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ISSN: 2365-9793

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ABSTRACT

Do Supplementary Jobs for Welfare Recipients Increase the Chance of Welfare Exit? Evidence from Germany*

Welfare recipients in Germany are allowed to take up supplementary jobs while receiving welfare. The possibility of having a supplementary job was introduced to reduce welfare dependency and facilitate successful labor market integration. In the present study, we use the German Panel Study "*Labour Market and Social Security*" (PASS) for the years 2006-2014 to analyze the impact of supplementary jobs on the chances of welfare exit. Dynamic multinomial logit models controlling for unobserved heterogeneity and the problem of initial conditions reveal that (part- and full-time) employed males are more likely to exit welfare receipt into employment than their non-employed counterparts. This effect is not driven by household composition changes or earnings increases of household members. For women, however, we find only stepping stone effects for full-time supplementary jobs during welfare receipt. Women having a supplementary part-time job have an even lower probability of leaving welfare into full-time employment.

JEL Classification: C33, J60, I38

Keywords: supplementary jobs, labor market mobility, state dependence, stepping stone effect, dynamic panel data models

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* We gratefully acknowledge comments from Kerstin Bruckmeier and Mark Trappmann, as well as from participants at the EALE annual conference in Uppsala, at the Welfare and Unemployment Dynamics Workshop at the IAB, and at a workshop at the University of Mainz. Stefan Schwarz gratefully acknowledges financial support from the Joint Graduate Program of IAB and FAU Erlangen-Nuremberg (GradAB).

1 Introduction

Between 2002 and 2005, a package of major reforms (the "Hartz reforms") was implemented in the German labor market to activate, in particular, the long-term unemployed. The fourth reform package (Hartz IV) changed the wage-related welfare system, providing a means-tested replacement scheme for persons in need and able to work; this scheme was named "Arbeitslosengeld II" or Unemployment Benefit II (Eichhorst et al. 2010). *Inter alia*, Unemployment Benefit II (UBII) recipients have the opportunity to take up supplementary jobs during benefit receipt, with the accompanied welfare reduction being lower than before (Bruckmeier & Wiemers 2012).

From 2013 to 2019, the number of employed welfare recipients decreased by approximately 22 percent, while the number of non-employed welfare recipients decreased by less than 7 percent.[1] The larger decline in employed welfare recipients could be due to their higher welfare exit rates or due to lower entry rates into employed welfare (or due to a mixture of both). The former would suggest that it is beneficial for non-employed benefit recipients to take up a supplementary job in order to increase their chances of welfare exit. We investigate this question in the current paper.

In general, two different mechanisms may be responsible for higher UBII exit rates of employed welfare recipients. First, employed welfare recipients may have socioeconomic characteristics that make welfare exit more likely (e.g., better health, higher education or higher work motivation). If higher exit rates of employed welfare recipients are entirely caused by differences in characteristics, then econometric models controlling for these differences should yield the same predicted welfare exit rates of employed and non-employed welfare recipients. Second, employment while receiving welfare benefits may directly increase the chances of welfare exit. This could

[1] Statistik der Bundesagentur für Arbeit: "Tabellen: Erwerbstätige erwerbsfähige Leistungsberechtigte (Monats- und Jahreszahlen), Nürnberg, Januar 2021, own calculations."

be the case because employers interpret having a job (even if the job has low pay) as a signal of higher work motivation and productivity compared to being non-employed. Alternately, it could be because the negative scarring effects of unemployment (such as human capital depreciation) can be prevented or at least extenuated (Cockx et al. 2013).[2] Moreover, new labor market skills may be acquired by taking up a supplementary job. In addition, supplementary jobs may reduce search costs due to better networks and the possibility of extended working contracts within the same firm. In this case, non-employed welfare benefit recipients could directly benefit from taking up supplementary jobs during benefit receipt.[3]

While having a supplementary job when receiving welfare benefits may be regarded as a stepping stone because it is better than having no job at all (Cockx et al. 2013), taking up a supplementary job may also have adverse effects due to limited human capital accumulation in low-quality jobs (Dickens & Lang 1985). Human capital accumulation for employees in low-quality jobs may even be lower than for unemployed individuals receiving some training during unemployment. Supplementary jobs may also provide negative signals to employers when interpreted as an indicator of low future productivity (Layard et al. 2005, McCormick 1990). In addition, the intensity of the person's job search may be reduced since less time is available (Burdett 1978). Therefore, it is an open question whether supplementary jobs can increase the chances of welfare exit.

In this paper, we apply dynamic multinomial logit models controlling for time-constant unobserved heterogeneity and endogenous initial conditions to investigate whether taking up part- or full-time supplementary jobs during welfare benefit receipt directly increases the chances of welfare exit. The dependent variable represents an individual's labor market state in a particular year, constructed by interacting the categorical variable of employment (full-time, part-time, no-job) with a binary indicator of receiving welfare benefits. This leaves us with six labor market

[2]Negative effects of unemployment experience on labor market outcomes due to signaling effects and human capital depreciation are modeled for instance by Lockwood (1991) or Pissarides (1992).

[3]The second mechanism of higher welfare exit rates is called true or genuine state dependence (Heckman 1981*a*), in contrast to spurious state dependence due to the first mechanism.

states: (1) full-time employment, (2) part-time employment, (3) non-employment, (4) full-time employment with welfare receipt, (5) part-time employment with welfare receipt, and (6) welfare receipt and not having a job. We run separate estimations for men and women since the importance of household characteristics for labor force participation decisions may differ between the two groups.

UBII is paid at the household level. Thus, some of the observed exits from employed welfare benefit receipt into employment without benefit receipt may solely be caused by household changes (e.g., household members moving out or labor income increases of household members) and not accompanied by increases in individual labor income. To rule out this mechanism, we include interaction terms allowing for distinct coefficients of the lagged labor market state for persons who have never lived with a partner or children in the household throughout the observation period, whom we denote as *singles*. The labor market transitions of this group are most likely due to increases in individual labor income, for which reason the *singles* are the main group of our focus.

Our results indicate that men are better off by taking up part- or full-time employment during welfare benefit because the probability of moving into employment without benefit receipt increases (compared to men without a supplementary job). For *single* women, however, we find such stepping stone effects only for full-time supplementary jobs during welfare receipt. Taking up a part-time job during welfare receipt does not lead to a higher probability of being employed part-time without welfare payments. Additionally, there is even a lower probability of obtaining a full-time job without welfare payments in the next period (compared to a *single* women without a supplementary job). The negative effect of supplementary part-time jobs for women is consistent with the empirical literature suggesting a part-time penalty may exist because part-time jobs incur low human capital accumulation or negative signals compared to full-time jobs (Connolly & Gregory 2008, Manning & Petrongolo 2008, Mosthaf et al. 2014).

Our paper relates to two strands of literature. First, it extends the literature

on the dynamics and dependence of welfare/social assistance benefit receipt. The research on benefit dependence originated in the United States with the pioneering work of Bane & Ellwood (1986, 1994). Since then, many empirical studies have analyzed benefit dependence and welfare transitions in several countries. The existence of genuine state dependence on social assistance benefit receipt has been documented for the United States (Blank 1989, Chay & Hyslop 2014), Canada (Hansen et al. 2014), Sweden (Hansen & Lofstrom 2009, 2011, Andrén & Andrén 2013), the UK (Cappellari & Jenkins 2014), South Korea (Lee et al. 2018) and Germany (Wunder & Riphahn 2014, Königs 2014, Riphahn & Wunder 2016, Bruckmeier et al. 2018).

Second, our paper relates to the stepping stone effects literature, which analyzes whether the take-up of certain employment types enhances the chances of subsequent regular employment. More precisely, the existence of stepping stone effects has been investigated (and in most cases also confirmed) for low-wage employment[4] (Uhlendorff 2006, Knabe & Plum 2013, Mosthaf 2014, Mosthaf et al. 2014, Cai et al. 2018, Boschman et al. 2021), for temporary agency work (Kvasnicka 2009, de Graaf-Zijl et al. 2011, Gebel 2013, Jahn & Rosholm 2014), for atypical work in general (Auray & Lepage-Saucier 2021), for (subsidized) part-time jobs (Cockx et al. 2013, Kyyrä et al. 2013, Nightingale 2020) and for marginal employment[5] (Freier & Steiner 2008, Caliendo et al. 2016, Lietzmann et al. 2017).

Our paper contributes to the literature in several ways. First, we analyze whether both full- and part-time supplementary jobs during benefit receipt increase the chance of welfare exit. In addition, we distinguish between three (non-)employment-related destination states (full-time employment, part-time employment, and non-employment). To the best of our knowledge, this study is the first to look at both

[4]Typically, workers are defined as low-paid if they earn less than two-thirds of the median hourly gross wage and as high-paid, if their wage is above this threshold.

[5]Marginal employment (in Germany also denoted as *Mini-Jobs*) defines employment below a certain income threshold (which increased from 400 to 450 euros in 2013) where employees are exempted from taxes and social security contributions and employers pay an overall reduced rate of social security contributions. Regular employment denotes employment subject to taxes and social security contributions.

the employment take-up and welfare exit process in such detail. The finding of Hohmeyer & Lietzmann (2020) that taking up employment and leaving welfare are two distinct processes (e.g., recipients leave unemployment more quickly than welfare) illustrates the importance of examining both processes jointly to obtain a more detailed understanding of labor market transitions. Second, we do not focus on one particular employment type but assess whether employment, irrespective of its kind, increases the chances of leaving welfare. We argue that better signals for work motivation and the prevention of human capital depreciation are not primarily related to a particular employment type but rather to the number of hours worked. For this reason, we split our examination between part-time and full-time employees. Focusing on part-time employed individuals is particularly relevant because many German welfare recipients are employed part-time. In fact, in 2013, only 18 percent of employed persons receiving UBII were working full-time.[6] Third, in contrast to previous studies, we do not have to impose the strict assumption that supplementary jobholders and the control group share the same unobserved heterogeneity. Hence, our results provide information on whether previous findings can be found in a more general setting. Fourth, besides the study of Lietzmann et al. (2017), our study is the only one that investigates stepping stone effects in Germany after the Hartz IV reforms.

The remainder of the paper is organized as follows. In Section 2, we provide the institutional background. Section 3 presents the econometric framework. We describe the data in Section 4 and discuss the results in Section 5. Section 6 concludes.

2 Institutional framework

The main goal of the 'Hartz reforms' implemented in Germany until 2005 was to activate the unemployed and to increase labor force participation (Eichhorst et al. 2010). The increased incentives to take up work were meant to tackle high

[6] See Statistik der Bundesagentur für Arbeit: "Tabellen: Erwerbstätige erwerbsfähige Leistungsberechtigte (Monats- und Jahreszahlen). Nürnberg, Januar 2021." The reported figure is based on calculations excluding apprenticeships.

unemployment persistence in Germany at the beginning of the century and to increase labor force participation among young parents (Caliendo & Hogenacker 2012). With the implementation of the fourth package of Hartz reforms ('Hartz IV') in January 2005, the previous unemployment insurance benefits were replaced by 'Unemployment Benefit I' (UBI), and unemployment and social assistance benefits were replaced by the means-tested replacement scheme, UBII.

