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Does privatisation of vocational rehabilitation improve labour market opportunities? Evidence from a field experiment in Sweden

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Does privatisation of vocational rehabilitation improve labour market opportunities?

Evidence from a field experiment in Sweden

by

Lisa Jönsson[1] and Peter Skogman Thoursie[2,3]

January 25, 2012

Abstract

This paper analyses if privatisation of vocational rehabilitation can improve labour market opportunities for individuals on long-term sickness absence. We use a field experiment performed by the Employment Service and the Social Insurance Agency in Sweden during 2008 to 2010, in which over 4,000 participants were randomly offered private and public rehabilitation. We find no differences in employment rates following rehabilitation between individuals who received rehabilitation by private and public providers. Also the average cost of rehabilitation was essentially equal for the two types of providers. This suggests that there are no large efficiency gains from privatising vocational rehabilitation.

Keywords: Vocational rehabilitation, Privatisation, Field experiment
JEL-codes: J14, J68, L33

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1 Introduction

There has been an intense debate about whether the private sector can provide a variety of public services more efficiently than the government. The controversy has concerned services ranging from education, job placement services and healthcare to transportation and garbage collection. One motivation for privatisation is to induce incentives for innovation and cost reduction (Grossman and Hart 1986; Hart and Moore 1990; Hart et al. 1997). As pointed out by Hart et al. (1997), however, incentives to engage in pure cost reduction may be too strong, which could deter the quality of the services. This is particularly problematic when quality is imperfectly observable.

The merit of outsourcing public services is ultimately an empirical question, but the empirical evidence is too scarce for drawing a general conclusion of whether privatisation improves efficiency. Existing studies suggest that the result depends on the nature of the service provided. In a recent review, Andersson and Jordahl (2011) argue that outsourcing works relatively well for public services with little contractibility problems, such as garbage collection, but appears more problematic for credence goods, such as residential youth care. The authors also conclude that the lack of exogenous variation in outsourcing remains a major weakness in the empirical literature.

In this paper, we study if privately provided vocational rehabilitation can improve labour market opportunities of individuals on long-term sick leave, compared to rehabilitation provided by the public. The understanding of how to motivate individuals with a long history of health-related absence to return to work is limited (Autor and Duggan 2006) and the efficiency of vocational rehabilitation per se is an unresolved question (see Johansson et al. 2011). The Ticket to Work program in the US offers disability beneficiaries increased opportunities to obtain return-to-work services but the participation rate has been low (Stapleton et. al 2008). The Pathways to Work program, offering support for incapacity benefit claimants in the UK, however, seems to have increased the return to work (Adam et al. 2008). Since vocational rehabilitation is a complex service and little is known about the relative efficiency of different types of rehabilitation measures, the potential for innovation might be large. This makes it particularly interesting to study what private providers can achieve.

Our estimation strategy relies on a field experiment in which 4,090 participants were randomly assigned to private and public rehabilitation. The experiment was conducted

during 2008–2010 in four Swedish regions with different local labour markets, which increases the external validity of the results. The participants had been receiving sickness benefits for at least two years or were receiving temporary disability benefits, and were either unemployed or unable to return to their previous workplace for health reasons. The private providers competed for contracts through public tenders, competed for clients through consumer choice and were rewarded based on results in terms of acquiring employment. The public provider faced no financial incentives but was subject to a quantitative performance goal when operating on a regular basis. Rehabilitation could be provided for up to one year.

The research design avoids the problem of endogenous selection into private and public vocational rehabilitation that would be the case without the random assignment. Individuals who were randomised to private rehabilitation could demand rehabilitation by the public, but not the other way around, which implies one-sided non-compliance. We estimate the causal effect of privately provided vocational rehabilitation using an instrumental variable approach in which the initial assignment is the instrument for private rehabilitation. We follow the participants up to two years after randomisation and compare the probability of acquiring employment in the second year, when rehabilitation should be completed.

The main contribution of this paper is to provide direct evidence on the relative performance of the private and the public sector in providing vocational rehabilitation services to individuals on long-term sickness absence. It also contributes to the empirical literature on the effectiveness of privatisation in general.[4] Given the extent to which public services are being outsourced, there is remarkably little research on how private actors perform. In particular, there is little experimental evidence. Bennmarker et. al. (2009) analyse an experiment with privately provided job placement services in Sweden and find no differences in the relative performance of private and public providers in terms of acquiring employment. Behaghel et al. (2011) use an experiment with privately provided job placement services in France and find that the public provider acquired employment to a substantially larger extent than the private providers. The target group for vocational rehabilitation is in general further from the labour market than the target group for job placement services and the vocational rehabilitation

[4] See e.g., Dewenter and Malatesta (2001), Duggan (2004) and Aizer et al. (2007).

services are typically more comprehensive and provided for a longer period than job placement services. In that sense, we study the virtues of privatisation of a more complex public service compared to the above-mentioned studies.

Our main finding is that there is no difference in the success of acquiring employment following rehabilitation between private and public rehabilitation providers. There was a substantial transition to employment following rehabilitation for both types of providers but the transition rates were the same across the two groups. The development over time by month since randomisation was also remarkably similar. There are no indications of one type of provider performing better than the other up to two years following randomisation. Rough calculations suggest that also the public cost of private and public rehabilitation was the same. This suggests that there are no large efficiency gains from privatising vocational rehabilitation.

One difference we found is that private and public providers made use of different types of employment subsidies. Whereas private providers were more successful in providing employment with a new start job subsidy, which is based on the length of absence from the labour market, the public provider more often provided employment with a wage subsidy for disabled workers, which is based on the degree of reduced work capacity. A likely reason for this is that the assessment of work capacity for work subsidies was carried out by the Employment Service and that this type of subsidy therefore might have been more accessible to the public provider. Up to two years following randomisation, however, we find no difference in employment duration for the two types of subsidised employments. A study by the Swedish Agency for Public Management (2011) also shows that the average subsidy payment per participant in general is similar across the two types of subsidies. Therefore, this difference has no financial implications for the short-run effects estimated in this paper. Future studies may show if the type of subsidised employment affects labour market opportunities in the long run.

The remainder of the paper is organised as follows. Section 2 describes the institutional framework of vocational rehabilitation and section 3 presents detailed information about the experiment. Section 4 discusses the theoretical aspects and provides a conceptual framework of treatment. Section 5 describes the data while section 6 discusses the empirical strategy. Section 7 presents the results of private

compared to public rehabilitation in terms of acquiring employment or education and section 8 discusses the implications of the results.

2 Background

The two main income support programs in Sweden for individuals who are unable to work for health reasons are the sickness insurance and the disability insurance programs. The sickness insurance program provides income replacement for individuals with a temporarily reduced working capacity whereas the disability insurance program replaces foregone earnings for individuals with a lasting impairment. Before 1 July 2008 there was no time limit for receiving sickness benefits and disability benefits could be temporary or permanent, which implied substantial overlap between the two programs. Since then, sickness benefits can be received for up to two and a half years and temporary disability benefits are no longer granted. Medical conditions are typically assessed by a physician but eligibility for benefits is determined by the Social Insurance Agency. Sickness and disability benefits can be granted full-time or to 25, 50, or 75 per cent. The replacement rate is 80 per cent of foregone earnings in the sickness insurance and 64 per cent of foregone earnings in the disability insurance, up to a cap. Most workers in Sweden also receive supplementary compensation from collectively bargained insurances with varying degrees of compensation.

