Stepping stones for the unemployed?
Effects of temporary jobs on job search duration of the unemployed

draft version

Marloes Zijl
Arjan Heyma
Gerard van den Berg

February 2002

Abstract

During the search for a regular job, unemployed individuals may accept a temporary job as an intermediate position. In the Netherlands agency work is more common than in most other countries. Therefore it is particularly useful to test its implications for the job search of Dutch unemployed. We use a longitudinal micro data set to investigate whether such work experience increases the probability of finding a regular job. To deal with selectivity we simultaneously model the transitions from unemployment to temporary jobs, from temporary jobs to regular jobs, from unemployment to regular jobs and from temporary jobs to unemployment. The results show whether stepping stones for the unemployed exist. They can serve as a tool for determining job flexibility policies and active labour market programmes in other OECD countries.

keywords: unemployment, fixed term contracts, temporary work, job search, duration model, treatment effect
JEL-codes: J64, C41

1. Introduction

Western societies experience an increase in the use of flexible forms of labour. Politicians, but also scientists in psychology, sociology and economics are involved in an extensive debate on the effects of flexible types of employment. For the social acceptance of atypical labour it is important that these effects are carefully studied. Several aspects of these effects can be distinguished.

Some authors have expressed concern about the quality of flexible jobs. Lack of training possibilities and opportunities for career advancement are argued to be associated with temporary work (Farber, 1997 and 1999; Arulampalam and Booth, 1998; Amuedo-Dorantes, 2002). Purcell et al. (1999) have found low levels of retention and motivation of temporary workers.

Other authors have stressed positive consequences of increased labour market flexibility. Temporary contracts imply lower layoff cost and therefore stimulate employment creation (see for example Bentolila and Bertola, 1990; Bentolila and Saint Paul, 1994; Booth, 1997; Hoffman and Walwei, 1999; McKinsey and Company, 2000). Ooto (1999) has found

evidence that the increased use of temporary workers has lowered the natural rate of unemployment. Furthermore economic performance of firms might increase, because there could be less of a need to hoard workers to protect against a sudden upswing in demand. And the use of temporary workers could reduce cyclical swings in labour productivity since firms might be better able to shed workers quickly during a downturn (Estevão and Lach, 1999).

In this paper we focus on the potentially positive effect of increased labour market flexibility by way of improving the match between firms and workers, thus helping unemployed in finding a job. In such a case temporary jobs provide an important potential route for benefit recipients to enter the permanent workforce. When this so-called 'stepping stone hypothesis' holds for long-term unemployed, it causes unemployment to become more equally spread in duration. The total pool of unemployed consists to a larger extent of short-term unemployed instead of a small group of long-term unemployed. Long-term unemployment declines, even if total unemployment does not change.

There are a few possible explanations for the so-called stepping stone hypothesis. First of all temporary jobs may allow individuals to acquire some additional human capital, which makes them more attractive to employers. Secondly, having had a temporary job may be informative on the ability and motivation of the individual (screening or signalling). Some authors show that employers do indeed use atypical contracts as a way of screening for permanent jobs (e.g. Atkinson et al., 1996; McKinsey and Company, 2000), although this hardly ever is the main reason.

We test the stepping-stone hypothesis and its possible explanations by examining whether work experience in a temporary job increases the individual transition rate to a permanent job. Using a Dutch longitudinal survey on labour supply we estimate a multi-state multi-spell duration model. We distinguish between unemployment, having a temporary job and having a permanent job. The relevant transition rates are modelled as functions of observed and unobserved explanatory variables. Allowing for variation of observed and unobserved explanatory variables is necessary in order to correct for non-random inflow into permanent jobs. If more motivated individuals have less trouble finding permanent jobs, but are also over-represented among those in temporary jobs, then a casual observer might conclude that there is a positive causal effect even if in reality there is none.

2. Data

We use longitudinal data collected by the Dutch Institute for Labour Studies (OSA). The OSA labour supply panel, first fielded in 1985, is a face-to-face biannual panel survey among a representative sample of some 4,000 individuals. We use data from 1988 to 1998. Since we are interested in the labour market transitions of the unemployed, we selected only those individuals that were unemployed at least once during this period. As a result we have 1101 observations.

