

STOCKHOLM SCHOOL OF ECONOMICS
Department of Economics
659 Degree project in economics
Spring 2015

IS PRIVATE PRIMARY CARE MORE EFFICIENT THAN PUBLIC PRIMARY CARE?

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Abstract: Efficiency and markets. Since the Act on Free Choice Systems was made mandatory in 2010, allowing for private actors to enter the Swedish primary care sector, the efficiency dimension has gained increased importance. The intent of this study is to investigate whether efficiency differs between private and public primary care centers in Sweden. By using public data covering Swedish primary care centers' scores on (i) patient-perceived quality, (ii) phone accessibility, (iii) ability to set up appointments with doctors and (iv) county councils' cost per capita, the conclusion is that private providers seem to deliver slightly higher perceived quality of primary care. It is also suggested that private providers perform slightly better on the two accessibility measures phone accessibility and appointments with doctors. Support is not found for differences in cost-effectiveness between private and public care centers. Furthermore, data show that primary care centers located in the five county councils that have had the highest increase in private actors' market share deliver higher perceived quality of primary care.

Keywords: primary care, private care, perceived quality, accessibility, policy analysis

JEL: H44, H51, I11, I18, L330

Supervisor: Kelly Ragan
Date submitted: May 18, 2015
Date examined: June 9, 2015
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Examiner: Martina Björkman Nyqvist

Acknowledgements

We greatly thank our supervisor Kelly Ragan, Assistant Professor at the Department of Economics at the Stockholm School of Economics, for giving us invaluable guidance and support in all aspects of this study.

We would also like to give a special thanks to Per Strömberg, Professor of Finance and Private Equity at the Stockholm School of Economics, and Henrik Jordahl, Program Director at the Research Institute of Industrial Economics, for giving us inspiration and helpful guidance on the research subject.

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1. Introduction

How health care should be organized is an issue that is discussed intensively both in Sweden and in other countries. During the last years, tax planning and the relationship between profit and quality within the publicly funded care has dominated the debate in Sweden. According to Jordahl (2013) the current Swedish welfare model has three distinguishing characteristics: first, the services are mainly publicly funded and accessible to all citizens; second, they are produced increasingly in a setting of competition between public, profit and non-profit providers and third, the users' ability to choose provider has gained increasing importance. The consequences of the change in these three characteristics are interesting to evaluate and study. These consequences do not only change the citizens' aspect when they have a need for care, but also the whole health care industry in Sweden. Decisions within politics have become more important than ever and suddenly we are discussing new important questions: how do we deal with private health care companies? How can we increase the accessibility within health care? Is health care equally available to all citizens? Are we treating patients or customers?

When discussing the political perspectives of health care there are some facts that are more easily observed than others. For example, municipalities that are governed by a right-wing majority outsource production to private providers to a greater extent than those with a left-wing majority (Jordahl, 2013). When politicians make the choice, ideological motives have a greater impact than when the users of the service do. This is consistent with the observation that voters' attitudes toward privatization are less polarized than the politicians' attitudes are (Jordahl, 2013). This observation is important to stress, because, at the end of the day, the voters are the ones that will use the service. These ideological motives are important merely since they affect the Swedish welfare to a great extent.

Talking about welfare opens up for important questions about the economic perspective of health care. One of numerous theories discusses the valuation of health in monetary terms (Zweifel, Breyer and Kifmann, 2009). How much money should society distribute to the healthcare sector? How much consumption is society willing to sacrifice to improve the state of health? Today, 13 percent of the Swedish taxes are allocated to health care. The same amount is allocated to education and general public services respectively. The majority of the taxes, 41 percent, go to social protection. Health care is thus a large and important public service activity. To increase investment in health care and thereby the quality of care, the government must either raise their taxes, redistribute the current tax money or find ways to use resources more

efficiently. Since resources are constrained the latter one is arguably the most wishful alternative. Therefore there is a natural transition to the related issue, which public choice uses the resources most efficiently and is thus minimizing the loss of welfare? Our study focuses on examining efficiency, by comparing perceived quality, accessibility and costs-effectiveness of private and public primary care centers in Sweden. Arguably in this study, when quality and accessibility are high and provided through the use of same amount of tax funding, it is a sign of higher efficiency. However, it is worth mentioning that costs are not only monetary, which impose limitations to the ability to assess the cost-effectiveness measure. There can be social costs, utility costs or even attitudinal costs. These costs are widely discussed but due to the problem of quantifying them, they are rarely examined. In our study we will therefore refer to costs as monetary. Still, the nonmonetary costs associated with public goods, such as health care, are important and present an area where further research would be beneficial to society.

In 2010 the Act on Free Choice Systems was made mandatory in Sweden. Public actors are now acting alongside private and non-profit actors in the provision of primary care to the citizens. By opening up to private care providers; the government anticipated seeing an improvement in quality, accessibility and continuity of Swedish primary care, that is, an improvement in the use of health care resources. By focusing the remaining part of our study on ownership of primary care centers and increasing competition in the primary care sector, we aim to come closer to an answer of the following research question:

Is private primary care more efficient than public primary care when it comes to perceived quality, accessibility and cost-effectiveness?

We will address this research question from different starting points and we will eventually find support for private care centers being slightly more efficient than public care centers on the measures perceived quality and accessibility. Additionally, we find support for that a larger market share of private care centers in the county council slightly increases overall perceived quality of primary care. We will not find support for private care centers being more cost-effective, nor that an increase in the number of private care centers increase perceived quality, accessibility and cost-effectiveness.

2. Background

Sweden is divided into 21 different county councils and regions (henceforth denoted: county councils), which in turn are divided into 290 municipalities. Politicians elected directly by the county's residents govern the county councils, the highest decision-making body at the regional level. Providing health care, dental care (until age 20) and public transport are mandatory commitments for the county councils. Politicians in the municipalities, in turn, are responsible for a large part of the public service such as preschools, schools, social services and elderly care. In addition to the county councils' commitments mentioned above they make budget decisions, decide the amount of tax the residents shall pay and determine how much health care should cost. 32 percent of the county councils' total primary care net costs went to private actors in 2012, which was an increase with 15 percent from year 2001 (Jordahl, 2013). When it comes to the county councils' total costs, about 15 percent go to private health care providers (Jordahl, 2013).

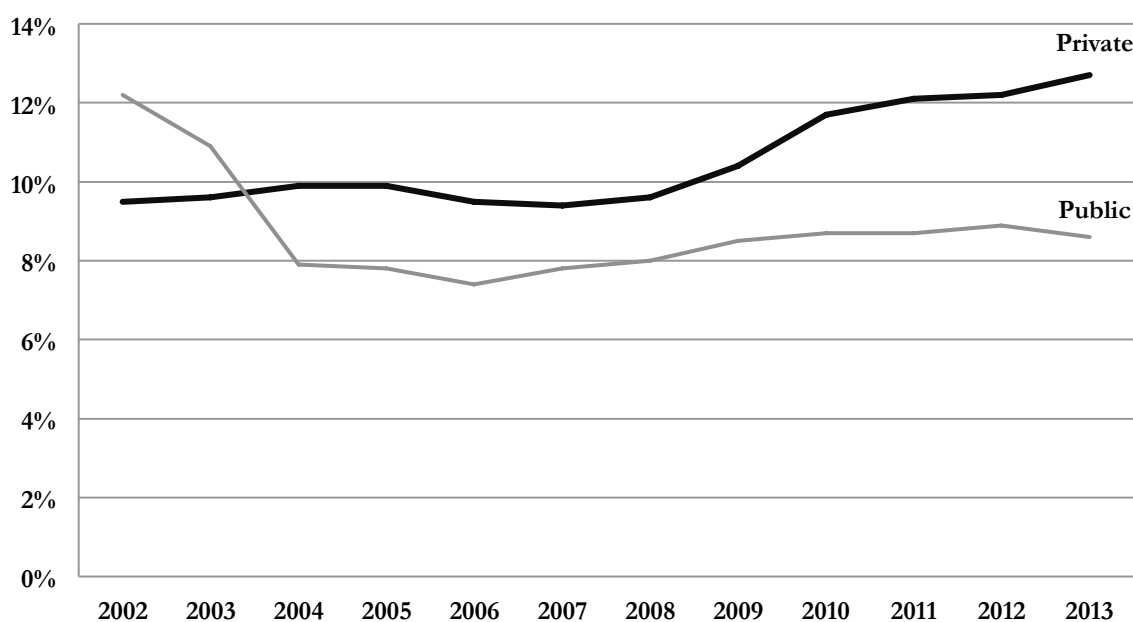


Figure 1. County council purchase of activities as a percentage of the net cost of the health care sector (Ekonomifakta 2014).

Furthermore, the share of county council's purchase of activities from private actors has increased over time (see Figure 1.). A stringent change of the purchase of health care activities can be observed between 2003 and 2004, since then, the purchase from public actors is below the purchase from private actors. Another change is observed after 2010. Since then, the

purchase from private actors has steadily increased whereas purchase from public actors has been rather unchanged. This tells us something about either political or user incentives in favor of a change towards a more widely privatized health care sector. However, further explanations to the privatization phenomenon are needed. Are there for instance any proved differences in efficiency between public and private health care actors that can explain this shift?

In 1982, the Health and Medical Services Act (Hälso- och sjukvårdslag [HSL] SFS 1982:763) was imposed. This generated a new health policy approach and the county councils were given a regulated responsibility for disease prevention through ensuring efficiency. In §28 HSL it follows that the management of health care shall be organized so that it meets high patient safety and quality of care and promotes cost-effectiveness. Focusing on the cost-effectiveness aspect of §28 HSL we find our first definition of efficiency: *a health service that is produced and performed with a lower cost than a comparable and approved health service.*

Having the quality aspect of §28 HSL in mind it is also important to discuss accessibility and patient perceived quality of health care. Among other things, accessibility comprises the attainableness of hospitals or care centers, the number of patients per doctor, the treatments available and the possibility to perform at each specific hospital or care center. Accessibility is arguably rather easy to measure and follow up. One can count the number of, and the distance to the hospitals or care centers as well as the density of patients and available treatments. Quality, on the other hand, is harder to define and to measure. This is partly because of information asymmetry. Hopefully, doctors know more about the patient's condition and need for treatment than the patient herself when the individual has a health problem and turns to the health care for help. However, there is always a risk of not receiving the desired results and the patient may be treated wrongly, both as a consequence of various reasons, because of bad compliance from the patient, a mistake from the doctor or because of some underlying incentives, such as the patient was given the cheapest method of possible treatment choices. In order for the patient to have enough incentives to decide to seek help at a care center or a hospital, the patient must feel that health care in general is performed with a certain amount of quality. Our second definition of efficiency focusing on the quality and accessibility aspect of health care is: *a health service that is of higher quality and more accessible to the patient than a comparable and approved health service.*

When combining the both definitions above, we attain a third cumulated definition: *an efficient health service is produced and performed with a lower cost, higher quality and is more accessible to the patient than a comparable and approved health service.*

2.1 Swedish Primary Care

This study will focus on Swedish primary care. In order to fully understand this sector, it needs to be explained in detail. First, the health care sector in Sweden is divided into two areas: primary care and specialized care (Ekonomifakta.se, 2014). According to National Board of Health and Welfare's term bank, which is based on §5 HSL, primary care is a part of outpatient care that, without demarcation of the disease, age or patient groups, is responsible for basic medical treatment, care, prevention and rehabilitation and does not require hospitals' medical and technical resources or other special skills.

2.2 Introducing the Act on Free Choice Systems

For the last 20-30 years, an accessible and well functioning primary care has been one of the top priorities in Swedish healthcare politics. Politicians have debated excessively on how to improve the primary care and a couple of minor reforms have been enacted. The most recent and also one of the largest reforms is the Act on Free Choice Systems (Lag om valfrihetssystem [LOV] SFS 2008:962) that was imposed in January of 2009. The LOV states that the county councils must specify the mission of the care units, their commitments and obligations, and decide a suitable compensation system for this. The compensation system in each county council must also be competitively neutral and given to all health care providers under the same conditions. As of 2010, all Swedish county councils have to provide free choice systems in the primary care sector in accordance with the LOV (National Board of Health and Welfare, 2012).

