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Opportunistic behaviour in quasi-markets of home care

A study on the compliance of granted and provided home care hours in
Swedish municipalities

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Abstract:

Building on a theoretical framework of New Public Management and agency theory, the study tests to what extent providers act opportunistically in a quasi-market context of welfare services and what factors affect their propensity to do so. Using individual level data from nine Swedish municipalities with quasi-marketised home care services, the degree of compliance between granted and provided home care is calculated and studied as a proxy for opportunistic behaviour. The findings indicate that users receive, on average, 86% of their granted home care hours. The results also indicate that there is substantial variation in compliance both between municipalities and across individuals within municipalities. Using an OLS regression, the relationship between the degree of compliance, reimbursement model design and the level of need of the user, defined in terms of the amount of granted hours, is examined. The results show that retrospectively determined reimbursement based on provided hours is associated with a higher degree of compliance compared with prospectively determined reimbursement based on granted hours, and that the degree of compliance decreases as the user's need increases.

Keywords: new public management, agency theory, quasi-market, home care, Sweden

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Abbreviations

ASC	Act of System of Choice in the Public Sector
NBHW	National Board of Health and Welfare
NPM	New Public Management
PPA	Public Procurement Act
SALAR	Swedish Association of Local Authorities and Regions

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1 Introduction

In the late 80s and 90s, there was a paradigm shift within public administration in many western economies as a response to an increasingly strong scepticism concerning the efficiency of the public sector. The new paradigm, which has later been labelled New Public Management (NPM), entailed the introduction of private sphere management practices and organisational forms in the public sphere. The formation of market-like setups within welfare provision, so called quasi-markets, was one of the more common reforms associated with the shift. The public sector in Sweden has also been increasingly influenced by the ideas underpinning NPM in various ways. The introduction of the Act on System of Choice in the Public Sector¹ (ASC) in 2009, which implies the possibility of full quasi-marketisation of multiple welfare fields through a new form of public procurement, represents one of the clearest manifestations of this influence. Swedish home care services were included in this reform and today, a majority of the municipalities have introduced private providers, competition and user choice in their respective home care sectors. However, this introduction of market mechanisms in the welfare sector has not been evaluated to any greater extent in the Swedish context. The quasi-markets that have been formed since 2009 make out an excellent opportunity to test the theoretical assumptions of private incentives being effective in the public sector, which NPM rests upon.

Simultaneously, Sweden, in similarity with many other western countries, is facing an ageing population. Projections show that the number of people above the age of 75 in Sweden will have more than doubled by 2060 and one forth of the population will then be classified as elderly (Statistics Sweden 2015a).² The Swedish Ministry of Health and Social Affairs (2010) forecasts the cost of elderly care to increase by 70% until 2050, an increase not only in absolute terms but also relative to the predicted growth of the elderly population. Comparing healthcare and elderly care, the percentage increase in elderly care costs are projected to be more than twice as high as in healthcare costs. Consequently, having a well-functioning elderly care that provides qualitative services in an efficient manner is a major challenge. Worried voices are raised concerning the lack of space in Swedish nursing homes leading to many elderly being forced to stay at home, reliant on home care. Simultaneously, there are alerts going off in media and in public reports concerning the quality of home care (Bull & Youcefi 2015; Bull & Florén Sandberg 2016; Sivberg 2016). This makes the lack of empirical studies of the consequences of recent reforms troublesome.

Taken together, the opportunity to study how actors respond to incentives in a quasi-market setting and the growing relevance of having an effective and efficient elderly care, makes studying the quasi-marketised home care services of Swedish municipalities highly relevant. Therefore the purpose of this study is to inquire to what extent providers in quasi-markets of home care act opportunistically and what factors affect their propensity to do so. It utilises a theoretical

¹ Act of System of Choice in the Public Sector = Lag om valfrihetssystem LOV (SFS 2008:962).

² People aged 65 years or older. Today's share of elderly people in Sweden is 20%.

framework of NPM, quasi-marketisation and agency theory, and we study a straightforward measure of opportunistic behaviour, namely an assessment of whether the home care users receive the actual hours they have been assessed to need. Through the fairly recent instalment of electronic registration systems in home care services³, we are able to use unique individual level data on provided home care hours from nine Swedish municipalities that have implemented ASC procurement in their home care. By matching these data with information on the number of granted hours for the same individuals, we can assess to what degree the users receive the hours they have been promised. This is what is defined as the degree of compliance. If the provided hours are fewer than the granted ones, this would be an indication that providers act opportunistically within the principal-agent relationship that prevails between the purchasing municipality and the provider.

Additionally, we also examine what factors may explain potential variation in the degree of compliance. We inquire the three research questions of how large the degree of compliance is, if the degree of compliance is dependent on what reimbursement model the purchasing municipality utilises and if the assessed need of the user has an impact on compliance.

The paper is structured as following: we will first give a brief background to how welfare services are procured in Sweden and to the Swedish home care sector. In section three, we go through the theoretical framework of NPM, quasi-markets and agency theory before a review of relevant literature in section four. The three research questions together with corresponding hypotheses are stated in section five. Section six describes the dataset and in section seven we specify our model. The results are presented in section eight and, finally, a discussion and conclusions based on the results are found in section nine.

³ We received information regarding the timing of implementation from five of the municipalities in this study, the earliest adoption of the technique was in 2012.

2 Background

Traditionally, the Swedish welfare sector has been characterised by a strong state bureaucracy administrating and providing the services. The country's strong welfare sector was to a large extent built in the post-war era and is, in essence, the result of ideologically driven policies from the Social Democratic Party who ruled consecutively for almost 45 years between 1932 and 1976. However, in the late 1980s, Sweden too was influenced by the NPM wave and reforms of deregulation and quasi-market formation was introduced in education, healthcare, elderly care etc. (Blomqvist 2004). In 1992, the responsibility of long-term care and service for elderly and disabled was delegated to municipality level (Larsson & Szebehely 2006). Finally, in 2009 the ASC was introduced by a right-wing coalition government, which enabled full quasi-marketisation of Swedish welfare services. The new form of procurement was to a large extent legitimised through NPM inspired arguments concerning the importance of increased competition for improving both the quality and efficiency of welfare services (Socialdepartementet 2008). The new law was intended to make procuring of private providers easier.

2.1 Public procurement of welfare services in Sweden

In the Swedish context, there are two different models for larger procurements.⁴ These two models are stipulated in the Swedish Public Procurement Act⁵, from hereon referred to as PPA, and in the ASC. PPA and ASC have some basic principles in common: providers respond to a procurement with tenders, there are certain requirements that providers need to meet and a contract is written between the provider and the purchasing public organ. However, there are some essential differences mainly related to the mechanism of competition between providers and the allocation of users to providers. In a PPA procurement, the providers compete for a limited number of contracts and it is the public purchaser who decides which providers get contracts. The purchaser also distributes the users to the selected providers. In the ASC setting, the purchaser can write an unlimited number of contracts with all providers who meet the requirements. It is then up to the users to decide which provider they want to get their service from and thus, the providers compete in a quasi-market. The quasi-market setting will be further explained in Section 3.2.

It is up to each municipality to decide whether to use the PPA or ASC as procurement model in their home care services. The Swedish Association of Local Authorities and Regions, from hereon referred to as SALAR, reports that as of October 2015, 176 municipalities had decided to implement the ASC (Swedish Association of Local Authorities and Regions [SALAR] 2015a).

⁴ For smaller purchases below a certain threshold value there is the possibility of direct procurement with specific providers to avoid the procurement costing more than the actual purchase itself.

⁵ Public Procurement Act = Lag om offentlig upphandling LOU (SFS 2007:1091).

2.2 The Swedish home care system

Home care is supportive care provided in the user's own home. It is a means of assisting the user in their daily living. Home care can typically be divided into two types: service and nursing (Seniorval 2016). Service includes activities such as preparing meals and making purchases, whereas nursing includes more health-related activities such as personal hygiene or clothing assistance. In 2014, 7.1 % of the population aged 65 or older were granted home care in Sweden (Kommun- och landstingsdatabasen [KOLADA] 2016).

Home care in Sweden has been characterised by its universal provision, with publicly financed service available to all citizens on an equal basis determined by the principle of need for care. It is regulated by the Social Services Act.⁶ Home care is the responsibility of the municipalities unlike health and medical care which is managed by the county councils. Due to a high degree of autonomy of the municipalities, there is variation in the details of how home care is provided. However, certain elements are shared across municipalities, such as the need assessment of the individual always being conducted by the purchasing municipality.

The municipality grants the user home care services based on an assessment of the user's needs. Usually, someone from the municipality sits down with the user, often together with his or her family, and makes an assessment of what assistance is needed. Based on this, the user gets a list of activities that they are entitled to be assisted in and an associated amount of hours that these activities are deemed reasonable to take to provide. Generally this assessment is re-evaluated annually, or semi-annually, if nothing drastically changes during the year. After this, users living in ASC municipalities choose which provider he or she wants to perform the service. In order to assist users in making a choice, the National Board of Health and Welfare, from hereon referred to as NBHW, provides *Äldreguiden*, a guide containing information about providers and their ratings by current users (National Board of Health and Welfare [NBHW] 2015a). If the user does not make a choice, he or she will be assigned to a pre-determined provider in accordance with the municipality's rules for non-choosers. The ASC also allows the user to immediately cancel a provider and re-choose if unsatisfied.

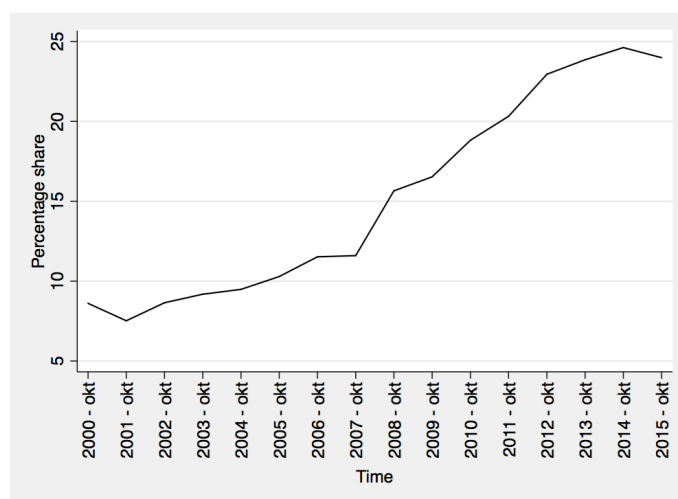
For home care services in Sweden, there are mainly three different payment models. Providers can either be reimbursed prospectively determined with an hourly fee based on the number of granted hours, retrospectively determined based on provided hours or based on a fixed fee per provided activity. It is up to the municipality to decide which model to use (SALAR 2009). In our dataset, all municipalities use one of the two hourly reimbursement models. As of October 2015, 61 of the ASC municipalities reimburse based on granted hours whereas 72 municipalities reimburse based on provided hours (SALAR 2015a).⁷

⁶ Social Services Act = Socialtjänstlag (SFS 2001:453).

⁷ In the report, only 140 of the 176 municipalities with ASC responded to this question.

Since the introduction of the ASC, private providers have increased their presence and now provide around 24% of the total home care hours nationally (NBHW 2016). This can be compared to 15.6% in October 2008, two months before the introduction of the ASC (see Figure 1). The market for privately provided home care is rather concentrated, with the four largest private home care providers holding 40% of the market (Bergman & Jordahl 2014). The number of providers is increasing which makes monitoring and evaluation difficult for municipalities.⁸ It is not until only some years back that the municipalities have had the technical ability to electronically register the provided hours of home care. This is likely one of the reasons why so few empirical studies and evaluations of the home care quasi-markets in Sweden have been conducted.

Figure 1. Percentage share of total home care services delivered by private providers 2000-2015



Source: NBHW (2016)

3 Theoretical framework

3.1 New Public Management

The new in NPM refers to the break away from the previously dominating traditional public administration. In broad terms, Stoker (2006) describes traditional public administration as a system where the competition between politicians running for elections works as a way to select policy makers driven by an intrinsic motivation, a form of public service ethos. These are then free to define the goals of the public sector and the state holds a monopoly of public service provision. The provision is carried out through large hierarchical bureaucracies with clearly defined division of tasks and standards for processes. Public servants are employed with high job protection to encourage a long-term career climb within the public bureaucracy (ibid.). The

⁸ From 2013 to 2014, the number of providers within elderly care increased from 2027 to 2202 (Statistics Sweden 2015b). As this indicator was created by Statistics Sweden in 2013, corresponding figures from previous years are not available.

criticism that rose against traditional public administration in the early 1980s, which resulted in NPM, derives a substantial part of its theoretical basis from public choice theory (Gruening 2001). Essentially, public choice theory applies neoclassic economical assumptions to the realm of politics and its actors. Public servants are viewed as rational actors who have clear preferences and acts to maximise utility according to these preferences (Buchanan and Tollison 2009). This stands in stark contrast to the public service ethos that the proponents of traditional public administration assume as the key motivator of public servants. The implication is that the public sector is not necessarily any better at the provision of public goods than the private sector. In light of the increasing influence of these ideas, NPM reforms were a natural response to the perceived inefficiency of traditional public administration and the claim that the public sector often served the interest of its employees rather than those of the tax payers.

