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Limited Non-Profit Competition Leads Private For-Profit Nursing Homes to Raise Prices and Lower Quality

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Abstract

Context. Private providers play a central role in shaping prices and quality in the long-term care sector, a market characterized by widespread intersectoral competition and relatively light regulation. Yet it remains unclear whether competition from non-profit (NP) providers affects market outcomes differently than competition among private for-profit (FP) providers. In France, FP nursing homes account for about a quarter of available places although their presence varies significantly across local markets. This study examines how competition from NP providers affects accommodation prices and service quality in FP nursing homes. **Method.** We combine data from a national survey of 935 FP facilities, representing 53% of the sector, with administrative claims data, from 2014 to 2019, used to construct a set of quality indicators. To measure intersectoral competition, we develop a market power index that captures the competitive position of each FP provider within its local market. The index accounts for both the total nursing home supply and the share of private FP facilities within one-hour drive. To address the potential endogeneity of FP market power, we estimate instrumental variable (IV) models. **Results.** The results suggest that FP nursing homes facing weaker competition from NP providers charge significantly higher accommodation prices despite having similar level of staffing and building quality, while their outcome quality is lower. **Conclusion.** These findings suggest that competition from the non-profit sector plays an important role in constraining prices and sustaining quality in the for-profit nursing home market.

Keywords: public-private competition, private for-profit facilities, nursing homes, price, quality

Highlights

- The market power of private for-profit (FP) facilities vary significantly across regions
- FP facilities charge higher prices when competition from non-profit sector is low
- Higher prices are not linked to higher staffing levels or building quality
- Patient outcomes are lower in areas where non-profit competition is weak

1. Introduction

The cost and quality of accommodation in nursing homes have become major concerns for ageing populations and policymakers, as growing demand for long-term care places increasing pressure on both families and public budgets [1–3]. Ensuring that nursing home residents have access to affordable, high-quality care is particularly challenging because long-term care markets are characterized by substantial information asymmetries. Although nursing home care is generally less technical than acute medical care, potentially making some aspects of quality more observable to consumers [4], the multi-dimensional nature of long-term care quality complicates its assessment. Quality encompasses a wide range of dimensions, including staffing levels, clinical outcomes, safety, residents' quality of life, and the physical environment, many of which are difficult for prospective residents and their families to observe or evaluate accurately before admission. Therefore, prospective residents and their families often have limited information about the quality of care provided by facilities and may interpret higher prices as an indicator of better service quality. Information asymmetries are also compounded by the circumstances under which placement decisions are typically made. Admission frequently follows a sudden health shock or the loss of informal care arrangements, reducing the ability of older adults and their families to search for and compare providers. In addition, consumer mobility is inherently limited in the nursing home market. Once admitted, residents face substantial financial, administrative, and emotional costs of relocation [5]. This limited capacity to switch providers weakens competitive pressures and may reduce providers' incentives to compete on quality.

These market imperfections have motivated extensive research on the role of competition in shaping nursing home performance, particularly with regard to price and quality outcomes. The evidence on quality remains mixed: some studies suggest that competition leads to higher quality in nursing homes [6–8], whereas others report either negligible effects or declines in quality [9–13]. In contrast, the evidence regarding prices is more consistent, with most studies concluding that greater competition tends to reduce the prices charged by nursing homes [11, 14–16]. However, competition in this literature is typically measured using market concentration indices based on the overall supply of nursing home beds, without distinguishing between ownership types.

Arrow (1963) and Hansmann (1980) argued that nonprofit providers help address quality uncertainty in healthcare markets characterized by information asymmetries [17, 18]. In the nursing home sector, Hirth (1999) showed theoretically that competition from NP providers can improve the performance of FP facilities by signalling quality to consumers [19]. When quality is difficult to observe, nonprofit ownership may be perceived as a mark of credibility, creating incentives for for-profit providers to improve quality in order to remain competitive [20].

Despite these theoretical arguments, empirical studies have rarely examined whether competition from NP providers differs from competition among FP providers. Competition is typically measured using market concentration indices based on the overall supply of nursing

home beds, without distinguishing between ownership types. Yet the way competition is measured appears to matter. Starkey et al. compared several indicators of market competition, including concentration indices, excess demand, and supply restrictions [21]. While they found no association between market concentration and quality, alternative measures capturing competitive pressure were positively associated with quality. These findings suggest that conventional concentration indices may not adequately reflect the competitive environment faced by nursing homes and underscore the need for more refined measures that account for differences in ownership structure and market power.

In the United States (US), Scanlon [22] introduced the “excess demand” paradigm, arguing that when demand for nursing home care exceeds available supply, providers face weaker incentives to compete for residents and may therefore reduce quality. Several US studies supported empirically Scanlon's Theory showing that, quality is negatively associated with Medicaid reimbursement rates (public prices) in markets characterized by excess demand [23–26]. In these studies, excess demand is typically defined as a situation in which nursing homes within a market have, on average, fewer than five vacant beds without distinguishing between ownership types, hence treating all nursing home beds as equally substitutable.

A strand of the literature focused specifically on competition within the for-profit nursing home sector. This research argues that ownership concentration, particularly through the expansion of large for-profit chains, may weaken competitive pressures and affect both prices and quality. Studies from different settings have shown that chain-affiliated facilities often benefit from greater market power, which may enable them to charge higher prices and reduce incentives to maintain quality standards [27, 28]. More recent evidence has also linked increasing market concentration and private equity or corporate ownership to poorer quality outcomes and weaker performance in long-term care facilities [29, 30].

Outside of the US, very few studies investigated the impact of competition between non-profit and for-profit providers on prices and quality of nursing home care. In the US context, empirical studies consistently suggest that larger presence of non-profit facilities in the market enhances the quality of private for-profit nursing homes, supporting Hirth’s theory that non-profit providers exert a disciplining effect on their for-profit competitors [20, 31]. More recently, [32] identified a U-shaped relationship between competition and service quality in markets serving a mix of publicly and privately funded residents, whereas quality increased monotonically with competition in predominantly publicly funded and price-regulated markets.

