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ORIGINAL ARTICLE

Do supplementary jobs for welfare recipients increase the chance of welfare exit? Evidence from Germany

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Abstract

Welfare recipients in Germany are allowed to take up supplementary jobs while receiving welfare. 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 these supplementary jobs on the chances of welfare exit. Dynamic multinomial logit models controlling for unobserved heterogeneity and endogenous initial conditions reveal that full-time employed men and women are more likely to exit welfare into employment than their non-employed counterparts. For supplementary part-time jobs, however, we find no or (only in some specifications for men) much smaller stepping stone effects.

JEL CLASSIFICATION

C33, J60, I38

INTRODUCTION

Until the mid-2000s, the German unemployment rate rose to an unprecedented high level. Thereafter, it declined from 11.7% in 2005 to 6.7% in 2014.[1] Inter alia, the reversal has been attributed to a package of major reforms (the "Hartz reforms") which were implemented between 2002 and 2005 in the German labor market, to activate, in particular, the long-term unemployed.[2] 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 jobs during

[1]Rates refer to registered unemployed individuals within the overall labor force (including self-employed persons). Statistik der Bundesagentur für Arbeit: "Tabellen: Arbeitslosigkeit im Zeitverlauf, Nürnberg, Januar 2023".

[2]See Dustmann et al. (2014) for other reasons of Germany's transition from "sick man of Europe to economic superstar".

benefit receipt, with the accompanied welfare reduction being lower than before (Bruckmeier & Wiemers, 2012). In the following, we refer to working while receiving welfare as having a supplementary job.

From 2013 to 2019, the number of employed welfare recipients decreased by approximately 22%, while the number of non-employed welfare recipients decreased by <7%.[3] 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 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. Alternatively, 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).[4] 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.[5]

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, consisting of six different categories: (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.

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

[4]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).

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

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 individuals are better off by taking up full-time employment during welfare benefit because the probability of moving into employment without benefit receipt increases between 10 and 20 percentage points (compared to individuals without a supplementary job). For supplementary part-time jobs, however, we find no or (only in some specifications for men) much smaller stepping stone effect. This is partly in line with Kyyrä (2010). Although he focuses on a different target population (unemployment insurance recipients) than we do (welfare recipients which should be more detached from the labor market), we both find that full-time supplementary jobs are beneficial for transitions to regular work. In contrast to Kyyrä (2010), we do not find an unambiguously positive effect of part-time supplementary jobs for men.

For *single* women, our results unambiguously show that taking up a part-time job during welfare receipt does not lead to a higher probability of being employed part-time without welfare payments and even lead to a larger persistence in welfare. The opposing effects of supplementary part- and full-time jobs is consistent with the empirical literature (for women) 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 and 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 (Andrén & Andrén, 2013; Hansen & Lofstrom, 2009, 2011), the UK (Cappellari & Jenkins, 2014), South Korea (Lee et al., 2018), and Germany (Bruckmeier et al., 2018; Königs, 2014; Riphahn & Wunder, 2016; Wunder & Riphahn, 2014).

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[6] (Boschman et al., 2021; Cai et al., 2018; Knabe & Plum, 2013; Mosthaf, 2014; Mosthaf et al., 2014; Uhlendorff, 2006), for temporary agency work (de Graaf-Zijl et al., 2011; Gebel, 2013; Jahn & Rosholm, 2014; Kvasnicka, 2009), for atypical work in general (Auray & Lepage-Saucier, 2021), for (subsidized) part-time jobs (Cockx et al., 2013; Kyyrä, 2010; Kyyrä et al., 2013; Nightingale, 2020) and for marginal employment[7] (Caliendo et al., 2016; Freier & Steiner, 2008; Lietzmann et al., 2017).

[6]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.

[7]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.

We contribute to the literature by analyzing 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 the employment take-up and welfare exit process in such detail. The finding of Hohmeyer and 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. Other studies look at welfare exits in general, no matter if employment-related or not (e.g. Cappellari & Jenkins, 2014; Hansen et al., 2014; Königs, 2014) or distinguish only between welfare exits into employment or inactivity (Wunder & Riphahn, 2014). Moreover, in contrast to the current paper, these studies do not differentiate between welfare recipients with and without a supplementary job. While the studies of Kyyrä (2010) and Boschman et al. (2021) also investigate whether supplementary jobs serve as a stepping stone into employment, our study offers additional insights. We further distinguish between welfare exits into part- and full-time employment, which is particularly relevant since the risk of future welfare dependency may differ between part- and full-time jobs (without welfare). In contrast to Boschman et al. (2021), we differentiate between part- and full-time supplementary jobs and document that only the former lead to a significant stepping stone effect. In contrast to our study, Kyyrä (2010) examine unemployment insurance recipients, i.e., individuals who have been working and contributing to an unemployment fund for at least 10 months during the 2 years prior to unemployment, while our target population are welfare recipients which should be more detached from the labor market.

Further extensions to the literature are as follows. First, 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- 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% of employed persons receiving UBII were working full-time.[8] Second, 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. Third, examining separately the group of *single* individuals ensures that welfare exits are not solely driven by household composition or partner income changes. 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 the first section, we provide the Institutional framework. The next section presents the Empirical method. In the following section, we describe the Data and then discuss the Results. The final chapter draws Conclusions.

INSTITUTIONAL FRAMEWORK

The main goal of the 'Hartz reforms' implemented in Germany between 2002 and 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 unemployment persistence in Germany at the beginning of the century and to increase labor force

[8]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.

participation among young parents (Caliendo & Hogenacker, 2012). With the implementation of the fourth package of the 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 2 years. UBI amounts to 60% or 67% 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.[9] 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.[10]

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 UBI is not sufficient to meet their household needs, and (c) employed persons whose earnings are insufficient to meet their household needs.

Roughly 30% of the UBII recipients are employed.[11] 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% (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.

EMPIRICAL METHOD

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

$$y^*_{ijt} = \boldsymbol{x_{it}}\boldsymbol{\beta_j} + \boldsymbol{y_{it-1}}\boldsymbol{\gamma_j} + \alpha_{ij} + \epsilon_{ijt}, \tag{1}$$

where $i = 1, \ldots, N$; $j = 1, \ldots, 6$; $t = 2, \ldots, T$. $\boldsymbol{x}$ is a vector of observable socioeconomic characteristics which may be associated with the labor market state, and $\boldsymbol{\beta_j}$ is the accompanying parameter vector. $\boldsymbol{y_{it-1}}$ 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

[9]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).

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

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

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, and *non-single* men) and also that $\boldsymbol{\beta_j}$ varies between men and women.

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.[12] 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).[13]

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 $\boldsymbol{y_{i1}}$ (Heckman, 1981b). 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 ($\boldsymbol{y_{i1}}$) and all observations of time-varying observables ($\boldsymbol{x_{it}}$), 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).[14]

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

Substituting into Equation (1) yields:

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

The ϕ_j are absorbed by the coefficient for the constant in the $\boldsymbol{x}$-vector. The inclusion of the initial labor market state $\boldsymbol{y}_{i1}$ as an additional explanatory variable has some advantages over the more traditional approach suggested by Heckman (1981b). In particular, as noted

[12]Modeling unobserved heterogeneity as the sum of time-constant random effects α_{ij} and strictly exogenous contemporary time shocks ϵ_{ijt} rules out individual-specific time trends. The estimates of state dependencies might be biased if the assumption of uncorrelated errors is not satisfied. Prowse (2013) estimates a dynamic multinomial logit model with random effects and relaxes the assumption of time-constant individual effects by modeling autocorrelation in the time shocks. According to her results, this more general specification performs better. However, in our paper we use non-parametric mass points to model the time-invariant part of unobserved heterogeneity whereas in models allowing for autocorrelation typically the stronger assumption of normality is imposed.

[13]An alternative approach is the timing-of-events model (Abbring & van den Berg, 2003) which has some advantages. For instance, the treatment effect (which in our case is the effect of a supplementary job) is non-parametrically identified. However, we cannot apply the timing-of-events framework since it requires data on durations where changes are observed at least on a monthly basis. Our data does not meet this requirement.

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

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.

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:

$$P\left(y_{ijt} | \, \boldsymbol{x}_{it}, \boldsymbol{y}_{it-1}, \alpha_{ij}\right) = \frac{\exp\left(\boldsymbol{x}_{it}\,\boldsymbol{\beta}_j + \boldsymbol{y}_{it-1}\,\boldsymbol{\gamma}_j + \boldsymbol{y}_{i1}\boldsymbol{\nu}_j + \overline{\boldsymbol{x}}_i\boldsymbol{\lambda}_j + \eta_{ij}\right)}{\sum_{k=1}^{6}\exp\left(\boldsymbol{x}_{it}\,\boldsymbol{\beta}_k + \boldsymbol{y}_{it-1}\,\boldsymbol{\gamma}_k + \boldsymbol{y}_{i1}\boldsymbol{\nu}_k + \overline{\boldsymbol{x}}_i\boldsymbol{\lambda}_k + \eta_{ik}\right)} \tag{4}$$

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

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

We assume that unobserved heterogeneity $\boldsymbol{\eta}_i = \eta_{i2}, \ \ldots\ , \eta_{i6}$ follows a discrete distribution with an a priori unknown number of M mass-points (Heckman & Singer, 1984).[15] 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

$$L_i = \sum_{m=1}^{M} p_m \prod_{t=2}^{T}\prod_{j=2}^{6}\left\{\frac{exp\left(\boldsymbol{x}_{it}\,\boldsymbol{\beta}_j + \boldsymbol{y}_{it-1}\,\boldsymbol{\gamma}_j + \boldsymbol{y}_{i1}\boldsymbol{\nu}_j + \overline{\boldsymbol{x}}_i\boldsymbol{\lambda}_j + \tau_{mj}\right)}{1 + \sum_{k=2}^{6} exp\left(\boldsymbol{x}_{it}\,\boldsymbol{\beta}_k + \boldsymbol{y}_{it-1}\,\boldsymbol{\gamma}_k + \boldsymbol{y}_{i1}\boldsymbol{\nu}_k + \overline{\boldsymbol{x}}_i\boldsymbol{\lambda}_k + \tau_{mk}\right)}\right\}^{d_{ijt}} \tag{6}$$

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. In case the model only includes one mass point τ_{1j}, its effect is equal to the effect of the constant term in a multinomial logit model without time-constant unobserved heterogeneity. Hence, the interpretation of the effects of mass points in the model specified in this paper is similar to the interpretation of the effects of constants in the standard multinomial logit model. In contrast to the model with only one mass point, this effect is heterogenous when the number of mass points is larger than one and the degree of heterogeneity is also described by the probabilities p_m of the mass points τ_{mj}.

