

ERASMUS UNIVERSITY ROTTERDAM

ERASMUS SCHOOL OF ECONOMICS



# **“Who cares? The Impacts on the Quality of Nursing Homes owned by Private Equity”**

**Evidence from The U.K. and The Netherlands**

MSc thesis Financial Economics

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## ABSTRACT

European countries are experiencing a fast population ageing. It is expected that the population over 65 will increase from 20.3% in 2019 to 29.5% in 2050. With more old people and fewer young people taking care of them, it is projected that the demand for nursing homes will also increase over time. Given this and governmental subsidies, private equity (P.E.) firms see this as a long-term investment opportunity to obtain a stable source of revenue. Multiple authors have studied the differences in the quality of private vs public nursing homes, but just a few have studied the effect of P.E. ownership on the quality of nursing homes, especially in the European market. I aim to unravel how nursing home quality is affected by different types of ownership, with a special focus on P.E. ownership. Information is gathered from public sources to analyse the markets in the Netherlands and the U.K. by using different statistical methods. The results show that in the Netherlands, customers perceive P.E.-owned organisations as of better quality, but a second analysis using the Donabedian model shows that in the Structural pillar, they perform worse than the control group, while in the other two pillars (Processes and Outcomes) the results are not significant. In the U.K., the results show that these firms deliver a worse quality of care than other companies according to government inspection reports. These results help set the foundations for future research on a topic that will most likely catch the public attention as the population gets older and it becomes more relevant to find highly skilled personnel and organisations to face this challenge. Governments must address this issue having in mind the requirements of both the population and the business owners.

Keywords: Private Equity, Nursing homes, Quality of care.

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# Chapter 1 Introduction

## 1.1 Social Problem Statement

The ageing of the European population is a source of concern for governments; the proportion of older individuals in the total people is growing, posing several new economic issues (European Commission, 2019). Why should we be concerned? Because the ratio of old-age dependency<sup>1</sup> is increasing, meaning fewer potential workers are available to assist the elderly, putting pressure on economic growth, reducing labour supply, and increasing social costs and government finances (European Commission, 2019). In 2019, the total population of 65 in the 27 countries of the European Union was 20,3%<sup>2</sup>. By 2050, this figure will have risen to 29,5% or nearly one-third of the total population in Europe. One of the flaws in this scenario is the long-term care system (hereafter, 'L.T.C.') where the ageing population threatens to render the current system unfit for the future (European Commission, 2019). Furthermore, as family structures change, many older adults will no longer have a relative to care for them, increasing the demand for formal long-term care services rather than home and informal care.

Today, approximately 7% of the European population requires long-term care<sup>3</sup>. In total, 30.8 million people are potentially dependent on L.T.C. The number of people who may require long-term care is expected to climb to 38.1 million by 2050<sup>4</sup>. The elderly are overrepresented in long-term care (Wittenberg et al.,2002) where more than half of all prospective dependents are 65 and older<sup>5</sup> as we can see in **FIGURE 1**. This means that countries will need to find a way to provide this population with affordable and adequate access to long-term services. Furthermore, another

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<sup>1</sup> The old-age dependency ratio is the ratio of the number of elderly people at an age when they are generally economically inactive (i.e. aged 65 and over), compared to the number of people of working age (i.e. 15-64 years old).

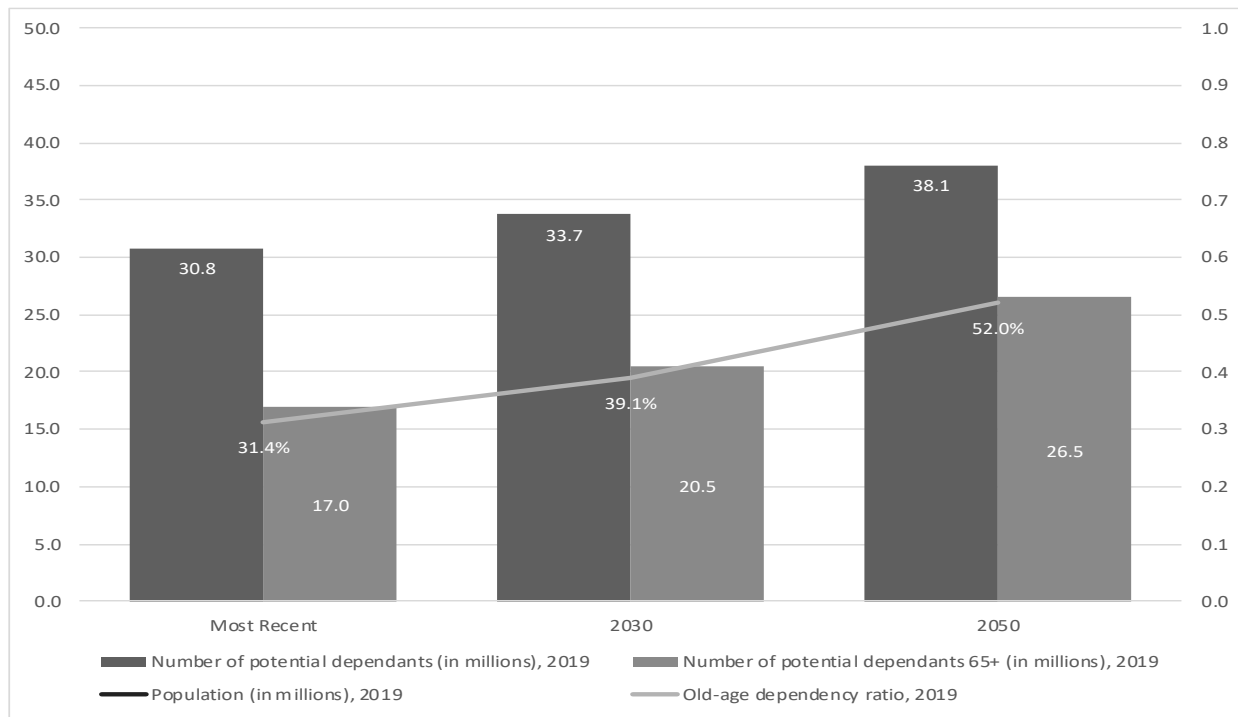
<sup>2</sup> Data from the Joint report prepared by the Social Protection Committee (S.P.C.) and the European Commission (DG EMPL) "Long-Term Care Report" 2021

<sup>3</sup> Share of population 65+ in need of L.T.C.\*, defined as having at least one severe difficulty in personal care activities (A.D.L.s) and household activities (IADLS), is the preferred indicator of the I.S.G. to estimate the number of people in need of L.T.C. For personal care activities, respondents are asked whether they have difficulties Feeding yourself/ Getting in and out of a bed or chair/ Dressing and un-dressing/ Using toilets/ Bathing or showering. Household activities include 'Preparing meals/ Using the telephone/ Shopping/ Managing medication/ Light housework/ Occasional heavy housework/ Taking care of finances and everyday administrative tasks' (Eurostat, EHIS, hlth\_ehis\_tadle).

<sup>4</sup> Data from The Report Long-term Care jointly prepared by the European Commission and the Social Protection Committee, 2021.

<sup>5</sup> Data from The Report Long-term Care jointly prepared by the European Commission and the Social Protection Committee, 2021.

critical challenge will be ensuring high-quality conditions for patients, particularly the elderly, as many of them spend their retirement years in nursing homes.



**FIGURE 1: DEMOGRAPHICS AND OLD-AGE DEPENDENCY RATIO 2019**

SEVERAL POTENTIAL DEFENDANTS (FOR THE TOTAL POPULATION AND POPULATION 65+) SHOW THE DATA USED IN THE AGEING REPORT TO IDENTIFY THE NUMBER OF PEOPLE WHO MIGHT NEED L.T.C. THE POPULATION OF POTENTIAL DEFENDANTS IS BASED ON AN AVERAGE OF THE LAST FOUR YEARS OF EU-SILC DATA (2015-2018) ON SEVERE 'SELF-PERCEIVED LONGSTANDING LIMITATION IN ACTIVITIES BECAUSE OF HEALTH PROBLEMS [FOR AT LEAST THE LAST SIX MONTHS]' FOR PEOPLE IN PRIVATE HOUSEHOLDS, WITH THE ADDITION OF NATIONAL DATA ON RECIPIENTS OF INSTITUTIONAL L.T.C. (WHO ARE DEPENDENT AND WHO ARE NOT INCLUDED IN THE EU-SILC SURVEY).

SOURCE: (European Commission, Directorate-General for Employment, Social Affairs and Inclusion, 2021)

The way elderly care is structured varies greatly among European countries, mainly due to levels of public spending, government policies, and regulations affecting the composition of firms in this sector, promoting, or hindering the role of for-profit organizations. In the Netherlands, 20% of Nursing Homes are private for-profit (Bos et al., 2020). However, in England, private for-profit represents more than 80% of the total beds available (Competition & Market Authority [C.M.A.], 2017).

In the recent decade, private equity (hereafter 'P.E.') firms have emerged as important buyers in this market and have strengthened their participation in this industry, owing to the demographic ageing trend, stable revenues, and the ability to expand further through subsidies and



independent property companies (REITs). In addition, P.E. firms can reduce taxes, litigation, and regulatory scrutiny through these REITs to enhance profitability (Panos et al.,2016; Harrington et al., 2011; Herning, 2012; Lloyd et al., 2014; Stevenson et al., 2008; Stevenson et al., 2013; U.S. Government Accountability Office, [GAO], 2010). These firms are actively involved in European countries, such as Norway, Sweden, and the United Kingdom, and also outside Europe, such as Canada, and the United States.

It can be challenging to understand what causes quality differences between nursing homes. One hypothesis is that the ownership type affects the quality of care in nursing homes. This relationship has been studied, but largely to compare non-profit and for-profit businesses, without differentiating by for-profit ownership types such as P.E. The literature suggests that for-profit companies provide lower-quality services (Bos et al., 2017a; Comondore et al., 2009; Hillmer et al., 2005; Harrington et al., 2011; McGregor et al., 2010). In addition, for-profit providers achieve worse employee satisfaction (Bos et al.,2017b) but offer better outcomes regarding cost-effectiveness (Bos et al.,2017b) compared to non-profit and public-owned care homes. However, the effect that P.E. ownership has on the quality of nursing homes is not well-researched.

Nonetheless, some authors have explored the relationship between private equity ownership and quality in nursing homes (Stevenson et al., 2006 and 2008), finding little evidence that quality deteriorates significantly after a P.E. purchase, based on deficiencies<sup>6</sup> or resident outcomes. Other studies, mainly conducted in the United States, show that nursing homes owned by private equity firms provide lower-quality care with a specifically troubling change in nurse staffing and a significantly higher number of deficiencies (Harrington et al., 2012; Pradhan et al., 2014). Similarly, Gupta et al., (2021) found that P.E. ownership nursing homes reduced nurse staffing and increase short-term mortality of Medicare patients by 10% over a twelve-year sample period. There was also a systematic change in post-acquisition expenditures, such as monitoring fees, interest, and leasing payments. However, the relationship between ownership and quality care remains

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<sup>6</sup> Deficiencies are issued to facilities failing to meet the federal Medicare and Medicaid participation standards. Deficiencies are classified into several categories based on their scope and severity.

ambiguous outside of the US, where less data on ownership information and quality indicators are available.

Therefore, this thesis will aim to analyse how private equity ownership influences the quality of nursing homes in the EU and the UK, to determine whether the effects found in the U.S. can be transferred to other areas. To achieve that, this research will focus on two countries: the Netherlands and the United Kingdom.

I will address the research question: *Does private equity ownership impact the quality-of-care nursing homes deliver to their residents in EU-UK?*

To answer this question, I have conducted two research studies in the Netherlands and one in the U.K. The first is based on customer reviews to assess the quality of nursing homes, based on the opinions of patients and their relatives. To do so, information from more than 13,600 reviews for 2,748 facilities between 2010 and 2021 was collected from a public website. The second research applies the Donabedian framework to evaluate the quality of nursing homes in terms of structure, process, and outcome (Hjelmar et al., 2018; Herman et al., 2009; Weech-Maldonado et al., 2004). Finally, for the UK case, quality research was conducted through the CQC inspection report, where facilities are rated according to the quality they deliver from Outstanding to Inadequate.

The results of this thesis research show that in the Netherlands the results are mixed. In terms of customer reviews, I found that private equity firms received on average higher evaluations than non-profit and for-profit organizations. This contradicts the findings of Bos et al., (2020), who tentatively suggest that customer ratings of P.E.-owned establishments are lower than those of non-profit and for-profit organisations. The association between ownership and each pillar is mixed in the second analysis. Our findings are consistent with those of Winbland et al. (2017), who found that public providers score higher on the structural pillar and private providers score better on the process pillar. In the case of the U.K., the findings of this thesis show that, based on quality information provided by inspection ratings by home care regulators, nursing homes run by a P.E. provider are, on average, of lower quality than those run by for-profit or non-profit organisations. Barron et al., (2017) came to similar conclusions stating that, on average, local authorities and not-profit organisations have a higher quality compared to for-profit nursing homes in the UK.

The results show that for-profit providers offer lower quality than other providers, but this does not mean that the centres are of bad quality. More than 60% of facilities in the United Kingdom are rated as outstanding or good and other studies in Nordic countries do not support that for-profit providers offer lower quality compared to others (Hjelmar et al., 2018; Winbland et al., 2017). As a result, the effect of P.E. on quality in the long-term care sector may be dependent on the market, region, or regulation.

This thesis is structured as follows: Section 2 describes the institutional overview of private equity and nursing homes in the Netherlands and the U.K. Section 3 provides a review of the literature on a different type of ownership and their effect on quality. Section 4 sets out the hypotheses this research will test to help answer the research question. Section 5 discusses the data process and description of variables incorporated into the study. Section 6 describes the methods of analysis. Section 7 reports the results of the research. Lastly, section 8 presents the conclusion of this thesis and lists the limitations of this research.

## Chapter 2 Institutional Background

The purpose of this section is to provide an overview of the institutional context for long-term care in the Netherlands and the United Kingdom, as well as some insights into why private equity firms enter this industry. The section concludes with a detailed discussion of what is quality of care and how important it is to quantify the quality of care using the Donabedian framework.

### 2.1 Background of Long-Term Care Institutions

In the European context, public spending on long-term care as a percentage of G.D.P. was 1.7% in 2019 and is projected to double to 3.4% by 2050. North Eastern Europe is the biggest spender on L.T.C., with the Netherlands being at the top together with the Scandinavian countries (Denmark, Norway, and Sweden)<sup>7</sup>, with annual spending of 3.7% in 2019<sup>8</sup>. In the U.K., 2.8% of the G.D.P. was spent on L.T.C. in 2019<sup>9</sup>. These countries have more formal L.T.C. services, and one-quarter or more of the total health spending is related to L.T.C. services (OECD, 2021).

For this study, it is essential to delineate the meaning of Long-term Care. According to the OECD definition:

*L.T.C. consists of a range of medical, personal care and assistance services that are provided with the primary goal of alleviating pain and reducing or managing the deterioration in health status for people with a degree of long-term dependency, assisting them with their personal care (through help for activities of daily living (A.D.L.s), such as eating, washing, and dressing) and assisting them to live independently (through help for instrumental activities of daily living, IADL, such as cooking, shopping, and managing finances) (OECD, 2021).*

The purpose of long-term care is to make an unpleasant condition more bearable. Some examples are the restriction of a person in daily activities due to a disability, a chronic condition,

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7 <https://www.oecd.org/health/health-systems/Spending-on-long-term-care-Brief-November-2020.pdf>

8 Data come from SPC and DG EMPL (2021) for countries from EU and from OECD (2021) or Office fédéral de la Statistique (<https://www.bfs.admin.ch/bfs>) for Switzerland. The data correspond to data collected between 2016 and 2019, COVID.

9 Data come from: <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthcaresystem/bulletins/ukhealthaccounts/2019>

trauma, or illness. The limitations and inability of this person to carry out essential daily self-care or personal tasks may render him/her in need of long-term care and make him/her dependent (in the case of dependency, the L.T.C. divides the group into dependents and non-dependents).

Comparing long-term care spending curves with the healthcare spending curves, it can be concluded that L.T.C. expense is essentially non-existent before the age of 60-65. However, from 65 over, this L.C.T. cost increases sharply. In addition, the expenditure may have features, such as the combination of formal and informal care and the current prevalence of dependency (disability status) (Oliveira et al., 2006).