Table 1 provides some descriptive statistics of the duration data. Even though it tells us no more than the labour market position of individuals at the survey moments, it does give some insight into the data. E.g. it shows that 15% of the unemployed are in temporary

employment two years later. For twelve western European countries the OECD (1996) has determined the labour market position of the unemployed after one year. The share that was in temporary employment one year later ranged from 5% in Belgium to 24% in Spain in 1994. In the Netherlands this share was estimated at 8%. Dekker and Kaiser (2000) showed that in 1996 10% of men and 9-14% of women unemployed in 1995 were in temporary jobs in countries such as Germany, the Netherlands and the UK. Therefore our numbers are roughly consistent with earlier findings.

Also, table 1 shows that 30% of the individuals in temporary employment found a permanent position two years later. The OECD (1996) has indicated that in France 32% of the temporary employed were in a permanent job after one year. In Germany, Spain and the UK these numbers were respectively 15%, 9% and 25%. Dekker and Kaiser find for Germany, the Netherlands and the UK respectively 33%, 24% and 31% of the temporary employed on a permanent contract. Segal and Sullivan (1997) for the US find 57% of temporary employees in regular jobs after one year. Samek Lodovici and Semenza (2001) for Italy show this share to be 43% after 1¼ years.

Transition to unemployment are extremely large in our sample since we selected only those persons that were unemployed at least once during the years under consideration.

Table 1   Labour market transition rates in the Netherlands 1988-1998 (percent)

Labour force status t	*Labour Force Status t+2*			
	Out of the labour force	Unemployment	Temporary employment	Permanent employment
Out of the labour force	58%	29%	5%	8%
Unemployment	25%	34%	15%	26%
Temporary employment	8%	26%	36%	30%
Permanent employment	3%	23%	7%	67%

As noted, table 1 just shows the labour market position of individuals at the survey moment. Our data allow us much more insight, because they also provide information on the labour market transition between survey moments. Figure 1 shows the total number of these transitions. Although we present the number of transitions to and from the status 'not in the labour force', we will not use this state in our analyses. Also the transition from permanent employment to unemployment and from permanent employment to temporary employment will be ignored. We focus on the transition from unemployment to permanent employment and the role of temporary employment in that transition.

Figure 1   Labour market transitions in the data set
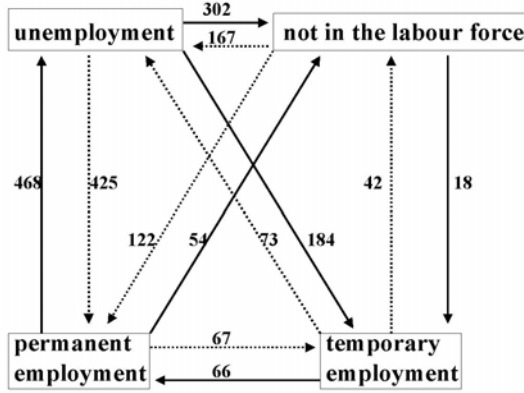
3. The model specification

The transition rates

In our analysis we use the model by Van den Berg et al. (1999), which they constructed in order to determine the existence of stepping stone jobs in the Dutch medical profession. They develop a competing risk hazard model, like the one used in Amuedo-Dorantes (2000) on temporary employment. There are however two important differences: (1) Van den Berg et al. (1999) use multiple states and multiple spells; and (2) they correct for unobserved heterogeneity.

Competing risk hazard models are used to examine the likelihood of transitions from one state to multiple other states. Our model examines the likelihood of transition between multiple states, namely between unemployment, temporary employment and permanent employment. The hazard rate measures the rate at which an individual flows from one state i to another j, given that he survived in that state until the current moment. If we let the indices 1, 2 and 3 denote the states of "unemployment", "temporary employment" and "permanent employment", and denote the hazard rate from state i to j by θ_{ij} then the survivor function in state i can be expressed by:

$$S_i(t) = e^{-\sum_{j=1, j\neq i}^{j=3} \int_0^t \theta_{ij}(s)ds}$$

Once an individual is in state i, he has two possibilities: he either remains in that state or a transition is made towards another state. Thus, if we define the dummy variable d_{ijk} to equal 1 if the individual makes a transition from state i to state j in spell k (out of a total of m_i spells in state i), the log likelihood contribution of an individual can be expressed by:

$$\log L = \sum_{i=1}^2 \sum_{k=1}^{m_i} \log S_i(t_k) + \sum_{j=1, j\neq i}^{j=3} d_{ijk} \log \theta_{ij}(t_k)$$

4

The only unknowns in this model are the θ_{ij}. Since the log likelihood is separable in θ_{ij}, they can be estimated separately (see Lancaster 1990).

