Do temporary jobs serve as stepping stones into permanent work for the unemployed? Evidence from the Netherlands

Jelle Zwetsloot

Abstract

Based on administrative data obtained from Statistics Netherlands, I apply dynamic propensity score matching to assess whether temporary jobs serve as stepping stones towards permanent employment for unemployed workers in the Netherlands, in the period 2010-2014. My results show a positive overall stepping-stone function of temporary jobs for the unemployed. Fixed-term contracts and temporary agency work both serve as a bridge into permanent employment, although fixed-term contracts perform substantially better in this regard. Effects are somewhat higher for older and higher educated individuals, the latter primarily a consequence of higher educated individuals being overrepresented in fixed-term contracts, and lower educated individuals being disproportionally found in temporary agency work. From a policy point of view, my results emphasize the usefulness of temporary jobs in getting unemployed workers (back) into stable employment.

Keywords: Unemployment, Temporary jobs, Fixed-term contracts, Temporary agency work, Propensity Score Matching.
JEL Classification: C31, J41, J62, J64.

Supervisor: Dr. M. Mastrogiacomo
Co-supervisor: Dr. J.A. Bolhaar
Thesis Msc Economics 2015-2016
Faculty of Economics and Business Administration
Vrije Universiteit Amsterdam

1 Introduction

Employers in many European countries have increased their labor force flexibility by hiring temporary workers, using independent contractors and implementing flexible work arrangements. Especially notable is the expansion in temporary employment (i.e. all employees whose job has a pre-determined end date). In the European Union, the share of employees holding a temporary contract increased from 10.9 percent in 1994 to 14.2 percent in 2014, displaying a growth of more than 30 percent (OECD, 2016a). Also, there is great heterogeneity across countries regarding this specific development. Whereas some countries saw almost no increase or even a decline in the share of temporary employees, others exhibited much higher growth rates. The Netherlands constitutes a prime example of the latter group. The proportion of temporary employees has nearly doubled, from 10.9 percent in 1994 to 21.7 percent in 2014, which is far above the European Union average. In light of this development, it is of increased importance to understand the social and economic consequences of (more) temporary employment in the (Dutch) labor market, both at the individual level and for the society as a whole.

In this study, I assess the stepping-stone function of temporary jobs for unemployed workers in the Netherlands. That is, I investigate whether taking up a temporary job increases the probability of finding a permanent job, compared to searching for a permanent position out of unemployment.[1,2] My sample consists of workers becoming unemployed in 2010, as measured by those starting to collect unemployment insurance (UI) benefits. Monthly outcomes are analyzed over a three-year period after taking up a temporary job. Next to estimating an overall stepping-stone effect of temporary jobs, I explore 'stepping-stone heterogeneity' by separately analyzing particular types of temporary contracts and subgroups in the population. The main types of temporary contracts studied are fixed-term contracts (FTC), temporary agency work (TAW) and temporary on-call employment. Regarding the empirical strategy, I apply dynamic propensity score matching as proposed by Sianesi (2004) on a rich administrative dataset obtained from Statistics Netherlands. This approach matches individuals entering temporary work with those remaining unemployed on similar characteristics and equal elapsed unemployment durations. Consequently, it accounts for selection effects, as some individuals are more likely to take up a temporary job, and duration dependence, as the probability of obtaining permanent work depends on time spent in unemployment.

[1] In the following, the synonyms permanent work/job/position/employment/contract and open-ended contract refer to jobs without a pre-determined end date.

[2] As is common in the (stepping-stone) literature, I assume that individuals prefer open-ended contracts to temporary jobs, which is already plausible given the fact that temporary jobs by definition entail less job security. Supporting the notion of individuals being more content with a permanent position, De Graaf-Zijl (2012) and Booth et al. (2002) find on average lower levels of job satisfaction among temporary workers in the Netherlands and the UK respectively.

Theoretically, the net effect of temporary jobs for the unemployed is unclear. It is often argued that unemployed workers could benefit from taking up temporary work, as it provides them with human capital, work experience and it deepens their labor market attachment (De Graaf Zijl et al., 2011), giving rise to increased productivity and employability.[3] Also, taking up a temporary job can be a signal of high motivation to (future) employers, and it provides individuals with useful social contacts and information about (permanent) job vacancies (Ichino et al., 2008). Finally, as employers can easily lay off low ability workers at the end of their contract, employers use temporary contracts as a screening device (Booth et al., 2002). Once they offer permanent contracts, firms want to be sure whether an individual worker meets their expectations, since it will be costly to fire these workers once in a permanent position.[4,5]

On the other hand, there are concerns that temporary contracts will only lead to dead-ends. That is, taking up a temporary contract will not increase the chances of obtaining a permanent position and could even result into lower labor market outcomes compared to remaining unemployed. First, although being employed means easier access to social networks, it reduces the time available for the job search and hence the probability of finding a permanent job (Gebel, 2013). Second, in case that the main reason for firms to hire temporary workers (or use independent contractors) is to adjust to economic fluctuations or replace temporary absent staff, it is less probable that temporary workers become eligible for a permanent position on the job (Booth et al., 2002).[6] Finally, contrary to the idea of signaling high motivation, being employed on a temporary contract might be perceived by prospective employers as the inability to obtain permanent work due to low productivity, decreasing the probability of receiving a permanent job offer (Galiarducci, 2005).

A few empirical studies have estimated the stepping-stone function of temporary jobs. Besides differences in countries, time periods and population groups, these studies represent a great heterogeneity in types of contracts analyzed. Whereas some studies focus exclusively on particular types of temporary work, other studies group different contracts into one 'temporary contract'. Regarding temporary agency work, Kvasnicka (2009) finds no significant effects on the probability of

[3] Yet, as the probability of temporary workers remaining in the firm is relatively low, employers have less time to recoup their (costly) investments and will provide less training to their temporary workforce, which seems to be the case in the UK (Booth et al., 2002), Spain (Albert et al., 2005) and several other European countries (Arulumpalam et al., 2004). If workers cannot acquire necessary skills and employers expect them to leave early, (within-firm) career opportunities of (insecure) temporary workers are limited, as is shown for several European countries (Origo & Pagani, 2009).

[4] The extent to which firing permanent employees is costlier than laying off temporary workers depends on the regulations regarding those contracts, which I will discuss in the next section.

[5] Faccini (2014) finds that for most European countries the high temporary to permanent transition rates can be explained by a job-matching model where firms use temporary contracts as screening devices. A similar result is obtained by Portugal & Varajão (2009) in Portugal, providing empirical evidence that screening employees through temporary jobs is a dominant strategy of employers recruiting for permanent positions.

[6] Houseman (2001) finds that the main reasons cited by employers in the United States to use temporary workers are the needed help in times of unexpected rise in business, seasonal needs and temporary filling in absent staff.

finding regular work for unemployed workers in Germany in 1994-2001. On the contrary, workers in Denmark in 1997-2006 (Jahn & Rosholm, 2014) and Italy in the early 2000s (Ichino et al., 2008) do benefit from TAW in finding regular employment. Focusing on fixed-term contracts, Hagen (2003) finds evidence of a stepping-stone effect for unemployed workers in West Germany in 1991-2001. Aggregating multiple types of temporary contracts into one single contract, De Graaf-Zijl et al. (2011) finds no overall stepping-stone effect of temporary work for unemployed workers in the Netherlands in the period 1988-2000. Gebel (2013) performs a cross-country analysis and obtains significant stepping-stone effects for Great Britain and Germany in 1991-2007, but no effects are found for Switzerland. Temporary work seems to serve as a bridge into permanent employment for the unemployed in Italy in 1993-2003 (Barbieri & Sestito, 2008), but the results are not significantly different from zero.

Although none of these studies supports the notion of temporary jobs being dead-ends, there is no conclusive evidence on whether they act as bridges into permanent employment. Furthermore, by only focusing on a single contract or by grouping multiple types of temporary work into a single state, it is not possible to evaluate both contract-varying stepping-stone functions (within the same economic and institutional conditions), and an overall stepping-stone effect of temporary jobs. Knowing whether different types of temporary contracts diversely foster access to permanent jobs should be of core interest to policy makers aiming at fighting unemployment.

The studies mentioned above can be considered somewhat dated, as their conclusions are based on data covering the mid-2000s at the latest. Since then, the world (and the Netherlands) has experienced a financial crisis and ongoing economic trends such as globalization and technological change, altering the role and use of temporary work. To the best of my knowledge, there are two studies comparing stepping-stone outcomes before and after the crisis. Lehmer (2012) studies the role of TAW for long-term unemployed workers in Germany in the period 2004-2009. He obtains significantly lower stepping-stone effects in the first quarters after the Great Recession. Studying the French labor market in 2002-2010, Givord & Wilner (2015) finds that the financial crisis has not only influenced the stepping-stone effect of temporary jobs, but has also strengthened the difference between TAW and FTC. The authors find the stepping-stone effect of the latter to increase after the Great Recession, whereas the already weak positive effect of TAW becomes insignificant, which they relate to the different costs associated with both type of contracts. Contrary to TAW, the employer directly hires the employee in case of fixed-term contract workers. The employer has to put more time and effort into the hiring process, but is now able to learn specific characteristics of the applicant. Therefore, FTC lends itself more as a screening device than TAW. In case of TAW, the employer is less able to screen its workers, but saves the cost of the hiring process. However, the

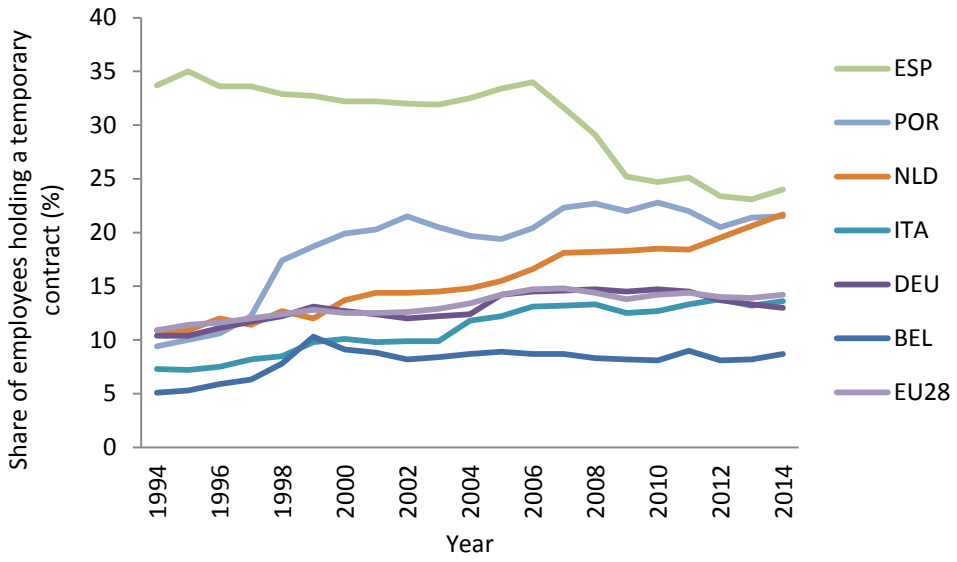

Figure 1 – Share of employees holding a temporary contract in selected European countries, 1994-2014.