Officially registered unemployed individuals can receive UBI for up to 12-24 months if they have been working in a job subject to social security contributions for at least 12 months during the previous two years. UBI amounts to 60 percent or 67 percent of previous net earnings.

UBII serves as basic income support with the aim of preventing individuals from poverty. In addition to a fixed payment for daily living expenses, UBII also includes costs for adequate accommodation and, if necessary, additional payments for special needs. In contrast to UBI, UBII is not conditional on previous employment, is paid at the household level ('Bedarfsgemeinschaft'), and the duration of receipt is unlimited. Employable individuals of working age whose chargeable income is below a defined threshold level are eligible for UBII.[7] This threshold depends on the type and size of the household as well as the residential location since rent and housing prices differ substantially across regions in Germany. The average need in Germany in September 2020 was approximately 792 euros for single households, 1519 euros for single-parent households, 1193 euros for couple households without children, and 2192 euros for couple households with children.[8]

Prominent groups among the UBII recipients are (a) long-term unemployed individuals who were not eligible for UBI or whose claims to UBI have been exhausted, (b) short-term unemployed who are not eligible for UBI or for which

[7]The basic income scheme includes UBII for employable individuals and an additional social allowance (Sozialgeld) for persons who live together with UBII recipients and who are not capable of working (e. g. children or partners with health impairments). Hence, the job center is the only authority responsible for all members of these households, whether they are employable or not (Eichhorst et al. 2010).

[8]Statistik der Bundesagentur für Arbeit: "Tabellen: Bedarfe, Zahlungen und Einkommen (Monatszahlen), Nürnberg, Januar 2021." Note that the actual need for single-parent and couple households with children varies with regard to the number and age of the children.

UBI is not sufficient to meet their household needs, and (c) employed persons whose earnings are insufficient to meet their household needs. Roughly 30 percent of the UBII recipients are employed.[9] Welfare recipients are allowed to earn 100 euros per month without any deduction, while additional earnings above 100 euros are subtracted from welfare payments with an increasing rate between 80 and 100 percent (Eichhorst et al. 2010). In the present paper, we examine whether individuals of group (a) and (b) benefit from taking up a supplementary job during UBII (which corresponds to a move into group (c)) in terms of better chances to exit UBII.

3 Empirical method

In this paper, we specify the latent propensity $\mathbf{y}^*$ of individual i to be in one of the six labor market states j at year t as follows:

$$\mathbf{y}^*_{ijt} = \mathbf{x}_{it}\boldsymbol{\beta}_j + \mathbf{y}_{it-1}\boldsymbol{\gamma}_j + \alpha_{ij} + \epsilon_{ijt} \tag{1}$$

where i=1,...,N; j=1,...,6; t=2,...,T. $\mathbf{x}$ is a vector of a constant and observable socioeconomic characteristics which may be associated with the labor market state, and $\boldsymbol{\beta}_j$ is the accompanying parameter vector. $\mathbf{y}_{it-1}$ is a vector of five mutually exclusive dummy variables indicating the observed labor market state in period $t-1$ (the sixth labor market state serves as reference category), and $\boldsymbol{\gamma}_j$ is the accompanying parameter vector. We allow $\boldsymbol{\gamma}_j$ (and $\boldsymbol{\beta}_j$) to differ between men and women by splitting the sample. In addition, for both men and women, through the inclusion of interaction terms, we allow the effect of the lagged labor market states to vary between persons with and persons without a partner or children in the household. We denote the former as *non-single* and the latter as *single* persons. For ease of exposition, the equations presented in this section ignore that the coefficient vector $\boldsymbol{\gamma}_j$ varies between these four subgroups (*single* women, *single* men, *non-single* women, *non-single* men) and also that $\boldsymbol{\beta}_j$ varies between men and women.

[9]Statistik der Bundesagentur für Arbeit: "Tabellen: Erwerbstätige erwerbsfähige Leistungsberechtigte (Monats- und Jahreszahlen), Nürnberg, Januar 2021".

ϵ_{ijt} denotes an idiosyncratic error term, and the random error component α_{ij} captures time-invariant and labor market state-specific unobserved individual heterogeneity. An individual can be in a particular labor market state either because it has experienced the same state in the preceding period (genuine state dependence) or because its observed and unobserved individual characteristics increase the propensity for experiencing this labor market state (spurious state dependence). The inclusion of the individual time-invariant random effect allows us to disentangle genuine (captured by $\boldsymbol{\gamma_j}$) and spurious state dependence (captured by α_{ij}). A further benefit of the inclusion of α_{ij} is the relaxation of the independence of irrelevant alternatives (IIA) assumption of the multinomial logit model Train (2009, p.141).

As in every dynamic labor market choice model with unobserved heterogeneity, the problem of endogenous initial conditions arises due to the correlation of individual unobserved heterogeneity α_{ij} and the initial labor market states $\mathbf{y}_{i1}$ (Heckman 1981*b*). To deal with the endogenous initial values, Wooldridge (2005) proposes a conditional maximum likelihood estimator where the distribution of the individual time-constant random error α_{ij} is specified conditional on the initial labor market states ($\mathbf{y}_{i1}$) and all observations of time-varying observables ($\mathbf{x}_{it}$), such that it coincides with the correlated random effects model by Chamberlain (1984).

To use unbalanced panel data, many studies include individual-specific averages of time-varying explanatory variables such that the model corresponds to the quasi-fixed effects model proposed by Mundlak (1978).[10]

$$\alpha_{ij} = \phi_j + \bar{\mathbf{x}}_i \boldsymbol{\lambda}_j + \mathbf{y}_{i1} \boldsymbol{v}_j + \eta_{ij} \tag{2}$$

Substituting into Equation (1) yields:

$$\mathbf{y}^*_{ijt} = \mathbf{x}_{it} \boldsymbol{\beta}_j + \mathbf{y}_{it-1} \boldsymbol{\gamma}_j + \mathbf{y}_{i1} \boldsymbol{v}_j + \bar{\mathbf{x}}_i \boldsymbol{\lambda}_j + \eta_{ij} + \epsilon_{ijt} \tag{3}$$

[10]Individual averages are calculated excluding the initial period: $\bar{\mathbf{x}}_i = \frac{1}{T-1} \sum_{t=2}^{T} \mathbf{x}_{it}$. Rabe-Hesketh & Skrondal (2013) show that this produces results that are similar to those from the specification by Wooldridge (2005).

The ϕ_j are absorbed by the coefficient for the constant in the $\mathbf{x}$-vector. The inclusion of the initial labor market state $\mathbf{y}_{i1}$ as an additional explanatory variable has some advantages over the more traditional approach suggested by Heckman (1981*b*). First, as noted by Wooldridge (2005, p.44), if attrition depends on the initial labor market state, this will be controlled for by including the initial conditions. Indeed, Trappmann et al. (2015) show that attrition in PASS depends on the labor market state. Similarly, including the initial labor market state as an explanatory variable solves the problem of endogenous selection into the PASS sample. As described in Section 4, one subsample of PASS consists of individuals living in households receiving UBII at the sampling date, such that selection into this sample depends on the initial labor market state. In our analysis, the initial labor market state corresponds to the labor market state at the sampling date.

Assuming that the ϵ_{ijt} follow a type I extreme value distribution results in a dynamic multinomial logit model with random effects. Thus, the probability of being in labor market state j for individual i in period $t > 1$ can be expressed as follows:

$$P(y_{ijt}|\mathbf{x}_{it}, \mathbf{y}_{it-1}, \alpha_{ij}) = \frac{exp(\mathbf{x}_{it}\boldsymbol{\beta}_j + \mathbf{y}_{it-1}\boldsymbol{\gamma}_j + \mathbf{y}_{i1}\mathbf{v}_j + \bar{\mathbf{x}}_i\lambda_j + \eta_{ij})}{\sum_{k=1}^{6} exp(\mathbf{x}_{it}\boldsymbol{\beta}_k + \mathbf{y}_{it-1}\boldsymbol{\gamma}_k + \mathbf{y}_{i1}\mathbf{v}_k + \bar{\mathbf{x}}_i\lambda_k + \eta_{ik})} \tag{4}$$

The coefficient vectors $\boldsymbol{\beta_1}$,$\boldsymbol{\gamma}_1$, $\boldsymbol{\nu}_1$, $\boldsymbol{\lambda}_1$ of the base category $j = 1$ and its unobserved heterogeneity η_{i1} are normalized to zero. Since the η_{ij} cannot be observed, the likelihood contribution of individual i is given by:

$$L_i = \int_{-\infty}^{\infty} \prod_{t=2}^{T} \prod_{j=2}^{6} \left\{ \frac{exp(\mathbf{x}_{it}\boldsymbol{\beta}_j + \mathbf{y}_{it-1}\boldsymbol{\gamma}_j + \mathbf{y}_{i1}\mathbf{v}_j + \bar{\mathbf{x}}_i\lambda_j + \eta_{ij})}{1 + \sum_{k=2}^{6} exp(\mathbf{x}_{it}\boldsymbol{\beta}_k + \mathbf{y}_{it-1}\boldsymbol{\gamma}_k + \mathbf{y}_{i1}\mathbf{v}_k + \bar{\mathbf{x}}_i\lambda_k + \eta_{ik})} \right\}^{d_{ijt}} f(\eta) d(\eta) \tag{5}$$

We assume that unobserved heterogeneity $\boldsymbol{\eta}_i = \eta_{i2}, ..., \eta_{i6}$ follows a discrete distribution with an a priori unknown number of M mass-points (Heckman & Singer 1984). We increase the number of mass points until the Akaike information criterion (AIC) does not improve further. Each of these M mass-points takes on different values τ_{mj} in the different labor market states such that the likelihood function is

given by:

$$L_i = \sum_{m=1}^{M} p_m \prod_{t=2}^{T} \prod_{j=2}^{6} \left\{ \frac{exp(\mathbf{x}_{it}\boldsymbol{\beta}_j + \mathbf{y}_{it-1}\boldsymbol{\gamma}_j + \mathbf{y}_{i1}\mathbf{v}_j + \bar{\mathbf{x}}_i\lambda_j + \eta_{ij} + \tau_{mj})}{1 + \sum_{k=2}^{6} exp(\mathbf{x}_{it}\boldsymbol{\beta}_k + \mathbf{y}_{it-1}\boldsymbol{\gamma}_k + \mathbf{y}_{i1}\mathbf{v}_k + \bar{\mathbf{x}}_i\lambda_k + \eta_{ik} + \tau_{mk})} \right\}^{d_{ijt}} \tag{6}$$

where the probability of mass point τ_{mj} is denoted by p_m. Note the absence of the subscript j indicating that the probability does not vary between the different labor market states.