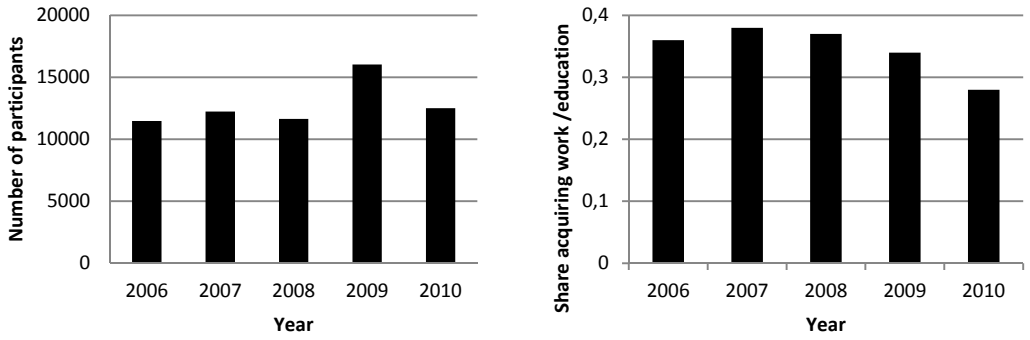
The Social Insurance Agency is responsible for the rehabilitation of individuals in the sickness and the disability insurance programs. Rehabilitation can be of medical, social or vocational character. The Social Insurance Agency assesses the need for rehabilitation and coordinates the rehabilitation process, but does not provide the rehabilitation services. The health care system provides medical rehabilitation, the social services provide social rehabilitation and the employer provides vocational rehabilitation for individuals who are able to return to their previous workplace. The Employment Service provides vocational rehabilitation for individuals who are unemployed or unable to return to their workplace because of the health impairment. The cooperation between the Social Insurance Agency and the Employment Service regarding rehabilitation of the individuals with no employment to return to is formalised within ‘the vocational rehabilitation program’.

The vocational rehabilitation program started in 2003 and was implemented across the country by 2005. The motivation was a large increase in recipients of sickness and disability benefits during the late 1990s and early 2000s and the fact that only 8 per cent of the long-term sick participated in a rehabilitation activity (The Social Insurance Agency and the Employment Service 2011). The purpose of the vocational rehabilitation program is to provide support during the process from health related absence to work. The target group is individuals on sickness or disability benefits who are unemployed or unable to return to their previous workplace because of the impairment and are assessed by the Social Insurance Agency to be in need of vocational rehabilitation. The most common diagnoses are mental disorders and musculoskeletal diseases. Whereas the Social Insurance Agency provides administrative and financial support, the Employment Service provides the rehabilitation activities, which can last for up to one year. Typical activities are counselling, job training and job search assistance.

The vocational rehabilitation program is subject to two explicit goals. The first goal is that 15,000 individuals should begin vocational rehabilitation each year. This figure can be related to the total number of individuals receiving sickness and disability benefits, which was about 550,000 in 2010. The second goal is that 40 per cent of the participants should be in work or education one year after entering the program. This includes unsubsidised or subsidised employments, regular education and occupational training programs. Figure 1 shows the fulfilment of the two goals during 2006–2010. The first goal of recruiting 15,000 participants yearly was only achieved in 2009, when more than 16,000 individuals entered the program. In the other years, the number of participants entering the program was around 12,000 per year. The second goal of acquiring work or education for 40 per cent of the participants has never been achieved, but the exit rate to work or education exceeded 35 per cent during 2005–2008.

Figure 1 Number of new participants in the vocational rehabilitation program and the share of participants acquiring work or education, 2006–2010

a. Number of new participants per year b. Share acquiring work or education



This type of quantitative goal might have selection effects such that certain types of individuals are selected for rehabilitation. This relates to the literature on cream skimming, defined as case workers selecting eligible clients into a program who would have done well without participation, rather than persons with the greatest expected gain from participating (see Anderson et al. 1992; Barnow 1992; Heckman et al., 1997, 2002). The issue of cream skimming is not an issue in this study since participants were randomly selected to private and public providers.

3 The experiment

In 2008, the Swedish government assigned the Social Insurance Agency and the Employment Service to perform an experiment with private provision of vocational rehabilitation as an alternative to the rehabilitation provided by the Employment Service. The purpose was to promote innovation and individualisation of vocational rehabilitation services. The experiment was performed during 2008–2010 in four Swedish regions: Stockholm, Gothenburg, Dalarna and Västerbotten. The target group was individuals who had been collecting sickness benefits for more than two years or were collecting temporary disability benefits, were either unemployed or unable to return to their previous workplace for health reasons, and were assessed to be in need of vocational rehabilitation.[5] The private providers competed for contracts through public

[5] This is a subset of the target group for the vocational rehabilitation program in general, which also includes individuals on sickness absence for a shorter period than two years and individuals collecting permanent disability benefits.

tenders, competed for clients through consumer choice and were rewarded based on results in terms of acquiring employment.

The Employment Service contracted the private providers through public tenders. The contestants were assessed based on a set of known criteria regarding the services offered, the degree of individualisation, the labour market relevance, the methodology, the degree of innovation and the qualification of the personnel. In each region, the highest ranked providers were contracted. The compensation scheme was determined in advance. Since the government explicitly wanted to encourage the participation of non-profit actors from the social economy,[6] and these actors were presumed to be more credit constrained than for-profit actors, non-profit actors faced a slightly more favourable compensation scheme. In this paper, we cannot compare the performance of for-profit and non-profit private providers, however, since participants randomised to private rehabilitation chose among the providers.

A provider could receive a total of 60,000 SEK per participant (€ 6,700), paid in three steps based on performance in terms of acquiring employment:

1. Assignment fee: for-profit 45 %, non-profit 55 %
2. Acquiring employment: for-profit 25 %, non-profit 20 %
3. Retaining employment for six months: for-profit 30 %, non-profit 25 %

The assignment fee was granted after two weeks of rehabilitation. Unsubsidised and subsidised employment entitled to full compensation whereas self-employment entitled to full compensation if the business was running without support from the Employment Service after six months. Regular education and occupational training reduced compensation in steps 2 and 3 to 25 per cent in total, granted after three months.[7] Rehabilitation could be provided for up to 12 months and should be provided on a full-time basis.

There are two main types of subsidised employments. The first is a 'wage subsidy for disabled workers', which is granted for individuals with a documented reduced work capacity. The subsidy compensates the employer for the lost productivity and the size is

[6] The social economy refers to organised activities which primarily aim at serving the community, are being built on democratic values, and are organisationally independent of the public sector (The Swedish Government, 1998). These activities are run mainly by associations, cooperatives or foundations and the main driving force is the benefit of the public or the members, and not profit.