We allow the individual transition rates to depend on observed characteristics. If λ_{ij} is a baseline hazard for transition from state i to j, β_{ij} is a vector of parameters to be estimated and x_{ij} contains individual characteristics, we define a proportional hazard model specification as follows:

$$\theta_{ij}(t \mid x) = \lambda_{ij}(t)e^{\beta_{ij}^{'}x_{ij}}$$

Observed characteristics to be used as explanatory variables are e.g. age, gender, educational level, region of living, number of kids at home and having a working partner. Annex 1 gives an overview of the sample average of these characteristics.

Thus far, the method is more or less the same as applied in Amuedo-Dorantes (2000). We proceed however with correcting for unobserved heterogeneity. Unobserved heterogeneity may lead to distortion in conclusions on the treatment effect of temporary employment in finding a permanent job. E.g. if individuals that are more motivated to find a job are more inclined to take a temporary position, and at the same time these individuals have a higher probability of finding a permanent job anyway, we might conclude that taking a temporary job helps in finding permanent employment. In case this motivation is observed in the data and included as explanatory variable, the model would correct for it. But if this motivation is unobserved, conclusions will be distorted. The inclusion of unobserved heterogeneity in the model corrects for omitted unobserved characteristics of individuals, as well as for measurement errors in the dependent variable (see Lancaster 1990). To include unobserved heterogeneity, following Van den Berg et al (1999) we use a mixed proportional hazard model for each transition rate, by introducing multiplicative random effects v_{ij} that are state and exit specific:

$$\theta_{ij}(t \mid x, v_{ij}) = \lambda_{ij}(t)e^{\beta_{ij}^{'}x_{ij}+v_{ij}}$$

$$S_i(t \mid x, v_{ij}) = e^{-\sum_{j=1, j\neq i}^{j=3} \int_0^t \theta_{ij}(s \mid x, v_{ij})ds}$$

For a given individual the values of v_{ij} are assumed to be identical across different spells in the same state. To deal with selective inflow into temporary employment and permanent employment, we allow the v_{ij} to be related for a given individual. For example, the observed transition rate from temporary employment to permanent employment may be higher than the observed rate from unemployment to permanent employment just because individuals for whom it is easy to find permanent employment tend to self-select into temporary employment. Then v_{12} is positively related to v_{13}.

The likelihood is conditional on v. If F is the cumulative distribution function of v, the marginal individual likelihood contribution equals:

$$\log L = \log \int_v \sum_{i=1}^2 \sum_{k=1}^{m_i} S_i(t_k) + \sum_{j=1, j\neq i}^{j=3} [\theta_{ij}(t_k)]^{d_{ijk}} dF(v)$$

5

This likelihood is not separable anymore in the parameters of the different transition rates.

In this model the effect of a temporary job on the individual transition rate into permanent employment follows from a comparison of $\theta_{13}(t|x,v_{13})$, the transition rate from unemployment to a permanent job and $\theta_{23}(t|x,v_{23})$, the transition rate from temporary employment to a permanent job. The difference between these two, which can be called the 'treatment effect' of temporary employment, consist of a difference in the baseline hazard $\lambda_{ij}(t)$, and a difference in the effect in β_{ij}. If the baseline hazards $\lambda_{ij}(t)$ are constant, the transition rates are constant over time, and their ratio defines the change in the rate of inflow into permanent employment that is due to having a temporary job, for an individuals with a given x and v. Non-constant baseline hazards take account of the way in which this effect changes over the duration of unemployment and temporary jobs. The β_{ij} show to what extend individuals with certain characteristics x make the transition from state i to state j. Differences in these reactions can also be attributed to having a permanent job. The fact that we allow for $\beta_{13} \neq \beta_{23}$ and v_{13}/v_{23} to be different across individuals, means that we allow the effect of a temporary job to differ between individuals. An average effect is obtained by averaging the individual effect over x and v.

For an individual with given x and v, this shows the probability of finding a permanent job within period t, either by direct transition or via a temporary job.