In this study, we examine how competition from non-profit providers affects prices and quality in for-profit nursing homes in France. France provides a particularly suitable setting for this analysis because of the substantial geographic variation in nursing home market structures and in the market power of for-profit providers. We combine data from a national survey of nursing homes with administrative claims data covering the period 2014-2019 and construct a comprehensive set of quality indicators. To measure intersectoral competition, we develop a novel market power index that captures the competitive position of for-profit (FP) providers within each facility's catchment area. The index incorporates both the overall supply of nursing home beds and the share of FP facilities located within a one-hour driving

distance. Unlike conventional concentration measures, it captures both ownership heterogeneity and the competitive pressure exerted by nonprofit providers in local markets, accounting for underlying demand. To address the potential endogeneity of FP market power, we employ an instrumental variables (IV) strategy that exploits variation in market characteristics across local areas (départements) while controlling for the same characteristics at the more granular residential-area level. We argue that conditional on local market characteristics, any remaining département-level variation affects nursing home prices and quality primarily through its effect on market competition rather than through other unobserved determinants of facility performance. In line with Hirth's theory, our results confirm that FP nursing homes operating in markets where the FP sector enjoys greater market power, where competitive pressure from non-profit providers is weaker, charge higher prices and deliver lower quality. These results suggest that intersectoral competition plays a significant role in constraining FP market power and improving outcomes in the nursing home sector.

This article contributes to the literature in several ways. First, it adds to the limited evidence on intersectoral competition in healthcare by providing new evidence from France. Approximately two-thirds of the studies on competition in nursing home markets have been conducted in the United States and Canada, while evidence from Europe remains particularly scarce. France, like most European countries, has a mixed long-term care system in which FP providers, accounting a quarter of nursing home capacity, compete with public providers. The French long-term care system is broadly comparable to those of many other European countries, where healthcare and assistance with activities of daily living are publicly funded under similar conditions for both for-profit and non-profit providers, while accommodation costs are mostly borne by residents and their families [33]. In France, accommodation charges in NP nursing homes are negotiated with local authorities which may influence the quality standards, whereas FP nursing homes are generally free to set their own accommodation prices and determine the level of non-medical amenities and services, such as room standards, comfort, and recreational activities. This pricing autonomy allows FP providers to adjust both prices and quality in response to local market conditions and competitive pressures. Such autonomy is common across most European long-term care systems [33]. Germany is a notable exception, as accommodation prices are negotiated with both non-profit and for-profit providers. Consequently, the French institutional setting provides a particularly suitable framework for examining how intersectoral competition influences pricing and quality strategies of for-profit nursing homes in Europe.

Second, we provide a novel test of Hirth's theory by developing an original measure of intersectoral competition at the local market level. Specifically, we construct an original index of for-profit market power that captures intersectoral competition within the catchment area of each FP facility. The index is based on a potential accessibility indicator that accounts not only for the number of nursing home beds located within a one-hour driving distance, but also for the potential demand generated by the population aged 65 years and over. By incorporating both supply and demand conditions, this measure provides a more comprehensive assessment of competitive pressure than conventional market concentration indices.

Third, we contribute to the literature by employing a broad original set of quality indicators covering the structural, process, and outcomes dimensions of care quality. Existing studies typically focus on a limited number of outcome measures, thereby providing only a partial assessment of nursing home performance. To our knowledge, this is the first study in France to examine the relationship between competition and nursing home performance using such a comprehensive quality framework, allowing for a more nuanced understanding of how market structure influences different aspects of care quality.

The following section describes the data and empirical methods used to estimate the impact of FP market power on accommodation prices and quality. Section 3 presents the descriptive statistics and empirical results, while Section 4 discusses the main limitations of the study and reports a series of sensitivity analyses. The last section offers a discussion of the findings and their implications for policy and future research.

2. Empirical Strategy

2.1. Data

Data on nursing homes come from a national survey which provides detailed information on facility characteristics, including building quality and staffing levels, carried out in 2015. These data were merged with patient-level healthcare consumption records from the National Health Data System (SNDS) between 2014 and 2019, for calculating outcome quality indicators. The sample included 3417 NP facilities (60% of NP facilities) and 935 private FP facilities (53% of the FP facilities). To correct for the lower response rate among FP facilities, we applied survey weights estimated by the statistical department of the Ministry of Health. The final sample is representative of the national nursing home sector in terms of ownership status, number of beds and regional repartition of capacity (Appendix A in table A1). For survey-based variables, we retained only those with less than 20% missing values. Missing observations were imputed using a hot-deck procedure based on a six-category facility typology defined by ownership type, number of beds, and residential area (table A2 in appendix A). Information on concerning the structure and process quality and the case-mix of residents including mean age, share of women, mortality rate, and average dependency and health scores was obtained from the survey. Data on accommodation prices in 2019 were obtained from the National Solidarity Fund for Autonomy (CNSA). The indicator of nursing-home supply by residential area, potential accessibility of nursing homes, was provided by the statistical department of the Ministry of Health, based on data from 2015 [34]. Potential accessibility is estimated using the two-step floating catchment area method [35], which avoids reliance on administrative boundaries. The indicator estimates the number of nursing home beds available per 100 prospective residents within an hour's drive from each nursing home facility. Prospective demand in a local area is estimated by the Ministry of Health based on national age-specific facility utilization rates and the age structure of the population in each local area [34]. The percentage of for-profit facilities in one hour drive is calculated using an exhaustive national facility database (Finess) and a distance chart measuring road travel times (in off-peak hours) across the 36 568 French residential areas in 2015. Consequently, the accessibility measure captures both the spatial distribution of nursing home capacity and the

geographic distribution of potential residents, providing an indicator of the balance between local supply and demand.

2.2. Index of competition

Intersectoral competition in the nursing home sector is typically measured by the market share of the non-profit providers [12, 20, 31, 36]. Following this literature, we consider the relative presence of non-profit and for-profit providers as a key determinant of competitive pressure. We further assume that the market power of FP providers depends also on the overall availability of nursing home capacity relative to local demand.

