

DISCUSSION PAPER SERIES

IZA DP No. 13772

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and Support Services for Disability
Benefits Recipients with Severe Mental
Illnesses**

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ABSTRACT

Long-Term Effects of Individual Placement and Support Services for Disability Benefits Recipients with Severe Mental Illnesses

This paper examines a broad set of short- and long-term impacts of Individual Placement and Support (IPS) for disability benefit recipients with severe mental disabilities. IPS is a specific intervention that first aims to place an individual in employment and subsequently trains the worker on the job. We compare the outcomes for IPS-recipients to a control group that received traditional vocational rehabilitation (TVR) services. We use administrative data to apply difference-in-difference estimation on a matched sample of 513 IPS recipients and almost 23,000 TVR-recipients in the Netherlands. Our results show that from six months after the start of the treatment onwards employment probabilities of IPS participants significantly outperform those of TVR participants. The higher probability to be in competitive employment does not come at the expense of fewer work in sheltered employment or trial periods. Nor do they come at the expense of shorter working hours or lower wages. The share of people on disability benefits declines equally in both group for quite some time after the start of the intervention but there is some indication that the benefit dependency in the long run declines faster for IPS recipients. Effects regarding medical costs are not statistically significant.

JEL Classification: C21, H51, H55, I38, J22, J24

Keywords: program evaluation, treatment effects, vocational rehabilitation, individual placement and support, temporary disability, labor supply, social insurance

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1. Introduction

In many western societies, rising numbers of disability benefit recipients are a cause of social, political and economic concern, especially since they go hand in hand with a growing employment gap between disabled persons and the rest of the population (OECD 2010, Van der Zwan and De Beer 2019). As a result, measures that reduce benefit dependency of (partly) disabled workers and increase their employment rates are highly sought after. Not only do people out of work abstain from contributing to economic output, their personal well-being may also suffer from joblessness. Employment is considered a basic human need in most industrialized societies and is widely identified by people with disabilities themselves as indispensable to their recovery (Fioritti et al., 2014). For that reason, employment is one of the dimensions on which the UN Convention on the Rights of Persons with Disabilities, which was introduced in 2008, states that persons with disabilities should not encounter more barriers than other people.

Even though the effectiveness of active labor market policies (ALMP) has been studied widely in the economic literature (see Card et al. 2015), the focus of this literature is mostly on the return-to-work for unemployed workers. The effects of ALMP for (partly) disabled people has so far received relatively little attention in the economic literature. Fröhlich et al. (2004) were the first to study outcomes of active labour market interventions for people with disabilities. They found no positive effects of vocational rehabilitation programs in Sweden, nor did Aakvik et al. (2005) who studied vocational rehabilitation in Norway. Years later, Dean et al. (2014 and 2015), Schimmel Hyde et al. (2014) and Campolieti et al. (2014), did find positive effects of vocational rehabilitation services in the US and Canada.¹ Markussen and Roed (2014) also found positive effects for the Norwegian case, but their findings suggest that a strategy focusing on rapid placement in the regular labor market is superior to vocational training or sheltered employment. It is this last study that our study relates to mostly; we also focus on the difference between 'first place then train' services and traditional vocational rehabilitation services.

The findings of Markussen and Roed (2014) are in accordance with abundant results in the scientific psychiatric literature. Research published in this area has established that IPS, a specific strategy that first places and then trains workers, has superior labor market outcomes over vocational rehabilitation programs for people with severe mental illness (SMI). These results were obtained from

¹ In addition, a few paper study the effect of ALMP for sicklisted workers: Fröhlich et al. (2004), Markussen et al. (2018), Holm et al. (2017), Kools and Koning (2019), Rehwald et al. (2016).

various randomized controlled trials in multiple countries² in which participants were randomly assigned to the vocational training group or the first-place-then-train IPS-group. In these studies, these groups are followed on average 18 months³ after the start of the treatment. In most cases the probability of having obtained competitive employment in the first-place-then-train groups was more than double that of the vocational training group.

In contrast to these studies in the psychiatric literature, which use rather small-scale randomized controlled trials to identify the effects of IPS, our paper describes the much larger-scale actual nationwide implementation of IPS interventions for Dutch disability benefit recipients in the period 2012-2018.⁴ Instead of survey data, which are typically used in the aforementioned trials, we use a rich set of administrative data on various outcome measures. This allows us to follow individuals continuously in the months and years after the start of the active labor market program. We broaden our analysis to other outcomes than employment effects only. Specifically, we focus on the employment rates, the hours worked, and the wages obtained in the months and years following the start of IPS, together with medical expenses and benefits reciprocity.⁵ Like other existing studies, we compare the outcomes of IPS with those of traditional vocational rehabilitation program.

Our empirical strategy is to apply a difference-in-difference approach combined with non-parametric matching. We use administrative data for the Netherlands that include employment related information on all employees, in combination with administrative data on disability benefit reciprocity, health insurance records and the use of medication. We start from the entire universe of disability benefit recipients who started an IPS-trajectory in the period 2012-2018 financed by the Netherlands Social Insurance Institute (UWV). We match a sample of disability benefit recipients that received traditional vocational rehabilitation services (TVR) and were not being treated by a mental

² E.g. Michon et al. (2014) for the Netherlands, Latimer et al. (2006) for Canada; Wong et al. (2004) for Hong Kong; Fioritti et al. (2014) for the UK, Italy, Netherlands, Spain; Bejerholm et al. (2015) for Sweden, Hoffmann et al. (2012) for Switzerland, and many studies for the US, where IPS originates from, and was first studied by Drake et al. 1996. Seven meta analyses have been carried out: Crowther et al. (2001), Twamley et al. (2003), Campbell et al. (2011), Kinoshita et al. (2013), Modini et al. (2016), Metcalfe et al. (2018), Frederick and Van der Weele (2019).

³ Ranging from 6 to 30 months, depending on the study.

⁴ To our knowledge,

⁵ Some psychiatric papers also study these type of outcomes, but very few find any statistically significant effects on quality of life (Frederick and Van der Weele, 2019; Nøkleby et al. 2017, Kinoshita et al., 2013), global functioning (Frederick and Van der Weele 2019, Kinoshita et al. 2013) or mental health (Frederick and Van der Weele 2019, Nøkleby et al. 2017, Kinoshita et al. 2013). Davis et al. (2012) and Oshima et al. (2014), however, did find that people who received IPS not only worked more often, but also worked longer hours, than people who received traditional vocational rehabilitation.

health institute that offers IPS. The latter requirement filters out potential selection into IPS that might occur within mental health institutes. Out of the potential control group, cases are selected that are exact matches on a rich set of observable characteristics, including their mental health condition. This strategy results in 513 persons in the IPS-group and almost 23,000 persons in the TVR-group. We apply difference-in-difference estimation in order to estimate the effect of IPS over TVR during the 36 months following the start of the treatment.