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, $\boldsymbol{\beta}_j$, $\boldsymbol{\gamma}_j$, $\boldsymbol{\nu}_j$, $\boldsymbol{\lambda}_j$, τ_{mj}) a thousand times from the distribution of the estimated coefficients and calculate the predicted probabilities averaged over observations and

[15]Assuming a discrete distribution leads to a non-parametric maximum likelihood estimator (npmle). Choosing a discrete distribution over alternatives such as the normal distribution has the advantage of requiring less strong assumptions on the distribution of unobserved heterogeneity. Gaure et al. (2007) discuss in detail the characteristics of specifying a discrete distribution and show in Monte-Carlo simulations that it leads to satisfactory results also when the true underlying distribution is parametric and continuous.

draws.[16] 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 in 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 1000 repetitions.

DATA

We use the German Panel Study "Labour Market and Social Security" (PASS) for 2006–2014.[17] 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 year. 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 and all refreshment samples 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, 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. To ensure internal validity of our estimator, the explanatory variables include a dummy variable indicating whether an individual received UBII at sampling date. Hence, selection in our sample is based on explanatory variables.

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

[17]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.

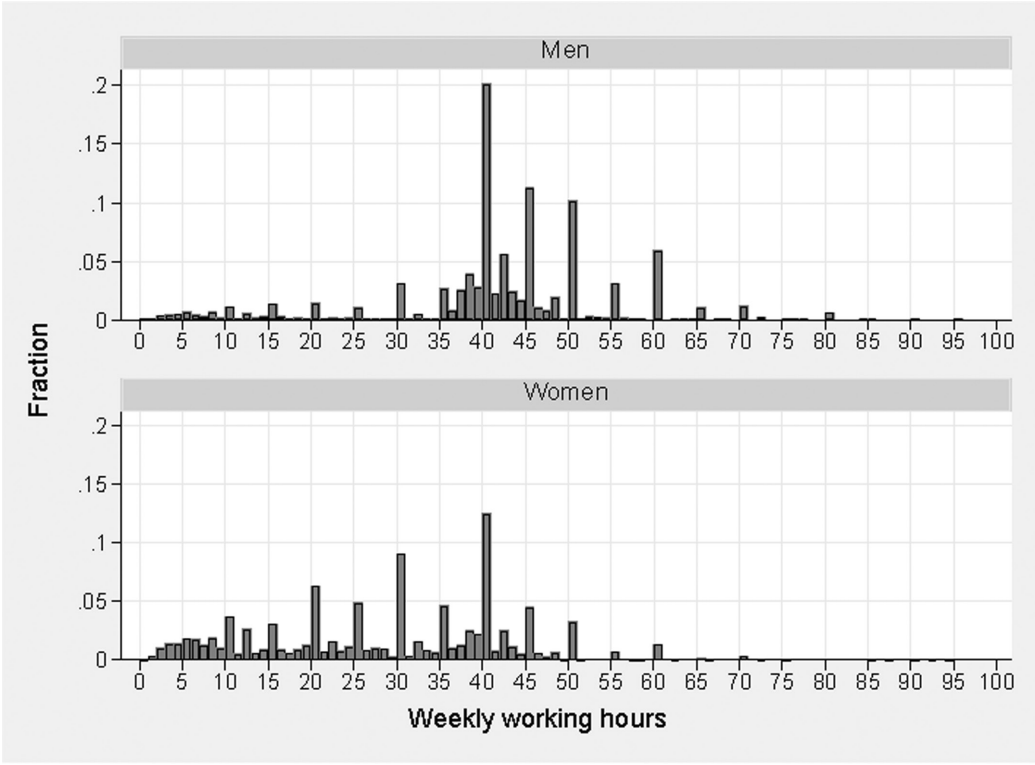

FIGURE 1 Distribution of weekly working hours by gender; regression sample. *Data source*: PASS 2006–2014; 11,423 observations from 3841 men and 13,717 observations from 4225 women.

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. We define persons to be part-time employed when working less than 30 hours per week and classify marginal employment as part-time employment. Figure 1 shows the distribution of weekly working hours in the regression sample, separately for men and women. Very few observations are directly below the threshold of 30 h: 0.4 (3.2) percent of men (women) work at least 26 h, but <30 h a week. While more women than men work part-time, the working time distribution of part-time employees is similar across gender. We can see that 3.9% of men and about 9% of women work exactly 30 h. In robustness checks, we reclassify part-time employment as working <31 (35) h.

The non-employment category serves as a catch-up category and includes observations from individuals registered as unemployed but not receiving UBII and from individuals currently in education, retired, doing military or civilian service, not employable due to health issues, on parental leave, or completely out of the labor market.[18] Since unemployment benefit II can only be claimed by working age individuals and special rules apply for individuals below the age of 25, we restrict our analysis to individuals between 25 and 64 years of age.

[18]In our sample, within observations from male (female) persons who are not employed and who do not receive welfare benefits 20.39 (13.25)% are registered as unemployed, 9.44 (7.84)% are in education, 56.53 (37.44)% are in retirement, 0.14 (0.12)% do military or civilian service, 4.29 (2.57)% are not employable due to health issues and 0.21 (5.85)% are on parental leave.

Due to our estimation strategy, we are only able to include individuals who have been interviewed in at least three consecutive waves. 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.[19] Our final regression sample consists of 18,945 observations from 4975 male individuals and of 24,034 observations from 6090 female individuals. The number of observations which are lost in each step are reported in the Table A1 in the Appendix 1. One concern may be that due to the estimation design we impose sample attrition which leads to selection bias. To address this issue, we have included in an additional analysis a dummy variable into the regressions which indicates that the person is not included in the next wave of the regression sample (see Wooldridge, 2010, 832). However, the five coefficients of the dummy variable were jointly insignificant in both, the multinomial regression for men and in the regression for women.[20] Hence, the test rejects that attrition in the next period is correlated with the error term which would lead to sample selection bias.

Tables 1 and 2 report the means of the included control variables (as well as of the hourly wage) 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.[21] Consistent with the differences in socioeconomic characteristics, within each group (i.e., for men as well as for women and for *singles* as well as for *non-singles*) employees who have a supplementary job receive on average a lower hourly wage than employees without welfare benefit receipt. Note also that for *single* supplementary job holders (the group of our main interest) the hourly wage is similar between both genders, while *non-singles* with supplementary jobs receive higher hourly wages than *singles* with supplementary jobs.

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 men and women who receive welfare benefits are (much) more likely to have a university degree and to be German citizens without a migration background than benefit recipients with no job. In contrast, female benefit recipients working part-time neither have higher education nor are more likely to be German citizens without a migration background 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

[19]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 samples that include observations before the time period when the individual leaves the panel leads to consistent parameter estimates. Do-files of the simulation and an accompanying documentation can be retrieved from https://github.com/Mosthaf/Initial_Conditions_Attrition

[20]For men, we obtain a chi-squared statistic of 7.56 (p-value of 0.1823) and for women we obtain a chi-squared statistic of 4.36 (p-value of 0.4993).

[21]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 Variable means by labor market state, men.

Men always without a partner or children in the household (*single*)							
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)	0.238	0.138	0.197	0.164	0.109	0.113	0.165
Age: 35–49 (dummy)	0.464	0.333	0.267	0.482	0.366	0.369	0.385
Age: 50–64 (dummy)	0.298	0.529	0.536	0.355	0.525	0.518	0.449
No vocational training (dummy)	0.095	0.094	0.181	0.227	0.208	0.176	0.153
With vocational training (dummy)	0.651	0.580	0.704	0.536	0.677	0.725	0.687
University degree (dummy)	0.255	0.326	0.115	0.236	0.115	0.098	0.159
Good health (dummy)	0.570	0.449	0.275	0.427	0.449	0.312	0.406
Average health (dummy)	0.302	0.319	0.330	0.373	0.344	0.346	0.330
Bad health (dummy)	0.128	0.232	0.396	0.200	0.206	0.341	0.265
Married (dummy)	0.025	0.022	0.047	0.009	0.037	0.029	0.030
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)	0.855	0.833	0.854	0.882	0.837	0.819	0.839
EU citizen (dummy)	0.012	0.051	0.007	0.009	0.006	0.020	0.015
Non-EU citizen (dummy)	0.022	0.022	0.020	0.018	0.014	0.028	0.023
Immigrant with German citiz. (dummy)	0.111	0.094	0.119	0.091	0.144	0.133	0.123
Welfare receipt at sampling date (dummy)	0.609	0.710	0.788	0.973	0.984	0.987	0.834
Unemployment rate in % (federal state)	8.041	7.399	8.266	9.274	8.705	8.684	8.406
Gross hourly wage (in Euros)	12.414	12.311	–	5.091	9.316	–	11.904
Number of observations	1764	138	801	110	514	2315	5642

(Continues)

TABLE 1 (Continued)