The purpose of the LOV was to entitle patients to choose their care provider based on their own preferences and thereby strengthen the citizens' influence over the Swedish health and medical services. The act gives people the right to choose private or public health centers and allow all primary care providers that fulfill the county councils' requirements to set up facilities and receive public compensation. The act also entitles the county councils the option to provide specialized outpatient care, thereby offering patients greater freedom of choice (Ministry of Health and Social Affairs 2014). By introducing the LOV and allowing for competing care providers in the Swedish primary care sector, the government anticipated seeing an improvement

in quality, accessibility and continuity of Swedish primary care (National Board of Health and Welfare, 2012). This creates an increased need for careful evaluation of how well the legislation works.

2.3 Evaluating the LOV

The Swedish bourgeois parties have long argued that accessibility and efficiency is improved with diversity in ownership of care centers. Since the introduction of the LOV and the allowance of private actors in the primary care sector, 185 new care centers have been initiated. This corresponds to a 20 percent increase in total number of care centers (Swedish Competition Authority, 2014). Most of these are private. In fact, since the introduction of the LOV the number of privately driven care centers has increased by 80%, whereas the number of publicly driven care centers has decreased. This has improved accessibility of Swedish primary care to the citizens. The distance to the nearest care center has also decreased for a large proportion of the population and today most citizens have a care center within a relatively short distance and travel time (Vårdanalys, 2014a). Furthermore, the patients' and the populations' opinion indicates that more individuals are positive than negative with regards to how accessibility has changed after the introduction of the LOV (Vårdanalys, 2014a).

However, since the reform is newly undertaken there is no total consensus about its effects. As mentioned above, some claim that increased privatization has led to a more accessible primary care and that the possibility to choose between private and public care centers has led to improved quality as well as patient empowerment (Olofsson, 2013). Others claim that it works as a counter-force to an equal distribution of primary care to the people. Research shows that improvements in accessibility are not evenly distributed across the country (Swedish Competition Authority, 2014). Larger cities, such as Stockholm and Gothenburg, have had a higher increase in the number of care centers and thus a higher increase in accessibility of care. Other cities, such as cities in the northern parts of Sweden, have had none or a very small increase in the number of care centers and thus almost no change in accessibility. As a consequence, institutions such as The Swedish Association of Local Authorities and Regions (SALAR) and National Board of Health and Welfare have been working on possibilities to estimate the effects of the LOV.

3. Previous Research

3.1 Four Perspectives of the LOV

Gert Paulsson (2009) is the author of a SALAR-report describing a model on how to follow up and evaluate the LOV. The model draws on four perspectives and suggests measurements that could be used to evaluate each of them. This report is also relevant as an inspiration to address the research question in this study.

3.1.1 The Industry- and Output Perspective

An important consideration when introducing the LOV was to positively affect the health care industry and to contribute to husbandry of scarce resources (Paulsson, 2009). The report suggests that number of visits is a feasible measurement when estimating this. Here, we address the question of scarce resources by investigating whether private actors manage to provide primary care more cost-effectively than public actors.

3.1.2 The Quality Perspective

All markets supply products and services. In the health care market, medical services are provided exclusively. Just as in the commercial markets, these services will be of different quality. There is a theory saying that the citizens' demand for services and quality of service would increase as the welfare society was built (Olofsson, 2013). And further, today, there is an idea that only the existence of hospitals and care centers is no longer enough. Patients also demand high quality, accessibility and different options. With regards to quality, there are various ideas within different academic disciplines on how it should be measured and interpreted.

One theoretical method divides the quality into two parts: technical (medical) and functional (perceived) quality. Medical quality is defined as the product or service the customer receives and perceived quality is how the customer perceives the product or service (Olofsson, 2013). The packaging of the product or service could therefore be just as important as the product itself. Since the introduction of the LOV, the primary care scope is largely determined by the rules developed by the county councils. This means that the medical quality is, in a sense, decided by the county council, the buyer of primary care. On the contrary, the level of perceived quality is largely decided by the care centers themselves when it comes to qualities like opening hours, i.e. their level of accessibility, and what kind of medical services they supply or not, etc.

The perceived quality might offset the medical quality in the sense that if the medical quality is perceived to be low or moderate, the total impression can still be positive if the perceived quality is perceived to be predominantly high. However, it is hard to measure medical quality and therefore one can doubt the patients' ability to assess it. Perceived quality on the other hand is more easily assessed and therefore some researchers find it easier to assess health care qualities by assess aspects of the perceived quality (Paulsson, 2009). Important but sketchy aspects of the perceived quality could be measured through care centers' ability to answer phone calls in time and to set up appointments with a doctor as well as through a survey measuring patients' perceived quality of primary care. This data is publicly available and of importance both for the health care unit as well as for existing and potentially new patients. Therefore, we intend to use this data to draw important conclusions of perceived quality and accessibility.

A further approach when discussing the LOV is the patients' increased demand for quality. Since the introduction of the LOV, the health care sector has been increasingly described as a market. Thus, the question whether the patients in this "market" are patients or customers becomes interesting. This naturally raises another question: what is the difference between being a customer and being a patient? Olofsson (2013), specialist in general practice, discusses this subject and defines a patient as a person who is in need of nursing care. Further, the patient is in a position of dependence towards health care and in no position to choose how care and treatment should be formed. It is possible to think of a patient in need of a nurse, a doctor, a psychologist or another specialist within the health care system. The customer on the other hand, could be thought of representing an economic situation in the sense that she has a higher legal economical status than the patient (Olofsson, 2013). It has been argued that this difference would contribute to oppositions against using the customer perspective, since it would affect the configuration of power between the patient and the doctor (Olofsson, 2013). Moreover, it could be argued that the customer perspective is perceived as threatening to the doctors because of the customers' ability to exercise power and influence the situation to a greater extent than the traditional patient is equipped to do (Olofsson, 2013). The customer perspective is a recent phenomenon that has arisen since the introduction of the LOV. The LOV has given the patient the power to actively choose or neglect a certain care center.

An increased number of care centers today compared to prior the LOV (Vårdanalys, 2014a) enables the patient to choose from more care centers. Introducing the LOV supports the

patients' needs of independence and integrity; it also suggests that the patient faces a greater responsibility to choose wisely. An increased number of options demand the patient to put more effort into which care center to choose. On the other hand, if the patient finds the quality to be insufficient, the LOV is constructed so that she can easily change care center because she has the ability to set high standards for the service she is given because she is, after all, a customer as well.

3.1.3 The Economic Perspective

The LOV was not introduced primarily as a mean to save money (Paulsson, 2009). However, the county councils' budgets have monetary restrictions and thus it is of interest to evaluate the effect of the LOV on the primary care net costs. The report suggests total cost per individual to be a feasible measurement (Paulsson, 2009).

In line with the discussions about health care budgets' monetary restrictions is the discussion of primary care compensation models. The compensation models are constructed differently in different county councils (Lindgren, 2014). This is of great importance for the incentives that drive health care actors when providing health care (Robinson, 2001). Therefore these models constitute an important component of health care governance and are consequently also significant for the quality, accessibility and organizational methods of health care. Since compensation to primary care providers is regulated locally and thereby formed independently by the county councils there is a large variation between the different models applied.

Compensation can be described on the basis of two main dimensions, time and activity, which in turn creates new types of incentives (Lindgren, 2014). This leads to a discussion whether some compensation models work better than others in incentivizing care providers to do their best and continuously try to provide better care. For instance, in 2013 eleven of the county councils used "compensation per visit", which is likely to stimulate care providers to increase the number of treated patients and, in the worse case, even unnecessary follow-up visits. This could potentially be at the expense of quality.

Lindgren (2014) is a medical doctor who works at IVBAR and is tied to the Medical Management Centre at Karolinska Institutet. In his research he divides the compensation models used in Sweden into five groups: appropriation, capitation, compensation per product category, action-based compensation and performance-based compensation. In primary care, the

capitation model is used as the core model for compensation by all county councils, where the county councils use a combination between a fixed compensation per listed patient, a variable compensation per visit as well as a goal oriented compensation based on indicators that reflect quality and efficiency (SALAR, 2015a). Except for the Stockholm county council, the fixed compensation per listed patient constitutes for the largest part of the capitation-based compensation to the care centers in the county councils (SALAR, 2015a).

The total capitation-based compensation, no matter if it is fixed, variable, or goal oriented, is then also adjusted according to characteristic of the underlying population. The factors that form the basis of the calculation of the total compensation vary, however. The age factor, used in 86 percent of the county councils, is the most common factor for adjustment (Lindgren, 2014). Another common factor, used by 57 percent of the county councils, is the Adjusted Clinical Group (ACG). It is a relative measure of the individual's expected or actual consumption of health services by classifying patients according to their age, gender, and previous diagnoses (Lindgren, 2014). A large proportion of the county councils, 71 percent, also take socio-economic factors into account using the Care Need Index (CNI). This index includes factors such as age, unemployment, education and proportion of foreign-born patients. One final adjustment for compensation is done based on the location of the care center, which is used by 66 percent of the county councils. This is done for example through higher compensation to municipalities located in rural areas, such as Uppsala, or based on distance to the hospital, such as Jämtland.

The effects of these compensation models are widely discussed but there is yet no total consensus about what is the best combination. Capitation-based models that rely heavily on a fixed compensation per listed patient reduce the pressure on doctors to treat as many patients as possible whereas high compensation per visit, on the other hand, incentivizes care centers to treat as many patients as possible potentially at the expense of quality. According to Robinson (2001), systems purely based on compensation per visit would produce above optimal levels of visits and systems purely based on capitation would produce below optimal level of visits.

Capitation based models can also incentivize cream skimming, which is when care centers prefer to treat easier patients at the expense of more difficult, time-consuming patients (Robinson, 2001). For instance, some argue that private care centers choose to treat less sick patients simply because it is easier and thus economically beneficial to do so. This implies that public care

centers will have to treat the more difficult-to-treat patients and this would also affect the quality that they deliver. If this is the case, one can imagine that the higher the fraction of private care centers the worse the public care centers perform, as they receive even more difficult patients. A potential solution to this problem is to adjust the capitation by ACG, as is done in Sweden.

3.1.4 The Employee Perspective

Swedish primary care's ability to provide the people with sufficient care depends on its ability to recruit and retain the best employees (Paulsson, 2009). The supply of doctors with expertise in primary care has been a problem in Sweden for a long time (Lindgren, 2014). The lack of general practitioners has resulted in job vacancies and an increased use of doctors employed through staffing companies. In order to adapt the provision of care to the citizens to meet their needs, it has been argued that primary care should have a significantly higher density of hospitals and care centers in the more rural areas of the country. The trend in the last 15 years has, on the contrary, gone in a different direction. Several of the county councils, which improved its relative doctor density in primary care, belonged to county councils that also had good access to doctors in general (Vårdanalys, 2014a).

Not only are there differences between county councils when it comes to the relative density of doctors. There are also differences between private and public care centers. According to a report from The Swedish Medical Association (2013), the number of listed patients¹ per specialist doctor was lower for private businesses than for public ones in 16 of the county councils in 2013. One can assume that a lower number of listed patients make it easier for the doctor to provide higher quality of care.

3.2 Contracting Out Public Services

Lane (2000) introduces New public management as “the theory of the most recent paradigm change in how the public sector is to be governed”(p.3). According to Lane, governments can either employ production of public services in-house or out-house and if it is to be produced out-house, governments will contract with the actors on the basis of competition, resulting in contracts stating what is to be delivered. However, there are some concerns regarding contracts

¹ All citizens are automatically listed at the care center closest to their home in the county council where they live. However, the LOV gives the patients the right to change this care center to a self-elected care center wherever they want. One can only be listed at one care center at a time (Vårdguiden, 2015)

and if it is possible to create them so that they will operate effectively without contradictions, which is why Lane suggests that there may be parts of the public sector that are more suited for out-house production than others.