Forder et al. (2005) describe, in a nutshell, what news NPM brought to the table:

NPM represents a move away from hierarchical to a market form of governance. This involves a separation of ownership and control, arm's length contracting, performance measurement and compliance monitoring. (Forder et al. 2005)

The emergent neoclassical view that public servants can be viewed as rational, utility maximising actors fed the idea that management theories traditionally applied in the private sector could also be applied in the public sphere. The separation between how the private and public sector function was increasingly blurred, and the idea of treating the provision of public goods and services the same as their private equivalents gained more and more ground. Naturally, there are different forms of NPM and no universal definition. However, there are certain aspects and characteristics that are generally accepted as belonging to the NPM family of policy reforms. These can be generalised as follows (Forder et al. 2005; Gruening 2001; Hood 1991; Stoker 2006):

- Management efforts and incentives are shifted from inputs and processes to outputs and performance
- Increased focus on measurement, performance indicators and standards to increase the efficiency of resource use
- Shift towards specialised and lean authority organisation
- Introduction of market mechanisms for the provision of public service, such as competition, privatisation, contracting out, development of quasi-markets etc.
- A transition from the prioritisation of equity and universalism towards a prioritisation of efficiency and individualism
- An increasing view of the beneficiaries of public services as consumers rather than as passive recipients

One of the earliest initiations of NPM style reforms, even though the term itself was coined later, was the Thatcher administration's marketisation of parts of the welfare sector in the UK. After that, several western countries have followed to various extent (Le Grand & Bartlett 1993).

3.2 Quasi-markets

One of the more common and most visible traits of NPM is the creation of so called quasi-markets; the introduction of market-like mechanisms in the provision of public goods and services through contracting out to competing private providers and freedom of choice of provider for users. Arguably, this trend has been most prominent within care and quasi-markets have been established of various forms across countries but, as Winkelmann et al. (2014) note, they all share some common traits influenced by the NPM values:

Despite marked differences across Europe, attempts to reform long-term care delivery have shared one trait in particular: they relied on market mechanisms and user choice, supported by a strong consumerist rhetoric (...) and NPM theories (...). Reforms have focused in particular on strengthening user choice, e.g. through cash benefits, and on the contractualisation of care services. (Winkelmann et al. 2014)

Le Grand and Bartlett (1993) define a quasi-market as diverging from a regular market in one or several of the following three ways: (i) the occurrence of non-profit actors (either solely or in competition with for-profit actors) (ii) consumer power is not expressed in cash but in earmarked vouchers (iii) consumers are often represented by a third party agent. In essence, it is a market created through the contracting out of public services by the government to private providers. Most commonly, users of the public services get to choose their provider themselves but the service is publicly funded. In line with the overall NPM vision, the idea behind creating quasi-markets is to increase both the efficiency of resource use and allocation (ibid.).

The efficiency of resource use is intended to increase through the introduction of competition in service provision. Ideally, the state can focus on administration while providers specialise in service provision. The competition in combination with user choice is also intended to maintain quality of the service through the reputational mechanism (Forder et al. 2005). When users are free to choose provider, in order to retain users and to gain new ones, the need to maintain a good reputation will incentivise upholding the quality of the service.

One of the clearest examples of the quasi-marketisation of a welfare sector is perhaps the development of the National Health Services (NHS) in the United Kingdom. Targeted reforms since the late 80s have transformed the market for home care in less than two decades; in 1992 98% of the total home care hours were delivered by publicly run providers while in 2005, more than 73% of the hours were instead provided by private actors (Glendinning 2012). The transition has increasingly included consumer choice and individualisation of the services through so called personal budgets which each user is allowed to decide how to spend on care (Rodrigues and Glendinning 2015). Other countries, like the Netherlands, Germany and Denmark have also

transformed into quasi-market provision of care with varying degrees of consumer choice (Winkelmann et al. 2014).

However, the theoretical benefits of quasi-market provision are not always realised and the literature observes a number of problems with the quasi-market model. Lowery (1998) notes that market failures do not only exist in regular markets but some of these do also occur in quasi-markets. In addition, there are certain quasi-market specific failures. For example, there is the possibility of failure of quasi-market formation, which implies that the service provision remains a monopoly but with a private provider as a monopoly provider instead of the state. Le Grand and Bartlett (1993) observes that this is common in scarcely populated areas where it may not be profitable for multiple providers to operate simultaneously and, consequently, the actual freedom of choice may not be extended quasi-marketisation. Thereby, many of the intended positive effects from such reforms are lost. Furthermore, Lowery (1998) observes the possibility of the quasi-market failure from, so called, user preference error. In essence, this means that users may not be capable of making utility-maximising choices, either due to insufficient information or due to noisy factors making it difficult for users to attribute high quality to certain providers. When user choice is based on flawed information, there is a clear risk of market failure. Arguably, this risk is especially present in elderly care where the users are weak and, potentially, in a particularly impaired position to make informed choices.

There are also several objections to be made against the original theoretical benefits of quasi-market provision. The increased resource efficiency may be substantially hampered by the significant costs associated with establishing a quasi-market. These are costs related to, for example, extensive procurement processes, the development of appropriate contracts, measurement and monitoring (Le Grand & Bartlett 1993). Thus, just as it does not automatically imply an increased freedom of choice, quasi-marketisation does not necessarily imply lower costs.

3.3 Agency theory

Forder et al. (2005) identify that quasi-markets of care purchasing are characterised by a three-fold principal-agent relationship:

- Between user (principal) and purchaser (agent)
- Between purchaser (principal) and provider (agent)
- Between state (principal) and purchaser (agent)

In the case of Swedish home care, the purchaser is the municipality. Users rely on the municipality to address their need appropriately and purchase care accordingly. In turn, the municipality relies on the provider to provide the care they have purchased with a sufficient level of quality. The third and final agency relationship implies that the state, having delegated the responsibility of purchasing to the municipalities, relies on the municipality to purchase care for the users in accordance with the overall policy goals of the state. This paper is focused on the

second principal-agent relationship. Arguably, this is the relationship that constitutes challenges most specifically related to the quasi-market setting. When the provision is contracted out of publicly control to private providers, the agency relationship is made more explicit.

At the core of agency theory is the presumption that the principal-agent relationship has an inherent risk of moral hazard due to asymmetric information. Because of the principal's difficulty in measuring the agent's effort, the agent may choose to shirk (Milgrom and Roberts 1992). The risk of moral hazard can be mitigated through various forms of incentive alignment and the creation of appropriate contracts.

3.3.1 Reimbursement models

One channel through which the principal can align the agent's incentives with its own, is through economic incentives and, more specifically, the payment model. How the reimbursement is designed has theoretical implications on agent behaviour. The balance between the risk-sharing between agent and principal and the awards to the agent is predicted to determine how much effort the agent puts in and how large the risk of shirking is (Sappington 1991). In the literature, a central aspect of the reimbursement design is the timing of the payment. Payment to the provider can be made either prospectively or retrospectively, or through a mix of the two. With a prospective payment, the payment is determined, and sometimes also paid out, before the service is provided. With retrospective payment, the reimbursement is set and paid out after the service provision. Naturally, the two alternatives yield very different incentives for the agent. Prospective payment incentivises a minimal effort from the agent as payment is already determined or even obtained before effort has been exerted (Robinson 2001). This may imply lowered quality of the service. There is also a risk of cream-skimming of patients where the provider only accepts or prioritises patients that are deemed to require low costs in order to maximise profit (Jegers et al. 2002).

Full retrospective payment, on the other hand, yields no incentives to cut costs as the provider is reimbursed for the effort exerted. Also, receiving payment at all is, in most cases, made contingent on effort being exerted. However, full retrospective payment implies the risk of over-provision and escalating costs for the principal without any real increase in aggregate welfare. Also, it increases the risk for the agent and excessive risk may deter actors from ever entering the market (Jegers et al. 2002).

3.3.2 Private and public incentives

In the Swedish ASC quasi-markets, the actors comprise of both private and public actors. It is therefore relevant to include a discussion on how the incentive structures differ between these two groups of agents. Providers that are publicly funded should theoretically have different economic incentives compared with private ones. There is not the same risk of going out of business that private actors face if they are unsuccessful in the market and there is no goal of making a profit. From that perspective, the incentives to shirk and act opportunistically are not as

apparent as for private ones. Is it then relevant to include public providers in a study of agent behaviour such as this one? According to the theoretical underpinnings of NPM, privately and publicly owned actors should respond similarly to incentive structures, and the structure of the Swedish ASC markets makes a rather strong case for why public providers should be included.

For example, the purchaser and provider role is completely separated within the municipality, which means that no municipal employee has double roles and conflicting interests. Consequently, there is a principal-agent relation formed also between the purchasing municipality and their public providers. Economically, while there are no intentions or requirements of making a profit, public providers are often highly economically pressured as many municipalities struggle with a budget deficit.⁹ While there is no direct threat of bankruptcy, it is not the case that money is an endless resource for public providers, rather the opposite. Consequently, there may be incentives for these providers to act opportunistically as well, not for the pursuit of profit, but for the sake of minimising loss.

Furthermore, the conditions of competition in the quasi-market are the same for public and private providers. They are procured in the same process, they are reimbursed with the same payment model and, consequently, losing users to other providers implies decreased resources regardless if being a public or private provider. These are all factors favouring a view that, in line with the NPM idea, agency theory-related hypotheses should not differ for public providers in these quasi-markets from those of private providers. Therefore, we find it valuable and reasonable to include all providers in our analysis. However, it remains possible that the difference in ownership results in differing behaviour between private and public providers. If that is the case, this should be captured in our regression as we control for ownership.

4 Literature review

4.1 Care providers and financial incentives

At the core of our research focus is a conjecture that home care providers adjust their behaviour based on different incentive structures, where reimbursement models constitute an essential component. The following section will discuss financial incentives' effects on care provision, specifically related to quantity.

Melichar (2009) compared the behaviour of physicians with capitation reimbursement versus non-capitation reimbursement. Capitation is a prospective reimbursement model where the physician receives a set fee per enrolled patient and thus no additional revenue is gained from

⁹ A report on the economy of the municipalities and county councils by SALAR from 2011 shows that, out of thirty municipalities which had introduced ASC procurement, a majority predicted that their public home care providers would report a loss in the end of the year (SALAR 2011a). The corresponding report from 2015 reported that the ageing population and an increased volume of refugee reception will leave many of the municipal economies heavily strained the coming years (SALAR 2015b).

exerting additional care or further testing. The author concluded that physicians spent less time with capitated patients compared to non-capitated, implying that physicians decreased the quantity of care supplied in response to the prospective payment model. Gosden et al. (2011) compared the retrospective model of fee-for-service, where the provider is reimbursed per provided service, to different prospective payment models. They found that fee-for-service was associated with a higher quantity of provided primary care services compared with capitation payment. In relation to salary reimbursement, where the physician receives a prospectively determined monthly salary, fee-for-service implied a higher number of patient visits and greater continuity of care. However, patient satisfaction, in terms of having access to a physician, was surprisingly lower in the fee-for-service context. The findings suggest that retrospective fee-for-service payment is a driver of care quantity but not necessarily of patient satisfaction.

In the US home care context, McKnight (2006) studied the short run effects of a change in Medicare¹⁰ reimbursement, with the introduction of a prospectively determined annual per patient limit as a complement to the traditional fee-for-service reimbursement model. The author concluded that home care providers reduced the quantity of care provided in response to the model modification. The study consequently suggests that providers appear to be sensitive to reimbursement level and not only timing. Furthermore, the study found that it was particularly home care users whose care was expected to cost above the limit value that experienced a reduction in received care. In similarity, Dalton et al. (2011) found signs of so called cream-skimming of patients based on their care intensity. They looked at the introduction of pay-for-performance programmes in British diabetes care where payment was made contingent on measurement of a number of outcome parameters. Their findings showed that physicians tended to exclude patients with severe diagnoses from the measurement groups and that this led to relatively worse health outcomes in this patient group.