[7] Non-profit actors were entitled to compensation for employment in the own establishment while for-profit actors were compensated for employment in the own establishment in step 2 only if the participant had acquired an employment outside the own establishment in step 3.

determined by the degree of impairment. The assessment of work capacity is conducted by the Employment Service. The second is a 'new start job subsidy', which is granted for individuals with a certain period of absence from the labour market due to unemployment, sickness absence, immigration or imprisonment. The subsidy is paid during a period equal to the length of absence from the labour market. The size of the subsidy is twice the payroll tax, at a normal rate of 31.42 per cent in 2010, for individuals aged 26–65 and one times the payroll tax for individuals aged 20–26.[8] According to The Swedish Agency for Public Management (2011), the average subsidy payment per participant is essentially equal across the two types of subsidies.

One concern in the experiment was that the public provider would have easier access to wage subsidies for disabled workers, since the assessment of work capacity was conducted by the Employment Service. Therefore, the Employment Service was explicitly instructed not to discriminate private providers who asked for such an assessment. Still, the public caseworkers might be more experienced handling this type of subsidy. The new start job subsidy, on the other hand, was a relatively new type of subsidy. Since a new start job could be organised without involvement of the Employment Service, there is reason to expect that new start job subsidies were more attractive to use for the private providers.

The public tenders were completed in August 2008 for for-profit actors and in January 2009 for non-profit actors, with a total of 1,770 rehabilitation slots contracted. There were more competitors than contracts in all regions. In Stockholm, for example, a total of 30 private providers competed and 11 received a contract. There were 9 providers contracted in Gothenburg, 6 in Dalarna and 3 in Västerbotten.

The Social Insurance Agency recruited the participants to the experiment through two different pathways. First, caseworkers continuously identified potential participants from the case files at the Social Insurance Agency. Second, the Social Insurance Agency sent out close to 24,400 information letters to all individuals who had been

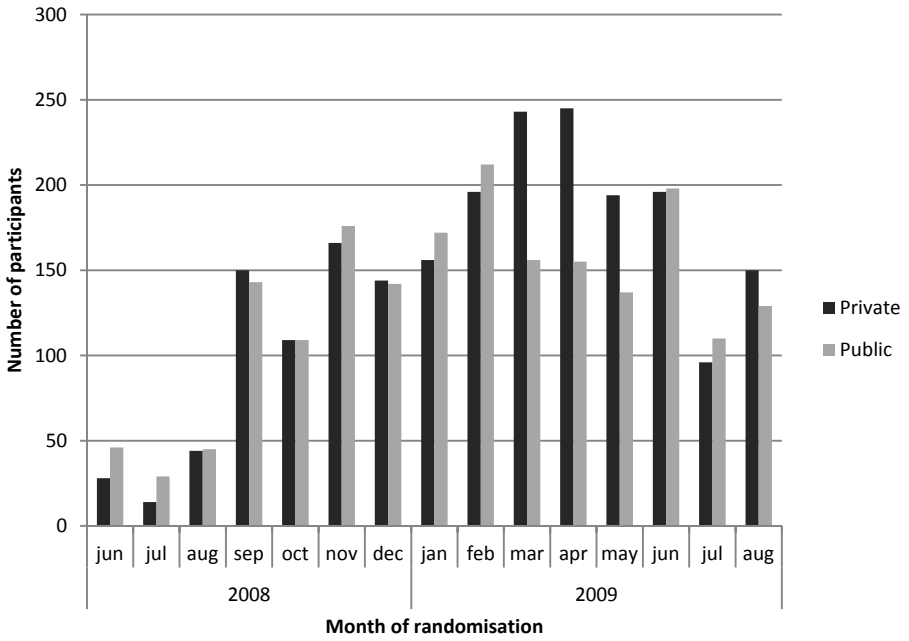
[8] The payroll tax rate is lower for individuals aged 26 or below, amounting to 15.49 percent in 2010. Individuals aged 27-54 must have been absent for at least 12 of the last 15 months. For individuals aged 20-26 or 55-65, absence for at least 6 of the last 9 months is enough for qualification. The maximum period is 12 months for individuals aged 20-26, 5 years for individuals aged 26-55 and 10 years for individuals aged 55-65. Individuals aged 20-26 who qualify for a new start job subsidy due to sickness absence receive an additional subsidy equal to the normal payroll tax rate and can be granted the subsidy for up to 5 years.

collecting sickness benefits for more than two years or were collecting temporary disability benefits, in which they offered active rehabilitation services in cooperation with the Employment Service. The purpose was to attract individuals who were not identified by the caseworkers but were motivated to participate in rehabilitation. Individuals responding to the letter were recruited to the experiment if they were assessed to be in need of vocational rehabilitation.

A total of 4,090 individuals were recruited to the experiment from June 2008 to August 2009, of which 3,587 entered through the 'ordinary pathway' and 503 through the 'information pathway'. Once the participants had been recruited, they were randomly offered private and public rehabilitation. Figure 2 shows the number of individuals randomised to private and public rehabilitation each month during the recruitment period. The increased probability of being randomised to private rehabilitation from March to May 2009 was due to a tilting of the randomisation because providers waited for being assigned participants.

Individuals randomised to private rehabilitation were asked by the Social Insurance Agency caseworkers to choose among the private providers in the neighbourhood based on information leaflets produced by the providers. The caseworkers were explicitly instructed not to influence the choice of provider. Individuals could not be forced to choose a private provider, however. If they denied privately provided rehabilitation, they were directed to the regular vocational rehabilitation program at the Employment Service. Individuals randomised to public rehabilitation were directed to the Employment Service without having the option of private rehabilitation. We therefore have one-sided non-compliance. Table 1 presents the number of participants randomised to private and public rehabilitation by column and the number of participants who complied with the assignment by row. Out of the 4,090 individuals who were recruited to the experiment, 2,131 were randomised to private rehabilitation and 1,959 were randomised to public rehabilitation. Among the individuals who were randomised to private rehabilitation, 1,730 complied with the assignment while 401 denied private rehabilitation. This implies a compliance rate of above 81 per cent.

Figure 2 Number of participants randomised to private and public rehabilitation, by month of randomisation



A study by Malmö University (2010) examines the differences in initial resources and the types of rehabilitation services provided across actors, based on interviews with providers and participants in the experiment. The study finds small differences in the academic competence and background of the employees, but larger differences in the organisational experience with the target group. Although many private provider employees had prior experience with the target group, the organisation as a whole did not. Another difference was that the private providers did not have access to the clients' case files, and thus had less information about the client history. Private providers also spent more time on guidance, charting of individual needs and job search assistance, which might be due to the lack of information about the clients. The public provider was more focused on job training.