Source: OECD (2016b). Note: Contracts are temporary if they have a pre-determined end date.

TAW worker is on average more expensive than the FTC worker, so using TAW is optimal as a short-term flexibility device. The authors argue that tight economic times increases both the need for flexibility and the importance of screening, explained through the increased use of TAW after the crisis and the divergence in the stepping-stone effect of FTC and TAW as discussed above. The stepping-stone effect can also be higher because a share of workers eligible for a permanent contract in economic favorable times is now among the temporary contract workers.

Next to the influence of the financial crisis there might be more structural developments causing the role of temporary jobs to have changed. As shown in Figure 1, growth in the share of temporary work in many European countries occurred both before and after the financial crisis. The Netherlands is an example of countries experiencing rather continues growth. This development can be closely related to economic trends as globalization and technological change. These trends are causing growing global competition, increasing the need for labor markets to adapt quickly to (demand and supply) shocks, requiring more short-term and volatile employment relationships (Auer, 2006). For example, as increased competition creates uncertainty among employers about their future production or sale volumes, they will be more reluctant to hire permanent employees and will make increasingly use of a flexible workforce, of which temporary jobs constitute a major part. This would imply fewer transitions from temporary to permanent contracts. Yet, following the reasoning in tight economic times, some workers who would be hired directly as permanent employees under 'normal' circumstances are now present in the temporary workforce, and uncertain employers are more careful whom they offer permanent positions, increasing both the

need for a screening device and the 'success rates' of stepping-stone mechanisms. For these reasons, the net overall effect of the financial crisis and/ or economic trends on the stepping-stone role of temporary jobs remains unclear.[7]

By both analyzing a recent period and distinguishing between different types of temporary contracts to assess their different 'roles', the contribution of this study to the existing literature is twofold. My results show a positive overall stepping-stone function of temporary jobs for the unemployed. Fixed-term contracts and temporary agency work both act as a bridge into permanent employment, although fixed-term contracts perform substantially better in this regard. Effects are somewhat higher for older and higher educated individuals, the latter primarily a consequence of higher educated individuals being overrepresented in fixed-term contracts, and lower educated individuals being overrepresented in temporary agency work.

The remainder of this paper is organized as follows. In the next section I will pay attention to institutional settings in the Netherlands. Specifically, I will describe the main types of temporary contracts, the regulations of both temporary and permanent contracts, and conclude the chapter describing the requirements and features of the UI scheme. In the third section, I will outline the data. The fourth section entails the empirical strategy. Results and discussion are presented in section 5, and the last section concludes.

2 Institutional setting

In this chapter, I will briefly describe the prevailing institutional setting in the Netherlands, which is necessary to interpret the results and provides background information on my sample composition. In the period studied, there have been no major institutional changes regarding the regulations of temporary contracts or the characteristics of the UI scheme.

2.1 Temporary contracts in the Netherlands

In order to explain possible varying stepping-stone effects across different types of temporary contracts, it is important to discuss their distinctive features. The main temporary contracts used to exit unemployment are fixed-term contracts, temporary agency work and temporary on-call employment. Regarding the former, particular types of these contracts are FTC which contain an agreement to turn into a permanent contract in case of good performance[8] (Houwing & Kösters, 2013). Except in situations of bad performance or economically difficult times, the employer can be

[7] The effect probably also depends on the bargaining power between employers and employees (which might differently change for certain population groups when globalization and technological change are skill or sector biased), and the existing regulations regarding the regulation and use of temporary and permanent contracts, the latter which I will discuss in the next section.

[8] Hereinafter 'FTC with prospect of permanent employment/work/appointment'.

legally enforced to offer a permanent position after the contract expires. As these FTC already entail a pre-determined bridge into permanent employment, they can be considered less flexible than other types of temporary jobs. Statistics Netherlands (2016a) states that in 2010-2014, on average, 31 percent of all FTC workers have a contract with prospect of permanent appointment. As argued in the first section, TAW is less optimal for screening as there is no recruitment and hiring process involved. Yet, by saving these (fixed) costs, being on average less 'tied to employees'[9], but incurring higher costs per hour[10], TAW may be preferable as a (short-term) flexibility device. Temporary on-call employment provides employers with high flexibility, since they can deploy staff based on the amount of work. Types of on-call employment are zero-hour contracts, min-max contracts (including at least a minimum amount of working hours) and contracts allowing the employee to not answer a call[11].

The likelihood of employers using temporary contracts in order to screen potential workers or increase their workforce flexibility depends on regulations regarding both temporary and permanent contracts. If there are few restrictions on the use of temporary employment or permanent jobs are accompanied by a great deal of employment protection, using temporary workers becomes more attractive. As can be seen in Figure 2, the Netherlands is an interesting example of analyzing the effects of temporary employment. In fact, of all OECD countries the Netherlands has the highest difference between the indicators of employment protection legislation (EPL) of permanent and temporary workers. Compared to the OECD average, there are few restrictions on the use of fixed-term contracts and temporary agency work, while the dismissal of workers holding a permanent contract is relatively costly.

Although not strictly regulated, the Flexibility and Security Act (*Wet Flexibiliteit en Zekerheid* in Dutch) enacted in 1999 limits the use of temporary contracts for employers in a couple of important ways. First, up to three consecutive contracts can be used with a maximum total duration of three years.[12,13] Consecutive here means that the time between two contracts is no longer than three months. Regarding on-call contracts, the employer has to pay the worker a minimum of three hours per 'call'. Moreover, when the employment contract specifies a minimum number of working hours and it has already lasted for six months, the employer is obliged to pay these hours, regardless of

[9] In case of temporary agency workers employed under a contract with agency clause (*Uitzendbeding* in Dutch), which is allowed for a limited time period of 78 weeks, the contract between the worker and the agency ends if the employer ends the contract with the agency (Tijdens et al., 2007). This provides high flexibility to agencies and thus to employers by allowing them to dismiss the worker at any time. On the other hand, the clause provides flexibility to the worker, who has the right to prematurely end the contract with the agency, with only a one-day notice required.

[10] Intuitively, as agencies have to pay their own staff and want to make a profit, there will be a premium set above the hourly wage of the worker.

[11] In case of such agreements, a new temporary contract will be constructed per 'answered call'.

[12] The Collective Labor Agreement (*CAO* in Dutch) may deviate from this restriction.

[13] As of 2015, the Work and Security Act (*Wet Werk en Zekerheid* in Dutch) replaces the Flexibility and Security Act. The most notable adjustment is the reduction in the maximum duration of temporary contracts to two years.

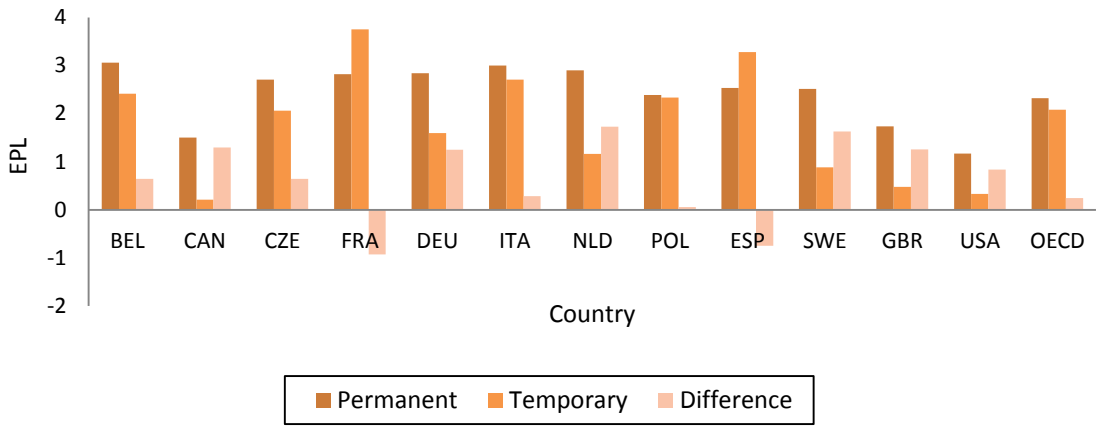

Figure 2 – Indicators of employment protection (EPL) of temporary and permanent workers in selected OECD countries, averaged over 2008-2013.

Source: OECD (2016b). Note: The indicators (ranging from 0 to 6) measure the costs and procedures involved in dismissing individual and groups of regular workers and the regulations regarding the use of contracts with a fixed duration and temporary agency work.

whether the worker actually performed any work or not. Temporary agency work is allowed in all types of work, sailors being the only exception.

2.2 Unemployment benefits

The features and requirements of UI benefits in the Netherlands are listed in The Unemployment Law (*Werkloosheidswet* in Dutch). In order for individuals to become eligible for benefits, some conditions apply. In general, exclusion occurs when one was not insured for unemployment[14], is blameworthy unemployed, has not worked a minimum of six months in the last 36 weeks or does not lose more than four hours of work a week. Once eligible, the minimum duration of benefits is three months. When one has at least worked four out of the last five years, the duration in months will be set equal to the amount of years worked, up to a maximum of 38 months.[15] The amount of benefits depends on the wage earned in the last year of work up to a certain (general) maximum. Unemployed workers receive 75 percent of their last earned wage during the first two months of benefits, and 70 percent thereafter. If one re-enters unemployment within six months of employment, the remaining months of UI benefits can be used. If one re-enters unemployment after six months of employment, a new benefit amount and duration is determined. Yet, if one does not fulfill the four-out-of-five years condition anymore, the remaining duration of benefits excluding the first three months will be added to the three 'new' months.

Next to these eligibility conditions, there are requirements that apply during benefit collection.

[14] In principle, all wage and salaried workers (employees) are mandatory insured. Business owners paying themselves a salary and domestic helpers working less than four days a week are exceptions.

[15] As of 2016, the maximum duration will stepwise be reduced to 24 months in 2019.