Due to the non-linearity of the multinomial logit model, the estimated coefficients cannot be interpreted directly. Thus, we calculate the average partial effects (APE) of the labor market state in $t-1$ on the six different response probabilities. Furthermore, for each observation and all possible labor market states in period $t-1$, we simulate the individual probabilities of being in a particular labor market state j at time t by parametric bootstrap methods. We achieve this by drawing values of (p_m, $\boldsymbol{\beta}_j$, $\boldsymbol{\gamma}_j$, $\boldsymbol{v}_j$, $\boldsymbol{\lambda}_j$, τ_{mj}) a thousand times from the distribution of the estimated coefficients and calculate the predicted probabilities averaged over observations and draws.[11] To obtain the corresponding confidence intervals, we rank the average predictions per draw according to their size. The lower bound of the confidence interval is obtained using the 25th smallest average prediction, and the upper bound corresponds to the 25th largest average prediction. The APE of labor market state j in period $t-1$ on the probability of being labor market state k in period t is computed as the difference between the predicted transition probability from j to k and the transition probability from the reference category to k. Standard errors of the APEs are obtained as the empirical variance of the averages (over observations of one repetition) within 1,000 repetitions.

[11] The procedure makes use of the property that under certain regularity conditions, maximum likelihood estimates are asymptotically normally distributed.

4 Data

We use the German Panel Study "Labour Market and Social Security" (PASS) for 2006–2014.[12] PASS was initiated by the Institute for Employment Research (IAB) after the introduction of UBII in 2005 to provide a database enabling research on the dynamics of welfare benefit receipt (Trappmann et al. 2013). PASS is a mixed-mode household panel study with roughly 10,000 interviewed households in each wave. These household interviews comprise questions concerning the whole household, such as household composition and housing situation. In addition, all household members aged 15 or older are interviewed such that around 15,000 personal interviews are carried out each wave. The individual questionnaire contains questions on the respondent's personal situation, such as employment status, income, health, and individual attitudes (Trappmann et al. 2019).

The initial PASS sample consists of two separate subsamples: a general population sample and a sample of UBII recipients. The general population sample is a sample of the residential population in Germany, slightly oversampling households with low socioeconomic status (Trappmann et al. 2013). The UBII sample consists of a random sample of all households containing at least one UBII recipient at the reference date in July 2006 (Trappmann et al. 2013). A household will be followed in the next wave regardless of whether it receives benefits or not. The UBII sample is refreshed every wave with newly selected households containing at least one benefit recipient on the reference date of a given wave and no benefit recipient on reference dates of previous waves (Trappmann et al. 2013).

In this paper, we use both subsamples of the PASS data set. This leads to considerable oversampling of (former) UBII recipients. While the sample is not representative of the German population, it has two clear advantages over more representative panel surveys, such as the German Socio-Economic Panel (SOEP). First, compared to our sample, the number of UBII recipients and, in particular,

[12] The study of Bruckmeier et al. (2018) shows that, despite the existence of benefit misreporting, PASS provides comparable results to an administrative data-corrected measure of benefit receipt and, hence, is suited for dynamic welfare transition analyses.

those with supplementary jobs is low in the SOEP, which makes it difficult to estimate the effects of supplementary jobs. Second, estimates obtained using our sample are more appropriate for policy analysis because they are valid for individuals who have a significant probability of being affected by the policy measures analyzed in this paper. In contrast, estimates obtained using a representative sample are valid for *average* individuals in the German labor market, which have rather low probabilities of receiving welfare and having supplementary jobs. In our analysis, we use the spell data set of PASS to guarantee that our measure of the initial labor market state coincides with the sampling date.[13]

For our analysis, we define six mutually exclusive labor market states: full-time employment, part-time employment, non-employment, full-time employment with welfare receipt, part-time employment with welfare receipt, and welfare receipt without employment.[14] The non-employment category includes all individuals that are neither employed nor receive welfare benefits, i.e., individuals registered as unemployed but not receiving UBII, individuals on parental leave, or individuals completely out of the labor market.[15]

Since we are interested in labor market transitions and not in education to work and work to retirement transitions, we restrict our analysis to individuals between 25 and 64 years of age. Due to our estimation strategy, we are only able to include individuals who have been interviewed in at least two consecutive waves (in addition to the initial state). We drop observations with non-response in any of the variables which we included as controls in our estimation model. In such cases, all following observations of an individual cannot be kept because the estimation strategy would not be valid if the y_{it} were not consecutive for a particular individual.[16] Finally, we

[13]Including the initial labor market states as explanatory variables and applying the method of Wooldridge (2005) ensures internal validity (see Section 3).

[14]We define persons to be full-time (part-time) employed when working at least (less) than 30 hours per week. We classify marginal employment as part-time employment.

[15]In our sample, 61.46 (20.69) percent of male (female) non-employed persons who do not receive welfare benefits are registered as unemployed.

[16]Wooldridge (2005) suggests applying his estimator on balanced samples. Own simulation studies show that using unbalanced samples, including observations where lagged values of previous time periods are missing, leads to biased coefficient estimates. This is because the correlation between the lagged labor market state and the random effects cannot be modeled. However, using

exclude individuals who are (at least once in the observation period) in education, retired, doing military or civilian service, or not employable because of health issues.

Table 1 and 2 report the means of the included control variables stratified by labor market state, gender, and whether or not an individual has lived without a partner or children in the household throughout the observation period. The latter two groups are denoted as *singles* respectively *non-singles*. Full-time (part-time) employed individuals without welfare benefit receipt often have more favorable socioeconomic characteristics compared to welfare recipients working full-time (part-time). They are more likely to have a university degree and are less likely to have no vocational training, they are more likely to be in good health (except for part-time working men) and, regarding *non-singles*, they are more likely to be married.[17] Interestingly, employed welfare recipients report a better health status than welfare recipients with no job. The evidence is mixed, however, concerning education and citizenship. *Single* full-time working women who receive welfare benefits are much more likely to have a university degree and are less likely to have a migration background than female benefit recipients with no job. In contrast, female benefit recipients working part-time neither have a higher education nor are more likely to have German citizenship compared to those without a job. For *single* men receiving welfare benefits, we observe similar but less pronounced patterns regarding the association of work volume with education and citizenship. Not surprisingly, female (*non-single*) employed welfare recipients are less likely to have small children than non-employed women who receive welfare. For men, however, the reverse relationship holds. It is also evident that employed individuals (without benefit receipt) live in regions with better labor market prospects (than benefit recipients), as unemployment rates are somewhat lower.

samples that include observations before the time period when the individual leaves the panel leads to consistent parameter estimates. Results are available on request.

[17]For men, marriage and fatherhood are typically associated with higher wages. For women, however, the literature usually reports a motherhood penalty, while most studies based on fixed-effects estimates find a female marriage premium (Killewald & Gough 2013).

[Table 1 about here]

[Table 2 about here]

Tables 3 and 4 depict yearly transition rates between the six different labor market states, again stratified by gender and household status. In all four groups, full-time employed welfare recipients exit benefit receipt into employment much more frequently than non-employed welfare recipients. Regarding women without a partner or children in the household (*single*), for example, 29.35 percent of full-time employed welfare recipients, but only 5.69 percent of the non-employed welfare recipients move into full-time employment without benefit receipt in the following year. Adding up columns 1 and 2 shows that exit rates into overall (full-time or part-time) employment without benefit receipt are positively correlated with work volume, with the highest turnover rates seen for the full-time employed and the lowest for the non-employed. The turnover rates of part-time employed welfare recipients fall between the other two welfare groups, but the gap to the non-employed welfare recipients is in most cases rather small. Looking again at women without a partner or children in the household, 10.53 percent of part-time employed welfare recipients and 6.86 percent of the non-employed welfare recipients exit into (part-time or full-time) employment without benefit receipt in the following year. Regarding men without a partner or children in the household, the respective figures are 13.78 percent and 8.99 percent.

[Table 3 about here]

[Table 4 about here]

The observed labor market transitions hint at a stepping stone effect, particularly for full-time employment during welfare benefit receipt. However, as pointed out

above, (full-time) employed welfare recipients also tend to have better characteristics indicating that at least part of the higher turnover rates into employment without welfare benefit receipt can be attributed to individual characteristics and not to a causal effect from employment during welfare benefit receipt. In the following, we investigate whether the stepping stone effect of (part- and full-time) employment during welfare benefit receipt is still evident for men and women after controlling for observed and time-constant unobserved characteristics.

5 Results

Tables 5 (men) and 6 (women) report coefficient estimates of a dynamic multinomial logit model with random effects, as specified in Equation (4). For men, the inclusion of three mass points yields the lowest AIC and is, therefore, the preferred model. For women, the model with four mass points yields the lowest AIC. Both cases document the importance of time-constant unobserved variables, given that a multinomial logit model with one mass point corresponds to a model without random effects. In addition, the coefficient estimates of the labor market states in $t = 1$ (the initial conditions) are always statistically significant. Hence, a model not controlling for the problem of initial conditions would be inconsistent. Note also that the interaction terms between the *single*-dummy (indicating that the person has never been observed living together with a partner or with children in the household) and the lagged labor market states are significant in many cases. Correspondingly, a likelihood ratio test clearly indicates that their inclusion has improved the model.[18]

In multinomial logit models, the coefficient β_j provides the sign of the effect of a covariate x_k on the probability of being in employment state j relative to the probability of the reference category in the dependent variable (Cameron & Trivedi 2005). In our context, the reference category is full-time employment without welfare benefit receipt in period t. Thus, the positive and significant coefficient of the variable

[18]For men, we obtain a test statistic of $\chi 2(25) = 60.96$. For women, the test statistic is $\chi 2(25) = 63.32$. The corresponding p-values are 0.000.

"part-time, $t-1$" in the equation for part-time employment in period t (for both men and women) implies that being part-time employed in period $t-1$ instead of being full-time employed in $t-1$ increases the probability of being part-time employed in period t relative to the probability of being full-time employed in period t. This is in line with the conjecture of genuine state dependence in part-time employment without welfare benefits. The positive and significant coefficient of "Age: 50 - 64" (in the equation for part-time employment) implies that for persons older than 49 years, the probability of being part-time employed in t relative to the probability of being full-time employed in t is larger than for the reference category "Age: 25 - 34".

In most cases, the coefficients of the separate equations are in line with our expectations. In the equation for "No-job, welfare" in period t, for example, the coefficient corresponding to "No vocational training" is positive and significant whereas the coefficient of "University degree" is negative and significant. Hence for those without vocational training, the probability of welfare receipt relative to the probability of full-time employment increases, whereas for those with a university degree, the relative probability decreases compared to the reference category "with vocational training". The coefficients for the health variables show that bad health compared to good health increases the probability of welfare receipt (without a job) relative to the probability of full-time employment. Interestingly, for women but not for men, the coefficient estimates referring to the presence of children in the household are positive and (in almost all cases) statistically significant. Thus, for women, the presence of children in the household decreases the probability of working full-time relative to the probability of the other labor market states.

[Table 5 about here]

[Table 6 about here]

Table 7 (men) and Table 8 (women) report the average partial effects (APE) of

the lagged labor market states on the different response probabilities for men and women. In each table, we distinguish between persons who live with a partner or children in the household (*non-single*) and those who do not (*single*). Note that those who reported only in some, but not all years, to live with a partner or children in the household are also classified as *non-single*. This ensures that the most likely reason why *singles* leave welfare benefit receipt is a change in labor income.[19] In contrast, the group of *non-singles* may also move out of welfare benefit receipt (i) due to changes in household composition or (ii) due to an income increase of other household members.[20] For men, the APEs are very similar between both groups, which indicates that also for *non-singles*, the obtained effects are mainly due to changes in labor income. For women, a few differences occur, which will be pointed out below. Unless otherwise mentioned, we refer to *single* persons when discussing the results.