The treatment that we focus on is a specific type of first-place-then-train program called IPS (Individual Placement and Support). It is the same type of program that has been studied in psychiatric studies. IPS is a very intensive form of job search assistance and job coaching that is specifically aimed at people with severe mental illnesses, but has proven to be more effective than TVR for other groups of disabled job seekers as well, such as people with opioid use disorders (Lones et al. 2017), people with spinal cord injuries (Ottomanelli et al. 2014) and veterans with post-traumatic stress disorders (Davis et al. 2012).

Our results indicate that IPS is indeed more effective in terms of employment rates than TVR. Our estimates show a higher probability to find work in the competitive labour market, which does not come at the expense of the probability to work in the sheltered sector: the effects on the overall probability to work, including both sheltered employment and unpaid trial periods are even stronger than the effects on working in competitive employment. The higher employment probabilities do not come at the expense of shorter working hours or lower hourly wages either. The effect on benefit dependency is not very strong, but the estimated coefficients become more and more negative from two years after the start of the almp onwards. This is an indication that IPS might also lead to less benefit dependency of people with severe mental illnesses in the long run. Regarding medical costs, the estimated coefficients are negative until 16 months after the start of the treatment, but not statistically significant.

The paper is organized as follows. Section 2 presents the institutional setting of disability insurance, health insurance and active labour market programs for people with mental illnesses in the Netherlands. Section 3 shows how we constructed the data from various administrative data sources, displays descriptive statistics and presents our empirical strategy. Section 4 discusses the results of our analyses, and Section 5 presents sensitivity analyses. Section 6 concludes.

2. Institutional setting

In the Netherlands, individuals with mental health problems can be eligible for disability benefits, which are paid out by the Social Security Institute (UWV). Young individuals without sufficient working history may apply for the “Young handicapped scheme” (Wajong), and people who have incurred their disability while active on the labour market may apply for the employee benefits disability scheme (WIA).⁶ In contrast to most other countries, the Dutch disability system does not distinguish between social and occupational risks, so a (severe) mental illness can be the reason for entering both regimes. Also in contrast to many other countries, the benefit regimes include financial incentives to work (more). As a result, benefit levels may increase after a benefit recipient starts to work.

The Dutch Social Security Institute (UWV) not only pays out benefits, but also organizes and finances active labour market programs for disability benefit recipients. Specifically for people with severe mental illnesses, these active labour market programs are carried out by public mental health institutes (GGZ). These people are already under medical treatment for their mental health issues at these mental health institutes, before they start an active labour market program there. At some point during their medical treatment, a mental health institute signals that a person is willing to work. At that point, the mental health institute contacts the Social Security Institute to ask permission to start an active labour market program with this person, financed by the Social Security Institute.

Until 2012 all labour market programs offered to disability benefit recipients with severe mental illnesses consisted of traditional vocational rehabilitation services (TVR). Since then, gradually mental health institutes started offering Individual Placement and Support (IPS). The differences between TVR and IPS are substantial. IPS entails a strictly regulated methodology, with eight key principles that need to be followed: (1) Zero-exclusion: every person with severe mental illness who wants to work is eligible for IPS. (2) Employment services are integrated with mental health treatment services. (3) Employment should be in regular jobs. (4) Personalized benefits counseling is provided. (5) First-place-then-train: the job search starts soon after a person expresses interest in working. (6) Employment specialists systematically develop relationships with employers based upon their client's preferences. (7) Job support is continuous and open-ended. (8) Client preferences are honored, e.g. regarding the preferred occupation. The difference between the IPS and TVR is often summarized as

⁶ Not all people with severe mental illnesses fall under these regimes: (1) Before (partly) disabled people are eligible to enter the WIA, their employer is responsible for the first two years of sick leave. (2) People who have incurred their disability while of working age, but who do not satisfy the insurance criteria (e.g. because they did not work long enough) depend on social assistance, which is carried out by the municipalities. This paper focusses on people with severe mental illnesses who receive disability benefits from UWV.

an integrated place-then-train model as opposed to a separated train-then-place model, since these are the key differences. But in fact the differences are broader. Van Weeghel et al. (2020) describe the evolution of IPS in the Netherlands in past, present and future.

It is important to note that the intention to first place a jobseeker in work and then train him on the job does not mean that everyone who starts an IPS-trajectory immediately starts in a job. First, intensive coaching takes place. At the start of the IPS trajectory, an IPS-coach investigates the preferences, skills, strengths and weaknesses of the client. Together the coach and the jobseeker determine realistic job prospects. The IPS-coach then uses his network of local employers to look for an organization that wants to give the person with the mental illness the opportunity to work. This can start with a two-months trial period during which no wages are paid (called a *proefplaatsing*).⁷ Not everyone who starts an IPS-trajectory actually makes it into the labour market. For some, their expectations are so unrealistic that they drop out once they realize what their realistic options are. For others, finding an employer willing to hire the worker is the obstruction.

Not every mental health institute can offer IPS. If an institute wants to offer IPS, it needs a certificate.⁸ All mental health institutes that start offering IPS need to apply for this certificate and are revisited on a regular basis. Only coaches with an IPS-certificate are allowed to offer IPS services within these institutes. Out of the several hundreds of institutes only 20 offered IPS more than incidentally in the period covered by our analysis. Although people are in principle free to choose their mental health care provider, it seems unlikely that people self-select into IPS by choosing a mental health institute specifically on the bases of their IPS-certificate. At least during our observation period, IPS was not a very well-known phenomenon. Even though IPS becomes more well-known among experts in the field, public information regarding the services of mental health institutes – which is provided on the website www.kiesbeter.nl – still does not contain any information on the availability of IPS programs. Instead, physical distance appears to be the core argument for choosing a mental health institute.⁹ This is

⁷ A prerequisite for a *proefplaatsing* is that the employer has the intention to offer the worker an employment contract of at least six months afterwards. During the *proefplaatsing* the worker continues to receive disability benefits.

⁸ In order to obtain such a certificate, professionals from the mental health institute first follow a training at the Dutch centre of expertise on mental illnesses (Phenos). Subsequently, the mental health organisation needs to perform an IPS fidelity test in which they show that they adhere to the key principles of the IPS-method.