Men with a partner and/or children in the household (*non-single*)							
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)	0.126	0.078	0.104	0.193	0.140	0.112	0.121
Age: 35–49 (dummy)	0.488	0.432	0.193	0.542	0.352	0.328	0.416
Age: 50–64 (dummy)	0.387	0.490	0.703	0.266	0.508	0.560	0.462
No vocational training (dummy)	0.072	0.095	0.149	0.214	0.242	0.217	0.115
With vocational training (dummy)	0.646	0.597	0.707	0.646	0.638	0.686	0.659
University degree (dummy)	0.281	0.308	0.144	0.141	0.120	0.098	0.226
Good health (dummy)	0.567	0.505	0.330	0.487	0.443	0.302	0.486
Average health (dummy)	0.303	0.364	0.348	0.370	0.325	0.345	0.320
Bad health (dummy)	0.130	0.130	0.322	0.143	0.232	0.353	0.193
Married (dummy)	0.812	0.772	0.822	0.708	0.691	0.713	0.791
Child younger than 2 years (dummy)	0.055	0.052	0.028	0.112	0.075	0.042	0.052
Child 2 or 3 years old (dummy)	0.084	0.052	0.052	0.211	0.094	0.077	0.081
Child 4, 5 or 6 years old (dummy)	0.134	0.134	0.062	0.247	0.142	0.120	0.125
Child between 7 and 16 years (dummy)	0.360	0.302	0.149	0.456	0.341	0.313	0.322
German (dummy)	0.812	0.783	0.787	0.747	0.583	0.632	0.772
EU citizen (dummy)	0.015	0.020	0.016	0.023	0.030	0.027	0.018
Non-EU citizen (dummy)	0.035	0.041	0.049	0.070	0.175	0.125	0.056
Immigrant with German citiz. (dummy)	0.137	0.156	0.148	0.159	0.213	0.217	0.154
Welfare receipt at sampling date (dummy)	0.261	0.430	0.519	0.896	0.959	0.956	0.445
Unemployment rate in % (federal state)	7.253	7.302	7.773	9.047	8.639	8.606	7.622
Gross hourly wage (in Euros)	17.081	17.465	–	7.159	13.588	–	16.636
Number of observations	8146	461	1994	384	508	1810	13,303

Data source: PASS 2006–2014; 5642 observations from 1530 men without a partner or children in the household and 13,303 observations from 3445 men with a partner and/or with children in the household; unbalanced panel; unweighted. The hourly wage is based on a smaller number of observations.

TABLE 2 Variable means by labor market state, women.

Women always without a partner or children in the household (*single*)							
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)	0.183	0.118	0.084	0.109	0.063	0.090	0.115
Age: 35–49 (dummy)	0.319	0.233	0.117	0.297	0.250	0.254	0.244
Age: 50–64 (dummy)	0.498	0.649	0.799	0.594	0.687	0.656	0.641
No vocational training (dummy)	0.072	0.065	0.201	0.109	0.216	0.217	0.159
With vocational training (dummy)	0.606	0.603	0.643	0.663	0.671	0.658	0.638
University degree (dummy)	0.322	0.332	0.156	0.228	0.113	0.125	0.203
Good health (dummy)	0.464	0.431	0.253	0.337	0.270	0.211	0.318
Average health (dummy)	0.334	0.347	0.306	0.317	0.367	0.322	0.329
Bad health (dummy)	0.203	0.221	0.441	0.347	0.363	0.467	0.352
Married (dummy)	0.035	0.034	0.031	0.040	0.047	0.046	0.039
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)	0.812	0.847	0.854	0.822	0.770	0.776	0.807
EU citizen (dummy)	0.012	0.011	0.023	0.000	0.017	0.024	0.018
Non-EU citizen (dummy)	0.002	0.015	0.016	0.020	0.042	0.030	0.019
Immigrant with German citiz. (dummy)	0.173	0.126	0.107	0.158	0.170	0.170	0.155
Welfare receipt at sampling date (dummy)	0.473	0.515	0.677	0.980	0.974	0.983	0.741
Unemployment rate in % (federal state)	7.931	7.783	7.968	8.723	8.307	8.363	8.121
Gross hourly wage (in Euros)	13.070	12.690	–	5.739	9.047	–	12.279
Number of observations	1298	262	896	101	575	1254	4386

(Continues)

TABLE 2 (Continued)

Women with a partner and/or children in the household (*non-single*)							
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)	0.144	0.108	0.167	0.160	0.149	0.223	0.154
Age: 35–49 (dummy)	0.505	0.548	0.323	0.588	0.566	0.478	0.481
Age: 50–64 (dummy)	0.351	0.344	0.510	0.252	0.285	0.299	0.365
No vocational training (dummy)	0.083	0.138	0.174	0.169	0.249	0.306	0.168
With vocational training (dummy)	0.661	0.704	0.680	0.759	0.682	0.614	0.671
University degree (dummy)	0.256	0.158	0.146	0.072	0.069	0.080	0.161
Good health (dummy)	0.502	0.492	0.375	0.384	0.405	0.330	0.434
Average health (dummy)	0.321	0.318	0.334	0.377	0.339	0.332	0.328
Bad health (dummy)	0.177	0.189	0.291	0.239	0.256	0.338	0.238
Married (dummy)	0.604	0.806	0.806	0.443	0.422	0.453	0.647
Child younger than 2 years (dummy)	0.015	0.023	0.072	0.020	0.011	0.068	0.037
Child 2 or 3 years old (dummy)	0.042	0.064	0.097	0.055	0.051	0.126	0.073
Child 4, 5 or 6 years old (dummy)	0.081	0.144	0.136	0.110	0.140	0.166	0.127
Child between 7 and 16 years (dummy)	0.313	0.475	0.304	0.502	0.525	0.465	0.397
German (dummy)	0.811	0.795	0.763	0.724	0.685	0.650	0.758
EU citizen (dummy)	0.015	0.018	0.019	0.031	0.028	0.034	0.021
Non-EU citizen (dummy)	0.024	0.034	0.058	0.064	0.088	0.108	0.054
Immigrant with German citiz. (dummy)	0.150	0.153	0.161	0.182	0.199	0.207	0.167
Welfare receipt at sampling date (dummy)	0.382	0.313	0.434	0.954	0.958	0.967	0.538
Unemployment rate in % (federal state)	7.921	6.818	7.590	9.133	8.251	8.694	7.784
Gross hourly wage (in Euros)	13.046	12.081	–	6.678	9.819	–	12.226
Number of observations	5665	4563	3973	456	1702	3289	19,648

Data source: PASS 2006–2014; 4386 observations from 1139 women without a partner or children in the household and 19,648 observations from 4951 women with a partner and/or with children in the household; unbalanced panel; unweighted. The hourly wage is based on a smaller number of observations.

TABLE 3 Transition rates in percent between labor market states, men.

Men always without a partner or children in the household (*single*)							
Year *t*							
	Full-time	**Part-time**	**No-job**	**Full-time, welfare**	**Part-time, welfare**	**No-job, welfare**	**Total**
Year $t-1$							
Full-time	82.25	1.42	6.23	1.85	0.80	4.44	100.00
Part-time	23.74	51.80	5.76	0.00	10.79	7.91	100.00
No-job	13.85	1.58	65.44	0.79	2.11	16.23	100.00
Full-time, welfare	33.64	0.00	5.61	39.25	7.48	14.02	100.00
Part-time, welfare	8.85	3.39	3.01	2.76	55.18	27.31	100.00
No-job, welfare	6.51	0.52	7.00	0.80	6.80	78.37	100.00
Total	31.27	2.45	14.20	1.95	9.11	41.03	100.00
Men with a partner or children in the household (*non-single*)							
Year *t*							
	Full-time	**Part-time**	**No-job**	**Full-time, welfare**	**Part-time, welfare**	**No-job, welfare**	**Total**
Year $t-1$							
Full-time	92.68	1.41	3.86	0.82	0.24	0.99	100.00
Part-time	26.73	54.15	11.75	0.69	4.38	2.30	100.00
No-job	13.20	3.11	75.31	0.70	1.23	6.44	100.00
Full-time, welfare	32.42	1.60	3.88	47.49	4.11	10.50	100.00
Part-time, welfare	11.65	5.26	5.64	5.45	51.32	20.68	100.00
No-job, welfare	7.84	0.99	9.07	3.20	7.69	71.22	100.00
Total	61.23	3.47	14.99	2.89	3.82	13.61	100.00

Data source: PASS 2006–2014; 5642 observations from 1530 men without a partner or children in the household and 13,303 observations from 3445 men with a partner and/or with children in the household; unbalanced panel; unweighted; figures indicate row percentages.

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.

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 (*singles*), for example, 19.79% of full-time employed welfare recipients, but only 4.58% 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. Correspondingly, 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, 20.83% of full-time employed welfare recipients, 9.42% of part-time employed welfare recipients, and 5.67% of the non-employed welfare recipients exit into (part-time or full-time) employment

TABLE 4 Transition rates in percent between labor market states, women.

Women always without a partner or children in the household (*single*)							
Year *t*							
	Full-time	**Part-time**	**No-job**	**Full-time, welfare**	**Part-time, welfare**	**No-job, welfare**	**Total**
Year $t-1$							
Full-time	88.49	2.76	4.70	0.97	0.89	2.19	100.00
Part-time	13.77	60.14	12.32	1.09	8.33	4.35	100.00
No-job	6.13	3.25	79.47	1.00	2.00	8.14	100.00
Full-time, welfare	19.79	1.04	4.17	55.21	7.29	12.50	100.00
Part-time, welfare	6.13	3.31	4.47	2.81	62.75	20.53	100.00
No-job, welfare	4.58	1.09	10.02	0.58	10.09	73.64	100.00
Total	29.59	5.97	20.43	2.30	13.11	28.59	100.00
Women with a partner or children in the household (*non-single*)							
Year *t*							
	Full-time	**Part-time**	**No-job**	**Full-time, welfare**	**Part-time, welfare**	**No-job, welfare**	**Total**
Year $t-1$							
Full-time	87.86	5.23	4.57	1.26	0.40	0.69	100.00
Part-time	8.86	78.60	8.52	0.25	2.95	0.82	100.00
No-job	6.19	12.10	73.72	0.33	1.22	6.44	100.00
Full-time, welfare	26.09	1.66	3.11	47.83	7.66	13.66	100.00
Part-time, welfare	6.43	12.36	4.43	3.55	55.16	18.07	100.00
No-job, welfare	4.58	3.01	9.48	1.89	12.55	68.49	100.00
Total	28.83	23.22	20.22	2.32	8.66	16.74	100.00

Data source: PASS 2006–2014; 4386 observations from 1139 women without a partner or children in the household and 19,648 observations from 4951 women with a partner and/or with children in the household; unbalanced panel; unweighted; figures indicate row percentages.

without benefit receipt in the following year. Regarding men without a partner or children in the household, the respective figures are 33.64%, 12.24%, and 7.03%.