Further, Savas (1999) introduces the concept of privatization as “the act of reducing the role of government or increasing the role of the private institutions of society in satisfying people’s needs; it means relying more on the private sector and less on government” (p. 2). When describing this change from one that relies heavily on government to one that relies more on the private sector, Savas presents three broad methods that result in privatizing government-run services: delegation, divestment and displacement. Delegation is where government retains responsibility and oversight but uses the private sector for service delivery; divestment, is where government relinquishes responsibility and displacement is where the private sector grows and displaces a government activity. When it comes to Swedish primary care and the introduction of the LOV, the government has chosen delegation.

Savas (1999) also presents seven criteria where contracting is likely to be better than direct, in-house provision of public services that primary care fulfills. For instance, primary care handles relatively uncomplicated patients where it is easy to measure results, was the treatment of the patient declared successful or not? The competition is high among providers and this increases the private actors’ incentives to produce care more efficiently since they need to make a profit in order to not go out of business. They might therefore put a greater effort into hiring the people with the needed skills and they might be better at retaining their employees by offering higher salaries and better working hours.

In this section the reasoning behind why some services are better suited for privatization than others will be presented (Levin & Tadelis, 2007). The two authors develop a theoretical model to capture the differences between private and public production. In public production employees with a fixed salary usually perform operations, therefore the financial incentives to work cost-effective are low. Private producers have stronger incentives to reduce costs since they are compensated for work performed. The risk of private production is instead that the strong incentives to reduce costs make the producer tempted to reduce the quality of the service. When contracting out public services, it is therefore highly important to sign a contract where the quality of the service is clearly specified. It can however be costly to write such contracts and to verify the result. Levin and Tadelis’ model therefore shows that private production of services is

appropriate when it is easy to validate quality of the service. Primary care is relatively uncomplicated to execute and the requirements the care centers need to meet can therefore be contracted upon and rather easy assessed. Thus, primary care should be thought of as a service where quality can be validated.

In another report, alternative forms of operation in health care are being reviewed (Vårdanalys and Expertgruppen för studier i offentlig ekonomi, 2014). In the report it is stated that private actors can operate some businesses more effectively. What businesses are being privatized and to what extent, however, varies from business area to business area. The report examines how factors such as organization and specific properties of individual health services affect the conditions for different modes of operation. The report begins by discussing when a private mode of operation can be used to create as large social benefit as possible. The general conclusion is that it is essentially simpler care services that are being provided both publicly and privately, while more complex services often continue to be operated publicly. For example, the development has preceded much further in primary care than in specialist care.

4. Specification of Detailed Research Focus

The focus of this study is the Swedish primary care sector. It has recently been introduced to the LOV, which has increased the number of private actors. As a consequence, benefits and costs associated with this introduction are important to assess. The studies that are performed on the subject so far are executed from the point of view of care centers as an entity. This study therefore contributes to the previous research on the effects of introducing the LOV, as it is the first study to perform pooled cross-sectional data regressions at the care center level in order to evaluate whether private actors are more efficient than public actors when it comes to perceived quality, accessibility and cost-effectiveness of primary care. It is unique in a sense that no one has separated care centers based on ownership in order to compare efficiency of private and public actors in this setting before.

4.1 Research Question

Is private primary care more efficient than public primary care when it comes to perceived quality, accessibility and cost-effectiveness?

4.2 Hypotheses

4.2.1 Hypothesis I: Private Actors Improve Quality and Accessibility

As mentioned, primary care centers need to fulfill a set of requirements in order to be allowed to provide primary care. When these requirements are fulfilled, the actors can design their services freely to meet the needs of the patients. We believe that public businesses are not able to adapt as fast as private businesses to a more market-oriented society. Furthermore, the introduction of the LOV increases competition in the primary care sector. Therefore care centers need to fight harder to survive. One can argue that private care providers have to fight even harder than the public ones because if private care centers lack visitors, they will not get a sufficient amount of state compensation. However, since the municipality or county council cannot be declared bankrupt, public businesses can obtain better terms than private companies when it comes to financing the operation (SALAR, 2011). Thus, we believe that the higher risk of going out of business that private actors face make them more prone to provide higher quality, answer the phone on time and set up more appointments with doctors. Actually, 14 of the 20 highest rated care centers in the NPS of 2012 were privately driven (Vårdföretagarna, 2013). Our aim is to

develop this finding by investigating whether private actors, not only the 20 top-ranked, deliver higher perceived quality and accessibility of primary care.

4.2.2 Hypothesis II: Private Actors are More Cost-effective

Public services exist to support the needs of the population and these services are financed with tax money. Thus, the costs of production are important to society. However, public care centers can obtain better financing terms than private ones. Arguably, this system does not provide public businesses with the same incentives as private actors when it comes to the use of monetary resources. Private producers have stronger incentives to use resources efficiently. Therefore, when the LOV was introduced, there were hopes of attracting more private primary care providers to the market and that a higher diversity of primary care providers would stimulate the development of innovative and cost-effective solutions (Swedish Competition Authority, 2014). However, has this been the case? We intend to evaluate whether private care providers deliver care at a lower cost than public ones. Additionally, we would like to investigate if there is a time trend that suggests an overall increase in primary care costs per capita over time. We believe that consumption of primary care has increased as more care centers have opened and accessibility has increased. A potentially higher consumption of primary care over time would increase overall costs per capita.

4.2.3 Hypothesis III: An Increase in Private Actors' Market Share Improves Perceived Quality

One of the main arguments in favor of the introduction of the LOV was that an increase in competing primary care actors would increase the quality of primary care. Now, five years later, the ongoing debate discusses whether there has been an overall improvement in quality or not. Our aim is therefore to try to present an answer to this debate and thus provide additional value to this discussion. This is to be done using data on the percentage point increase in private actors' market share from September 2009 to September 2013 and the total percentage increase in number of care centers during the same time period. We believe that a larger increase in private actors' market share as well as a larger increase in number of care centers improves perceived quality.

5. Method

In order to answer the research question the data will be examined on care center level where Hypothesis I and II will be tested using multivariate OLS and Hypothesis III will be tested using the Differences-in-Differences method. In order to control for trends in perceived quality, accessibility and cost-effectiveness that are location specific, dummy variables representing each of the 290 municipalities will be included in all regressions. Thereby we will be able to reduce the risk of having regressions that suffer from omitted variable bias.

5.1 Data

The cross-sectional data that will form the basis of the study consist of two yearly surveys on patient perceived quality and Swedish primary care centers' accessibility as well as county councils' annual primary care cost per capita.

Table 1. Summary Statistics

Dependent Variables

Variable	Mean	Std. Dev.	Min	Max	Source
Cost per capita	3797.06	490.48	2805.00	4991.00	Statistics Sweden
Doctor visits	0.93	0.09	0.00	1.00	SALAR
Phone accessibility	0.92	0.11	0.00	1.00	SALAR
Perceived quality	0.80	0.06	0.54	0.97	SALAR

Independent Variables²

Variable	Mean	Std. Dev.	Min	Max	Source
Avg. score on DV	0.92	0.04	0.76	0.98	SALAR
Avg. score on phone PA	0.90	0.07	0.62	1.00	SALAR
Avg. score on PQ	0.81	0.02	0.76	0.85	SALAR
Cost per capita	5170.21	373.73	4293.00	6282.00	Statistics Sweden
Fraction private	0.41	0.26	0.00	1.00	SALAR
Median wage	299.92	38.61	233.31	518.34	Statistics Sweden
Unemployment rate	0.08	0.03	0.02	0.15	Statistics Sweden
Fraction foreign born	0.15	0.07	0.04	0.40	Statistics Sweden

² Note that our dummy variables are not shown in the Summary Statistics Table due to the fact that these variables do not provide us with statistical information that is relevant to summarize. They are to be found in "Appendix: Definition of Dependent and Independent Variables" instead.

Average age	41.53	2.68	36.60	49.00	Statistics Sweden
Net income	-236.87	479.43	-1352.00	1081.00	Statistics Sweden
Population density	703.87	1386.92	0.20	5073.60	Statistics Sweden
Listed patients	1949.76	210.58	1584.00	2422.00	Statistics Sweden
Staffing companies	0.48	0.14	0.21	0.69	Statistics Sweden
Capitation	0.81	0.12	0.57	1.00	Statistics Sweden

5.1.1 Advantages of Pooled Cross-sectional Data

The advantage of pooling cross-sectional data in this study is that the sample size increases and therefore our results hopefully become more precise. When carrying out the regressions, time dummy variables are used to capture structural change over time and this makes it possible to draw inferences about the population at more than one single point in time.

Another advantage of pooled cross-sections is its usefulness when evaluating the impact of certain policies, such as the LOV. Policy evaluation of the LOV is possible since we find the policy to be a form of a natural experiment that changes the environment in which primary care centers operate.

5.1.2 National Patient Survey

The data from the first survey used in this study is the National Patient Survey (NPS). The NPS is a recurrent national survey that measures patients' perceived quality of primary care based on eight indicators: welcoming, participation, information, accessibility, trust, perceived benefit, recommendation and overall impression³. The questionnaires are sent via mail to randomly selected patients who, during the given sample period, have made a visit to or have been admitted to a primary care center. The results are then reported on SALAR's website. According to SALAR, the questionnaire is created to capture the patient's overall impression of the visit at the care center (SALAR, 2015b).

The first NPS was conducted on Swedish primary care in the autumn of 2009. That year, all county councils but Norrbotten county council was included. Ever since 2009 the NPS has been conducted on a national level every two years (odd years). Most county councils also conduct so-called inter-annual studies (even years).

³ See Appendix for a complete set of questions asked.

The data used in this study, was collected by Vårdföretagarna and consists of the NPS result from 2012, 2013 and 2014. In 2012, 14 county councils participated in the NPS and more than 111,000 patients answered the survey. This corresponds to a corrected response rate of 52.2 %. In 2013, all county councils participated in the NPS and almost 138,000 patients chose to answer the survey. This corresponds to a response rate of 53%. In 2014, 13 county councils participated in the NPS and nearly 110,000 people chose to answer the survey. This corresponds to a 51.4% corrected response rate (SALAR, 2015b). This rate can be considered to be quite low and not fully representative of the whole population. Those who respond probably have specific characteristics. They might care more about their own health or the overall health of the population or perhaps they are very satisfied or dissatisfied with the service they received at the care center. Therefore the respondents might represent the top-bottom percentiles of the care center visitors.

Using the data that Vårdföretagarna has retrieved is beneficial since Vårdföretagarna, in contrast to SALAR, has separated care centers based on ownership: private or public. However, using data from Vårdföretagarna comes with a potential limitation; it may be the case that the results were manipulated in the process of separating care centers. We assume this to be relatively unlikely.

There is an additional limitation associated with using the NPS. When using data based on a patient survey one must take into account that it might be biased. It is probably the case that most people already have a predetermined opinion regarding privatization of health care. This opinion can affect the how the patient chooses to respond in the survey. If the patient is in favor of privatization she might give high scores to the care center if it is private and low scores if it is public, regardless of how she is treated. Conversely, if the patient is against privatization she might be affected by the fact that the care center is private when answering the survey, only based on the fact that it is privately driven. On the other hand, one could argue that the patient might not know or simply not care whether the care center is public or private. She just visits a care center because it is closest to her home, no matter if it is private or not. In that case, the patient will hopefully give a fair response to the survey and not cause the survey to be biased. Another reason that speaks in favor of unbiasedness of the survey is that people are likely to find quality of health care to be vastly important. Thus, instead of succumbing to their own personal opinion about privatization they will give a fair-minded response to the survey. There are thus explanations both against and in favor of biasedness of the survey. Random assignment and a

large sample size, which is the case of the NPS, arguably diminish the potential bias. However, unbiasedness is harder to obtain and therefore the data probably suffers from biasedness to some extent. We acknowledge that it may affect the interpretation of the results.

5.1.3 Primary Care Centers' Accessibility

The data from the second survey used in this study has been collected by SALAR semi-annually since 2009. It covers Swedish care centers' accessibility and is conducted by SALAR in order to investigate how well primary care centers meet the requirements stated in the National Health Care Guarantees.