In the Netherlands, the percentage of the population aged 65 and over was 19.1 per cent and the percentage of the population aged 80 and over was 4.6 per cent in 2019. For the United Kingdom, the population aged 65 and over was 18.5 per cent, and the population aged 80 and over was 5 per cent in 2019<sup>10</sup>. While the rise of the population aged 65 and over has been remarkable, the increase in life expectancy has increased further. On average, people in the Netherlands and England are expected to live 20,2 and 20,0 years after age 65 respectively<sup>11</sup>. However, not all of these additional years are lived in good health. In the European Union, an index called "healthy life years" is calculated based on a general question on disability in the E.U. Statistics survey on Income and Living Conditions (EU-SILC). In the Netherlands, people 65 and over live healthy for 9.9 years and live for 10.3 years with some kind of activity limitation<sup>12</sup>.

The health problems the older population has encountered have significantly impacted and shortened life expectancy in recent years. For example, during the recent pandemic, mortality was concentrated in this age group; in 21 OECD countries, 93% of Covid-19 deaths were among those aged 60 and over<sup>13</sup>. The problem is compounded when this poor health has an impact and generates limitations in their daily lives<sup>14</sup>. For example, in the Netherlands, specifically for adults aged 65

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<sup>10</sup> Source: OECD Health Statistics 2021, OECD Historical Population Data and Projections Database, 2021.

<sup>11</sup> Source: OECD Health Statistics 2021.

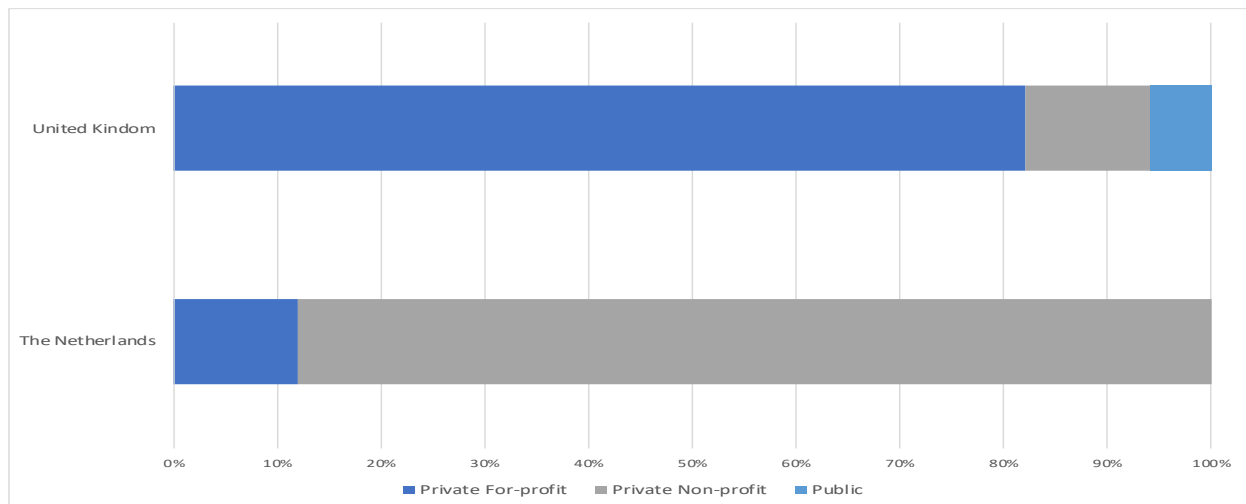
<sup>12</sup> Source: Eurostat Database. Data comparability is limited because of cultural factors and different formulations of questions in EU-SILC; there is no information on the United Kingdom. For the Netherlands, the average between men and women was calculated.

<sup>13</sup> OECD (2021), health at a Glance 2021: OECD Indicators, OECD Publishing, Paris, <https://doi.org/10.1787/ae3016b9-en>.

<sup>14</sup> Such activities are defined as activities of daily living, A.D.L.s (eating, dressing, bathing, getting in and out of bed, toileting and continence) or instrumental activities of daily living, IADLs (preparing own meals, cleaning, laundry, taking medication, getting to places beyond walking distance, shopping, managing money affairs and using the telephone/Internet).

years and over, 48,5% had limitations in daily activities, 8,9% had severe limitations, and 39,6% had some limitations in 2019<sup>15</sup>.

The type of organisation of nursing homes can be divided into public, private non-profit or private for-profit (including private equity). The participation of these entities in the market depends on regulations. As shown in **FIGURE 2** the United Kingdom is the country with the most private operators, with 82% of all beds<sup>16</sup> managed by private operators and only 6% by state providers, the remaining 12% is being managed by private non-profit providers. The Netherlands, on the other hand, has no publicly owned care homes, and for-profit providers account for only 12% of the market. The Netherlands relies mainly on non-profit nursing facilities, but recently the relevance of for-profit and privately owned providers in the sector has been boosted ([Jeurissen et al., 2019](#)).



**FIGURE 2: DISTRIBUTION OF CARE HOMES OWNERSHIP (%) IN THE U.K. AND THE NETHERLANDS (2019)**

Source: ORPEA, National Statistics, Cushman & Wakefield, 2019

Source: data for the Netherlands from Bos et al., 2020.

Over the past decade, most European countries have seen the market share of private providers of L.T.C. increase, while public care facilities have declined or grown slowly. In the case of the U.K, the increase in private for-profit providers was driven by government policy that allows local authorities to outsource L.T.C. service to the private sector, as they offer cost-savings<sup>17</sup>.

<sup>15</sup> Source: Eurostat Database.

<sup>16</sup> Source: National Statistics, Cushman & Wakefield, 2019

<sup>17</sup> Source: [https://www.eurofound.europa.eu/sites/default/files/ef\\_publication/field\\_ef\\_document/ef1723en.pdf](https://www.eurofound.europa.eu/sites/default/files/ef_publication/field_ef_document/ef1723en.pdf)

In these countries, quality is regulated based on inspection<sup>18</sup>, which means that the primary responsibility for regulation remains with the government, making them comparable. Despite this, it is essential to note that there are many differences between these countries. For instance, the financing of the Netherlands' L.T.C. is based on social security models (financed by compulsory contributions), while in the U.K., the L.T.C system rests on a means-tested system, which depends on the individuals' income and assets, to establish the degree of coverage applied.

## 2.2 Private Equity Institutional background

Private equity investment in the healthcare sector has been steadily increasing worldwide. For example, between 1998 and 2008, private equity firms in the United States acquired 1,876 individual nursing homes (G.A.O., 2010), and between 2003 and 2008, P.E. firms owned 40% of the large for-profit chains (Bos et al., 2017a). In the U.K., since the opening of financial markets in 1980, new players have emerged in the nursing home sector. The rise of private corporations to supply public services through outsourcing and private financing was a prominent embodiment of this rationale (Blakeley et al., 2019). As a result, private equity firmly and steadily increased its position in the U.K. adult care sectors; between 2005 and 2008, there were 370 P.E. deals in the U.K. healthcare sector worth £33.3 bn<sup>19</sup>.

But what exactly are private equity firms? Private equity firms were founded in the 1970s and 1980s after becoming attractive to companies looking to raise cash outside the public market. P.E. firms began with what is known as a leveraged buyout investment (hereafter 'L.B.O. '), where they acquired a company largely using external debt financing (Kaplan et al., 2009). Within private equity firms they set up fund management to raise funds from investors, investors such as pension funds and institutional investors. With these funds, P.E. purchases companies that would be part of their investment portfolio. Using the fund's capital and a loan commitment, the P.E. firms acquire the portfolio companies for a period of 3 to 7 years (Gilliang et al., 2008). During this time, L.B.O. seeks to increase the value of the company.

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<sup>18</sup>Countries with inspection-based quality regulation, such as England and Australia, rely on inspections and audits for compliance against standards as the main basis for regulating quality, with the main responsibility residing with the government." Source: Review of international systems for long-term care of older people: Report prepared for the Royal Commission into Aged Care Quality and Safety: research paper 2. Flinders University, 2019

<sup>19</sup> Financial Times (05/2008): Four Seasons tries to repay debt (16.08.2021).

P.E. is seeking to increase or maximize the value of the firm through three different actions: financial engineering, governance engineering, and operational engineering (Kaplan et al., 2009). In financial engineering, private equity firms pay particular attention to the incentive they give to the managers of their portfolio companies; the managers usually participate in private equity through stock options and shares (Kaplan et al., 2009; Jensen, 1989; Kaplan, 1989a, b). On the other hand, the use of leverage puts pressure on managers to prevent excess cash from being wasted (Gompers et al., 2016). Due to the tax shelter of interest, leverage could increase the firm's value; however, there is also the risk of having too much debt, which could increase the likelihood of costly financial difficulties (Myers, 1977).

Governance engineering is the process by which private equity investors control their portfolio companies and become more involved in governance. Private equity investors value having strong equity incentives for their management teams to enhance value for their investors. After the investment, they often replace top management and completely overhaul the board, replacing it with insiders and outsiders, and structuring it with a smaller size.

Finally, operational engineering refers to increasing the value of their portfolio companies and developing the industrial and operational expertise they bring to their companies (Kaplan et al., 2009).

After a private equity buyout, the empirical evidence on firms' operating performance is mainly positive (Kaplan et al., 1989b). Empirical works post-1980 with a focus on Europe concluded that leverage and buyout are associated with significant improvements in operating performance and productivity<sup>20</sup>. Also, the ratio of operation to sales tends to increase (Kaplan et al., 2009) and leveraged buyouts are associated with experiencing a significant increase in total productivity after the buyout. (Lichtenberg et al., 1990).

One of the most frequently mentioned ways for private equity firms to generate value for their portfolio companies is cost reduction. However, according to Gompers et al. (2016), in order of importance, it is the last one. Typically, P.E. firms increase revenues, improve incentives and

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<sup>20</sup>This work includes Harris, Siegel, and Wright (2005) for the United Kingdom; Boucly, Sraer, and Thesmar (2008) for France; and Bergström, Grubb, and Jonsson (2007) for Sweden. Cumming, Siegel, and Wright (2007)



governance, facilitate high value-exits, make more acquisitions, replace management, and finally reduce costs. This suggests a shift from the emphasis on cost reduction mentioned by [Jensen \(1989\)](#).

Finally, many researchers have expressed concerns about the influence of private equity on employment. Critics of L.B.O. argue that the transaction benefits investors at the expense of job reductions and wage cuts. However, [Kaplan \(1989b\)](#) shows evidence that employment increased after the buyout, albeit at a slower rate than rivals in the industry. [Lichtenberg et al., \(1990\)](#) reached comparable results. More recently, [Davis et al., \(2011\)](#) examined a larger sample of U.S. buyouts and noticed that employment losses are concentrated in public-to-private buyouts and specific industries, such as retailing. Notably, they observe evidence that private equity buyouts catalyse the process of job creation and destruction in the labour market, with a low impact on net employment. The main response is the rapid reallocation of jobs across the many facilities of the target firms. Overall, the evidence is mixed, but it has not been easy to demonstrate that they employ fewer people than other businesses in the industry. Despite this, the general public's image of private equity remains negative<sup>21</sup>.

### 2.3 Why P.E. in Nursing Homes?

Private equity-owned nursing facilities face different financial considerations compared to for-profit and non-profit providers. When private equity firms purchase a nursing facility, they typically use debt and equity funds to acquire the organization. The L.B.O then sells the nursing home property and leases it back. Due to the large debt commitment, hefty interest payments restrict the cash available to the nursing facility. According to [Gupta et al., \(2021\)](#), cash on hand in the United States drops to 38% following a private equity takeover, leading to budget constraints, and making it difficult to react to emergencies (such as Covid-19).

To generate cash, private equity investors cut costs by reducing headcount. The most significant capital expenditure in the nursing home market is labour. This is due to the high level of staffing required for the residents<sup>22</sup>. In particular, the highly qualified nursing staff is very

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<sup>21</sup>Source: <https://www.forbes.com/sites/timothyspangler/2013/04/10/private-equitys-public-image-issues/?sh=1de26335256b>

<sup>22</sup> According to Hallidays, Report: "Care Home Industry."

expensive. Given the importance of labour, the sector has experienced a high labour supply deficit over the last five years, which has put pressure on and constrained margins in the sector. However, increased regulation has focused on controlling the levels of highly skilled nurses, which has prevented private equity firms from reducing costs using this tactic.

Nursing homes are attractive to P.E. because of their pre-tax profit margins, which typically range between 25-35%, and because of the trend towards an ageing population<sup>23</sup>. Private providers tend to be located in affluent urban locations<sup>24</sup> where revenues are supported by high occupancy rates and increased fees charged to the consumer. The nursing home sector in the United Kingdom has an occupancy rate of 90%<sup>25</sup> with a steady number of residents seeking care beds and, in the Netherlands, monthly expenses range from €3,000 to €6,000 for private for-profit facilities, which earn 23% more per person than non-profit nursing homes<sup>26</sup>. In addition, the leasing of nursing home properties is an important driver for attracting nursing home companies and real estate investors<sup>27</sup>.

The effect of P.E. on nursing homes is ambiguous. On the one hand, P.E. firms are concerned about short-term profits that do not correspond to long-term patient care. Furthermore, L.B.O. tends to shift wealth from employees to investors (Palepu et al., 1990; Burns et al., 2016; Froud et al., 2007). On the other hand, due to the labour-intensive nature of the industry, the process of technology incorporation has been slow. However, thanks to private actors, capital is brought into the industry that non-profit or small firms cannot, allowing them to invest in life-saving technologies and innovations to improve long-term care. In addition, P.E firms generate potential benefits for the sector through their networks, sector knowledge, and management expertise (Appelbaum et al., 2014).

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<sup>23</sup><https://content.knightfrank.com/research/656/documents/en/european-healthcare-care-homes-elderly-care-market-2020-6902.pdf>

<sup>24</sup>[https://www.eurofound.europa.eu/sites/default/files/ef\\_publication/field\\_ef\\_document/ef1723en.pdf](https://www.eurofound.europa.eu/sites/default/files/ef_publication/field_ef_document/ef1723en.pdf)

<sup>25</sup> Source: Knight Frank

<sup>26</sup>[https://www.eurofound.europa.eu/sites/default/files/ef\\_publication/field\\_ef\\_document/ef1723en.pdf](https://www.eurofound.europa.eu/sites/default/files/ef_publication/field_ef_document/ef1723en.pdf)

<sup>27</sup><https://content.knightfrank.com/research/656/documents/en/european-healthcare-care-homes-elderly-care-market-2020-6902.pdf>

## 2.4 The Netherlands

In 2015, the Long-Term Care Act (W.L.Z.) reformed the system, shifting it away from nursing homes and closer to a homecare-based approach. The government did this primarily because the system's costs rose significantly despite cost-cutting measures. In addition, the long-term care industry was decentralized, and regional offices were given more authority over the L.T.C. market in their respective areas to shift care from institutional to community-based. The new role of the government was limited to market oversight and financial management.

Elderly people in nursing homes are cared for by the W.L.Z., funded by the national government, and administered by the care offices. People with a chronic illness or handicap who require 24-hour surveillance or care are eligible for this W.L.Z. Care. The Care Assessment Center (C.I.Z. in Dutch) will then conduct a needs assessment and a means test to determine the person's access to L.T.C. public funds. L.T.C. has three possibilities in the system:

1. **In-kind intramural packages:** staying in a care institution, with available care in the vicinity or permanent supervision 24 hours a day.
2. **In-kind extramural packages:** Two packages, the home-care option, and the modular care option (V.P.T. and M.P.T. in Dutch). For the V.P.T. package, the care institution provides complete care at the patient's home. For M.P.T., the adult who needs L.T.C. receives W.L.Z. care at home. In addition, they can purchase different types of care services (nursing, personal care, domestic help) if listed in their care profile. Unfortunately, providing food and drink is not possible via an M.P.T.
3. **Personal Budget (P.B. in Dutch):** This is a specific amount for the adult needing L.T.C. to purchase and organize the care. For-profit organizations can use the P.B. strategy to select their clientele.

