Social policy and labor supply: the impact of activating labor market institutions on reservation wages

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Abstract
Activation is an efficacious policy paradigm in modern welfare states. Taking the case of Germany, we study the relationship between the embeddedness of benefit recipients in activating labor market institutions and individual labor supply. Using panel data, we estimate the effects of transitions between key institutional states with different degrees of activation on reservation wages (RWs). We show that RWs react to activation: the transition from gainful employment to unemployment benefit receipt leads to an average decrease of 3.1% in RWs. The transition from gainful employment to welfare benefit receipt—an institutional state with far more rigorous activation—leads to a stronger decrease of 4.9%. Mediation analyses show that the income associated with different institutional states is the predominant mechanism that drives the effect on RWs. However, subjective social status also partly mediates the effect. Implications of these findings for active labor market policies are discussed.

Key words: labor market institutions, labor supply, social policy, social security, wages, welfare state

JEL classification: H55, I38, J28

1. Introduction
Active labor market policies and their corresponding programs for unemployed and welfare recipients have become widespread among European countries since the 1950s. Understood as active policies designed to facilitate employment transitions (Kalleberg, 2018), these programs have played an important, although politically controversial, role in combating...
unemployment. Recent decades illustrate that international economic and labor market trends have led to a process of cross-country learning and, thus, to the widespread use of active labor market programs. In the same way, the *activation paradigm*, which places a particular emphasis on incentives, enforcement and sanctions alongside support measures, has gained influence since the mid-1990s (Bonoli, 2010). Although the political discourse on activation has decreased substantially since the late 2000s (Viebrock and Clasen, 2008), this has not been associated with a substantial reduction of activation policies since the policy paradigm is still efficacious in modern welfare states. Activation has also received increasing scientific attention in recent discussions on the effectiveness of measures to reduce the detrimental effects of unemployment on subjective outcomes such as life satisfaction or social integration (e.g. Wulfgramm, 2011; Gundert and Hohendanner, 2015). As evidence on the effectiveness of activation regimes stimulates countries’ mutual learning processes and thus the diffusion of activation into social policy (Clasen and Clegg, 2006), our study examines the consequences of activation for the individual labor supply.

We take the case of Germany to study the effects of activating labor market policies, as incisive reforms implemented between 2003 and 2005 marked a significant shift toward an activation-centered labor market regime. A main component of the ‘Hartz reforms’ was the restructuring of social security for employable individuals by merging former unemployment assistance and social assistance schemes into a universal, means-tested welfare benefit (WB) (for an overview, see Eichhorst et al., 2010). Alongside unemployment insurance benefits (UIBs), these WBs constitute one of the two main institutions of social security for the working-age population. Corresponding to the implemented policy paradigm, both benefit schemes contain various elements of activation: recipients of UIB face a shortened maximum receipt duration, are required to participate in vocational integration measures and must be available for appointments established by the employment agency. For WB recipients, activation evolves even more strictly through a rigorous mutual obligation system that includes cash transfers and various individualized support measures on the one hand and rigorous demands on the other hand, such as the obligation to accept every reasonable job offer. WB recipients are further prone to benefit sanctions if they do not meet activation requirements. Thus, the case of Germany, with a clear orientation toward activation and institutional states with varying degrees of activation, provides an excellent basis for examining the consequences of activation policies.

On the individual level, activation policies intend to make benefit receipt less attractive than paid work to raise the labor supply of the targeted benefit recipients (Eichhorst and Konle-Seidl, 2008). From this perspective, the *reservation wage* (RW) is crucial. Whether an individual accepts a job offer depends on the acceptable minimum wage for her, that is, the RW. Extensive research demonstrates the substantial impact of RWs on labor market outcomes such as reemployment (Barron and Mellow, 1981; Lancaster and Chesher, 1983; Prasad, 2000; Bloemen and Stancanelli, 2001). Despite its central role in the labor supply, research on the effects of labor market institutions on RWs is scarce. Furthermore, existing evidence is largely based on cross-sectional data and might suffer from unobserved heterogeneity.

Our article is a first step toward closing this research gap and aims to advance knowledge on the role of activating labor market institutions for the labor supply. The article contributes to the literature in three ways. First, we provide a socioeconomic conceptual framework for analyzing the effects of institutional embeddedness on RWs and carve out different
economic and social mechanisms of how activation affects the labor supply. Second, our analyses cover a broad set of institutional states with different degrees of activation to analyze changes in RWs. By using longitudinal data with a large sample size, we investigate whether institutional status changes cause intraindividual changes in RWs, thereby avoiding bias due to unobserved heterogeneity. Third, we conduct mediation analyses to explore which economic and social mechanisms—household income, subjective social status, and subjective social integration—bring about changes in RWs.