As it can be difficult to get a true image of quantity of care provided, several studies focus on cost cutting among care providers instead. Cutting costs can potentially be a proxy for both reductions in the quantity of care provided and of reductions in the quality of the provided care. In a study examining patient discharge data in California, Meltzer et al. (2002) examined the effects of a change in reimbursement, going from retrospectively determined to prospectively determined. They found that high-cost patients were associated with relatively larger cost cuts than low-cost patients. Chen and Shea (2002) studied the impact of a transition from retrospective to prospective payment in US nursing homes and found that the transition yielded a general decrease in costs. Additionally, they found a strong relationship between cost and quality and concluded there is a clear risk that costs are cut at the expense of quality. Therefore, the authors concluded that careful monitoring is needed to prevent providers from cutting production costs through reducing quality.

¹⁰ Medicare is a US national social insurance programme that provides health insurance to elderly.

In summary, the literature shows that care providers respond to financial incentives by adjusting their behaviour accordingly. There seems to be a correlation between retrospective reimbursement and larger quantities of provided care. However, it is worth noting that in this study, quantity of provided care is observed in relation to the quantity of care that the user has been assessed to actually need and, consequently, lower amounts of care are therefore viewed as a token of opportunistic behaviour among providers. In the studies referred to here, reductions in the quantity of care is not automatically something negative; as the user need is also assessed by the care provider, quantity reductions could also be seen as a hampered tendency of over-supply among providers.

4.2 Limited user sovereignty

As has already been touched upon in previous sections there are signs that the impact of reimbursement on provider behaviour varies depending on the care intensity among users. An important aspect of the quasi-market context is the user's ability to take on the role of an active consumer. Meinow et al. (2011) found in their study of a nationally representative sample of people aged 77 and above in Sweden that more than half of the sample need help managing their role as customers of care services due to impaired cognitive and physical abilities. Eika (2009) calls this situation of dependence that users of home care are in *limited consumer sovereignty*. He identifies that the key mechanism to upholding quality in a quasi-market, namely users' ability to re-choose provider if unhappy, may be offset when the user is weak. As the need for stability and continuity makes changing provider highly costly on a personal level, the option of re-choosing may actually never be real. Statistics from Sweden show that up to 90% of the home care users with a possibility to choose make an active choice of provider but that re-choosing provider is very rare. Only about 1-5% of the users changed their initial choice during 2014 (NBHW 2015b).

Furthermore, Eika (2009) suggests that the introduction of user choice may actually imply a lowered quality of care for the weakest group of users as the providers with the highest quality gets filled up with stronger users or users with engaged relatives who make active choices. This is also supported by Gavanas (2011) who claims that users who have strong relatives have a higher chance of receiving extra services, beyond what is granted by the municipal need assessment, and that the extra time for these services has a tendency to be taken from weaker users. Studies from the British home care market show that the possibility to choose provider at all is more appreciated among younger and healthier users compared with older and less healthy ones (Szebehely 2011).

Galle et al. (2010) found that users who reported that they had close contact with their relatives had a higher propensity to make demands and bring forth complaints to their provider. The importance of having strong relatives in an environment with user choice makes a comparison with the educational quasi-market field relevant as school children depend on their parents in a similar manner. Vlachos (2011) notes, in the Swedish schooling context, that the possibility of actively choosing a school for their child is predominantly used by parents with high education

levels and high incomes. This indicates that there are systematic differences between users with capable relatives and users without.

A report from NBHW (2005) mapping time usage among the personnel in elderly care found systematic differences in the degree of compliance depending on how extensive the need of the individual was. The report shows that users with a high amount of granted time had a lower degree of compliance than those with less time granted. In fact, it was not unusual that users with less extensive needs even received more care hours than they had been granted. However, these patterns were clearer within the care provided in nursing homes than within home care.

Extending the perspective to health care, evaluating reports of the effects of the introduction of ASC within Swedish primary care point in a somewhat different direction. Studies show that, in multiple county councils, there was a disproportional increase in use of primary care services among already care intensive patient groups (Janlöv & Rehnberg 2011; Janlöv et al. 2013). The same held true for patients in low income groups. However, Janlöv and Rehnberg (2011) point out the fact that this is in line with traditional usage patterns in healthcare, where primary care is used more by low income groups and specialised care more by high income users. On the other hand, looking at care prioritisation once patients have consulted care providers, the Swedish Medical Association conducted a survey in 2009 as well as in 2015 with the common aim of reviewing the profession's experiences of ASC introduction in primary care. The 2009 survey showed that a vast majority of the doctors thought the ASC had made it more difficult to prioritise patients with large and chronic care needs and in the 2015 survey, 36% did not think they were able to treat patients on equal terms, regardless of their needs and preconditions (Läkarförbundet 2009, 2016).

Summarising, the literature suggests that user freedom of choice of provider can have a negative impact on equity among users in welfare services. Differences relate mainly to the varying capacity between users who are relatively healthy and/or who have close ties with relatives and those users who lack close relatives and/or have a lower capacity. Furthermore, the capacity of users is also important for the functionality of the re-choosing option. As indicated, users in the Swedish home care market have a substantially impaired personal capacity and are to a large degree dependent on assistance with managing their role as consumer of care services. This implies that there is a significant risk of opportunistic exploitation of weak users in the market with consequential inequalities between different user groups.

4.3 The degree of compliance within home care services

The gathering and reporting of statistics regarding home care services is the optional task of each municipality. As a consequence, national databases with statistics in this field are rather flawed as they often lack data observations and rely on individual municipalities' data handling etc. Thus, previous studies examining the degree of compliance in the Swedish home care sector are rare. The main point of comparison, for the purposes of this paper, consists of the report published by the NBHW in 2005 on time usage in elderly care. With a dataset containing granted and provided home care hours of 8,000 individuals, the report concluded that the median degree of compliance was 60% and that one fourth of the users received less than 40% of their granted hours (NBHW 2005). These figures are, to the best of our knowledge, the only previous benchmark of an aggregated average degree of compliance in Swedish home care services. Note, however, that the study was conducted in a pre-ASC context.

Some municipalities contract external auditors to examine their elderly care, where the degree of compliance in home care hours may be one of the audit items. Few of the municipalities studied in this paper have made such audits or, alternatively, published the produced reports. However, an audit of the elderly care in one of the municipalities in our dataset conducted in 2014 shows a fairly high degree of compliance. Private providers had a degree of compliance of 92%, which was higher compared to that of public providers whose corresponding figure was 84% (Bengtsson & Abrahamsson 2014). Another municipality, also included in this study, found that the highest observed degree of compliance was 58% and the lowest 44% (Harr & Blank 2015).

In conclusion, there is a highly limited availability of previous studies on the degree of compliance in the Swedish home care sector, but the main point of reference is the observed mean compliance of 60%. There are indications of substantial variation between municipalities in their degree of compliance.

5 Purpose and research questions

As the asymmetrical information inherent in the relation between the purchasing municipality and the providers of home care creates an agency issue, the purpose of this study is to inquire to what extent providers in quasi-markets of home care act opportunistically and what factors affect their propensity to do so. This is done in the context of Swedish municipalities that have quasi-marketised their home care services through ASC procurement. The compliance between granted and provided home care hours is used as a measure of opportunistic behaviour. As the availability of such data is fairly recent, and with the access still being highly limited, there is a limited number of previous studies looking at this form of opportunistic behaviour. With a unique dataset, we are able to evaluate the behaviour of providers in the quasi-market context in order to see whether it adheres to incentives as predicted by agency theory. Ultimately, this will yield an indication of whether the theoretical underpinnings of NPM hold in practise.

Given the purpose of the study, we test the three research questions

- 1. How large is the degree of compliance in the Swedish home care quasi-market setting?*
- 2. Is the degree of compliance dependent on what reimbursement model the purchasing municipality utilises?*
- 3. Is the degree of compliance dependent on how great the assessed need of the user is?*

In response to these research questions, we formulate the following three hypotheses:

- H1: The degree of compliance is less than 100%.*
- H2: Retrospectively determined reimbursement is associated with a higher degree of compliance than prospectively determined reimbursement.*
- H3: Individuals with greater need are associated with a lower degree of compliance.*

6 Data

This paper is predominately based on primary data collected from nine Swedish municipalities. It is a unique dataset on individually granted and provided home care hours. It has also been supplemented with various secondary municipality level data from public sources to create control variables. Due to confidentiality reasons, the municipalities have been made anonymous and will only be referred to by number throughout the paper. For brief descriptions of municipality characteristics, see Appendix I.

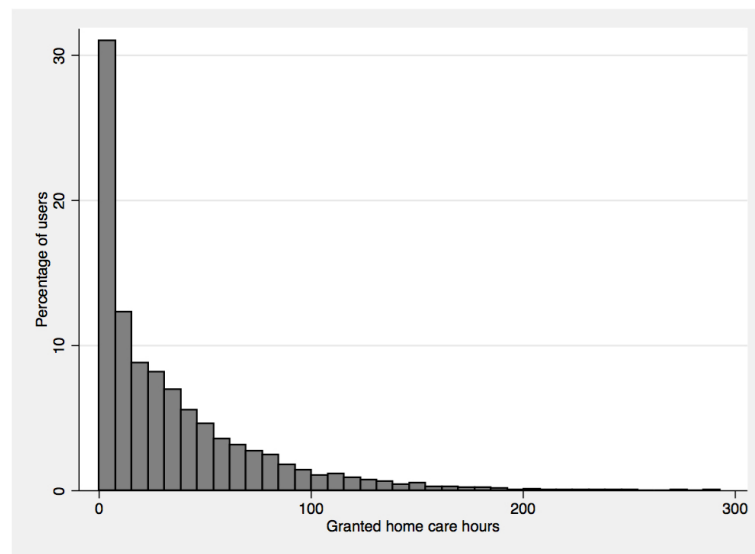
6.1 Primary data

The data was collected in each municipality through registration of provided hours during one month. Which month of the year varies between municipalities, but the majority of the data was collected during 2015.¹¹ Information on the individuals consists of age, gender, the number of hours granted for the month, the total amount of care hours received during the month and which provider performed the services.

An initial glance at the distribution of granted hours in the aggregated dataset (Figure 2) indicates a large variation in the amount of home care hours granted across users. Although the majority are granted fairly few hours, there are some individuals who have been granted more than 100 and up to 300 hours.

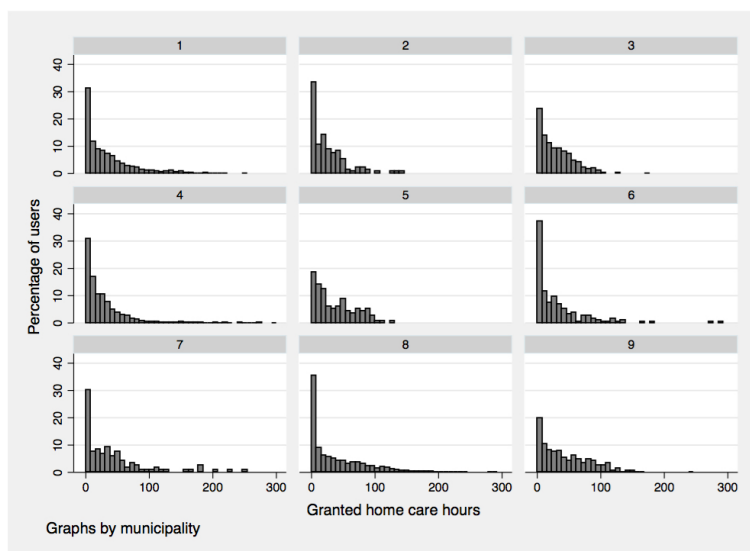
¹¹ Data for two of the municipalities was collected during 2014.

Figure 2. Distribution of granted home care hours



Analysing the granted hours for each municipality, the shape of the distribution look roughly the same for all municipalities. As can be seen in Figure 3, there is some variation in terms of extreme values but the overall pattern is similar. Thus, the municipalities appear to be comparable in terms of their populations' need of home care.

Figure 3. Distribution of granted home care hours across municipalities



The registration of provided hours is conducted electronically by the home care employee at each visit. The registration reports the total amount of time spent with the user.

6.2 Representativeness

One could question how representative a dataset containing nine municipalities is of quasi-market provision of welfare in general. This study yields insights into provider behaviour in one type of setting and the results should be evaluated as part of a larger perspective together with previous studies and with consideration of potential contextual variations. When it comes to the Swedish home care service sector, one has to consider how well the selected municipalities represent the remaining 281 of the country's total municipalities. Undoubtedly, the municipalities represented have been selected primarily on a basis of data access. Consideration of representativeness in terms of geographic spread, variation in size, population etc. has been given secondary priority simply due to the fact that data access is so limited. This yields a potential risk of selection bias as the municipalities have chosen to submit data to the study. Hypothetically, municipalities that know they have a poorly performing home care sector may not be very interested in getting studied. The anonymisation of the municipalities mitigates this risk. Having stated this, there remains a strong case for the dataset still being relevant to study and for our results yielding interesting conclusions.