The beneficiaries of institutional care contribute through their pensions, and their cost sharing is determined by an assets test, which decides which institution they can live in. Nonetheless, in rare exceptional cases, a dialogue with the care office may allow a deviation from the designated care facility.

The Netherlands is well-known for its high level of non-profit participation in nursing homes (Jeurissen et al., 2019). However, the composition of the market changed with the

introduction of the W.L.Z. in 2015. As a result of this change, new offerings emerged in the sector and many for-profit companies boosted their participation. With the entry into the market of this new law, for-profit companies increased their participation, taking advantage of two key benefits.

Firstly, the distribution of profits to third parties in nursing facilities was prohibited for intramural schemes in-kind. However, this prohibition was not extended to extramural or personal budget plans, allowing for-profit companies to capture that market. Secondly, high-income residents in need of long-term care paid more significant co-payments in non-profit nursing homes, allowing for-profit nursing homes to offer a less expensive option, boosting their market presence (Bos et al., 2020). For financing long-term care, co-payments increased to a maximum of € 2,506 for W.L.Z. intramural and to € 764 for P.G.B. and M.P.T. in 2022<sup>28</sup>.

Because of the recent open market for for-profit nursing homes in the Netherlands, few studies on private equity have been done. However, some data can be found in the relationship between non-profit and for-profit organizations. In the Dutch system, for-profit organizations have more high-income clients and are generally small-scale, thus having higher client ratings than the non-profit sector (Bos et al., 2020). In addition, the for-profit provider has an advantage in the sense of novelty.

## 2.5 United Kingdom

The United Kingdom has one of the most mature nursing home markets in Europe, and it is similar to other European countries such as Germany and France, where care is provided by a variety of players, including private, public, and charitable organizations (non-profit). Unlike healthcare provided through the National Health Services, long-term care is a decentralized system, where 152 separate local governments provide the service, which creates many heterogeneities in the quality of care (Crawford et al., 2021). As a result of this privatization of the N.H.S.,<sup>29</sup> private for-profit providers clasp a strong position in the care sector, with more than 80% of the total market (Competition & Market Authority [C.M.A.], 2017).

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<sup>28</sup> <https://www.hetcak.nl/>

<sup>29</sup> Harrington et al. (2017). Marketization in Long-Term Care: A Cross-Country Comparison of Large For-Profit Nursing Home Chains. Health Services Insights, June 2017.

According to Care Home U.K., the U.K. has a total of 5.127 Nursing Homes, with 4.104 in England, 260 in Wales, 497 in Scotland, and 248 in Northern Ireland in 2021<sup>30</sup>. The total population that needs long-term care homes aged 65 or over in 2020 is 418.978<sup>31</sup>. Around 4% of the population of the United Kingdom aged 65 and over are currently receiving care in a care home, rising to 15% of those aged 85 and over<sup>32</sup>. The largest providers with a dominant force in the market have 16.8% of the total number of beds in England in 2019<sup>33</sup>.

The local system is partly funded by the central government and local taxes, but the long-term care resident is means-tested. Therefore, long-term care payments depend on the type of care and support the client needs and their future circumstances.

The threshold for savings and assets in the U.K. is different for each country (for the other area's information, see Appendix A. Long-term care system). In England if a person's capital exceeds £23.250 (about €27.086), they must pay the full cost of care; if it is less than £23.250, they must pay part of the cost of care. 84.7% of care home beds in England were occupied between 2019 and 2020. Self-funders account for around 36.7% of long-term care clients and state-funded account for 63.3% of care home residents. There is much variation in the residential cost across the U.K., with London being one of the most expensive areas.

## 2.6 Quality

Quality in nursing home care is well-known to be multidimensional (Zimmerman, 2003). This premise, combined with the subjective nature of nursing home care (Davis, 1991) makes it a difficult subject to define and measure. According to Malley and Fernández (2010) capturing quality care is a complex system. This is due to three significant qualities. Firstly, determining the most valuable characteristics requires first-hand experience as a service provider. Secondly, as a labour-intensive sector, there can be major disparities among long-term care providers. Thirdly, as

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<sup>30</sup> Data from June 2020 by the Department of Health Northern Ireland.

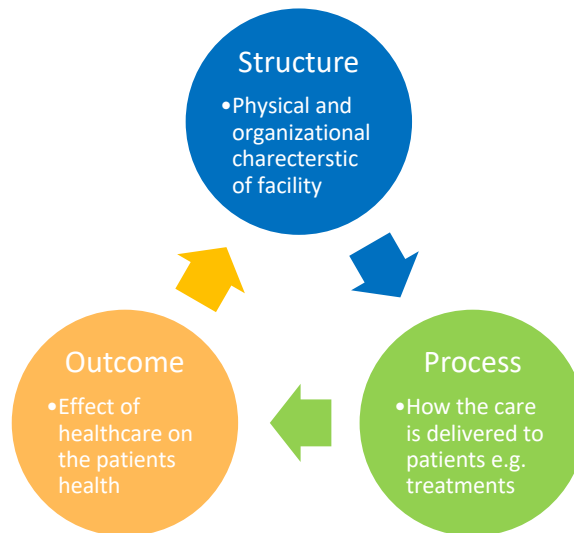
<sup>31</sup> Care home and non-care home populations used in the Deaths involving COVID-19 in the care sector article, England and Wales, 2020 Data prepared by Office for National Statistics. Release date: 8 September 2020. Detail: 348.832 in England, 20.651 in Wales, 30.502 in Scotland, 8.191 in nursing homes (assuming only adult people live in N.H.) June 20 and Northern Ireland 10.802 in June 2020.

<sup>32</sup> Laing and Buisson survey 2016

<sup>33</sup> Following Burns et al. (2016), the definition they use of 'large' providers is those operating at least 50 care homes. Data from: Future Care Capital, Report Data that Care, 2020.

the consumption and production of services are closely intertwined, it is impossible to separate the influence of the provider on the quality of the service (Malley and Fernández, 2010).

The Donabedian framework, structures, processes, and outcomes are widely used to measure quality in care settings. This quality framework takes into account all essential features of a healthcare provider, meaning that it is well-suited for assessing quality. The Structural pillar includes all organisational features and resources, such as the staff, building and equipment. The Processes pillar encompasses the way care is provided and received by residents. Finally, the Outcome pillar is the impact of the care service on the L.T.C. recipient. (Donabedian, 1988). On the other hand, gathering all of the information for each pillar and their connection is challenging, and certain indicators are difficult to standardize.



**FIGURE 3: DONABEDIAN STRUCTURE-PROCESS-OUTCOME FRAMEWORK.**

## Chapter 3 Literature Review

This section explores the available literature to determine how different types of ownership may affect the quality of nursing homes. In this chapter, I will describe a gap in the literature, which translates into a lack of understanding of the effect of ownership type on nursing homes' quality in the European markets. Finally, this section will conclude by discussing the significance and contribution of this thesis to the literature and laying the groundwork for the subsequent chapters.

### 3.1 Overview of Literature review

**TABLE 1** provides a summary of the papers reviewed, related to how different types of ownership affect the quality of care provided by nursing homes. Column 2 shows that the scope of these studies was broad, as multiple European countries, and the United States were studied. However, the authors' focus on assessing the influence of private equity on quality is limited to the United States. In column 6, we can observe how P.E. affects the quality of services provided by the establishment. Only papers that report a specific P.E.-related conclusion have a comment in column 6. Finally, most of the research shows a negative impact on the quality when a P.E. firm is the owner of a nursing home.

**TABLE 1** shows most authors concluded a negative effect of P.E.-ownership on quality (Gupta et al., 2021; Pradhan et al., 2014; Harrington et al., 2012) in this and in other industries, such as higher education, where the effect is also poorer on the quality they provided. On the other hand, only Gandhi et al., (2020) found that P.E. ownership is related to an improvement in the quality of the care provided by nursing homes in highly competitive markets. Lastly, Stevenson et al., (2008) reported no difference in quality related to P.E. ownership.

**TABLE 1: SUMMARY OF LITERATURE REVIEW**

This table provides information on the existing literature review. The column "Ownership Focus" mentioned specifically how the study approaches the type of ownership. The final column displays the effect that private equity ownership has on the quality of care. A (-) means a negative impact, (+) a positive impact, (Mixed) evidence in both directions, and (No effect) little or no clear evidence.

<b>Study (1)</b>	<b>Scope (2)</b>	<b>Ownership Focus (3)</b>	<b>Data Private Equity (4)</b>	<b>Main Findings (5)</b>	<b>Effect of Private Equity on quality (6)</b>
Winblad et al., (2017)	Sweden	(1) Private Providers: For-Profit, Non-Profit & P.E. (2) Public Providers	201 P.E. facilities	Public nursing homes have higher quality in two structural quality measures: staffing level and individual accommodation  Private nursing homes tend to have a higher score in process-based quality measures: medication review and screening for falls and malnutrition.  No significant differences between different private providers	-
Hjelmar et al., (2018)	Denmark	(1) Private Providers: For-Profit & Non-Profit (2) Public Providers	-	Public nursing homes have higher quality in structural quality measures: staffing level  FP providers tend to have a higher score in process-based quality measures: in the form of individualised care	-
Barron et al., (2017)	United Kingdom	(1) Private Providers: For-Profit & Non-Profit (2) Public Providers	-	For-profit have lower CQC quality ratings than public and non-profit providers	-



**TABLE 1:SUMMAY OF LITERATURE REVIEW (CONTINUED)**

Study	Scope	Ownership Focus	Data Private Equity	Main Findings	Effect of Private Equity on quality
Harrington et al., (2012)	United States	(1) 10 For-profit largest chain compared to (1) others FP chains, (2) FP nonchains, (3) NFP chains, (4) NFP nonchains, and (5) government facilities (2) 4 largest nursing home chains purchased by P.E. firms	(1) Top 10 chains (1,977 facilities) (2) Four chains purchased by P.E. firms (996 facilities)	(1) Top 10 for-profit chains are related to low staffing and higher deficiencies than other government facilities (2) The largest chains will have poorer quality after purchase by PE firms	(Mixed) PE companies have little change in staff level (-) The chains purchased by P.E. present a greater number of deficiencies reports
Pradhan et al., (2014)	United States, Florida	Private Equity	-	Private equity nursing homes have lower RN staffing intensity and lower RN skill mix compared to other F.P. nursing homes  Private equity nursing homes perform significantly worse on deficiencies	(-) P.E. firms have a lower-skilled RNs staff composition that is substituted with cheap and less skilled nurses.  (-) P.E. facilities report a significantly higher number of deficiencies
Stevenson et al., (2008)	United States	Private Equity	1,500 facilities	Private Equity nursing homes do not report significant deterioration of quality as measured by deficiencies or resident outcomes	(No effect) After a P.E. purchased a nursing home, there is little evidence that the quality of care has deteriorated.
Hillmer et al., (2005)	United States	Private Providers: For-Profit & Non-Profit Public Providers	-	For-profit nursing homes appear to provide a lower quality of care in many important areas of process and outcome.	-
Gupta et al., (2021)	United States	Private Equity	136 deals (1,674 facilities)	Negative effect on patient welfare at nursing homes	(-)
Gandhi et al., (2020)	United States	Private Equity	69 deals (1,455 facilities)	P.E.-owned facilities increase the quality of care provided in highly competitive markets while reducing the quality of care in less competitive markets	(-) in a less competitive market (+) in a highly competitive market
<b>Other industries</b>					
Eaton et al., (2019)	United States	Private Equity in higher education	88 P.E. deals (994 schools)	Lower-quality P.E. firms exploit large government subsidies and the opacity of product quality	(-) After buyouts, lower education inputs, graduation rates, loan repayment rates, and earnings among graduates

There are reasons to believe nursing homes with a P.E. provider perform worse because P.E. firms are under pressure to deliver higher profits to their investors and Pradhan et al., (2014) found private equity firm-owned nursing homes are more profitable than others. Another reason is that P.E. firms tend to reduce costs. As the nursing home industry is a labour-intensive industry, cost-cutting involves replacing and reducing expensive and skilled RNs for less expensive and less skilled nurses (Pradhan et al., 2014). The quality of the care provided is strongly influenced by the availability and expertise of nurses, which means that a reduction in either of these dimensions leads to a worse service provided (Harrington et al., 2000, Konetzka et al., 2008). The final argument is that P.E. short-term horizon plan outlook is incompatible with the long-term care quality provided by nursing homes to patients.

In addition to the above, private equity is also increasingly present through nursing home chains (more than two facilities), and since private equity acquires ownership, the quality of care provided has changed (Grabowski et al., 2013; Harrington et al., 2011). Previous research in the United States discovered larger deficiencies in for-profit chains connected to poor patient care quality (Harrington et al., 2017; Harrington et al., 2013; Grabowski et al., 2016). Similarly, studies in Canada, the United States, Sweden and the UK, show low staffing levels in nursing homes in the largest for-profit chains related to poorer quality of care (Harrington et al., 2017; Hsu AT et al., 2016; Struksnes et al., 2012; Harrington et al., 2016).\_However, the presence of large for-profit chains in nursing homes has been different among countries. As a result, in Chapter 5, we show how we control for organizational size to isolate the chain effect.

To conclude the literature review, I will mention where this research fits within the existing literature and what the study hopes to add to the existing literature. Firstly, this research will aim to expand the scope of the previous studies from the U.S to Europe in the spirit of Gupta et al., (2021). Secondly, as Hjelm et al., (2018) did in the Danish nursing home market, this study will use the Donabedian framework to assess care quality (only in the Netherlands I was able to apply this methodology). Thirdly, this research will attempt to incorporate the customers' review as Bos et al., (2020) did, as a relatively different data source to see if there is a relationship between nursing home characteristics as measured by government quality registers and nursing home patient satisfaction.

## Chapter 4 Research Question & Hypothesis

The previous chapter reviewed the present state of research on the effect of private equity on nursing home care quality. This section summarizes those points of view for testing in this study. This section is structured as follows. Firstly, to establish the backdrop for the research question, we will first explore the context of L.T.C. in the United States vs Europe. Secondly, I will formulate the research question and hypothesis that will underpin this thesis.

**TABLE 2: POPULATION STATISTICS AND HEALTHCARE COVERAGE FOR THE NETHERLANDS UNITED KINGDOM AND THE U.S.**

	US	The Netherlands	U.K
Total Population, millions (2017)	327.2	17.2	66.4
Population 65+ %	16	19	18
Nº facilities <sup>34</sup>	15,646		5,144
Dependency Rate	-	30% at 2019	29% at 2018
<b>Ownership by type (%)</b>			
For-Profit	69.8	12.0	82 <sup>35</sup>
Non-Profit	24.0	88.0 <sup>36</sup>	12.0
Government	6.2	-	6.0
<b>Largest Top five For-profit chain<sup>37</sup> (2015-2016)</b>			
Type of Owner	1 public, 2 PE, 2 privates	2 privates <sup>38</sup>	4 PE, 1 private
Market Share	10% all beds	-	35% Fall beds
<b>Health Insurance</b>			
Population covered by government/social health insurance, %	36	99.9	100
Population covered by private health insurance, %	63	84	10

SOURCE: [HTTPS://WWW.BMJ.COM/CONTENT/BMJ/367/BMJ.L6326.FULL.PDF](https://www.bmj.com/content/bmj/367/bmj.l6326.full.pdf)

In formulating the hypotheses, I referred to the study by [Gupta et al., 2021](#) as well as other studies with a U.S. focus to try to investigate whether a similar conclusion could be reached in the Netherlands and the UK. According to [Rodrigues et al., \(2012\)](#), demographics and beneficiary numbers may not fully explain the long-term care system. Factors such as market structure, demography, and government funding can provide a fuller view of similarities and differences in

34 Source: Harrington et al., 2017

35 Source: Laing Buisson, Cushman & Wakefield, 2019

36 Source: Bos et al., 2020

37 Source: Harrington et al., 2017

38 Source: Laing Buisson, Cushman & Wakefield, 2019

nursing home systems among countries. **TABLE 2** displays cross-countries comparisons on a variety of these characteristics.

For-profit nursing homes have become an important provider of healthcare in many countries (Molinuevo et al., 2017; Meagher et al., 2013; Gray et al., 1986). These for-profit nursing homes have increasingly been taken over by large private companies and private equity funds (Harrington et al., 2017). For-profit nursing homes have made significant inroads through purchases of other facilities or nursing home chains, leading to an increase in their number and size. The authors, Harrington et al., (2017) found that private equity firms and investors owned the largest for-profit nursing care chain in five nations, including the United States and the United Kingdom. This large for-profit chain did not provide high-quality service when compared to its competitors.