The level of competition in the LTC sector is most commonly measured using the Herfindahl-Hirschman Index (HHI) [6–13]. However, concentration measures such as the HHI do not account for variations in demand across geographic areas. As a result, they are highly sensitive to the degree of urbanization, with markets appearing more competitive when nursing home beds are distributed across a larger number of facilities (Figure A1 in Appendix A). For example, the Paris region would be classified as highly competitive because many facilities are located within a one-hour driving distance. Yet, this characterization overlooks the exceptionally high demand for nursing home care generated by population density in Paris. In practice, available capacity remains insufficient to meet local needs, limiting the effective choice available to residents and their families. To overcome this limitation, we use a measure of potential accessibility to nursing homes, defined as the total number of nursing home beds per 100 prospective residents within a one-hour driving distance. Prospective demand in one hour drive is estimated by applying national age-specific nursing home utilization rates to the local population age structure.

We computed an index of FP market power using principal component analysis (PCA) based on i) the share of for-profit nursing home beds in the area ii) potential accessibility of nursing home beds within one-hour drive of each residential area. The first principal component, which summarizes the common variation between these indicators, is used as our measure of FP market power. The resulting score is normalized using a min-max transformation and ranges from 0 (indicating areas with the lowest FP market power) to 1 (indicating areas with the highest for-profit market power). In other words, the higher the index, the lower the level of intersectoral competition in the local nursing home market.

2.3. Indexes of quality

We constructed five quality indices covering the three dimensions of quality identified by Donabedian (1988): structure, process, and outcome quality. Structural quality was further divided into nursing staff quality, other staff quality, and building quality. For each dimension, we first calculated a set of relevant indicators and then used a factorial analysis (Multiple Correspondence Analysis (MCA)) to derive a composite quality index. All indices were subsequently normalized, using a “min-max normalization”, ranging from 0 for the facility with the lowest quality to 1 for the highest quality.

The nursing staff quality index is based on five indicators. Three capture staffing intensity, measured as the number of caregivers, including nurses, per 100 residents during daytime, nighttime, and weekends. The remaining two indicators reflect the attractiveness of the facility to care workers through reported recruitment difficulties and the annual turnover rate of care staff. The other staff quality index measures the number of non-care personnel per 100 residents, including employees responsible for recreational activities, building maintenance, and food services. The building quality index captures several aspects of the physical environment, including the time elapsed since the last renovation or construction, living space per resident, the presence of a garden, and the proportion of rooms equipped with wheelchair-accessible showers, sufficient space for a medical bed, and air conditioning.

The process quality index is based on three indicators reflecting coordination with primary and specialized healthcare providers: the use of telemedicine in facility and collaboration with mobile geriatric, psychiatric, and palliative care teams. In France, no data are available on key resident-level outcomes such as pressure ulcers, changes in dependency status, or quality of life. Therefore, we used residents' hospitalization records to measure outcome quality. Repeated hospitalizations and emergency room visits by frail older adults are widely recognized as indicators of suboptimal care and are associated with adverse physical and psychological consequences [37, 38]. We calculated four outcome indicators: annual number of acute care admissions, potentially avoidable hospitalizations, emergency room visits per 100 residents per year, and 30-day rehospitalizations per 100 hospitalized residents. Detailed results of the MCA for each index, describing the contribution of each variable to the index and the change in the index value by variable introduced, are presented as supplementary material (Figures A2 to A5).

3.4 Empirical approach

The empirical analysis was conducted across three hierarchical levels: for-profit nursing homes (f), nested within residential areas (j) at which the market power index was computed, and nested in local areas or departments (k). France comprises 36,568 residential areas distributed across 96 metropolitan departments. We estimate the impact of FP market power in residential area j on price and quality of facility f, using IV estimations to address potential endogeneity arising from reverse causality. In particular, higher-quality or higher-priced facilities may influence local market structure, making FP market power endogenous to facility performance. To overcome this issue, we use a Two-Stage Least Squares (2SLS) estimator and separately estimate the impact of FP market power on accommodation price and on each quality dimension through the following linear regressions:

$$P_{fjk} = \alpha_1 + \theta_1 \widehat{\mathrm{MP}_{fjk}} + \beta_1 C_{fjk} + \varphi_1 R_{jk} + \delta_1 m_{jk} + \gamma_1 S_{jk} + \vartheta_1 S_k + e_{fjk} \quad (1)$$

$$Q_{fjk} = \alpha_2 + \theta_2 \widehat{\mathrm{MP}_{fjk}} + \beta_2 C_{fjk} + \varphi_2 R_{fk} + \delta_2 m_{fk} + \gamma_2 S_{fk} + \vartheta_2 S_k + w_{fjk} \quad (2)$$

where, P_{fjk} represents the accommodation price paid by residents in facility f in residential area j and department k, and Q_{fjk} represents facility quality, which is measured by four

quality indices (staffing, building, process, and outcome). R_{jk} is the real estate prices in the residential area j of the facility, and is included to account for local cost conditions that may affect accommodation prices. C_{fjk} is a vector of facility characteristics, including the number of beds, resident case-mix (mean age, share of women, average death rate, dependency and health scores), and distance to the nearest hospital emergency department (ED). All these variables are expected to impact both prices and quality in nursing homes. Facility size is well known as an indicator of economies of scale, which affect operating costs and quality of care [39]. Case-mix of residents can influence both resource requirements and quality outcomes, as facilities caring for more dependent or less healthy residents face greater care needs. The distance to the nearest hospital ED may also impact process and outcome quality indicators through its influence on access to acute care services, and cooperation with hospital-based mobile teams, etc. Finally, e_{fjk} and w_{fjk} represent the error terms, assumed to have a normal distribution with zero mean, for equations 1 and 2.

The coefficients θ_1 and θ_2 represent the causal effect of FP market power on price and quality, respectively. Because FP market power may be endogenous, we replace the observed measure with its fitted value, $\widehat{\mathrm{MP}_{fjk}}$ obtained from a first-stage regression using a set of instruments Z, through the following linear regression:

$$\mathrm{MP}_{fjk} = \alpha_3 + \beta_3 C_{fjk} + \varphi_3 R_{jk} + \delta_3 m_{jk} + \gamma_3 Z_k + \gamma_3 S_{jk} + \vartheta_3 S_k + u_{fjk} \quad (3)$$

Where Z_k denotes the instrumental variables and u_{fjk} is the error term. The fitted value $\widehat{\mathrm{MP}_{fjk}}$ is subsequently used in the second-stage equations to estimate the impact of FP market power on facility prices and quality outcomes.