SALAR uses a nationally recognised classification system of municipalities that takes into account population size, geographic location and if the municipality is particularly characterised by reliance on a certain industry as income source (SALAR 2011b). There are ten different groups of municipalities of which six are represented in our dataset. The municipalities' population size extends between 8,000 to 150,000 and population density ranges from 10 to 200 inhabitants per square kilometre (Statistics Sweden 2016). We view this as a fairly good spread in terms of population characteristics. The national average share of the population above 65 years that receives home care services is 7.1% (KOLADA 2016) and the average among our nine municipalities is 6.8% (see summary statistics in Table 1) and should thus be deemed as demographically representative. The national average waiting time for nursing homes is 57 days (KOLADA 2016) and the corresponding number for our dataset is 60 days, which is strikingly similar (see summary statistics in Table 1). Geographically, the dataset is somewhat biased towards municipalities in the southern part of Sweden.

6.3 Data limitations

Having stated that the dataset at hand is unique and recognising that there is no better data available for the purposes of this paper, it is important to be transparent about the fact that it has a number of flaws. These will now be discussed as they should be kept in mind while drawing conclusions based on our results.

6.3.1 Inconsistent data reporting

First of all, the data is collected using each municipality's own methods and systems. Consequently, there is some variation in what information has been extracted and at what level of detail it is registered. There is no common classification system of granted activities that

municipalities follow. For example, two municipalities in the dataset do not specify which activities have been granted but, instead, solely report the total number of hours. Several municipalities grant activities with labels like *afternoon assistance*, which makes it difficult to know what the activity entails. This yields some disadvantages when it comes to analysing the need profile of users. To understand the level of need of a user, arguably, one does not only have to look at the amount of consumed home care but also what type of home care they receive. The distinction between home care hours related to service and to nursing is important for these purposes. The service activities are more related to the everyday physical ability of the user while the nursing activities concern their overall health status. Arguably, users who have a large share of granted nursing activities are less capable than those with mainly service activities. It would therefore have been ideal to be able to take the individual distribution of hours between service and nursing into account when creating groups of need. However, due to the discussed issues related to activity specification, we refrain from incorporating this parameter in the study.

Having stated this, a categorisation based on total amount of granted hours does, indirectly, take the nature of the home care into account. The amount of pure service hours that can be granted is fairly low; the need for cleaning and shopping can only be so large. In cases when the amount of granted hours is large, it is almost exclusively nursing hours that inflate the figure. Concluding, the current categorisation based solely on the amount of hours is not ideal but should provide a sufficiently good image of the users' relative need of home care.

6.3.2 Outliers and measurement error

With very few exceptions, there is always a risk of measurement error in data collection. Human error is possible as the electronic registration is conducted by individual employees of home care providers. Registration errors may also occur when the data is compiled by a municipality employee. Furthermore, there are individuals whose observed values show that they have received substantially more hours than the record shows that they have been granted. This means that the degree of compliance for these users take on abnormally high values, with the most extreme cases reaching levels of 8,000%. In most cases, this is likely due to measurement error or, more commonly, the needs of the user and, consequently also his or her granted hours, have changed at a faster pace than that at which the records have been updated. These values are consequently not representative.

In order for the outliers to not have unreasonable impact on our results we have removed such outliers when running regressions. Individuals with a degree of compliance equalling zero are removed from the dataset as these are apparent errors. Individuals with abnormally high degree of compliance are also removed following a decision rule where an individual is considered an outlier if the degree of compliance is above 400 % and the absolute difference between granted and provided hours is more than 10 hours. Taking the absolute difference into consideration allows for individuals with reasonable granted and provided hours to remain in the dataset despite having a high degree of compliance. The idea is to keep those outliers that are likely not a

result of measurement error. For example, it is not unreasonable to believe that an individual with one hour granted home care receives five hours, implying a degree of compliance of 500 %. However, an individual with 30 granted home care hours that has 500% compliance receives 150 hours, which indicates measurement error.

Using this decision rule, there remain some users with very high degrees of compliance. These data points are deemed to not derive from data errors. However, their potential impact will be further discussed in the robustness checks in Section 8.4.

Finally, the public sources from which we take our secondary data is commonly viewed rather critically in terms of data quality. This is related to the same lack of standardised methods for data reporting as the primary data suffers from. Therefore, the data in these sources is generally characterised by a high degree of missing values and occasional obvious measurement errors. We have carefully reviewed the data we have collected from these sources to ensure it does not suffer from any of these.

To conclude, municipality level data is characterised by a high level of measurement error and irregularity which causes problems when it comes to making cross-municipality comparisons. While we have taken multiple measures to rectify these issues, it remains important to keep this in mind when interpreting our results. There is currently no better available data to fulfil the research purpose of this thesis and there are numerous factors that make this dataset highly relevant to study. Taking both of these aspects into account, the conclusion should be that there remains a high potential for the study to yield interesting results but these should be interpreted in light of the above mentioned limitations. Tentatively, focus should be on the sign and relative size of coefficients rather than on a literal interpretation of effect size in terms of coefficient size.

7 Model specification

An Ordinary Least Squares (OLS) method is used to examine research question two and three. The degree of compliance is the dependent variable and the main independent variables of interest are reimbursement model and need. X is a set of control variables specified in Appendix II. Standard errors are clustered on municipality level.

$$\text{compliance} = \beta_1 + \beta_2 * \text{reimbursement_model} + \beta_3 * \text{need2} + \beta_4 * \text{need3} + \beta_5 * \text{need4} + \beta_6 * \text{need5} \\ + \beta_7 * \text{model_need2} + \beta_8 * \text{model_need3} + \beta_9 * \text{model_need4} + \beta_{10} * \text{model_need5} + X + \varepsilon$$

7.1 Degree of compliance

The degree of compliance is a percentage calculated as:

$$\text{compliance} = \frac{\text{Provided hours}}{\text{Granted hours}} * 100$$

where a percentage value of 100 implies full compliance.

In evaluating whether users receive the home care hours they have been granted, the mean degree of compliance is calculated. The mean is also calculated per municipality in order to see whether there exists large inter-municipal differences in compliance.

7.1.1 Assumption of correct granted hours

As the degree of compliance is dependent on two variables: granted hours and provided hours, in order to classify a discrepancy between the two as opportunistic behaviour, the study rests on the assumption that the municipally granted hours give a correct description of the home care users need. In other words, we assume that the third of the three principal-agent relationships that Forder et al. (2005) elaborate on, that between the state and purchasing municipality, is not characterised by opportunistic behaviour from the municipality's side. With today's data availability it is not possible to study whether granted hours differ systematically between municipalities for individuals with similar needs and conditions.¹² As municipalities have a long-standing experience of granting home care services, we believe that it is a rather reasonable assumption to make. This is also supported by the similar granting distributions displayed in Figure 3. Regardless, it is necessary to make such an assumption in order to facilitate any further analysis.

7.2 Main variables of interest

The reimbursement model variable, *reimbursement_model*, is a dummy variable coded as 0 if the municipality reimburses the provider based on granted hours and 1 if the purchaser reimburses the provider based on provided hours.

¹² This is an issue related both to insufficient data collection and laws and regulation concerning individual medical data.

In constructing a variable categorising the level of need for an individual, the amount of granted home care hours is used. The individuals are coded into five groups based on percentiles, where individuals coded in group 1 have the lowest amount of granted hours and those coded in group 5 have the highest amounts. As individuals who live in different municipalities are not provided home care services from the same provider and, thus, individuals are not competing to receive home care hours across municipalities.¹³ The need categorisation is therefore constructed within each municipality and not with the entire dataset as reference point. Consequently, two individuals with the same amount of granted hours can potentially be coded into two different need groups. Appendix III specifies the cut-off hours for each need group within the different municipalities.

The regression model specifies the need groups as dummy variables, *needX*, with need group 1 as reference point, in order to be able to compare differences across groups. We test these differences using Wald tests. Additionally, an F test is performed to examine if need has an overall effect on compliance.

7.3 Interaction variables

Interaction variables combining reimbursement model design and need are created. The interaction variables identify whether providers act differently towards need groups depending on which type of reimbursement model the municipality utilises. An interaction variable is created for each need group dummy in order to investigate this potential effect across all need groups, *model_needX*.

7.4 Control variables

In addition to the individual attributes age and gender, control variables are included in the model in order to account for municipality characteristics that might have an effect on compliance. These control variables are discussed more thoroughly in Appendix II. Age dummy groups have been created in order to examine potential differences in compliance between age groups. The reference age group is users aged 85 and older, and the corresponding three dummies in the regression are users younger than 65, users of ages between 65 and 74, as well as users of ages between 75 and 84.

¹³ While some providers have a presence in several municipalities, the care is not provided by the same employees in different municipalities. This eradicates competition between users across municipalities.

8 Results

8.1 Summary statistics

Table 1. Summary statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
female	7,180	0.68	0.47	0	1
age	7,180	81.84	10.75	20	107
age<65 ¹⁴	504	54.27	9.24	20	64
65≤age≤74 ¹⁴	871	70.39	2.74	65	74
75≤age≤84 ¹⁴	2,314	80.31	2.82	75	84
age>84 ¹⁴	3,491	89.68	3.59	85	107
need1 ¹⁵	1,517	2.56	1.26	0.07	8.39
need2 ¹⁵	1,358	8.25	3.76	3.02	25.76
need3 ¹⁵	1,440	22.11	7.17	9.58	47.38
need4 ¹⁵	1,434	44.74	13.10	24.50	81.00
need5 ¹⁵	1,431	97.75	41.96	42.70	292.70
ownership_provider ¹⁶	7,180	0.27	0.44	0	1
<i>Municipality data</i>					
reimbursement_model ¹⁷	9	0.67	0.50	0	1
reimbursement_level ¹⁸	9	354.48	45.15	288	418
reimbursement_difference ¹⁹	9	0.67	0.50	0	1
number_providers ²⁰	9	5.89	4.40	2	13
waiting_nursinghome ²¹	9	60.22	38.47	22	144
yrs_asc ²²	9	4.00	2.00	0	6
share_homecare ²³	9	6.76	1.17	5	8.4

In the dataset, 68% of the users are female. The average age is approximately 82 years, but note that the youngest user is 20 years old, whereas the oldest is 107. Although home care is highly associated with people of older ages, which is also the case for this dataset, with 93% of the users being aged 65 or older, people in need of home care are eligible irrespective of age. No users are excluded based on age as the focus of the study is on the quasi-marketisation of home care and not on elderly care in particular. Six out of nine municipalities use a reimbursement model based on provided hours and, on average, it has been four years since the implementation of the ASC.

¹⁴ The summary statistics report on age within the age group.

¹⁵ The summary statistics report on the number of granted home care hours within the group.

¹⁶ 0=public, 1=private.

¹⁷ 0=reimbursement model based on granted hours, 1=reimbursement model based on provided hours.

¹⁸ The reimbursement level associated with the provider (SEK).

¹⁹ Dummy variable specifying whether there is a difference in reimbursement level between public and private providers.

²⁰ Number of providers that are available for users to choose from.

²¹ Waiting days until access to nursing home.

²² Years since the implementation of ASC.

²³ Share of population aged 65 and older that are users of home care.

8.2 Degree of compliance

The distribution of the degree of compliance is shown in Figure 4. As discussed in Section 6.3.2, some outliers remain. A better image of the distribution of these outliers can be found in Figure 5. It is mainly of interest to study the distribution around 100% compliance as a majority of the values range between 0 and 200%. As can be seen in Figure 6 the distribution is skewed to the left with a majority of the observations concentrated between 50% and 100%. The distribution for each municipality can be found in Appendix IV.