The above-mentioned points provide evidence that private equity-owned nursing homes may be related to a lower quality of service. Therefore, the aim of the thesis is to determine whether the ownership structure significantly impacts a nursing home's provided care quality. This is translated into the following research question:

*R.Q.: Does private equity ownership impact the quality-of-care nursing homes deliver to their residents in the EU-UK?*

**TABLE 3** shows a summary of the hypotheses to be tested, indicating the independent variable, dependent variable, and the effect direction of the independent variable on the dependent variable. In addition, **TABLE 3** displays the conceptual model indicating the direction of the relationship between independent and dependent variables in the three analyses to be conducted in the Netherlands and the U.K. in this research.

**TABLE 3: SUMMARY OF CONCEPTUAL MODEL**

Hypotheses	Type	Independent Variable	Effect direction	Dependent Variable	Country
H1.1 <sub>0</sub>	Based on Clients Reviews	Private Equity Ownership	Negative (-)	Quality is categorized into six areas: Dates, Nursing, Dealing with Employees, Quality of Life, Listening, and Accommodation.	The Netherlands
H1.2 <sub>0</sub> H1.3 <sub>0</sub> H1.4 <sub>0</sub>	Quality indicators, based on questionnaires filled by the facilities	Private Equity Ownership	Negative (-) for Structural Positive (+) for Process Positive (+) for Outcome	Quality based on Donabedian framework: Structural, Process, and Outcome indicators	The Netherlands
H2.1 <sub>0</sub>	Inspection reports conducted by an independent organization, CQC	Private Equity Ownership	Negative (-)	Quality based on the result from the inspection report, categorized into Safe, Effective, Caring, Responsive, and Welled	The U.K.

The first group of hypotheses is based in the Netherlands. [Bos et al., \(2020\)](#) tentatively suggest that customers' ratings of P.E.-owned facilities are lower than those of non-profit and for-profit in the Netherlands. Most evidence from existing literature found a negative effect of private equity-owned firms compared to others. Therefore, I formulated the hypotheses:

H1.1<sub>0</sub>: Private equity-owned nursing homes have lower ratings compared to other types of ownership, based on customers' reviews.

[Hjelmar et al., \(2018\)](#) found that public nursing homes perform better than for-profit nursing homes in Denmark in the Structural aspects. [Winblad et al., \(2017\)](#) reached similar findings, but for the Swedish market. [Gupta et al., \(2021\)](#), [Pradhan et al., \(2014\)](#), [Harrington et al., \(2012\)](#) reached similar findings. All mentioned studies found that the staffing level was higher in non-profit organisations. Since the motivations behind the owners of for-profit organisations and private equity organisations are similar, we formulate the next hypothesis:

H1.2<sub>0</sub>: Private equity nursing homes have lower scores in the Structural-based quality index.

Winblad et al., (2017) found that the processes were better developed in private nursing homes, where there were more falling screenings and medication reviews were more common. Thus, the next hypothesis is formulated as:

H1.3<sub>0</sub>: Private equity nursing homes have higher scores in the Process-based quality index.

Gupta et al., (2021), found that the short-term mortality rate increased by up to 10% deriving from private equity ownership in the United States. There are reasons to believe that the European market should behave in a similar way as the American market. Therefore, the next hypothesis is formulated:

H1.4<sub>0</sub>: Private equity nursing homes have higher scores in the Outcome-based quality index.

For the United Kingdom, Barron et al., (2017) used the CQC database, which was also used in this study. The authors found that for-profit facilities provide a lower quality of service to their customers. However, they did not distinguish private equity-owned facilities from other for-profit facilities. Therefore, the last hypothesis is formulated as follows:

H2.1<sub>0</sub>: Private equity-owned organisations provide a lower quality of care in nursing homes.

## Chapter 5 Data and methodology

This chapter describes the data that will be used to test the hypothesis formulated in the previous section. The first part of the chapter describes the process of obtaining data for the analysis. Secondly, sections 5.2 to 5.4 describe the variables used in the analysis. Finally, section 5.5 outlines the methodology used in the analysis.

### 5.1 Data source

**For the Netherlands**, I used two different datasets. The first is from the Dutch Patients Federation (In Dutch: ZorgkaartNederland). This website provides insights into the patient's experience by allowing patients and their relatives to leave reviews of healthcare providers on their website. Since 2021, healthcare institutions must include the score from ZorgkaartNederland on their website. For this research, I took the reviews submitted between 2010 and 2021.

To obtain this information, I visited the website [www.zorgkaartnederland.nl](http://www.zorgkaartnederland.nl); it was impossible to download a dataset containing all the data. However, on the website, it is possible to see the ratings provided by customers for each facility, which are divided into six different characteristics of the facility, namely Dates, Nursing, Dealing with Employees, Quality of Life, Listening, and Accommodation. Please refer to **TABLE 4** for more details. In the Netherlands Patients Federation, patients can assign a rating from 1 to 10, with one being the worst and ten being the best for these six areas.

Given that there are thousands of facilities, and each facility may have several reviews, a web-scraping tool was developed in python, which allows to extract of the data in an automatic way. This script works by accessing the page of each facility on the website and parsing the website's HTML code to extract the relevant data from each review. This allows for extracting information from thousands of facilities in a standardized format while avoiding mistakes related to manual extraction. The relevant data of each review includes the rating given to each category and the review date. Additionally, the script parsed and saved the direction, zip code, city, and name of the facility to easily match each facility with the information collected from the financial platform Orbis. I collect 13.622 reviews for 2748 facilities from 2010 to 2021 (more details in

**FIGURE 10).** As shown by [Kim et al., \(2019\)](#), data collection and extraction from healthcare research via web-scraping is very efficient and helpful when a big-data approach is required.

**TABLE 4: THE NETHERLANDS PATIENTS’ FEDERATION RATINGS**

Area	Question
Dates	A rating consists of several figures and a text in which you briefly describe your experiences with a healthcare provider.
Nursing	How do you assess the quality and effect of nursing, care, or treatment?
Dealing with Employees	Do the employees treat you with care? Do the employees treat you well?
Quality of Life	Is the care aligned with what you consider essential? Does it suit the way you want to live?
Listen	Are you seen and heard? Is there an appropriate response to your question or request?
Accommodation	Do you like the building, the facilities, and the environment?

SOURCE: [HTTPS://WWW.ZORGKAARTNEDERLAND.NL/ZORGINSTELLING/PARTICULIER-WOONZORGCENTRUM-DOMUS-MAGNUS-BENVENUTA-HILVERSUM-3060311/WAARDEER](https://www.zorgkaartnederland.nl/zorginstelling/particulier-woonzorgcentrum-domus-magnus-benvenuta-hilversum-3060311/waardeer)

The second data set comes from the Dutch National Healthcare Institute 2019, from which I obtained fundamental safety and staff composition indicators. With this database, I prepared the second analysis. Fortunately, all these datasets are open to the public. To frame the analysis, I will use the valuable and frequent technique of Donabedian's model to assess quality in nursing homes. This technique divides quality into three-pillar, namely Structure, Process, and Outcomes ([Donabedian, 1998](#)). Structural measures are organizational characteristics, Process measures involve things being done to and for the resident, and Outcome measures are related to the resident's outcomes, such as mortality rate and changes in health status and conditions. It is also understandable that each pillar supports the others; a good structure facilitates a good process, and a good process facilitates a good outcome ([Castle et al., 2010](#)).

**For the U.K.**, I gather quality data mainly from Care Quality Commission (CQC) and Adult Social Care Outcomes Framework (ASCOF). CQC is an independent regulator institution that monitors and inspects all health and social care organizations in England<sup>39</sup>. All N.H.S. and care services must register with the CQC, and to operate, they must fulfil a set of standards. Each inspection report is incorporated on the website and publicly available. In the inspections, the

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<sup>39</sup> The CQC inspects only care services in England. The case of Wales is *Care and Social Services Inspectorate Wales*. The *Care Inspectorate* is Scotland's healthcare regulator, and *Health Improvement Scotland* oversees independent healthcare regulation. Northern Ireland: *Regulation and Quality Improvement Authority*.



reports include ratings that qualify the care services from Outstanding to Inadequate. The definition of each category is the following<sup>40</sup>:

- *Outstanding*: The services are performing exceptionally well.
- *Good*: The service is performing well and meeting our expectations.
- *Requires Improvement*: The service is not performing as well as it should, and we have told the service how it must improve.
- *Inadequate*: The service is performing poorly, and we have taken action against the person or organization that runs it.

**TABLE 5: FIVE QUESTIONS CQC ASKS CARE SERVICES**

Area	Question
1	Are they safe? <b>Safe</b> : you are protected from abuse and avoidable harm.
2	Are they effective? <b>Effective</b> : your care, treatment, and support achieve good outcomes, help you to maintain quality of life, and are based on the best available evidence.
3	Are they caring? <b>Caring</b> : staff involve and treat you with compassion, kindness, dignity, and respect.
4	Are they responsive to people's needs? <b>Responsive</b> : services are organized so that they meet your needs.
5	Are they well-led? <b>Well-led</b> : the leadership, management, and governance of the organization make sure it is providing high-quality care that's based on your individual needs, that it encourages learning and innovation, and that it promotes an open and fair culture.

SOURCE: CQC WEBSITE [HTTPS://WWW.CQC.ORG.UK/WHAT-WE-DO/HOW-WE-DO-OUR-JOB/FIVE-KEY-QUESTIONS-WE-ASK](https://www.cqc.org.uk/what-we-do/how-we-do-our-job/five-key-questions-we-ask)

According to the CQC website: "CQC's ratings are designed to give a clear indication to patients and the public about the quality of services." To do this, the ratings are based on a combination of five questions-survey, as shown in **Table 5**, combined with what they find in the inspection itself, what the residents tell them, and the information provided by the care services themselves about the facility. Each question is given a rating and an overall rating is constructed for the services. It is essential to mention that CQC does not factor in financial risk in assigning quality ratings and CQC data is the only one that can be linked to individual nursing homes.

Finally, I used a second database to get information on the level of deprivation in the establishment's service area, which is essentially a measure of poverty. This metric was used as a

<sup>40</sup> Definitions from the CQC website.

control variable to see if the socioeconomic situation in the establishment's service area may explain differences in outcomes seen among nursing homes (Barron et al., 2017; Tornes et al., 2020). I used the Income Deprivation Affecting Older People Index (IDAOPI), which measures the proportion of all people aged 60 and over who are income-deprived. I used the IDAOPI 2019<sup>41</sup> score and matching to establishments was done with postcode and LSOA code.

**For Private Equity:** I establish if a care home organization is private equity owned from Orbis. First, I look for all firms that, according to NACE codes 87.1 and 87.3 (residential nursing care activities and residential care for the elderly and disabled, respectively), include nursing and residential care homes for older persons in their core activities. I acquired information on their ownership structure, economic activities, and legal status, which allowed me to determine if they were for-profit, non-profit, or private equity. However, many firms did not have the primary code for nursing care activities in the case of the Netherlands, for the ones I could not match, I searched the KvK-number<sup>42</sup> in Orbis and obtained the information. In the case of the Netherlands, I matched the previous data using the postcode of the facilities. In the case of the United Kingdom, the match between facility and size was performed using their company ID.

Furthermore, we acquired the firm size from Orbis, which specified four categories: very large companies, large companies, medium companies, and small companies. **TABLE 6** displays how each category is broken down depending on operating revenue, total assets, or employees.

**TABLE 6: ORBIS-DEFINED SIZE**

Very Large Companies		Medium Companies	
Operating Revenue >	100 million EUR	Operating Revenue >	1 million EUR
or Total Assets >	200 million EUR	or Total Assets >	2 million EUR
or Employees >	1000	or Employees >	15
Large Companies		Small Companies	
Operating Revenue >	10 million EUR	Companies not fulfilling these criteria	
or Total Assets >	20 million EUR		
or Employees >	150		

SOURCE: DATA FROM: [HTTP://LIBRARY.FA.RU/FILES/ORBIS.PDF](http://library.fa.ru/files/orbis.pdf)

<sup>41</sup> Data from: <https://www.gov.uk/government/statistics/english-indices-of-deprivation-2019>

<sup>42</sup> Your KVK number is proof of your registration at the Netherlands Chamber of Commerce KVK.

It should also be noted that, even though Orbis has extensive data on private equity ownership and transactions, the final owner of the facilities in the United Kingdom was unknown in some cases when the provider was controlled by private equity. In certain circumstances, we use Google to find the most profitable care home operators and, if available, information about their shareholders. I used information from Investigate Europe<sup>43</sup> to identify the final owner. A clear example is HC-One Limited, with more than 244 nursing homes until 2021, owned by F.C. Skyfall L.P., a limited partnership registered in Cayman Island. However, the shareholders are two P.E. firms, according to Investigate Europe, Safanad and Formation Capital (both from the U.S.A.). Currently, they have changed their name to HC-One Finco Limited and are registered in Darlington, UK.

## 5.2 Dependent variables

**The Netherlands, first analysis:** we conducted two analyses, the first of which analyses data from ZorgkaartNederland. Indicators based on online reviews provide a different quality perspective of nursing home quality than ratings based on inspection reports and authority survey data. Furthermore, nursing homes that perform well on clinical measures do not necessarily perform well on patient experiences and outcomes (Bardach et al., 2013). Nonetheless, if a healthcare provider underperforms as measured by patient ratings, the healthcare inspectorates may label the provider as "at risk" (Kool et al., 2016). Finally, we can expect some correlation between patient rating scores and quality indicators, although it is often weak (Verhoef et al., 2014).

**The Netherlands, second analysis:** We create three indexes, one for each pillar, using data from the Dutch National Healthcare Institute in 2019 and following the Donabedian quality framework. First, the data for the indicators were thoroughly checked, and those variables that were highly correlated were removed to prevent duplicating the effect in the regression. **Table 7** shows which indicators were used to create the index for each pillar. Second, after the indicators were chosen, a standardization of indicators was carried out. The goal was to categorize the indicators without regard to their scale.

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<sup>43</sup> <https://www.investigate-europe.eu/en/2021/elder-care-for-profit>

**TABLE 7: DESCRIPTIVE STATISTICS FOR COMPOSITION INDEX FOR THE PILLARS: STRUCTURAL, PROCESS, AND OUTCOME.**

Structural Index		Process Index		Outcome Index	
#1	Employees/resident	#10	Percentage of departments where medication errors are discussed in a multidisciplinary manner with department employees at least quarterly based on reports made.	#15	Overall customers' reviews of the facilities
#2	Number of full-time employees divided by number of employees *100	#11	Percentage of clients in the room where a bathroom care plan has not been recorded in the care file	#16	Percentage of respondents who completed an 8, 9, or 10 for the NPS question
#3	Number of temporal employees divided by number of employees *100	#12	Percentage of clients in the room where food preferences have been discussed and recorded in the health record in the last six months.		
#4	Number of temporal employees & PNIL utilized divided by number of employees *100	#13	Percentage of clients -with an indication for ZZP V&V with treatment- in whom a formal medication review has been carried out in the presence of a health worker who provides the medication to the client (If they choose to respond yes to the indicator Medication review to learn and improve in your location)		
#5	Number of recently employed employees divided by number of employees *100	#14	Percentage of clients who have had pharmacological agents and measures applied in the ward in the last 30 days.		
#6	Size of the outflow of employees				
#7	Number of apprentices divided by number of residents				

The indicator score for each unit was calculated as the unit minus the minimum in the dataset divided by the difference between the maximum value and minimum value.

$$I^S = \frac{I - \min(I)}{\max(I) - \min(I)} \quad (1)$$

Where  $I$  is the value of the indicator for a unit,  $\max(I)$  is the maximum value for all the data for that indicator.  $\min(I)$  is the minimum value of  $I$ . Finally,  $I^S$  is the standardized score for  $I$ , that will satisfy.  $0 < I^S \leq 1$ . The calculations were performed in the same manner as [Weaver et al., \(2014\)](#) calculations, with minor modifications. The authors used this definition to calculate the Urban Health Index, which determines health outcomes in urban areas.