⁹ What also plays a role is the health insurance. The Netherlands has a universal healthcare system, which is managed by the government and carried out by 11 private health insurance companies. It is mandatory for all Dutch inhabitants to contract one of those insurers. Mental health care is part of the basic insurance, so everyone is insured for their mental health problems. In principle, people are free to choose the mental health institute they prefer. But mental health providers are not contracted by all insurers. People do not

illustrated by the fact that not a single mentally disabled benefit recipient living in one of the two areas¹⁰ in which no mental health institute has obtained an IPS-certificate actually obtained IPS.

3. Data and empirical strategy

3.1 Data

This paper uses administrative data from Statistics Netherlands regarding disability benefit recipients, supplemented with information from the Netherlands Social Security Institute (UWV) on the type of active labour market program people received in the period 2012-2018.¹¹ Together, these data provide information about the amount and type of benefits received on a monthly basis, the involvement in active labour market programs, and on the personal characteristics such as age, sex, household composition, ethnic background and region of living.

In addition, we use administrative information about the use of medication and health insurance costs for psychiatric assistance (and other types of declarations). These data are available at Statistics Netherlands, which receives this information from health insurance companies.¹² On their invoice to health insurance companies, health care providers need to indicate the diagnosis-treatment combination (DBC). The health insurance records at Statistics Netherlands contain this information which allows us to identify the persons that received psychiatric assistance. In addition, we have administrative information on the medication prescribed, which provides us insight into the use of medication related to mental illnesses. In the Netherlands, it is not registered who suffers from an SMI. According to Delespaul (2013), a person with a severe mental illness is someone with a psychiatric disorder according to the DSM-criteria¹³, who is not free of complaints –even though interchanging periods with and without complaints or varying degrees of complains may occur–, with long-lasting

receive full insurance for the care delivered by non-contracted institutes. In addition, the contract between the health insurance company and the health care provider involves a maximum budget on a yearly basis. Once this maximum is reached, individuals are put on waiting lists. As a result, in practise patients are not fully free in their options to choose the mental health institute.

¹⁰ These two areas are the province of Zeeland and the area around the city Venlo.

¹¹ In our analysis, we only include people who receive disability benefits from the Netherlands Social Security Institute UWV, not those on social assistance (see section 2 for an explanation of the institutional details).

¹² The Netherlands has universal healthcare, and the government requires all adults living or working in the Netherlands to have basic health insurance. The basic health insurance plan covers the basic standard of care like visits to the GP and hospital and includes psychiatric assistance.

¹³ Diagnostic and Statistical Manual of Mental Disorders, the taxonomic and diagnostic tool published by the American Psychiatric Association (APA) and used internationally. Examples of SMI include psychosis, schizophrenia, bipolar disorders, personality disorders and pervasive developmental disorders, but cannot be restricted to specific psychiatric disorders and not everyone with this type of disorder can be classified as having an SMI (Delespaul, 2013).

limitations in their social functioning. This group has continuous probability of fall-backs and continuous risks of emergencies. Delespaul argues that it is hard to determine deterministically from available data who suffers from an SMI, since patients in remission remain patient with an SMI, as long as there is a risk of fall-back. The consensus is that only after a period of several years without fall-backs a person is no longer classified as having an SMI. This implies that we need information on several years of medication use and health insurance declarations in our matching procedure. For the operationalisation of SMI in administrative data files, usually a person is considered to have an SMI in a specific year if one of the next 4 criteria is satisfied: (1) at least one health insurance claim for schizophrenia related treatment in the last three years (i.e. current year and past two years); (2) open and closed longer-lasting health insurance claims for the last three years in a row, for any treatment, excluding diagnostics, indirect time, treatment related to alcohol, addiction, dementia or delirium; (3) an indication for sheltered or supported living, and/or (4) expenses on medicines related to bipolar disorders or psychosis.¹⁴

In order to follow people on the labour market, we use administrative data in which all jobs of all Dutch citizens can be followed over time, added by administrative information on unpaid trial periods. The so-called Social Statistical File (SSB) from Statistics Netherlands includes information on the exact start and end date of jobs, whether these jobs are in competitive or sheltered employment, the hours worked and the wages earned in those jobs. Employment is defined as having positive non-zero wage and number of hours worked in these monthly earnings records. This implies that the individual worked at least one hour of paid employment per month. In these data, we can distinguish between competitive employment and sheltered employment by an indicator in the data that signals whether a worker is employed by a special firm for sheltered employment. Hours worked are recorded per month. Wages are recorded as gross monthly wages, including wage from overtime work and holiday pay, excluding old age pension contributions by the employer. In order to determine hourly wages, we divide the monthly wages by the number of hours worked in that month. Income from self-employment is not taken into account and consequently self-employment is not included in the employment status that we use in this paper.

Information on unpaid trial periods is collected from administrative files from the Netherlands Social Security Institute (UWV). These unpaid trial periods are designed to last for two months. During

¹⁴ These criteria have been developed by the Dutch organisation Vektis in cooperation with mental health care providers, a business intelligence centre for health insurance providers. They use these criteria in order to determine e.g. the number of people with an SMI in the Netherlands.

this period, the worker maintains his disability benefits. The firm has to sign for an intention to offer the worker a paid employment contract at the end of the trial period if the trial period proves to be successful. From the perspective of workers with a severe mental illness, participating in such a trial period may already be perceived as a success. By using this information, we are able to design three employment concepts: (1) competitive employment, (2) paid employment and (3) the broadest category of all employment, including unpaid trial periods.

Since the timeliness of the data sources differs, and we want to follow individuals as long as we can, we follow individuals up to March 2020 for their employment status, until December 2019 for their disability benefit status, and until December 2017 for their medical costs.

3.2 The treatment and control group

Our treatment group consists of the entire universe of disability benefit recipients that received Individual Placement and Support (IPS) services in the period 2012-2018. From the data, we draw a control group of disability benefit recipients that are as similar as possible to the IPS-group, but were exogenously assigned to received vocational rehabilitation services as usual in the same time frame. Exogenous assignment is enforced by restricting the control group to people who received treatment from mental health institutes that do not offer IPS. Whether an individual receives IPS or TVR highly depends on the mental health institute where a person is treated. By selecting only those TVR-recipients who were being treated for their mental health issues by institutes that do not offer IPS, we avoid selection issues into IPS that may occur within the mental health institute. As argued in section 2, it is not very likely that people self-select into IPS by choosing a specific mental health because it offers IPS.¹⁵ Our choice to focus on persons who receive TVR as a control group, and not on persons who receive no active labour market support at all, increases the likelihood that people in the control group actually want to work. For both IPS and control group we selected people who were not in competitive employment in the month before starting their intervention.