Functional forms

Following Van den Berg et al. (1999) we take the duration dependence functions $\lambda_{ij}(t)$ to have piecewise constant specifications. Let the time axis be subdivided into a finite number of intervals numbered 1,2,… from the origin onwards. Let t denote the elapsed duration, τ refer to the consecutive intervals and $I_\tau(t)$ denote time-varying dummy variables that are equal to 1 iff t is in the interval τ. The piecewise constant duration dependence function can be written as

$$\lambda_{ij}(t) = \sum_{\tau=1,2,\ldots} \lambda_{ij\tau} I_\tau(t)$$

With an increasing number of time intervals any duration dependence pattern can be approximated arbitrarily close. Duration dependence specifications with only one parameter (like a Weibull specification) are considered to be overly restrictive (see e.g. Lancaster 1990).

Again following Van den Berg et al. (1999) we take the distribution of unobserved heterogeneity $F(v)$ to be discrete with a finite number of mass points (N). Both the locations of the mass points and the associated probabilities are unknown parameters. Let p_n with $n=1,2,\ldots,N$ denote probabilities that add to 1, and let v_{ijn} denote a realisation of the random variable v_{ij}. We assume that

$$\Pr(v_{ij} = v_{ijn}) = p_n \quad \text{for all } ij \in \{12,12,21,23\}$$

and $v_{ij} = v_{ijn} \Leftrightarrow v_{i^*j^*} = v_{i^*j^*n} \quad \text{for all } ij, i^*j^* \in \{12,12,21,23\}$

This family of distributions is a special case of the general multivariate discrete distribution for $(v_{12}, v_{13}, v_{21}, v_{23})$. The latter has N possible realisations of each v_{ij}, while every combination of v_{ij} and v_{i*j*} is allowed. Therefore, the vector v has $4N$ possible realisations and N^4 combinations, which amount to N^4 p's, minus one p for normalisation. This results in $N^4 + 4N - 1$ unknown parameters, which is unfeasible to estimate even for $N=2$. In contrast, our multivariate specification limits the possible combinations of v_{ij} and v_{i*j*} by the restriction $v_{ij} = v_{ijn} \Leftrightarrow v_{i*j*} = v_{i*j*n}$. Then we have only $5N-1$ unknown parameters. It restricts the general multivariate distribution by imposing a deterministic relation between the elements of $(v_{12}, v_{13}, v_{21}, v_{23})$. This relation is not imposed to be monotone.

This specification implies that for given N, the total number of unknown parameters equals the sum of:
(a) the number of elements of β_{ij} times the number of ij-combinations
(b) the number of parameters $\lambda_{ij\tau}$ minus one for normalisation, times the number of ij-combinations
(c) $5N-1$ parameters of the specification of $F(v)$.

Identification

Our model implies that (properties of) the distribution of the observed durations are quite complicated non-linear functions of the parameters. Some caution on identification therefore seems appropriate. By Heckman and Honoré (1989), the parameters of a flexible competing risk model with mixed proportional hazards are nonparametrically identified under weak conditions. Our model implies competing risk specifications for the exits out of unemployment as well as out of temporary employment. The distribution of v in the inflow into temporary employment is determined by the distribution of v in the outflow out of unemployment. Note that in both cases we observe more than in a competing risks model, as the observation window only ends upon a transition into the state of permanent employment (or because of right censoring). Moreover, we may observe multiple spells in the states of unemployment and temporary employment. A formal proof of nonparametric model identification along the lines of Heckman and Honoré (1989) is beyond the scope of this paper.

4. Results

At the deadline for the IZA summer school no definite results were available yet. But we can present some results of a more simplified version of the model. Table 2 shows the estimation results for a model described in the former section, without duration dependence.

If we look at the transition from unemployment to temporary jobs, we see that age is very significant and negative. So this type of transitions is more likely to be made by young unemployed individuals. Also men with a working partner and female re-entrants are more likely to do so, whereas women with kids at home are less likely to. Temporary jobs appear to be more common in the west of the Netherlands and less in the four largest cities.

The transition from unemployment directly to a regular job is, like the transition to a temporary job and even to a larger extent, more likely to be made by younger individuals. It

is harder for women, especially for those with kids at home, to make this transition than it is for men. This does not hold for women with a working partner. For ethnic minorities it is harder to do so than for native Dutch. The higher educated find a regular job more easily than those with a lower education level.

The transiton from a temporary job to a regular job is most easily made by women, excluding female re-entrants, lower educated and men with kids at home or a non-working partner.