On average, being a *single* full-time employed male (female) welfare recipient increases the probability of moving into full-time employment without benefit receipt in the next year by 15.2 (15.8) percentage points, compared to welfare recipients without supplementary jobs. This maps into an overall impact on the likelihood to work without welfare benefits of equal size because the chances to move into part-time employment without benefit receipt in t do not differ between full-time employed welfare recipients and welfare recipients without a job in $t-1$. These highly significant estimates are evidence for the stepping stone function of full-time supplementary jobs. This result holds for both men and women, independent of

[19]It might also happen that a *single* person with a supplementary job exits welfare due to an increase in wealth or due to lower rent. Regarding the latter, however, we could only identify one person in our data within the group of *singles* who unambiguously left welfare due to a (plausible) rent reduction (i.e., not due to higher wages).

[20]If the results for the *non-singles* were mainly driven by these two additional channels, we would expect significant transitions into welfare benefit receipt, i.e., from "Full-time" in $t-1$ to "Full-time, welfare" in t as well as from "Part-time" in $t-1$ to "Part-time, welfare" in t, which is not the case, however. This suggests that for *non-singles*, the most important mechanism is also a change in labor income. In addition, descriptive statistics show that even for persons with a partner or children in the household, transitions from employment with benefit receipt to employment without benefits are accompanied by considerable changes in labor income. For example, men (women) changing from "Full-time, welfare" in $t-1$ into "Full-time" in t experience an average increase in monthly income of 443 (345) euros. Note that due to a considerable number of missing values in the labor income variable, we are unable to use the income information for further analysis.

whether or not the person lives without a partner and children in the household.[21]

The higher employment probability (without welfare receipt) is accompanied for *single* men by a 15.3 percentage points lower probability of receiving welfare benefits (with or without a job). In contrast, for *single* female full-time employed welfare recipients, the likelihood of receiving welfare in the next period (with or without a job) is unchanged. Correspondingly, genuine state dependence in full-time employment with benefit receipt is much more pronounced among *single* women, as female full-time employed welfare recipients are almost twice as likely to be in the same state in the next period than their male counterparts (25.5 versus 13.2 percent; see Appendix Tables A1 and A2). For *single* women, the higher employment probability (without welfare receipt) is accompanied by a lower likelihood of exiting into non-employment without welfare receipt.[22]

To sum up, for *singles* as well as for *non-singles* the results indicate that for both men and women, it is advantageous to take up a full-time job which is not sufficient for the needs of the household in terms of higher future employment chances (without welfare benefit receipt). For men only, however, we find clear evidence of a higher chance to exit *overall* welfare benefit receipt.

[Table 7 about here]

[Table 8 about here]

We now turn to the effects of part-time jobs during welfare benefit receipt. Again, true state dependence in part-time employment with benefit receipt is higher for women, who are approximately 1.7 times more likely to be observed in the same

[21] While *non-single* female full-time welfare recipients have an 8.1 percentage points lower chance of moving into part-time employment without benefits, they still have a 13.1 percentage points higher overall probability of moving into employment without welfare benefits (compared to *non-single* female welfare recipients with no job in $t-1$).

[22] *Sinlge* persons move from the category "No-job, welfare" to the category "No-job" if they are no longer employable (e.g., because of health problems or participation in measures of labor market policy) or no longer take up benefits.

state in the next period (35.3 versus 21.0 percent; see Appendix Tables A1 and A2).

Men gain from taking up a part-time job during benefit receipt both in terms of a 6.9 percentage points higher employment probability (without welfare) and a 5.5 percentage points higher welfare exit probability. These are the same qualitative effects as having a full-time job and receiving welfare, although smaller in size. *Single* women, however, do not gain from a supplementary part-time job while receiving welfare. Compared to *single* women without a part-time job during welfare receipt, they have the same probability of leaving welfare and the same probability of having a part-time job without welfare payments.[23]

Interestingly, women with part-time jobs during welfare benefit receipt are also less likely to work full-time in the next period (compared to non-employed women receiving welfare). In contrast, part-time employed men (whether receiving welfare or not) have the same probability of working full-time without benefit receipt in the next period as non-employed benefit recipients. In sum, supplementary part-time jobs during welfare benefit receipt have mixed effects. Only men experience an increase in employment likelihood without benefit receipt in the next period, but the effect is smaller than for full-time supplementary jobs. However, for women, supplementary part-time jobs neither increase the chance of welfare exit nor employment prospects and even lead to lowered chances of taking up a full-time job.

The different effects of part-time supplementary jobs for men and women may be explained by women having part-time jobs that provide less human capital accumulation, give stronger negative signals, or furnish fewer opportunities for work contract improvements within or outside the firm.[24] This is in accordance with

[23] *Non-single* women with a supplementary part-time job have higher chances of having a part-time job without welfare payments in the next period (compared to *non-single* female welfare recipients who are not working). Since this is different from the null effect for *single* women, the observed transition may reflect changes in household composition or income increases of household members.

[24] Own calculations based on the *Sample of Integrated Welfare Benefit Biographies (SIG) — Version 0717 v1* (`DOI:10.5164/IAB.SIG0717.de.en.v1`) show that women with supplementary part-time jobs are significantly more likely to work in the trade as well as in the health care and social services sectors, but are significantly less likely to work in the construction as well as in transport and storage sectors (compared to men with supplementary part-time jobs). The

Schank et al. (2009), who document that the chances of low-wage workers advancing to high-wage jobs are reduced if working for establishments with a large share of women. Additionally, the dead-end of supplementary part-time jobs for women may also (partly) be driven by supply-side effects arising if women change preferences after entering part-time employment and become less interested in working full-time (Johnson & Pencavel 1984, Hotz et al. 1988). The differential effect of part-time supplementary jobs for men and women is consistent with international evidence from Kyyrä et al. (2013) for Denmark and from Boschman et al. (2021) for the Netherlands, who found that part-time work during benefit receipt is less beneficial for women.

Our finding that only supplementary full-time jobs provide a stepping stone effect for women, but not supplementary part-time jobs, is consistent with the results of Mosthaf et al. (2014). The authors use the German SOEP and find that low-paid women working part-time have considerably lower chances of advancing to high-paid jobs compared to low-paid women working full-time.[25]

A substantial fraction of welfare benefit recipients in Germany are single-parent households, with the majority being single-mother households.[26] One might expect single mothers to have different exit rates from welfare receipt compared to other women due to a higher utility from household production. Therefore, in a further robustness check, we (additionally) include a dummy variable that indicates whether a woman is a single parent throughout the observation window and its

computations also show that women with supplementary part-time jobs are more likely to carry out unskilled/semiskilled tasks but are less likely to carry out skilled tasks (compared to men with supplementary part-time jobs), which suggests that the quality of supplementary jobs held by men and women differ.

[25]Mosthaf et al. (2014) define individuals as a low-wage worker if their hourly wage lies below two-thirds of the median hourly wage. The threshold is calculated yearly and ranges for the years 1999–2009 between 7.88 and 8.41 euros. However, for two reasons, the authors are not able to distinguish between low-wage employees receiving UBII and those who do not receive UBII. First, their sample covers the period 1999–2009 and hence starts before UBII's introduction in 2005. Second, even for the period after 2005, the number of female low-wage workers receiving UBII in their sample is low: due to additional household income such as the labor income of the partner living in the household, considerable portions of female low-wage workers do not receive UBII.

[26]Approximately 17 percent of all welfare benefit receiving households were single-parent households in September 2020, see Statistik der Bundesagentur für Arbeit: Tabellen, Bedarfsgemeinschaften und deren Mitglieder (Monatszahlen), Nürnberg, Januar 2021.

interaction terms with the various lagged labor market states (results available upon request).[27] However, according to the obtained average partial effects, transition rates are similar for single mothers and for other women: full-time, but not part-time supplementary jobs lead to higher transition rates to employment without benefit receipt (compared to non-employed welfare benefit recipients).

6 Conclusions

In this paper, we analyze whether part- or full-time supplementary jobs during welfare benefit receipt can increase the chance of welfare exit. More specifically, we investigate whether it is better for unemployed welfare benefit recipients to take up a part-time or full-time job, even though wages are not sufficient to satisfy the household needs, or alternatively, wait for a better job offer and remain unemployed during welfare benefit receipt. Using panel data from the German Panel Study "Labour Market and Social Security" (PASS) covering the years 2006-2014, we distinguish between six different labor market states: full-time employment, part-time employment, non-employment, full-time employment with welfare receipt, part-time employment with welfare receipt and non-employment with welfare receipt. We estimate separate dynamic multinomial logit models with random effects for men and women and account for endogenous initial conditions.

We find that men are better off by taking up part- or full-time employment during the welfare benefit period. The male benefit recipients with a supplementary job have a higher probability of moving into employment without welfare benefit receipt compared to non-employed welfare recipients. This effect is not driven by changes in the household composition or by earnings increases of household members, since we also find these stepping stone effects for individuals who have never lived with a partner or children in the household throughout the observation period. Their transitions from employment with welfare receipt to employment without welfare

[27] From the 18,634 observations of women with a partner and/or children in the household, 4,488 observations stem from women who are a single parent throughout the observation window.

receipt can only occur due to changes in individual labor income (i.e., because of taking up a new job, extending working hours, or earning higher wages in the current job).

For women, only supplementary *full-time* jobs during benefit receipt (compared to non-employed welfare benefit receipt) increase the chances of employment with earnings enough to satisfy household needs in the next period. However, this is not the case for supplementary part-time jobs, which can even lead to a lower probability of full-time employment without benefit receipt in the next period. Hence, for women, supplementary part-time jobs (which are much more prevalent than supplementary full-time jobs) may be regarded as a dead-end, from which it is difficult to escape. From a woman's individual perspective, it may be better to wait for a better job (in terms of higher wages satisfying household needs) or to invest in human capital than to take up any job readily available. From a policy perspective, alternative measures to bring women into employment along with expanded childcare provisions may be called for.

For future research, it will be interesting to investigate whether the stepping stone effect varies with the income level obtained from the supplementary job. Another question is whether the introduction of the minimum wage in 2015 has changed the structure and extent of the available supplementary jobs and their nature of acting as a stepping stone effect.