In the original data, we have 1,118 people in the IPS-group and 95,499 people who were being treated for their mental health issues by a mental health institute that does not offer IPS, and received traditional vocational rehabilitation services from UWV. This size allows us to apply exact non-parametric matching in order to form a control group of TVR-recipients that is as similar as possible to

¹⁵ In order to test this assumption, we have calculated the correlation between the region of living (based on the first digit of postal code) and individual mental health institute. This correlation is rather strong (Cramér's $V=0.76$).

the IPS-group. Exact matching has the advantage over matching on a propensity score that the persons in the TVR-group have the exact same characteristics as their counterparts in the IPS-group. When using a propensity score, matched pairs have similar scores, but may differ in terms of observed variables of interest, which may introduce a bias in the results. Exact matching forces the TVR- and IPS-group to have the exact same characteristics, but may have the drawback that fewer matches can be made due to a lack of exact matches for every treated (i.e. the common support is smaller). This may introduce a selection bias in itself, since fewer treated are taken into account in the analysis. As a sensitivity check, we have also estimated our model using propensity score matching methods (see section 5).

We use the four SMI-criteria that were described in section 3.1 as matching criteria in our matching procedure. In addition, we match on gender (2 groups), age (4 groups), region (2 groups), number of months worked over the last 12 months before the start of the program (2 groups), number of months of disability benefits over the last 12 and 36 months (2 groups), medical costs (4 groups), mental health care costs in the last 12 months before start of the intervention (3 groups) and size of the mental health institute (3 groups). A person can serve as a match for an IPS-recipient if his TVR-trajectory started within two calendar years from the starting date of the IPS-trajectory of the person he is matched to (see section 5 for a sensitivity analysis on this).

Our matching strategy results in a TVR-group of 22,856 controls for 513 persons who received IPS, i.e. for nearly half of the IPS-group at least one control was found. On average, we have 45 controls per treated, with a minimum of 1 and a maximum of 2,647 controls per treated. A person in the TVR-group can serve as a control for multiple treated. In the analysis, every person in the TVR-group is weighted by the inverse of the number of controls for the specific treated he or she is matched to.

3.3 Descriptive statistics

Characteristics of pre and post matching samples

Table 1 shows the characteristics of the pre- and post-matching samples. The matched IPS sample has more or less the same characteristics as the total IPS-group, with a few differences: (1) the matched

sample scores lower on all¹⁶ SMI-criteria compared to the total IPS-group and (2) the average total medical and mental health care costs are somewhat lower in the matched IPS-sample than in the total IPS-group. In addition, the share of ethnic minorities is somewhat smaller in the matched sample, compared to the total IPS-group, the share of people in de Randstad is smaller and the share of people in the Young Handicapped scheme is somewhat bigger. Our analysis is therefore based on a relatively favorable subgroup of people with severe mental illnesses.

Table 1 Characteristics of IPS and TVR groups, pre and post matching

	Pre-matching		Post-matching	
	TVR	IPS	TVR (weighted)	IPS
Men	0.58	0.67	0.65	0.65
Avg. age at start treatment	33.9	35.7	34.9	35.1
Ethnic background				
- native Dutch	0.74	0.70	0.73	0.74
- western immigrant	0.08	0.11	0.12	0.10
- non-western immigrant	0.18	0.20	0.15	0.16
Region				
- Randstad (agglomeration of big cities)	0.42	0.54	0.44	0.44
- Other	0.58	0.46	0.56	0.56
Type of benefit				
- Young handicapped (Wajong)	0.61	0.55	0.60	0.60
- Employee disability benefit (WIA)	0.39	0.45	0.40	0.40
Type of household				
- single with or without children	0.38	0.67	0.60	0.66
- couple with or without children	0.34	0.17	0.23	0.18
- other	0.28	0.15	0.17	0.16
SMI-criteria:				
- schizophrenia treatment in one of last 3 years	0.01	0.25	0.09	0.09
- Mental health care costs for last 3 years	0.05	0.57	0.46	0.46
- Indication for sheltered housing in last year	0.04	0.14	0.09	0.09
- Using medicine for bipolar decease or psychosis in last year	0.08	0.71	0.59	0.59
On disability benefits 12 months before start almp	0.79	0.90	0.91	0.91
# months employed in last 12 months before start almp	1.1	0.5	0.2	0.2
# months on disability benefits in last 12 months before start almp	10.5	11.3	11.6	11.6
# months on disability benefits in last 36 months before start almp	26.0	30.7	32.3	32.5
Avg. total medical costs in 12 months before start almp (in Euros)	3,538	13,515	11,142	11,201
Avg. mental health care costs in 12 months before almp (in Euros)	1,091	11,153	8,698	9,230
Number of observations	95,499	1,118	22,853	513

¹⁶ In particular the share of persons with schizophrenia is smaller in the matched sample than in the total IPS group. This is the result of the fact that very few persons in the pre-matching TVR group have this type of disorder.

Descriptive outcomes for the matched IPS and TVR samples – before and after treatment

