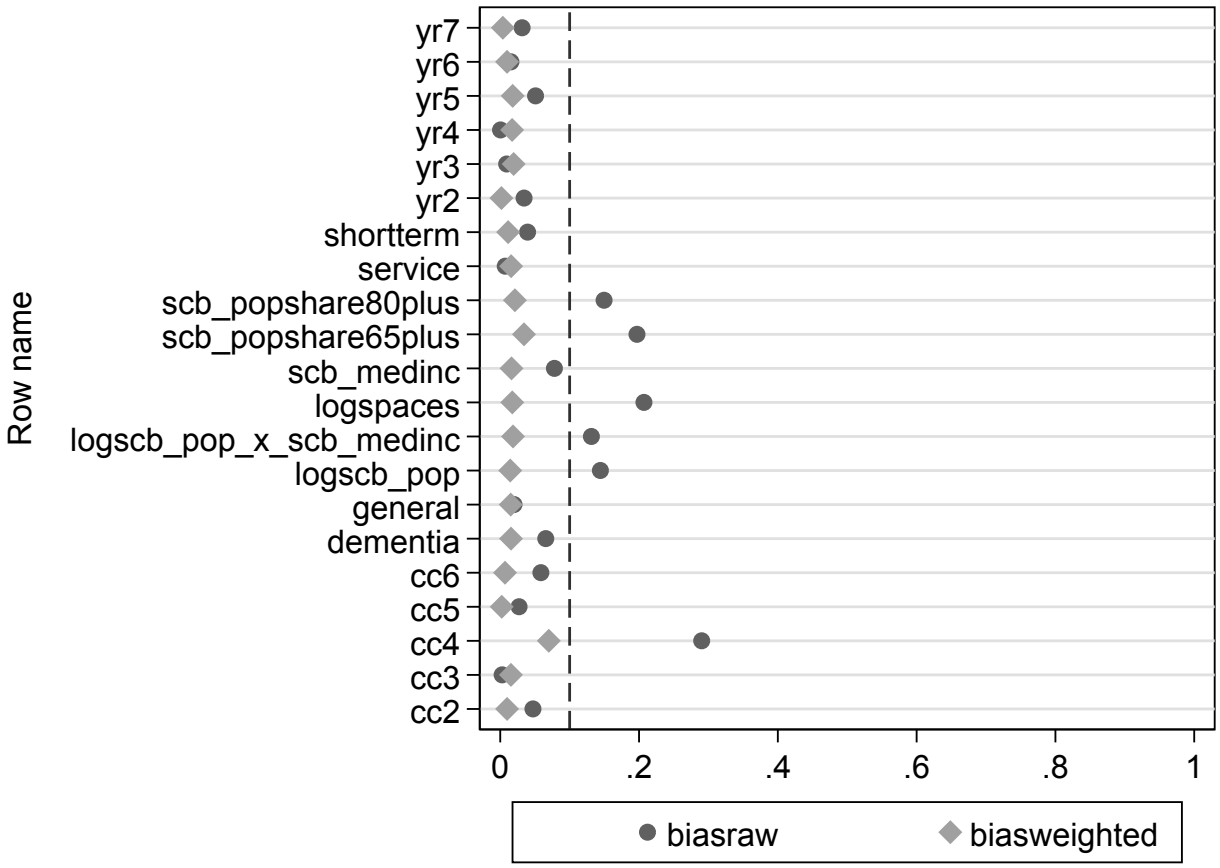


Figure A6: Covariate balance: within for-profit providers (graphical comparison)

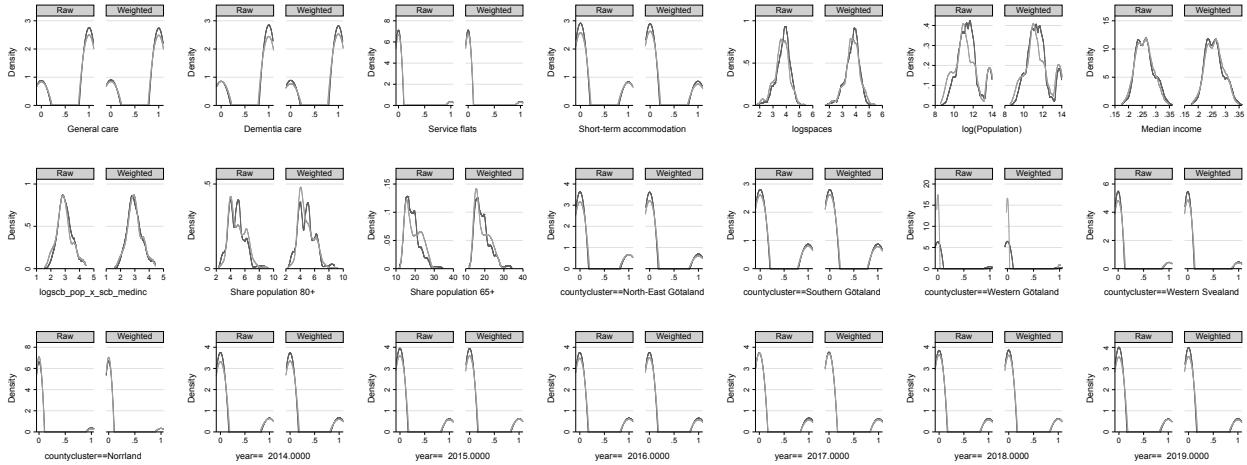


Figure A7: Overlap: for-profit-run facilities