Table 1 Number of individuals randomised to private and public rehabilitation and the compliance with the assignment

		Randomisation outcome (Z)		
		Private rehabilitation	Public rehabilitation	Total
Compliance (D)	Private rehabilitation	1,730	0	1,730
	Public rehabilitation	401	1,959	2,360
	Total	2,131	1,959	4,090

Important for the comparison of private and public rehabilitation is to also take costs into account. We can only perform rough calculations of the cost of rehabilitation by private and public providers. The cost of public rehabilitation is calculated based on the 2007 yearly report for the vocational rehabilitation program, and include costs for administration and the provision of rehabilitation services for the Employment Service (The Social Insurance Agency and the Employment Service, 2007). The cost of private rehabilitation includes procurement costs and realised payments to the private providers in accordance with the compensation scheme. Our calculations suggest a cost per client of around SEK 24,000 (€ 2,700) for both private and public providers. The similar cost of rehabilitation for the two types of providers motivates the comparison of labour market outcomes of the participants following rehabilitation.

4 Theoretical framework

The total effect of privatisation estimated in this paper consists of several different components, which can broadly be divided into two groups: initial resources and incentives. Differences in initial resources and incentives across providers can affect the way rehabilitation is carried out, which may in turn affect the labour market opportunities of the participants. To formalise the discussion about the components of the treatment effect, we formulate a rehabilitation production function of the form

$$\Pr(Emp_i) = r(R(Private), I(Private), \mu_i, W), \tag{1}$$

where R are initial resources, I are incentives, $Private$ indicates organisation type, μ_i represents individual human resources such as ability, motivation, education and experience and W are external factors such as local labour market conditions. Due to the random assignment of participants into private and public rehabilitation, the individual's human resources μ_i and the external factors W are independent of organisation type. The function r describes how the input factors create different types of rehabilitation, which in turn affects the probability that the participant acquires employment, Pr (Emp).

In this simple model, the total effect of privatisation is given by

$$\frac{dPr(Emp_i)}{dPrivate} = \frac{\partial r}{\partial R}\frac{\partial R}{\partial Private} + \frac{\partial r}{\partial I}\frac{\partial I}{\partial Private}, \tag{2}$$

where the first term represents the effect of initial resources and the second term represents the effect of incentives. In terms of initial resources, one might claim that the private providers were disadvantaged. We know from Section 3 that they had less organisational experience with the target group and less client information. If these differences in initial resources ($\partial R/\partial Private < 0$) are important for providing efficient rehabilitation ($\partial r/\partial R > 0$), the first term in equation 2 is negative.

In terms of incentives, there are several differences between private and public providers. The first incentives component is the private ownership. The basis is the property-rights theory of Grossman and Hart (1986) and Hart and Moore (1990), which was applied to public service contracting by Hart, Schleifer and Vishny (1997). Assuming contractual incompleteness, the residual control right that comes from the ownership of an asset will increase the bargaining power in the renegotiation of the contract. This increases the incentives for innovation and cost reduction, since the owner will secure a larger share of the surplus from the investments. The implication from the model is that private provision of a public service will reduce costs but have an ambiguous effect on quality. The risk is that the private provider reduces costs in a way that deteriorates non-contractible quality.

The second incentives component is competition. The experiment introduced competition for both public and private providers, which might have affected quality also of publicly provided rehabilitation (for contributions that point out that more competition may stimulate innovations, see for instance, Aghion et al. 2001, 2005). The private providers, however, faced additional competition since they competed for contracts to participate in the experiment and competed for clients through consumer choice.

The third incentives component, which is closely related to the notion of competition, is reputation building. In settings with repeated interactions, private providers might have large gains from establishing a credible reputation for high quality (Francois and Vlassopoulus 2008). The additional competition facing the private providers reinforces the importance of reputation building. The performance during the experiment is important for the prospects in future public tenders, and is likely to affect the probability of a permanent shift from public to private provision of vocational rehabilitation. If private providers put an extra amount of effort during the experimental

period in order to build up a good reputation, we would overestimate the effect of privatisation. Reputation building is also important for attracting new clients during the experiment.

The fourth incentives component is the compensation scheme. The private providers were compensated based on performance. The assignment fee gave an incentive to attract clients, the payment when acquiring employment encouraged the provision of efficient rehabilitation measures, and the compensation when retaining employment for six months motivated the achievement of high quality matches between workers and firms. The public provider had no financial incentives for acquiring employment, but was subject to a quantitative goal of acquiring employment for 40 per cent of the participants (for effects of payment schemes, see for example Barnow 1992; Heckman et al. 2001).

The fifth incentives component relates to the literature on pro-social motivation, suggesting that public sector employees might be more motivated than private sector employees, which would increase the quality of the provided service (see e.g., Besley and Ghatak 2005; Akerlof and Kranton 2005). Extrinsic incentives, such as monetary rewards, might also harm the intrinsic motivation of mission-oriented workers at the private providers (see Francois and Vlassopoulos (2008) for a review).

Taken together, the theory about incentives suggests that private providers faced stronger incentives for providing efficient rehabilitation in terms of differences in ownership, the degree of competition, the importance of reputation building and the terms of compensation. The exception is the theory on how employees in different types of organisations may be differently motivated. If stronger incentives for providing efficient rehabilitation ($\partial I/\partial Private > 0$) translate into increased rehabilitation efficiency ($\partial r/\partial I > 0$), the second term in equation 2 is positive. In total, however, a positive effect of incentives could be counteracted by a negative effect of initial resources for private compared to public providers. The experimental estimate obtained in this paper will capture the total effect of privatisation and cannot disentangle the impact of the separate components.

5 Data

It is crucial for the experimental design that the randomisation of individuals into private and public rehabilitation was carried out properly. Administrative records from the Social Insurance Agency contain demographic information about the participants. Table 2 presents the average characteristics of the two groups at the time of randomisation along with their differences and the normalised difference. There are no significant differences between individuals randomised to private and public rehabilitation, which indicates that the division of the two groups was indeed random. This is also confirmed if we consider the scale-free normalised difference in means, which is reported in column 4 of Table 2.[9]

We create a set of outcome variables by combining daily records of the collection of sickness and disability benefits from the Social Insurance Agency with daily registrations of unemployment and program participation from the Employment Service, from June 2007 until August 2011.[10] Based on these records, we categorise the participants into eight mutually exclusive states on each day since randomisation. The first state is to be registered as unemployed at the Employment Service, without participating in an organised activity. The second state is to participate in rehabilitation, including the initial charting period as well as active rehabilitation services and labour market programs. The third state is to be employed with a wage subsidy for disabled workers and the fourth state is to be employed with a new start job subsidy, both of which were discussed in section 3. The fifth state is to be in unsubsidised employment and the sixth state is to participate in regular education or occupational training. The seventh state is to be unregistered at the Employment Service for other reasons than work or education but having decreased the degree of benefits collection from the Social Insurance Agency compared to the day of randomisation. The eighth state is to be unregistered at the Employment Service and receive benefits from the Social Insurance Agency to the same extent as on the day of randomisation.

[9] The scale-free difference in means is calculated as $(\mu_1 - \mu_0)/\sqrt{\sigma_1^2 + \sigma_0^2}$. Imbens and Wooldridge (2009) recommend reporting this difference since it does not systematically increase with the sample size which is the case when relying on the t-statistic. As a rule of thumb, a normalised difference exceeding 0.25 is likely to lead to sensitive results. As shown in Table 2 all normalised differences are substantially below 0.25.