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.

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

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	4.021*** (0.229)	1.731*** (0.223)	0.850 (0.651)	3.263*** (0.398)	1.140*** (0.422)
No-job	2.182*** (0.217)	3.963*** (0.132)	1.177*** (0.369)	2.600*** (0.361)	2.607*** (0.217)
Full-time, welfare	0.813* (0.456)	0.579* (0.329)	3.134*** (0.256)	1.910*** (0.399)	1.979*** (0.292)
Part-time, welfare	2.524*** (0.315)	1.308*** (0.277)	2.339*** (0.335)	4.768*** (0.343)	2.660*** (0.283)
No-job, welfare	1.189*** (0.321)	2.125*** (0.170)	2.775*** (0.269)	3.840*** (0.303)	4.127*** (0.194)
Without partner or children in the household (*single*)	0.536 (0.629)	0.514 (0.336)	−0.060 (0.659)	0.946* (0.571)	0.971** (0.391)
***Single* × labor market state in *t* − 1**					
Part-time	0.003 (0.379)	−1.052** (0.480)	−42.954 (.)	−0.181 (0.620)	0.153 (0.613)
No-job	−0.801* (0.422)	−0.667*** (0.196)	−0.662 (0.590)	−0.449 (0.529)	−0.293 (0.292)
Full-time, welfare	−36.615 (.)	−0.464 (0.552)	−0.855** (0.426)	−0.431 (0.649)	−0.944* (0.489)
Part-time, welfare	−0.166 (0.447)	−0.665* (0.404)	−1.080** (0.508)	−0.277 (0.463)	−0.068 (0.354)
No-job, welfare	−0.440 (0.451)	−0.431** (0.213)	−1.685*** (0.397)	−0.609 (0.421)	−0.501** (0.250)
Labor market state in *t* = 1					
Part-time	1.704*** (0.344)	1.056*** (0.245)	0.640 (0.474)	1.776*** (0.390)	1.193*** (0.418)
No-job	1.192*** (0.258)	1.359*** (0.182)	0.771** (0.367)	1.522*** (0.340)	1.764*** (0.258)
Full-time, welfare	0.648* (0.350)	0.209 (0.263)	1.467*** (0.325)	1.524*** (0.374)	0.633* (0.353)
Part-time, welfare	1.382*** (0.382)	1.106*** (0.259)	1.208*** (0.362)	3.205*** (0.393)	2.554*** (0.364)
No-job, welfare	1.469*** (0.349)	1.321*** (0.205)	0.773*** (0.298)	2.407*** (0.329)	2.920*** (0.275)
Age: 35–49	0.675*** (0.240)	−0.112 (0.148)	0.173 (0.219)	−0.085 (0.232)	0.062 (0.195)
Age: 50–64	1.078*** (0.257)	1.034*** (0.154)	0.132 (0.268)	1.007*** (0.245)	1.190*** (0.210)
No vocational training	0.234 (0.184)	0.422*** (0.109)	0.755*** (0.184)	0.709*** (0.150)	0.528*** (0.130)
University degree	0.160 (0.131)	−0.499*** (0.095)	0.025 (0.190)	−0.426** (0.166)	−0.681*** (0.138)
Average health	0.026 (0.151)	0.165* (0.099)	0.369** (0.173)	0.025 (0.142)	0.351*** (0.110)
Bad health	−0.115 (0.211)	0.508*** (0.124)	0.218 (0.235)	0.263 (0.183)	0.684*** (0.139)
Married	0.310 (0.402)	0.314 (0.268)	−0.904** (0.406)	−0.337 (0.404)	−0.080 (0.306)
Child younger than 2 years	0.528 (0.395)	−0.065 (0.278)	0.250 (0.335)	0.726** (0.366)	0.041 (0.312)
Child 2 or 3 years old	−0.292 (0.399)	0.117 (0.268)	0.764** (0.324)	−0.164 (0.368)	0.145 (0.289)
Child 4, 5 or 6 years old	0.212 (0.321)	−0.272 (0.240)	0.505* (0.289)	−0.199 (0.327)	−0.026 (0.258)
Child between 7 and 16 years	0.161 (0.309)	−0.188 (0.227)	0.194 (0.311)	−0.031 (0.336)	0.528** (0.264)
EU citizen	0.405 (0.369)	−0.229 (0.286)	−0.143 (0.547)	0.243 (0.431)	0.660** (0.333)
Non-EU citizen	−0.022 (0.275)	−0.049 (0.180)	−0.288 (0.291)	0.584*** (0.226)	0.575*** (0.200)
Immigrant with German citizenship	0.078 (0.158)	−0.002 (0.102)	−0.347* (0.205)	0.255* (0.154)	0.304** (0.126)
Welfare receipt at sampling date	0.243 (0.163)	0.541*** (0.105)	1.905*** (0.248)	1.937*** (0.261)	2.133*** (0.174)

(Continues)

TABLE 5 (Continued)

Labor market state in *t*					
	Part-time	**No-job**	**Full-time, welfare**	**Part-time, welfare**	**No-job, welfare**
Unemployment rate in % (*federal state*)	−0.056 (0.106)	−0.025 (0.060)	0.208** (0.101)	0.140* (0.084)	0.139** (0.064)
Individual averages $\bar{x}_i$					
Medium health	0.390* (0.207)	0.503*** (0.134)	0.230 (0.240)	0.332* (0.198)	0.469*** (0.162)
Bad health	0.554** (0.268)	1.254*** (0.160)	0.309 (0.307)	0.775*** (0.235)	1.285*** (0.187)
Married	−0.521 (0.424)	−0.301 (0.283)	0.725* (0.437)	0.110 (0.428)	−0.231 (0.332)
Child younger than 2 years	−0.392 (0.538)	−0.309 (0.345)	0.483 (0.431)	−0.234 (0.467)	−0.181 (0.406)
Child 2 or 3 years old	−0.194 (0.504)	−0.113 (0.333)	0.283 (0.417)	0.763* (0.457)	0.546 (0.390)
Child 4, 5 or 6 years old	0.252 (0.401)	0.080 (0.294)	−0.499 (0.371)	0.052 (0.411)	−0.073 (0.338)
Child between 7 and 16 years	−0.261 (0.342)	−0.189 (0.248)	0.147 (0.353)	0.429 (0.370)	−0.255 (0.298)
Unemployment rate	0.017 (0.109)	0.058 (0.062)	−0.051 (0.106)	−0.072 (0.088)	−0.061 (0.067)
AIC	24,547.527				
Log Likelihood	−11,986.763				
Wald-Test-Chi2 [p − value]	1188.97 [0.000]				
$m1$ ($p1 = 0.563$)	−5.971*** (0.486)	−5.413*** (0.320)	−9.050*** (0.513)	−10.536*** (0.545)	−9.732*** (0.399)
$m2$ ($p2 = 0.124$)	−19.634 (669.507)	−4.295*** (0.540)	−5.941*** (0.503)	−7.436*** (0.559)	−7.933*** (0.527)
$m3$ ($p3 = 0.313$)	−4.211*** (0.398)	−3.799*** (0.276)	−8.135*** (0.582)	−7.776*** (0.523)	−5.894*** (0.353)

Data source: PASS 2006–2014; 18,945 observations from 4975 individuals; unbalanced panel; unweighted; all variables except the unemployment rate and the individual averages ($\bar{x}_i$) are dummy variables; wave dummies and interaction terms of *single* with the age group variables as well as with the waves dummies are also included; reference categories: full-time, $t-1$, full-time, $t=1$ age: 25–34, with vocational training, good health, German. Due to the mass-point specification, regression does not include an additional constant. 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.

with six 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 almost 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 several cases. Correspondingly, a likelihood ratio test clearly indicates that their inclusion has improved the model.[22]

In multinomial logit models, the coefficient $\boldsymbol{\beta}_j$ 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

[22]For men, we obtain a test statistic of $\chi^2(25)=46.12$. For women, the test statistic is $\chi^2(25)=58.37$. The corresponding p-values are 0.000.