Individuals who do not accept suitable (in terms of educational levels required) work face the risk of benefit reduction. After one year of benefit collection, all types of work are considered suitable, and one has to accept every job he or she is offered. Another requirement is that unemployed workers have to be engaged in some (verifiable) type of job search activity once a week. If their efforts are considered insufficient, benefits could be sanctioned as well. Empirical research has shown the effectiveness of implementing benefit sanctions. Abbring et. al (2005) finds that imposing a sanction substantially raises re-employment rates of UI benefits recipients in the Netherlands. Lalive et. al (2005) and Svarer (2011) obtain similar results in the case of Switzerland and Denmark respectively.

3 Data and Descriptives

To evaluate the stepping-stone function of temporary jobs, this study uses administrative data of the Social Statistical database (SSB) provided by Statistics Netherlands. The SSB contains detailed individual-level information on income sources, job characteristics, demographics and other socio-economic characteristics of all citizens in the Netherlands. For my analysis, I select individuals entering UI benefits in 2010, where entering is defined as UI benefits becoming the main source of income in a given month.[16] Hence, individuals who start collecting UI benefits but still receive their main income out of other sources are not considered unemployed. Furthermore, as described in the previous section, not all unemployed workers are eligible for UI benefits. As individuals who receive only little or no benefits at all might differ substantially in their job search behavior, excluding them improves the homogeneity of my sample. In order to reduce the interference of school or retirement decisions with job search behavior, I restrict the sample to individuals who are between 25 and 60 years old. These restrictions leave me with a total of 262,908 unemployed workers, of whom summary statistics are reported in Appendix A1.

Descriptive statistics regarding the exits out of unemployment are reported in Table 1. Of all individuals entering UI benefits, more than two –thirds of them end their UI spell by finding some kind of employment (i.e. employment becoming the main income source). A vast majority (77.7 percent) of those entering (dependent) employment take up a temporary job, which is much higher than the average share of temporary jobs in the Dutch labor market in the period studied, namely 30.1 percent[17] (Statistics Netherlands, 2016b). Temporary work can thus be considered important for unemployed workers returning to the labor market**.** Conditional on taking up temporary work, 58.8 percent finds work under a fixed-term contract, 36.5 percent becomes a temporary agency

[16] If individuals have multiple entries into UI benefits in 2010, only their first entry is used in the analysis.

[17] This percentage substantially differs from the one reported in Figure 1. The latter is based on the Dutch Labor Force Survey, whereas the 30.1 percent is based on administrative data and refers to jobs instead of employees. Differences could as well stem from harmonization of definitions between OECD countries.

Table 1: Exits out of UI benefits

Exit state	Percentage (of total)
Permanent job	14.0%
Temporary job:	
Fixed-term contract	28.7%
Temporary agency work	17.8%
Temporary on-call employment	2.1%
Other	0.2%
Self-employment	5.9%
Social assistance	6.1%
Sickness benefits	9.3%
Other benefits	4.6%
No income	9.7%
Out of SSB	0.5%
Education	0.9%
Right-censored spell	0.1%

Source: SSB, own computations. Note: Sample size = 262,908 individuals.

worker, 4.3 percent enters temporary on-call employment, and the remaining 0.4 percent starts an internship or enters subsidized employment. As said before, a substantial share of FTC workers have a contract with prospect of permanent employment, yet the dataset does not allow me to distinguish those individuals from other FTC workers.

Almost one out of ten unemployed workers leave UI benefits for sickness benefits, which is possible when individuals become sick during or right after UI benefit collection. Close to one out of five individuals not leaving UI benefits for employment enters social assistance. In case of benefit exhaustion, individuals become eligible for social assistance only if their own and their partner's wealth and income do not exceed a certain maximum. With benefit exhaustion, sufficient (partner) income or wealth, and without being eligible for other benefits or returning to education, individuals are registered as 'No income', which applies to nearly 10 percent of my sample.

4 Empirical approach

4.1 Evaluating the stepping-stone hypothesis

The aim of this study is to analyze the stepping-stone effect of temporary jobs for unemployed workers. Lacking a quasi-experimental design with no institutional changes, I apply a dynamic propensity score matching approach as formalized by Sianesi (2004) in her study on the effectiveness of active labor market programs in Sweden. Kvasnicka (2009) and Gebel (2013) apply dynamic propensity score matching in evaluating the stepping-stone effect of TAW and temporary jobs in general respectively. This approach conditions the event of taking up a temporary job versus

not taking up a temporary job on elapsed unemployment duration in months. Specifically, future outcomes of those unemployed entering temporary work after a certain elapsed unemployment duration are compared to the hypothetical situation of them not taking up a temporary job and remaining unemployed for at least one extra month. Conditioning on time spent in unemployment instead of comparing unemployed workers taking up temporary work with those never observed to enter temporary work has the advantage of accounting for the event of right-censoring (Kvasnicka, 2009).[18] For example, a reason why some unemployed workers are never observed to enter temporary employment is simply because they have made a direct transition to permanent work instead.[19] Choosing those workers as controls would in that case lead results to be negatively biased. In addition, the approach allows outcomes to depend on unemployment duration, which might be the case if unemployed workers lose their skills, become less motivated to search for a job over time or stigmatization of long-term unemployed reduces the amount of (permanent) job offers.

Formally, let Y denote having a permanent job, u the number of months spent in unemployment and t the time in months. The outcome variable of interest is being employed with an open-ended contract over time, $\{Y_t^{(u)}\}_{t=u+2}^{T}$, measured from the first month after the exit month out of unemployment. T is set to 38 so that outcomes over a three-year period after entering temporary employment can be analyzed. Treatment is denoted by $D^u = \{1,0\}$, with $D^u = 1$ for those taking up a temporary job after u months of unemployment and $D^u = 0$ for those remaining unemployed for at least one additional month. The potential outcomes of having a permanent position at time t (where $t > u + 1$) are denoted by $Y_t^{1(u)}$ for unemployed workers entering temporary employment at $u + 1$, and by $Y_t^{0(u)}$ for those still unemployed in that particular month. Interest lies in the average increase in the probability of obtaining permanent work for those taking up a temporary job after u months spent unemployed, compared to if the same individuals would have remained unemployed for at least one additional month, i.e. the average treatment effect on the treated (ATET): [20]

$$\Delta_{\mathrm{t}}^{\mathrm{u}} = \mathrm{E}\left(Y_t^{1(u)} - Y_t^{0(u)} \mid D = 1\right) = \mathrm{E}\left(Y_t^{1(u)} \mid D = 1\right) - \mathrm{E}\left(Y_t^{0(u)} \mid D = 1\right) \quad (1)$$

for $t = u + 2, .., T$

[18] Also, choosing those never observed to enter temporary employment implies effectively conditioning on the future, as the 'treatment' of entering temporary employment is not limited by time.

[19] Exits to states other than temporary jobs are treated as right-censored.

[20] Unemployed workers can be chosen as controls for all their months of elapsed unemployed duration and as treated if they take up temporary work in a later stage. Once treated however, individuals becoming unemployed cannot serve as controls anymore, since whatever happens after treatment is considered as an outcome of treatment.

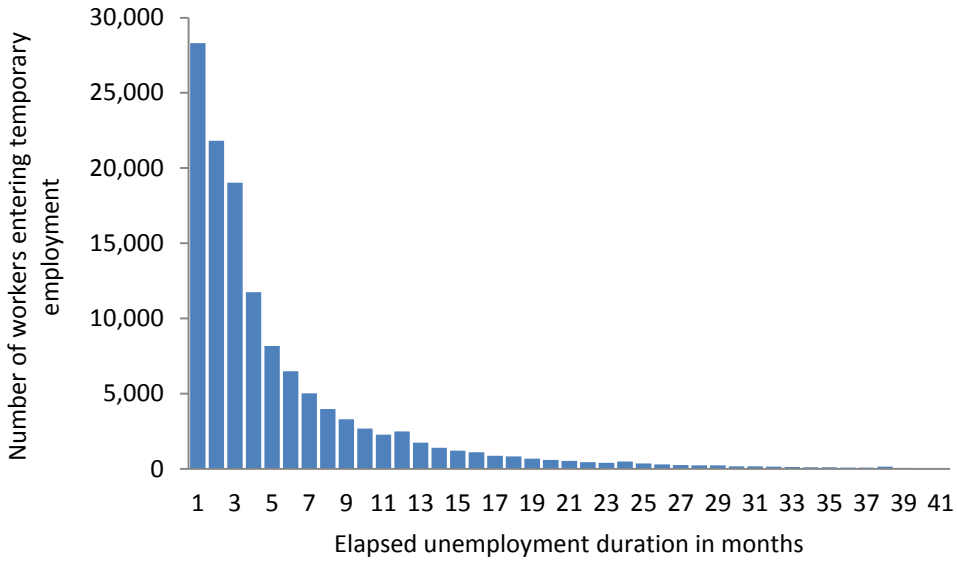

Figure 3 – Monthly entries into temporary employment out of unemployment (UI benefits) by elapsed unemployment duration in months.
Source: SSB, own computations.

The first term on the right-hand side in (1) is identified in the data. The second term, namely $\mathrm{E}\left(Y_t^{0(u)} \mid D = 1\right)$ refers to the unobserved counterfactual. Approximating the latter with individuals who remained unemployed for at least another month might lead to biased results, if those observed to enter temporary employment have characteristics both influencing their treatment status and their potential outcomes. I identify the second term under the conditional independence assumption (CIA):

$$Y_t^{0(u)} \perp D^u \mid X = x \quad \text{for } t = u+2, \ldots, T \tag{2}$$

Equation (2) means that for individuals having an equal elapsed unemployment duration u and a similar set of observables $X = x$, the potential outcome in case of not entering temporary employment is independent of treatment, the credibility of which I will discuss in subsection 5.3. The ATET is then derived by comparing the outcomes of treated individuals with those non-treated conditional on both u and X. In order for my analysis to have any empirical content, the common support assumption requires that for each individual with a particular set of observables taking up a temporary job after u months of unemployment, a potential control has to exist:

$$0 < \Pr\left(D^u = 1 \mid X\right) < 1 \tag{3}$$

In line with earlier research on the stepping-stone function of temporary jobs, I finally make the assumption of stable unit treatment value, i.e. the assumption that potential outcomes of individuals do not depend on treatment status of other individuals. I rule out both general

equilibrium effects and cross-effects. Assessing the credibility of this assumption would go beyond the scope of this paper and I leave the discussion to further research.