[10] The records at the Employment Service regard the registration status and not the collection of unemployment benefits.

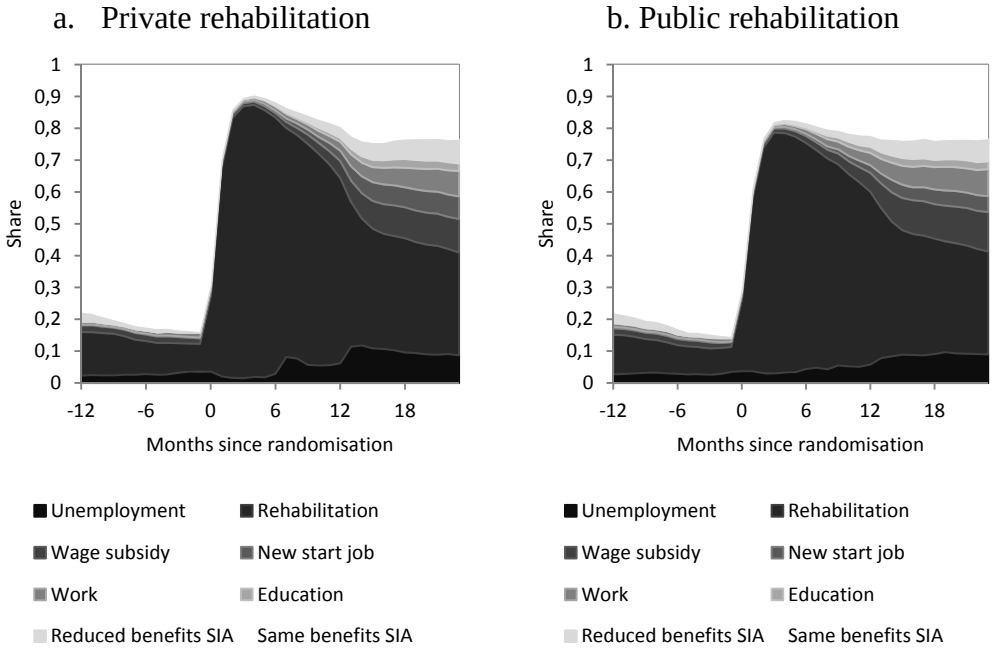
Table 2 Pre-program summary statistics by randomisation status

Variable	Private	Public	Difference	Normalised Difference
Birth year	1966.40	1966.63	-0.233	0.016
	(0.215)	(0.229)	(0.314)	
Women	0.654	0.666	-0.012	0.019
	(0.010)	(0.011)	(0.015)	
Immigrant	0.225	0.236	-0.012	0.019
	(0.009)	(0.010)	(0.013)	
Employed	0.166	0.172	-0.006	0.012
	(0.008)	(0.009)	(0.012)	
Information pathway	0.130	0.116	0.014	0.029
	(0.007)	(0.007)	(0.010)	
Part-time benefits	0.097	0.084	0.012	0.031
	(0.006)	(0.006)	(0.009)	
Type of benefits				
Temporary disability benefits	0.696	0.687	0.009	0.014
	(0.010)	(0.010)	(0.014)	
Sickness benefits	0.304	0.313	-0.009	0.014
	(0.010)	(0.010)	(0.014)	
Diagnosis				
Mental disorder	0.355	0.364	-0.009	0.013
	(0.010)	(0.011)	(0.015)	
Musculoskeletal disease	0.146	0.136	0.010	0.021
	(0.008)	(0.008)	(0.011)	
Other/Unknown/Combination	0.499	0.500	-0.001	0.002
	(0.011)	(0.011)	(0.016)	
Education				
Less than high school	0.230	0.226	0.005	0.008
	(0.009)	(0.009)	(0.013)	
High school	0.552	0.567	-0.014	0.020
	(0.011)	(0.011)	(0.016)	
More than high school	0.217	0.208	0.009	0.016
	(0.009)	(0.009)	(0.013)	
Region				
Stockholm	0.481	0.490	-0.009	0.012
	(0.011)	(0.011)	(0.016)	
Gothenburg	0.263	0.265	-0.002	0.003
	(0.010)	(0.010)	(0.014)	
Västerbotten	0.145	0.138	0.007	0.014
	(0.008	(0.008)	(0.011)	
Dalarna	0.110	0.107	0.003	0.007
	(0.007)	(0.007)	(0.010)	
Number of observations	2,131	1,959		

Standard errors in parentheses.

The explicit goal for the private as well as the public providers was to get the participants into any type of employment or education. A positive outcome of rehabilitation is therefore defined as being in subsidised employment with a wage subsidy for disabled workers or a new start job subsidy, being in unsubsidised employment or being in regular education or occupational training, i.e. the third through the sixth state. These four states of activity will constitute our main outcome measure, which we will refer to simply as ‘employment’.

Figure 3 Types of activity per month since randomisation



We follow the activities of the participants from one year before randomisation until two years after randomisation. Figure 3 shows the average share of individuals in each type of activity per month since randomisation, for individuals randomised to private and public rehabilitation. Some individuals were registered at the Employment Service, in particular in rehabilitation, even before participating in the experiment, but the share was equal across the two types of provider. Immediately after randomisation, the share of individuals participating in rehabilitation increased sharply in both groups. Twelve months later, the share in rehabilitation decreases again and other types of activity gain importance. In particular, a substantial fraction of individuals transfer to employment, i.e., unsubsidised employment, education and subsidised employments. This indicates that rehabilitation in general was successful in making participants return to the labour market. The difference in outcomes between individuals randomised to private and public rehabilitation will be formally analysed in the results section.

6 Empirical strategy

The randomised field experiment allows for a simple estimation strategy to study the causal effect of private rehabilitation. The main outcome variable is ‘employment’, which is defined as being in unsubsidised or subsidised employment, regular education or occupational training. In the first part of the analysis, the outcome is the average

employment rate during the second year since randomisation i.e., when rehabilitation is supposed to have ended. In the second part of the analysis, we study the development of labour market outcomes over time per month since randomisation.

Our interest is to estimate the effect on employment of receiving vocational rehabilitation by private providers instead of public providers. However, around 20 per cent of the individuals randomised to private providers chose to receive rehabilitation by the public. These individuals might systematically differ from those who chose to comply with the random assignment with respect to individual characteristics that can affect labour market outcomes. If this is the case, the comparison of average differences in outcomes between individuals who received rehabilitation by private and public providers is flawed.

Still, we begin by studying the results of such an analysis by estimating the following OLS model:

$$Y_{di} = \delta Private_i + \sum_{m=12}^{23} \lambda_m Month_m + X_i\beta + \varepsilon_{di} \quad (3)$$

where Y_{di} indicates if individual i has acquired employment at day $d = \{366, \dots, 730\}$ after randomisation. The set of month dummies $Month_m$ is included to capture the average effect per month since randomisation. The matrix X contains the pre-treatment individual covariates presented in Table 2 and a set of indicator variables for the month of randomisation as presented in Figure 2. The indicator variable $Private$ takes the value 1 if the individual received rehabilitation by a private provider. The coefficient of interest is δ which measures the average outcome difference during the second year after randomisation between those who received rehabilitation by private and public providers. Since the participants are observed every day, standard errors are clustered at the individual level.