Third, I adopted an equal weight for each indicator in the index, because defining the importance of each indicator would need extensive research that is outside the scope of this study. If the indicator value is zero, we keep  $I^S$  it at 0% for indicators #1 Employees/resident and #2 How many full-time employees per total employees but alter it to 0.001 for the others to avoid extreme results in the geometrical average.

**TABLE 8: DESCRIPTIVE STATISTICS FOR THE INDEX DIVIDED BY PE FIRMS, FOR-PROFIT, NON-PROFIT FACILITIES**

This table displays the descriptive statistics for the complete sample, which has been divided into three indices. Column 2 to 5 shows the mean for each form of ownership, which ranges from 0 to 1, with a higher score indicating higher quality. Column 6 indicates if the private equity and for-profit groups differ and column 7 indicates if for-profit and non-profit groups differ. A score greater than 0.05 indicates that the mean of the group does not differ significantly, implying that the differences are meaningful.

Index: 0 < $I^S \leq 1$ (1)	Mean				T-test (6)	T-test (7)	Observations (8)
	PE (2)	For-Profit (Non-PE) (3)	Non-Profit (4)	Total (5)			
Structural Index	0.36	0.43	0.44	0.44	0.16	0.47	456
Process Index	0.84	0.88	0.89	0.89	0.56	0.39	209
Outcome Index	0.60	0.64	0.58	0.59	0.72	0.02	199

**Table 8** shows the descriptive statistics for the quality indicators. For the Structural pillar, the quality indicators show that on average, private equity-owned facilities have a lower score than for-profit and non-profit facilities. For the Process pillar, the quality indicators show that on average, the scores are slightly lower in private equity-owned facilities than in for-profit and non-profit. However, column 6 in **Table 8** demonstrates that without controlling for other variables, the private equity and for-profit groups are not significantly different from each other.

For the Outcome pillar, gathering the data was rather tricky. The mortality rate is an important indicator, but neither the Netherlands nor the U.K. has information about them as the data is considered too sensitive since Covid-19. As a result, we selected the total customer assessment provided by ZorgkaartNederland because they examined various areas of the facilities in 2019<sup>44</sup>. A brief explanation is required for the N.P.S. question (#16). The N.P.S. is known as the Net Promoter Score and ranges from 0-10. It reflects the likelihood of residents, families, and caregivers recommending nursing homes to others as it is used as a global quality indicator in the Netherlands (Triemstra et al., 2021). Since a good score is 9-10 (and 7-8 neutral)<sup>45</sup> (Kool et al., 2016), we note that giving a grade of 8, 9 and 10 is a favourable sign of the quality of the facility.

<sup>44</sup> If they did not have information that year, we used the previous rating.

<sup>45</sup> The threshold is 6,5

In column 7 of **Table 8** we can see that only for the Outcome index is the difference between for-profit and non-profit is significant.

**The U.K.:** I used the CQC quality rating as the dependent variable. I used the four categories that the CQC provide, from Inadequate to Outstanding. Sometimes an additional fifth category can be seen, namely "Insufficient Evidence to Rate", but this happens only in a few cases.

### 5.3 Independent variables

In both analyses conducted in the Netherlands, the type of ownership is the independent variable. We divided the private market into three categories: for-profit, non-profit, and private equity providers. **FIGURE 2** displays the market participation of each type of ownership in the Dutch and British markets. We define F.P. providers as those who extract profit from the business; in the Dutch system, these are parties with the legal status of private for-profit (private limited company, general partnership, or sole proprietorship) (Bos et al., 2020).

For The U.K. We also used the type of ownership of the facilities as an independent variable. In this case, this variable has four possible categories: government, private for-profit, private equity firms, and private non-profit.

### 5.4 Control Variables

In the United Kingdom, two types of control variables were included in the study: facility characteristics (number of beds per facility, total employees, organisation size), and socioeconomic variables in the establishment's service area (IDAOP index). In the case of the Netherlands, for both analyses only control variables were included on facility characteristics and, as in the case of Bos et al., (2020), it was not possible to include specific resident-mix variables as control variables.

As stated in the Literature Review chapter, larger facilities have been found to have lower staffing level and more deficiencies (Harrington et al., 2004), and evidence suggest for-profit nursing home chains deliver inferior care quality (Harrington et al., 2012; Kitchener et al., 2008). Therefore, controlling for facility size may explain the differences in outcomes seen among nursing homes.

To control for the socio-economic variables of the establishment served, I used the IDAOPI score. The higher the score, the more deprived the neighbourhoods are. For example, in the neighbourhood of Tower Hamlets, 43.9% of older people lived in low-income households in 2019. This index also allows us to control the types of patients served by the facilities. For instance, care homes located in the most deprived area have a lower proportion of self-funders residents (21,6%). At the same time, the least deprived area has a higher proportion of self-funders (53,8%)<sup>46</sup>.

## 5.5 Method of analysis

**The Netherlands, first analysis:** I conducted an O.L.S. regression for each dependent variable in this case. The coefficients are related to how private equity ownership impacts each client's rating score. In addition, I also measured the company's size concerning the reviews.

**The Netherlands, second analysis:** I used an O.L.S. regression, divided into three sections, namely Structural, Processes and Outcome. The independent variable is the same for all the sections; we transform the type of ownership into a dummy variable for whether the provider can be N.F.P., F.P., or P.E. I used controlled variables, such as the size of the provider and the number of residents, at the organizational level.

**The U.K.:** Since the CQC inspection report ratings are ordinal, with five categories, I used an ordinal logistic regression analysis similar to (Barron et al., 2017). I used a proportional odds logistic model regression because I have an ordinal dependent variable. This means that each category can be ordered from high to low, being *Outstanding*=5, *Good*=4, *Requires Improvement*=3, *Inadequate*=2, and *Insufficient Evidence to rate*=1.

The proportional odds model is a generalized linear model, where we model the ordinal dependence category affected by a discrete or continuous covariate, in the model, where the logit for cumulative probability  $j$  has its intercept,  $a_j$ . The vector  $\beta$  of parameters describes the effect of the explanatory variables and is the same for each cumulative logit (Agresti, 2010). In addition,

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<sup>46</sup> Office for National Statistics, U.K.: Care homes and estimating the self-funding population, England: 2019 to 2020. <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/socialcare/articles/carehomesandestimatingtheselffundingpopulationengland/2019to2020>



this model will estimate a single equation over the levels of the dependent variable. Therefore, the used equation can be described as:

$$\mathbf{Logit} [\mathbf{pr}(Y \leq j|x)] = \alpha_j + \beta^T x \quad j = 1, \dots, c - 1, \quad (2)$$

This model is used in common areas such as survey research, industry quality assurance, and clinical research, so it is a good fit for our U.K. quality nursing homes analysis ([Barron et al., 2017](#); [Bloom et al., 2001](#)).

## Chapter 6 Results and discussion

This chapter reports the results of the research and answers the hypotheses formulated in chapter 4. Firstly, Section 6.1 first shows the results of the OLS regression conducted in the Netherlands based on customer feedback. Secondly, section 6.2 presents the results of the Donabedian model applied in the Netherlands. Thirdly, in section 6.3, the results of the proportional odds logistic model regression conducted in the UK are presented. Finally, section 6.4 provides a robustness test for the second analysis in the Netherlands that provides a validity check of the results found.

### 6.1 First Analysis: Netherlands Customer Reviews

**TABLE 9: DESCRIPTIVE STATISTICS FOR-PROFIT NURSING HOME SECTOR IN THE NETHERLANDS**

	Non-Profit	For-Profit	Private Equity Providers
Number of nursing home locations	81.6% (1,861)	16.9% (385)	1.5% (35)
Reviews per type of ownership (total reviews) <sup>a</sup>	88.8% (12,135)	10.3% (1,411)	0.8% (116)
Average number of clients <sup>b c</sup>	61.3 (1,979)	33.49 (289)	13.85 (41)
Average number of employees	97.7 (2,001)	44.0 (300)	27.9 (41)

Notes: Information is at the facility level and from ZorgkaartNederland (2010-2021). <sup>a</sup> Total number of reviews per facility. <sup>b</sup> Estimation is based on the rate of indicator on how many FTEs the organization has per client (INID013533). <sup>c</sup> Information is at the organization's level and is from Dutch National Healthcare Institute, indicators from 2019. Number of locations, between brackets.

**TABLE 9** displays descriptive statistics for the nursing home sector in the Netherlands. Non-profit nursing homes have significant market dominance. In addition, non-profit establishments have more clients than for-profit ones, with an average of 61.30 clients per location versus 33.49. On the other hand, private equity facilities have an even smaller average number of clients than the other F.P. locations, with an average of 14 clients per location and a small market presence of 1.5% in terms of the number of nursing home facilities. This means that approximately 7.4% of all clients live in a nursing home owned by for-profit, and 0.5% live in a home owned by private equity. The average number of employees is also lower in P.E. than in the rest, as N.F.P. have an average of 98 employees, F.P facilities have an average of 44 employees, and P.E. facilities have only 28 employees on average.

In 2019, around 300 non-profit organizations provide L.T.C. services, managing around 120,000 beds, representing 92% of the total market measured by bed capacity. The remainder is provided by private for-profit providers, with 148 F.P. operators and only three private equity operators. (Bos et al.,2020), show in their study that for-profit establishments have a market share of 12.2%. This study shows that F.P. has a share of 18.4%. This is in line with what was mentioned in the literature review: private providers are expanding and gaining market share, which the market attributes to changes in the financing structure (Jeurissen et al., 2019).

**TABLE 10: DESCRIPTIVE STATISTICS FOR-PROFIT AND PRIVATE EQUITY NURSING HOME SECTOR, CUSTOMER REVIEWS 2010-2021**

This table reports the customer reviews for the nursing home facilities in the Netherlands. The facilities could be rated more than once in this period. Columns 1 and 2 show the mean rating for private equity and for-profit facilities. Column 3 shows if the customers' ratings for private equity and for-profit groups differ. A score greater than 0.05 indicates that the mean of the group does not differ significantly. Column 4 presents the total sample size for private equity facilities and Column 5 for for-profit nursing homes.

	Mean				
	Private Equity (1)	For-Profit (2)	T-test (3)	Observations (4)	Observations (5)
Average rating location	8.91 (0.56)	8.71 (0.78)	0.007	112	1,321
Average rating dates	8.95 (0.73)	8.61 (0.93)	0.000	99	1,132
Average rating nursing	8.78 (0.64)	8.71 (0.82)	0.430	112	1,296
Average rating dealing with employees	9.08 (0.53)	8.91 (0.02)	0.022	109	1,300
Average rating life quality	8.70 (0.66)	8.56 (0.91)	0.169	83	1,189
Average rating listen	8.82 (0.69)	8.66 (0.88)	0.069	106	1,300
Average rating accommodation	9.12 (0.64)	8.75 (0.90)	0.000	110	1,303

Note, Standard deviation are between parentheses

The market is quite concerned about the effect of the entry of P.E. companies into the nursing home market. Many newspapers and social media mention this relationship. It is common to find articles citing the private equity firm with words like "reduction of staff"<sup>47</sup>, "worse quality" and other unfavourable adjectives. Therefore, we expect customer ratings to be lower for private

<sup>47</sup> <https://www.newyorker.com/news/dispatch/when-private-equity-takes-over-a-nursing-home>

equity than for-profit nursing homes. However, in **TABLE 10**, it is shown that private equity compared to F.P., the average client review is significantly higher for the period 2010-2021. Nevertheless, in this study, the number of reviews per private equity facility is rather small. Finally, in column 3 of **TABLE 10**, we can see that the mean of the private equity group is significantly different from that of the for-profit nursing homes in four of the seven areas for the categories: general rating location, dates, dealing with employees and accommodation.

[Bos et al., \(2020\)](#) explain why we expect Dutch for-profit companies to have higher ratings than non-profit. For-profit companies built new facilities rather than using the non-profit provider's heritage; as a result, they benefit from their novelty. Nonetheless, private equity-owned facilities have lower ratings when compared to for-profit facilities.

**TABLE 11: DESCRIPTIVE STATISTICS FOR-PROFIT AND PRIVATE EQUITY NURSING HOME SECTOR BY SIZE.**

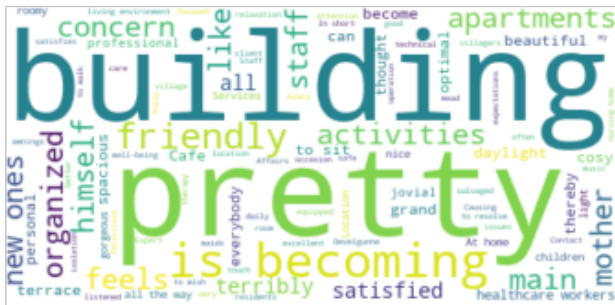
This table reports the customer reviews for the nursing home facilities in the Netherlands. The facilities could be rated more than once in this period. Columns 1 and 2 show the mean rating for private equity and for-profit facilities. Column 3 shows if the customers' ratings for private equity and for-profit groups differ. A score greater than 0.05 indicates that the mean of the group does not differ significantly. Column 4 present the total sample size for private equity facilities and Column 5 for for-profit nursing homes.

Variable (1)	Private Equity  Large (2)	For-Profit  Large (3)	T-test (4)	Observations (5)	Observations (6)
Average rating location	8.91 (0.56)	8.49 (0.73)	0.000	112	154
Average rating dates	8.95 (0.73)	8.46 (0.88)	0.000	99	125
Average rating nursing	8.78 (0.64)	8.50 (0.77)	0.002	112	154
Average rating dealing with employees	9.08 (0.53)	8.70 (0.75)	0.000	109	154
Average rating life quality	8.70 (0.66)	8.41 (0.77)	0.005	83	132
Average rating listen	8.82 (0.69)	8.45 (0.84)	0.000	106	154
Average rating accommodation	9.12 (0.64)	8.57 (0.83)	0.000	110	149

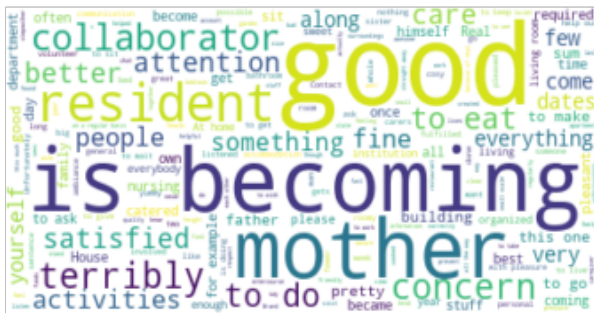
Note, all categories have a scale between 1-10; the standard deviation is between parentheses.

Another approach is to group each type of ownership by the size of the organisation. Private equity only has "large" sized providers, so we split two groups from the total sample: large private equity nursing home companies and large for-profit companies. **TABLE 11** displays these two groups; again, private equity nursing homes have on average a better customer review than large for-profit companies. Finally, for all categories, the averages of the large private equity group are significantly different from those of the large for-profit group.

To better understand the motivations and feelings behind customer reviews, we will use a simple tool called “word cloud”. These word clouds can be seen in **FIGURE 4** and **FIGURE 5**.



**FIGURE 4: CLOUD OF WORDS FOR PRIVATE EQUITY NURSING HOMES CUSTOMER REVIEWS.**



**FIGURE 5: CLOUD OF WORDS FOR FOR-PROFIT NURSING HOMES CUSTOMER REVIEWS.**

We undertake a quality analysis, thanks to web-scraping, which allows us to extract information from hundreds of facilities; the script includes the rating given to each category and the text review for each comment (if it has one). We constructed two-word clouds using that information. These two clouds of words were created using a python library named “word cloud”.

The tool requires as input only the reviews of the facilities and the stop words (which depend on the language) to be removed (i.e., “het”, “aan”, etc) from the analysis. The size of each word in the cloud depends on the number of times a word has been mentioned compared to the number of times other words have been repeated. Thus, it is the relative frequency of the words that determines their size in the cloud. Since this research is written in English, it was then necessary to translate the results to English and create the clouds again using the same relative frequencies.