The first requirement is that all patients who call a primary care center shall be given advisory and/or an appointment with a doctor the very same day of the call (§3 HSL; §2 Förordning om vårdgaranti SFS 2010:349). The second requirement is that all patients who are in need of an appointment with a general practitioner shall receive an appointment within seven days. SALAR separates these requirements when measuring them.

Data on the first requirement that we denote "phone accessibility" are retrieved from care centers that have a callback or a computerized telephone system. The measurement takes place during normal business hours and includes all calls that involve healthcare advice or booking appointment with doctors. Stockholm county council is not included in this measurement since its approach to measuring the phone availability is not comparable with the rest of the country (Väntetider.se, 2015). The data show the proportion of the calls that were answered the same day and we have separated the data based on care center ownership.

Data on the second requirement that we denote "doctor visits" include patients who are determined to be in need of a visit for a new health problem or for a significant deterioration of a previously known health problem. Patients who have chosen to wait longer than the set limit of seven days are not included in the report (Väntetider.se, 2015). The data show the proportion of patients who got an appointment with a general practitioner at the care centers within seven days and we have separated the data based on care center ownership.

5.1.4 Primary Care Costs per Capita

Based on Gert Paulsson's SALAR-report (2009) and the suggested feasible measurements, we will use primary care costs per capita both as a dependent variable and an independent variable. Data on primary care costs per capita that are related to the county council's own consumption are retrieved from Statistics Sweden on county council level (Statistics Sweden, 2014). The limitation with this data set is that it is only available for county councils and that Gotland is not included. Thus our cost analysis is restricted to 20 county councils. A few numbers of observations could potentially make it difficult to draw valid conclusions.

5.1.5 Control Variables

To be able to draw accurate conclusions about the causal effect of privately driven care centers on our dependent variables *perceived quality*, *phone accessibility*, *doctor visits*, and *primary care cost per capita*, we have included various demographic and socio-economic measures as control variables to isolate the effects of ownership on the dependent variables. We believe that these control variables might be correlated with the variables *fraction private*⁴ and *private*⁵ and were therefore included in order to avoid having coefficient estimates that suffers from omitted variable bias.

Municipal dummy variables: Health care is supposed to be equally available to all citizens. The quality of treatments and the availability of care centers should not depend on the place of residence. Nonetheless, there are differences in health care between county councils. For example, the number of available care centers within a reasonable travel time and the number of listed patients per doctor differs between county councils (Vårdanalys, 2014a). This implies that certain county councils are better at providing a more accessible health care than others. Some are also able to provide higher quality to their citizens. There are arguably even accessibility and quality differences within county councils, especially within the larger ones that comprise a large set of municipalities. Therefore, in order to control for as many location specific trends as possible, municipal dummy variables have been created, denoted FE in the regression tables.

Population density: Studies show that more care centers in general and private care centers in particular open in larger cities compared to small cities (Vårdanalys, 2014a). In a study by Trydegård (2001), this positive relationship between population density and privatization is also

⁴ The fraction private variable represents the fraction of private care centers in each municipality that is represented in the data.

⁵ The private dummy variable equals 1 if the care center is privately driven and 0 if it is publicly driven.

found. Therefore, by adding municipal population density denoted *population density*, we aim to control for at least some part of the effect of not having an equal distribution of primary care centers across Sweden, when it comes to ownership of the care centers.

Median wage and Net income: To control for the county councils' capacity to allocate resources to primary care, the county council's annual net income is included. Additionally, the citizens' median wage in the municipality is included, to control for their ability to pay for the visits.

Large and Large & Private: Studies show that 245 different care providers, out of which 22 are publicly driven and 223 are privately driven, run the existing care centers in Sweden. Out of the 223 private care providers, 182 providers only run one single care center. This shows that most private care centers are small businesses (Swedish Competition Authority, 2014). It is possible to argue that small businesses do not make infinitely big profits. We aim to control for size of care centers by adding a size dummy denoted *large* that equals 1 if the care center is among the 20% largest care centers in the data set. Additionally, an interaction variable denoted *large & private* that equals 1 if the care center is both among the 20% largest ones and privately driven is included to examine if there is an effect of care center size attributable to ownership. However, due to lack of data on the size of care centers in the NPS, the size dummy variables have only been created when testing phone accessibility and doctor visits.

Right-wing, Private & Right-wing: Trydegård (2001) found a positive relationship between right-wing ideology and privatization. Therefore a dummy variable denoted *right-wing* that equals 1 if the care center is located in a county council that is right-wing governed is included. To see whether there is an effect associated with ownership of care centers, an interaction variable denoted *private & right-wing* that equals 1 if the care center is both private and located in a county council that is right-wing governed is included as well.

ACG/CNI: Since people are not equally sick, we aimed to include the ACG-measures age, gender and treated diagnoses, to identify what diseases are treated and if there is a difference between private and public care centers. However, due to lack of public data on what diagnoses Swedish care centers treat and the age and gender of treated patients; we were not able to include ACG in our regressions. However, we were able to include the municipal CNI-measures: average age, the fraction of foreign-born people, the fraction of highly educated and the unemployment rate.

Compensation model specific: To control for variables that determine the compensation to care centers four variables are added: the proportion of the compensation to care centers in the county council that is capitation based, a dummy variable denoted *compensation/visit* that equals 1 if the county council compensate care centers per visit are included, number of listed primary care patients per specialist doctor denoted and the proportion of care centers in the county council that have doctors who are employed through staffing companies.

5.2 Testing Perceived Quality, Accessibility and Cost-effectiveness

To test Hypotheses I and II, the following multivariate OLS regression models were set up.

The OLS estimator used when testing perceived quality might be written as:

$$(1) \quad \text{perceived quality} = \beta_0 + \beta_1 \text{private} + \delta_1 i.\text{municipality} + \beta_2 x + u$$

$$(2) \quad \text{perceived quality} = \beta_0 + \beta_1 \text{fraction private} + \delta_1 i.\text{municipality} + \beta_2 x + u$$

The OLS estimator used when testing the accessibility measures may be written as:

$$(3) \quad \text{phone accessibility} = \beta_0 + \beta_1 \text{private} + \delta_1 i.\text{municipality} + \beta_2 x + u$$

$$(4) \quad \text{phone accessibility} = \beta_0 + \beta_1 \text{fraction private} + \delta_1 i.\text{municipality} + \beta_2 x + u$$

$$(5) \quad \text{doctor visits} = \beta_0 + \beta_1 \text{private} + \delta_1 i.\text{municipality} + \beta_2 x + u$$

$$(6) \quad \text{doctor visits} = \beta_0 + \beta_1 \text{fraction private} + \delta_1 i.\text{municipality} + \beta_2 x + u$$

The OLS estimator when testing cost-effectiveness may be written as:

$$(7) \quad \text{cost per capita} = \beta_0 + \beta_1 \text{private} + \delta_1 i.\text{municipality} + \beta_x x + u$$

$$(8) \quad \text{cost per capita} = \beta_0 + \beta_1 \text{fraction private} + \delta_1 i.\text{municipality} + \beta_x x + u$$

where,

perceived quality is the care center's score on perceived quality retrieved from the NPS,
phone accessibility is the proportion of phone calls answered on time in each care center,
doctor visits is the care center's ability to set up a meeting with a doctor within seven days,
cost per capita is the county council's annual primary care cost per capita,
fraction private is the fraction of privately driven care centers in the municipality,
private is a dummy variable equal to 1 if the care center is privately driven,
 x is our control variables that would otherwise be left in the unobserved error term.

5.3 Testing If Private Actors' Market Share Increases Perceived Quality

To test hypothesis III and investigate whether there are differences in mean values and whether these differences originate from an increase in private actors' market share and not from unobserved factors correlating with the independent variables of interest, a difference-in-differences (DID)-method is applied. The DID-method is applicable when evaluating the LOV. In theory, the treatment group is assumed to be affected by the policy change whereas the control group is not. In our study, on the other hand, the county councils are divided into "high-intensity treatment" and "low-intensity treatment" groups, since per definition no county council fit into the control group. The reason for this is that the LOV was introduced on a national level in 2010, which implies that it affects all county councils. Therefore, in our study the high-intensity treatment group is assumed to be affected to a larger extent by the policy change than the low-intensity treatment group. Since using the DID-method implies that the difference in outcomes between the high-intensity treatment and low-intensity treatment groups before and after treatment is compared, this method may help to answer the following question: is perceived quality higher for county councils that have had a higher percentage point increase in private actors' market share or not?

5.3.1 Private Actors' Market Share as the Determinant

In order to answer Hypothesis III, the county councils are grouped based on their respective percentage point increase in private actors' market share from September 2009 to September 2013. That is, based on the time period before and after the introduction of the LOV. The NPS data on perceived quality that is used was obtained in September of 2009 (pre LOV) and September of 2013 (post LOV).

Table 13 shows DID-regressions where county councils that had a higher-than-average percentage point increase in private actors' market share between September 2009 and September 2013 is the high-intensity treatment group and the county councils that had a less-than-average percentage point increase during the same time period is the low-intensity treatment group. Table 14 shows DID-regressions that are slightly different. This time only ten county councils are included; the five county councils that had the highest percentage point increase in private actors' market share from September 2009 to September 2013 is the high-intensity treatment group and the five county councils that had the lowest percentage point increase in private actors' market share during the same time period is the low-intensity treatment group.

5.3.2 Increase in Number of Care Centers as the Determinant

There is an alternative way to answer Hypothesis III. As mentioned, since the introduction of the LOV there has been a 20 % increase in total number of care centers in Sweden. Separating this increase based on ownership, the number of private care centers has increased by 80% whereas the number of public care centers has decreased. Thus, one can argue that the addition of new care centers is exclusively thanks to private actors and it can be interpreted as if the county councils as owners of care centers have adopted a passive role and are instead allowing the market to handle new establishments of care centers. Having this in mind, the percentage increase in number of care centers is an alternative way to answer Hypothesis III.

Using the increase in care centers as the determinant, Table 15 shows DID-regressions where county councils that had a higher-than-average percentage increase in the number of care centers between September 2009 and September 2013 is the high-intensity treatment group and the county councils that had a less-than-average percentage increase during the same time period is the low-intensity treatment group. Table 16 shows DID-regressions when only ten county councils are included. The five county councils that had the highest percentage increase in number of care centers from September 2009 to September 2013 is the high-intensity treatment group and the five county councils that had no percentage increase in the number of care centers during the same time period is the low-intensity treatment group. The data from the NPS on perceived quality was obtained in September 2009 and September 2013.

5.3.3 The DID-estimator

The DID-estimator may be written as:

$$(9) \quad y = \beta_0 + \delta_0 d2 + \beta_1 \text{highly treated} + \delta_1 d2 * \text{highly treated} + \beta_x x + u$$

The coefficients have the following interpretation:

β_0 is the intercept

β_1 is the high-intensity treatment group specific effect, to account for average permanent differences between the high-intensity treatment group and the low-intensity treatment group

δ_0 is the time trend common to both groups that captures aggregate factors that would cause changes in perceived quality, even in the absence of a policy change

δ_1 is the true effect of treatment i.e. the additional effect on observation belonging to both the high-intensity treatment group and the year of 2013.

β_x is the effect of the control variables. Since the treatment, the LOV, can be suspected to be endogenous (correlated with the error term) these factors are included to control for the possibly different composition of the county councils.

OLS predicts average outcomes for different groups, consequently:

$$(10) \quad \hat{\delta}_1 = (\bar{y}_{2,T} - \bar{y}_{2,C}) - (\bar{y}_{1,T} - \bar{y}_{1,C})$$

where,

$\bar{y}_{2,T} - \bar{y}_{2,C}$ is the difference in average outcomes between the high-intensity treatment and low-intensity treatment groups after treatment

$\bar{y}_{1,T} - \bar{y}_{1,C}$ is the difference in average outcomes between the high-intensity treatment and low-intensity treatment groups before treatment

$(\bar{y}_{2,T} - \bar{y}_{2,C}) - (\bar{y}_{1,T} - \bar{y}_{1,C})$ is the difference between these two differences

The identifying assumption, that needs to be true for the DID-estimator to identify a causal effect, is that the high-intensity treatment group and the low-intensity treatment group have common trends, i.e. that absent the LOV the perceived quality trend should have been the same in all county councils. We believe this to be true for Swedish primary care. For instance, today all county councils offer patients the ability to read their medical records online at minavardkontakter.se (Vårdguiden Västra Götalandsregionen 2014). This improves the

communication between patients and doctors and the accessibility of care to the patient no matter what county council the patient is a resident and this will most likely affect the overall trend of perceived quality positively.