In the empirical analysis I set $U = 12$. I examine only those individuals who take up temporary work not later than one year after becoming unemployed in 2010. Restricting my analysis in this way allows me to observe the outcomes of at least 36 months after entering temporary employment for each unemployed worker. As can be seen in Figure 3, most unemployed workers taking up a temporary job do so in the first months after entering unemployment. Imposing the restriction of $U = 12$ leads to only 10.17 percent of treated individuals not being analyzed.

4.2 Propensity score matching

As my dataset is highly dimensional and includes multiple continuous variables, it will be difficult finding individuals with a similar set of observables. I find similar individuals based on their *propensity score*, i.e. the conditional probability of receiving treatment after u months in unemployment:

$$\Pr\left(D^u = 1 \,\middle|\, X\right) = p(X; u) \tag{4}$$

Rosenbaum & Rubin (1983) shows that individuals with the same value of the propensity score will have the same distribution of observables. This implies that if the CIA holds conditional on u and X, it will also hold conditional on u and the propensity score. As a matching algorithm, I apply nearest-neighbour propensity score matching with replacement and within caliper. Conditional on u, each treated individual is matched to at least one non-treated individual with the closest propensity score, and used in my analysis if the distance in their respective scores does not exceed a certain maximum (caliper), which I set to 3 percent. To estimate the specific ATET's, I use the built-in command 'teffects psmatch' for STATA, which has the advantage of taking into account that the propensity scores are estimated rather than known when calculating the variances of the ATET's (Abadie & Imbens, 2016).

4.3 CIA

The conditional independence assumption in (2) requires the set of observable characteristics in the estimated propensity score to include all variables, that conditional on u both determine treatment as well as potential outcomes in case of non-treatment (Sianesi, 2004). In other words, conditional on the set of observable characteristics and time spent in unemployment, the fact that individuals enter temporary employment is not correlated with their probability of obtaining permanent employment had they stayed unemployed for at least one additional month. Following Kvasnicka

(2009), I separately discuss the plausibility of the CIA from the viewpoint of the main actors involved, the employer and the unemployed worker, and in relation to regional, seasonal and sectoral labor market conditions.

Regarding employers, it is important to understand the mechanisms causing employers to decide whom to offer a temporary or permanent job, or even no job at all. Intuitively, employers would *ceteris paribus* like to hire and keep individuals with the highest perceived ability/productivity, and will offer no jobs to those not considered to have a sufficient level of productivity. As less productive workers have a lower probability of finding a permanent position and are more likely to remain unemployed, the CIA is implausible. I control for ability in multiple ways. First, I match individuals on general personal characteristics such as gender, age, origin, location and educational levels attained, the latter indicating accumulated human capital levels or providing signals of ability (Arrow, 1974). Next to education, previous occupational status could serve as an important indicator of one´s productivity as well (Scherer, 2004). I adjust for both characteristics of the last job and more general labor market history. Regarding the former, I add information about the type of contract, working hours per week, the hourly wage, job tenure at the last employer and the sector of the last occupational status. More general labor market history is indicated by experience with different types of temporary contracts, employment and unemployment. Finally, employers might consider individuals with a high distance to the labor market and/ or a long unemployment spell as bad hires. By adding the status before unemployment, an indicator if the last job was more than two months ago and conditioning the event of taking up a temporary job on elapsed unemployment duration, I attempt to capture such stigma effects.

Regarding unemployed workers, if individuals accepting temporary jobs have no expected probability of permanent work at all, or on the other hand expect a quick transition of their temporary job in a permanent one, the CIA is not credible. In my analysis, I account for these selection effects in many ways. First, adding the contract type of the last job and experience with certain types of temporary jobs may have some predictive power regarding the decision to accept that particular contract again. Second, individual productivity levels adjust for high ability individuals having a higher realistic expectation of their permanent job prospects. Third, I control for benefit duration by adding covariates regarding employment experience in years, unemployment experience in months UI benefits and an indicator if one fulfills the four-out-of-five years condition. Approaching benefit exhaustion can lead to intensified job search and a declining reservation wage, and will influence both the probability of accepting temporary employment and the amount of permanent job offers. Finally, conditioning on elapsed unemployment duration takes into account duration dependence affecting both the probability of obtaining a permanent position and accepting

temporary work, for example due to the most 'talented' individuals finding a job first, the decrease of human capital (and perceived employment prospects) or the loss of motivation to search for a (permanent) job over time.

General labor market conditions can influence the search behavior of unemployed workers, the hiring behavior of employers and the chances of finding permanent work (Kvasnicka, 2009). For example, the nature of work in certain sectors might require more short-term volatile employment relationships. Workers in these sectors presumably are less hesitant to accept temporary work, but at the same time have a low probability of finding a permanent job. By adding the sector of the last employment spell, I predict the sector in which workers will perform their job search. Variables indicating the quarter of inflow into UI benefits (in 2010) and the part of country one lives in adjust for seasonal and regional effects respectively.

Finally, the CIA is violated if workers that remain unemployed stop searching for a permanent job in anticipation of their future employment status. For example, if one does not search for a job in a certain month simply because he or she has found a permanent job starting in the months after, results are negatively biased. I assume that, when an employer and unemployed worker have found each other, both parties prefer to start the employment relationship at the earliest opportunity. Due to seasonal variations or nature of work in particular sectors, this might be partially infeasible. As mentioned, I control for these variations by adding the quarter of inflow into UI benefits and characteristics of the last job in the estimation of the propensity score.

4.4 Propensity score, matching quality and common support

Estimated propensity scores for three months of elapsed unemployment duration are reported in Appendix B. Caution is required when interpreting the significance and size of the particular coefficients, as multiple effects may be captured into a single covariate and a high degree of multicollinearity between two or more control variables is expected to occur. Yet, the finding that workers with a high distance to the labor market or those whose last job was permanent have a lower probability of entering temporary work is in line with expectations.

Following Sianesi (2004), I reported statistics regarding matching quality and the exclusion of treated individuals due to the caliper in Table 2. As is shown, the matching process substantially reduced the standardized median biases for all months of elapsed unemployment duration (see Appendix C for balancing per covariate), with resulting values far below the common accepted thresholds of 3 or 5 percent (Caliendo & Kopeinig, 2008). The common support condition does not lead to the exclusion of many treated individuals, as for only 3 out of 115,352 workers no match

Table 2: Covariate balancing and common support assumption, before and after matching, by month of elapsed unemployment duration in months

U	No. observations before	No. treated before	Median bias before	Median bias after	No. outside caliper
(1)	(2)	(3)	(4)	(5)	(6)
1	248,724	28,299	6.6	0.3	0
2	207,337	21,816	6.3	0.8	0
3	164,024	19,035	5.8	0.7	2
4	131,628	11,757	6.9	0.7	1
5	113,248	8,182	7.0	0.7	0
6	98,929	6,491	4.6	0.9	0
7	86,886	5,032	5.8	1.0	0
8	76,985	3,985	6.3	1.2	0
9	68,741	3,297	4.9	1.2	0
10	61,685	2,686	4.6	1.9	0
11	55,673	2,288	5.9	1.1	0
12	49,936	2,484	7.5	1.2	0

Source: SSB, own computations. Note: Before = before matching, after = after matching. (1): Elapsed unemployment duration in months. (2): Number of unemployed workers before matching. (3): Number of treated workers (i.e., taking up a temporary job after u months spent unemployed). (4), (5): Median absolute standardadized biases before and after matching taken over all regressors for every month u, where the standardized bias per regressor is calculated as suggested by Rosenbaum & Rubin (1985):

$Bias_{before} = 100 * \frac{\bar{X}_1 - \bar{X}_0}{\sqrt{[V_1(X) + V_0(X)]/2}}$, $Bias_{after} = 100 * \frac{\bar{X}_{1P} - \bar{X}_{0P}}{\sqrt{[V_1(X) + V_0(X)]/2}}$, where $\bar{X}$ and V denote sample mean and associated variance respectively, subscripts 1 and 0 refer to treatment and control group, and subscript P refers to the propensity-score matched sample of treated and non-treated individuals (within the common support). (6): Number of treated workers lost to the common support caliper of 3 percent.

within the caliper of 3 percent exists (see Appendix D for common support graphs displaying the probability of being treated after matching).

5 Results and discussion

5.1 Overall stepping-stone effect

Figure 4 shows that for all months of elapsed unemployed duration u, taking up a temporary job significantly increases the probability to have a permanent job in the three years post treatment.[21] In other words, temporary work provides a stepping-stone into permanent employment for the unemployed. Moreover, the results indicate positive state dependence, as the probability of obtaining permanent work for the unemployed not entering temporary employment is decreasing over time spent in unemployment. Stigma effects, loss of motivation and/ or skills can explain this

[21] Assessing the sensitivity of my results with respect to different matching methods, I perform the same analysis with both Nearest-neighbor mahalanobis matching and Inverse probability weighting with regression adjustment. Results (not shown here) from both methods do not significantly differ from the ones reported in Figure 4.

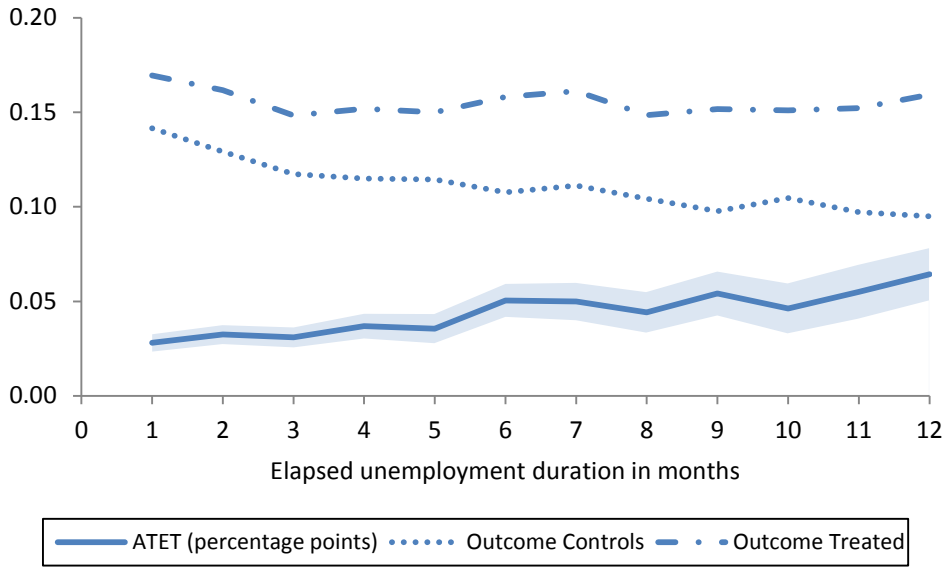

Figure 4 – Average probability of having a permanent job by month of elapsed unemployment duration.