As instruments (Z), we use variables that capture the attractiveness of local markets for FP nursing home providers, namely the share of adults aged 75 and over living alone and the median income of individuals over 75 years at the department level. These variables are expected to influence the profitability of operating a for-profit nursing home by reflecting both potential demand and residents' ability to pay. To isolate their effect on market structure, we simultaneously control for the same variables measured at the more granular residential area level j (m_{jk}).

This strategy exploits variation in market attractiveness across departments while accounting for potentially confounding demand-side characteristics in the immediate environment of each facility. Indeed, substantial heterogeneity exist between residential areas within the same department. Facilities located in residential areas with higher property values, wealthier older populations, or a larger share of older adults living alone may charge higher prices and provide different levels of quality because of local preferences, willingness to pay, or differences in demand. By controlling for these characteristics at the residential-area level, we remove their direct influence on facility outcomes.

Conditional on these controls, we assume that variation in the income level and living arrangements of older adults at the broader department level affects nursing home prices and quality only indirectly, through its impact on the competitive environment and the market power of for-profit providers. In other words, areas with higher incomes and a larger

proportion of older adults living alone are likely to be more attractive to FP operators, thereby influencing entry decisions, ownership composition, and ultimately the degree of competition in the local nursing home market. The exclusion restriction therefore assumes that, after controlling for residential-area characteristics, the remaining variation in department-area attractiveness affects facility prices and quality solely through FP market power and not through any other direct channel.

Similar instruments have been employed in previous literature to estimate the impact of competition on price and quality [11]. To further support the exogeneity of our instruments, we control for the supply of alternative LTC services both at residential area (S_{jk}) and department level (S_k). These controls include the availability of home care and nursing services (number of full-time employees at 30 minute drive from the facility per 100 000 adults aged 60+), number of social residences for older adults (non-medicalized housing facilities), and the density of self-employed nurses per 100 000 inhabitants. Including these variables helps account for local differences in the availability of substitute care options that may directly influence both demand for nursing home services and facility performance. By controlling for the broader care environment, we reduce the likelihood that our instruments capture unobserved factors affecting prices or quality through channels other than market competition.

The term u_{fjk} represents the random error term of the first-stage equation, assumed to have a normal distribution. Standard errors are clustered at the local area level to account for potential correlation in unobserved factors among facilities operating within the same market.

3. Results

3.1. Descriptive statistics

Table 1 describes facility characteristics by ownership type. On average, private FP nursing homes have 70 beds, which is smaller than NP facilities (79 beds). The residents in FP facilities are slightly older (89 years), the share of women (76%), death rate (21%) and dependency scores are slightly higher than in non-profit facilities. FP facilities are more often located in areas where the house prices and median income of older adults are higher and closer to an emergency department. Accommodation price is on average 1820 euros per month in NP facilities against 2650 euros in FP facilities. Price variation (standard deviation) is higher across FP facilities (table 1).

Table 1. Characteristics of nursing homes, accommodation prices and quality by ownership status

	For-profit (N=935)		Non-profit (N=3417)	
	Mean	Std. Dev.	Mean	Std. Dev.
Facility characteristics				
Number of beds	70.1	23.2	78.7	40.6
Mean age	88,7	2,42	87,7	2,6
Share of women	75,8%	9,7%	74,6%	9,7%
Average yearly death rate of residents *	20,6%	2,8%	18,6%	3,3%
Average dependency score of residents	733,3	61,5	701,7	85,0
Average diagnostic score of residents	216,8	67,4	213,1	92,1
Share of population aged 75 + in the residential area	9,8%	3,1%	10,7%	3,0%
Share of people aged 75 + living alone in the residential area	37,2%	6,4%	37,3%	5,1%
Median income of people 75 + (base 100, national average)	104,4	28,3	93,0	20,6
Real estate price per square meter in the local area (in euros)	2804,1	1568,7	2036,4	1221,3
Distance to the nearest emergency department (in minute)	8,7	9.2	13,6	12,2
Self-employed nurses within 30 minutes from the facility per 100 000 inhabitants	102.4	48.3	98.2	37.4
No. of employees in home-care and nursing services within 30 minutes from the facility per 100 000 adults aged 60+	1152.5	854.5	1179.0	977.3
No. of beds in social residences at 30 minutes from the facility per 100 000 older adults 60+	699.0	476.8	626.9	494.2
Accommodation price (in euros/month)	2648	584	1818	271
Nursing staff quality				
No of caregivers per 100 residents				
During the day	46,7	12,5	50,4	12,2
At night	2,8	1,6	2,3	1,6
During the weekend	13,7	5,2	12,8	5,7
Annual turnover rate of caring staff	13,6%	5,5%	10,7%	5,7%
Percentage of facilities reporting recruitment difficulties	48,4%	50,0%	43,9%	49,6%
Caregiver quality index**	0,36	0,20	0,42	0,23
Other staff ratio (per 100 residents)	7.2	5.2	9.1	6.8
Building quality				
Age of the building or last renovation (in years)	16,3	21,7	18,7	27,6
Living space per resident (square meters)	53,5	27,2	57,9	23,1
Share of facilities with a garden	94,4%	23,0%	86,8%	33,8%
Share of single rooms	89,4%	14,9%	91,7%	13,9%
Share of rooms with wheelchair accessible showers	84,7%	32,4%	76,1%	37,8%
Share of rooms that accommodate a medical bed	60,1%	47,3%	70,9%	42,9%
Share of rooms with air-condition	14,2%	33,3%	3,7%	17,8%
Building quality index**	0,63	0,19	0,63	0,22
Process quality				
Number of interventions by Mobile hospital team care per 100 residents	2,1	2,4	1,4	1,9
Mobile hospital team intervention for palliative, psychiatric or geriatric pattern (% of facilities reporting support)	64,4%	47,9%	66,6%	47,2%
Telemedicine use in facility (% between 2017 and 2019)	26,4%	44,1%	19,4%	39,6%
Process quality index**	0,60	0,24	0,54	0,25
Outcome quality				
No. of admissions to acute care hospitals (per 100 residents per year)	54,3	15,5	51,3	16,9
No. of readmissions to acute care hospital (per 100 hospitalisation)	5,9	3,0	5,5	3,1
No. of admissions for ambulatory care sensitive conditions (per 100 residents per year)	7,9	3,4	7,5	3,6
No. of emergency admissions to acute care hospital (per 100 resident per year)	33,6	12,3	31,2	13,2
Outcome quality index**	0,46	0,31	0,51	0,32

*Averages are calculated over 2014 and 2019

**Indexes varies between 0 and 1 with 0 being the facility with the lowest quality and 1 being the facility with the highest quality.