Figure 4. Distribution of degree of compliance

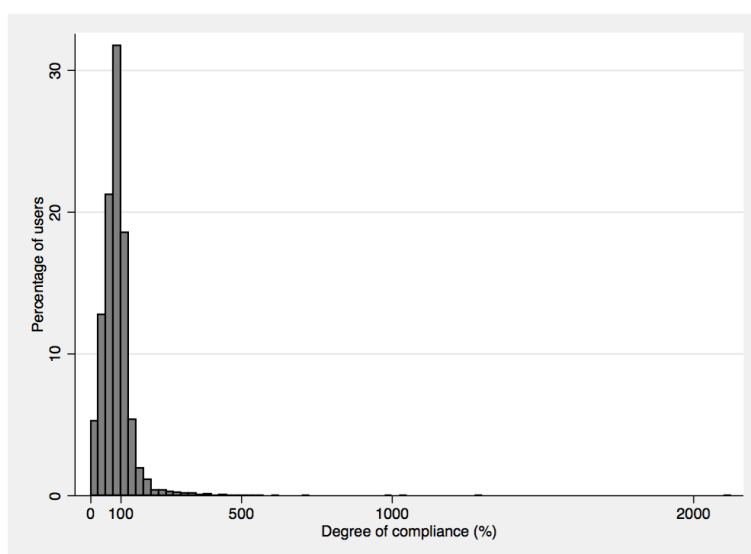


Figure 5. Distribution of degree of compliance around 400-2200%

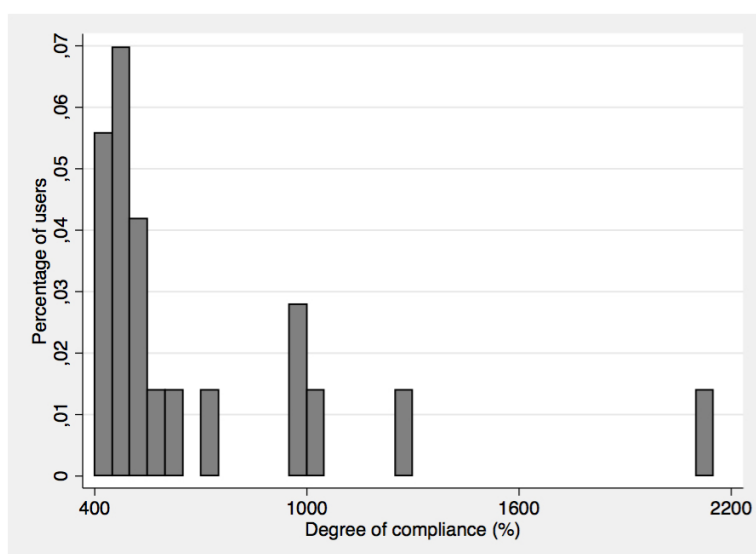


Figure 6. Distribution of degree of compliance around 0-200%

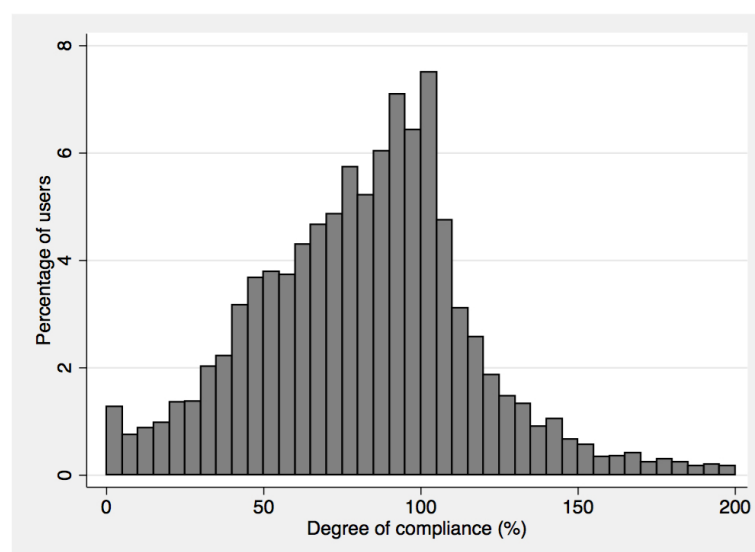


Table 2. Mean and median degree of compliance

	Observations	Degree of compliance		
		Median	Mean	Std.Dev.
Full sample	7,180	84.94	86.91	0.679
Municipality 1	1,719	68.16	71.91	0.883
Municipality 2	132	70.62	83.52	7.591
Municipality 3	512	101.06	111.10	2.911
Municipality 4	1,840	93.94	94.02	0.867
Municipality 5	113	57.62	71.53	5.525
Municipality 6	188	74.23	83.37	6.013
Municipality 7	119	75.00	82.71	4.512
Municipality 8	2,085	89.18	92.27	1.676
Municipality 9	472	72.42	71.01	1.565

Matching the data on granted hours with the corresponding hours provided, we calculate a degree of compliance for all users. The mean compliance for our dataset is 86.9%, as shown in Table 2. This implies that, on average, the users in the dataset receive 86.9% of their granted home care service hours. This is a rather high observed compliance compared to the previous studies referred to in the literature study. While the average degree of compliance in the sample is rather high, we note that there is a large variation in compliance across municipalities, ranging from 71.0% to 111.1%. Eight of the nine municipalities have a degree of compliance below 100 % whereas municipality 3 provides more home care than it grants.

8.3 Regression results

Table 3. Regression output

<i>Dep.var: compliance</i>	(1)	(2)	(3)	(4)	(5)
reimbursement_model	19.42*** (1.492)		19.42*** (1.468)	18.01*** (3.191)	13.74** (4.467)
need2		-19.69*** (2.115)	-19.68*** (2.090)	-19.69*** (3.934)	-19.76*** (2.127)
need3		-22.87*** (2.083)	-22.88*** (2.058)	-23.28*** (3.879)	-23.23*** (4.506)
need4		-25.27*** (2.086)	-25.27*** (2.061)	-28.63*** (3.884)	-28.59*** (5.337)
need5		-27.83*** (2.087)	-27.84*** (2.062)	-30.22*** (3.885)	-30.19*** (6.084)
model_need2				0.575 (4.642)	0.600 (3.142)
model_need3				0.621 (4.575)	0.566 (5.351)
model_need4				4.289 (4.577)	4.232 (6.149)
model_need5				3.372 (4.584)	2.820 (6.829)
female				2.493* (1.424)	1.958** (0.720)
age<65				-10.56*** (2.689)	-11.26*** (2.833)
65≤age≤74				-5.570*** (2.127)	-5.224*** (0.916)
75≤age≤84				-1.787 (1.505)	-1.319 (1.241)
reimbursement_level					-0.135** (0.0470)
reimbursement_difference					-3.843* (1.776)
ownership_provider					6.279*** (0.787)
number_providers					-3.368*** (0.439)
waiting_nursinghome					-0.218*** (0.0129)
yrs_asc					7.765*** (1.373)
share_homecare					6.913*** (1.508)
Constant	72.96*** (1.265)	105.8*** (1.454)	91.86*** (1.782)	93.15*** (2.945)	102.2*** (19.37)
Observations	7,180	7,180	7,180	7,180	7,180
R-squared	0.023	0.031	0.054	0.058	0.077

Robust, clustered standard errors in parentheses

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

Table 4. Wald test with p-values comparing need coefficients

H0	p-value
$\beta_{\text{need2}} \leq \beta_{\text{need3}}$	0.107
$\beta_{\text{need3}} \leq \beta_{\text{need4}}$	0.000***
$\beta_{\text{need4}} \leq \beta_{\text{need5}}$	0.175
$\beta_{\text{need2}} \leq \beta_{\text{need4}}$	0.018**
$\beta_{\text{need3}} \leq \beta_{\text{need5}}$	0.002***
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$	

Reimbursement based on provided hours is associated with a 13.7 percentage point higher degree of compliance compared with reimbursement based on granted hours (see Table 3). The result is significant on a 5% level.

Comparing the coefficients of the need groups 2-5 with the baseline group 1, the regression shows that all of these four need groups are associated with a lower degree of compliance (see Table 3). The decrease in compliance compared to group 1 ranges from 19.8 up to 30.2 percentage points and these differences are significant on a 1% level. The F-test testing the joint hypothesis that all need coefficients equal zero is rejected on a 1% level, which means that need has an overall effect on compliance (see Appendix V). As the standard errors are large, we also test the difference between these four groups and not only in relation to group 1, using Wald tests with the null hypothesis that the lower need group in each pair has an equal or smaller coefficient value compared with the higher need group. The results are shown in Table 4; the null hypothesis is rejected on a 1% level when testing group 3 against group 4. In the case where we fail to reject the null hypothesis for neighbouring need groups, a test between the lower need group and the need group two levels above is performed and the results indicate a difference on 1% or 5% significance level. Thus, the degree of compliance decreases systematically the larger the need of the user. Finally, the interaction variables are not significant for neither group, implying that there is no difference in opportunistic behaviour among need groups resulting from utilising different reimbursement models.

As regards the control variables it is worth noting that compliance increases with age. The results show that people aged 75 and older are associated with a higher degree of compliance than those below 75. Intuitively, this somewhat contradicts our results for the need variable. One would predict that need would increase with age and, thus, also imply a lower degree of compliance. However, the dataset does not show a correlation between age and granted home care hours (see Appendix VI). Thus, the amount of home care consumed better explains the need of the user rather than their corresponding age, and there is no straightforward explanation of the higher compliance for users over 75 years.

Private providers are associated with approximately six percentage points higher degree of compliance compared with their public equivalents. Having a one percentage point higher share of home care users is associated with a close to seven percentage point increase in compliance. This is in line with our prediction that a high share of home care users implies that home care is a

prioritised issue in the municipality. The regression results also show that compliance increases with the number of years ASC procurement has been implemented.

8.4 Robustness checks

8.4.1 Outlier exclusion

Robustness checks are performed to evaluate the validity of our original model.²⁴ Firstly, the decision rule for which extreme outliers to exclude from the study is altered both in values and in design (see Table 5). By changing the cut-off values in the original decision rule, both in terms of the degree of compliance and the absolute differences between granted and provided hours, we ensure that the results showed in the study is not purely a result of which individuals are excluded. The absolute difference is tested using values of 5 and 15 hours, in combination with a cut-off degree of compliance of 400%. A simpler rule excluding individuals solely based on the degree of compliance is also used, using cut-off values of 400%, 500% and 600%. Finally, as the distribution of granted home care hours is skewed to the left (as can be seen in Figure 2) with many users receiving low amounts of home care, individuals with fewer than 5 granted hours are removed from the dataset as an extension of the original decision rule in order to see whether these individuals have a large effect on the results.

Table 5. Sample robustness check specification

Outlier decision rule	Observations kept in sample
Original	Compliance<400% & absolute difference between granted and provided hours<10
1	Compliance<400% & absolute difference between granted and provided hours<5
2	Compliance<400% & absolute difference between granted and provided hours<15
3	Compliance<400%
4	Compliance<500%
5	Compliance<600%
6	Original rule + granted hours>5

Table 6. Sample robustness check, mean degree of compliance

Outlier decision rule	Observations	Degree of compliance	
		Mean	Std.Dev.
Original	7,180	86.91	0.679
1	7,169	85.80	0.545
2	7,189	87.97	0.789
3	7,160	85.21	0.504
4	7,179	86.17	0.549
5	7,188	86.72	0.578
6	5,515	81.61	0.525

²⁴ Two robustness checks are performed. The second robustness check, which concerns the need group categorisation, can be found in Appendix VIII.

Table 7. Sample robustness check, regression output

<i>Dep.var:</i> <i>Compliance</i>	Original rule	1	2	3	4	5	6
reimbursement_ model	13.74** (4.467)	10.63** (3.295)	17.96*** (5.273)	10.57*** (2.932)	13.99*** (3.647)	15.27*** (4.162)	10.91** (3.705)
need2	-19.76*** (2.127)	-17.73*** (1.268)	-18.67*** (1.125)	-16.87*** (1.219)	-16.76*** (2.339)	-16.76*** (2.338)	-4.971 (3.641)
need3	-23.23*** (4.506)	-21.11*** (1.854)	-23.26*** (4.477)	-20.51*** (1.986)	-21.13*** (1.873)	-21.15*** (1.874)	-7.435*** (1.644)
need4	-28.59*** (5.337)	-26.38*** (2.652)	-28.69*** (5.343)	-25.65*** (2.812)	-26.40*** (2.635)	-26.43*** (2.627)	-11.58** (3.607)
need5	-30.19*** (6.084)	-28.03*** (3.532)	-30.28*** (6.099)	-27.25*** (3.690)	-28.04*** (3.540)	-28.06*** (3.548)	-11.62** (4.652)
model_need2	0.600 (3.142)	4.815* (2.329)	-6.817 (3.897)	7.280*** (1.893)	5.925 (3.287)	6.212* (3.275)	4.506 (3.650)
model_need3	0.566 (5.351)	4.500* (2.246)	-5.793 (6.250)	7.191** (2.255)	6.006** (2.393)	4.787 (2.622)	2.073 (1.764)
model_need4	4.232 (6.149)	8.326** (3.207)	-2.031 (6.944)	11.06*** (3.136)	9.306** (3.133)	7.710** (3.193)	7.342* (3.804)
model_need5	2.820 (6.829)	6.942 (4.537)	-3.407 (7.479)	9.567* (4.462)	7.457 (4.334)	5.921 (4.454)	4.951 (5.115)
Constant	102.2*** (19.37)	94.05*** (20.94)	96.05*** (19.65)	104.9*** (19.65)	117.2*** (21.46)	116.7*** (22.92)	49.12 (26.90)
Observations	7,180	7,169	7,189	7,160	7,179	7,188	5,515
R-squared	0.077	0.097	0.070	0.101	0.096	0.093	0.102

Robust, clustered standard errors in parentheses

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

Note: The full regression model is run, but only the variables of interest are shown in the table. For full regression results, see Appendix VII.