Source: SSB, own computations. Note: Average probability over 36 months post treatment. Shaded area represents 95 percent confidence interval.

finding.

As opposed to De-Graaf Zijl et al. (2011), I do find evidence of a stepping-stone function of temporary jobs for unemployed workers in the Netherlands. As pointed out, the increased need for screening and more 'promising' workers being among the temporary workforce can account for this difference. A second explanation is related to different types of temporary contracts analyzed. Whereas I study all types of temporary work, the other authors specifically exclude FTC with prospect of permanent employment in their analysis, most likely causing lower effects. The next subsection entails contract-type stepping stone heterogeneity, which makes it possible to assess whether FTC are the only contracts providing a stepping-stone into permanent employment.

5.2 Contract-type heterogeneity

I separately analyze fixed-term contracts, temporary agency work and temporary on-call employment.[22] Regarding the latter, small sample sizes lead to mostly insignificant results and inadequate covariate balancing, which is why I choose not to report them. As is evident from Figure 5, both TAW and FTC on average foster access into permanent jobs. The notion of these jobs being dead-ends is clearly rejected. Moreover, the results for TAW provide evidence of FTC (whether or not with prospect of permanent appointment) not being the only type of temporary contract acting as a bridge into permanent employment. Yet, as in France (Givord & Wilner, 2015), FTC do substantially perform better in this regard, which can be related to FTC and TAW being used as

[22] Exits to temporary contract types other than the one being analyzed are treated as right-censored events.

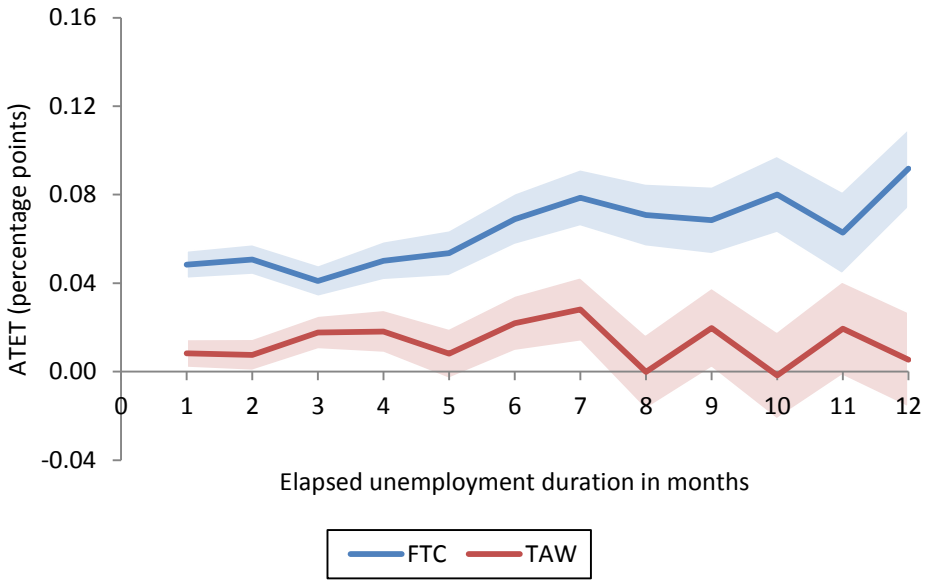

Figure 5 – Treatment effects on average probability of having a permanent job in case of FTC and TAW by month of elapsed unemployment duration.

Source: SSB, own computations. Note: Average probability over 36 months post treatment. Shaded area represents 95 percent confidence interval. Outcomes controls TAW ranging from 8.6 to 11.8 percent. Outcomes controls FTC ranging from 9.8 to 15.3 percent.

screening and flexibility devices respectively. Assuming that employers use FTC for screening, positive effects for TAW indicate the functioning of other mechanisms, such as human capital accumulation, labor market attachment or the access to social networks.

In order to provide more insights into the differences in the stepping-stone effects of those two contracts, treatment effects over time are plotted in Figure 6. As is shown, both types of contracts show initial lock-in and increasing stepping-stone effects, although their specific development patterns substantially differ. Whereas TAW slowly and (roughly) continuously increases the probability of having a permanent job over time, the stepping-stone effect of FTC is characterized by jumps at one, and to a smaller extent at two and three years after entering temporary work. The large increase in the stepping-stone effect at twelve months after entering fixed-term contract work in all likelihood displays the conversion of many one-year contracts into permanent ones.[23] Heyma & van der Werff (2013) and De Vries et al. (2013) obtain similar results by analyzing the transition to permanent jobs in the Netherlands in the late 2000s, from FTC and all flexible employment relationships respectively. Houwing & Kösters (2013) shows that in 2011 nearly half of all FTC workers having a contract with prospect of permanent work in the Netherlands obtain an open-ended contract at the same employer within a year, shares for other FTC ranging from 24 to 38

[23] There is no administrative data available regarding the number of FTC workers holding a one-year contract in the Netherlands. Yet, a survey shows that almost three out of four FTC workers (without an open-ended agreement) in 2011 are employed under a one-year contract (Tijdens, 2012).

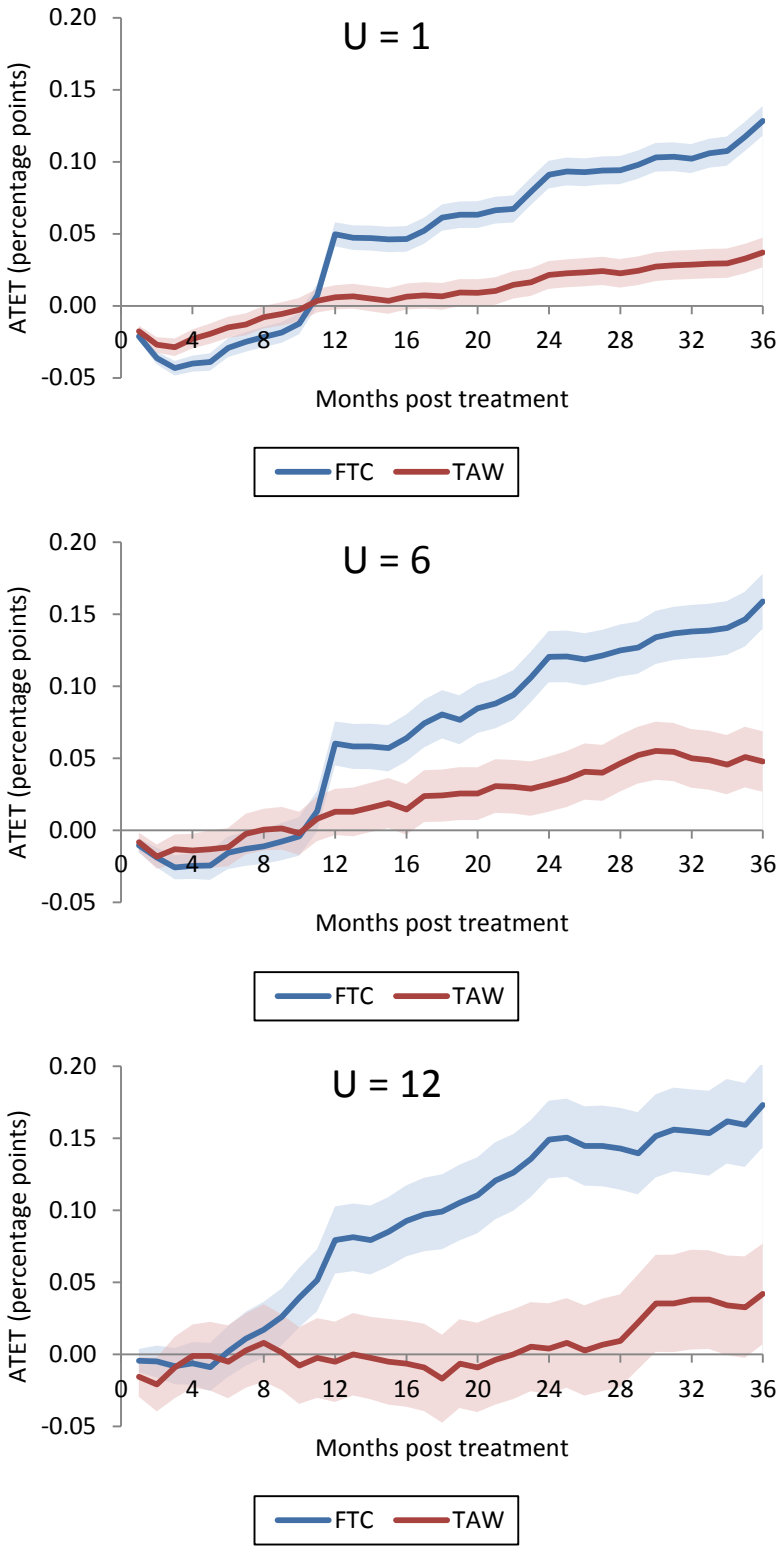

Figure 6 – Treatment effects over time on probability of having a permanent job in case of FTC and TAW for 1, 6 and 12 months of elapsed unemployment duration.

Source: SSB, own computations. Shaded area represents 95 percent confidence interval.

percent. The use of multiple one-year contracts or contracts lasting 24 or 36 months can explain the jumps two and three years after taking up a temporary job, the latter also being the maximum duration that temporary contracts can be offered. Although employers can choose from a number of alternative contract lengths[24], one-year contracts could be optimal in terms of both screening and flexibility. It provides employers with enough time to detect promising workers (compared to the maximum probationary period of two months with open-ended contracts), and they can lay off low ability workers already after twelve months. Finally, as there is a maximum of three temporary contracts in three years that can be offered to the same worker, employers can make the most of both flexibility and keeping relatively productive workers by offering three one-year contracts in a row. Temporary agency work does not show these yearly increases in the probability of obtaining permanent work. This is not surprising considering the distinctive contractual arrangements applying to TAW, as stated in the universally binding Collective Labor Agreement (CLA) of the Dutch Association of Temporary Work Agencies (abbreviated *ABU* in Dutch). Before entering a phase in which the agency can offer eight temporary contracts in a time period of two years[25], agency workers are in principle employed with an agency clause for 78 weeks (see section two), in which there applies no maximum number of contracts allowed.[26]

5.3 Subgroup heterogeneity

As shown in Figure 7, treatment effects are on average higher for older workers, and significantly so for four months of elapsed unemployment duration. Ichino et al. (2008) and Barbieri & Sestito (2008) obtain similar results for Italy, whereas others (e.g. De-Graaf Zijl et al., 2011; Kvasnicka, 2009) find no clear age pattern. Older workers may be highly motivated to find a permanent position, as they have a permanent job as reference point or their (family) situation requires a stable employment relationship. Younger workers presumably want to try out different jobs. From the demand side, older workers may be perceived as less flexible and adaptable, or employers are unsure whether the productivity of older workers will outweigh their relatively high labor costs (see e.g. Heyma et al., 2016), increasing the need for screening devices. In addition, screening younger workers with less work experience in a certain field could be time consuming, as it takes a while

[24] The largest Collective Labor Agreements (CLA's) in the Netherlands do at least not specify a fixed durationn, although the CLA's for nursing and home-care (*Verpleeg-,Verzorgingshuizen en Thuiszorg* in Dutch) in 2010-2012 and primary education in 2009 and 2013 (*Primair Onderwijs* in Dutch) do limit the duration of fixed-term contracts to twelve months.