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	4.017*** (0.126)	2.593*** (0.137)	0.692* (0.365)	3.653*** (0.278)	2.042*** (0.307)
No-job	3.119*** (0.137)	4.368*** (0.147)	0.597* (0.342)	3.060*** (0.306)	3.789*** (0.256)
Full-time, welfare	0.225 (0.408)	0.318 (0.324)	3.334*** (0.226)	2.965*** (0.351)	2.979*** (0.320)
Part-time, welfare	3.110*** (0.171)	2.113*** (0.205)	2.437*** (0.246)	5.706*** (0.278)	4.107*** (0.258)
No-job, welfare	2.175*** (0.186)	2.771*** (0.171)	1.874*** (0.243)	4.469*** (0.275)	4.882*** (0.247)
Without partner or children in the household (*single*)	0.106 (0.441)	−1.050** (0.414)	−1.319* (0.771)	−0.130 (0.574)	0.168 (0.518)
***Single* × labor market state in *t* − 1**					
Part-time	0.236 (0.291)	0.020 (0.336)	1.378* (0.771)	0.048 (0.514)	0.263 (0.556)
No-job	−0.498 (0.336)	0.230 (0.261)	1.406** (0.592)	−0.365 (0.528)	−1.064** (0.413)
Full-time, welfare	0.198 (1.128)	0.093 (0.673)	0.717 (0.478)	−0.687 (0.678)	−1.165** (0.593)
Part-time, welfare	−0.890** (0.373)	−0.154 (0.360)	0.434 (0.486)	−0.405 (0.455)	−0.780* (0.414)
No-job, welfare	−0.468 (0.381)	−0.193 (0.271)	−0.721 (0.531)	−0.891** (0.444)	−1.019*** (0.371)
Labor market state in *t* − 1					
Part-time	1.754*** (0.216)	0.881*** (0.200)	0.540 (0.373)	1.787*** (0.318)	1.686*** (0.410)
No-job	0.712*** (0.192)	1.877*** (0.218)	1.309*** (0.337)	1.687*** (0.326)	2.572*** (0.393)
Full-time, welfare	0.417 (0.296)	0.813*** (0.289)	1.283*** (0.318)	1.062*** (0.402)	1.146** (0.472)
Part-time, welfare	1.262*** (0.223)	1.002*** (0.237)	0.903*** (0.342)	2.279*** (0.323)	2.384*** (0.380)
No-job, welfare	0.928*** (0.233)	1.904*** (0.237)	1.292*** (0.341)	2.489*** (0.324)	3.752*** (0.386)
Age: 35–49	0.087 (0.117)	−0.189 (0.120)	0.179 (0.193)	0.328** (0.147)	0.155 (0.152)
Age: 50–64	0.374*** (0.140)	0.888*** (0.141)	0.519** (0.239)	0.926*** (0.183)	0.880*** (0.192)
No vocational training	0.180* (0.106)	0.565*** (0.105)	0.247 (0.172)	0.593*** (0.118)	0.855*** (0.128)
University degree	−0.306*** (0.091)	−0.381*** (0.098)	−0.518*** (0.188)	−0.762*** (0.143)	−0.620*** (0.154)
Average health	0.113 (0.087)	0.242*** (0.091)	0.245 (0.161)	0.241** (0.110)	0.378*** (0.108)
Bad health	0.239** (0.110)	0.491*** (0.112)	0.326* (0.195)	0.359*** (0.134)	0.779*** (0.130)
Married	0.575** (0.231)	−0.377 (0.240)	−0.403 (0.375)	−0.138 (0.263)	−0.491* (0.261)
Child younger than 2 years	0.977*** (0.277)	2.483*** (0.271)	1.319** (0.549)	0.867** (0.405)	2.189*** (0.320)
Child 2 or 3 years old	−0.147 (0.221)	0.048 (0.228)	0.404 (0.434)	0.121 (0.297)	0.176 (0.264)
Child 4, 5 or 6 years old	−0.043 (0.176)	−0.113 (0.188)	0.216 (0.349)	0.432* (0.228)	−0.008 (0.217)
Child between 7 and 16 years	0.072 (0.158)	−0.094 (0.176)	0.541* (0.310)	0.161 (0.208)	0.115 (0.208)
EU citizen	−0.277 (0.250)	0.027 (0.245)	0.373 (0.388)	0.317 (0.280)	0.633** (0.305)
Non-EU citizen	0.260 (0.187)	0.395** (0.186)	0.629** (0.280)	0.841*** (0.202)	0.868*** (0.220)
Immigrant with German citizenship	−0.113 (0.094)	−0.052 (0.096)	0.124 (0.158)	0.128 (0.115)	0.284** (0.126)
Welfare receipt at sampling date	−0.109 (0.111)	0.354*** (0.116)	2.423*** (0.326)	2.685*** (0.241)	3.583*** (0.315)

(Continues)

TABLE 6 (Continued)

Labor market state in *t*					
	Part-time	**No-job**	**Full-time, welfare**	**Part-time, welfare**	**No-job, welfare**
Unemployment rate in % (*federal state*)	−0.044 (0.059)	−0.074 (0.057)	0.147 (0.092)	0.070 (0.066)	0.170*** (0.063)
Individual averages $\overline{x}_i$					
Medium health	−0.072 (0.129)	0.086 (0.135)	0.184 (0.227)	0.318* (0.162)	0.433** (0.174)
Bad health	0.156 (0.151)	0.770*** (0.152)	0.359 (0.255)	0.612*** (0.180)	0.953*** (0.187)
Married	0.210 (0.242)	1.213*** (0.253)	0.501 (0.392)	0.262 (0.278)	0.612** (0.281)
Child younger than 2 years	0.249 (0.360)	0.697* (0.355)	0.147 (0.703)	0.533 (0.476)	1.394*** (0.442)
Child 2 or 3 years old	0.330 (0.291)	−0.104 (0.292)	−0.449 (0.559)	0.007 (0.395)	0.470 (0.360)
Child 4, 5 or 6 years old	0.628*** (0.228)	0.470* (0.241)	0.039 (0.427)	−0.205 (0.299)	0.513* (0.295)
Child between 7 and 16 years	0.354** (0.177)	0.230 (0.195)	0.050 (0.337)	0.331 (0.234)	0.201 (0.240)
Unemployment rate	−0.031 (0.061)	0.068 (0.059)	−0.045 (0.095)	−0.032 (0.070)	−0.078 (0.067)
AIC	38,270.657				
Log Likelihood	−18,836.329				
Wald-Test-Chi2 [*p* − value]	3357.33 [0.000]				
*m*1 (*p*1 = 0.257)	−3.373*** (0.334)	−6.510*** (0.379)	−9.968*** (0.675)	−10.340*** (0.531)	−13.399*** (0.580)
*m*2 (*p*2 = 0.353)	−5.017*** (0.285)	−5.186*** (0.317)	−7.873*** (0.583)	−10.436*** (0.515)	−11.699*** (0.547)
*m*3 (*p*3 = 0.055)	−4.199*** (0.812)	−2.349*** (0.793)	−6.063*** (0.942)	−5.961*** (0.817)	−9.038*** (0.911)
*m*4 (*p*4 = 0.289)	−2.441*** (0.300)	−4.001*** (0.300)	−6.995*** (0.620)	−7.549*** (0.499)	−8.493*** (0.552)
*m*5 (*p*5 = 0.045)	−3.800*** (0.681)	−4.248*** (0.655)	−5.376*** (0.656)	−5.830*** (0.584)	−5.675*** (0.571)

Data source: PASS 2006–2014; 24,034 observations from 6090 individuals; unbalanced panel; unweighted; all variables except the unemployment rate and the individual averages ($\overline{x}_i$) are dummy variables; wave dummies and interaction terms of *single* with the age group variables as well as with the waves dummies are also included; reference categories: full-time, $t-1$, full-time, $t=1$, age: 25–34, with vocational training, good health, German. Due to the mass-point specification, regression does not include an additional constant. 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.

and significant coefficient of the variable "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".[23]

[23]For two of the reported coefficients in Table 5, no standard errors could be estimated (for the coefficient of the interaction term between *single* and part-time employment in $t-1$ in the equation for "Full-time, welfare" and for the coefficient of the interaction term between *single* and "Full-time, welfare" in $t-1$ in the equation of part-time employment). This can be explained by zero observations in the respective cells, e.g., by zero observations for the transition of *single* men from "Part-time" in $t-1$ to "Full-time, welfare" in t. In these cases, we used the actual coefficients instead of drawing values from a distribution to obtain the simulated transition probabilities. Due to the large negative coefficients, this resulted also in simulated transition probabilities of zero (i.e. matching the actual transition probabilities)

The coefficients of the separate equations are often 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 (with no job) 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 which are younger than 2 years are positive and statistically significant. Thus, for women, the presence of very young children in the household decreases the probability of working full-time relative to the probability of the other labor market states.

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-singles*) and those who do not (*singles*). 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-singles*. This ensures that the most likely reason why *singles* leave welfare benefit receipt is a change in labor income.[24] 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.[25] For individuals working full-time and receiving social welfare, generally the APEs are qualitatively rather similar between both groups, which indicates that also for *non-singles*, the obtained effects are mainly due to changes in labor income. For individuals working part-time and receiving social welfare, 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 20.0 (12.3) percentage points, compared to welfare recipients without supplementary jobs. While the reported percentage points effect appears to be somewhat larger for men, one should note that the transition rate of the comparison group (welfare recipients without a supplementary job) is also considerable larger for men (37.7%) than for women (20.9%). Hence, the percent increase in the transition rate is for both, male as well as female full-time employed welfare recipients between 50% and 60%. The chances to move into part-time employment without benefit receipt in *t* are only slightly reduced for full-time employed welfare recipients compared to welfare recipients without a job in $t-1$.

Therefore, the increased probability of moving into full-time employment without benefit receipt maps into an overall impact on the likelihood to work without welfare benefits of almost equal size. Hence, we find clear evidence for the stepping stone function of full-time supplementary jobs. This result holds for both men and women, independent of whether or not a person lives without a partner and children in the household.

[24]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 three persons 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).

[25]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 on average 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 485 (257) 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.

TABLE 7 Average partial effects of labor market states in year $t-1$, men.