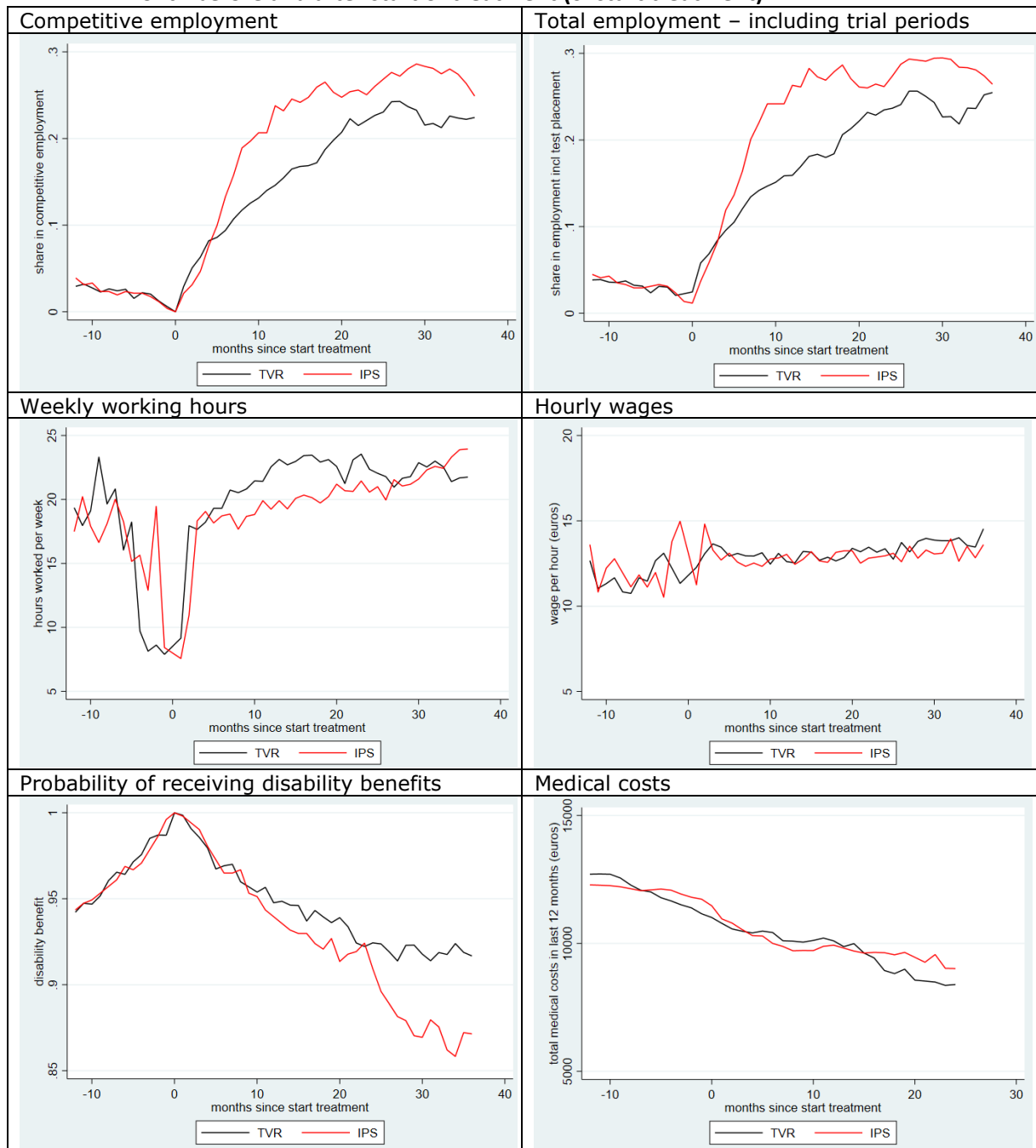
The outcome variables are presented graphically in Figure 1. The upper left corner of Figure 1 shows that the pre-treatment competitive employment rate is equally low in the IPS-group and matched TVR-group. Quickly after the start of the treatment, the employment rates start to diverge. The total employment rates, including sheltered employment and unpaid trial periods, are shown in the upper right corner of Figure 1. This shows the same pattern as competitive employment, but at a somewhat higher level.

For those in competitive employment, we study weekly working hours and hourly wages. The middle left panel in Figure 1 shows that in both the IPS and TVR group, weekly working hours decline quickly in the months leading up to the start of the treatment. Immediately after the start of the treatment, weekly working hours increase equally quickly for employed TVR and IPS-recipients. From 4 to 24 months after the start of the treatment, weekly working hours of IPS-recipient appear to lag somewhat behind those of working TVR-recipients. Regarding hourly wages, the middle right panel in Figure 1 shows no difference between the IPS and TVR groups.

Regarding benefit dependency, we study the share of people on benefits, and not the benefit *levels* per se, since the Dutch disability benefits system includes incentives to work that may even cause benefits to increase when benefit recipients start to work. Before the start of the treatment, and up to 9 months after the start, the share of people on disability benefits is very similar in the IPS and TVR groups (see the lower left corner in Figure 1). Beyond that point, the share of people on disability benefits declines faster in the IPS-group than in the TVR-group.

Medical costs show a rather similar pattern for both groups as well. Only beyond 16 months after the start of the treatment does the TVR-group show a somewhat quicker decline in medical costs than the IPS-group.

Figure 1 Outcome variables for the IPS-group and for the matched and weighted TVR-group, per month before and after start of treatment (0=start treatment)



3.4 Methodology: Difference-in-difference estimation on the matched sample

We apply difference-in-difference estimation to the matched sample, which allows us to estimate the causal effect of IPS over traditional vocational rehabilitation services (see e.g. Eichler and Lechner, 2002). By using exact matching, we reduce the bias in the estimated treatment effect by assuring that IPS- and TVR-recipients have the same distributions of observable factors. The difference-in-difference estimation corrects for potential pre-treatment differences between the IPS and the TVR group.

The model specification is:

$$Y_{it} = \tau_t + \sum_{t=0}^{36} \beta_t IPS_i T_{it} + \sum_{t=0}^{36} \gamma_t T_{it} + \epsilon_{it} \quad (\text{Equation 1})$$

where, i is the individual disability benefit recipient, t calendar time, Y_{it} is the outcome of interest (employment status, health insurance claims, benefits received or wage) for individual i in month t , IPS_i is a dummy variable taking the value 1 if individual i is in the IPS-group and 0 if he is in the TVR-group, T_{it} is a dummy variable for each month since the start of the treatment. τ_t captures calendar time effects (specified by year dummies), γ_t captures the baseline development of the outcome variable since the start of the treatment and ϵ_{it} is the individual and time-specific error term.¹⁷ The β_t are the parameters of interest, which capture the effect of IPS over traditional vocational rehabilitation for every month since the start of the treatment. We measure the effects for every month in the four years after the start of IPS.

A precondition for the application of difference-in-difference design is that there is a common trend in the outcome variables before the start of the intervention. Figure 1 shows the outcome variables for both the IPS-group and the TVR-group before and after the start of the treatment. Eyeballing these figures, we see that the employment rates nearly overlap: both the pre-treatment level and trend are very similar for the IPS and the TVR-group. For the other outcome variables the pre-treatment trends and levels appear very similar in both groups as well. Empirical placebo tests confirm that both groups have common trends on all outcome variable (see section 5).

4. Results

¹⁷ The individual specific fixed effect α_i and the time-invariant IPS-effect $\sum_{t=0}^{36} \delta_i IPS_i$ drop out of the equation due to the difference-in-difference specification.