[25] As of 1 July 2015, this phase changes to a maximum of six contracts in four years.

[26] Agencies affiliated with the Dutch Association of Intermediary Organisations and Temporary Employment Agencies (abbreviated *NBBU* in Dutch) are exempted from the ABU CLA. Regarding contractual arrangements, the NBBU CLA differs in that the agency-clause period lasts for 130 weeks, after which four contracts can be offered in 52 weeks. As of 1 July 2015, the latter phase changes to a maximum of six contracts in four years, while the agency-clause period will be restricted to 78 weeks as of 1 July 2016.

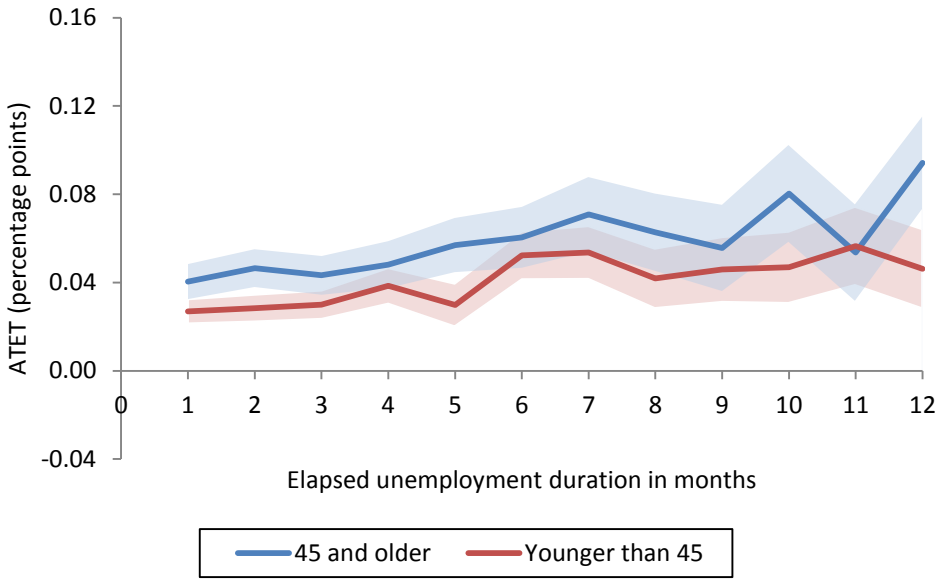

Figure 7 – Treatment effects on average probability of having a permanent job for different age groups by month of elapsed unemployment duration.

Source: SSB, own computations. Note: Average probability over 36 months post treatment. Shaded area represents 95 percent confidence interval.

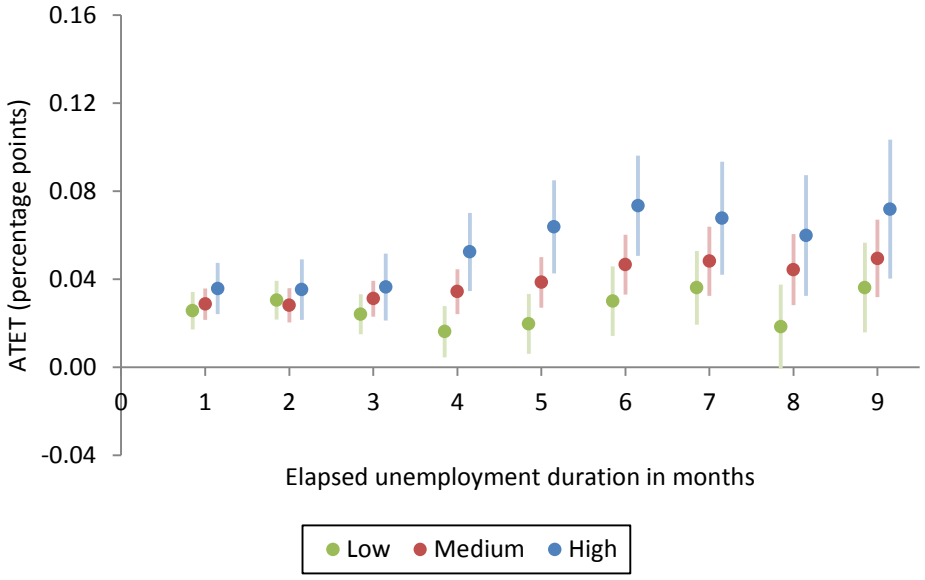

Figure 8 – Treatment effects on average probability of having a permanent job for different educational levels by month of elapsed unemployment duration.

Source: SSB, own computations. Note*:* Average probability over 36 months post treatment. Educational attainment levels correspond to those stated by Eurostat. Due to inadequate covariate balancing, elapsed unemployment months 10-12 are not reported. Vertical bars represent 95 percent confidence intervals.

before their real productivity can be assessed.

Figure 8 depicts outcomes for different educational levels. Higher educated seem to benefit more from temporary jobs in finding permanent jobs. Effects between two successive educational

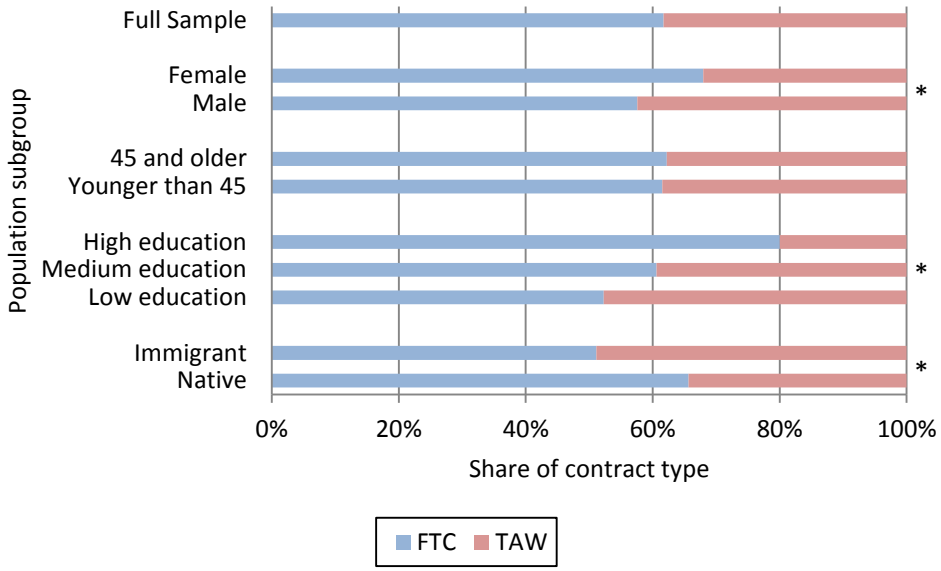

Figure 9 – Share of contract type in exits to TAW and FTC for different population subgroups.
Source: SSB, own computations. Note: * indicates that, at the 1 percent level, (all) subgroups are differently represented in FTC and TAW.

levels are never statistically different from each other, but higher educated individuals do for some months u perform significantly better than their lower educated counterparts. Yet, this does not necessarily mean that obtaining higher education entails a higher stepping-stone effect, as it could also reflect educational groups being differently represented in FTC and TAW. Figure 9 shows that higher education individuals are overrepresented in fixed-term contracts, whereas TAW provides a major exit route out of unemployment for lower educated workers. Such a disproportional allocation does not apply to age groups, and only to a smaller extent to gender and ethnicity. Disentangling 'pure' educational stepping-stone heterogeneity, I perform separate analyses for educational levels conditional on contract type. As is evident from Figure 10, the pattern of higher educated having a higher stepping-stone effect is substantially less clear for both FTC and TAW, and there are no remaining significant differences between the effects of any education level for any month of elapsed unemployment duration. Yet, it is (especially) difficult for TAW to obtain significant differences across educational levels, as the sample size of higher educated entering temporary agency work is relatively low.

Finally, ethnicity and gender do not seem to matter for the stepping-stone effect of temporary jobs (results not shown here). Regarding ethnicity, this contradicts findings by Jahn & Rosholm (2013) and De Graaf-Zijl et al. (2011), who obtain higher stepping-stone effects for immigrants (especially from non-western countries) and male-ethnic minorities respectively. Both studies relate their findings to employers having more difficulties with assessing the productivity of non-native unemployed workers, increasing the need for screening devices. Following the same line of