5.3.4 Limitations of the DID-regressions

It is important to underline that the data on perceived quality is only available from September of 2009 and forward. Our data therefore does not take into account the fact that some county councils introduced the LOV before September of 2009. Halland introduced the LOV in 2007, Västmanland and all municipalities in Stockholm but Norrtälje municipality introduced the LOV in 2008. Gotland, Kronoberg, Skåne, Uppsala, Östergötland, Västra Götaland and Södermanland introduced the LOV during the first six-months of 2009 (National Board of Health and Welfare, 2010). If the county councils introduced the LOV earlier than September of 2009, the percentage point increase in private actors' market share between September 2009 and September 2013 will most likely be affected. For example, it might be probable to think that the increase is larger in close proximity to the introduction of LOV when many new private actors establish themselves and that it might slowly stagnate the years after as the market becomes saturated. This affects if the county council is assigned to the high-intensity group or low-intensity treatment group.

An additional limitation to our data is that Norrbotten county council was not included in the 2009 NPS. Thus, Norrbotten is not included in our DID-regressions. Norrbotten had the lowest percentage increase in number of care centers from September 2009 to September 2013 (a decrease of 2.9%) and also the fourth lowest percentage point increase in private actors' market share from September 2009 to September 2013 (3.1%) (Vårdanalys, 2014a). Norrbotten would therefore have been assigned to the low-intensity treatment group both when all county councils are included and when the top- and bottom 5 are included. These two limitations are important to acknowledge since they may bias the regression estimates.

6. Analysis

6.1 Perceived Quality and Accessibility

6.1.1 Perceived Quality

Looking at Table 1 below, our results show that privately driven care centers deliver higher perceived quality of primary care on a 1 % significance level, holding all other factors fixed.

Looking at the control variable *right-wing* and the interaction variable *private & right-wing* in Table 1, our results suggest that private care centers in left-wing governed county councils are in fact the ones driving these positive results.

Table 1: Relationship between care centers' score on perceived quality and privately driven care centers. Clustered on county councils.

VARIABLES	Perceived Quality (Regression I)	Perceived Quality (Regression II)	Perceived Quality (Regression III)
Private	0.03*** (0.00)	0.03*** (0.00)	0.03*** (0.00)
Right-wing	-0.03*** (0.01)	-0.02 (0.02)	0.05*** (0.01)
Private & right-wing	-0.01* (0.00)	-0.01* (0.01)	-0.01* (0.01)
Year 2013	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Year 2014	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
Net income		0.00 (0.00)	0.00 (0.00)
Population density		0.00*** (0.00)	0.00*** (0.00)
Cost per capita		0.00*** (0.00)	-0.00*** (0.00)
Median wage		0.00 (0.00)	
Average age		-0.01** (0.00)	-0.01* (0.01)
Highly educated			-0.86 (0.74)
Listed patients			-0.00*** (0.00)
Staffing companies			0.57*** (0.03)
Compensation/visit			-0.15*** (0.02)
Constant	0.76*** (0.00)	0.84*** (0.12)	2.06*** (0.56)
FE	YES	YES	YES
Observations	2,984	2,962	2,962
R-squared	0.33	0.33	0.33

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

There could be several potential explanations for why ideological belonging and motives would affect the way the citizens perceive the quality of care. One of them may have to do with the

proportion of higher educated citizens in the county councils. For instance, our data show that citizens in right-wing county councils are more educated than citizens in left-wing county councils. It could be that people with a higher education are more selective and less prone to answer the NPS-questions using the higher scores. When looking at Table 1 Regression III, where the variable *highly educated* is added, an increase in the proportion of highly educated citizens seems to lower the score on perceived quality.

Looking at the regressions in Table 2, it is suggested that an increase in the fraction of privately driven care centers in the municipality also improve perceived quality. This variable is not significant, however, but possesses the expected positive sign. Looking at the control variable *right-wing* and the interaction variable *private & right-wing* in Table 2 instead, it is not a clear priori whether perceived quality is higher in left-wing or right-wing governed county councils.

Table 2: Relationship between care centers' score on perceived quality and the fraction of privately driven care centers. Clustered on county councils.

VARIABLES	Perceived Quality (Regression I)	Perceived Quality (Regression II)	Perceived Quality (Regression III)
Fraction private	0.05 (0.05)	0.05 (0.05)	0.05 (0.05)
Right-wing	-0.03*** (0.01)	-0.03* (0.01)	0.03*** (0.01)
Private & right-wing	0.02*** (0.00)	0.02*** (0.00)	0.02*** (0.00)
Year 2013	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Year 2014	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
Net income		0.00 (0.00)	0.00 (0.00)
Population density		0.00*** (0.00)	0.00*** (0.00)
Cost per capita		0.00 (0.00)	-0.00*** (0.00)
Median wage		-0.00* (0.00)	
Average age		-0.01 (0.00)	-0.01 (0.01)
Highly educated			-0.87 (0.76)
Listed patients			-0.00*** (0.00)
Staffing companies			0.49*** (0.03)
Compensation/visit			-0.12*** (0.02)
Constant	0.74*** (0.04)	1.09*** (0.17)	1.97*** (0.64)
FE	YES	YES	YES
Observations	2,984	2,962	2,962
R-squared	0.31	0.31	0.31

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

To summarize, our data suggest that private care centers are delivering higher perceived quality on a 1 % significance level and that an increase in private actors improve perceived quality. However, the *fraction private* variable is not significant and the R^2 ranges from 0.31 – 0.33 in the regressions, implying that our independent variables are able to explain approximately 30 % of the variation in perceived quality. This means that there are still variables that we were unable to include in our regressions that affect the outcome. Therefore, we are careful when drawing any conclusions saying that private actors are more efficient when it comes to perceived quality. We are merely able to say that there seems to be a trend suggesting this.

6.1.2 Accessibility

Holding all other factors fixed, our results in Table 3 suggest that privately driven care centers are better at answering the phone on time and set up appointments with doctors compared to publicly driven care centers. Looking closer at the control variable *right-wing* and the interaction variable *private & right-wing* are added, our results show that private care centers in left-wing governed county councils are the ones driving the positive phone accessibility result and that private care centers in right-wing governed county councils drive the positive doctors visits result.

Furthermore, when the control variable *large* is added, our results show that small care centers are both better at answering the phone on time and set up appointments with doctors. This is a significant and interesting finding. It could be that small care centers receive fewer phone calls in relation to the number of administrators, that each doctor have fewer listed patients, or merely that they are working harder to fulfill the needs of their patients. Additionally, when the interaction variable *large & private* is included in the regressions, it is suggested that care centers that are both large and privately driven are better at answering the phone on time and setting up appointments with doctors compared to large and public care centers. This could potentially be explained by the amount of doctors and administrators employed at private and public care centers. As mentioned in the previous research section, it is shown that the number of listed patients per doctors is lower for private care centers. It is reasonable to argue that the fewer patients a doctor needs to attend, the more time and devotion the doctor can assign each patient, raising the ability to provide the patients with appointments within seven days.

Table 3: Relationship between care centers' score on the two accessibility measures and privately driven care centers. Clustered on county councils.

VARIABLES	Phone Accessibility (Regression I)	Doctor Visits (Regression II)
Private	0.00 (0.01)	0.02** (0.01)
Right-wing	-0.15*** (0.01)	0.02 (0.01)
Private & right-wing	0.02 (0.03)	-0.01 (0.01)
Year 2013	0.01 (0.01)	-0.00 (0.00)
Year 2014	-0.01 (0.01)	-0.02** (0.01)
Large	-0.03*** (0.01)	-0.01** (0.01)
Large & private	0.03* (0.01)	0.01 (0.01)
Median wage	0.00*** (0.00)	-0.00*** (0.00)
Net income	0.00 (0.00)	0.00 (0.00)
Cost per capita	0.00*** (0.00)	0.00*** (0.00)
Population density	-0.00 (0.00)	0.00** (0.00)
Average age	0.00 (0.00)	-0.01*** (0.00)
Listed patients	-0.00*** (0.00)	-0.00*** (0.00)
Staffing companies	-0.60*** (0.03)	-0.06*** (0.02)
Compensation/visit	0.28*** (0.01)	0.01* (0.00)
Constant	0.81*** (0.07)	1.40*** (0.06)
FE	YES	YES
Observations	2,604	3,335
R-squared	0.38	0.26

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Even though the coefficient on *private* has the expected positive sign in both regressions in Table 3, it is only significant when *doctor visits* is the dependent variable, not when *phone accessibility* is. An explanation to why statistical significance is hard to obtain on the *phone accessibility* measure is that Swedish primary care centers, no matter if they are private or public, manage to answer almost all phone calls. Looking at the summary statistics table, the mean on phone accessibility in the data set is 0.92, where 1.00 is the highest possible value, i.e. all phone calls are answered.

Looking at Table 4 instead, the results suggest that an increase in the fraction of privately driven care centers improves phone accessibility and doctor visits. The coefficients on *fraction private* possesses the expected positive sign in these regressions as well, however is only significant

when *phone accessibility* is the dependent variable. Furthermore, the R^2 ranges from 0.26 to 0.39 in Table 3 to 4, implying that we did not include all of the independent variables that possess explanatory value. Therefore, we are careful when interpreting our results as support for private actors being better at answering the phone in time and setting up appointments. Rather we conclude that we seem to have identified a potential trend suggesting this.

Table 4: Relationship between care centers' score on the accessibility measures and the fraction of privately driven care centers. Clustered on county councils.

VARIABLES	Phone Accessibility (Regression I)	Doctor Visits (Regression II)
Fraction private	0.06* (0.03)	0.00 (0.00)
Right-wing	-0.10*** (0.01)	-0.02*** (0.00)
Private & right-wing	0.02 (0.03)	0.00 (0.00)
Year 2013	0.01 (0.01)	-0.00 (0.00)
Year 2014	-0.01 (0.012)	-0.02 (0.01)
Large	-0.033*** (0.01)	-0.02* (0.01)
Large & private	0.03** (0.01)	0.02* (0.01)
Median wage	0.00*** (0.00)	-0.00*** (0.00)
Net income	0.00 (0.00)	0.00 (0.00)
Cost per capita	0.00 (0.00)	0.00*** (0.00)
Population density	-0.00 (0.00)	0.00 (0.00)
Average age	-0.00 (0.01)	-0.01*** (0.00)
Listed patients	-0.00*** (0.00)	-0.00*** (0.00)
Staffing companies	-0.68*** (0.07)	-0.13*** (0.02)
Compensation/visit	0.26*** (0.03)	0.06*** (0.00)
Constant	1.02*** (0.14)	1.62*** (0.06)
FE	YES	YES
Observations	2,604	2,594
R-squared	0.39	0.27

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Concluding, our results suggest that private actors are slightly more efficient than public actors on the measures perceived quality and accessibility. When the independent variable is fraction private, the coefficients are positive but not significant, suggesting that a more extensive research is needed in order to come closer to a causal relationship. This is for example done through a larger sample size.