The estimated β 's of the difference-in-difference estimation are plotted, with their 95%-confidence bands, in Figure 2. In line with results from randomized controlled trials, our results confirm that IPS leads to higher employment probabilities than traditional vocational rehabilitation services. Figure 1 has already shown how the competitive employment probabilities in the IPS-group outperform those of the TVR-group. These results are confirmed by the difference-in-difference estimates. From the sixth month after the start of the treatment onwards, IPS leads to a statistically significant higher probability of being in competitive employment. From month 8 to 18 after the start of the treatment, the probability to be in employment is estimated to be 8 to 9%-points higher for IPS-recipients than for TVR-recipients. After 20 months the effect of IPS still remains positive but is no longer statistically significant (until around month 30).

The results for the total employment rate, i.e. including sheltered employment and employment in unpaid trial periods, are shown in the upper right corner of Figure 2. These are quite similar to the results for the competitive employment rate, even somewhat bigger. From months 9 to 18 after the start of the treatment the probability to be in any type of employment is estimated 10%-point higher for IPS-recipients than for TVR-recipients. The results on this outcome variable are statistically significant from 5 months after start of the intervention onwards (and at 90% significance level from 4 months onwards). This indicates that the higher probability to find work in the competitive labour market does not come at the expense of the probability to work in the sheltered sector, as was e.g. found by Bond et al. (2007).

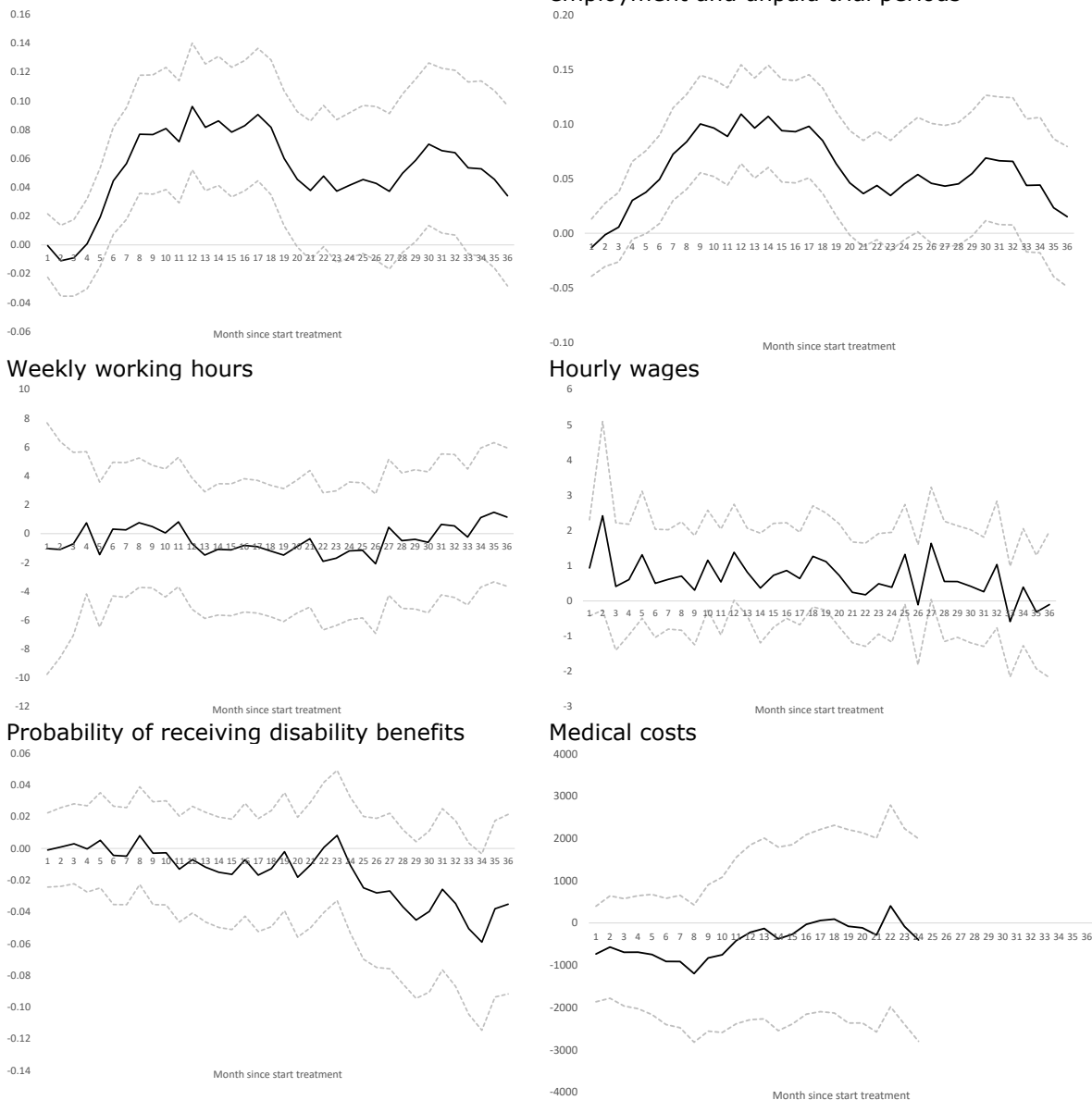
Our findings suggest that the higher employment probabilities do not come at the expense of shorter working hours or lower hourly wages either. The middle left panels in Figure 2 shows the estimated coefficients for the effect of IPS compared to TVR on the weekly working hours of those in employment. Even though the descriptive results in Figure 1 suggested fewer weekly working hours for IPS-recipients, the estimated coefficients fluctuate around 0 and are at no point in time statistically significant. The estimated coefficients for the effect of IPS over TVR on the hourly wage rate are plotted in the middle right panel of Figure 2. These estimates are positive, but not statistically significant at the 95% level, except for one point in time (12 months after the start of the treatment). At a few points in time, these results are statistically significant at the 90% level.

The lower left panel of Figure 2 shows the estimated coefficients for the effect of IPS compared to TVR on the probability to receive disability benefits. As mentioned before, we study this outcome measure instead of benefit levels, since the Dutch benefit system includes financial incentives for disability benefit recipients. As a result of these financial incentives benefit levels may even increase

when a person starts to work. In line with the descriptive results in Figure 1, the estimated coefficients for the probability to receive disability benefits fluctuates around 0 for quite a while. From two years after the start of the treatment onwards, the estimated coefficients become more and more negative, and are even statistically significant at the 95%-level at one point in time (34 months) and at the 90%-level at a few points. This is an indication that IPS might also lead to less benefit dependency of people with severe mental illnesses in the long run.