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Table 1: Variable means by labor market state, **men**

Men **always without** a partner or children in the household

	labor market state in year t						
	Full-time	Part-time	No-job	Full-time, welfare	Part-time, welfare	No-job, welfare	All
Age: 25 - 34 (dummy)	0.305	0.174	0.270	0.200	0.156	0.150	0.216
Age: 35 - 49 (dummy)	0.445	0.333	0.388	0.425	0.375	0.395	0.411
Age: 50 - 64 (dummy)	0.249	0.493	0.342	0.375	0.469	0.455	0.374
No vocational training (dummy)	0.097	0.111	0.190	0.242	0.205	0.177	0.150
With vocational training (dummy)	0.653	0.632	0.679	0.525	0.665	0.730	0.685
University degree (dummy)	0.250	0.257	0.131	0.233	0.130	0.093	0.165
Good health (dummy)	0.585	0.424	0.460	0.442	0.447	0.348	0.456
Average health (dummy)	0.294	0.347	0.304	0.342	0.352	0.332	0.319
Bad health (dummy)	0.121	0.229	0.236	0.217	0.201	0.320	0.225
Married (dummy)	0.024	0.035	0.013	0.025	0.033	0.026	0.026
Child younger than 2 years (dummy)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Child 2 or 3 years old (dummy)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Child 4, 5 or 6 years old (dummy)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Child between 7 and 16 years (dummy)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
German (dummy)	0.835	0.840	0.865	0.900	0.835	0.824	0.833
EU citizen (dummy)	0.016	0.049	0.021	0.008	0.007	0.020	0.018
Non-EU citizen (dummy)	0.022	0.021	0.021	0.008	0.018	0.025	0.023
Immigrant with German citiz. (dummy)	0.128	0.090	0.093	0.083	0.139	0.131	0.127
Unemployment rate in % (*federal state*)	8.169	7.358	8.861	9.536	8.809	9.021	8.642
First observation in PASS	0.274	0.285	0.350	0.208	0.293	0.314	0.295
Number of observations	2033	144	237	120	546	2357	5437

Men **with** a partner and/or children in the household

	labor market state in year t						
	Full-time	Part-time	No-job	Full-time, welfare	Part-time, welfare	No-job, welfare	All
Age: 25 - 34 (dummy)	0.133	0.090	0.152	0.222	0.161	0.137	0.137
Age: 35 - 49 (dummy)	0.509	0.474	0.406	0.525	0.380	0.342	0.474
Age: 50 - 64 (dummy)	0.357	0.437	0.442	0.253	0.459	0.521	0.389
No vocational training (dummy)	0.073	0.099	0.141	0.222	0.238	0.224	0.111
With vocational training (dummy)	0.645	0.572	0.651	0.629	0.626	0.673	0.645
University degree (dummy)	0.282	0.329	0.208	0.149	0.136	0.104	0.244
Good health (dummy)	0.579	0.520	0.430	0.540	0.468	0.336	0.529
Average health (dummy)	0.301	0.356	0.327	0.352	0.340	0.338	0.313
Bad health (dummy)	0.120	0.124	0.244	0.108	0.192	0.326	0.158
Married (dummy)	0.828	0.782	0.828	0.711	0.697	0.735	0.803
Child younger than 2 years (dummy)	0.060	0.060	0.055	0.120	0.090	0.055	0.062
Child 2 or 3 years old (dummy)	0.088	0.067	0.105	0.200	0.115	0.090	0.093
Child 4, 5 or 6 years old (dummy)	0.142	0.149	0.115	0.248	0.184	0.140	0.146
Child between 7 and 16 years (dummy)	0.373	0.329	0.335	0.417	0.367	0.337	0.366
German (dummy)	0.808	0.761	0.719	0.733	0.564	0.613	0.761
EU citizen (dummy)	0.017	0.023	0.020	0.027	0.038	0.027	0.020
Non-EU citizen (dummy)	0.037	0.057	0.065	0.087	0.180	0.144	0.063
Immigrant with German citiz. (dummy)	0.138	0.159	0.196	0.154	0.219	0.216	0.157
Unemployment rate in % (*federal state*)	7.423	7.729	8.515	9.580	8.884	8.911	7.836
First observation in PASS	0.237	0.211	0.349	0.359	0.319	0.342	0.264
Number of observations	8271	435	505	415	479	1767	11872

Data source: PASS 2006–2014; 5,437 observations from 1,607 men without a partner or children in the household and 11,872 observations from 3,245 men with a partner and/or with children in the household; unbalanced panel; unweighted.

Table 2: Variable means by labor market state, **women**

Women **always without** a partner or children in the household

	labor market state in year t						
	Full-time	Part-time	No-job	Full-time, welfare	Part-time, welfare	No-job, welfare	All
Age: 25 - 34 (dummy)	0.249	0.133	0.250	0.096	0.078	0.136	0.175
Age: 35 - 49 (dummy)	0.325	0.266	0.285	0.384	0.287	0.288	0.303
Age: 50 - 64 (dummy)	0.427	0.601	0.465	0.521	0.635	0.576	0.522
No vocational training (dummy)	0.073	0.094	0.111	0.082	0.234	0.225	0.151
With vocational training (dummy)	0.598	0.579	0.674	0.671	0.650	0.659	0.629
University degree (dummy)	0.328	0.326	0.215	0.247	0.116	0.116	0.220
Good health (dummy)	0.477	0.468	0.382	0.370	0.287	0.241	0.363
Average health (dummy)	0.328	0.339	0.361	0.301	0.384	0.356	0.347
Bad health (dummy)	0.195	0.193	0.257	0.329	0.329	0.404	0.290
Married (dummy)	0.029	0.043	0.014	0.055	0.044	0.045	0.037
Child younger than 2 years (dummy)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Child 2 or 3 years old (dummy)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Child 4, 5 or 6 years old (dummy)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Child between 7 and 16 years (dummy)	0.000	0.000	0.000	0.000	0.000	0.000	0.000
German (dummy)	0.826	0.888	0.806	0.932	0.774	0.780	0.808
EU citizen (dummy)	0.012	0.009	0.028	0.000	0.019	0.021	0.016
Non-EU citizen (dummy)	0.004	0.021	0.021	0.000	0.036	0.025	0.017
Immigrant with German citiz. (dummy)	0.158	0.082	0.146	0.068	0.171	0.175	0.158
Unemployment rate in % (*federal state*)	8.033	7.712	8.994	9.453	8.675	8.842	8.445
First observation in PASS	0.233	0.275	0.375	0.205	0.274	0.324	0.277
Number of observations	1376	233	144	73	526	1167	3519

Women **with** a partner and/or children in the household

	labor market state in year t						
	Full-time	Part-time	No-job	Full-time, welfare	Part-time, welfare	No-job, welfare	All
Age: 25 - 34 (dummy)	0.162	0.123	0.233	0.188	0.169	0.262	0.182
Age: 35 - 49 (dummy)	0.500	0.573	0.422	0.584	0.575	0.479	0.514
Age: 50 - 64 (dummy)	0.338	0.304	0.344	0.229	0.255	0.259	0.304
No vocational training (dummy)	0.077	0.136	0.176	0.180	0.238	0.292	0.164
With vocational training (dummy)	0.673	0.712	0.683	0.745	0.689	0.626	0.678
University degree (dummy)	0.249	0.152	0.141	0.076	0.073	0.083	0.157
Good health (dummy)	0.515	0.509	0.470	0.408	0.403	0.345	0.461
Average health (dummy)	0.315	0.311	0.315	0.402	0.344	0.335	0.323
Bad health (dummy)	0.171	0.179	0.215	0.190	0.253	0.319	0.216
Married (dummy)	0.612	0.815	0.839	0.443	0.420	0.449	0.637
Child younger than 2 years (dummy)	0.017	0.026	0.136	0.012	0.012	0.085	0.047
Child 2 or 3 years old (dummy)	0.043	0.071	0.146	0.057	0.059	0.134	0.083
Child 4, 5 or 6 years old (dummy)	0.083	0.152	0.206	0.108	0.151	0.190	0.144
Child between 7 and 16 years (dummy)	0.307	0.494	0.393	0.484	0.540	0.472	0.424
German (dummy)	0.810	0.799	0.751	0.718	0.671	0.644	0.752
EU citizen (dummy)	0.014	0.014	0.021	0.024	0.025	0.033	0.020
Non-EU citizen (dummy)	0.023	0.035	0.063	0.073	0.093	0.117	0.057
Immigrant with German citiz. (dummy)	0.153	0.152	0.166	0.184	0.211	0.206	0.171
Unemployment rate in % (*federal state*)	8.159	6.975	7.690	9.456	8.624	9.093	8.065
First observation in PASS	0.205	0.221	0.314	0.284	0.294	0.340	0.260
Number of observations	5713	4625	2384	490	1818	3604	18634

Data source: PASS 2006–2014; 3,519 observations from 976 women without a partner or children in the household and 18,634 observations from 4,909 women with a partner and/or with children in the household; unbalanced panel; unweighted.

Table 3: Transition rates in percent between labor market states, **men**

Men **always without** a partner or children in the household

	Year t						
	Full-time	Part-time	No-job	Full-time, welfare	Part-time, welfare	No-job, welfare	Total
Year $t-1$							
Full-time	87.72	1.67	4.30	1.62	0.73	3.96	100.00
Part-time	27.61	50.00	3.73	0.00	9.70	8.96	100.00
No-job	30.15	4.78	23.16	2.21	5.15	34.56	100.00
Full-time, welfare	43.90	1.83	3.66	25.61	6.71	18.29	100.00
Part-time, welfare	10.63	3.15	1.18	2.56	55.32	27.17	100.00
No-job, welfare	8.41	0.58	3.12	1.17	8.34	78.38	100.00
Total	37.39	2.65	4.36	2.21	10.04	43.35	100.00

Men **with** a partner and/or children in the household

	Year t						
	Full-time	Part-time	No-job	Full-time, welfare	Part-time, welfare	No-job, welfare	Total
Year $t-1$							
Full-time	94.15	1.54	2.47	0.83	0.16	0.84	100.00
Part-time	33.07	52.49	6.82	0.79	4.72	2.10	100.00
No-job	41.45	9.23	31.43	1.57	1.97	14.34	100.00
Full-time, welfare	35.49	2.27	4.02	40.39	5.42	12.41	100.00
Part-time, welfare	12.02	6.12	2.04	5.90	49.89	24.04	100.00
No-job, welfare	8.98	1.25	4.49	4.04	9.328	71.92	100.00
Total	69.67	3.66	4.25	3.50	4.04	14.88	100.00

Data source: PASS 2006–2014; 5,437 observations from 1,607 men without a partner or children in the household and 11,872 observations from 3,245 men with a partner and/or with children in the household; unbalanced panel; unweighted; figures indicate row percentages.

Table 4: Transition rates in percent between labor market states, **women**

Women **always without** a partner or children in the household

	Year t						
	Full-time	Part-time	No-job	Full-time, welfare	Part-time, welfare	No-job, welfare	Total
Year $t-1$							
Full-time	90.67	2.75	3.22	0.71	0.71	1.96	100.00
Part-time	19.21	63.76	4.37	0.87	7.86	3.93	100.00
No-job	29.66	10.35	22.76	3.45	4.83	28.97	100.00
Full-time, welfare	29.35	3.26	0.00	43.48	7.61	16.30	100.00
Part-time, welfare	6.68	3.85	2.83	1.82	64.58	20.24	100.00
No-job, welfare	5.69	1.17	3.58	0.62	12.93	76.01	100.00
Total	39.10	6.62	4.09	2.07	14.95	33.16	100.00

Women **with** a partner and/or children in the household

	Year t						
	Full-time	Part-time	No-job	Full-time, welfare	Part-time, welfare	No-job, welfare	Total
Year $t-1$							
Full-time	87.59	6.36	3.91	1.18	0.38	0.59	100.00
Part-time	10.02	79.56	6.47	0.26	2.89	0.81	100.00
No-job	8.08	21.66	60.22	0.31	1.41	8.32	100.00
Full-time, welfare	29.26	4.50	2.73	41.00	10.29	12.22	100.00
Part-time, welfare	6.50	13.42	2.50	4.00	55.46	18.13	100.00
No-job, welfare	4.16	3.47	7.24	2.01	14.96	68.15	100.00
Total	30.66	24.82	12.79	2.63	9.76	19.34	100.00

Data source: PASS 2006–2014; 3,519 observations from 976 women without a partner or children in the household and 18,634 observations from 4,909 women with a partner and/or with children in the household; unbalanced panel; unweighted; figures indicate row percentages.