Scope: 935 private for profit French nursing homes and 3417 non-profit nursing homes.

Source: based on French individual level data from nursing homes (Resid-Ehpad) matched with the National Health Data System (SNDS) from 2014 to 2019 and the survey of nursing homes ("Enquête auprès des établissements d'hébergement pour personnes âgées", EHPA) from 2015.

On average, there are 50 full-time-equivalent (FTE) caregivers per 100 residents, with a slightly lower average caregiver ratio in for-profit facilities (47 versus 50 per 100 residents). The level

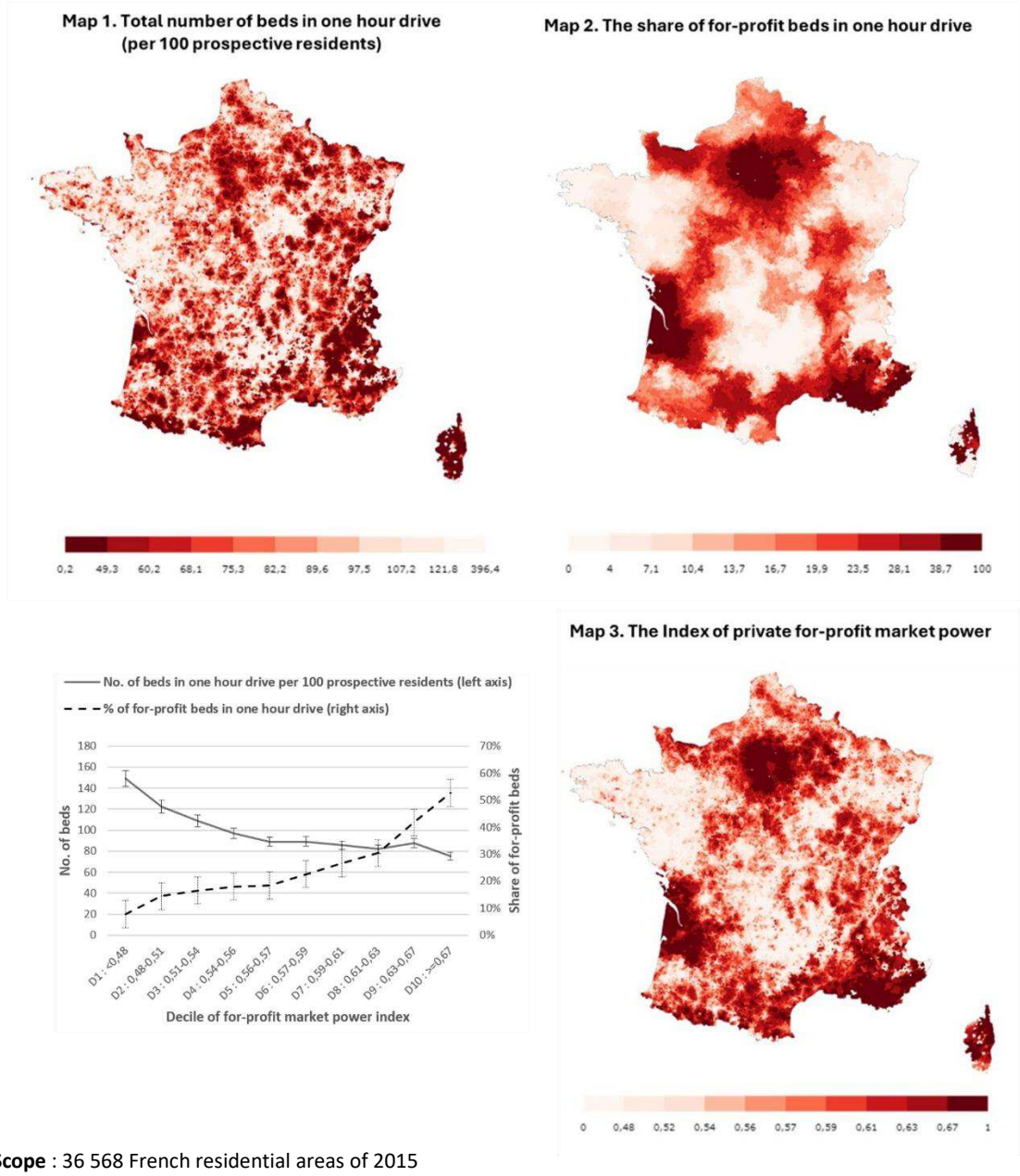
of other staff is also lower in for-profit facilities with 7 FTE per 100 residents (against 9 in NP facilities). Moreover, turnover (14%) and difficulties in recruiting (48% of FP facilities) are slightly higher in for-profit sector. Private facilities have newer or more recently renovated building and more often have gardens and air-conditioned rooms. While the average living space per resident is slightly smaller in FP facilities, wheelchair accessibility in showers is higher (85% of the rooms in FP facilities compared to 76% in NP facilities). Telemedicine is practiced in 26% of FP nursing homes on average, (against 19% in NP facilities). On average, 64% of FP facilities declare received advice from multiprofessional mobile teams. Between 2014 and 2019, on average, there were 54 acute care admissions per year per 100 residents, two-thirds of which are entered through the emergency department (ED) and about 15% were potentially preventable hospitalizations (table 1). The number of admissions, potentially preventable hospitalizations, and 30-day readmissions are slightly higher in FP facilities.