Men always without a partner or children in the household (*single*)

	Labor market state in *t*			
	Full-time	**Part-time**	**No-job**	**Full-time or part-time**
Labor market state in $t-1$				
Full-time	0.317*** (0.023)	0.007 (0.007)	−0.025 (0.017)	0.324*** (0.024)
Part-time	−0.001 (0.058)	0.300*** (0.043)	−0.052** (0.025)	0.298*** (0.046)
No-job	−0.077*** (0.024)	0.007 (0.007)	0.344*** (0.024)	−0.071*** (0.024)
Full-time, welfare	0.200*** (0.043)	−0.013*** (0.004)	−0.045 (0.032)	0.187*** (0.043)
Part-time, welfare	0.019 (0.032)	0.057*** (0.019)	−0.066*** (0.018)	0.076** (0.030)
No-job, welfare: reference				
	Full-time, welfare	**Part-time, welfare**	**Welfare, no-job**	**Welfare, all**
Full-time	0.008 (0.007)	−0.039*** (0.010)	−0.268*** (0.021)	−0.299*** (0.022)
Part-time	−0.019*** (0.005)	0.059* (0.030)	−0.286*** (0.038)	−0.246*** (0.044)
No-job	−0.007 (0.007)	−0.033*** (0.011)	−0.234*** (0.021)	−0.274*** (0.023)
Full-time, welfare	0.098*** (0.027)	−0.018 (0.018)	−0.222*** (0.036)	−0.143*** (0.041)
Part-time, welfare	0.003 (0.008)	0.175*** (0.023)	−0.188*** (0.024)	−0.010 (0.029)
No-job, welfare: reference				

Men with partner and/or children in the household (*non-single*)

	Labor market state in *t*			
	Full-time	**Part-time**	**No-job**	**Full-time or part-time**
Labor market state in $t-1$				
Full-time	0.374*** (0.026)	0.003 (0.009)	−0.053*** (0.020)	0.377*** (0.026)
Part-time	−0.018 (0.040)	0.321*** (0.030)	−0.006 (0.025)	0.303*** (0.033)
No-job	−0.115*** (0.021)	0.017** (0.008)	0.418*** (0.021)	−0.098*** (0.022)
Full-time, welfare	0.163*** (0.033)	0.011 (0.014)	−0.066*** (0.025)	0.174*** (0.032)
Part-time, welfare	0.036 (0.031)	0.076*** (0.021)	−0.054*** (0.020)	0.112*** (0.029)
No-job, welfare: reference				
	Full-time, welfare	**Part-time, welfare**	**No-job, welfare**	**Welfare, all**
Full-time	−0.033*** (0.010)	−0.043*** (0.009)	−0.247*** (0.020)	−0.324*** (0.022)
Part-time	−0.036*** (0.013)	0.022 (0.019)	−0.283*** (0.025)	−0.297*** (0.031)
No-job	−0.041*** (0.009)	−0.038*** (0.009)	−0.242*** (0.019)	−0.321*** (0.022)
Full-time, welfare	0.083*** (0.022)	−0.030*** (0.011)	−0.161*** (0.025)	−0.108*** (0.029)
Part-time, welfare	−0.011 (0.011)	0.143*** (0.020)	−0.189*** (0.020)	−0.057** (0.027)
No-job, welfare: reference				

Data source: PASS 2006–2014; 5642 observations from 1530 men without a partner or children in the household and 13,303 observations from 3445 men with a partner and/or with children in the household; unbalanced panel; unweighted. Calculations are based on parametric bootstrap (1000 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 1000 repetitions, are in parentheses.

The higher employment probability (without welfare receipt) is accompanied for *single* men by a 14.3 percentage points lower probability of receiving welfare benefits (with or without a job). For female full-time employed welfare recipients, however, the likelihood of receiving

TABLE 8 Average partial effects of labor market states in year $t-1$, women.

Women always without a partner or children in the household (*single*)

	Labor market state in *t*			
	Full-time	**Part-time**	**No-job**	**Full-time or part-time**
Labor market state in *t* – 1				
Full-time	0.369*** (0.033)	−0.030 (0.024)	−0.108*** (0.027)	0.339*** (0.032)
Part-time	−0.093*** (0.029)	0.310*** (0.036)	−0.050 (0.033)	0.217*** (0.036)
No-job	−0.107*** (0.024)	0.006 (0.027)	0.369*** (0.030)	−0.102*** (0.028)
Full-time, welfare	0.123** (0.057)	−0.021 (0.067)	−0.157*** (0.039)	0.102* (0.053)
Part-time, welfare	−0.028 (0.028)	0.026 (0.029)	−0.109*** (0.027)	−0.002 (0.029)
No-job, welfare: reference				
	Full-time, welfare	**Part-time, welfare**	**No-job, welfare**	**Welfare, all**
Full-time	0.014* (0.008)	−0.059*** (0.015)	−0.185*** (0.024)	−0.230*** (0.024)
Part-time	0.017 (0.016)	0.017 (0.025)	−0.201*** (0.032)	−0.167*** (0.032)
No-job	0.004 (0.006)	−0.062*** (0.013)	−0.208*** (0.020)	−0.267*** (0.022)
Full-time, welfare	0.246*** (0.043)	−0.020 (0.030)	−0.172*** (0.038)	0.055 (0.046)
Part-time, welfare	0.028** (0.011)	0.240*** (0.025)	−0.157*** (0.021)	0.112*** (0.024)
No-job, welfare: reference				

Women with partner and/or children in the household (*non-single*)

	Labor market state in *t*			
	Full-time	**Part-time**	**No-job**	**Full-time or part-time**
Labor market state in *t* − 1				
Full-time	0.445*** (0.028)	−0.068*** (0.017)	−0.096*** (0.019)	0.377*** (0.024)
Part-time	−0.055** (0.022)	0.320*** (0.025)	−0.015 (0.019)	0.264*** (0.024)
No-job	−0.090*** (0.017)	0.046*** (0.017)	0.295*** (0.021)	−0.043** (0.020)
Full-time, welfare	0.195*** (0.030)	−0.086*** (0.023)	−0.145*** (0.019)	0.110*** (0.028)
Part-time, welfare	−0.041** (0.018)	0.099*** (0.018)	−0.102*** (0.015)	0.058*** (0.018)
No-job, welfare: reference				
	Full-time, welfare	**Part-time, welfare**	**No-job, welfare**	**Welfare, all**
Full-time	0.011 (0.009)	−0.083*** (0.010)	−0.209*** (0.016)	−0.281*** (0.019)
Part-time	−0.010* (0.005)	−0.017 (0.014)	−0.223*** (0.016)	−0.250*** (0.019)
No-job	−0.017*** (0.004)	−0.080*** (0.009)	−0.155*** (0.014)	−0.252*** (0.017)
Full-time, welfare	0.178*** (0.024)	−0.028* (0.017)	−0.114*** (0.022)	0.035 (0.024)
Part-time, welfare	0.012** (0.006)	0.173*** (0.015)	−0.141*** (0.013)	0.044*** (0.015)
No-job, welfare: reference				

Data source: PASS 2006–2014; 4386 observations from 1139 women without a partner or children in the household and 19,648 observations from 4951 women with a partner and/or with children in the household; unbalanced panel; unweighted. Calculations are based on parametric bootstrap (1000 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 1000 repetitions, are in parentheses.

welfare in the next period (with or without a job) is not reduced. Correspondingly, genuine state dependence in full-time employment with benefit receipt is much more pronounced among *single* women than among *single* men, as female full-time employed welfare recipients are more than twice as likely to be in the same state in the next period than their male counterparts (25.6% versus 11.7%; see Tables A2 and A3: Appendix 1). For *single* women, the higher employment probability (without welfare receipt) is accompanied by a lower likelihood of exiting into non-employment without welfare receipt (15.7 percentage points), while the probability of receiving welfare remains unchanged.[26]

To sum up, the results indicate that for men and also for 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 evidence of a higher chance to exit overall welfare benefit receipt.

We perform various robustness checks. In contrast to the baseline (where part-time employment is classified as working <30 h per week), we redefine part-time employment when working <31 weekly hours and in an alternative specification when working <35 weekly hours. Furthermore, to address the concern that estimates will partly be driven by individuals who are not welfare recipients and therefore not part of the population of interest, we run regressions without those who never received welfare in the sample period. We apply both the 30-h and the 31-h part-time threshold to this welfare recipients only sample. Table 9 summarizes the results of these robustness checks for the estimated transitions rates out of full-time employment with benefit receipt. It is evident that our main findings discussed above are remarkably robust across specifications. For both men and women and independent of whether or not a person lives without a partner and children in the household, full-time supplementary jobs serve as an economically and statistically significant stepping stone effect into employment without benefit receipt.

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, but the differences are much less pronounced (33.5% vs. 23.7%; see Tables A2 and A3: Appendix 1). Men still gain from taking up a part-time job during benefit receipt in terms of a 7.6 percentage points higher employment probability (without welfare). However, the effect from part-time employment is much smaller in size than having a full-time job and receiving welfare. Moreover, for *single* men only full-time supplementary jobs reduce benefit dependency.

Single women, however, although receiving a similar average hourly wage as men (see Table 2), do not gain in any aspect from a supplementary part-time job while receiving welfare. Compared to *single* women without a job during welfare receipt, they have the same probability of obtaining a part-time job without welfare payments and even a larger probability to remain in welfare.[27] Next, we have a look whether the baseline findings for part-time supplementary jobs are robust across specifications, the results of which are summarized in Table 10. For *single* women, working part-time while receiving welfare does uniformly not lead

[26] *Single* 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), move into education, parental leave or retirement, or no longer take up benefits.

[27] *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. This is supported by our data according to which (on average) individual gross income of *non-single* women (switching from part-time employment with welfare receipt to part-time employment without welfare receipt) rises much less than their reported household net income. An alternative explanation for the different effects between *single* and *non-single* women would be that female individuals who have never been part of a household (throughout the time they appear in the regression analysis) are a selective group. However, we do not observe a pronounced difference in the average hourly wage between both groups (see Table 2). Moreover, regarding the other transitions, namely into "full-time employment, no welfare" and into "non-employment, with welfare", we obtain very similar (negative) effects for both *single* and *non-single* part-time working women receiving welfare.

TABLE 9 Average partial effects of transitions rates from labor market state full-time welfare in year $t-1$; various specifications; reference group: no job and welfare in $t-1$.