Table 5: Dynamic discrete choice models with random effects, **men**

	labor market state in t									
	Part-time		No-job		Full-time, welfare		Part-time, welfare		No-job, welfare	
labor market state in $t-1$:										
Part-time	3.325***	(0.233)	1.339***	(0.304)	−0.155	(0.748)	2.787***	(0.457)	0.933**	(0.466)
No-job	1.916***	(0.269)	2.214***	(0.230)	1.105***	(0.427)	1.983***	(0.498)	2.119***	(0.253)
Full-time, welfare	0.142	(0.518)	0.248	(0.423)	3.497***	(0.259)	2.698***	(0.449)	2.454***	(0.301)
Part-time, welfare	2.089***	(0.328)	0.324	(0.451)	2.319***	(0.354)	4.845***	(0.411)	3.249***	(0.292)
No-job, welfare	1.264***	(0.314)	1.236***	(0.224)	2.830***	(0.265)	4.086***	(0.357)	4.567***	(0.206)
Without partner or children in the household *(Single)*	−0.019	(0.256)	0.666***	(0.202)	0.448*	(0.270)	1.057**	(0.433)	1.343***	(0.227)
Single × labor market state in $t-1$:										
Part-time	0.308	(0.365)	−0.777	(0.588)	−28.048	(.)	0.060	(0.638)	0.279	(0.595)
No-job	−0.155	(0.426)	−0.227	(0.289)	0.414	(0.628)	0.423	(0.630)	0.132	(0.337)
Full-time, welfare	−0.399	(0.704)	−0.817	(0.533)	−0.918***	(0.342)	−0.899	(0.596)	−1.154***	(0.372)
Part-time, welfare	−0.506	(0.445)	−0.805	(0.598)	−0.926**	(0.469)	−0.578	(0.487)	−0.771**	(0.340)
No-job, welfare	−0.693*	(0.411)	−0.644***	(0.249)	−1.552***	(0.340)	−0.981**	(0.441)	−0.951***	(0.234)
labor market state in $t=1$:										
Part-time	3.781***	(0.311)	1.346***	(0.463)	1.801***	(0.629)	4.105***	(0.583)	1.751***	(0.490)
No-job	2.594***	(0.307)	2.379***	(0.285)	1.750***	(0.451)	2.734***	(0.549)	2.541***	(0.321)
Full-time, welfare	1.405***	(0.315)	1.211***	(0.241)	2.642***	(0.362)	3.018***	(0.513)	1.548***	(0.252)
Part-time, welfare	3.158***	(0.400)	2.529***	(0.446)	3.014***	(0.489)	5.864***	(0.581)	3.851***	(0.380)
No-job, welfare	2.124***	(0.306)	2.861***	(0.273)	2.113***	(0.402)	4.484***	(0.533)	4.024***	(0.282)
Age: 35 - 49	0.390**	(0.182)	−0.017	(0.137)	0.310**	(0.155)	0.216	(0.157)	0.302**	(0.121)
Age: 50 - 64	0.791***	(0.200)	0.509***	(0.152)	0.414**	(0.185)	0.961***	(0.172)	1.063***	(0.135)
No vocational training	0.133	(0.181)	0.458***	(0.143)	0.762***	(0.152)	0.559***	(0.154)	0.467***	(0.124)
University degree	0.138	(0.136)	−0.365***	(0.129)	0.034	(0.166)	−0.460***	(0.166)	−0.872***	(0.132)
Average health	−0.080	(0.161)	−0.049	(0.135)	0.205	(0.167)	0.137	(0.149)	0.331***	(0.115)
Bad health	−0.331	(0.227)	0.212	(0.172)	−0.115	(0.236)	0.432**	(0.198)	0.628***	(0.148)
Married	0.135	(0.396)	0.552	(0.366)	−0.601	(0.411)	−0.119	(0.420)	−0.082	(0.318)
Child younger than 2 years	0.878**	(0.378)	0.261	(0.326)	0.462	(0.315)	0.492	(0.366)	−0.042	(0.299)
Child 2 or 3 years old	0.130	(0.375)	0.305	(0.301)	0.488	(0.299)	−0.077	(0.358)	0.009	(0.281)
Child 4, 5 or 6 years old	0.393	(0.313)	−0.147	(0.274)	0.539**	(0.269)	0.291	(0.321)	−0.172	(0.249)
Child between 7 and 16 years	0.264	(0.302)	0.104	(0.263)	0.124	(0.292)	0.649**	(0.331)	0.339	(0.251)
EU citizen	0.311	(0.345)	0.081	(0.326)	0.101	(0.408)	0.270	(0.362)	0.379	(0.289)
Non-EU citizen	0.072	(0.250)	0.163	(0.220)	−0.229	(0.237)	0.391*	(0.231)	0.650***	(0.183)
Immigrant with German citizenship	0.177	(0.165)	0.209	(0.137)	−0.174	(0.169)	0.118	(0.159)	0.261**	(0.125)
Unemployment rate in % (*federal state*)	0.052	(0.090)	0.209***	(0.064)	0.166**	(0.077)	0.112	(0.075)	0.140**	(0.056)
Individual averages ($\bar{x}_i$) :										
Medium health	0.579**	(0.256)	0.706***	(0.216)	0.339	(0.257)	0.470*	(0.242)	0.465**	(0.193)
Bad health	1.104***	(0.316)	1.372***	(0.246)	0.622*	(0.320)	0.365	(0.285)	1.164***	(0.216)
Married	−0.232	(0.426)	−0.478	(0.389)	0.322	(0.441)	−0.185	(0.450)	−0.123	(0.344)
Child younger than 2 years	−0.915	(0.718)	−0.279	(0.545)	0.356	(0.529)	0.315	(0.603)	0.745	(0.485)
Child 2 or 3 years old	−0.151	(0.584)	0.392	(0.473)	0.681	(0.464)	1.025*	(0.533)	0.461	(0.446)
Child 4, 5 or 6 years old	0.013	(0.453)	−0.330	(0.392)	−0.415	(0.387)	−0.349	(0.463)	−0.075	(0.365)
Child between 7 and 16 years	−0.333	(0.348)	0.132	(0.301)	0.066	(0.341)	−0.452	(0.392)	−0.101	(0.294)
Unemployment rate	−0.047	(0.092)	−0.128*	(0.067)	−0.024	(0.079)	−0.028	(0.078)	−0.030	(0.058)
AIC	21486.258									
Log Likelihood	-10466.129									
Wald-Test-Chi^2 [$p-$value]	1008.30 [0.000]									
m_1 ($p_1 = 0.580$)	−6.012***	(0.481)	−7.029***	(0.444)	−8.500***	(0.514)	−11.186***	(0.640)	−9.966***	(0.416)
m_2 ($p_2 = 0.348$)	−5.280***	(0.475)	−4.313***	(0.336)	−8.516***	(0.509)	−9.234***	(0.645)	−6.742***	(0.337)
m_3 ($p_3 = .072$)	−2.868***	(0.478)	−4.414***	(0.565)	−5.574***	(0.516)	−6.421***	(0.583)	−6.778***	(0.611)

Data source: PASS 2006–2014; 17,309 observations from 4,852 individuals; unbalanced panel; unweighted; all variables except the unemployment rate and the individual averages ($\bar{x}_i$) are dummy variables; wave dummies are also included; reference categories: full-time, $t-1$, full-time, $t=1$, age: 25 - 34, with vocational training, good health, German. Individual averages of age dummies not included due to convergence problems. Significance level: $^*p < 0.10$. $^{**}p < 0.05$. $^{***}p < 0.01$. Standard errors are in parentheses.