If receiving private rehabilitation is endogenous to individual characteristics that affect labour market outcomes, the estimation of equation (3) yields a biased effect of private rehabilitation. Comparing differences in outcomes between individuals who were randomised to private and public providers would, on the other hand, reflect the causal effect of being offered the opportunity to receive rehabilitation by private providers. This effect is of direct policy interest since private rehabilitation would likely

be voluntary if implemented in a large scale and non-compliance would be inevitable. We estimate this intention-to-treat effect by the following reduced form model:

$$Y_{di} = \pi Z_i + X_i\beta + \sum_{\mathrm{m}=12}^{23} \lambda_m Month_m + \varepsilon_{di} \qquad (4)$$

where Z is an indicator variable for being randomised to private rehabilitation and the parameter π is the estimated intention-to-treat effect.

We can also estimate the causal effect of actually receiving private rehabilitation by using the initial random assignment as an instrument for private rehabilitation. Since individuals randomised to public providers could not choose private rehabilitation we have one-sided non-compliance. The instrumental variable estimate can therefore be interpreted as an average treatment-on-the-treated effect rather than a local average treatment effect, which would have been the case if we had two-sided non-compliance (Imbens and Angrist 1994). We estimate the causal effect of private rehabilitation by the reduced form model represented by equation (4) and the following first stage equation:

$$Private_i = \theta Z_i + \sum_{m=12}^{23} \lambda_m Month_m + X_i\beta + \varepsilon_{di} \qquad (5)$$

The instrumental variable estimate is obtained by dividing π in the second stage regression by θ from the reduced form regression. The first stage regression, represented by equation (5), is interesting in itself since it reveals which individual characteristics affect the probability of choosing public rehabilitation even if randomised to private rehabilitation. Comparing the flawed OLS estimate from equation (3) and the IV-estimate also highlights the importance of utilising the experimental variation for drawing conclusions about privately provided rehabilitation.

In order to capture the development over time, the second part of the analysis estimates the causal effect of private rehabilitation per month since randomisation. In addition to the outcome in terms of employment, we also estimate separate effects for the different types of activities included in the employment variable, namely unsubsidised work, education, new start job and wage subsidy for disabled workers. This analysis is based on the following equation:

$$Y_{kdi} = \sum_{m=0}^{23} \delta_{km} Month_m \times Private_i + \sum_{\mathrm{m}=0}^{23} \lambda_{km} Month_m + X_i\beta + \varepsilon_{di} \qquad (6)$$

where Y_{kdi} indicates if individual i has achieved outcome k at day $d = \{1, \dots, 730\}$ after the day of randomisation. The variables of interest are the interactions between the indicator for month since randomisation $Month_m$ and the variable indicating whether the individual received rehabilitation by private providers, $Private$. The coefficient δ_{km} measures the differences in outcomes between individuals receiving private and public rehabilitation at month $m = \{0, \dots, 23\}$ after the day of randomisation. Since $Private$ is potentially endogenous we instrument all interactions between $Private$ and the month dummies with the corresponding interactions between month dummies and the initial random assignment.

7 Results

Table 3 presents the main results of the effect of private rehabilitation. Column 1 presents the OLS estimate obtained from equation (3), which suggests that the probability of acquiring employment was 3.1 percentage points lower for individuals who received rehabilitation by a private provider. As discussed in Section 6, however, this is not a causal effect since receiving private rehabilitation is not randomly assigned. Column 2 presents the causal effect of being offered private rehabilitation, obtained from the reduced form equation (4). The estimates show that there is no significant difference in acquiring employment during the second year since randomisation between individuals randomised to private and public rehabilitation. Thus, the causal effect of being offered the opportunity to receive rehabilitation by private providers, i.e. the intention-to-treat effect, is zero. Since the statistical significance level of the treatment effect from this reduced form equation is equal to the significance level of the IV-estimate, also the causal effect of actually receiving rehabilitation by private providers must be zero. This is confirmed by the insignificant IV-estimate reported in Column 4 of Table 3.

Table 3 Employment effects of private rehabilitation

Variables	(1) OLS	(2) Reduced form	(3) First stage	(4) IV
Private rehabilitation	-0.031***			-0.008
	(0.011)			(0.014)
Randomisation to private		-0.007	0.813***	
		(0.011)	(0.008)	
Birth year	0.003***	0.003***	-0.000	0.003***
	(0.001)	(0.001)	(0.000)	(0.001)
Woman	-0.012	-0.013	0.045***	-0.013
	(0.012)	(0.012)	(0.010)	(0.012)
Immigrant	-0.058***	-0.058***	0.011	-0.058***
	(0.013)	(0.013)	(0.011)	(0.013)
Employed	0.028*	0.028*	0.028**	0.028*
	(0.016)	(0.016)	(0.011)	(0.016)
Information pathway	-0.078***	-0.080***	0.060***	-0.079***
	(0.017)	(0.017)	(0.012)	(0.017)
Part-time benefits	0.146***	0.146***	-0.022	0.146***
	(0.022)	(0.022)	(0.016)	(0.022)
Sickness benefits	0.043***	0.043***	0.011	0.043***
	(0.013)	(0.013)	(0.010)	(0.013)
Musculoskeletal disease	0.017	0.016	-0.000	0.016
	(0.019)	(0.019)	(0.014)	(0.019)
Other diagnosis	-0.005	-0.005	-0.001	-0.005
	(0.013)	(0.013)	(0.010)	(0.013)
High school	0.024*	0.023*	0.032***	0.023*
	(0.014)	(0.014)	(0.012)	(0.014)
College	0.029*	0.028	0.035**	0.028
	(0.017)	(0.017)	(0.014)	(0.017)
Gothenburg	0.005	0.003	0.049***	0.004
	(0.014)	(0.014)	(0.010)	(0.014)
Dalarna	-0.030	-0.031	0.014	-0.031
	(0.019)	(0.019)	(0.015)	(0.019)
Västerbotten	-0.035**	-0.034**	-0.022	-0.034**
	(0.017)	(0.017)	(0.015)	(0.017)
Constant	-5.739***	-5.770***	0.374	-5.766***
	(1.148)	(1.149)	(0.946)	(1.149)
Observations	1,486,472	1,486,472	1,486,472	1,486,472
R-squared	0.043	0.042	0.687	0.042

Standard errors clustered at the individual level in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

The results from the first stage regression, presented in Column 3 of Table 3, show what characterises the individuals who complied with the assignment to a private provider. Since the majority of the participants complied with the randomisation it is not surprising that the instrument is highly significant. We also see that certain types of individual characteristics are related to the propensity of accepting private rehabilitation. Based on the estimated coefficients we see that women, individuals with an underlying employment and individuals who entered the experiment through the information pathway were more likely to comply with the random assignment. Having a

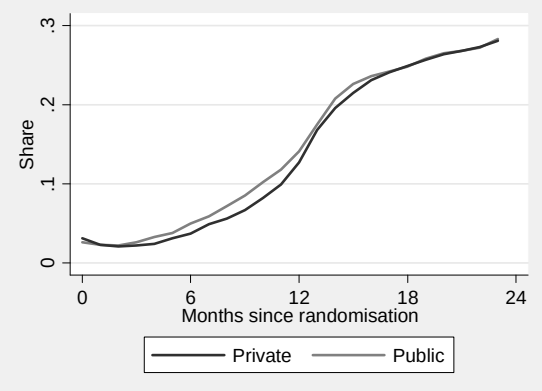
higher education or being in the Gothenburg region also increased the probability of accepting private rehabilitation.