We relate this qualitative analysis to the analysis we performed in **TABLE 10** and **TABLE 11**, where the highest coefficient was accommodation for private equity and, as we see in the cloud for private equity **FIGURE 4**, the words “building” and “pretty” have the highest relative frequency. In the case of for-profit facilities, **FIGURE 5**, the words with the highest frequency are "is becoming" "good" and "mother". There is no specific category that can be matched to the words in the customer review. However, the mean of the ratings is between 8.32 and 8.64 for large for-profit nursing homes, reflecting the high frequency of the word "good" in the cloud.

**TABLE 12: (O.L.S.) REGRESSION BETWEEN THE TYPE OF OWNERSHIP AND CLIENTS’ RATINGS, CONTROLLED BY THE SIZE OF THE COMPANY.**

This table reports the results for the effects of (1) Overall Reviews per establishment (2) Dates (3) Nursing (4) Dealing with employees (5) Quality of Life (6) Listen. (7) Accommodation. The dependent variable is thus the quality measured through these seven categories. Dummy variables were constructed for ownership only for private providers with a profit incentive: private equity and for-profit, using for-profit nursing homes as a reference group. The ownership categories were treated as independent variables.

Variable of Interest	Customer’s Reviews						
	Overall Reviews (1)	Dates (2)	Nursing (3)	Dealing with Employees (4)	Quality of Life (5)	Listen (6)	Accommodation (7)
PE Ownership	0.44*** (0.08)	0.51*** (0.11)	0.31*** (0.09)	0.38*** (0.08)	0.29** (0.10)	0.38*** (0.10)	0.54*** (0.09)
Very Large Company	-0.48*** (0.06)	-0.64*** (0.07)	-0.46*** (0.06)	-0.39*** (0.06)	-0.54*** (0.07)	-0.41*** (0.07)	-0.44*** (0.07)
Large Company	-0.48*** (0.07)	-0.49*** (0.09)	-0.46*** (0.08)	-0.40*** (0.07)	-0.45*** (0.08)	-0.43*** (0.08)	-0.43*** (0.08)
Medium Company	-0.24*** (0.05)	-0.32*** (0.07)	-0.22*** (0.06)	-0.15** (0.05)	-0.25*** (0.07)	-0.13* (0.06)	-0.20** (0.06)
Cons	8.95*** (0.04)	8.95*** (0.05)	8.94*** (0.04)	9.11*** (0.04)	8.85*** (0.05)	8.87*** (0.04)	9.0*** (0.05)
Observations	1459	1250	1434	1423	1278	1412	1413
Adjusted- R <sup>2</sup>	0.05	0.07	0.04	0.04	0.05	0.04	0.04

Note, Robust standard deviation is between parentheses; \* p<0.05; \*\* p<0.01; \*\*\* p<0.001

The effect of private equity ownership versus for-profit ownership as a function of organisation size is represented in **TABLE 12** as a dummy variable where P.E. ownership equals one and for-profit ownership equals zero; non-profit facilities are not included in this analysis. A linear probability model is estimated using an O.L.S. The higher the ranking and the more positive the response, the higher the quality of the P.E. providers. A closer examination reveals that the coefficient of P.E. ownership in the first column (Overall Reviews) is positive and statistically significant, indicating that P.E.-owned nursing homes have a higher overall customer rating of 0.44. When we look at the other areas of customer ratings, we find that the relationship between P.E.-owned facilities and their rating is also positive, with some being higher than the overall location rating. Despite the positive direction, the coefficients on Nursing, Quality of Life and Listening are not statistically significant. On the other hand, Appointments, Dealing with Employees and Accommodation have positive and statistically significant coefficients, implying a higher score than for-profit centres. Accommodation is the highest, implying that for-profit centres have better on-site accommodation according to customers.

All company-size related (large, very large, etc.) coefficients of the OLS regression in **TABLE 12** show a negative direction and are statistically significant. What we can interpret is that the larger the facility, the worse the score in all aspects compared to a smaller one (which is the control group). In particular, in the case of very large suppliers (remember the definition: operating revenues > 100 million euros or total assets > 200 million euros or more than 1000 employees), the coefficient is between 0.39 and 0.64 lower in the score compared to smaller companies. This result is not surprising; chains have higher profit margins and documented quality problems; for example, in the US, four of the largest chains committed fraudulent billing practices and had more quality violations than the average nursing home ([Harrington et al., 2017](#)).

To summarize the results from the OLS regression model show evidence that P.E.-owned organisations have better customer reviews than for-profit organisations, as the results are positive and significant across every category for the P.E.-ownership variable. Therefore, hypothesis H1.1<sub>0</sub> is rejected based on customer reviews, as there is no evidence of lower quality in P.E.-owned nursing homes in the Netherlands.

## 6.2 Netherlands Quality indicators

### 6.2.1 Structural quality indicators

In this section, I will use the Donabedian model (Donabedian, 1988) to measure quality in nursing homes in the Netherlands. By including control variables, an OLS regression model was conducted.

For the quality outcome index, we used two indicators from the previous analysis: the overall rating that clients give to each facility and the percentage of respondents giving 8, 9 or 10 points to the N.P.S. questions per facility (#16) in **Table 7**, from the National Institute of Health in the Netherlands). We have already mentioned that they classify the scores into promoters (9 or 10), passives (7 or 8) and detractors (0-6) (Krol et al., 2015).

**Table 13** compares P.E. with F.P. with N.F.P. for all quality indicators divided into three indices: structural, process and outcome. We use for-profit nursing homes as a benchmark. Since the value of many indicators is at the level of the organisation rather than at the level of the facility, the data sample in this table is smaller than in other analyses, and many of the coefficients are not statistically significant. In summary, the coefficient N.F.P. has no statistical significance and no difference is seen concerning the F.P. facilities. P.E. has a statistically significant negative coefficient for the structural index and slightly positive for the other two indices, but the latter is not statistically significant.

Consequently, we only find evidence of lower quality in P.E. relative to F.P. in the structural quality index, which is in line with our literature review and our hypothesis. Therefore, hypothesis H1.2<sub>0</sub> is not rejected, as there is evidence of the lower quality of P.E.-owned nursing homes in the structural pillar. However, there is not enough evidence for rejecting H1.3<sub>0</sub> and H1.4<sub>0</sub> because for the Process index and the Outcome index, the results appear to not have a significant difference between P.E.-owned nursing homes and F.P. nursing homes.



**TABLE 13: (O.L.S.) RESULTS FOR THE STRUCTURAL-RELATED QUALITY INDICATORS, PROCESS-RELATED QUALITY INDICATORS AND OUTCOME-RELATED QUALITY INDICATORS.**

This table reports the results for the effects of (1) Structural Index, (2) Process Index (3) Outcome Index. The dependent variable is thus the quality measured through these three indices. The variable type of owner of the establishment has three categories: Non-profit, For-Profit and Private Equity.

Variable of Interest	Structural Index (1)	Process Index (2)	Outcome Index (3)
Non-profit	0.00 (0.115)	0.09 (0.11)	0.00 (0.037)
PE firm	-0.08*** (0.014)	0.13 (0.20)	0.04 (0.049)
Very Large C	0.02 (0.019)	-0.709* (0.30)	-0.079 (0.061)
Large C	0.01 (0.013)	-0.08 (0.154)	-0.064 (0.047)
Medium C	0.002 (0.012)	-0.08 (0.082)	0.023 (0.043)
Total Clients/1000	-0.10** (0.035)	1.24 (0.674)	-0.01 (0.088)
Total Employees/1000	0.06** (0.021)	-0.57 (0.298)	-0.01 (0.043)
Constant	0.43*** (0.009)	1.52*** (0.059)	0.627*** (0.041)
Control variables	Yes	Yes	Yes
Robust Error	Yes	Yes	Yes
R-squared	0.04	0.08	0.08
Adjusted R-squared	0.03	0.04	0.04
Observations	454	97	196

Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### 6.3 UK Quality indicators

This section provides a UK-based analysis using inspection reports from the CQC. First, a breakdown of the CQC inspection report by property type is provided. Secondly, the results of the proportional odds logistic model regression conducted with control variables are shown.

**TABLE 14** shows the cross-tabulations of the number of CQC inspections and the type of property. In the first column, we can see all locations with at least one inadequate area, in the second column all nursing homes that have at least one area requiring improvement and in the third column facilities that have all areas with a review of "Good" or "Outstanding". In the case of the for-profit nursing homes, we see that 61.5% of the total have received a good or outstanding report

in all areas, compared to the P.E. companies, which have received 59% and in the case of the non-profit nursing homes, 72%. In the first column, that of the locations with at least one insufficient area, the non-profit homes have 4.6%, which compares unfavourably with the for-profit ones, with 3%, and the P.E, with 2.1%.

Before moving to the next analysis, the result from **TABLE 14** stated that 62% of the total nursing homes have a good report or outstanding, implying a high quality of care and only 3% of the total facilities have a really deprived care quality in the United Kingdom.

**TABLE 14: DESCRIPTIVE STATISTICS FOR-PROFIT NURSING HOME SECTOR NETHERLANDS**

	At least one inadequate area (1)	At least one area requiring improvement (2)	All areas are good or outstanding (3)	Total
Private Equity Facility	7 2.1%	128 38.8%	195 59.1%	<b>330</b> 7.93%
For-Profit Facility	113 3.0%	1,326 35.4%	2,303 61.5%	<b>3,742</b> 89.91%
Non-profit Facility	4 4.6%	20 23.0%	63 72.4%	<b>87</b> 2.1%
Local Authority	1 33.3%	0 0.0%	2 66.7%	<b>3</b> 0.07%
<b>Totals</b>	<b>125</b>	<b>1,474</b>	<b>2,563</b>	<b>4,162</b>

**TABLE 15: ORDINAL LOGISTIC REGRESSION RESULTS USING CQC INSPECTION RATINGS**

This table reports the results for the effects of (1) Overall (2) Safe (3) Effective (4) Caring (5) Responsive (6) Well-led. The dependent variable is thus the quality measured through these six categories. The variable type of owner of the establishment has three categories: Non-profit, For-Profit and Private Equity.

Variable of Interest	Overall (1)	Safe (2)	Effective (3)	Caring (4)	Responsive (5)	Well-led (6)
Non-profit	0.37 (0.29)	0.21 (0.32)	0.10 (0.37)	0.49 (0.38)	0.35 (0.31)	0.27 (0.28)
PE firm	-0.28 (0.15)	-0.08 (0.16)	-0.59** (0.18)	-0.22 (0.22)	-0.48** (0.17)	-0.21 (0.14)
Medium size company	0.29 (0.27)	0.15 (0.29)	0.14 (0.35)	1.05** (0.35)	0.56 (0.30)	0.17 (0.27)
Large size company	0.56* (0.28)	0.37 (0.30)	0.35 (0.35)	1.13** (0.36)	0.74* (0.31)	0.47 (0.27)
Very Large size company	0.68* (0.29)	0.54 (0.31)	0.36 (0.37)	1.06** (0.38)	0.70* (0.32)	0.54 (0.28)
IDAOPI Score	-1.35*** (0.32)	-1.11*** (0.33)	-1.60*** (0.38)	-1.14* (0.46)	-1.36*** (0.36)	-1.09*** (0.30)
Care homes beds/1000	-8.14*** (1.41)	-10.34*** (1.45)	-6.23*** (1.72)	-4.58* (2.07)	-4.78** (1.64)	-7.67*** (1.36)
Employees/10.000	0.26 (0.15)	0.13 (0.16)	0.49* (0.19)	0.23 (0.21)	0.34* (0.16)	0.11 (0.14)
Insufficient evidence to rate Inadequate	-8.46***			-6.93***	-7.41***	
Inadequate Requires Improvement	-4.22***	-4.34***	-5.70***	-5.83***	-5.53***	-3.92***
Requires Improvement Good	-1.38***	-1.48***	-2.18***	-2.10***	-1.79***	-1.18***
Good Outstanding	2.77***	5.05***	3.43***	3.66***	2.83***	2.73***
Log-likelihood	-3067.1	-2544.4	-2031.4	-1661.1	-2448.4	-3329.4
Observations	3907	3907	3904	3902	3903	3907

Note, Standard deviation are between parentheses; \* p<0.05; \*\* p<0.01; \*\*\* p<0.001

In the regression analysis in **TABLE 15**, I present the results for the proportional odds logistic model regression. I create a dummy variable comparing non-profit firms and P.E. with for-profit nursing homes (as in the Dutch analysis). The local authority's variable was not included due to a lack of data. The logit scale shows the parameter estimates in equation (1). Using the coefficients shown in **TABLE 15**, we can obtain the odds ratio by taking e to the power of the coefficients. For example, for the P.E. firms in the first column, which have a coefficient of -0.28, the odds ratio is calculated with the following formula:  $e^{-0.28} = 0.76$ . When all other variables are held constant, the odds of overall facility rating are 0.76 times lower for private equity-owned nursing homes than for for-profit nursing homes. In column 1, we see that when all other variables

are held constant, the odds of a non-profit facility receiving a higher overall inspection rating are 1.45 times higher than for for-profit providers.

We can see in **TABLE 15** that P.E. providers consistently have the lowest quality ratings on all five inspection criteria and overall location scores compared to for-profit nursing homes. Although only the Care and Responsiveness criteria are statistically significant. Non-profit nursing homes have consistently higher quality scores compared to for-profit providers. Despite this, the coefficient is not statistically significant for any criterion. The IDAOPI score is statistically significant for all criteria. The higher the IDAOPI score, the more disadvantaged the neighbourhood and the worse the CQC inspection ratings for all areas measured.

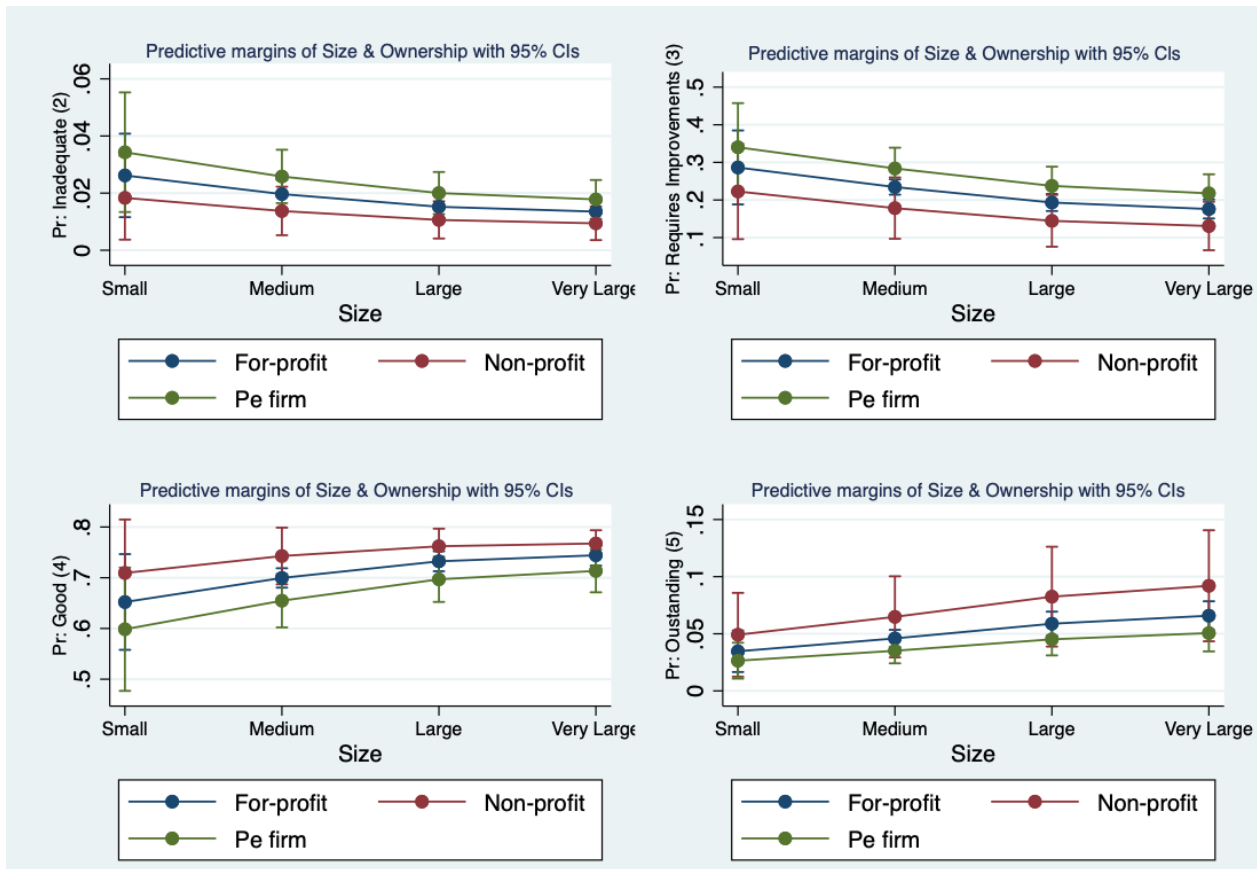
Regarding the number of beds and the size of the company, a small company has an average of 49 beds in residential care homes, a medium-sized provider has 44 beds, a large provider has 50 and a very large company has 60 beds in residential care homes. The P.E. nursing homes have an average of 65 beds per facility. On the other hand, for-profit nursing homes have an average of 51 beds and non-profit companies have an average of 39 beds per facility, the lowest. So, we observe that the higher the number of beds, the lower the probability of receiving better CQC inspection ratings, which is statistically significant for all five criteria and the overall score.