Table 8. Sample robustness check, Wald test with p-values comparing need coefficients

H0	Original rule	p-values					
		1	2	3	4	5	6
$\beta \text{ need2} \leq \beta \text{ need3}$	0.107	0.114	0.134	0.095*	0.147	0.147	0.150
$\beta \text{ need3} \leq \beta \text{ need4}$	0.000***	0.000***	0.000***	0.001***	0.000***	0.000***	0.034**
$\beta \text{ need4} \leq \beta \text{ need5}$	0.175	0.167	0.181	0.174	0.169	0.172	0.489
$\beta \text{ need2} \leq \beta \text{ need4}$	0.018**	0.021**	0.035**	0.019**	0.040**	0.040**	0.000***
$\beta \text{ need3} \leq \beta \text{ need5}$	0.002***	0.002***	0.002***	0.002***	0.002***	0.002***	0.110

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

Tables 6 and 7 show the corresponding results. The mean degree of compliance and the regression coefficients remain rather stable using decision rules 1-5. Note that the various decision rules do not affect the sample size much, the small variation in compliance and regression results is thus not too surprising.

However, using decision rule 6, where individuals with less than five granted hours are excluded, the number of observations drop by 1,665 and more pronounced changes are observed in the results. The mean degree of compliance decreases to 81.6%. The coefficient of reimbursement

model drops slightly but remains significant. Need group 2 is no longer associated with a different compliance compared to need group 1. Thus, individuals with less than five granted hours explain a large part of the high difference in compliance between need group 1 and 2 in the original model (19.76 percentage points). The other need group coefficients also drop. This is a natural consequence: the individuals removed have a high compliance and, thus, as a result of removing them, the variance in compliance across groups decreases and, consequently, all coefficients drop. However, the F-test is rejected on a 1% level, which implies that need still has an overall effect on compliance (see Appendix VII). The Wald tests comparing the need coefficients show slightly weaker results than in the full model, but there are still indications of opportunistic behaviour across groups, as can be seen in Table 8.

Overall, the results of the regression using decision rule 6 show that individuals with less than five granted hours have a rather significant impact on our main results related to the effect of need. The reduced sample shows the same general patterns as our main model but contributes to a better understanding of our research questions through uncovering some of the mechanisms leading up to our results.

9 Discussion and conclusion

9.1 Opportunistic behaviour in home care services

On average, the users in our data set receive 87% of the hours they have been assessed to need. The evaluation of this figure can take on two different perspectives; on one hand it is alarming that users do not receive the home care they need but, on the other hand, they appear to be receiving a larger share of their granted hours in comparison with previous studies. The report by NBHW from 2005 showed a median degree of compliance of 60% which can be compared to the median compliance of 85% in our study. While bearing in mind that the studies were not performed on the same sample and using different methods, this is a most relevant comparison. It indicates that the development, in terms of compliance, has gone in a positive direction since 2005. Also, the 2005 report showed that 25% of the studied users received less than 40% of their granted hours, the corresponding group in our dataset constitutes only 11% of the total sample. Thus, the improvement, compared to the NBHW study, has also impacted those with lowest compliance.

While the average degree of compliance of 87% may not be as alarming as one could have expected, the picture is made more complex when disaggregating the analysis. The compliance between municipalities ranges between approximately 70%-110% and the difference between mean and median compliance within each municipality ranges between 0%-14%. The variation between municipalities is worrying from an equity perspective: according to the principle of need, where you live should not affect what type of or how much care you receive. Municipality 5 has a median of 57.6% which is well below the sample median of the 2005 report from NBHW. Furthermore, it is also interesting that municipality 3 has a mean compliance of 111.1%, implying

that their average user receives more home care hours than it has been granted. The average number of granted hours of this municipality is 30 hours per user which is five hours below the average of the dataset.²⁵ Low originally granted amounts of hours could play a part in explaining the high degree of compliance, if relaxing the initial assumption that the municipal assessment gives a correct image of the individual's need. However, there are two municipalities with averages of granted hours below that of municipality 3, and these have compliance averages below 100%, one of them as low as 83.5%. Thus, lower average amounts of granted hours do not automatically imply excessively high degrees of compliance.

For a municipality to have a degree of compliance above 100% is not un-problematic. Compliance above, as well as below, 100% is a sign that the incentives of providers are not aligned with those of the purchaser. It hints that an over-supply of home care services is incentivised and that tax money is spent carelessly. The implication of this, in turn, is that the theoretical benefits, with which proponents of NPM legitimise quasi-marketisation, are not realised in practise.

9.2 The impact of reimbursement model on compliance

The hypothesis predicted that reimbursement based on provided hours rather than on granted hours would be associated with a higher degree of compliance. Our results clearly indicate that the hypothesis holds. The effect of using the retrospectively determined payment appears to be rather substantial: according to our results it is associated with a 13.74 percentage points increase in compliance. Our results confirm the observations of previous studies that providers in a quasi-market setting respond to financial incentives through modification of the quantity of supplied care.

As the literature highlights, retrospective reimbursement comes with the risk of over-supply of the service. The municipality with a compliance above 100% does indeed use a reimbursement model based on provided hours. While this could potentially help explain the excessive compliance in this municipality, the overall picture conveyed by our results is not that the risk of over-supply has been realised as all other municipality exhibit an under-supply. However, as we do not have access to any earlier data we can make no comparisons over time in these municipalities and cannot say anything about whether the volumes of provided hours have gone up in the relevant municipalities after the introduction of retrospective payment models. It would therefore be highly relevant for future studies to make such over time comparisons or comparisons with PPA municipalities in order to assess the potential risk of over-supply.

²⁵ For summary statistics of average granted hours, refer to Appendix IX.

9.3 The impact of user need on compliance

The third hypothesis, relating to the level of need of the user, predicted that compliance would decrease as the level of user need increased. The results confirm such a relation in the data. Need group 1 has the highest compliance and need group 5 has the lowest with a decreasing scale in between. This confirms the theory of limited consumer sovereignty which predicts that weaker users will be made worse off in a quasi-market setting, relative to stronger users. These results are also in line with the findings of the 2005 report from NBHW and previously discussed international studies from quasi-market settings.

It is relevant to raise the question of whether this observed relation between compliance and amount of granted hours really is the consequence of the need profile of the user. It could be the case that having a large amount of hours simply makes it more difficult to schedule visits etc. which leads to a lower compliance. This would imply that the captured effect is purely a consequence of the amount of granted hours rather than the ability and capacity of the user. In essence, the question is whether the amount of time really is a good proxy of the need of the user. As previously discussed, to capture the full need profile of a user it would have been ideal to sophisticate the categorisation in terms of what type of activities have been granted, inclusion of individual medical data etc. However, with current data access, this is not possible. Using the amount of granted home care hours as a proxy for need is warranted as there is an obvious relation between the need of an individual and the amount of hours of home care they are granted. Thus, this is no perfect measure of the relationship between compliance and user need but does certainly give an indication that users with a high level of need receive a lower proportion of their granted hours compared to users with lower levels of need. Again, this is highly problematic from an equity perspective, especially as the home care services of Sweden are increasingly serving more and more users with high needs as the waiting time for nursing homes are extending.

9.4 Conclusions and implications of quasi-marketisation

What can these results tell us about the general effects of the ASC form of home care provision in specific, and of quasi-market provision of welfare services in general? This paper studies a snapshot of the current situation in the home care services of Sweden. In that sense, the conclusions that can be drawn are related to how the ASC provision form functions in itself rather than to how it functions compared to the PPA provision form. However, it is worth noting that the NBHW report from 2005, being the main reference point for previous results, uses data collected between 1997 and 2004. Consequently, it was conducted in a pure PPA context as the quasi-market reform of ASC had not yet been implemented. Thus, the discussion on the development of compliance and possible trends can, to some extent, also be viewed as a discussion on a possible comparison between ASC and PPA provision of home care. Our data also shows that the average degree of compliance is higher among private providers compared with public ones. The reasons behind this could be many, one interpretation is that the quasi-

market incentive structures have a stronger effect on private providers. This study provides far from enough evidence to make any claims regarding the quality of private versus public ownership or to draw the conclusion that quasi-marketization has had a positive effect on the degree of compliance within Swedish home care. For such conclusions it would be necessary to study a different dataset containing, for example, both ASC and PPA municipalities. Nevertheless, judging from the results of this study, quasi-marketisation has to the very least not increased opportunistic behaviour, related to the quantity of care supplied, within home care service.

A rather straightforward conclusion of the study is that making reimbursement contingent on the performed hours rather than on the granted hours increases the degree of compliance. This may seem self-evident and intuitive given agency theory. However, the fact remains that out of the 176 municipalities that have introduced, or decided to introduce, ASC provision of home care, at least 61 municipalities reimburse based on granted hours (SALAR 2015a).²⁶ An implication of this study should be for these municipalities to look over the possibility of shifting to a payment model based on provided hours instead of granted.

The study implies that the risk of moral hazard prevailing in the principal-agent relationship between providers and purchaser is commonly realised in the quasi-market context. Above all, what policy makers should be mainly concerned with is that we find a large variation in compliance across municipalities and between individuals. The Swedish care system, in similarity with many other welfare states, is built on the principle that care resources should be distributed based on the principle of need. Our findings indicate that the actual provision of home care to some extent is influenced by in which municipality the user lives and that the relation between care reception and need is reversed to the intended one: those most in need receive the smallest share of the care hours they have been granted. Remembering that one of the characteristics of NPM reforms is an orientation away from focus on equity towards a focus on efficiency and individualisation, this may not come as a surprise. The implication of these results is therefore that policy-makers need to have a clear prioritisation of equity in relation to efficiency, and to be aware of how policy design affects the relationship between the two. Swedish care is, explicitly, based on the principle of need and, thus, equity is a top priority. Therefore, there may be reason for policy makers in Sweden to consider better incentive alignments for providers when it comes to care intense users. Potential actions could be strengthened control systems around these patients or differentiated reimbursement levels so that the hours of users with high levels of need become more profitable. However, it remains for future studies to inquire the details of how the compliance varies with level of need and if the initial granting process is appropriate in capturing the actual need of the users.

²⁶ In the report from SALAR, only 140 municipalities replied to the question regarding reimbursement model. Thus, of the 36 remaining municipalities, there is a possibility that some reimburse based on granted hours as well.

From a broader perspective, NPM builds on the idea that actors in the public sector are driven by similar mechanisms as their private sector equivalents, rather than by some form of public ethos. The subsequent conclusion is that the two sectors could and should be managed with the same principles. In similarity with previous studies, our results suggest that actors in the public sector respond to incentives, like for example reimbursement model design, in accordance with what classic agency theory predicts. This favours the idea that the incentives of actors in the public sector can be aligned with those of the principal's using the same type of mechanisms as in private settings. In that sense, the NPM idea is to some extent supported by these findings. However, our results, again together with previous literature, point at some serious shortcomings of quasi-market form of welfare provision. We show indications of NPM inspired quasi-markets leading to the discrimination of less able users and that the amount of received care is impacted by where the user lives.

Going back to the original ideas of NPM, the introduction of market mechanisms and private management methods in the public sphere should also be paired with performance measurement and monitoring, as is tradition in the private sphere. It is undeniably so that the possibility of performance monitoring and benchmarking between municipalities is highly limited in the Swedish context. The decentralisation of elderly care to municipal level was never paired with any directives of monitoring or mandatory reporting to national authorities. Thus, it appears as if the quasi-marketisation of Swedish elderly care took inspiration in parts of the NPM idea but never implemented the monitoring side of the theory. It should therefore be in the interest of policy makers to create national databases and standardised measurement methods in this field. In order to enable future studies like this one but, mainly, to decrease the asymmetry in the information in the relation between purchasing municipalities and providers and between the state and the municipalities.