Table 2a   Estimation results for covariate effects

	Parameter estimate	Standard error
Unemployment to temporary job		
Age/100	-2.8909	0.6217**
Female	0.0120	0.2094
Ethnic minority	-0.5379	0.4543
Education:		
Low	-0.2227	0.1260*
High	-0.06646	0.1504
Region		
Four largest cities	-1.3045	0.3390**
West	0.5600	0.2539**
North	-0.2208	0.2765
East	-0.1166	0.2709
South	0.1961	0.2610
Kids		
Man with kids at home	-0.2051	0.2251
Woman with kids at home	-0.6702	0.2273**
Partner		
Man with working partner	0.5315	0.2363**
Woman with working partner	0.2947	0.2377
Man with non-working partner	-0.0191	0.2923
Woman with non-working partner	-6.4337	5.5412
Female re-entrant	0.5755	0.2563**
Unemployment to regular job		
Age/100	-5.1898	0.6835**
Female	-0.5446	0.1627**
Ethnic minority	-0.7966	0.3318**
Education:		
Low	-0.0775	0.1256
High	0.7483	0.2012**
Region		
Four largest cities	0.1109	0.2507
West	0.6866	0.2282**
North	-0.1007	0.2474
East	0.6757	0.2204**
South	0.5173	0.2214**
Kids		
Man with kids at home	0.0080	0.1776
Woman with kids at home	-0.4494	0.1702**

Partner		
Man with working partner	0.4462	0.2078**
Woman with working partner	0.5109	0.1809**
Man with non-working partner	0.4779	0.2238**
Woman with non-working partner	-1.0202	0.1381**
Female re-entrant	0.2339	0.2741
Temporary job to regular job		
Age/100	1.3818	1.0452
Female	0.4522	0.1957**
Ethnic minority	0.5044	0.3993
Education:		
Low	-0.3419	0.1907*
High	0.4125	0.2793
Region		
Four largest cities	1.0873	0.5733*
West	0.4398	0.4752
North	0.1453	0.4813
East	0.3485	0.5037
South	0.4192	0.5006
Kids		
Man with kids at home	0.5112	0.2075
Woman with kids at home	-0.1504	0.2112
Partner		
Man with working partner	0.1692	0.2094**
Woman with working partner	0.0611	0.1052
Man with non-working partner	1.0172	0.3078**
Woman with non-working partner		
Female re-entrant	-0.74287	0.2812**

* indicates two-sided significance at a 10% level, ** at a 5% level

What do these results tell us about the stepping stone hypothesis? As explained in section 3, we derive conclusions on this issue from the comparison between the transition rates directly from unemployment to regular employment and from temporary employment to a regular job. Based on the estimated model, the hazards for an average unemployed can be calculated. Figure 2 shows the results. The actual hight of the hazard does not tell us much. But the comparison between both hazards shows that the transition rate from unemployment to regular employment is much smaller than from a temporary job. This indicates that in the Netherlands temporary jobs indeed serve as stepping stones towards regular employment. The implication in terms of search durations are the following. From unemployment the probability of finding a regular job within half a year is 0.20, while from a temporary job it is 0.81.

Figure 2   Transitions rates into regular employment
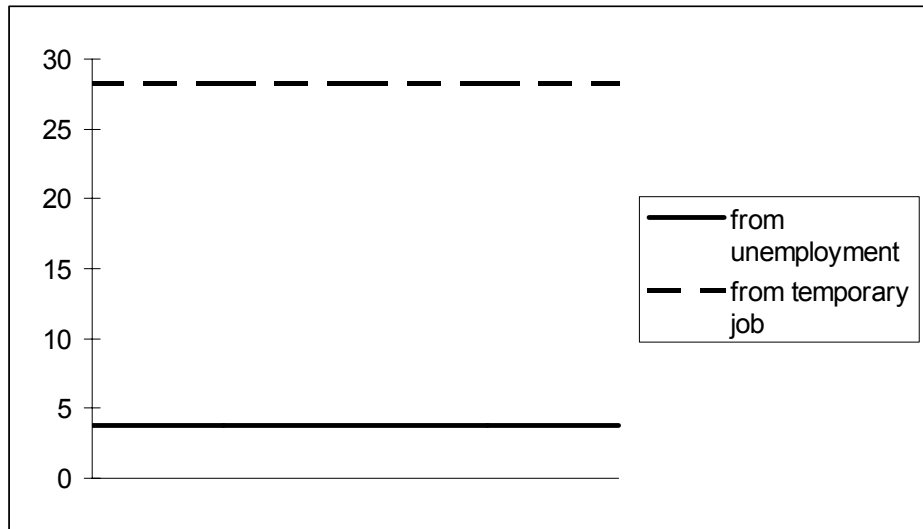
NB: when duration dependence is introduced, this picture will be much more interesting