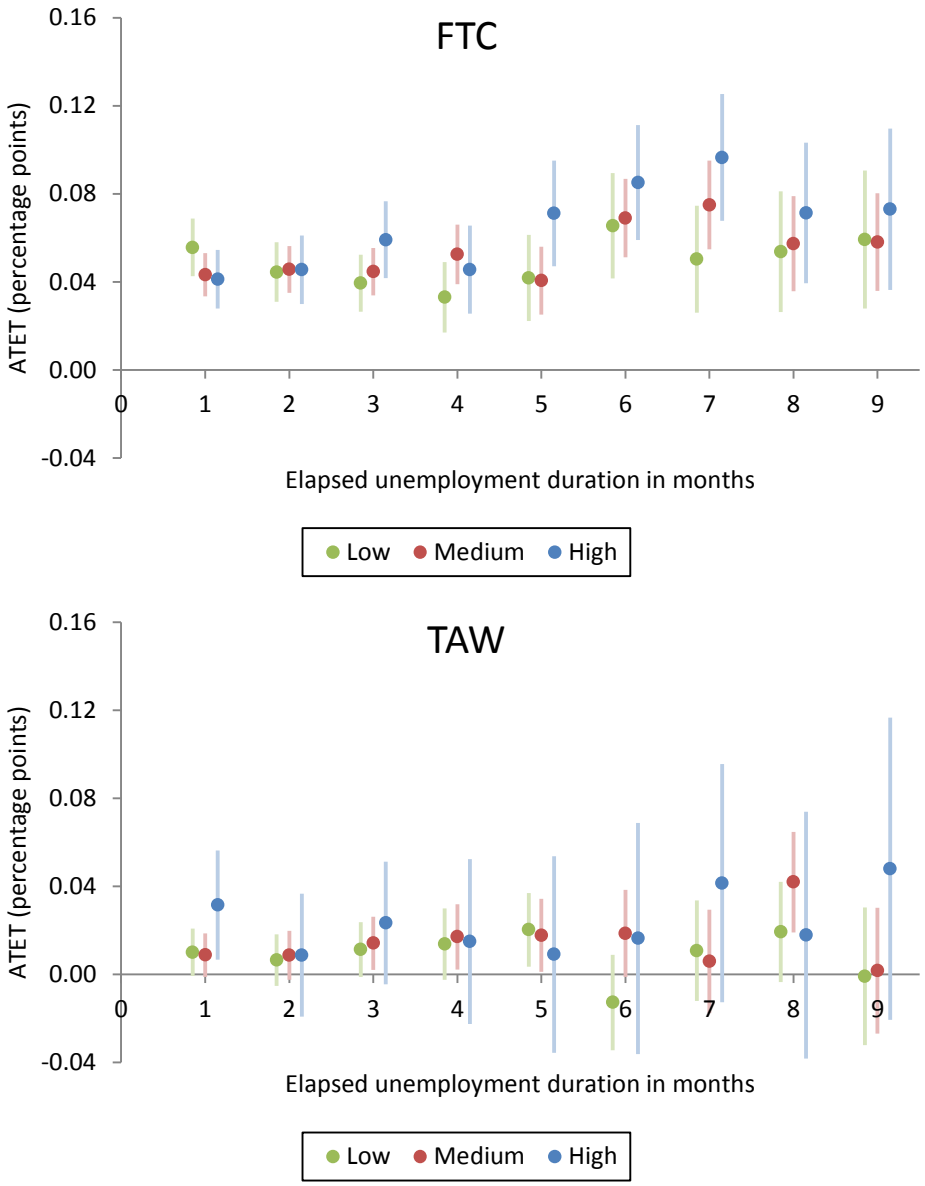

Figure 10 – Treatment effects on average probability of having a permanent job for different education levels by type of temporary contract and month of elapsed unemployment duration. Source: SSB, own computations. Note: Average probability over 36 months post treatment. Educational attainment levels correspond to those stated by Eurostat. Due to inadequate covariate balancing, elapsed unemployment months 10-12 are not reported. Vertical bars represent 95 percent confidence intervals.

reasoning, these 'difficulties' probably decreased over the years, as employers became increasingly more accustomed to non-native individuals among their workforce.

6 Conclusion

Using data covering the period 2010-2014, I apply dynamic propensity score matching to assess whether temporary jobs provide a stepping-stone towards permanent employment for unemployed workers in the Netherlands. I find that temporary jobs on average do help the unemployed in finding

permanent positions. Both fixed-term contracts and temporary agency work serve as stepping stones, although fixed-term employment performs substantially better in this regard. Effects are somewhat higher for older and higher educated individuals, the latter primarily a consequence of higher educated individuals being overrepresented in fixed-term contracts, and lower educated individuals being disproportionally found in temporary agency work. From a policy point of view, my results emphasize the usefulness of temporary jobs in getting unemployed workers (back) into stable employment. The best way of achieving this is to provide access to fixed-term contracts. Yet, if for some individuals obtaining such contracts appears to be infeasible, they should be stimulated to register at temporary work agencies. Incentive policies making temporary work more attractive for individuals collecting unemployment benefits should be encouraged. These implications are particularly true for older unemployed workers, as they seem to benefit more from temporary jobs in terms of finding a permanent position than their younger counterparts.

It should be noted that by only looking at the permanency of the job, I ignore other aspects of job quality such as job satisfaction or the wage level. Furthermore, limiting the analysis to the probability of having permanent work neglects more general but important labor market outcomes such as the probability of being employed or unemployed. Further research should address these issues in order to give a complete picture of the benefits of temporary jobs for the unemployed. Finally, the plausibility of my results rests on a method that corrects for selection effects by matching individuals on observed characteristics. Despite the richness of the dataset, I cannot exclude the existence of any remaining unobserved heterogeneity. Future institutional changes providing exogenous variation into taking up a temporary job can be useful for assessing the validity of my results.

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Appendix A

Table A1: Summary statistics of the sample at entry into UI benefits (in percentages, unless stated otherwise)

Personal characteristics:		Wage (in euro per hour)	15.69
Gender (female)	42.14	Wage (in euro per hour) groups:	
Age (in years)	40.92	Less than 10	18.12
Age (in years) groups:		Between 10 and 15	43.04
Between 25 and 35	32.27	Between 15 and 25	30.40
Between 35 and 45	31.79	25 or more	8.44
Between 45 and 60	35.94	Sector:	
Native	70.23	Agriculture, forestry and fishing	1.04
Part of Country:		Construction and industry	17.49
North	11.65	Trade and transport	18.51
East	20.80	Accommodation and food service activities	3.28
West	45.25	Information and communication	4.26
South	22.30	Financial, insurance and real estate activities	4.65
Educational attainment:		Professional, technical and support service activities	34.50
Primary and pre-primary	7.76	Public administration, health care and education	12.69
Lower secondary	18.13	Arts, recreation and other services	3.57
Upper secondary	36.56	Job tenure at last employer:	
Post-secondary non-tertiary	3.30	Less than one year	36.35
Tertiary	17.41	Between one and five years	47.04
Unknown	16.83	Five years or more	16.61
Status before unemployed:		Last job was more than two months ago	10.74
Inactive	7.32	General (un)employment characteristics:	
Sickness benefits	8.93	Any experience with (since 2006):	
Dependent wage-employed	78.88	Temporary agency work	37.92
Other	4.87	Temporary on-call employment	10.81
Characteristics last job:		Fixed-term contracts	63.79
Contract type:		Employment experience since 1999 (in years)	8.95
Open-ended contract	42.91	Worked at least four out of last five years	81.46
Temporary agency work	16.37	Unemployment experience since 1999 (in months UI benefits)	5.19
Temporary on-call employment	2.69	Quarter of inflow into UI benefits:	
Fixed-term contract	38.03	1st quarter	36.53
Working hours a week:		2nd quarter	21.34
Less than 25	25.77	3rd quarter	21.75
Between 25 and 35	21.26	4th quarter	20.38
35 or more	52.97		

Source: SSB, own computations. Note: Sample size = 262,908 individuals.

Appendix B

Table B1: Estimation of propensity score by month of elapsed unemployment duration

	U = 1		U = 6		U = 12	
Personal characteristics:						
Gender (female)	0.031	(0.015)*	0.040	(0.030)	0.128	(0.049)**
Age	-0.020	(0.001)***	-0.041	(0.002)***	-0.063	(0.003)***
Native	0.227	(0.016)***	0.208	(0.032)***	0.285	(0.052)***
Part of country (ref: West):						
North	0.064	(0.021)**	0.080	(0.045)	0.052	(0.072)
East	0.079	(0.017)***	0.004	(0.035)	0.092	(0.056)
South	0.140	(0.017)***	0.076	(0.034)*	0.175	(0.055)**
Educational attainment (ref: Upper secondary):						
Primary and pre-primary	-0.160	(0.028)***	-0.174	(0.058)**	-0.163	(0.092)
Lower secondary	-0.085	(0.019)***	-0.081	(0.037)*	0.030	(0.059)
Post-secondary non-tertiary	0.082	(0.038)*	0.064	(0.072)	0.101	(0.110)
Tertiary	0.095	(0.020)***	0.083	(0.040)*	0.038	(0.066)
Unknown	-0.047	(0.020)*	-0.040	(0.039)	-0.121	(0.062)
Status before unemployed (ref: Dependent wage-employed):						
Inactive	-0.216	(0.032)***	0.094	(0.051)	0.024	(0.083)
Sickness benefits	-0.675	(0.043)***	-0.351	(0.072)***	-0.502	(0.117)***
Other	-0.349	(0.041)***	-0.336	(0.077)***	-0.277	(0.113)*
Characteristics last employment spell:						
Contract type (ref: Open-ended contract):						
Temporary agency work	0.731	(0.027)***	0.568	(0.057)***	0.346	(0.095)***
Temporary on-call employment	0.326	(0.044)***	0.232	(0.107)*	0.199	(0.159)
Fixed-term contract	0.196	(0.019)***	0.244	(0.037)***	0.107	(0.061)
Working hours per week (ref: Less than 25):						
Between 25 and 35	-0.045	(0.019)*	0.116	(0.040)**	-0.126	(0.062)*
35 or more	0.046	(0.017)**	0.207	(0.037)***	-0.083	(0.057)
Wage	-0.006	(0.001)***	-0.003	(0.002)	-0.004	(0.003)
Sector (ref: Professional, technical and support service activities):						
Agriculture, forestry and fishing	0.299	(0.063)***	0.637	(0.128)***	-0.466	(0.328)
Construction and industry	0.013	(0.024)	0.189	(0.046)***	0.126	(0.073)
Trade and transport	0.030	(0.023)	0.118	(0.043)**	0.054	(0.069)
Accommodation and food service activities	0.062	(0.040)	0.175	(0.079)*	-0.103	(0.137)
Information and communication	-0.153	(0.039)***	0.010	(0.069)	-0.053	(0.111)
Financial, insurance and real estate activities	-0.214	(0.040)***	-0.094	(0.068)	-0.322	(0.109)**
Public administration, health care and education	0.204	(0.024)***	-0.081	(0.051)	-0.091	(0.078)
Arts, recreation and other services	-0.004	(0.039)	-0.046	(0.079)	0.099	(0.117)
Job tenure at last employer (ref: Less than one year):						
Between one and five years	-0.388	(0.015)***	-0.208	(0.031)***	-0.228	(0.051)***
Five years or more	-0.669	(0.029)***	-0.482	(0.050)***	-0.411	(0.076)***

Table B1 (continued)