Regarding medical costs, the estimated coefficients are negative until 16 months after the start of the treatment, but not statistically significant. Beyond that point the coefficients fluctuate around 0. Due to restrictions in the data availability we cannot study the effects on medical costs longer than two years after the start of the treatment.

Figure 2 Estimated coefficients for the effect of IPS over TVR with 95% confidence interval



Notes: Calculations on the basis of fixed effects estimates of Equation 1. Calculations for all outcome measures are based on separate regressions. Year dummies are included for the years 2011-2020.
Source: Own calculations using registration data from Statistics Netherlands

5. Sensitivity analyses

We have carried out various sensitivity analyses: (1) we have performed a placebo test, (2) we have experimented with various alternatives in the matching procedure, (3) we have checked for heterogeneous treatment effects and (4) we have analysed the probability of having found employment instead of the probability to be in employment, in order to compare our results to those presented in the psychiatric literature.

Our first sensitivity analysis was a placebo test. We have introduced a placebo effect of IPS over TVR at various months before the actual start of the intervention. This did not result in any statistically significant effects prior to the intervention for any of the outcome measures. Had we found any statistically significant effects, then the common trend hypotheses of the difference-in-difference design would have been violated.

Secondly, we have tested the effect of changes in the matching procedures. In our preferred specification presented above, the maximum distance in calendar time between the start of the TVR-treatment of the controls to the start of the IPS-treatment of the IPS-recipient is 24 months. We have varied with a maximum calendar time difference of 12 and 6 months. This led to fewer persons with IPS that could be matched and fewer matched TVR-recipients, but the results remained to a large extent unaffected. Furthermore, we have maximised the number of matches to 5 or 10 per IPS-person. This did not affect our results either. In addition, we have used propensity score matching instead of exact matching, including nearest neighbours up to 5 and 10 matches (with replacement) and radius matching. All variants caused only slight differences in results compared to the main specification presented in section 4.

Thirdly, in order to check for heterogeneous treatment effects, we have repeated the analyses for subgroups by gender, age, type of benefit, ethnic background, household situation, region and the year in which the IPS-intervention started. In general, the smaller number of observations for subgroups led to larger confidence intervals and fewer statistically significant estimated coefficients. We observe some difference in the effect of IPS for various subgroups. Men benefit more from IPS than women with respect to competitive employment. Persons living in the Randstad benefit more from IPS over TVR in terms of employment as well, as do people receiving a young-handicapped benefit compared to those who became (partly) disabled later in life. The positive effects of IPS over TVR start later for older persons than for younger persons.

Finally, in order to compare our results with psychiatric studies that usually report the cumulative probability of having been in employment for at least one day, we have performed duration analysis on the matched sample. The Kaplan Meier estimates are shown in Figure 3. Table 2 compares these numbers at the three points in time with reported by Michon et al. (2014), who conducted a randomized controlled trial with 151 severely mentally ill persons in the Netherlands. The findings for the IPS-group are rather comparable. Our profile is a bit steeper: starting a bit lower and ending somewhat higher, but at no point is the difference bigger than 4%-points. The findings for

the TVR control group are also comparable six months after the start of the intervention, but substantially different after 18 and especially after 30 months. The employment rate that we find in our matched TVR-group is much higher than in the study by Michon et al. There are several explanations for this discrepancy. First, in the Michon study 20% of the TVR-group did not take up the TVR-program, while in our study they all did. In addition, the population we study has somewhat more favourable characteristics than in the Michon-study, while we know from the meta-analysis by Campbell et al. (2011) that IPS is more effective for more severe subpopulations. Campbell et al. found that people without recent work history, older workers, Afro-Americans, lower educated, people suffering from psychosis, with multiple mental problems and people recently hospitalized for their mental illness benefit more from IPS compared to TVR. The difference in characteristics between our study population and that of Michon occurs not so much in terms of age or labour market history, but it does in terms of the severity and 'freshness' of the mental illness: we have fewer people with schizophrenia and/or psychosis and fewer recently hospitalized persons. This is partly due to our matching strategy (see section 3.3), but already before matching our IPS-group had some more favourable characteristics. Third, even though it was a randomised trial, in the Michon study the TVR-group had more severe mental health issues than the IPS-group, with more people ever admitted to a mental health hospital and more people with psychotic disorders. Finally, both studies are situated in the same country, but at different points in time. The participants in the Michon-study started their intervention between 2005-2007, and were followed in the subsequent years. Labour market opportunities collapsed in 2008/2009 as a result of the financial crisis. The participants in our study started their intervention between 2014-2018. These were years when the labour market opportunities improved continuously, and continued to do so over the full period we study. This may explain why both the TVR and IPS-group have higher employment probabilities at the later measurement points in our study.

Figure 3 Kaplan Meier estimates of the cumulative probability of having found employment in the competitive labour market