It is not straightforward to relate the results from the first stage regression to the result obtained by the biased OLS estimate of privatisation. The OLS estimate yielded a negative effect of privatisation despite the fact that, for example, relatively more highly educated individuals chose to receive rehabilitation by private providers. However, there are no a priori reasons to expect that individuals with certain types of characteristics will benefit more from rehabilitation than others. One explanation pointed out by the Social Insurance Agency (2010) is that a main reason for denying rehabilitation by private providers was that the individual already had a plan for rehabilitation at the Employment Service. If these individuals were closer to achieving employment from the start this might explain why the OLS estimate is negative while the IV estimate is zero.

Next, we consider the monthly development of the difference in outcomes between private and public rehabilitation. We begin by analysing total employment, including unsubsidised or subsidised employment, regular education and occupational training. Results are reported in Figure 4. Panel (a) shows the monthly development of raw averages of employment, separately for individuals randomised to private and public rehabilitation. Panel (b) shows the monthly differences in employment, based on the IV-estimates from equation (6), including 95 per cent confidence intervals of the estimated effects. As shown in the figure, the employment rate of individuals receiving public rehabilitation was slightly higher during the first year, when rehabilitation was supposed to take place. This implies that private rehabilitation on average lasted for a longer time period. Most important, however, is that one year after randomisation, when the individuals were supposed to have finished their rehabilitation, there is no significant difference between private and public rehabilitation. By the end of the observation period, the employment rate of individuals receiving private and public rehabilitation is essentially identical.

Figure 4 Employment rates and IV-estimates of the difference in employment between individuals randomised to private or public rehabilitation, per month since randomisation

a. Employment rates



b. Estimated difference, employment

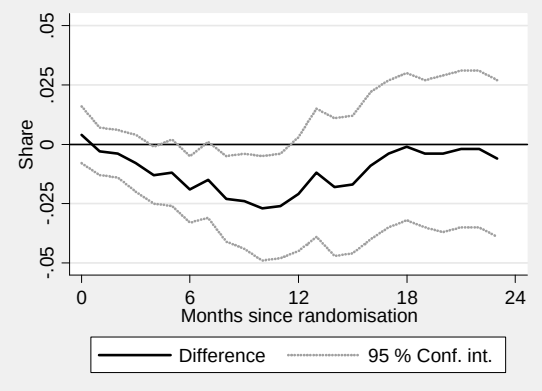


Figure 5 presents the effects of private rehabilitation for the separate types of activity included in the total employment measure. Panels (a) and (b) present the result for acquiring unsubsidised employment. From the seventh month after randomisation significantly fewer of the participants in private rehabilitation acquired unsubsidised employment, but the difference disappears after the twelfth month. This might also be explained by private rehabilitation lasting for a longer time period. Panels (c) and (d) show that there is no significant effect of private rehabilitation on the probability of participating in education.

Panels (e) and (f) present the results for employment with a new start job subsidy. From about twelve months after randomisation, there was a large and significant difference between private and public rehabilitation in the share of individuals having a new start job. During this period, the probability of being employed with a new start job subsidy was almost two percentage points higher for participants in private rehabilitation. In terms of per cent, this is a large effect since the fraction of individuals rehabilitated by public providers who received a new start job is five per cent. Panels (g) and (h) show the results for employment with a wage subsidy for disabled workers. The public provider was more successful in getting participants into employments with a wage subsidy than private providers. The difference almost fully counteracts the larger extent to which the private providers managed to acquire employment with a new start

job subsidy, although insignificant.[11] The differences in the types of employment subsidy private and public providers used are consistent with the hypothesis that wage subsidies for disabled workers were more easily accessible for the public provider while new start job subsidies were easier to obtain for private providers, as discussed in Section 3.

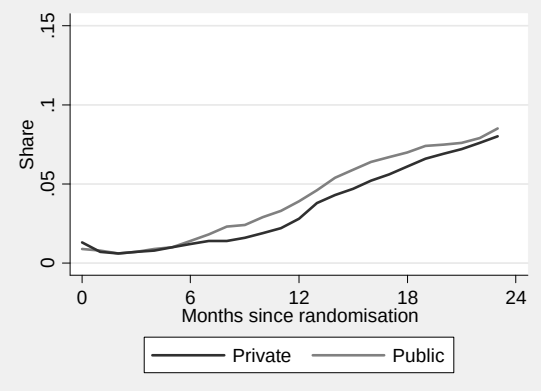
Based on the results from the above analysis we conclude that there is no effect on employment of private compared to public rehabilitation. The estimated coefficient is insignificant and very close to zero. Studying the development over time by month since randomisation, we show that the employment rates for the two types of providers converge to exactly the same level following rehabilitation. When looking at separate types of activities we find that private providers managed to acquire employment with a new start job subsidy for their clients to a larger extent than the public provider. The public provider, on the other hand, seems to have acquired employment with a wage subsidy for disabled workers to a larger extent. This might be due to wage subsidies being a more established type of subsidy at the Employment Service whereas new start job subsidies were more accessible for private providers.

A final question is whether private and public providers had access to different employer networks which may have resulted in differences in match quality between the worker and the firm. One might worry that jobs provided by one type of provider lasted for a longer period. If a small number of individuals received stable jobs in one type of organisation type but a large number of individuals received jobs for a short period in the other type of organisation, such differences are not detected in the estimated treatment effects. To address this issue we have estimated survival rates for the first employment spell obtained, separately for individuals randomised to public and private providers. Results show very small and insignificant differences in survival rates.

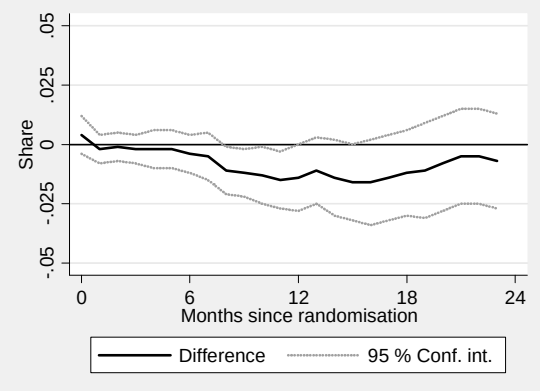
[11] We have also estimated heterogeneous effects with respect to the available individual characteristics but find no significant results. We also find no differences in the probability of being unregistered at the Employment Service while having reduced the benefits from the Social Insurance Agency, which could potentially be seen as a positive outcome.