Variations in FP market power

Figure 1 illustrates the spatial variations in nursing homes bed availability, the share of FP facilities and the resulting index of FP market power across residential areas. The availability of nursing home care, measured as the number of beds per 100 prospective residents, varies substantially across the country. Although all regions have residential areas with low levels of supply (<49 beds for 100 prospectives residents), some regions, including greater Paris area, the Alps and Corsica, are particularly underserved. The share of FP facilities located within a one-hour driving distance also exhibits considerable geographic variation. These differences may reflect both attractiveness of local markets for FP providers and differences in regulatory policies of local authorities governing nursing home development (see Figure A6 in appendix A). For instance, the limited presence FP beds in Brittany (in western France) may reflect historical policy choices by local authorities that favoured non-profit provision and contained the expansion of the private FP sector.

The number of beds per 100 prospective residents ranges from an average of 149 in the first decile of the FP market power index to 75 beds in the last decile. The share of FP beds also increases markedly along the distribution of the index, from an average of 8% of nursing home beds in residential areas belonging to the first decile to 53% in those in the last decile. As expected, FP market power is the highest in Paris area, south of France (*Bouches-du-Rhône*, *Var*, etc.) and Corsica. These areas are characterized by both a low number of beds relative to demand and a high proportion of for-profit beds. On the other end of the distribution, regions in west of France (Brittany and *Loire*), combine a high number of beds per potential resident with a very low share of FP beds. In between, there are areas, for example in Normandy, where nursing home supply is high with a high share of FP facilities.

Figure 1. Index of private for-profit market power



Scope : 36 568 French residential areas of 2015

Sources : Carrère et al., 2021; Finess, 2015, authors' calculations.

3.2. Regression results

Table 2 shows IV regression results. The underidentification tests results reject the null hypothesis that the instruments are insufficiently correlated with the FP market power index, confirming the relevance of the instruments in the first-stage regression (Table A3 in Appendix A). In addition, the identification tests provide support for the validity of the exclusion restriction. Finally, the Hansen J overidentification test fails to reject the null hypothesis that the instruments are exogenous, except for the accommodation staff ratio and the process quality indices, for which the Hansen test was close to the rejection threshold, and should

therefore be interpreted with caution. Overall, these results suggest that the instruments are both relevant and plausibly exogenous.

The IV estimates differ notably from the corresponding OLS results, particularly with respect to accommodation prices. While the relationship between FP market power and prices is not statistically significant in the OLS specifications (Table A4 in Appendix A), the IV estimates reveal a significant positive effect, indicating that ignoring endogeneity may lead to an underestimation of the impact of market power on prices. Among the control variables, the strongest predictors of accommodation prices are local real estate prices, the income level of older adults, and the share of the population aged 75 years and over.

All else being equal, a 10% increase in FP market power is associated with a 5% increase in private FP accommodation prices, which represents on average 130 euros per resident per month. Moreover, a 10% increase in private FP market power is associated with a 2% decrease in process quality and 8% decrease in outcome quality. Caregiver quality index, accommodation staff ratio, and building quality index in FP facilities are not significantly impacted by the level of FP market power despite negative coefficients.

Table 2. Impact of the private for-profit market power on price and quality of for-profit facilities