The sample model suggests that very large providers obtain higher CQC inspection scores than those run by small firms. For the very large firms and the large firms, the results are significant in the Overall inspection, in the Care inspection and in the Response inspection. In the case of medium-sized firms, the coefficient is only statistically significant in the Care criterion. Interestingly, the direction of this coefficient is the opposite of its counterpart in the Netherlands.

**FIGURE 6** shows 4 charts, one for each score in the CQC in the regression of **TABLE 15** (*Inadequate=2, Requires Improvement=3, Good=4, Outstanding=5*), representing the marginal effects for the Overall rating. The value of Outcome 1 (Insufficient Evidence to Rate) is not shown because the sample was too small to derive correct analyses. Each chart has on the X-axis the size of the facilities and has three lines that represent the ownership type. The Y-axis indicates the probability a facility has of receiving the score of that chart from the CQC. Looking at the two graphs in the bottom row, we can see that P.E.-owned facilities (green line) are less likely to have an inspection outcome of "Good" or "Outstanding" than for-profit and non-profit providers.

Furthermore, if we move from left to right, from a small to a very large company, the probability of having outcomes 4 and 5 increases, which is in line with the regression shown in **TABLE 15**.

On the other hand, the charts for Outcomes 2 and 3, which show poor-quality, private equity-owned firms (green line) have a higher probability of receiving "Requires improvement" and "Inadequate" reports. The larger the size of the provider, the lower the probability of receiving the worst score.



**FIGURE 6. EFFECT PLOTS.**

To summarize, the analysis shows that Private Equity-owned companies have higher chances of receiving low scores from the CQC and lower chances of receiving high scores from the CQC than for-profit and non-profit companies. Therefore, Hypothesis H2.1<sub>0</sub> is not rejected as there is evidence of lower quality related to P.E.-owned nursing homes in the United Kingdom.

## 6.4 Robustness Check

### 6.4.1 Netherlands first analysis

This section provides a robustness test to check the validity of the methodology and the results of the second analysis in the Netherlands using the same Donabedian framework. The approach to the method is similar to the one presented in **Table 13**, except that now, instead of using the same weighting to construct each index, I have used a different weighting for the indicators that make up the indices.

(Kara et al., 2022) mention in their study that the common approach to weighting composite measures of quality of care is to use equal weights. In their study, it was found that 59% of a total of 2,711 publications use this type of method. We use regression weights as an alternative method (Simms et al, 2013). To calculate the indicators' weight, each indicator was correlated with the outcome index, and they were assigned a weight based on the magnitude of the correlation.

The three indices generated for Structure, Process and Outcome were recomputed. To compose these indices, we gave a different weight to each indicator according to the method mentioned in (Kara et al., 2022). A weighted geometric mean was calculated as follows according to (Weaver et al., 2014).:

$$Index = \prod_{i=1}^j s I_i^{w_i} \quad (3)$$

The weight for the indicators is the  $w_i$  term of the equation.

**TABLE 16: RESULTS ON HYPOTHESES**

Summary of the hypothesis results derived from the Robustness Check

Hypotheses	Robustness Check Results	Main Analysis Results
H1.2 <sub>0</sub> Private equity nursing homes have lower scores in the Structural-based quality index	Not Rejected	Not Rejected
H1.3 <sub>0</sub> Private equity nursing homes have higher scores in the Process-based quality index	Rejected	Rejected
H1.4 <sub>0</sub> Private equity nursing homes have higher scores in the Outcome-based quality index.	Rejected	Rejected

**TABLE 18** in Appendix C. Robustness Test shows the results of the robustness test implementing different weights for the quality indicators in the indices. The result of the robustness test is shown in **Table 16** for each index of the Donabedian model.

The results of the Robustness Check are in line with the results of the main analysis, which ensures the validity of the results of this research.

## Chapter 7 Summary and Conclusions

This chapter summarizes the findings, presents this thesis's conclusion, presents managerial, and academic relevance, and finally lists the research's limitations.

The research question this thesis aimed to respond to was: “*Does private equity ownership impact the quality-of-care nursing homes deliver to their residents in EU-UK?*”

This thesis examined private equity in the long-term care market, specifically in nursing homes, and its relationship with the quality of care. I analyzed whether private equity-owned nursing homes affect the quality of care in two different markets: the UK and the Netherlands. These two markets developed differently; the former has a long history of private and private equity-owned providers, while the latter has recently opened its market to private for-profit providers. To this end, this research conducted three analyses, two in the Netherlands and one in the UK. In the Netherlands, the research integrates the views of customers and regulator inspections to assess quality in a multidimensional way. In the first analysis, customer reviews were used, and in the second, the Donabedian model was applied using quality reports required by the government. In the UK, the method used is similar to that of [Barron et al., \(2017\)](#).

The main finding of this thesis in the Netherlands, based on client reviews, is that there is no evidence that private equity-owned nursing homes provide a lower quality of care than for-profit and non-profit facilities. For the second analysis, using the Donabedian model, private equity-owned nursing homes offer a worse quality of care in terms of Structural characteristics compared to others. Finally, in the UK, I found that private equity-owned companies offer a lower quality of care, according to the CQC inspection reports.

The results, based on customer feedback, showed that private equity nursing homes have a higher rating compared to other types of ownership. Probably because private equity and for-profit companies have recently entered the Dutch market and have fewer clients per facility (private equity nursing homes have an average of 14 clients, compared to the average of 61 clients in non-profit facilities). Because of the size of non-profit nursing homes, they provide a large-scale and bureaucratic service ([Bos et al., 2020](#)) which could harm client satisfaction. On the other hand, I found that private equity-owned nursing homes have better customer satisfaction in terms of



accommodation. The word "building" has a high frequency in customer comments, and it typically comes together with positive-sentiment words.

In the second Dutch analysis, using the Donabedian framework, I found significantly lower quality if we measure quality in Structural terms in the Dutch market. The average score for private equity-owned facilities was the lowest at 0.36 points, compared to 0.44 points for non-profit and 0.43 points for for-profit facilities. One possible explanation is that private equity-owned facilities tend to reduce labour costs by switching from highly qualified to less qualified nurses. On the other hand, I found no significant evidence indicating that private equity-owned facilities offer a lower quality of care in terms of Process and Outcome indicators.

The third analysis was performed in the United Kingdom, where private equity organisations in healthcare have a longer tradition than in the Netherlands. The results of the analysis based on the data from the inspection reports of the Quality Commission (CQC) show that there is significant evidence in some areas that private equity-owned facilities offer a lower quality of care to their patients compared to other for-profit nursing homes.

In terms of the context of our results compared to other studies, (Bos et al., 2020) suggested that private equity-owned facilities tend to have lower client satisfaction compared to other for-profit facilities. However, in this study, we found the opposite, which could be explained by the fact that we controlled for the size of the organisation. Second, this research is in line with other studies that have found that private equity firms reduce the number of highly qualified nurses to reduce labour costs (Gupta et al., 2021; Pradhan et al., 2014). Staffing indicators were measured through the Structural index.

Finally, like Barron et al., (2017), this research found that non-profit centres do not present clear evidence of better or worse quality than for-profit centres in the UK. On the other hand, this research suggests that private equity-owned nursing homes have a lower quality of care compared to other for-profit facilities. Barron et al., (2017) found similar results, but compared all for-profit facilities with non-profit facilities in the UK, without distinguishing private equity-owned facilities.

The contribution of this research to the existing literature review is as follows. Firstly, this research extends the scope of previous studies from the US to Europe in the spirit of Gupta et al.,

(2021). Second, this research used the Donabedian model to assess the quality of care in the Netherlands to understand where specifically quality is affected by private equity ownership. Third, this research incorporated client review as did Bos et al., (2020) assessing the multidimensionality of quality. This research found differences in quality as measured by government quality records and patient satisfaction in nursing homes.

## 7.1 Managerial & Policy & Academic Relevance

As stated in this thesis, nursing home quality has long been a concern for governments, research, and potential long-term care recipients. However, as analysed, the private sector's involvement in the industry is controversial, with critics claiming that nursing homes for-profit tends to be rated as lower quality by the regulator<sup>48</sup>.

But also, the market faces several challenges. First, there is a crisis of worker supply deficit, resulting in a significant gap between care needs and care services<sup>49</sup>. And nurse care services are essential for nursing home providers, since, according to (Dellefield et al., 2015), higher registered nurse staffing and higher R.N. ratios in the skill mix of nurses are related to higher nursing home quality. Second, the role and benefits of private actors involved in the market are not clear and it can affect the healthcare sector and the real estate market, as many private equity players lease their facilities. As seen in the UK, private companies are the leading actor in the market, a tendency that is expected that the Netherlands will follow<sup>50</sup>, which can be seen as an advantage, since learning from a more mature market can aid in the reduction of errors and policymakers could promote and set incentives for more favourable conditions (e.g., subsidies for top management education in nursing homes). Therefore, improving staffing levels and competencies could also produce an alignment of favourable conditions.

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<sup>48</sup> Future Care Capital, Report Data that Care, 2020.

<sup>49</sup>Data from: <https://www.healthcarefinancenews.com/news/survey-only-1-nursing-homes-are-fully-staffed/>  
<https://www.forbes.com/sites/howardgleckman/2021/09/22/staff-shortages-are-hammering-long-term-care-facilities-home-care-agencies-and-families/?sh=6a2e2fcd1e7a/> <https://www.who.int/europe/news/item/14-09-2022-ticking-timebomb--without-immediate-action--health-and-care-workforce-gaps-in-the-european-region-could-spell-disaster>

<sup>50</sup> Cushman & Wakefield L.L.P. (2019). MARKETBEAT EUROPEAN NURSING HOMES REPORT: Overview of the European Nursing Homes Market.

Many nursing facilities in the United States fail to meet basic regulatory criteria, and despite taxpayers paying tens of billions of dollars each year on nursing care, many providers continue to provide low-quality<sup>51</sup>. [Gupta et al., \(2021\)](#) data revealed the same issue, poor quality, resulting in a 10% increase in death among residents at private equity-owned facilities in the United States.

Nursing home quality has been a primary concern for policymakers, and the budget for long-term care is predicted to skyrocket in the coming years. In OECD countries, spending is estimated to reach 9.5% of G.D.P. in 2060 under a cost-cutting scenario and up to 14% under a cost-pressure scenario<sup>52</sup>. The problem is that it is not clear that a significant increase in the budget is directly related to a significant rise in nursing home quality, highlighting the complex elements impacting nursing home quality. Understanding why some organizations have poor quality indicators and others do not help to allocate and understand the cost of these organizations. Moreover, according to [\(US GAO, 2002\)](#) the quality of nursing homes is more related to staffing than spending problems. Finally, as indicated in earlier studies [\(Gupta et al., 2021; Braun et al., 2020\)](#), certain private equity-owned nursing homes delivered lower quality and even greater mortality rates.

## 7.2 Limitations

The limitations of this thesis are: i) lack of patient data, mainly related to the control of those facilities that have more cases of dementia or other diseases and require more intensive care, ii) lack of data on the quality indicators from nursing homes in the Netherlands and in the U.K. to be able to conduct a more comprehensive analysis, which is connected to the previous point, iii) lack of proven Outcome indicators, such as mortality rate, and iv) lack of quality indicators at the facility level.

Firstly, due to the limited data available, the analysis conducted for the Netherlands and the United Kingdom did not include an evaluation of the patients' backgrounds. This is a relevant limitation for this study, as some nursing homes might have a higher number of dementia patients who need more intensive care [\(Lin et al., 2014; Baks et al., 2020\)](#), which could distort the number

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<sup>51</sup> [https://rooseveltinstitute.org/wp-content/uploads/2021/04/RI\\_NursingHomesandPE\\_IssueBrief\\_202104.pdf](https://rooseveltinstitute.org/wp-content/uploads/2021/04/RI_NursingHomesandPE_IssueBrief_202104.pdf)

<sup>52</sup> <https://www.oecd.org/economy/growth/Health%20FINAL.pdf>

of staff per resident a result in a higher number. Therefore, this thesis could potentially overestimate the effect of nurse staffing on patient care. Secondly, data available in the Netherlands was narrowed to a few quality indicators using public data. The small sample of private equity providers in the Netherlands affected our statistical significance for those coefficients in the regression. In the case of the U.K., the data sample was larger enough. Thirdly, in the Donabedian paradigm, more outcome indicators were needed, for example, access to mortality rate per facility in the Netherlands or the United Kingdom. In the Netherlands, the C.B.S. does not provide a breakdown of deaths by a nursing home, facility, or organization. In the case of the U.K., Care Quality Commission (CQC), together with the Office for National Statistics (O.N.S.), publish provisional death counts breakdown per care home. However, at the time of this thesis, we did not have mortality data per nursing home provider or location. Finally, some analysis takes place at the facility level, while others take place at the organizational level. When we apply the Donabedian model to analyse nursing home indicators, we do it at the organizational level, which implies that we ignore differences between facilities and assume that each facility in an organization has the same quality.

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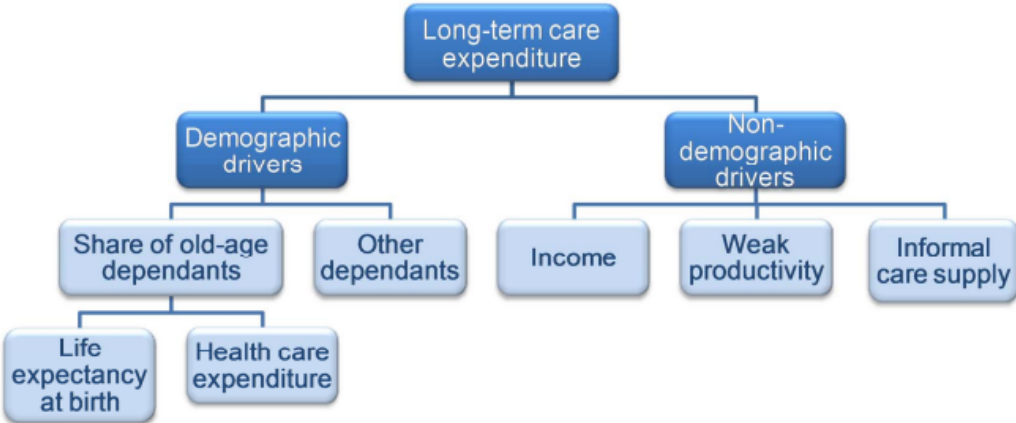
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# Appendix A. Long-term care system



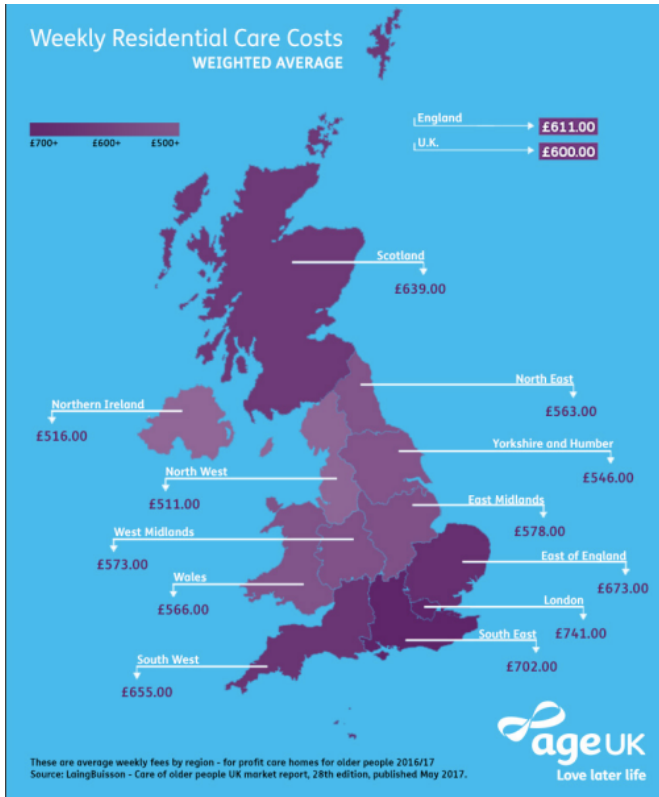
**FIGURE 7. THE DETERMINANTS OF LONG-TERM CARE EXPENDITURE**

Source: Public spending on health and long-term care: a new set of projections.