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Appendix

Appendix I Municipality characteristics

Municipality	Reimbursement model	Population size	Municipality type
1	Granted hours	80,000-100,000	Large city
2	Provided hours	0-20,000	Commuter municipality
3	Provided hours	20,000-40,000	Municipality in sparsely populated region
4	Provided hours	100,000-150,000	Large city
5	Granted hours	60,000-80,000	Large city
6	Granted hours	0-20,000	Manufacturing municipality
7	Provided hours	0-20,000	Suburban municipality
8	Provided hours	100,000-150,000	Large city
9	Provided hours	40,000-60,000	Suburban municipality

Source for municipality type: SALAR (2011b)

Appendix II Control variables

Variable	Description	Source
female	Dummy variable specifying the gender of the user	Primary
age<65	Dummy specifying whether the user is younger than 65 years	Primary
65≤age≤74	Dummy specifying whether the user is aged between 65 and 74	
75≤age≤84	Dummy variable specifying whether the user is aged between 75 and 84	
reimbursement_level	The reimbursement level in SEK associated with the provider	SALAR (2015a)
reimbursement_difference	Dummy variable specifying whether there is a difference in reimbursement level between public and private providers	SALAR (2015a)
ownership_provider	Dummy variable specifying whether the provider is public or private	Primary
number_providers	Number of providers that are available for users to choose from	NBHW (2015a)
waiting_nursinghome	Number of days that a user needs to wait to get access to a nursing home	KOLADA (2016)
yrs_asc	How many years it has been since the introduction of the ASC in the municipality	SALAR (2015a)
share_homecare	Share of population aged 65 and older that are users of home care	KOLADA (2016)

Motivation of control variables

Reimbursement level

Even though some research, as previously stated, suggest that the reimbursement level does not affect quality in care, higher reimbursement levels might be associated with shirking behaviour in the degree of compliance due to the opportunity of higher profit margins. Also, in order to create a competition neutral environment between public and private providers, some of the municipalities compensate for the VAT that public providers do not have to pay through a slightly higher reimbursement level to private providers. In order to account for the potential effect of reimbursement level on the degree of compliance, a variable specifying the reimbursement level associated with the individual's choice of provider is included, as well as an indicator of whether the municipality reimburses public and private providers differently.

Number of available actors

In order to account for the actual possibility of choice that the individual has, we include a variable detailing how many actors that are operating in each municipality. As users have the option to change provider if not satisfied with the provided service, a municipality with many actors are exposed to a more competitive environment than municipalities with few actors. This may have an effect on compliance as tough competition between providers could mean that the threat of users changing provider if unhappy with the services provided is more real in a municipality with many actors. Consequently, compliance could potentially increase due to the competition. However, simultaneously, competition could be thought to have the opposite effect if providers are financially pressured and chasing profit margins becomes very important. Regardless of the actual effect, we capture it through the inclusion of this variable.

Ownership

By including a variable describing whether the provider is privately or publically run, we account for any differences between public and private providers. A majority of the private providers are profit-oriented and may thus have a stronger motivation to shirk. However, public providers often suffer from a budget deficit (SALAR 2011a) and might therefore be forced to cut down on the number of provided hours in order to stay within budget. In any case, different ownership may have different incentive structures and in order to capture this effect, the model controls for ownership.

Waiting days to nursing home

There is a general lack of space in Swedish nursing homes and a user who does not get a spot is referred to home care services instead. This results in some individuals that in fact have care needs so large that they should be in a nursing home, instead being users of great amounts of home care services. Such users may be more exposed to the risk of getting less hours than granted as they are granted such large amounts of home care services. Municipalities with long waiting lines to nursing homes may have a larger share of such users in their home care services. Thus, we include the control variable of waiting days to nursing home in the municipality.

Years since implementation of ASC

It seems reasonable to believe that there are learning effects from having had a quasi-market form of provision during a longer period of time. The purchasing municipality may become better at noting opportunistic behaviour or at assisting users in their role as active consumers of home care. Furthermore, long-lasting relations between the municipality and providers may form informal contracts that are as strong, or even stronger, than the formal contracts and have an effect on the degree of compliance. We therefore choose to control for this potential effect of having had ASC implemented during a longer period of time.

Share of elderly in home care

Finally, a municipality with a high share of elderly in the home care system could arguably consider home care an important topic of discussion. The development of the home care system might therefore be more elaborate in these municipalities with detailed controlling and reporting, and thus, a variable specifying the share is included in the regression.

Appendix IV Cut-off hours for need groups

Original model

Municipality	Max value need group 1	Max value need group 2	Max value need group 3	Max value need group 4	Max value need group 5
1	4.34	13.39	30.58	55.81	252.71
2	4.46	11.71	24.30	41.34	145.39
3	6.43	17.14	32.52	50.78	176.44
4	4.90	11.20	24.40	42.60	292.70
5	8.39	19.86	40.72	69.88	129.46
6	2.90	9.07	27.25	50.89	289.73
7	2.48	18.07	38.25	65.00	250.43
8	3.00	10.79	36.57	75.79	286.14
9	8.00	25.76	47.38	81.00	245.00

Robustness check, cut-off hours using three need groups

Municipality	Max value need group 1	Max value need group 2	Max value need group 3
1	9.47	37.81	252.71
2	7.59	29.13	145.39
3	12.09	37.50	176.44
4	8.70	29.05	292.70
5	15.53	49.70	129.46
6	6.09	32.00	289.73
7	10.00	45.36	250.43
8	6.57	48.39	286.14
9	19.00	57.03	245.00

Robustness check, cut-off hours using seven need groups

Municipality	Max value need group 1	Max value need group 2	Max value need group 3	Max value need group 4	Max value need group 5	Max value need group 6	Max value need group 7
1	2.29	6.52	15.34	27.78	42.77	70.66	252.71
2	2.50	6.25	15.04	22.80	35.25	47.39	145.39
3	4.29	10.29	19.11	29.91	41.44	57.25	176.44
4	3.30	7.10	12.90	22.10	33.40	53.30	292.70
5	5.07	14.20	21.79	38.77	52.34	78.42	129.46
6	2.32	4.93	12.61	24.60	37.54	70.66	289.73
7	2.14	4.29	20.00	33.90	49.64	77.50	250.43
8	2.50	4.83	13.90	32.43	57.07	90.14	286.14
9	5.00	14.00	27.00	43.00	64.00	88.00	245.00

Appendix IV Distribution of degree of compliance around 0-200%

Figure 6. Distribution of degree of compliance around 0-200%, municipality 1

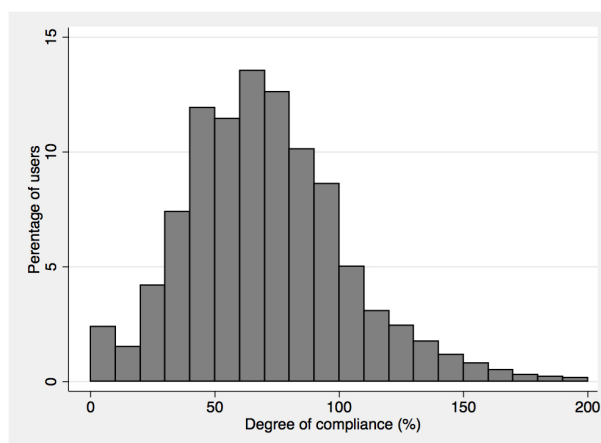


Figure 7. Distribution of degree of compliance around 0-200%, municipality 2

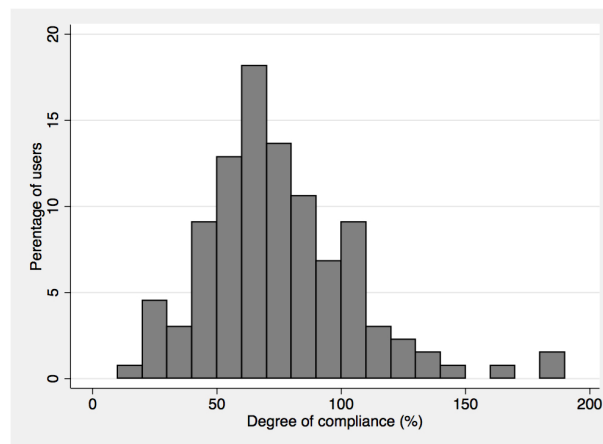


Figure 8. Distribution of degree of compliance around 0-200%, municipality 3

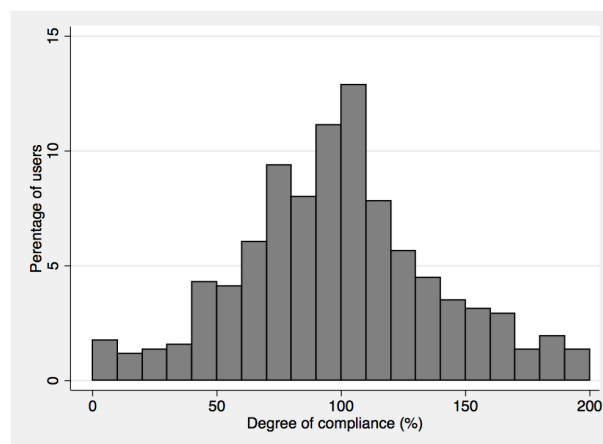


Figure 9. Distribution of degree of compliance around 0-200%, municipality 4

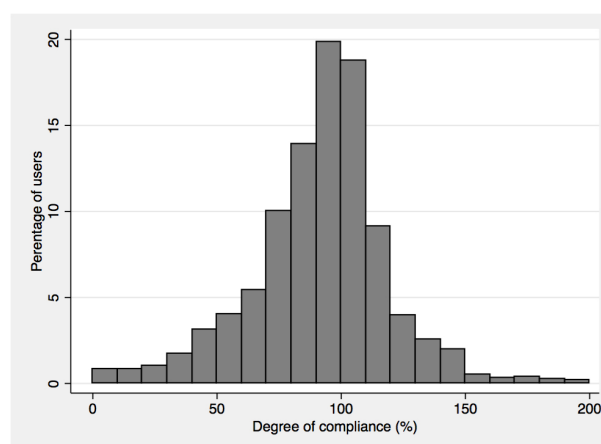


Figure 10. Distribution of degree of compliance around 0-200%, municipality 5

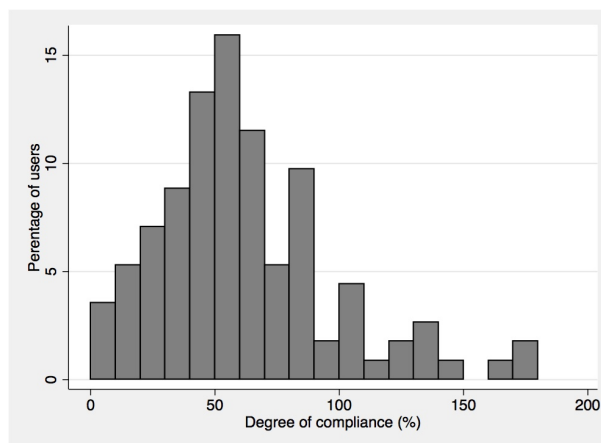


Figure 11. Distribution of degree of compliance around 0-200%, municipality 6

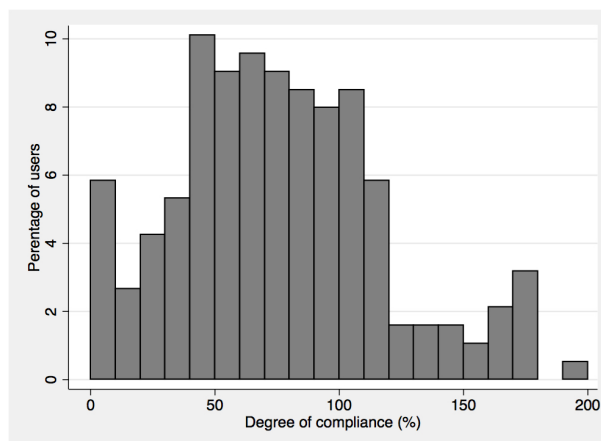


Figure 12. Distribution of degree of compliance around 0-200%, municipality 7

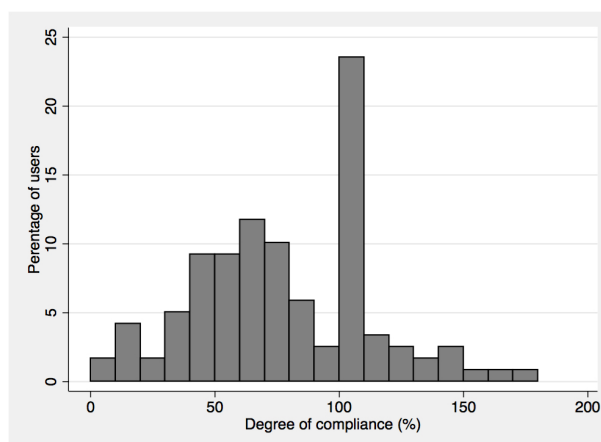


Figure 13. Distribution of degree of compliance around 0-200%, municipality 8

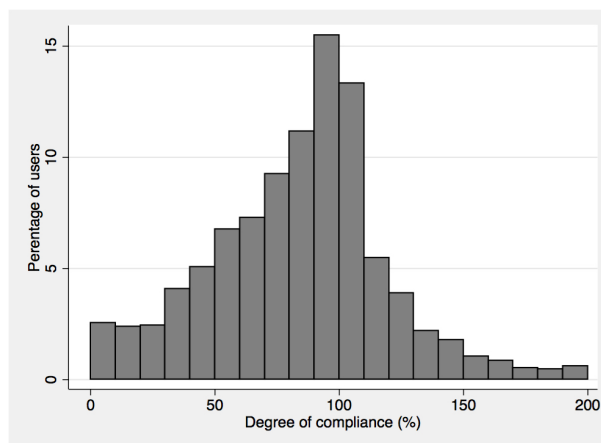
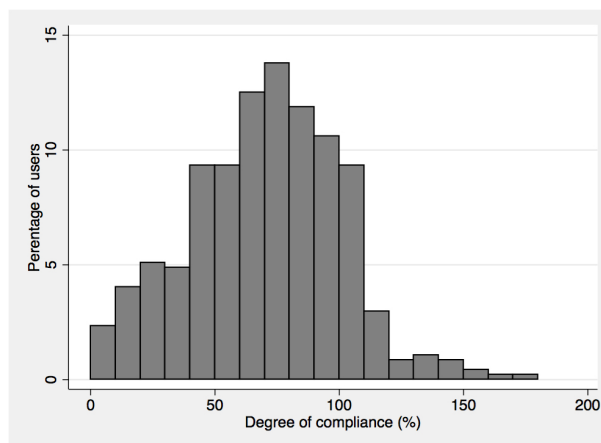