	U = 1		U = 6		U = 12	
Last job was more than two months ago	-0.473	(0.043)***	-0.307	(0.069)***	0.007	(0.108)
General (un)employment characteristics:						
Any experience with (since 2006):						
Temporary agency work	0.131	(0.017)***	0.068	(0.035)	0.111	(0.060)
Temporary on-call employment	0.148	(0.022)***	-0.112	(0.053)*	0.162	(0.087)
Fixed-term contracts	0.154	(0.018)***	0.005	(0.038)	0.177	(0.061)**
Employment experience since 1999 (in years)	0.048	(0.004)***	0.011	(0.009)	0.055	(0.015)***
Unemployment experience since 1999 (in months UI benefits)	-0.013	(0.001)***	0.003	(0.002)	-0.010	(0.003)***
Worked at least four out of last five years	0.109	(0.025)***	0.380	(0.066)***	0.158	(0.104)
Quarter of inflow into UI benefits (ref: 1st quarter):						
2nd quarter	0.043	(0.018)*	0.051	(0.035)	-0.522	(0.057)***
3rd quarter	0.251	(0.017)***	0.001	(0.036)	-0.637	(0.059)***
4th quarter	-0.006	(0.018)	0.165	(0.036)***	-0.764	(0.065)***
Constant	-1.997	(0.051)***	-1.725	(0.123)***	-0.524	(0.214)*

Source: SSB, own computations. Note: Standard errors in parantheses. * significant at 5%, ** significant at 1%, *** significant at 0.1%

Appendix C

Table C1: Covariate balancing: raw and weighted standardized differences of all covariates by month of elapsed unemployment duration

	U = 1		U = 6		U = 12	
	Raw	Weighted	Raw	Weighted	Raw	Weighted
Personal characteristics:						
Gender (female)	-0.003	0.001	-0.027	-0.019	0.081	-0.006
Age	-0.292	0.001	-0.431	-0.007	-0.555	-0.011
Native	0.077	0.005	0.029	0.014	0.072	-0.015
Part of country:						
North	0.044	0.014	0.038	0.020	0.022	0.027
East	0.015	0.008	-0.008	-0.009	0.021	-0.011
West	-0.077	-0.014	-0.028	-0.008	-0.069	-0.030
South	0.042	-0.002	0.013	0.003	0.045	0.026
Educational attainment:						
Primary and pre-primary	-0.067	0.001	-0.061	-0.002	-0.074	0.038
Lower secondary	-0.007	0.003	0.000	-0.007	0.038	-0.022
Upper secondary	0.050	-0.002	0.061	0.010	0.076	0.007
Post-secondary non-tertiary	-0.009	-0.005	-0.016	-0.005	-0.011	-0.020
Tertiary	0.049	0.004	0.034	0.011	0.015	0.014
Unknown	-0.059	-0.003	-0.064	-0.013	-0.092	-0.012
Status before unemployed:						
Inactive	-0.134	-0.002	-0.038	0.001	-0.068	-0.004
Sickness benefits	-0.219	0.002	-0.142	0.013	-0.123	-0.011
Dependent wage-employed	0.295	0.002	0.188	-0.027	0.169	0.011
Other	-0.115	-0.003	-0.125	0.039	-0.074	-0.002
Characteristics last job:						
Contract type:						
Open-ended contract	-0.322	-0.002	-0.268	-0.003	-0.262	0.002
Temporary agency work	0.294	0.001	0.178	-0.014	0.157	-0.001
Temporary on-call employment	0.046	-0.001	-0.004	0.006	0.059	0.005
Fixed-term contract	0.055	0.001	0.149	0.013	0.149	-0.003
Working hours per week:						
Less than 25	0.036	0.004	-0.075	-0.013	0.103	0.003
Between 25 and 35	0.001	0.005	0.009	-0.004	-0.009	0.017
35 or more	-0.033	-0.008	0.056	0.014	-0.085	-0.016
Wage	-0.122	-0.003	-0.091	-0.008	-0.153	0.022
Sector:						
Agriculture, forestry and fishing	0.011	0.008	0.041	-0.003	-0.048	0.021
Construction and industry	-0.118	0.002	-0.019	-0.017	-0.032	-0.008
Trade and transport	-0.065	0.000	0.007	0.003	0.026	-0.019
Accomodation and food service activities	-0.006	0.000	0.023	0.030	-0.002	0.007
Information and communication	-0.070	-0.003	-0.028	0.014	-0.035	-0.019

Table C1 (continued)

	U = 1		U = 6		U = 12	
	Raw	Weighted	Raw	Weighted	Raw	Weighted
Financial, insurance and real estate activities	-0.099	0.000	-0.076	-0.006	-0.110	0.023
Professional, technical and support service activities	0.195	-0.001	0.115	-0.015	0.129	0.004
Public administration, health care and education	0.029	-0.003	-0.087	0.014	-0.064	0.010
Arts, recreation and other services	-0.024	0.005	-0.026	0.009	0.019	0.013
Job tenure at last employer:						
Less than one year	0.323	0.002	0.193	0.000	0.214	-0.030
Between one and five years	-0.127	-0.011	0.051	-0.002	0.064	0.049
Five years or more	-0.283	0.015	-0.286	0.003	-0.289	-0.026
Last job was more than two months ago	-0.267	0.002	-0.192	0.028	-0.145	-0.003
General (un)employment characteristics						
Any experience with (since 2006):						
Temporary agency work	0.293	0.001	0.236	0.001	0.228	-0.008
Temporary on-call employment	0.126	0.004	0.035	-0.009	0.109	0.007
Fixed-term contracts	0.216	-0.007	0.231	-0.003	0.265	0.017
Employment experience since 1999 (in years)	0.059	-0.004	-0.008	0.002	0.064	-0.017
Worked at least four out of last five years	0.105	0.000	0.118	0.014	0.067	-0.039
Unemployment experience since 1999 (in months UI benefits)	-0.066	0.002	0.014	0.017	-0.049	0.002
Quarter of inflow into UI benefits:						
1st quarter	0.002	0.003	-0.007	0.013	0.355	0.002
2nd quarter	-0.044	-0.007	-0.015	0.005	-0.107	-0.009
3rd quarter	0.080	0.006	-0.034	-0.013	-0.147	0.030
4th quarter	-0.043	-0.003	0.058	-0.006	-0.198	-0.025

Source: SSB, own computations. Note: Raw and weighted standardized differences per regressor are calculated as suggested by Rosenbaum & Rubin (1985):

$Bias_{raw} = 100 * \frac{\bar{X}_1 - \bar{X}_0}{\sqrt{[V_1(X) + V_0(X)]/2}}$, $Bias_{weighted} = 100 * \frac{\bar{X}_{1P} - \bar{X}_{0P}}{\sqrt{[V_1(X) + V_0(X)]/2}}$, where $\bar{X}$ and V denote sample mean and associated variance respectively, subscripts 1 and 0 refer to treatment and control group, and subscript P refers to the propensity-score matched sample of treated and non-treated individuals (within the common support).

Appendix D

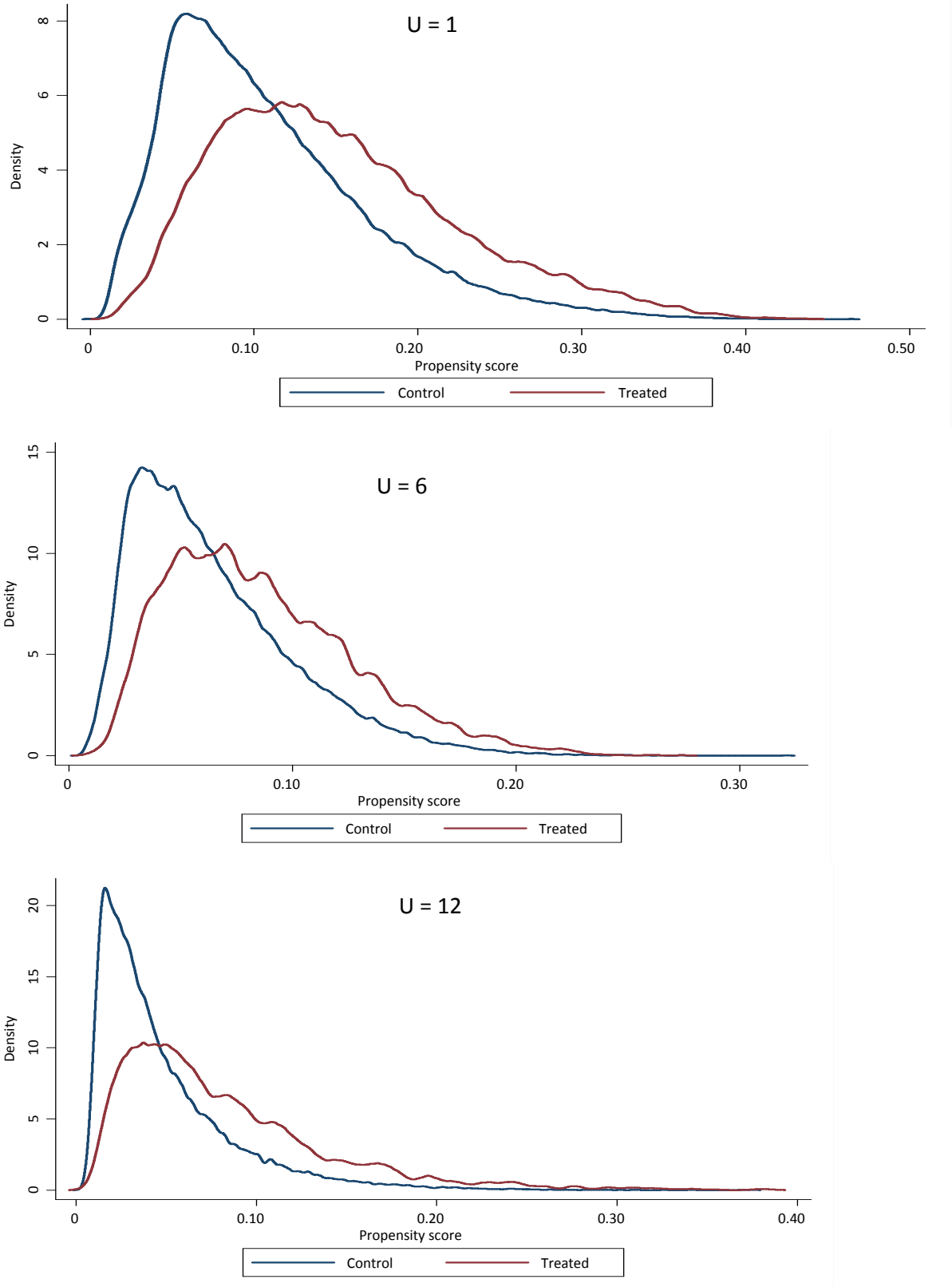

Figure D1 – Probability of treatment after matching by month of elapsed employment duration.
Source: SSB, own computations