Table 6: Dynamic discrete choice models with random effects, **women**

	labor market state in t									
	Part-time		No-job		Full-time, welfare		Part-time, welfare		No-job, welfare	
labor market state in $t-1$:										
Part-time	3.817***	(0.114)	2.123***	(0.167)	0.228	(0.391)	3.421***	(0.286)	1.759***	(0.326)
No-job	2.764***	(0.166)	3.418***	(0.192)	0.451	(0.447)	3.306***	(0.347)	4.161***	(0.284)
Full-time, welfare	−0.047	(0.398)	−0.592	(0.513)	3.135***	(0.305)	2.653***	(0.376)	2.313***	(0.366)
Part-time, welfare	2.895***	(0.177)	1.845***	(0.265)	2.430***	(0.285)	5.658***	(0.298)	4.144***	(0.286)
No-job, welfare	1.948***	(0.186)	2.311***	(0.206)	1.639***	(0.285)	4.445***	(0.294)	5.164***	(0.275)
Without partner or children in the household *(Single)*	−0.033	(0.202)	0.776***	(0.216)	−0.219	(0.393)	0.943**	(0.428)	1.567***	(0.326)
Single × labor market state in $t-1$:										
Part-time	0.247	(0.280)	−0.443	(0.444)	1.373	(0.898)	0.062	(0.548)	0.062	(0.575)
No-job	−0.708*	(0.383)	−1.231***	(0.353)	1.734**	(0.731)	−0.649	(0.635)	−0.969**	(0.451)
Full-time, welfare	0.295	(0.684)	−32.568	(.)	0.574	(0.515)	−0.809	(0.648)	−0.913*	(0.550)
Part-time, welfare	−0.673*	(0.374)	0.070	(0.438)	−0.105	(0.570)	−0.399	(0.481)	−1.035**	(0.414)
No-job, welfare	−0.630*	(0.364)	−0.903***	(0.302)	−0.848	(0.553)	−0.948**	(0.456)	−1.309***	(0.355)
labor market state in $t=1$:										
Part-time	2.885***	(0.178)	1.438***	(0.217)	1.223**	(0.535)	2.834***	(0.338)	2.737***	(0.365)
No-job	2.424***	(0.198)	3.423***	(0.250)	2.411***	(0.441)	2.351***	(0.369)	3.357***	(0.341)
Full-time, welfare	1.222***	(0.224)	0.913***	(0.286)	3.329***	(0.524)	2.947***	(0.445)	3.168***	(0.491)
Part-time, welfare	2.386***	(0.224)	1.479***	(0.300)	3.440***	(0.547)	4.739***	(0.411)	4.617***	(0.428)
No-job, welfare	1.779***	(0.201)	2.297***	(0.243)	3.587***	(0.547)	4.609***	(0.402)	5.763***	(0.413)
Age: 35 - 49	0.263***	(0.099)	0.012	(0.118)	0.275	(0.174)	0.479***	(0.127)	0.211*	(0.127)
Age: 50 - 64	0.430***	(0.116)	0.520***	(0.141)	0.393*	(0.211)	0.921***	(0.152)	0.750***	(0.154)
No vocational training	0.253**	(0.100)	0.596***	(0.123)	0.552***	(0.178)	0.737***	(0.127)	1.010***	(0.132)
University degree	−0.303***	(0.086)	−0.325***	(0.114)	−0.598***	(0.199)	−0.794***	(0.140)	−0.706***	(0.145)
Average health	0.152*	(0.090)	0.261**	(0.107)	0.359**	(0.167)	0.329***	(0.117)	0.355***	(0.114)
Bad health	0.290**	(0.113)	0.428***	(0.133)	0.218	(0.209)	0.334**	(0.143)	0.534***	(0.137)
Married	0.628***	(0.211)	−0.173	(0.249)	−0.537	(0.373)	−0.306	(0.257)	−0.299	(0.248)
Child younger than 2 years	1.332***	(0.259)	3.320***	(0.260)	0.928	(0.592)	1.350***	(0.383)	2.891***	(0.303)
Child 2 or 3 years old	0.393*	(0.203)	0.802***	(0.221)	0.703*	(0.423)	0.687**	(0.281)	0.786***	(0.248)
Child 4, 5 or 6 years old	0.484***	(0.164)	0.666***	(0.188)	0.554	(0.342)	0.917***	(0.224)	0.564***	(0.210)
Child between 7 and 16 years	0.355**	(0.149)	0.280	(0.180)	0.875***	(0.296)	0.431**	(0.203)	0.395**	(0.197)
EU citizen	−0.359	(0.234)	−0.130	(0.303)	0.524	(0.430)	0.499*	(0.297)	0.886***	(0.305)
Non-EU citizen	−0.016	(0.173)	0.485**	(0.201)	0.871***	(0.281)	0.904***	(0.202)	1.082***	(0.213)
Immigrant with German citizenship	−0.139	(0.088)	−0.089	(0.114)	0.224	(0.166)	0.210*	(0.117)	0.285**	(0.125)
Unemployment rate in % (*federal state*)	−0.098**	(0.050)	0.131**	(0.054)	0.118	(0.080)	0.112*	(0.059)	0.181***	(0.057)
Individual averages ($\bar{x}_i$) :										
Medium health	−0.296**	(0.147)	−0.110	(0.184)	0.313	(0.275)	0.239	(0.200)	0.461**	(0.206)
Bad health	−0.120	(0.168)	0.329	(0.202)	0.467	(0.308)	0.725***	(0.215)	1.243***	(0.217)
Married	0.152	(0.225)	1.054***	(0.268)	0.360	(0.397)	0.060	(0.277)	−0.007	(0.270)
Child younger than 2 years	0.183	(0.397)	0.670	(0.442)	−0.195	(0.820)	0.139	(0.562)	0.990**	(0.501)
Child 2 or 3 years old	0.048	(0.314)	−0.255	(0.353)	−0.207	(0.616)	−0.330	(0.432)	−0.157	(0.397)
Child 4, 5 or 6 years old	−0.156	(0.229)	−0.246	(0.277)	−0.394	(0.462)	−0.789**	(0.318)	−0.098	(0.308)
Child between 7 and 16 years	0.158	(0.171)	0.082	(0.211)	−0.343	(0.335)	0.313	(0.235)	0.076	(0.235)
Unemployment rate	0.014	(0.051)	−0.140**	(0.057)	−0.013	(0.082)	−0.067	(0.061)	−0.099*	(0.058)
AIC	35318.263									
Log Likelihood	-17376.132									
Wald-Test-Chi^2 [$p-$value]	3513.02 [0.000]									
m_1 ($p_1 = 0.267$)	−3.735***	(0.324)	−7.552***	(0.534)	−9.628***	(0.687)	−9.292***	(0.534)	−11.272***	(0.513)
m_2 ($p_2 = 0.301$)	−3.806***	(0.308)	−3.814***	(0.301)	−8.245***	(0.663)	−9.798***	(0.533)	−10.153***	(0.514)
m_3 ($p_3 = 0.187$)	−1.680***	(0.294)	−3.693***	(0.384)	−5.890***	(0.508)	−6.160***	(0.460)	−6.653***	(0.444)
m_3 ($p_4 = 0.245$)	−3.200***	(0.325)	−5.482***	(0.409)	−10.634***	(0.786)	−10.937***	(0.615)	−12.965***	(0.650)

Data source: PASS 2006–2014; 22,153 observations from 5,855 individuals; unbalanced panel; unweighted; all variables except the unemployment rate and the individual averages ($\bar{x}_i$) are dummy variables; wave dummies are also included; reference categories: full-time, $t-1$, full-time, $t=1$, age: 25 - 34, with vocational training, good health, German. Individual averages of age dummies not included due to convergence problems. Significance level: $^*p < 0.10$. $^{**}p < 0.05$. $^{***}p < 0.01$. Standard errors are in parentheses.

Table 7: Average partial effects of labor market states in year $t-1$, **men**

Men **always without** a partner or children in the household

	labor market state in t			
	Full-time	Part-time	No-job	Full-time or part-time
labor market state in $t-1$				
Full-time	0.294*** (0.023)	0.012* (0.007)	0.066*** (0.016)	0.306*** (0.023)
Part-time	0.027 (0.048)	0.259*** (0.044)	0.035 (0.030)	0.286*** (0.045)
No-job	0.035 (0.034)	0.038** (0.015)	0.154*** (0.026)	0.073** (0.036)
Full-time, welfare	0.152*** (0.035)	0.000 (0.010)	0.001 (0.018)	0.152*** (0.035)
Part-time, welfare	0.044 (0.027)	0.025** (0.012)	−0.014 (0.010)	0.069** (0.027)
No-job, welfare: reference				
	Full-time, welfare	Part-time, welfare	Welfare, no-job	Welfare, all
Full-time	−0.001 (0.007)	−0.037*** (0.010)	−0.334*** (0.025)	−0.372*** (0.026)
Part-time	−0.022*** (0.005)	0.028 (0.027)	−0.327*** (0.039)	−0.321*** (0.043)
No-job	0.014 (0.015)	−0.008 (0.015)	−0.232*** (0.030)	−0.227*** (0.031)
Full-time, welfare	0.110*** (0.024)	−0.006 (0.019)	−0.256*** (0.032)	−0.153*** (0.036)
Part-time, welfare	0.005 (0.009)	0.150*** (0.022)	−0.210*** (0.025)	−0.055** (0.028)
No-job, welfare: reference				

Men **with** partner and/or children in the household

	labor market state in t			
	Full-time	Part-time	No-job	Full-time or part-time
labor market state in $t-1$				
Full-time	0.365*** (0.025)	0.006 (0.010)	0.045*** (0.014)	0.371*** (0.025)
Part-time	0.084** (0.037)	0.247*** (0.033)	0.071*** (0.024)	0.331*** (0.032)
No-job	0.116*** (0.030)	0.059*** (0.017)	0.175*** (0.021)	0.175*** (0.032)
Full-time, welfare	0.119*** (0.030)	−0.010 (0.011)	0.001 (0.016)	0.109*** (0.029)
Part-time, welfare	0.060** (0.031)	0.044** (0.017)	−0.012 (0.011)	0.104*** (0.030)
No-job, welfare: reference				
	Full-time, welfare	Part-time, welfare	No-job, welfare	Welfare, all
Full-time	−0.045*** (0.013)	−0.048*** (0.009)	−0.323*** (0.023)	−0.416*** (0.025)
Part-time	−0.056*** (0.012)	−0.012 (0.016)	−0.334*** (0.025)	−0.402*** (0.030)
No-job	−0.039*** (0.013)	−0.037*** (0.011)	−0.274*** (0.023)	−0.350*** (0.026)
Full-time, welfare	0.122*** (0.024)	−0.018 (0.014)	−0.214*** (0.028)	−0.110*** (0.030)
Part-time, welfare	−0.016 (0.014)	0.113*** (0.022)	−0.189*** (0.025)	−0.092*** (0.030)
No-job, welfare: reference				

Data source: PASS 2006–2014; 5,437 observations from 1,607 men without a partner or children in the household and 11,872 observations from 3,245 men with a partner and/or with children in the household; unbalanced panel; unweighted. Calculations are based on parametric bootstrap (1,000 repetitions) using estimation results presented in Table 5. The APEs are obtained as averages over observations and draws. Significance level: $^{*}p < 0.10$. $^{**}p < 0.05$. $^{***}p < 0.01$. Standard errors, which are obtained as the square root of the empirical variance of the APEs (averaged over observations) within 1,000 repetitions, are in parentheses.

Table 8: Average partial effects of labor market states in year $t-1$, **women**

Women **always without** a partner or children in the household

	labor market state in t			
	Full-time	Part-time	No-job	Full-time or part-time
labor market state in $t-1$				
Full-time	0.304*** (0.030)	−0.011 (0.024)	0.011 (0.025)	0.293*** (0.034)
Part-time	−0.116*** (0.030)	0.387*** (0.040)	−0.021 (0.032)	0.272*** (0.043)
No-job	−0.024 (0.032)	0.062* (0.037)	0.082** (0.033)	0.038 (0.040)
Full-time, welfare	0.158*** (0.054)	−0.007 (0.049)	−0.131*** (0.016)	0.151*** (0.053)
Part-time, welfare	−0.074*** (0.027)	0.034 (0.032)	0.015 (0.032)	−0.040 (0.034)
No-job, welfare: reference				
	Full-time, welfare	Part-time, welfare	No-job, welfare	Welfare, all
Full-time	0.016* (0.009)	−0.072*** (0.016)	−0.248*** (0.029)	−0.304*** (0.031)
Part-time	0.012 (0.015)	0.016 (0.030)	−0.279*** (0.035)	−0.251*** (0.040)
No-job	0.022 (0.014)	−0.043* (0.025)	−0.099*** (0.034)	−0.120*** (0.035)
Full-time, welfare	0.249*** (0.047)	−0.037 (0.029)	−0.231*** (0.036)	−0.020 (0.051)
Part-time, welfare	0.013 (0.007)	0.247*** (0.027)	−0.234*** (0.023)	0.025 (0.032)
No-job, welfare: reference				

Women **with** partner and/or children in the household

	labor market state in t			
	Full-time	Part-time	No-job	Full-time or part-time
labor market state in $t-1$				
Full-time	0.403*** (0.025)	−0.044** (0.019)	−0.034** (0.017)	0.359*** (0.027)
Part-time	−0.056** (0.022)	0.383*** (0.025)	−0.020 (0.016)	0.328*** (0.026)
No-job	−0.036* (0.021)	0.093*** (0.021)	0.133*** (0.018)	0.057** (0.024)
Full-time, welfare	0.212*** (0.033)	−0.081*** (0.025)	−0.095*** (0.018)	0.131*** (0.032)
Part-time, welfare	−0.047*** (0.017)	0.103*** (0.020)	−0.051*** (0.015)	0.055*** (0.020)
No-job, welfare: reference				
	Full-time, welfare	Part-time, welfare	No-job, welfare	Welfare, all
Full-time	0.026** (0.011)	−0.087*** (0.011)	−0.264*** (0.018)	−0.325*** (0.023)
Part-time	−0.008 (0.005)	−0.020 (0.015)	−0.280*** (0.018)	−0.308*** (0.023)
No-job	−0.010** (0.004)	−0.056*** (0.012)	−0.125*** (0.020)	−0.191*** (0.022)
Full-time, welfare	0.214*** (0.023)	−0.032** (0.016)	−0.217*** (0.020)	−0.035 (0.030)
Part-time, welfare	0.017*** (0.006)	0.175*** (0.017)	−0.196*** (0.015)	−0.004 (0.018)
No-job, welfare: reference				

Data source: PASS 2006–2014; 3,519 observations from 976 women without a partner or children in the household and 18,634 observations from 4,909 women with a partner and/or with children in the household; unbalanced panel; unweighted. Calculations are based on parametric bootstrap (1,000 repetitions) using estimation results presented in Table 6. The APEs are obtained as averages over observations and draws. Significance level: $^{*}p < 0.10$. $^{**}p < 0.05$. $^{***}p < 0.01$. Standard errors, which are obtained as the square root of the empirical variance of the APEs (averaged over observations) within 1,000 repetitions, are in parentheses.