2. Theoretical background

2.1. RWs and activation policies

Initially, RW was introduced as a theoretical construct in the framework of microeconomic search theory. The microeconomic standard model of sequential job search (McCall, 1970) addresses the labor supply of an unemployed actor (for an overview of the model and its extensions, see Van den Berg and Uhlenendorff, 2018). This model predicts three main determinants of the RW level: income expectations, the discount rate of future income and, particularly relevant in our framework, the amount of UIB within the respective labor market regime. According to the RW property (Cox and Oaxaca, 1992), rational actors will only supply labor and take on a job if the expected income exceeds the income that can be obtained from social security institutions. The simple, stationary model of job searching predicts a time-constant RW in this context and found substantial empirical corroboration.

Sociological life-course theory shares this focus on individual actors and their decisions with the outlined microeconomic origins of the RW concept (Mayer, 2009) but applies a different perspective on the labor market and social security institutions. Paradigmatic principles of the life-course approach (Elder et al., 2003; Mayer, 2009) are the temporal, institutional and social embeddedness of actors, time-dependent impacts of life events and socially bounded decision-making (agency). In the context of labor supply, these principles imply the view of an actor who purposefully adjusts the RW over the course of life, taking into account her temporal, social and institutional embeddedness.

In this study, we focus on the concept of institutional embeddedness without neglecting the existence and relevance of other forms of embeddedness. We assume that markets and market participants are embedded in institutions such as the welfare state and its benefit schemes that are essentially of nonmarket origin. For example, despite being connected to the preceding labor market participation, UIB provision is not a natural result of economic transactions but is enabled by welfare state institutions and, as Gangl (2004) argues, is closely linked to RW dynamics. Anxo and Erhel (2008) show from a life-course perspective that transitions of working-age individuals between different institutional states can be conceptualized with the transitional labor market approach.

1 Note the heterogeneous usage of the embeddedness concept in sociological research (see Krippner et al., 2004). Our institution-centered conceptualization of embeddedness contrasts, for instance, with Granovetter’s (1985) social embeddedness that focused Polanyi’s (1957) initial embeddedness concept on social networks. Our conceptualization, however, does not imply an irrelevance of social networks or other forms of embeddedness for RW dynamics. On the contrary, the following theoretical considerations acknowledge the interplay of social and institutional embeddedness (e.g. the link between unemployment, social status, and social integration).
This approach identifies five crucial transitions: school-to-work, job-to-job, employment–unemployment, housework–employment and employment–retirement. According to this perspective, life-course transitions between and within core institutionally defined states are the main areas that modern social and labor market policy can target to stabilize individual life courses (Schmid and Gazier, 2002).

In this outlined nexus of labor supply in an activating labor market regime, the welfare state’s life-course policy embeds individuals into different institutional states according to their respective social situations (Leisering, 2003). As their social situation changes, the obtained institutional state changes accordingly, for example, from UIB receipt to WB receipt when the former benefit receipt duration is exhausted. Due to the heterogeneous degrees of activation between institutional states, transitions between these states should be associated with the dynamic development of RWs. For instance, individuals who change their status from gainful employment to UIB receipt or WB receipt are confronted with specific life-course risks (e.g. poverty) as well as with the respective activation measures implemented by the employment agency. While each institutional state consists of what Eichhorst and Konle-Seidl (2008) describe as ‘the two sides of activation’—demanding and enabling measures—there is no doubt that activation measures are far more rigorous for WB receipt than for all other institutional states.

Consistent with the agency assumption, individuals will consider adjusting their RW to influence the probability of leaving their given institutional state as a UIB or WB recipient. Furthermore, a major goal of activation policies is increasing recipients’ efforts to overcome benefit receipt. Thus, embeddedness in an institutional state with a high degree of activation will result in lower RWs than embeddedness in a less activating institutional state. This corresponding degree of activation will be, to a certain extent, anticipated before the transition into this state. Particularly, we expect that UIB recipients decrease their RWs shortly before a transition to being a WB recipient. However, RWs should also vary by benefit receipt duration within institutional states due to tightening activation measures, exacerbated by growing financial strain and deprivation as benefit receipt continues (Christoph and Lietzmann, 2013).

Accordingly, we derive three hypotheses from our socioeconomic framework:

- **H1**: RWs are not stationary but undergo substantial intraindividual changes between different institutional states of benefit receipt.
- **H2**: Due to the higher level of activation, WB receipt has a stronger negative effect on RWs than UIB receipt.
- **H3**: RWs decrease with the duration of UIB and WB receipt and reflect the anticipation effects of imminent transitions.

### 2.2. Socioeconomic mechanisms of activation

In addition to the total effects of activating institutional states on RWs, it is necessary to examine theoretically the mechanisms that bring about these effects. In addition to the intended economic consequences of activation measures for household income, we are interested in the unintended social consequences of benefit receipt for social status and integration that may partly explain the effect on RWs.

**Household income** The monetary amount of benefits is a crucial instrument of activating labor market regimes to adjust the household income of benefit recipients. Providing
lower benefits, thereby decreasing household income, can reinforce incentives for job finding and job take-up (Bonoli, 2010; see also Dinan, 2019). Specifically, this mechanism can affect concession-making in terms of work location, work content and working conditions. A particularly important aspect of work-related concessions is wages, and it is likely that reductions in RWs are determined by the household income that results from the amount of benefits; low benefits, as a tool of rigorous activation, are a key feature of institutional states with high activation, such as WB receipt.