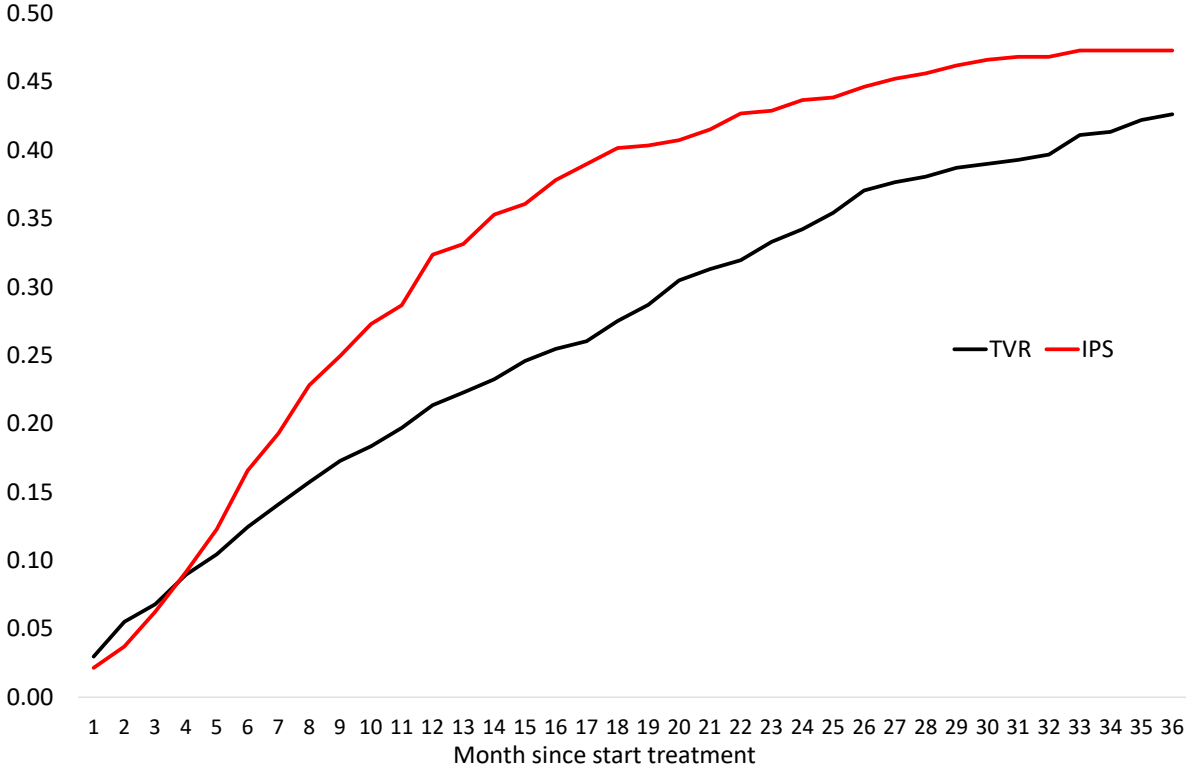


Table 2 Comparison of the cumulative probability of having found employment in the competitive labour market

# months since start intervention	Michon et al. (2014)		Our study	
	IPS	TVR	IPS (matched)	TVR (matched)
6 months	21%	13%	17%	12%
18 months	39%	20%	40%	27%
30 months	44%	25%	47%	39%

6. Conclusion and discussion

This paper analysed the effects of the first-place-then-train program called Individual placement and support (IPS) services compared to traditional vocational rehabilitation (TRV) services for a group of disability benefit recipients with severe mental illnesses in the Netherlands. We have shown that IPS has far greater employment impacts than TVR: quickly after the start, the share of people in work increases faster in the IPS-group than in the TVR-group. From the sixth month after the start of the treatment onwards, IPS leads to a statistically significant higher probability of being in competitive employment of 8 to 9%-points. Since the employment probabilities of the TVR-group increase at later points, the effect of IPS over TVR is no longer statistically significant beyond 20 months after the start.

Our findings show that the higher probability to find work in the competitive labour market does not come at the expense of the probability to work in the sheltered sector. The results for the effect of IPS over TVR on the total probability to be in work, including sheltered employment and employment in unpaid trial periods, are even stronger than the effects on competitive employment. The higher employment probabilities do not come at the expense of shorter working hours or lower hourly wages either. The estimated coefficients for the weekly working hours fluctuate around 0 and are at no point in time statistically significant. The estimated coefficients for the effect of IPS over TVR on the hourly wage rate are positive, and statistically significant at the 90% level at a few points in time. In addition, our results indicate that IPS may also lead to less benefit dependency of people with severe mental illnesses in the long run. From two years after the start of the treatment onwards, the estimated coefficients become more and more negative, and are even statistically significant at the 90%-level at a few points in time. Regarding medical costs, the estimated coefficients are negative until 16 months after the start of the treatment, but not statistically significant.

Regarding the employment effects of IPS over TVR, our results support the finding by Markussen and Roed (2014), who concluded that a strategy focusing on rapid placement in the regular labor market is superior to alternative strategies giving higher priority to vocational training or sheltered employment. IPS is a strategy that focusses on rapid placement, and was already found to have superior effects on the share of people with severe mental illnesses that find employment in many psychiatric randomized controlled trials (for an overview, see Suijkerbuijk et al. 2017, Frederick and Van der Weele 2019). In addition, some other studies found a positive effect on the duration until employment (e.g. Bond et al. 2008, Heslin et al. 2011, Bejerholm et al. 2015), the probability to remain in work for a longer period of time (e.g. Heslin et al. 2011, Hoffmann et al. 2012, Bejerholm et al. 2015) and hours worked (Davis et al. 2012 and Oshima et al. 2014).

For the Dutch case, Michon et al. (2014) conducted a randomized controlled trial, in which they divided 151 persons with severe mental illnesses over an IPS-groups and a group receiving traditional vocational rehabilitation. They found an effect a 19%-point higher probability of having worked of IPS-recipients compared to the TVR-group. The fact that our estimates result in a lower figure, may be explained from (1) the fact that all our TVR-recipients actually took up treatment, while in the Michon-study the take-up rate in the TVR-group was only 80%, (2) the population that we study has more favourable characteristics than in the Michon-study, while we know from the meta-analysis by Campbell et al. (2011) that IPS is more effective for more severe subpopulations, (3) in the Michon study the TVR-group had more severe mental health issues than the IPS-group, and (4) both studies are situated in at different points in time at different phases of the business cycle. Basically, however, our findings are in line with those of Michon and many other randomised controlled trials. The advantage of our study over these studies is that we have studied an actual nationwide implementation of IPS instead of a trial. In addition, our study uses administrative data, so that we are able to follow all participants for every month since the start of the treatment and we have no problems with attrition. And our measures go beyond the measure of having worked at least one day, which is the common outcome measure in most psychiatric studies.

The fact that we do not find statistically significant differences regarding medical costs is also in line with earlier studies in the psychiatric literature that find few positive effect on outcome measures related to medical costs. Most of these studies found no statistically significant effects of IPS over TVR on quality of life (Frederick and Van der Weele, 2019; Nøkleby et al. 2017, Kinoshita et al., 2013), global functioning (Frederick and Van der Weele 2019, Kinoshita et al. 2013) or mental health (Frederick and Van der Weele 2019, Nøkleby et al. 2017, Kinoshita et al. 2013). Only Burns et al. (2007) found a higher probability to be readmitted to hospital in the TVR than in the IPS-group. The Dutch trial by Michon et al. (2014) analysed the effects on mental health, self-esteem, and quality of life. They found no statistically significant results, neither in a positive, nor in a negative direction. Both the IPS- and the TVR-group showed positive changes. The stronger increase in mental health and quality of life in the IPS group was not statistically significant. As the authors mention, this might be due to small numbers in the trial. Our study is based on a much larger group and shows similar results regarding medical costs: the estimated coefficients are negative until 16 months after the start of the treatment, but not statistically significant. Beyond that point the coefficients fluctuate around 0.

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