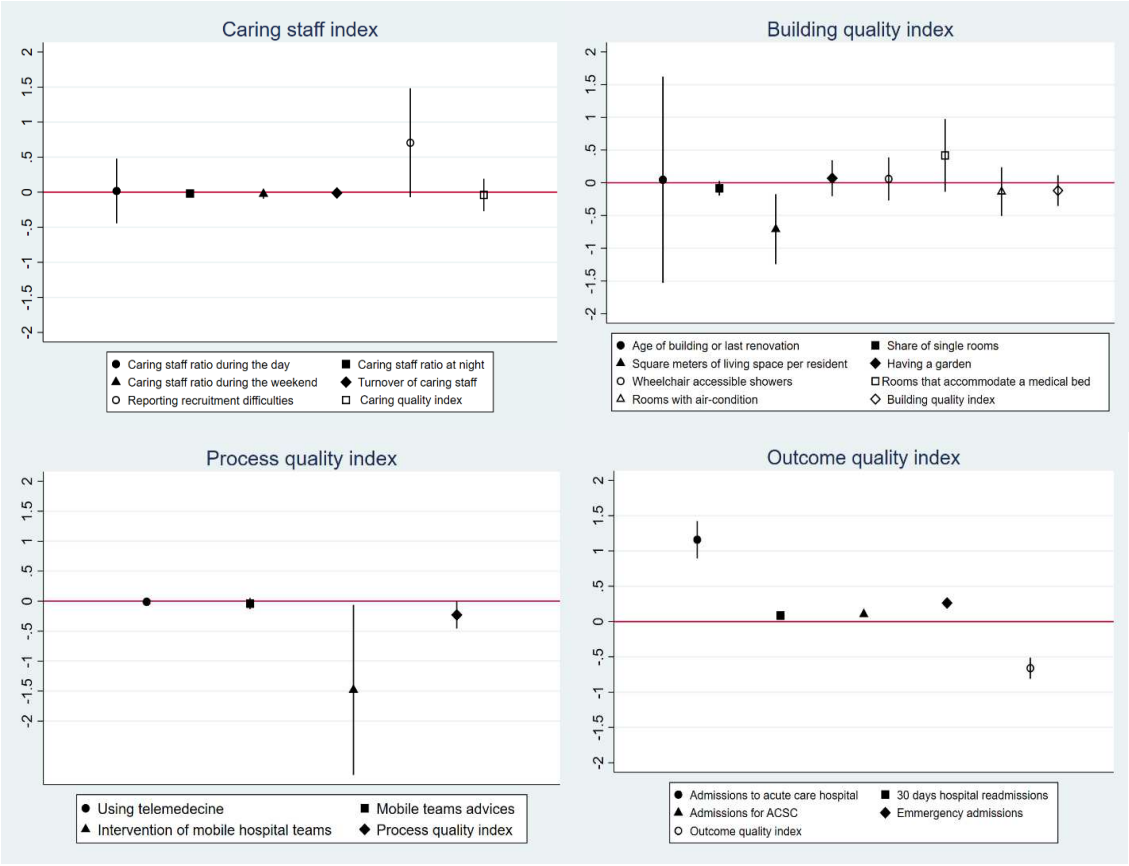
IV estimations All variables in log	For profit facilities (N=935)					
	Price	Caring Staff quality index	Accommodation Staff ratio	Building quality index	Process quality index	Outcome quality index
Index of private for-profit market power	**0.487*** **	-0.046	-0.151	-0.090	**-0.230** **	**-0.813*** **
	(0.142)	(0.109)	(0.484)	(0.111)	(0.116)	(0.165)
Number of beds	0.0618***	-0.1264***	0.2063***	0.0182*	0.0745***	-0.0462**
	(0.0153)	(0.0148)	(0.0795)	(0.0109)	(0.0135)	(0.0189)
Mean age	-0.0545	-0.0904**	0.1399	0.1240**	0.0475	0.0873*
	(0.0784)	(0.0392)	(0.2437)	(0.0624)	(0.0418)	(0.0499)
Age squared	0.0004	0.0005**	-0.0009	-0.0007*	-0.0003	-0.0005*
	(0.0005)	(0.0002)	(0.0014)	(0.0004)	(0.0003)	(0.0003)
Share of women	-0.1501	0.0904	-0.2572	0.0133	-0.2354**	0.0655
	(0.1189)	(0.1008)	(0.3986)	(0.0875)	(0.0940)	(0.1636)
Average death rate	-1.060***	0.0617	0.4895	-0.649***	0.717***	-0.181
	(0.2737)	(0.2205)	(1.0820)	(0.1950)	(0.2336)	(0.3575)
Dependency/ health score	0.0147	0.0179	0.0165	0.0003	-0.0064	0.0280
	(0.0163)	(0.0172)	(0.0683)	(0.0135)	(0.0146)	(0.0236)
Distance to the nearest ED (residential area level)	-0.022***	0.0057	0.0406	0.0041	0.0036	0.0169**
	(0.0064)	(0.0052)	(0.0255)	(0.0050)	(0.0055)	(0.0082)
Share of 75+ leaving alone (residential area level)	0.2851***	0.0417	-0.0323	0.0568	0.0855**	-0.2132***
	(0.0540)	(0.0378)	(0.1838)	(0.0372)	(0.0426)	(0.0577)
Average income of 75+ (residential area level)	0.0980***	0.0557*	0.0400	0.0077	0.0483	0.0386
	(0.0374)	(0.0304)	(0.1345)	(0.0325)	(0.0305)	(0.0448)
Share of 75 + (residential area level)	-0.0208	0.0005	0.2939***	-0.0299*	-0.0317	0.1422***
	(0.0217)	(0.0174)	(0.0925)	(0.0167)	(0.0198)	(0.0295)
Average house price in local area (residential area level)	0.0841***	0.0080	0.1984*	0.0294	0.0388	0.1566***
	(0.0297)	(0.0246)	(0.1138)	(0.0244)	(0.0272)	(0.0405)
Supply of home care and support services (residential area level)	0.0234**	0.0035	-0.0166	-0.0112	0.0121	0.0027
	(0.0097)	(0.0064)	(0.0365)	(0.0071)	(0.0078)	(0.0117)
Supply of home care and support services (local area level)	0.0655**	-0.0196	-0.0139	0.0023	-0.0105	-0.1975***
	(0.0321)	(0.0242)	(0.1187)	(0.0230)	(0.0252)	(0.0401)
Supply of social residencies (residential area level)	0.0017	0.0004	0.0032	0.0000	0.0005	-0.0152**
	(0.0056)	(0.0042)	(0.0237)	(0.0038)	(0.0047)	(0.0059)
Supply of social residencies (local area level)	-0.0330*	-0.0062	0.0106	0.0005	-0.0064	0.0164
	(0.0173)	(0.0130)	(0.0663)	(0.0127)	(0.0133)	(0.0191)
Supply of self-employed nurses (residential area level)	-0.125***	-0.036*	-0.1162	0.0048	0.037*	0.082**
	(0.0276)	(0.0215)	(0.0944)	(0.0240)	(0.0213)	(0.0334)
Supply of self-employed nurses (local area level)	-0.0340**	0.0203*	0.0578	0.0126	0.0091	0.0291
	(0.0153)	(0.0113)	(0.0615)	(0.0140)	(0.0133)	(0.0191)
_cons	7.7316**	3.9966**	-6.7684	-5.4125**	-2.6634	-4.0173*
	(3.4036)	(1.7172)	(10.5829)	(2.7320)	(1.7872)	(2.1542)
Under-ident	51.18***	51.18***	51.18***	51.18***	51.18***	51.18***
Weak ident (F-test)	31.107	31.107	31.107	31.107	31.107	31.107
Weak ident (KP rK Wald F)	25.026	25.026	25.026	25.026	25.026	25.026
Over-ident (Hasen J stat)	0.125	0.015	4.116**	1.027	4.197**	0.851

*, **, and *** indicate 10%, 5%, and 1% significance, respectively. Standard errors in brackets.
Scope: 935 private for-profit French nursing homes.
Source: Resid-Ehpad; National Health Data System (SNDS); 2015 EHPA Survey.

Figure 2 presents the IV estimates for each variable included to estimate the four quality indexes. Overall, the results suggest that the adverse effect of FP market power on quality is concentrated in specific dimensions of care rather than being uniformly distributed across all indicators. For the nursing staff quality dimension, none of the individual indicators is significantly associated with the level of FP market power. Regarding building quality, only one indicator is significantly affected. A 10-percentage-point increase in FP market power is associated with an 8% reduction in the number of square meters available per resident. Concerning process quality, greater FP market power is associated with weaker collaboration with hospital-based services. Specifically, a 10-percentage-point increase in FP market power is associated with a 15% decrease in the use of mobile hospital teams including geriatric and

palliative care teams. Finally, all four outcome indicators are significantly associated with FP market power. A 10-percentage-point increase in FP market power is associated with a 16% increase in acute-care hospital admissions, a 1% increase in 30-day readmissions, a 1% increase in hospitalizations for ambulatory care-sensitive conditions, and a 3% increase in emergency department admissions. These findings suggest that higher FP market power is primarily associated with poorer resident outcomes, despite limited observable differences in staffing levels and most structural indicators.