One explanation to the higher perceived quality and accessibility among private providers could have to do with competition. As competition increases, actors need to fight harder to survive. In the primary care sector one can argue that private care providers have to fight even harder than the public ones. If a private care center lacks visitors, they will not get a sufficient amount of state compensation. However, since the municipality or county council cannot be declared bankrupt, public businesses can obtain better terms than private companies when it comes to financing the operation (SALAR, 2011). Thus, we believe that the tougher climate that private actors face make them more prone to strive to fulfill the patients' needs, i.e. provide higher quality and accessibility. Furthermore, in line with the discussion that doctors who are working at private care centers have fewer listed patients to attend and thus are more able to meet with the patients within seven days is the reasoning that it will also raise the perceived quality of the visit

6.2 Cost-effectiveness

At first sight, our results suggest that private care centers are more cost-effective than public actors. Looking at Table 5, it is suggested that private actors lower the annual primary care costs per capita by 47.24 SEK. Furthermore, it seems that large care centers increase annual county council primary care costs per capita by 51.57 SEK, whereas care centers that are both large and private lower the annual primary care costs by 12.20 SEK. That is, private actors seem to manage monetary resources more effectively than public actors.

Table 5: Relationship between county councils' primary care cost per capita and privately driven care centers

VARIABLES	Primary Care Cost Per Capita
Private	-47.24*** (14.26)
Right-wing	-287.60*** (12.46)
Large	51.57*** (19.42)
Large & private	-12.20 (29.94)
Constant	5,314*** (11.07)
Observations	3,335
R-squared	0.15

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

However, as our regressions are based on county council's primary care cost per capita, not care centers' primary care costs per capita, we are careful when interpreting the relationship between ownership of care centers on cost-effectiveness using Table 5 solely.

When municipality dummy variables and a set of control variables are added to the regressions in Table 6 and 7, our results still suggest that private actors deliver primary care at a lower cost than public actors, i.e. private actors seem to improve cost-effectiveness. The results also suggest that an increase in the fraction of private care centers increases cost-effectiveness. However, the coefficients are now very small and not significant, making us unable to draw a causal conclusion about the relationship between primary care costs and private care centers. If it had been possible to collect data on primary care costs per capita on care center level, it would have increased the possibility to draw a causal conclusion.

Table 6: Relationship between county councils' primary care cost per capita and privately driven care centers. Clustered on county councils.

VARIABLES	Primary Care Cost Per Capita (Regression I)	Primary Care Cost Per Capita (Regression II)	Primary Care Cost Per Capita (Regression III)	Primary Care Cost Per Capita (Regression IV)
Private	-1.88 (1.74)	-2.02 (1.91)	-1.88 (1.74)	0.00* (0.00)
Right-wing	-528.50 (382.20)	-528.30 (382.10)	-527.00 (380.70)	21.84*** (0.00)
Year 2013			-1.03 (1.16)	-0.00** (0.00)
Year 2014			-2.53 (2.19)	-0.00** (0.00)
Median wage			4.61 (5.78)	32.95*** (0.00)
Net income			-0.00 (0.00)	-0.00 (0.00)
Population density			-0.01 (0.01)	-0.00 (0.00)
Highly educated			-60.30 (109.90)	0.00** (0.00)
Average age			47.72 (41.14)	214.60*** (0.00)
Listed patients				-8.21*** (0.00)
Staffing companies				3,381*** (0.00)
Compensation/visit				-705.30*** (0.00)
Perceived quality		5.49 (6.50)		
Constant	5,23*** (1.34)	5,23*** (3.65)	1,80 (3,554)	1,375*** (0.00)
FE	YES	YES	YES	YES
Observations	2,962	2,962	2,962	2,962
R-squared	0.99	0.99	0.99	1.00

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 7: Relationship between county councils' primary care cost per capita and the fraction of privately driven care centers. Clustered on county councils.

VARIABLES	Primary Care Cost Per Capita (Regression I)	Primary Care Cost Per Capita (Regression II)	Primary Care Cost Per Capita (Regression III)	Primary Care Cost Per Capita (Regression IV)
Fraction private	-9.37 (10.43)	-2.02 (1.91)	-9.29 (9.88)	-0.00 (0.00)
Right-wing	-529.40 (383.00)	-528.30 (382.10)	-527.90 (381.60)	21.84*** (0.00)
Year 2013			-1.03 (1.19)	-0.00** (0.00)
Year 2014			-2.47 (2.13)	-0.00** (0.00)
Median wage			4.66 (5.84)	2.97*** (0.00)
Net income			-0.00 (0.00)	0.00 (0.00)
Population density			-0.01 (0.01)	0.00 (0.00)
Highly educated			-68.85 (118.50)	0.00** (0.00)
Average age			47.41 (40.81)	-150.00*** (0.00)
Listed patients				-8.21*** (0.00)
Staffing companies				3,381*** (0.00)
Compensation/visit				-2,597*** (0.00)
Perceived quality		5.49 (6.50)		
Constant	5,235*** (8.02)	5,233*** (5.58)	1,804 (3,553)	25,914*** (0.00)
FE	YES	YES	YES	YES
Observations	2,962	2,962	2,962	2,962
R-squared	0.99	0.99	0.99	1.00

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Even though we are unable to find support for private actors being more cost-effective, some coefficients in Table 6 and 7 are still providing us with interesting insights. Firstly, care centers employ rented doctors through staffing companies since they are not able to employ enough permanently employed doctors. As rented doctors are more expensive to employ (Blekinge Läns Tidning, 2014), primary care costs are thought to increase as the number of care centers that use staffing companies increases. Actually, Table 6 and 7 show that a 1-percentage point increase in the number of care centers using staffing companies increases the primary care costs per capita by 33.81 SEK. From the point of view of society, this is a rather large effect. Additionally, our regressions show that an additional listed patient at any of the care centers in the county council reduces the primary cost per capita by 8.21 SEK. Moreover, receiving a fixed compensation per visit reduces cost per capita. This could be explained by economies of scale. Fixed costs, such as

personnel costs, are divided over more patients. Lastly, we suggested that there might be a time trend showing an increase in primary care cost per capita. Since the time period is relatively short, 2012 to 2014, it is not surprising that this was something that we did not find support for. If anything, it seems that primary care costs have slightly decreased during this time period.

6.3 Perceived Quality Higher in ‘Five Highest Treated’ County Councils

Our results in Table 8 and 9, show that the five county councils that have had the highest percentage point increase in private actors’ market share deliver slightly higher perceived quality of primary care. The same is true for the five county councils that have had the highest percentage increase in number of care centers. Data also suggest, however not significantly, that the county councils that have had an above average percentage point increase in private actors’ market share deliver slightly higher perceived quality (see Appendix Table A8). The same is suggested for the county councils that have had an above average percentage increase in number of care centers (see Appendix Table A9).

Table 8: Effect of the five county councils with the highest percentage point increase in private actors’ market share on perceived quality. Clustered on county councils.

VARIABLES	Perceived Quality (Regression I)	Perceived Quality (Regression II)
Five highest treated	-0.05* (0.03)	-0.02 (0.02)
DID-variable	0.01** (0.01)	0.01** (0.01)
Right-wing		0.01 (0.01)
Net income		-0.00*** (0.00)
Cost per capita		-0.00* (0.00)
Population density		-0.00 (0.00)
Average age		0.00 (0.00)
Constant	0.79	0.78*** (0.11)
FE	YES	YES
Observations	859	843
R-squared	0.27	0.28

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

Table 9: Effect of the five county councils with the largest percentage increase in number of care center on perceived quality. Clustered on county councils.

VARIABLES	Perceived Quality (Regression I)	Perceived Quality (Regression II)
Five highest treated	-0.13*** (0.00)	-0.05*** (0.00)
DID-variable	0.01* (0.00)	0.01*** (0.00)
Right-wing		-0.00 (0.00)
Net income		0.00 (0.00)
Cost per capita		-0.00*** (0.00)
Population density		-0.00*** (0.00)
Constant	0.87*** (0.00)	0.88*** (0.01)
FE	YES	YES
Observations	1,040	1,025
R-squared	0.26	0.27

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

Looking at Table 8 and 9, the variable of interest that is indicating the effect of the LOV, the *DID-variable*, is positive and significant in all regressions. That is, over time the high-intensity treatment group performs better on the perceived quality measure. Interesting to see is that the variable *five highest treated*, representing a permanent specific effect of the high-intensity treatment group is negative in both tables. That is, the low-intensity treatment group is permanently delivering a higher level of perceived quality compared to the high-intensity treatment group. This finding is not affecting the possibility to conclude that treatment, i.e. the LOV, is having a positive effect on the perceived quality delivered.

However, one limitation is important to discuss; the sample was not randomly chosen. It was rather the proportion of privately driven care centers that decided whether the county council was assigned to the high-intensity treatment group or not. Even though control variables were added in the regressions, it is not unreasonable to think that some characteristics were left in the unobserved error term and could have been a determining factor for why county councils were assigned to the high-intensity treatment group or not. For example, preferences may be correlated with the proportion of private care centers. It may be the case that the county council's choice of how much to spend on primary care is not only correlated with our control variables, such as county councils' annual net income, but with other control variables such as preferences, i.e. how valuable the county councils find primary care to be compared to other

parts of health care and dental care. If this was the case, then the high-intensity treatment group and the low-intensity treatment group would differ systematically, inferring with the possibility to draw any valid conclusions. However, in practice it is impossible to know whether the county councils differ systematically.

To summarize, the five county councils where privatization has gone the furthest, i.e. where private actors' market share has increased the most and where the increase in new care centers have been the highest, deliver slightly higher perceived quality of primary care. These results could be used as partial support for the LOV's successfulness.

6.4 Addressing Limitations of the Data

As mentioned, Stockholm county council is not included in the data on phone accessibility. Additionally, Stockholm county council is unique compared to the rest of Sweden. Looking at our data, it has the highest absolute number of care centers, population density, mean income, foreign-born population and highly educated individuals. Furthermore, it is the only county council where the LOV was not implemented uniformly. All the municipalities in Stockholm county council but Norrtälje municipality implemented the LOV in January 2008 (National Board of Health and Welfare, 2010). Norrtälje did not implement the LOV until November 2010 (Norrtälje municipality, 2013).

Therefore, in order to rule out that there is a Stockholm effect, we decided to run the regression model for the dependent variables: *perceived quality*, *doctor visits* and *cost per capita* twice (using *private* as the independent variable). All the county councils from which data is available were included in the first regression, while Stockholm was excluded in the second one. By comparing the regression where all county councils are included against the one where Stockholm is excluded, the coefficients on *private* and *fraction private* possess the expected positive sign in all of the regressions. Thus, a Stockholm specific effect does not seem to exist.

7. Discussion

The aim of this study was to evaluate whether private actors are more efficient than public actors. The results show that they are, on the measures perceived quality and accessibility. This can be used to guide policy makers in these two sketchy but important factors, when examining improvements in accessibility and efficiency through the presence of the private sector in primary care. Additionally, it can be used to facilitate the decision making process for other countries, where privatization of primary care is under consideration but has not yet been taken into place. Needless to say, our results only touch one part of efficiency. The definition of efficiency is arguably broader than our definition. Therefore we will discuss areas that further could contribute to the understanding of efficiency and potential amendments of primary care when private actors enter the market.

7.1 Raising the Discussion About Profits

There are numerous of variables that are interesting to discuss when comparing private and public primary care. For example, data about each care center's bonus allocations is interesting to investigate since this might reveal whether higher bonus allocations reduce quality. An answer to this question would contribute to future policy decision-making since some politicians' main argument for prohibiting profits in welfare is that private companies stretch the quality to make big profits. However, is this really the case? If not, and if this argument can be proven statistically false, it will be hard for these politicians to argue against private companies in primary care. Unfortunately, it is difficult to find enough data to draw a complete conclusion about private companies' internal politics when it comes to the allocation of bonuses through dividends versus reinvestments in the business, because dividend politics is a complicated question. Whilst dividends are acting as a key driver for managers to run the care center as efficiently as possible, it can also serve as a reason to cut costs at the expense of quality. Despite the complex nature of these two motives, trying to understand which of them that plays the greatest role is of great interest and importance.

Even though some argue that allowing for profit making in the welfare sector comes with the cost of setting quality at risk, this risk is not an unnecessary cost that can always be avoided when municipalities and county councils produce all public services themselves. On the contrary, it is often possible to lower the costs of these services by allowing private companies to provide them (Morin, 2011). Capio and Praktikertjänst are useful examples of profit-driven businesses

that can be innovative, service-minded and popular. The profit can be a strong driving-force to expand successful businesses so that it can be accessible to even more users. However, positive effects that are associated with profits are hard to evaluate and are often overlooked by empirically focused economists (Morin, 2011). But that does not mean that they are not important. This study has in fact shown that private actors, thus profit-driven care centers, are more efficient than public ones on the measures perceived quality and accessibility.