Figure 5 Raw averages in outcomes and IV estimates of the effect of private rehabilitation, per month since randomisation

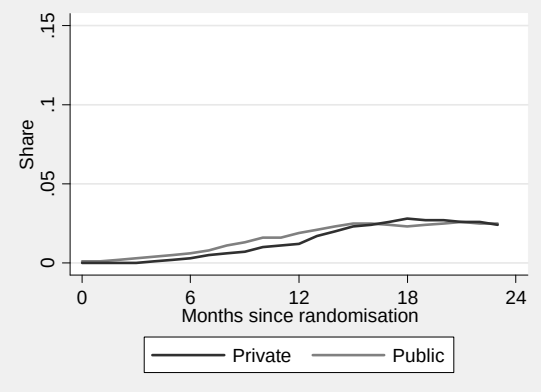
a. Unsubsidised employment



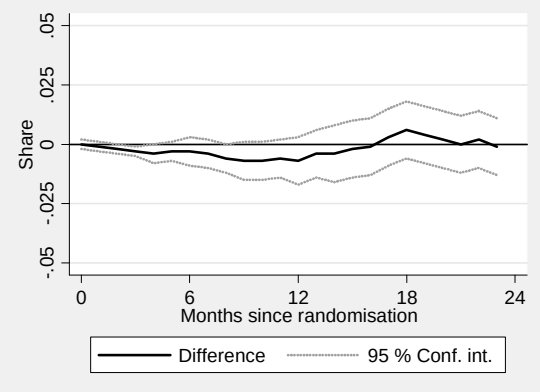
b. Estimated difference, unsubsidised employment



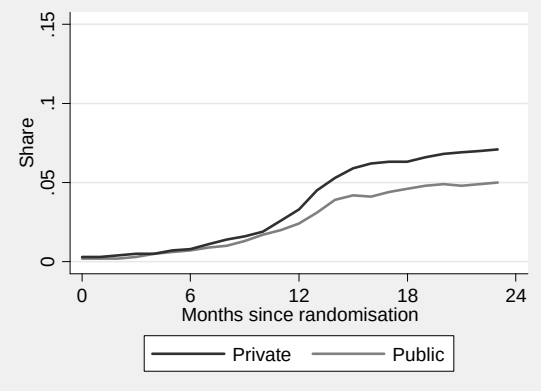
c. Education



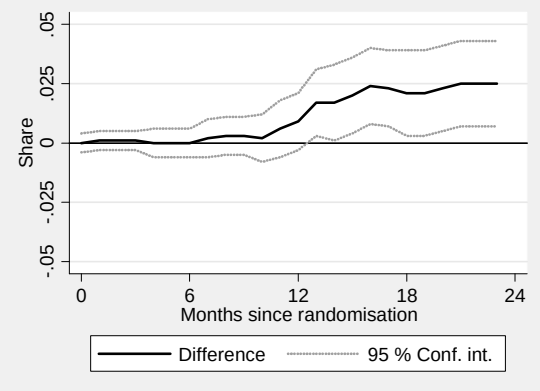
d. Estimated differences, education



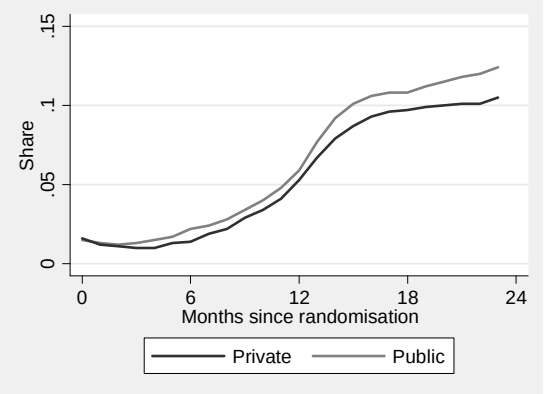
e. New start job subsidy



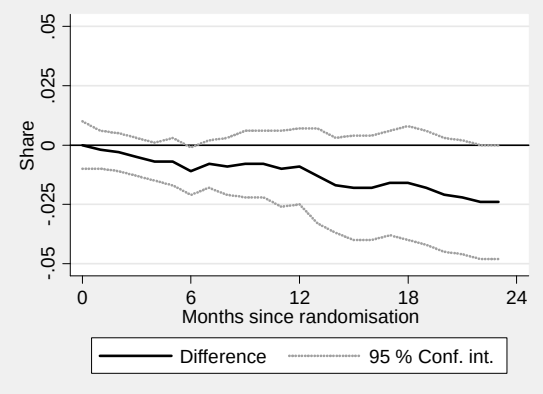
f. Estimated differences, new start job



g. Wage subsidy for disabled workers



h. Estimated differences, wage subsidy



8 Conclusion

The merit of privatisation is an unresolved question and the empirical evidence is limited. A randomised field experiment gave us the unusual opportunity to assess the effect of privately provided vocational rehabilitation on individual labour market outcomes. The results show that there is no difference in the probability of acquiring employment following rehabilitation for individuals receiving private or public rehabilitation. The estimated effect is insignificant and very close to zero. Although a substantial share of the participants returned to work, the exit rate to employment followed a remarkably similar development over time for private and public providers. Rough calculations show that also the average cost of rehabilitation was essentially equal for the two types of actors. This suggests that there are no large efficiency gains from privatising vocational rehabilitation.

The difference we find regards the types of employment subsidies used between private and public providers. Private providers acquired employment with a new start job subsidy, for which the subsidy is based on a certain period of absence from the labour market, to a larger extent. Public providers, on the other hand, more often acquired employment with a wage subsidy for disabled workers, which is based on the degree of reduced work capacity. This difference could be expected since the assessment of work capacity was performed by the Employment Service and wage subsidies therefore might have been easier accessible for the public provider. Since the average size of the subsidy is similar across the two types of subsidies and the duration of employment is the same during the follow-up period in this paper, however, this difference has no financial implications in the short run. Future research will show if the type of subsidy affects labour market prospects in the long run.

How can the absence of differences between private and public providers be interpreted? Although a large share of participants from both private and public providers returned to employment, this paper cannot evaluate whether vocational rehabilitation was effective in general. One might argue that the lack of differences between private and public providers speaks in favour of private providers, since they had less initial experience with the target group and no access to the clients' case files. On the other hand, because of the importance of reputation building and the prospects of vocational rehabilitation being outsourced on a permanent basis, the private providers might have put down additional effort during the experimental period than what would be possible in the long run. This would counteract the potential positive effect of increased experience and would lead to an overestimation of the effect of privatisation.

It is important to emphasise that a complete welfare analysis of privatisation should include the potential welfare gain from getting the opportunity to choose among rehabilitation providers. The study by Malmö University (2010) shows that the opportunity to choose among the private providers was appreciated, although some participants found the choice to be difficult. An analysis of the value of choice is, however, beyond the scope of this paper. Given that the experiment with privatisation of vocational rehabilitation was motivated by efficiency considerations rather than the value of consumer choice, however, we think that the focus on relative performance of private and public providers still is motivated.

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