	Always without a partner or children in the household (*single*)		With a partner and/or children in the household (*non-single*)	
	Men	**Women**	**Men**	**Women**
Transition from *Full-time welfare in t − 1* into *Full-time* in *t*				
Baseline (Tables 7 and 8): Part-time work: <30 h per week	0.200*** (0.043)	0.123** (0.057)	0.163*** (0.033)	0.195*** (0.030)
Part-time work: <31 h per week	0.164*** (0.047)	0.201*** (0.071)	0.136*** (0.034)	0.286*** (0.040)
Part-time work: <35 h per week	0.155*** (0.048)	0.198*** (0.073)	0.142*** (0.033)	0.290*** (0.037)
Only individuals who ever received social welfare; Part-time work: 30 h per week	0.169*** (0.044)	0.098** (0.042)	0.157*** (0.032)	0.146*** (0.030)
Only individuals who ever received social welfare; Part-time work: 31 h per week	0.135*** (0.044)	0.117** (0.049)	0.124*** (0.031)	0.184*** (0.035)
Transition from *Full-time welfare in t − 1* into *Full-time or Part-time* in *t*				
Baseline (Tables 7 and 8): Part-time work: <30 h per week	0.187*** (0.043)	0.102* (0.053)	0.174*** (0.032)	0.110*** (0.028)
Part-time work: <31 h per week	0.160*** (0.047)	0.155** (0.063)	0.125*** (0.033)	0.162*** (0.035)
Part-time work: <35 h per week	0.160*** (0.048)	0.158** (0.064)	0.133*** (0.033)	0.171*** (0.033)
Only individuals who ever received social welfare; Part-time work: 30 h per week	0.163*** (0.044)	0.097* (0.052)	0.182*** (0.034)	0.114*** (0.030)
Only individuals who ever received social welfare; Part-time work: 31 h per week	0.206*** (0.060)	0.115* (0.059)	0.146*** (0.035)	0.135*** (0.037)
Transition from *Full-time welfare in t − 1* into *Welfare, all* in *t*				
Baseline (Tables 7 and 8): Part-time work: <30 h per week	−0.143*** (0.041)	0.055 (0.046)	−0.108*** (0.029)	0.035 (0.024)
Part-time work: <31 h per week	−0.150*** (0.045)	0.011 (0.056)	−0.091*** (0.031)	−0.018 (0.030)
Part-time work: <35 h per week	−0.156*** (0.046)	0.040 (0.059)	−0.096*** (0.031)	−0.016 (0.029)
Only individuals who ever received social welfare; Part-time work: 30 h per week	−0.186*** (0.056)	−0.049 (0.060)	−0.178*** (0.038)	−0.051* (0.031)
Only individuals who ever received social welfare; Part-time work: 31 h per week	−0.219*** (0.069)	−0.034 (0.062)	−0.142*** (0.042)	−0.052 (0.035)

Data source: PASS 2006–2014; unbalanced panel; unweighted. Calculations are based on parametric bootstrap (1000 repetitions). 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 1000 repetitions, are in parentheses.

to a higher chance of obtaining a job without welfare benefit receipt. Correspondingly, across all specifications, *single* women with a supplementary part-time job have a larger probability to remain in welfare (compared to *single* women without a job during welfare receipt). The picture is ambiguous, however, for *single* men having a supplementary part-time job. According to the baseline reported above such jobs lead to an increase of 7.6 percentage points in the employment probability (without welfare) in the future. While this is confirmed when using the subsample who ever received welfare, we find no stepping stone effect when adjusting the part-time threshold to 31 h or 35 h.[28]

To summarize, for *single* women supplementary part-time jobs do not rise the chances to obtain a job without welfare receipt. For *single* men, the effect is heterogenous and varies between zero and 7.6 percentage points. Hence, even in the best-case scenario, the stepping stone effect is considerably smaller than for supplementary full-time jobs.

Although Kyyrä (2010) examine a different target population (unemployment insurance recipients) in a different country (Finland), his results are partly in line with ours. We both find that full-time supplementary jobs are beneficial for transitions to regular work. In contrast to Kyyrä (2010), however, we do not find an unambiguously positive effect of part-time supplementary jobs for men. While Boschman et al. (2021) examine the same target population as we do, but for another country (Netherlands), we differentiate between part- and full-time supplementary jobs and document that only the former lead to a significant stepping stone effect.

The different effects between supplementary part- and full-time jobs may be explained by part-time jobs providing less human capital accumulation, giving stronger negative signals, or furnishing fewer opportunities for work contract improvements within or outside the firm.[29] Additionally, the dead end of supplementary part-time jobs may also (partly) be driven by supply-side effects arising if individuals change preferences after entering part-time employment and become less interested in working full-time (see, for the case of women, Hotz et al., 1988; Johnson & Pencavel, 1984).

Our finding that only supplementary full-time jobs provide a stepping stone effect for women supplementary part-time job 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.[30]

While we find differences between part- and full-time jobs during welfare benefit receipt in terms of different employment exit probabilities, there is no clear evidence that part- and full-time jobs without benefit receipt come with different risks of becoming welfare dependent in the next period. Although the simulated transition probabilities from full-time employment

[28]Note that across all specifications *non-single* men with supplementary part-time jobs have higher chances to obtain a job without welfare payments in the next period (compared to *non-single* men who are not working). Similar as for women, we attribute the difference in the obtained effect between *non-single* and *single* men to changes in the household composition of *non-singles* or income increases of their household members.

[29]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 benefit recipients with supplementary part-time jobs are significantly more likely to work in retail trade, the hotel and restaurant industry as well as in health care and social services sectors, but are significantly less likely to work in manufacturing and construction industries (compared to benefit recipients with supplementary full-time job). The computations also show that benefit recipients with supplementary part-time jobs are more likely to carry out unskilled tasks but are less likely to carry out skilled and high-skilled tasks (compared to benefit recipients with supplementary full-time jobs), which suggests that the quality of supplementary jobs held by differ by working time.

[30]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.

TABLE 10 Average partial effects of transitions rates from labor market state part-time welfare in year $t-1$; various specifications; reference group: no job and welfare in $t-1$.

	Always without a partner or children in the household (*single*)		**With a partner and/or children in the household (*non-single*)**	
	Men	**Women**	**Men**	**Women**
Transition from *Part-time welfare in t−1* into *Part-time* in *t*				
Baseline (Tables 7 and 8): Part-time work: <30 h per week	0.057*** (0.019)	0.026 (0.029)	0.076*** (0.021)	0.099*** (0.018)
Part-time work: <31 h per week	0.046*** (0.016)	0.008 (0.029)	0.073*** (0.018)	0.072*** (0.018)
Part-time work: <35 h per week	0.052*** (0.017)	0.022 (0.031)	0.084*** (0.020)	0.101*** (0.020)
Only individuals who ever received social welfare; Part-time work: 30 h per week	0.046*** (0.015)	0.004 (0.014)	0.067*** (0.010)	0.053*** (0.013)
Only individuals who ever received social welfare; Part-time work: 31 h per week	0.032** (0.012)	0.007 (0.015)	0.060*** (0.009)	0.060*** (0.014)
Transition from *Part-time welfare in t−1* into *Full-time or Part-time* in *t*				
Baseline (Tables 7 and 8): Part-time work: <30 h per week	0.076** (0.030)	−0.002 (0.029)	0.112*** (0.029)	0.058*** (0.018)
Part-time work: <31 h per week	−0.016 (0.029)	−0.019 (0.029)	0.051* (0.027)	0.035** (0.018)
Part-time work: <35 h per week	−0.016 (0.029)	0.008 (0.031)	0.049* (0.028)	0.064*** (0.019)
Only individuals who ever received social welfare; Part-time work: 30 h per week	0.065*** (0.024)	−0.013 (0.020)	0.112*** (0.027)	0.038** (0.017)
Only individuals who ever received social welfare; Part-time work: 31 h per week	0.041* (0.021)	−0.009 (0.020)	0.092*** (0.026)	0.048*** (0.016)
Transition from *Part-time welfare in t−1* into *Welfare, all* in *t*				
Baseline (Tables 7 and 8): Part-time work: <30 h per week	−0.010 (0.029)	0.112*** (0.024)	−0.057** (0.027)	0.044*** (0.015)
Part-time work: <31 h per week	0.090*** (0.028)	0.137*** (0.027)	0.016 (0.024)	0.070*** (0.016)
Part-time work: <35 h per week	0.089*** (0.028)	0.078*** (0.027)	0.016 (0.025)	0.017 (0.015)
Only individuals who ever received social welfare; Part-time work: 30 h per week	−0.045 (0.028)	0.053** (0.026)	−0.111*** (0.032)	−0.008 (0.019)
Only individuals who ever received social welfare; Part-time work: 31 h per week	−0.031 (0.027)	0.058** (0.024)	−0.100*** (0.030)	−0.004 (0.017)

Data source: PASS 2006–2014; unbalanced panel; unweighted. Calculations are based on parametric bootstrap (1000 repetitions). 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 1000 repetitions, are in parentheses.

into welfare without employment (all welfare states together) are larger than those from part-time employment, which holds for all four groups, their confidence intervals overlap (see Tables A2 and A3 in the Appendix 1).

A substantial fraction of welfare benefit recipients in Germany are *single*-parent households, with the majority being *single*-mother households.[31] 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 interaction terms with the various lagged labor market states.[32] 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).[33]

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 individuals are better off by taking up full-time employment during the welfare benefit period. Benefit recipients with a supplementary job have a 10–20 percentage points 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 (*singles*). Their transitions from employment with welfare receipt to employment without welfare 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 supplementary part-time jobs, we find no or (only in some specifications for men) much smaller stepping stone effects. Hence, 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 an individual's 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

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

[32]From the 19,648 observations of women with a partner and/or children in the household, 4371 observations stem from women who are a single parent throughout the observation window.

[33]The APE for lone mothers of moving from full-time working with benefit receipt to employment without benefit receipt is equal to 13.6 percentage points (t-statistic of 3.6). In contrast, the APE of moving from part-time working with benefit receipt to employment without benefit receipt is equal to 1.3 percentage points (t-statistic 0.6)

than to take up any job readily available. From a policy perspective, alternative measures to bring individuals into employment, possibly along with expanded childcare provisions, may be called for.

For future research, it will be interesting to trace out aspects which differ between full-time and part-time supplementary jobs and if these can explain why only the former serve as a stepping stone into employment without welfare benefit receipt. One could also 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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DATA AVAILABILITY STATEMENT

Researchers can apply for the data at the IAB Research Data Centre.

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APPENDIX 1

TABLE A1 Genesis of the regression sample.

	Number of obs.	Number of persons
Raw Pass Sample	114,783	36,381
Information available on whether individual receives benefit receipt	114,179	36,184
Individual is in the first observed wave 25 years or older	94,688	28,615
Only observations where individuals are 64 or younger	81,868	25,840
No missings on		
… marital status	80,061	25,257
… health status known	79,929	25,214
… occupational qualification	79,741	25,179
… gender	79,736	25,177
… citizenship and migration background	77,827	24,578
… working hours known	77,297	24,493
First observation from each individual not included[a]	52,804	16,247
Only consecutive observations up to first attrition	47,420	15,501
Only individuals with at least two observations	42,979	11,060

[a]First observation from each individual cannot be included since lagged labor market state is not available.