On the other hand, it is not hard to understand why the positive effects that come with privatization are rarely spoken of. It goes hand in hand with limited research on this subject. Few studies have evaluated primary care based on separation of private and public care providers. Thus, there are limited results showing improved quality of primary care when the provider is private. In addition, it is important to mention that when private actors make a profit they pay taxes on this profit that in turn also finances public services and even, to some extent, public businesses that are suffering a deficit. Restricting profits in primary care, which the left-wing politicians suggest (Shekarabi and Sjöstedt, 2015), could have considerable consequences, not only for the care centers but also for the Swedish citizens. Improvement of quality would be inhibited, as diversity and accessibility of care centers becomes restricted. Fewer entrepreneurs would invest, as they would not be compensated for the risk taken for their investment. Additionally, without this compensation, private care centers that are already providing primary care would face the risk of eventually being phased out and thereby diversity would be phased out as well. Lower competition and decreased diversity could potentially lead to less cost-effective welfare that would make it more difficult to finance the welfare through today's tax system. As the discussion about profits is important and closely linked to the discussion about quality, accessibility and cost-effectiveness, it is an area that we suggest future studies to build upon.

7.2 Employees and Their Level of Satisfaction

A discussion about the employee and management perspective is naturally important as well. The care centers' scores on perceived quality and accessibility are not able to provide us with the whole story on what is going on beneath the surface. For example, some county councils compensate care providers per visit and this might cause care centers to overproduce primary care. It is possible to argue that this risk is higher at private care centers, since they are seeking a profit and thus are more prone to work efficiently. This could in turn increase the level of stress

among the employees. However, according to Jobbhälsobarometern, a survey that is executed by Sveriges Företagshälsor and Svenskt Kvalitetsindex, the employees working in the private care sector are more pleased with the workload, work management and the ability to make progress at the working-place (Vårdanalys, 2014b). Further, looking at the whole private health care sector and comparing it with the public health care sector, the private sector scores higher when it comes to employee satisfaction. This also applies to the salaries; employees in the private sector earn eight percent more than their “colleagues” in the county council (Statistics Sweden, 2014). Furthermore, introducing the LOV and thus allowing for both private, non-profit and public care centers allows the employees to choose, and not choose their employer to a greater extent. This could make the employers, private or public, work harder to keep their employees, improving the employees overall satisfaction.

7.3 Further Considerations

What will the consequences be of increasingly treating patients as customers, both under economic conditions and under the dominance of the current debate about care center ownership? Should not our mere humanity make us treat the patient using the best possible quality, whether we see the patient as a customer or patient? It is difficult to tell because when there are patient, economic, political, business and employee incentives at stake there will be an increased need for balancing these interests. Regardless of the underlying incentive, one could hope that the customer approach forces the politicians to become more involved in the question of how it is possible to find the best quality for the citizens.

Going forward, how can we continue to ensure that there is development in quality, accessibility and cost-effectiveness of primary care? We believe that clear requirements of quality, well-developed compensation models and careful monitoring of how the services are executed will allow politicians to relax the debate about ownership of care centers and instead focus on achieving the highest level of quality.

To summarize, we have explored some significant variables when examining the Swedish primary care when it comes to perceived quality and two aspects of accessibility. They are relatively easy to measure and to make calculations on. Although these variables do not tell the whole story about efficiency and about what happens behind the scenes of primary care centers, about the meeting with the doctor and the results of the treatments etc., the fact cannot be

ignored that it is difficult to obtain high values of these measures if the service offered by the care center is flawed. This means that our results are convincing and play an important part of an initiated investigation of privatization in Swedish primary care. Regardless of what may be considered about private care, one cannot deny that privatization so far seems to have been beneficial to the Swedish primary care sector.

8. Conclusion

The LOV was introduced to entitle patients to choose their care provider based on their own preferences and thereby strengthen their influence over primary care. Since the introduction of LOV and the allowance of private and non-profit actors to operate alongside the public actors there has been an increased fraction of private actors in the primary care sector. This shift, has initiated intense debates about the consequences of allowing private actors to make profits since this could cause private providers to stretch quality.

This study has thus examined the impact of ownership of care centers on three measures of efficiency. Relating back to the theoretical section of our study, an efficient health service: *is produced and performed with a lower cost, higher quality and is more accessible to the patient than a comparable and approved health service*. Having this definition of efficiency, our research question and previous research as the basis, our results suggest that private care providers deliver signs of slightly higher perceived quality and accessibility of primary care. That is, private actors seem to make primary care more accessible to the citizens and contribute to an improved perceived quality. In addition, we have found that a larger market share of private actors in the county council increases overall perceived quality of primary care. However, the regression results do not support private actors being more cost-effective.

Even though our definition does not comprise the complete scope of efficiency, our finding that private actors are more efficient when it comes to perceived quality and accessibility should encourage policy makers to relax the debate about ownership of care centers and instead allow them to focus on achieving the highest level of quality.

Going forward, broadening the definition of efficiency by including added variables such as data on profits and employee satisfaction, would be highly contributing to the discussion about privatization of primary care and ownership of care centers in Sweden.

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10. Appendix

Definition of Dependent and Independent Variables

Dependent Variables	Explanation
Cost per capita	County council's annual primary care cost per capita, in SEK
Doctor visits	Care center's proportion of patients that got an appointment with a doctor within 7 days
Perceived quality	Care center's score on perceived quality based on the NPS
Phone accessibility	Care center's proportion of phone calls answered in time

Independent Variables	Explanation		
Average age	Average age in the municipality 2013		
Avg. score on DV	County council's average ability to set up a meeting with a doctor within 7 days		
Avg. score on PA	County council's average proportion of phone calls answered on time		
Avg. score on PQ	County council's average score on perceived quality based on the NPS		
Capitation	The proportion of the compensation to care centers in the county council that is capitation-based		
Compensation/visit	Dummy variable: The county council compensate care centers per visit	1=Yes	0=No
Cost per capita	County council's annual primary care cost per capita, in SEK		
DID-variable	Dummy variable: County council is part of treatment group and the observation belongs to 2013.	1=Yes	0=No
Five highest treated	Dummy variable: County councils is one of the five highest treated county councils and thus assigned to the high-intensity treatment group	1=Yes	0=No
Fraction foreign born	Fraction of foreign born citizens in the municipality 2014		
Fraction private	Fraction of privately driven care centers in each municipality with respect to our data sets "perceived quality", "phone accessibility" and "doctor visits" respectively		
Highly educated	Proportion of highly educated citizens in the municipality, i.e. have pursued post high-school studies		
Highly treated	Dummy variable: County councils is one of the above average treated county councils and thus assigned to the high-intensity treatment group	1=Yes	0=No
Large & Private	Dummy variable: The care center is both among the 20% largest care centers in Sweden and privately driven	1=Yes	0=No
Large	Dummy variable: The care center is one of the 20% largest care centers in Sweden based on annual number of doctor visits	1=Yes	0=No
Listed patients	Number of listed primary care patients per specialist doctor, 2012		
Median wage	Annual median income in the municipality, in TSEK		
Net income	The county council's annual net income, in TSEK		

Population density	Number of inhabitants per km ² in the municipality		
Private	Dummy variable: Care center is privately driven	1=Yes	0=No
Private & Right wing	Dummy variable: Privately driven care center located in a county council that is governed by right-wings	1=Yes	0=No
Right-wing	The county council is governed by right-wings	1=Yes	0=No
Staffing companies	Proportion of care centers in the county council that have doctors who are employed through staffing companies		
Unemployment rate	Rate of unemployment in the municipality 2014		

Additional Regression Tables

Table A.1: Relationship between care centers' score on perceived quality and privately driven care centers. Clustered on county councils.

VARIABLES	Perceived Quality (Regression I)	Perceived Quality (Regression II)	Perceived Quality (Regression III)
Private	0.03*** (0.00)	0.03*** (0.00)	0.03*** (0.00)
Right-wing		-0.03*** (0.01)	-0.03*** (0.01)
Private & right-wing			-0.01* (0.00)
Constant	0.76*** (0.00)	0.76*** (0.00)	0.76*** (0.00)
FE	YES	YES	YES
Observations	2,984	2,984	2,984
R-squared	0.33	0.33	0.33

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

Table A.2: Relationship between care centers' score on phone accessibility and privately driven care centers. Clustered on county councils.

VARIABLES	Phone Accessibility (Regression I)	Phone Accessibility (Regression II)	Phone Accessibility (Regression III)
Private	0.01* (0.00)	0.02 (0.01)	0.01 (0.02)
Right-wing	-0.24*** (0.01)		
Private & right-wing	0.02 (0.03)		
Large		-0.02*** (0.01)	-0.03*** (0.01)
Large & private			0.02 (0.02)
Constant	0.94*** (0.01)	0.94*** (0.01)	0.94*** (0.01)
FE	YES	YES	YES
Observations	2,625	2,625	2,625
R-squared	0.38	0.38	0.38

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

Table A.3: Relationship between care centers' score on phone accessibility and privately driven care centers. Clustered on county councils.

VARIABLES	Phone Accessibility (Regression I)	Phone Accessibility (Regression II)	Phone Accessibility (Regression III)
Private	0.01* (0.01)	0.00 (0.01)	0.00 (0.01)
Right-wing	-0.24*** (0.01)	-0.22*** (0.01)	-0.15*** (0.01)
Private & right-wing	0.02 (0.03)	0.02 (0.03)	0.02 (0.03)
Year 2013	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Year 2014	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)
Large		-0.03*** (0.01)	-0.03*** (0.01)
Large & private		0.03* (0.01)	0.03* (0.01)
Median wage			0.00*** (0.00)
Net income			0.00 (0.00)
Cost per capita			0.00*** (0.00)
Population density			-0.00 (0.00)
Average age			0.00 (0.00)
Listed patients			-0.00*** (0.00)
Staffing companies			-0.60*** (0.03)
Compensation/visit			0.28*** (0.01)
Constant	0.94*** (0.01)	0.95*** (0.01)	0.81*** (0.07)
FE	YES	YES	YES
Observations	2,625	2,625	2,604
R-squared	0.38	0.38	0.39

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

Table A.4: Relationship between care centers' score on phone accessibility and the fraction of privately driven care centers. Clustered on county councils.

VARIABLES	Phone Accessibility (Regression I)	Phone Accessibility (Regression II)	Phone Accessibility (Regression III)
Fraction private	0.07* (0.04)	0.07* (0.04)	0.06* (0.03)
Right-wing	-0.20*** (0.03)	-0.17*** (0.02)	-0.10*** (0.01)
Private & right-wing	0.03 (0.03)	0.02 (0.03)	0.02 (0.03)
Year 2013	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Year 2014	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)
Large		-0.03*** (0.01)	-0.03*** (0.01)
Large & private		0.03** (0.01)	0.03** (0.01)
Median wage			0.00*** (0.00)
Net income			0.00 (0.00)
Cost per capita			0.00 (0.00)
Population density			-0.00 (0.00)
Average age			-0.00 (0.01)
Listed patients			-0.00*** (0.00)
Staffing companies			-0.68*** (0.07)
Compensation/visit			0.26*** (0.03)
Constant	0.89*** (0.03)	0.90*** (0.02)	1.02*** (0.14)
FE	YES	YES	YES
Observations	2,625	2,625	2,604
R-squared	0.38	0.39	0.39

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

Table A.5: Relationship between care centers' ability to set up appointments with doctors and privately driven care centers. Clustered on county councils.