Appendix

Table A1: Simulated transition matrix, **men**

Men **always without** a partner or children in the household

	labor market state in t							
	Full-time		Part-time		No-job		Full-time or part-time	
labor market state in $t-1$								
Full-time	0.716	[0.668,0.761]	0.026	[0.013,0.044]	0.098	[0.061,0.143]	0.741	[0.695,0.786]
Part-time	0.448	[0.348,0.546]	0.274	[0.165,0.403]	0.067	[0.024,0.135]	0.722	[0.628,0.810]
No-job	0.456	[0.384,0.526]	0.052	[0.024,0.092]	0.186	[0.119,0.269]	0.508	[0.430,0.583]
Full-time, welfare	0.573	[0.494,0.647]	0.014	[0.003,0.035]	0.034	[0.011,0.072]	0.587	[0.508,0.661]
Part-time, welfare	0.466	[0.400,0.530]	0.039	[0.017,0.071]	0.018	[0.006,0.039]	0.504	[0.435,0.570]
No-job, welfare	0.421	[0.367,0.475]	0.014	[0.006,0.026]	0.032	[0.018,0.051]	0.435	[0.379,0.491]
	Full-time, welfare		Part-time, welfare		No-job, welfare		Welfare, all	
Full-time	0.021	[0.010,0.037]	0.023	[0.011,0.040]	0.116	[0.083,0.153]	0.161	[0.120,0.205]
Part-time	0.000	[0.000,0.000]	0.088	[0.042,0.151]	0.123	[0.065,0.196]	0.211	[0.132,0.297]
No-job	0.036	[0.013,0.072]	0.052	[0.025,0.088]	0.218	[0.160,0.282]	0.305	[0.235,0.380]
Full-time, welfare	0.132	[0.073,0.208]	0.054	[0.024,0.095]	0.194	[0.137,0.259]	0.379	[0.302,0.462]
Part-time, welfare	0.027	[0.011,0.051]	0.210	[0.144,0.290]	0.241	[0.182,0.306]	0.478	[0.410,0.549]
No-job, welfare	0.022	[0.010,0.040]	0.060	[0.036,0.090]	0.451	[0.389,0.516]	0.532	[0.474,0.592]

Men **with** a partner and/or children in the household

	labor market state in t							
	Full-time		Part-time		No-job		Full-time or part-time	
labor market state in $t-1$								
Full-time	0.794	[0.752,0.834]	0.034	[0.019,0.056]	0.082	[0.052,0.117]	0.828	[0.788,0.865]
Part-time	0.512	[0.425,0.595]	0.276	[0.180,0.389]	0.108	[0.060,0.167]	0.788	[0.717,0.853]
No-job	0.544	[0.478,0.608]	0.087	[0.048,0.140]	0.212	[0.147,0.288]	0.632	[0.560,0.698]
Full-time, welfare	0.548	[0.471,0.619]	0.018	[0.006,0.038]	0.038	[0.016,0.072]	0.566	[0.487,0.638]
Part-time, welfare	0.489	[0.420,0.555]	0.072	[0.037,0.122]	0.025	[0.010,0.047]	0.561	[0.488,0.629]
No-job, welfare	0.429	[0.374,0.483]	0.028	[0.014,0.050]	0.037	[0.021,0.058]	0.457	[0.399,0.514]
	Full-time, welfare		Part-time, welfare		No-job, welfare		Welfare, all	
Full-time	0.018	[0.009,0.031]	0.014	[0.006,0.025]	0.059	[0.039,0.083]	0.091	[0.063,0.122]
Part-time	0.007	[0.001,0.020]	0.050	[0.024,0.087]	0.047	[0.022,0.083]	0.105	[0.062,0.157]
No-job	0.024	[0.009,0.047]	0.025	[0.011,0.046]	0.108	[0.074,0.148]	0.157	[0.112,0.209]
Full-time, welfare	0.185	[0.115,0.273]	0.044	[0.022,0.074]	0.167	[0.120,0.219]	0.396	[0.320,0.479]
Part-time, welfare	0.047	[0.022,0.084]	0.174	[0.117,0.247]	0.192	[0.142,0.249]	0.414	[0.346,0.488]
No-job, welfare	0.063	[0.034,0.103]	0.062	[0.038,0.093]	0.382	[0.323,0.444]	0.506	[0.447,0.567]

Data source: PASS 2006–2014; 5,437 observations from 1,607 men without a partner or children in the household and 11,872 observations from 3,245 men with a partner and/or with children in the household; unbalanced panel; unweighted. Simulated transition probabilities are based on parametric bootstrap (1,000 repetitions) using estimation results presented in Table 5. The predicted transition probabilities are obtained as averages over observations and draws. 95% confidence intervals, which are obtained by ranking the average prediction per draw and taking the difference between the 25th smallest and 976th largest value, are in parentheses. The transition probability of men always without a partner or children in the household from 'Part-time' to 'Full-time, welfare' is obtained by using the actual coefficient estimate instead of drawing the parameter from a distribution (with a very large variance). Therefore, the confidence interval of that transition includes only one point.

Table A2: Simulated transition matrix, **women**

Women **always without** a partner or children in the household

	labor market state in t							
	Full-time		Part-time		No-job		Full-time or part-time	
labor market state in $t-1$								
Full-time	0.577	[0.514,0.641]	0.090	[0.062,0.125]	0.142	[0.101,0.190]	0.668	[0.607,0.727]
Part-time	0.157	[0.115,0.205]	0.489	[0.402,0.578]	0.111	[0.062,0.171]	0.646	[0.564,0.725]
No-job	0.249	[0.194,0.308]	0.163	[0.108,0.227]	0.213	[0.151,0.283]	0.412	[0.338,0.487]
Full-time, welfare	0.431	[0.318,0.540]	0.095	[0.034,0.186]	0.000	[0.000,0.000]	0.525	[0.416,0.627]
Part-time, welfare	0.199	[0.152,0.250]	0.136	[0.087,0.193]	0.146	[0.092,0.212]	0.334	[0.266,0.405]
No-job, welfare	0.273	[0.224,0.324]	0.102	[0.066,0.145]	0.131	[0.094,0.174]	0.375	[0.316,0.434]
	Full-time, welfare		Part-time, welfare		No-job, welfare		Welfare, all	
Full-time	0.022	[0.009,0.044]	0.034	[0.017,0.059]	0.133	[0.095,0.176]	0.190	[0.146,0.238]
Part-time	0.018	[0.004,0.048]	0.122	[0.074,0.181]	0.103	[0.057,0.160]	0.243	[0.179,0.312]
No-job	0.028	[0.010,0.060]	0.064	[0.030,0.113]	0.283	[0.218,0.351]	0.375	[0.308,0.444]
Full-time, welfare	0.255	[0.147,0.387]	0.069	[0.029,0.127]	0.151	[0.089,0.224]	0.475	[0.373,0.584]
Part-time, welfare	0.019	[0.007,0.038]	0.353	[0.281,0.433]	0.147	[0.108,0.192]	0.519	[0.450,0.591]
No-job, welfare	0.006	[0.002,0.013]	0.106	[0.075,0.143]	0.382	[0.327,0.441]	0.494	[0.438,0.553]

Women **with** a partner and/or children in the household

	labor market state in t							
	Full-time		Part-time		No-job		Full-time or part-time	
labor market state in $t-1$								
Full-time	0.656	[0.601,0.710]	0.113	[0.087,0.144]	0.101	[0.074,0.133]	0.769	[0.721,0.815]
Part-time	0.197	[0.159,0.237]	0.541	[0.477,0.607]	0.115	[0.085,0.149]	0.738	[0.686,0.788]
No-job	0.217	[0.176,0.260]	0.250	[0.204,0.301]	0.269	[0.217,0.325]	0.467	[0.411,0.523]
Full-time, welfare	0.465	[0.382,0.544]	0.076	[0.041,0.122]	0.040	[0.018,0.072]	0.541	[0.457,0.618]
Part-time, welfare	0.205	[0.168,0.246]	0.260	[0.210,0.314]	0.084	[0.058,0.115]	0.465	[0.407,0.521]
No-job, welfare	0.253	[0.212,0.296]	0.157	[0.122,0.197]	0.135	[0.103,0.172]	0.410	[0.358,0.461]
	Full-time, welfare		Part-time, welfare		No-job, welfare		Welfare, all	
Full-time	0.043	[0.021,0.073]	0.023	[0.013,0.036]	0.064	[0.043,0.088]	0.130	[0.097,0.166]
Part-time	0.009	[0.004,0.018]	0.089	[0.062,0.119]	0.049	[0.032,0.070]	0.147	[0.112,0.184]
No-job	0.007	[0.003,0.015]	0.053	[0.034,0.078]	0.203	[0.165,0.244]	0.264	[0.222,0.308]
Full-time, welfare	0.231	[0.149,0.333]	0.077	[0.047,0.114]	0.111	[0.074,0.153]	0.419	[0.343,0.505]
Part-time, welfare	0.034	[0.017,0.057]	0.284	[0.229,0.346]	0.133	[0.103,0.166]	0.451	[0.397,0.508]
No-job, welfare	0.017	[0.009,0.029]	0.109	[0.081,0.142]	0.329	[0.282,0.379]	0.455	[0.406,0.506]

Data source: PASS 2006–2014; 3,519 observations from 976 women without a partner or children in the household and 18,634 observations from 4,909 women with a partner and/or with children in the household; unbalanced panel; unweighted. Simulated transition probabilities are based on parametric bootstrap (1,000 repetitions) using estimation results presented in Table 5. The predicted transition probabilities are obtained as averages over observations and draws. 95% confidence intervals, which are obtained by ranking the average prediction per draw and taking the difference between the 25th smallest and 976th largest value, are in parentheses. The transition probability of women always without partner or children in the household from 'Full-time, welfare' to 'No-job' is obtained by using the actual coefficient estimate instead of drawing the parameter from a distribution (with a very large variance). Therefore, the confidence interval of that transition includes only one point.