**TABLE 17. SAVING AND ASSETS THRESHOLDS IN THE U.K FOR 2022/23**

The savings and assets thresholds in the U.K. for 2022/23		
England	£	23.250
Northern Ireland	£	23.250
Scotland	£	28.750
Wales	£	50.000

SOURCE: CARE HOME U.K.

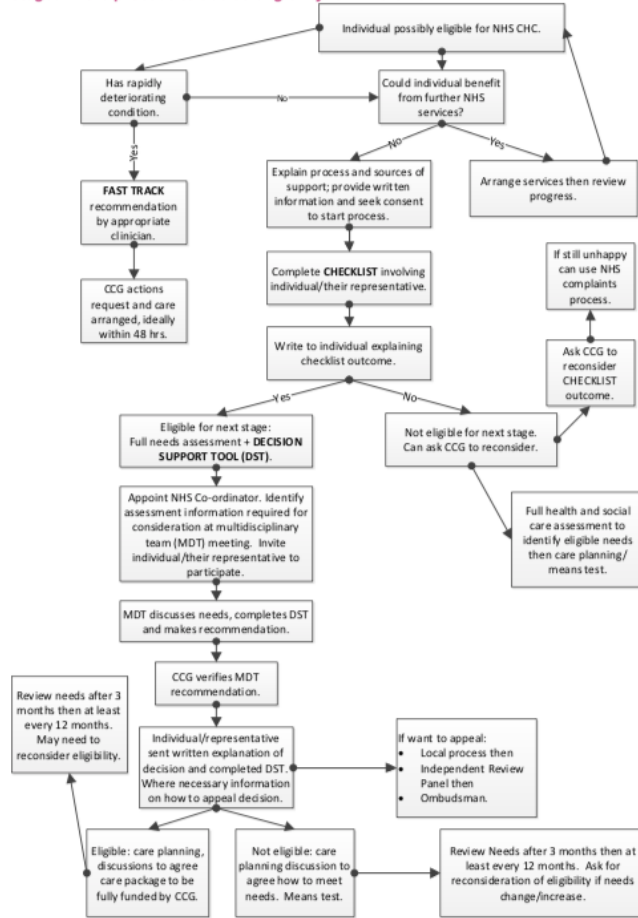


**FIGURE 8: WEEKLY RESIDENTIAL CARE COST**

SOURCE: AGE U.K.

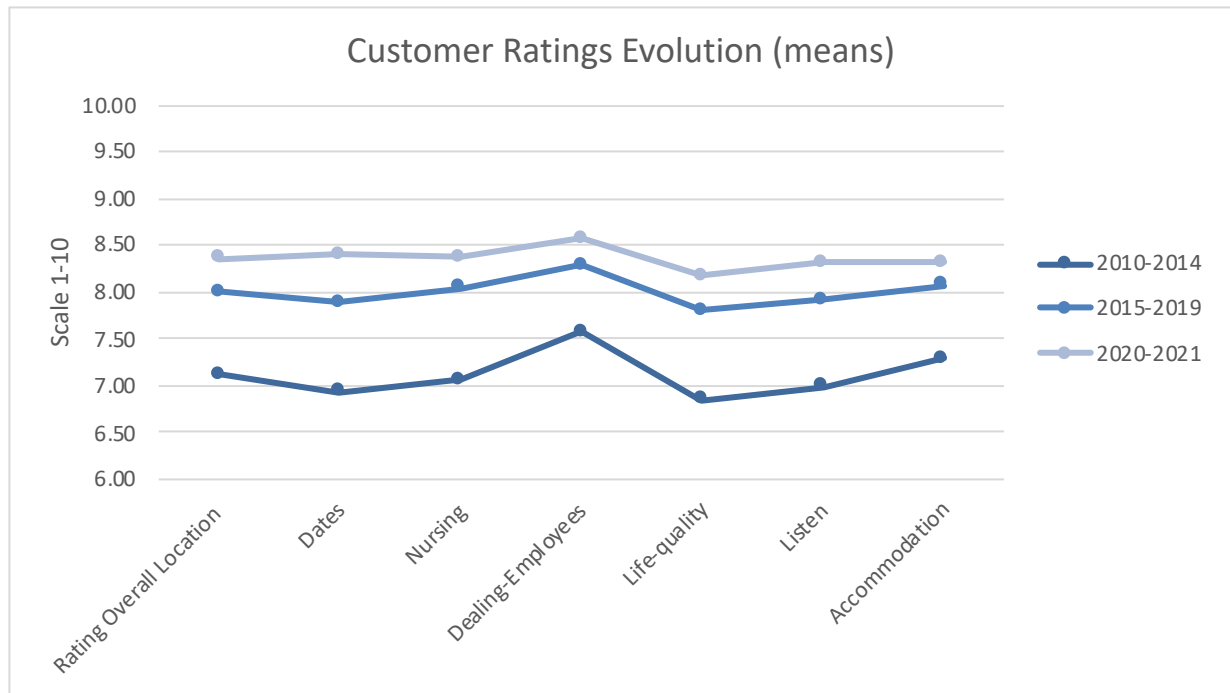


**Stages in the process to decide eligibility for NHS CHC**



**FIGURE 9: STAGES IN THE PROCESS TO DECIDE ELIGIBILITY FOR NHS CHC**

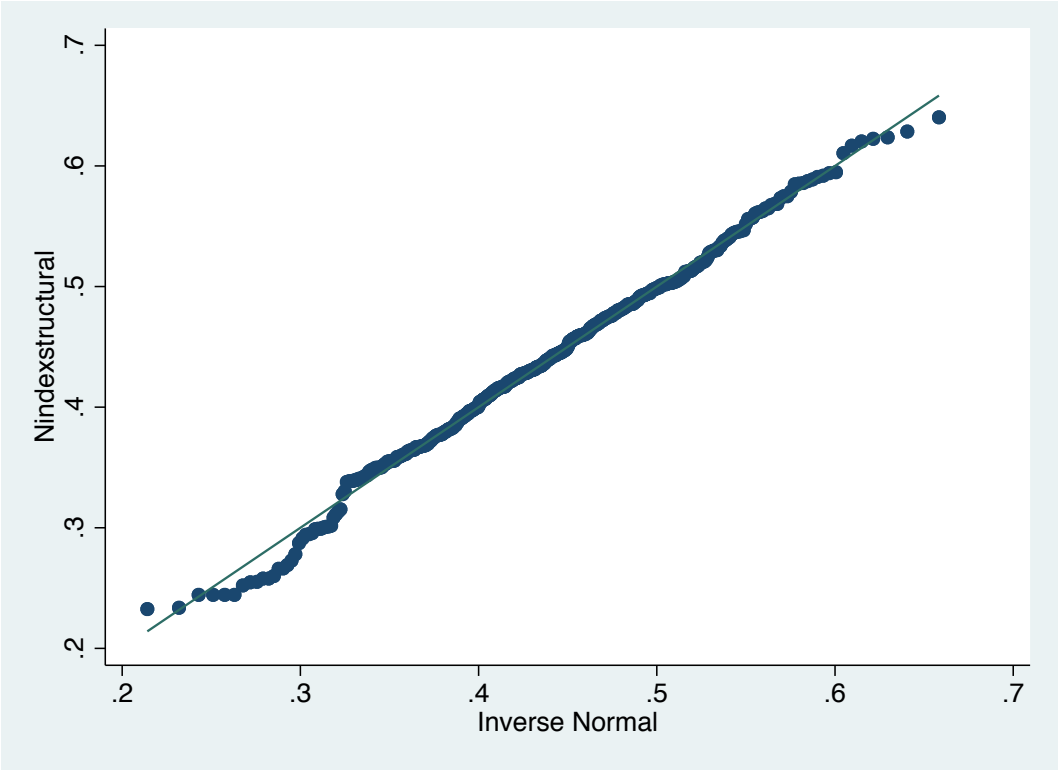
SOURCE: AGE U.K. FACTSHEET 20. N.H.S. CONTINUING HEALTHCARE AND NHS-FUNDED NURSING CARE, OCTOBER 2021



**FIGURE 10: DESCRIPTIVE STATISTICS FOR THE SIX CLIENT REVIEW CRITERIA.**

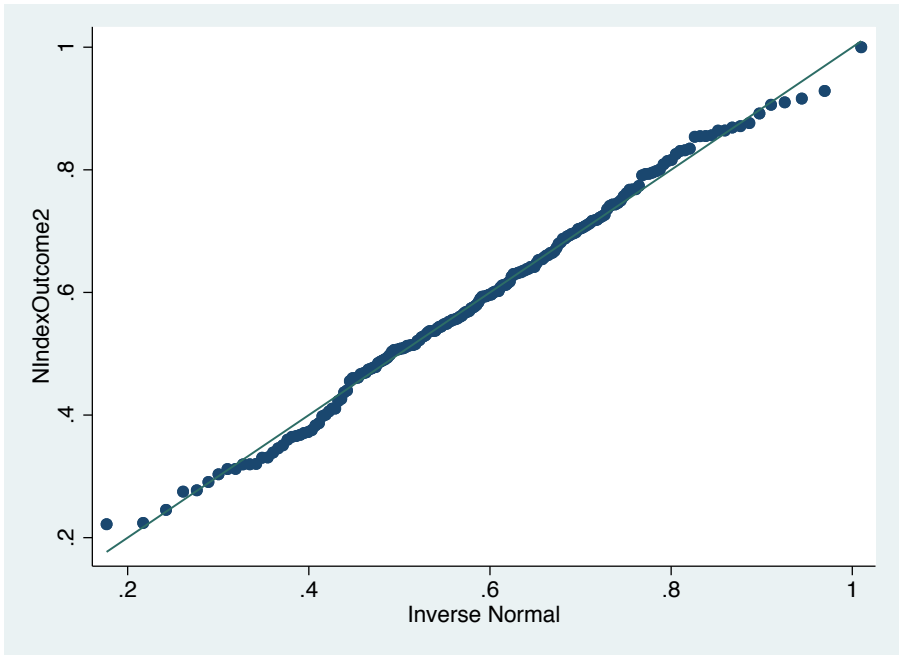
# Appendix B. Variable Dependent & Independent

Second analysis for the Netherlands: treatment of the variables:



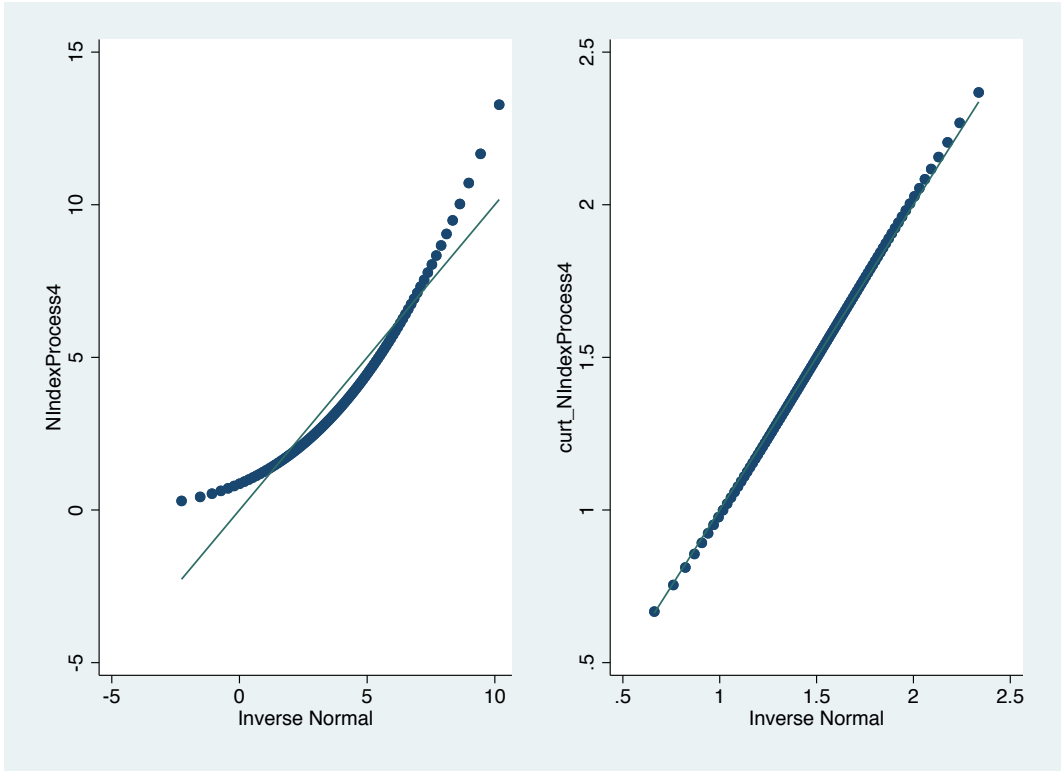
**FIGURE 11. STRUCTURAL INDEX, NORMAL DISTRIBUTION**

The Structural index has a normal distribution. Shapiro-Wilk and Shapiro-Francia test was applied, and both shows that the index has a normal distribution.



**FIGURE 12. OUTCOME INDEX, NORMAL DISTRIBUTION**

The Outcome index has to been transformed to Outcome Index<sup>2</sup> to have a normal distribution. Shapiro-Wilk and Shapiro-Francia test was applied, and both shows that the index has a normal distribution



**FIGURE 13. PROCESS INDEX, NORMAL DISTRIBUTION**

The cube root does an excellent job with a distinctly nonnormal distribution. It has often been applied to precipitation data, which are characteristically right-skewed and sometimes include zeros Cox 1992

Source: Cox, N. J. (2011). Stata tip 96: Cube roots. The stata journal, 11(1), 149-154.

## Appendix C. Robustness Test

**TABLE 18: (O.L.S.) ROBUSTNESS TEST FOR THE STRUCTURAL-RELATED QUALITY INDICATORS, PROCESS-RELATED QUALITY INDICATORS, AND OUTCOME-RELATED QUALITY INDICATORS.**

This table reports the results for the effects of (1) Structural Index, (2) Process Index (3) Outcome Index. The dependent variable is thus the quality measured through these three indices. The variable type of owner of the establishment has three categories: Non-profit, For-Profit, and Private Equity.

Variable of Interest	Structural Index (1)	Process Index (2)	Outcome Index (3)
Non-profit	-0.005 (0.15)	0.09 (0.11)	-0.014 (0.02)
PE firm	-0.09*** (0.02)	0.13 (0.20)	0.012 (0.03)
Very Large C	0.02 (0.02)	-0.71* (0.30)	-0.027 (0.039)
Large C	0.01 (0.018)	-0.08 (0.154)	-0.07* (0.031)
Medium C	0.006 (0.016)	-0.09 (0.082)	0.022 (0.028)
Total Clients/1000	-0.21*** (0.048)	1.24 (0.674)	0.03 (0.062)
Total Employees/1000	0.14*** (0.027)	-0.57 (0.298)	0.037 (0.038)
Constant	0.46**** (0.012)	1.52*** (0.059)	0.83*** (0.026)
Control variables	Yes	Yes	Yes
Robust Error	Yes	Yes	Yes
R-squared	0.05	0.08	0.12
Adjusted R-squared	0.03	0.004	0.08
Observations	460	97	170

Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1