VARIABLES	Doctor Visits (Regression I)	Doctor Visits (Regression II)	Doctor Visits (Regression III)
Private	0.02** (0.01)	0.01*** (0.00)	0.02** (0.00)
Right-wing	0.04*** (0.01)		0.03*** (0.01)
Private & right-wing	-0.01 (0.01)		-0.01 (0.01)
Large		-0.01 (0.01)	-0.01** (0.01)
Large & private			0.01 (0.01)
Constant	0.94*** (0.01)	0.95*** (0.00)	0.95*** (0.01)
FE	YES	YES	YES
Observations	3,355	3,355	3,355
R-squared	0.25	0.25	0.25

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A.6: Relationship between care centers' ability to set up appointments with doctors and privately driven care centers. Clustered on county councils.

VARIABLES	Doctor Visits (Regression I)	Doctor Visits (Regression II)	Doctor Visits (Regression III)
Private	0.02** (0.01)	0.02** (0.01)	0.02** (0.01)
Right-wing	0.05*** (0.01)	0.04*** (0.01)	0.02 (0.01)
Private & right-wing	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)
Year 2013	-0.01 (0.00)	-0.01 (0.00)	-0.00 (0.00)
Year 2014	-0.02** (0.01)	-0.02** (0.01)	-0.02** (0.01)
Large		-0.01** (0.01)	-0.01** (0.01)
Large & private		0.01 (0.01)	0.01 (0.01)
Median wage			-0.00*** (0.00)
Net income			0.00 (0.00)
Cost per capita			0.00*** (0.00)
Population density			0.00** (0.00)
Average age			-0.01*** (0.00)
Listed patients			-0.00*** (0.00)
Staffing companies			-0.06*** (0.02)
Compensation/visit			0.01* (0.00)
Constant	0.95*** (0.01)	0.95*** (0.01)	1.40*** (0.06)
FE	YES	YES	YES
Observations	3,355	3,355	3,335
R-squared	0.26	0.26	0.26

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

Table A.7: Relationship between care centers' ability to set up appointments with doctors and the fraction of privately driven care centers. Clustered on county councils.

VARIABLES	Doctor Visits (Regression I)	Doctor Visits (Regression II)	Doctor Visits (Regression III)
Fraction private	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Right-wing	-0.03*** (0.01)	0.02* (0.01)	-0.02*** (0.00)
Private & right-wing	0.01* (0.00)	0.00 (0.00)	0.00 (0.00)
Year 2013	-0.01 (0.00)	-0.01 (0.00)	-0.00 (0.00)
Year 2014	-0.02 (0.01)	-0.02 (0.01)	-0.02 (0.01)
Large		-0.02* (0.01)	-0.02* (0.01)
Large & private		0.02* (0.01)	0.02* (0.01)
Median wage			-0.00*** (0.00)
Net income			0.00 (0.00)
Cost per capita			0.00*** (0.00)
Population density			0.00 (0.00)
Average age			-0.01*** (0.00)
Listed patients			-0.00*** (0.00)
Staffing companies			-0.13*** (0.02)
Compensation/visit			0.06*** (0.00)
Constant	0.96*** (0.00)	0.96*** (0.00)	1.62*** (0.06)
FE	YES	YES	YES
Observations	2,608	2,608	2,594
R-squared	0.27	0.27	0.27

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

Table A.8: Effect of an above average percentage point increase in private actors' market share on perceived quality. Clustered on county councils.

VARIABLES	Perceived Quality (Regression I)	Perceived Quality (Regression II)
Highly treated	-0.07*** (0.03)	0.02 (0.03)
DID-variable	0.00 (0.00)	0.00 (0.00)
Right-wing		0.01 (0.01)
Net income		0.00*** (0.00)
Cost per capita		-0.00** (0.00)
Population density		0.00 (0.00)
Average age		0.01*** (0.00)
Constant	0.82	0.38*** (0.11)
FE	YES	YES
Observations	1,951	1,935
R-squared	0.29	0.29

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

Table A.9: Effect of an above average percentage increase in number of care centers on perceived quality. Clustered on county councils.

VARIABLES	Perceived Quality (Regression I)	Perceived Quality (Regression II)
Highly treated	0.01*** (0.00)	-0.12*** (0.00)
DID-variable	0.00 (0.00)	0.001 (0.01)
Right-wing		0.01 (0.01)
Net income		-0.00 (0.00)
Cost per capita		-0.00*** (0.00)
Population density		0.00 (0.00)
Constant	0.67*** (0.00)	0.94*** (0.02)
FE	YES	YES
Observations	1,951	1,936
R-squared	0.29	0.29

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

Table A.10: Relationship between care centers' score on perceived quality and privately driven care centers. Clustered on county councils. Stockholm excluded.

VARIABLES	Perceived Quality (Regression I)	Perceived Quality (Regression II)	Perceived Quality (Regression III)
Private	0.03*** (0.00)	0.03*** (0.00)	0.03*** (0.00)
Right-wing	-0.04*** (0.00)	-0.04*** (0.00)	-0.04*** (0.00)
Private & right-wing	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)
Year 2013	-0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Year 2014	-0.00 (0.00)	-0.00 (0.00)	0.00 (0.00)
Median wage		-0.00*** (0.00)	
Net income		0.00 (0.00)	0.00 (0.00)
Population density		-0.00 (0.00)	-0.00 (0.00)
Cost per capita		0.00*** (0.00)	0.00*** (0.00)
Average age		-0.02*** (0.00)	-0.01*** (0.00)
Highly educated			-0.70 (0.99)
Constant	0.76*** (0.00)	1.80*** (0.01)	1.13*** (0.19)
FE	YES	YES	YES
Observations	2,345	2,323	2,323
R-squared	0.35	0.35	0.35

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A.11: Relationship between care centers' ability to set up appointments with doctors and privately driven care centers. Clustered on county councils. Stockholm excluded.

VARIABLES	Doctor Visits (Regression I)	Doctor Visits (Regression II)	Doctor Visits (Regression IV)
Private	0.02** (0.01)	0.02** (0.01)	0.02** (0.01)
Right-wing	-0.06*** (0.01)	0.07*** (0.01)	0.06*** (0.01)
Private & right-wing	-0.02* (0.01)	-0.02* (0.01)	-0.01 (0.01)
Year 2013	-0.00 (0.00)	-0.00 (0.00)	-0.01 (0.01)
Year 2014	-0.02** (0.01)	-0.02** (0.01)	-0.03 (0.02)
Median wage		0.00*** (0.00)	0.00 (0.00)
Net income		0.00 (0.00)	0.00 (0.00)
Cost per capita		-0.00*** (0.00)	-0.00 (0.00)
Population density		0.00 (0.00)	-0.00 (0.00)
Average age		0.01*** (0.00)	0.00* (0.00)
Highly educated			2.01 (2.12)
Large			-0.01* (0.01)
Large & private			0.01 (0.01)
Constant	0.95*** (0.01)	0.38*** (0.12)	-0.00 (0.57)
FE	YES	YES	YES
Observations	2,765	2,745	2,745
R-squared	0.27	0.27	0.27

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table A.12: Relationship between county councils' primary care cost per capita and the fraction of privately driven care centers in the county council. Clustered on county council. Stockholm excluded.

VARIABLES	Primary Care Cost Per Capita (Regression I)	Primary Care Cost Per Capita (Regression II)	Primary Care Cost Per Capita (Regression III)
Private	-1.78 (1.81)	-2.08 (2.12)	-1.78 (1.80)
Right-wing	-135.30*** (0.75)	-134.80*** (1.18)	-135.30*** (0.68)
Year 2013			-0.42 (0.72)
Year 2014			-1.60 (1.45)
Median wage			-0.85*** (0.17)
Net income			-0.00 (0.00)
Population density			0.05 (0.05)
Highly educated			-93.13 (137.40)
Average age			9.09*** (1.22)
Perceived quality		10.87 (11.22)	
Constant	5,229*** (1.39)	5,221*** (7.17)	5,167*** (82.01)
FE	YES	YES	YES
Observations	2,323	2,323	2,323
R-squared	0.99	0.99	0.99

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The National Patient Survey (NPS)

Questions marked with an asterix (*) are filtered question, which means that only respondents that are directly affected get to answer these questions.

- A1 How did you get the time for your last visit to the care center?
- A2 * How was the welcoming from the person who took your appointment?
- A3 * How do you perceive the care center's availability by telephone?
- A4 * How long did you wait for your visit?
- A5 * What do you think about the time you had to wait?
- A6 * Did you get the opportunity to influence the date and time of your visit?
- A7 * Did you get an appointment with the person you wanted to meet?
- A8 How do you assess the care center's accessibility? (May include phone, e-mail, personal visits, etc.)
- B1 Did your visit begin on time?
- B2 If your visit did not start on time; did anyone tell you about the delay?
- B3 Was there any activity in the waiting room? (E.g. newspapers, healthcare information, toys)
- B4 How do you assess the welcoming you received from the person who welcomed you at the arrival/reception?
- B5 Did you get enough privacy when conversing with the staff on the arrival/reception?
- C1 Do you currently have a permanent contact with a physician at this care center?
- C2 Do you usually meet the same doctor during your visits at the care center?
- C3 How important is it for you that you meet the same doctor during your visits at the care center?
- C4 Did you get to meet the doctor you usually meet?
- C5 Did the doctor listen to what you had to say?
- C6 Did the doctor disinfect (with alcohol) the hands before the examination?
- C7 Did the doctor pay enough attention to your experience of your illness/problem?
- C8 When the doctor asked about something that was important to you, did you get a response that you understood?
- C9 If you felt worry or anxiety about your condition or your treatment, did you have the opportunity to talk to the doctor about it?
- C10 Did you get information about your diagnosis or an explanation of your problems in a way that you understood?
- C11 Did you get information about your treatment in a way that you understood?
- C12 Did you trust the doctor you met?
- C13 How do you assess the welcoming you got from the doctor?
- C14 Did the doctor ask you about previous illnesses or health problems that you felt were relevant for the visit?
- C15_child Did you discuss with your doctor or another staff member what you yourself can do to improve your child's health?
- C15a Did the doctor or another staff member discuss eating habits with you?
- C15b Did the doctor or another staff member discuss exercise habits with you?
- C15c Did the doctor or another staff member discuss smoking habits with you?
- C15d Did the doctor or another staff member discuss drinking habits with you?
- C16 Did the doctor explain what you should do if the problems or symptoms would continue to get worse or come back?

C17 Did the doctor tell you about the possible warning signs that you should be aware of regarding your disease or treatment?

C18 Did you participate and discuss the choice of remittance/reference for continued care at another health care provider or hospitalization?

C19 Did you get any prescription for drugs during the visit?

C20 * Did the doctor or another staff member ask about other medicines you use?

C21 * Did the doctor or another staff member declare why you should take the drug you received in a way that you understood?

C22 * Did the doctor or another staff member tell you about possible side effects of the drugs that you should pay attention to?

D1 Was there any samples (e.g. blood, urine) in connection to the visit?

D2 * Did a staff member declare why you needed to take the samples, in a way that you understood?

D3 * Did you get to know the test results in a way that you understood?

D4 * If you did not get to know the test results during the visit, did a staff member tell you how you could find them?

D5 * How do you assess the welcoming you received from the staff at the sampling?

E1 How do you value as a whole, the care/treatment you received?

E2 Did you feel involved in decisions about your care and treatment, as much as you wanted?

E3 Did you feel that you were treated with respect and in a considerate way?

E4 Did you receive sufficient information about your condition?

E5 Did you know where you could turn to if you needed help or had questions after the visit?

E6 How do you assess that the cooperation between staff worked?

E7 Do you consider your current needs of healthcare to have been satisfied by your visit to the care center?

E8 Would you recommend this care center to others?

E9 How did you experience the visit to the care center as a whole?

E9_1 No problem to enter the reception

E9_2 No problem to move around the premises

E9_3 No problem finding the premises

E9_4 No problem to hear when they called out the name or the queue number

E9_5 No problem staying in the premises because of smell or materials

E9_6 No problem to get personal help and assistance at the care center so that the visit functioned

F1 In general, how would you say your health is?

F2 addition to this visit - how many times have you been in contact with health care in the last six months?

F3 How old are you?

F4 Are you male or female?

F5 Is Swedish your first language?

F6 What is your highest completed education?

F6_child How have the questions in the questionnaire mainly been answered?