Figure 14. Distribution of degree of compliance around 0-200%, municipality 9



Appendix V F-test testing joint significance of need in original model

F-test	p-value
$\beta_{\text{need2}} = \beta_{\text{need3}} = \beta_{\text{need4}} = \beta_{\text{need5}} = 0$	0.0000***
*** p<0.01, ** p<0.05, * p<0.1	

Appendix VI Regression age on granted hours

<i>Dep.var: Granted hours</i>	
age	0.0381 (0.0438)
Constant	31.83*** (3.616)
Observations	7,180
R-squared	0.000
Standard errors in parentheses	
*** p<0.01, ** p<0.05, * p<0.1	

Appendix VII Sample robustness check, full model regression output

<i>Dep.var: Compliance</i>	Original rule	1	2	3	4	5	6
reimbursement_ model	13.74** (4.467)	10.63** (3.295)	17.96*** (5.273)	10.57*** (2.932)	13.99*** (3.647)	15.27*** (4.162)	10.91** (3.705)
need2	-19.76*** (2.127)	-17.73*** (1.268)	-18.67*** (1.125)	-16.87*** (1.219)	-16.76*** (2.339)	-16.76*** (2.338)	-4.971 (3.641)
need3	-23.23*** (4.506)	-21.11*** (1.854)	-23.26*** (4.477)	-20.51*** (1.986)	-21.13*** (1.873)	-21.15*** (1.874)	-7.435*** (1.644)
need4	-28.59*** (5.337)	-26.38*** (2.652)	-28.69*** (5.343)	-25.65*** (2.812)	-26.40*** (2.635)	-26.43*** (2.627)	-11.58** (3.607)
need5	-30.19*** (6.084)	-28.03*** (3.532)	-30.28*** (6.099)	-27.25*** (3.690)	-28.04*** (3.540)	-28.06*** (3.548)	-11.62** (4.652)
model_need2	0.600 (3.142)	4.815* (2.329)	-6.817 (3.897)	7.280*** (1.893)	5.925 (3.287)	6.212* (3.275)	4.506 (3.650)
model_need3	0.566 (5.351)	4.500* (2.246)	-5.793 (6.250)	7.191** (2.255)	6.006** (2.393)	4.787 (2.622)	2.073 (1.764)
model_need4	4.232 (6.149)	8.326** (3.207)	-2.031 (6.944)	11.06*** (3.136)	9.306** (3.133)	7.710** (3.193)	7.342* (3.804)
model_need5	2.820 (6.829)	6.942 (4.537)	-3.407 (7.479)	9.567* (4.462)	7.457 (4.334)	5.921 (4.454)	4.951 (5.115)
female	1.958** (0.720)	1.562 (0.960)	1.650 (1.341)	2.054 (1.150)	1.858 (1.046)	1.807** (0.648)	3.456*** (1.024)
age<65	-11.26*** (2.833)	-9.742*** (2.359)	-12.95*** (3.241)	-9.059*** (2.358)	-9.611*** (2.278)	-10.37*** (2.401)	-10.05*** (2.119)
65≤age≤74	-5.224*** (0.916)	-3.696* (1.677)	-6.823*** (0.638)	-3.086* (1.617)	-3.799* (1.649)	-3.462 (1.943)	-3.314* (1.714)
75≤age≤84	-1.319 (1.241)	-0.404 (0.784)	-2.544* (1.337)	-0.409 (0.491)	-0.484 (0.466)	-0.799 (0.577)	-1.536 (0.843)
reimbursement_ level	-0.135** (0.0470)	-0.124** (0.0519)	-0.125** (0.0476)	-0.178*** (0.0513)	-0.210*** (0.0571)	-0.205*** (0.0609)	-0.0892 (0.0723)
reimbursement_ difference	-3.843* (1.776)	-0.861 (1.896)	-4.489** (1.754)	-0.819 (1.511)	-2.748 (1.656)	-3.057 (1.944)	4.560** (1.912)
ownership_ provider	6.279*** (0.787)	5.807*** (1.095)	6.071*** (0.778)	4.367*** (1.017)	4.571*** (1.293)	4.619** (1.442)	5.078*** (1.198)
number_ providers	-3.368*** (0.439)	-3.074*** (0.449)	-3.502*** (0.445)	-3.072*** (0.407)	-3.346*** (0.451)	-3.391*** (0.484)	-2.751*** (0.511)
waiting_ nursinghome	-0.218*** (0.0129)	-0.210*** (0.0143)	-0.224*** (0.0128)	-0.196*** (0.0115)	-0.205*** (0.0126)	-0.211*** (0.0153)	-0.162*** (0.0138)
yrs_asc	7.765*** (1.373)	7.076*** (1.412)	8.287*** (1.391)	7.485*** (1.284)	7.918*** (1.433)	7.988*** (1.537)	6.314*** (1.674)
share_homecare	6.913*** (1.508)	6.797*** (1.520)	7.560*** (1.549)	7.169*** (1.445)	7.364*** (1.598)	7.352*** (1.647)	8.349*** (1.774)
Constant	102.2*** (19.37)	94.05*** (20.94)	96.05*** (19.65)	104.9*** (19.65)	117.2*** (21.46)	116.7*** (22.92)	49.12 (26.90)
Observations	7,180	7,169	7,189	7,160	7,179	7,188	5,515
R-squared	0.077	0.097	0.070	0.101	0.096	0.093	0.102

Robust, clustered standard errors in parentheses

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

Sample robustness check, F-test testing joint significance of need

F-test	p-value
$\beta_{\text{need2}} = \beta_{\text{need3}} = \beta_{\text{need4}} = \beta_{\text{need5}} = 0$	0.0000***
*** p<0.01, ** p<0.05, * p<0.1	

Appendix VIII Need group robustness check

The second robustness check concerns the need group categorisation. The number of need groups is altered to see if similar results of opportunistic behaviour are identified if divided into fewer or more groups. If very few need groups are created, the variation in granted hours within each group will be large. Results of differing compliance will not necessarily be a strong indication of systematic opportunistic behaviour across the entire dataset as effects might be missed on a more detailed level. On the other hand, if too many need groups are created, individuals between groups will be too similar in terms of granted hours which might result in inconclusive results. Dividing the dataset into fewer or more need groups does not affect the significance of reimbursement model or the interaction variables. However, the Wald tests comparing the need group coefficients show varying results. When dividing the sample into three groups rather than five, the regression results show that compliance differ across all groups. With seven groups, very few differences across groups are found and only one test comparing neighbouring need groups shows a significant difference. In summary, a classification using three groups does identify opportunistic behaviour across all groups, but this classification misses effects that is identified when using five groups.

Robustness check need group, regression output

<i>Dep.var: Compliance</i>	5 need groups	3 need groups	7 need groups
reimbursement_model	13.74** (4.467)	12.90** (3.986)	14.81** (5.323)
need2	-19.76*** (2.127)	-16.74*** (4.304)	-16.98*** (0.864)
need3	-23.23*** (4.506)	-22.92*** (5.853)	-21.10*** (3.948)
need4	-28.59*** (5.337)		-27.43*** (4.912)
need5	-30.19*** (6.084)		-28.08*** (3.876)
need6			-34.10*** (5.988)
need7			-32.60*** (6.766)
model_need2	0.600 (3.142)	1.317 (4.864)	-3.356 (3.589)
model_need3	0.566 (5.351)	3.841 (6.337)	-4.171 (5.921)
model_need4	4.232 (6.149)		1.283 (5.829)
model_need5	2.820 (6.829)		-0.915 (5.913)
model_need6			4.824 (7.196)
model_need7			1.554 (7.729)
female	1.958** (0.720)	1.906** (0.788)	1.962** (0.726)
age<65	-11.26*** (2.833)	-11.82*** (2.991)	-11.18*** (2.617)
65≤age≤74	-5.224*** (0.916)	-5.663*** (0.826)	-4.981*** (0.971)
75≤age≤84	-1.319 (1.241)	-1.325 (1.226)	-1.587 (1.215)
reimbursement_level	-0.135** (0.0470)	-0.125** (0.0469)	-0.132** (0.0477)
reimbursement_difference	-3.843* (1.776)	-3.759* (1.801)	-3.432* (1.831)
ownership_provider	6.279*** (0.787)	6.460*** (0.715)	6.334*** (0.767)
number_providers	-3.368*** (0.439)	-3.363*** (0.450)	-3.416*** (0.450)
waiting_nursinghome	-0.218*** (0.0129)	-0.217*** (0.0130)	-0.217*** (0.0133)
yrs_asc	7.765*** (1.373)	7.697*** (1.402)	7.887*** (1.403)
share_homecare	6.913*** (1.508)	7.012*** (1.550)	7.029*** (1.535)
Constant	102.2*** (19.37)	91.68*** (19.53)	102.6*** (19.50)
Observations	7,180	7,180	7,180
R-squared	0.077	0.068	0.080

Robust, clustered standard errors in parentheses

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

Robustness check need groups, Wald test with p-values comparing need coefficients

H0	p-values		
	Original sample	3 groups	7 groups
$\beta \text{ need2} \leq \beta \text{ need3}$	0.107	0.002***	0.200
$\beta \text{ need3} \leq \beta \text{ need4}$	0.000***		0.003***
$\beta \text{ need4} \leq \beta \text{ need5}$	0.175		0.408
$\beta \text{ need5} \leq \beta \text{ need6}$			0.111
$\beta \text{ need6} \leq \beta \text{ need7}$			0.866
$\beta \text{ need2} \leq \beta \text{ need4}$	0.018**		0.045**
$\beta \text{ need3} \leq \beta \text{ need5}$	0.002***		0.036**
$\beta \text{ need4} \leq \beta \text{ need6}$			0.000***
$\beta \text{ need5} \leq \beta \text{ need7}$			0.176

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

Appendix IX Granted and provided hours across municipalities

Municipality	Granted hours			Provided hours		
	Mean	Min	Max	Mean	Min	Max
Total	34.95 (39.91)	0.07	292.70	27.63 (34.58)	0.01	389.37
1	34.38 (38.75)	0.24	252.71	25.86 (31.37)	0.05	389.37
2	26.36 (28.07)	0.07	145.39	18.59 (21.08)	0.13	143.85
3	30.00 (25.74)	0.08	176.44	31.89 (30.24)	0.07	154.90
4	28.44 (35.78)	0.30	292.70	24.41 (29.79)	0.10	290.00
5	37.85 (31.22)	0.21	129.46	23.06 (23.64)	0.07	121.44
6	32.06 (43.03)	0.73	289.73	18.81 (21.96)	0.08	121.63
7	41.84 (50.92)	1.43	250.43	23.89 (25.18)	1.07	128.21
8	40.48 (45.87)	0.30	286.14	34.26 (42.91)	0.01	254.17
9	44.51 (38.56)	1.05	245.00	31.69 (31.77)	0.44	157.86

Standard errors in parentheses