Figure 2. IV results for each variables used to estimate quality indexes.



Scope: 935 private for-profit French nursing homes.
Source: Resid-Ehpad; National Health Data System (SNDS); 2015 EHPA Survey.

Limits and robustness checks

We should note some limitations of our analysis. First, although the statistical tests reported in Table 2 support generally the validity of our instrumental variable strategy, they cannot by themselves fully establish instrument exogeneity. A potential threat to identification arises from omitted intra-sector competition. Intersectoral competition between for-profit (FP) and non-profit providers is likely to be correlated with competition among FP facilities themselves. Consequently, areas with stronger competitive pressure from the non-profit sector may also exhibit greater competition within the FP sector, raising the possibility that our estimates partly capture unobserved intra-sector competitive pressures. First, we note that the competition within the FP market is relatively low in France where three major groups accounts for about two third of nursing homes. Second, to address this concern, we conducted a robustness analysis in which a measure of intra-sector competition was included in both stages of the IV estimation. For each FP facility, intra-sector competition was measured as the facility's market share among all FP nursing homes located within a one-hour driving distance. Although intra-sector and intersectoral competition are strongly correlated, the inclusion of this additional control does not alter the estimated effects of FP market power on quality. Moreover, the estimated effect on accommodation prices becomes even stronger. These findings suggest that our results are not driven by omitted variation in intra-sector competition and provide additional support for the validity of our identification strategy.

Third, we tested the robustness of the results using alternative measures of market power. We first replaced our indicator with that proposed by [20]: the market share of for-profit facilities. We then considered a second alternative measure and calculated a Herfindahl-Hirschman Index (HHI), defined as the sum of squared market shares of facilities (number of beds/total number of beds)^2 within one-hour drive of the residential area. We also computed the share of total market concentration attributable to the FP sector, defined as the ratio of the FP-specific HHI to the overall HHI. Using these two indicators we calculated a new index of private FP market power through factorial analysis. Results obtained are also very similar confirming that higher FP market power is associated with higher prices and lower quality.

Finally, despite our efforts to calculate a wide range of indicators that capture different dimensions of quality in nursing homes, some important aspects of nursing home performance remain unobserved. In particular, France does not systematically collect national data on residents' health status and functional autonomy, such as the prevalence of pressure ulcers, changes in mobility, or deterioration in cognitive and physical functioning. Similarly, information on residents' quality of life, care experience, and satisfaction, as well as that of their families, is not routinely available. As a result, our quality measures cannot fully capture all dimensions of nursing home quality. Nevertheless, the indicators developed for this study are original and provide a more comprehensive assessment of quality than has previously been available in the French context.

4. Discussion

In this study we examined the impact of FP market power on accommodation prices and quality of nursing homes in France. Most of the empirical literature on competition in

healthcare measures competition by an overall concentration index without considering the public-private mix of providers in the market [11, 40]. We contribute to this literature by developing an original measure of FP market power that combines the share of FP providers with nursing home accessibility, thereby accounting for both ownership structure and local demand conditions.

Our results reveal substantial geographic variation in overall availability of nursing homes and presence of FP facilities across residential areas in France, reflecting large differences in market attractiveness and local long-term care policies. Exploiting this variation, we find that FP facilities operating in areas where the FP sector enjoys greater market power charge higher accommodation prices. At the same time, these facilities do not exhibit higher staffing or building quality and, on the contrary, provide lower process and outcome quality. These findings are consistent with Hirth's theory suggesting that competition from non-profit sector can enhance the quality in the for-profit sector, as well as the theory of market segmentation. According to [41], when a FP facility enters a market, it chooses the combination of price and quality that best corresponds to the market segment it seeks to serve. Our results indicate that, in markets characterized by limited supply and a strong FP presence, for-profit facilities can adopt a high-price, low-quality strategy. Strong demand in the market allows these facilities to increase their prices without making corresponding investment in quality particularly in dimensions that are difficult to observe for potential residents and their families.

Our results are also consistent with the French and international literature showing that for-profit facilities tend to charge higher prices and provide lower quality when competitive pressures are weak, , particularly in markets dominated by large corporate chains [27, 28]. In France, three major nursing home groups–account for approximately two-thirds of all for-profit facilities. Therefore, the competition within the FP sector is relatively limited, making intersectoral competition from non-profit providers particularly important for constraining market power.

These findings have several policy implications. A number of OECD countries including Germany and Australia regulate accommodation prices in private nursing home market through negotiated rates or price ceilings [33]. Nevertheless, price regulation alone may generate unintended consequences if providers respond by reducing quality to maintain their profit margins. Strengthening the monitoring and public reporting of quality in nursing homes is therefore essential to reduce information asymmetries and promote competition based on quality rather than price alone. Another policy lever is to more actively regulate the supply of nursing homes by monitoring the market power of FP providers and considering limits on excessive concentration. For example, policymakers could establish thresholds for the proportion of for-profit beds within a defined geographic area. Nonetheless, changes in the ownership composition of local nursing home markets are likely to occur only gradually, given the slow turnover of facilities and the lasting effects of past regulatory decisions.

Conclusion

The public-private mix of nursing home supply at residential level has significant impact on both the prices charged and the quality delivered by for-profit facilities. Geographical inequalities in the availability of non-profit nursing homes across French regions create excess demand for nonprofit sector in some areas, reduces competitive pressure and increase the market power of for-profit providers. As a result, residents face higher accommodation prices, while quality, particularly in terms of care processes and outcomes, tends to be lower. These findings highlight the importance of preserving a balanced ownership structure in local nursing home markets and underscore the need for stronger public regulation to contain out-of-pocket costs, to promote quality and ensure more equitable access to long-term care in France and other countries facing similar demographic and market challenges.

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