Thus we conclude that temporary jobs indeed are stepping stones for the unemployed. However, for some groups it holds stronger than for others. If we look at age we see that younger individuals more easily find both temporary and regular jobs than older unemployed. This holds stonger for the rate of finding a regular job. And once in a temporary job, it are mostly the older individuals who find a regular job. So the stepping stone hypothesis holds stonger for older than for younger unemployed individuals.

Regarding ethnic minorities we see that they have a harder time than native Dutch to find both temporary and regular jobs. Since this holds stronger for regular jobs, and once in a temporary job it are the ethnic minorities who find a regular job, the stepping stone hypothesis holds stronger for ethnic minorities than for the native Dutch.

With respect to gender, the picture is rather complicated. Women and men find temporary jobs at the same rate. Women have a harder time making transitions directly to regular jobs, but once in a temporary job they are more likely than men to find a regular one. So in general the stepping stone hypothesis holds more for women than for men. However, this does not hold for female re-entrants. These women (40 years or older with a partner, returning to the labour force) are more likely to find a temporary job and once they have one are less likely to make a transition towards a regular position. So they stick with temporary employment. When there are kids in the household, women are less likely than men to find both temporary and regular jobs. But in this case it are the men who are more likely to find a regular job from a temporary position. We assume that this is not due to the stepping stone hypothesis holding for men with children. Instead we think the observed estimates indicated that when men start having kids they want become more interested in stability and thus prefer permanent employment. And once the man provides this, the female partner can have the flexibility of a temporary job, which makes it easier to combine work and care activities. This outcome confirms that in the Netherlands a traditional role pattern still exists. Finally the question of partners can be explicitly adressed. Men with non-working partners are less inclined than those with working partners to go to a temporary job and if they do so, they more easily make a transition to a regular job. This also has to do with the certainty aspect.

When men are the only breadwinner in the household the have more stimulus to find a permanent position.

The estimates for educational level show the standard outcome: employment, especially in permanent positions, is most easily found by higher educated.

In the four large cities it is less easy to find a temporary job than elsewhere, but once people do, the more easily make the transition to regular employment. In the western parts of the Netherlands people have less trouble finding employment, both temporary and regular. In the east and the south regular positions are relatively easily found, not by way of temporary jobs. This means that it is hardest to find employment in the Northern provinces.

In this model unobserved heterogeneity was included. For all transitions individuals can be either in a high or a low "probability group". The only restriction we pose is that when an individual is in the high (low) "probability group" for transition from unemployment to regular employment, he is also in the high (low) "probability group" for the transition from temporay employment to regular employment. Thus we have four options, shown in table 2b. The four groups are all of substantial size, indicating that there are both groups of individuals combining low (high) transition rates from unemployment to regular work with low (high) transition rates from unemployment to temporary work and individuals who combine low (high) transition rates from unemployment to regular work with high (low) transition rates from unemployment to temporary work.

Table 2b   Estimation results for unobserved heterogeneity

Heterogeneity term	Estimated coefficient		Standard error
Unemployment to temporary	1.9270	$(v_{ut}0)$	0.4070**
	-5.9188	$(v_{ut}1)$	7.7096
Unemployment to regular	1.75089	$(v_{ur}0)$	0.2574**
	3.3668	$(v_{ur}1)$	0.2453**
Temporary to regular	-0.5541	$(v_{tr}0)$	0.5666
	0.0193	$(v_{tr}1)$	0.5560

Probabilities of heterogeneity groups

	$v_{ut}0$ (high)	$v_{ut}1$ (low)
$v_{ur}0$ & $v_{tr}0$ (low)	0.387	0.203
$v_{ur}1$ & $v_{tr}1$ (high)	0.238	0.173

Correlation between v_{ut} and v_{ur}	-0.238
Correlation between v_{ut} and v_{tr}	-0.084

The total correlations given at the bottom of table 2b lead to the conclusion that also based on unobserved characteristics some individuals benefit more from a temporary job as stepping stone toward regular positions than others. The correlation between the transition rate from unemployment to temporary respectively regular employment is negative. This means that on average there are two groups of people: those who easily find regular employment and those who easily find temporary employment. The correlation between the transition to regular employment from respectively unemployment and temporary employment is much less negative. This means that indeed those with problems finding regular employment who easily find a temporary job, find a regular job quicker than they would have without the intermediate temporary job.