TABLE A2 Simulated transition matrix, men.

Men always without a partner or children in the household (*single*)

	Labor market state in *t*			
	Full-time	**Part-time**	**No-job**	**Full-time or part-time**
Labor market state in *t* − 1				
Full-time	0.693 [0.637, 0.746]	0.020 [0.008, 0.038]	0.095 [0.065, 0.132]	0.713 [0.659, 0.764]
Part-time	0.376 [0.252, 0.497]	0.312 [0.180, 0.469]	0.068 [0.031, 0.120]	0.688 [0.587, 0.784]
No-job	0.300 [0.234, 0.367]	0.019 [0.007, 0.040]	0.465 [0.375, 0.558]	0.319 [0.251, 0.389]
Full-time, welfare	0.577 [0.481, 0.667]	0.000 [0.000, 0.000]	0.075 [0.033, 0.139]	0.577 [0.481, 0.667]
Part-time, welfare	0.396 [0.319, 0.472]	0.070 [0.030, 0.131]	0.054 [0.030, 0.088]	0.465 [0.389, 0.541]
No-job, welfare	0.377 [0.319, 0.435]	0.013 [0.005, 0.026]	0.120 [0.083, 0.165]	0.390 [0.331, 0.448]
	Full-time, welfare	**Part-time, welfare**	**No-job, welfare**	**Welfare, all**
Full-time	0.028 [0.012, 0.051]	0.023 [0.011, 0.040]	0.141 [0.107, 0.178]	0.191 [0.150, 0.237]
Part-time	0.000 [0.000, 0.000]	0.121 [0.064, 0.196]	0.123 [0.065, 0.195]	0.244 [0.159, 0.335]
No-job	0.012 [0.004, 0.027]	0.030 [0.014, 0.053]	0.175 [0.130, 0.224]	0.216 [0.164, 0.274]
Full-time, welfare	0.117 [0.055, 0.205]	0.044 [0.018, 0.085]	0.186 [0.124, 0.257]	0.348 [0.261, 0.443]
Part-time, welfare	0.022 [0.008, 0.047]	0.237 [0.160, 0.328]	0.221 [0.163, 0.285]	0.480 [0.405, 0.559]
No-job, welfare	0.019 [0.007, 0.038]	0.062 [0.037, 0.096]	0.409 [0.347, 0.473]	0.490 [0.430, 0.552]

Men with a partner and/or children in the household (*non-single*)

	Labor market state in *t*			
	Full-time	**Part-time**	**No-job**	**Full-time or part-time**
Labor market state in *t* − 1				
Full-time	0.752 [0.707, 0.796]	0.025 [0.013, 0.043]	0.092 [0.066, 0.122]	0.777 [0.734, 0.819]
Part-time	0.360 [0.270, 0.448]	0.343 [0.233, 0.469]	0.139 [0.092, 0.197]	0.703 [0.624, 0.779]
No-job	0.263 [0.209, 0.319]	0.039 [0.020, 0.065]	0.564 [0.484, 0.644]	0.302 [0.242, 0.363]
Full-time, welfare	0.542 [0.466, 0.613]	0.033 [0.012, 0.065]	0.079 [0.045, 0.125]	0.574 [0.498, 0.644]
Part-time, welfare	0.415 [0.341, 0.486]	0.097 [0.051, 0.162]	0.091 [0.057, 0.134]	0.512 [0.439, 0.582]
No-job, welfare	0.378 [0.324, 0.432]	0.022 [0.010, 0.039]	0.145 [0.105, 0.192]	0.400 [0.345, 0.454]
	Full-time, welfare	**Part-time, welfare**	**No-job, welfare**	**Welfare, all**
Full-time	0.020 [0.010, 0.034]	0.015 [0.007, 0.026]	0.096 [0.070, 0.125]	0.131 [0.098, 0.166]
Part-time	0.017 [0.005, 0.040]	0.080 [0.043, 0.127]	0.060 [0.030, 0.101]	0.157 [0.102, 0.220]
No-job	0.012 [0.005, 0.023]	0.020 [0.010, 0.035]	0.102 [0.070, 0.137]	0.134 [0.095, 0.177]
Full-time, welfare	0.136 [0.080, 0.210]	0.028 [0.013, 0.049]	0.182 [0.135, 0.234]	0.347 [0.278, 0.422]
Part-time, welfare	0.042 [0.020, 0.074]	0.201 [0.136, 0.279]	0.154 [0.111, 0.202]	0.397 [0.328, 0.472]
No-job, welfare	0.053 [0.027, 0.088]	0.058 [0.035, 0.089]	0.343 [0.288, 0.403]	0.455 [0.397, 0.514]

Data source: PASS 2006–2014; 5642 observations from 1530 men without a partner or children in the household and 13,303 observations from 3445 men with a partner and/or with children in the household; unbalanced panel; unweighted. Simulated transition probabilities are based on parametric bootstrap (1000 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 probabilities of men always without a partner or children in the household from 'Part-time' to 'Full-time, welfare' and from 'Full-time, welfare' to 'Part-time' are 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 A3 Simulated transition matrix, women.

Women always without a partner or children in the household (*single*)

	Labor market state in *t*			
	Full-time	**Part-time**	**No-job**	**Full-time or part-time**
Labor market state in *t* − 1				
Full-time	0.578 [0.495, 0.659]	0.078 [0.044, 0.122]	0.132 [0.087, 0.184]	0.656 [0.583, 0.725]
Part-time	0.116 [0.072, 0.170]	0.418 [0.324, 0.516]	0.190 [0.124, 0.268]	0.534 [0.444, 0.623]
No-job	0.102 [0.065, 0.146]	0.113 [0.067, 0.170]	0.609 [0.518, 0.697]	0.215 [0.153, 0.284]
Full-time, welfare	0.332 [0.209, 0.452]	0.087 [0.015, 0.220]	0.083 [0.033, 0.157]	0.419 [0.304, 0.535]
Part-time, welfare	0.181 [0.126, 0.243]	0.134 [0.082, 0.197]	0.131 [0.085, 0.187]	0.315 [0.246, 0.386]
No-job, welfare	0.209 [0.150, 0.274]	0.108 [0.062, 0.163]	0.240 [0.179, 0.308]	0.317 [0.250, 0.386]
	Full-time, welfare	**Part-time, welfare**	**No-job, welfare**	**Welfare, all**
Full-time	0.023 [0.008, 0.049]	0.035 [0.017, 0.061]	0.154 [0.109, 0.204]	0.213 [0.161, 0.267]
Part-time	0.027 [0.006, 0.067]	0.112 [0.066, 0.171]	0.138 [0.084, 0.200]	0.276 [0.205, 0.352]
No-job	0.013 [0.004, 0.029]	0.032 [0.017, 0.054]	0.130 [0.091, 0.174]	0.176 [0.128, 0.229]
Full-time, welfare	0.256 [0.133, 0.411]	0.075 [0.030, 0.142]	0.167 [0.095, 0.249]	0.498 [0.389, 0.613]
Part-time, welfare	0.038 [0.013, 0.078]	0.335 [0.251, 0.428]	0.182 [0.130, 0.240]	0.555 [0.484, 0.626]
No-job, welfare	0.009 [0.003, 0.021]	0.095 [0.062, 0.135]	0.339 [0.281, 0.400]	0.443 [0.383, 0.504]

Women with a partner and/or children in the household (*non-single*)

	Labor market state in *t*			
	Full-time	**Part-time**	**No-job**	**Full-time or part-time**
Labor market state in *t* − 1				
Full-time	0.666 [0.605, 0.726]	0.086 [0.059, 0.118]	0.109 [0.079, 0.144]	0.752 [0.702, 0.801]
Part-time	0.166 [0.128, 0.208]	0.474 [0.411, 0.539]	0.191 [0.148, 0.238]	0.640 [0.581, 0.698]
No-job	0.131 [0.098, 0.167]	0.201 [0.158, 0.246]	0.501 [0.434, 0.568]	0.332 [0.276, 0.388]
Full-time, welfare	0.416 [0.341, 0.492]	0.069 [0.035, 0.113]	0.061 [0.035, 0.094]	0.485 [0.414, 0.554]
Part-time, welfare	0.180 [0.138, 0.225]	0.253 [0.205, 0.304]	0.104 [0.073, 0.139]	0.433 [0.378, 0.488]
No-job, welfare	0.221 [0.173, 0.272]	0.154 [0.118, 0.193]	0.206 [0.162, 0.253]	0.375 [0.323, 0.428]
	Full-time, welfare	**Part-time, welfare**	**No-job, welfare**	**Welfare, all**
Full-time	0.033 [0.016, 0.056]	0.023 [0.013, 0.037]	0.082 [0.057, 0.111]	0.138 [0.104, 0.176]
Part-time	0.012 [0.005, 0.023]	0.089 [0.063, 0.120]	0.068 [0.046, 0.095]	0.169 [0.131, 0.211]
No-job	0.005 [0.002, 0.010]	0.026 [0.017, 0.039]	0.136 [0.105, 0.170]	0.167 [0.132, 0.205]
Full-time, welfare	0.199 [0.124, 0.293]	0.078 [0.046, 0.118]	0.177 [0.128, 0.230]	0.454 [0.388, 0.526]
Part-time, welfare	0.034 [0.017, 0.057]	0.279 [0.222, 0.343]	0.150 [0.115, 0.189]	0.463 [0.411, 0.517]
No-job, welfare	0.022 [0.011, 0.037]	0.106 [0.078, 0.139]	0.291 [0.247, 0.338]	0.419 [0.372, 0.467]

Data source: PASS 2006–2014; 4386 observations from 1139 women without a partner or children in the household and 19,648 observations from 4951 women with a partner and/or with children in the household; unbalanced panel; unweighted. Simulated transition probabilities are based on parametric bootstrap (1000 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.