Literature

Amuedo-Dorantes, C. (2000), Work transitions into and out of involuntary temporary employment in a segmented market: evidence from Spain, *Industrial and Labor Relations Review*, vol. 53, no. 2.

Amuedo-Dorantes, C. (2002), Work safety in the context of temporary employment: The Spanish Experience, *Industrial and Labor Relations Review,* vol.55, no.2.

Arulampalam, W. and A.L. Booth (1998) "Training and Labour Market Flexibility: Is there a Trade-off?" *The British Journal of Industrial Relation*s, December 1998, 36(4) pp521-536.

Bentolila, S. and G. Bertola (1990), "Firing Costs and Labour Demand: How Bad is Eurosclerosis," *Review of Economic Studie*s, 57, 381-402.

Bentolila, S. and G. Saint-Paul (1994) "A Model of Labour Demand with Linear Adjustment Costs", *Labour Economic*s, 1, 303-326.

Booth, A.L. (1997), An Analysis of Firing Costs and their Implications for Unemployment Policy, pp. 359-388, in D. Snower and G. de la Dehesa (eds.), *Unemployment Polic*y, Cambridge University Press.

Dekker, R. and L.C. Kaiser (2000), *Atypical or flexible? How to define non-standard employment patterns – The cases of Germany, the Netherlands and the United Kingdom*, paper prepared for the European Analysis Group in the TSER PANEL Project, EPAG Working Paper 13, Colchester: University of Essex

Estevão, M. and S. Lach (1999), *Measuring temporary labor outsourcing in U.S. manufacturing*, NBER Working Paper no. 7421, Cambridge.

Farber, H.S. (1997), *The Changing Face of Job Loss in the Unites States, 1981-1995*, Brookings Papers: Microeconomics, 55-128.

Farber, H.S. (1999) 'Alternative and Part-time Employment Arrangements as a Response to Job Loss', *Journal of Labor Economic*s, 17(4, pt. 2), S142-S169.

Heckman, J.J., and B.E. Honoré (1989), The identifiability of the competing risk model, *Biometrica*, vol. 76, pp. 325-330.

Hoffmann, E. & U. Walwei (1999), *The change in employment forms – empirical results and first explanatory approaches*, Nürnberg: IAB Labour Market Research Topics no. 34

Lancaster, T, (1990), *The econometric analysis of transitions data*, Cambridge University Press, Cambridge.

Ooto, M.W. (1999), *Temporary employment and the natural rate of unemployment*, Federal Reserve Board, Discussion Paper.

Purcell, K., T. Hogarth and C. Simm (1999) *Whose Flexibility? The Costs and Benefits of Non-standard Working Arrangements and Contractual Relation*s, Joseph Rowntree Foundation, York: York Publishing Services.

Samek Lodovici, M. & R. Semenza (2001), *Non standard work arrangements in Italy*, Draft, March 2001, Instituto per la Ricerca Sociale.

Segal, L.M. and D.G. Sullivan (1997), The growth of temporary services work, *The Journal of Economic Perspectives*, vol. 11, no. 2, pp. 117-136.

Van den Berg, G.J., A. Holm and J.C. van Ours (1999*), Do stepping-stone jobs exist? Early career paths in the medical profession*, Tinbergen Institute Discussion Paper no. 99-041/3.

Annex 1   Explanatory variables

Table A1   sample averages of explanatory variables

variable	description	average	minimum	maximum
female		0.55	0	1
educ_low	only basic education	0.63	0	1
educ_medium	secondary education finished	0.26	0	1
educ_high	tertiary education finished	0.11	0	1
region_ls	Amsterdam, Rotterdam, Den Haag	0.11	0	1
region_west	Utrecht, North Holland, South Holland	0.27	0	1
region_north	Groningen, Friesland, Drenthe	0.12	0	1
region_east	Overijssel, Gelderland, Flevoland	0.21	0	1
region_south	Zeeland, North-Brabant, Limburg	0.27	0	1
ethnic minority	born in Surinam, Marocco, Turkey or Dutch Antilles	0.06	0	1
year of birth		1958	1929	1981
# kids at home		0.99	0	6
working partner		0.78	0	1