We assume household income to explain a substantial part of the effect of different institutional states on RWs. First, a drop in household income increases the marginal costs of searching so that the RW is expected to decline (Borjas, 2013). Second, reduced income restricts the recipient’s ability to reach desired goals and rewards and to control the life situation. Recipients are, therefore, likely to suffer from distress (Fryer, 1986). Reducing RWs to increase reemployment chances can be a way to cope with the situation and regain control over one’s life (McKee-Ryan et al., 2005). Conversely, the transition from gainful employment into employed WB receipt, that is, the receipt of in-work benefits and tax credits, will decrease the RWs of working individuals. However, due to the less rigorous activation of employed beneficiaries, we expect a smaller RW decrease in comparison with the transition from gainful employment to unemployed WB receipt.2

We derive the following hypothesis from these considerations:

**H4:** The amount of income partly explains the intraindividual changes in RWs between different institutional states of benefit receipt.

**Subjective social status** Another important mechanism is the effect of transitions into benefit receipt on RWs via subjective social status. According to latent deprivation theory (Jahoda, 1982), job loss, which is typically accompanied by UIB or WB receipt in modern welfare states, is likely to lead to the deprivation of a valued social status and identity. In most societies, work is still the main source of status and is important for the definition of an individual’s identity, while joblessness is a status that caries societal stigma (Gross et al., 2020). Therefore, UIB receipt and the even more stigmatized WB receipt are likely to disrupt an individual’s strategies, which are created to maintain a consistent and positive self-image. This can, in turn, lead to anxiety, self-doubt and lowered self-esteem (Ezzy, 1993), as well as affect how individuals appraise their position in society, that is, their subjective social status.

The different levels of activation can play an important role in such self-evaluations. For instance, benefit cuts and economic strains can serve as testimony of a lack of success and control and ‘erode positive concepts of self’ (Pearlin et al., 1981, p. 337). Likewise, benefit recipients are confronted with obligations (e.g. to take a certain job or lose benefits) and may feel a loss of control over their life course (Wulffgramm, 2011). Therefore, rigorously activating institutional states with a lower benefit level and higher restrictions regarding self-directedness should have stronger effects than less rigorously activating institutional states.

In sum, we assume that these processes negatively affect the subjective social status and that individuals who downgrade their position in society in conjunction with negative self-evaluations are likely to reduce their wage aspirations. We expect this effect to be

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2 In-work benefit recipients in Germany are, however, still prone to various activation measures such as mandatory consultation appointments or subsidized further education.
particularly important for benefit recipients since they do experience the respective downgrading resulting from the transition to being a benefit recipient.

We thus derive the following hypothesis:

H5: Subjective social status partly explains the intraindividual changes in RWs between different institutional states of benefit receipt.

Perceived social integration  The subjective sense of social integration can be another mechanism in the relationship between labor market institutions and RWs. Job loss leading to UIB receipt or WB receipt is a threat to social integration. Benefit recipients not only face a loss of their labor market position, which is an important part of their social identity (Jahoda, 1982) but also lose social contacts at the workplace and in private contexts (Jones, 1988). UIBs or WBs impair the capability of the recipient to participate in society, for instance, in terms of social activities or consumption (Kunze and Suppa, 2017; Pohlan, 2019), which will have a negative effect on the feeling of social integration.

Due to differences in benefit levels, opportunities for agency and the degree of social stigmatization, the different levels of activation play an important role. For instance, benefit reductions impair the capabilities for participation in social life, while demands that restrict the recipient’s scope of action may frustrate control over one’s life course (Gundert and Hohendanner, 2015). Similar to the effect of social status on RWs, we argue that decreased subjective social integration will have a negative effect on RWs: individuals who feel socially excluded will reduce their wage aspirations. In terms of benefit recipients, this may be a strategy to increase one’s reemployment chances, which in turn would be an important step toward regaining social integration.

We derive the following hypothesis from these considerations:

H6: Subjective social integration partly explains the intraindividual changes in RWs between different institutional states of benefit receipt.

3. State of research

Empirical studies on RWs and labor supply mostly rely on a survey measurement of individual RWs for decades (e.g. Barron and Mellow, 1981; Feldstein and Poterba, 1984; Jones, 1988, 1989; Hohmeyer and Wolff, 2018; Fedorets and Shupe, 2021). This measurement usually consists of a question in which the respondent is asked to determine the minimum monthly net income that an employer would have to pay to the respondent to take on a job. Then, the hourly RW is calculated from this amount and the preferred work hours that the respondent reports in a subsequent question. Almost all surveys only ask unemployed respondents to report this minimum income. The measurement has been validated in many studies in various countries and has become common practice (e.g. Prasad, 2000; Lammers, 2014; Kesternich et al., 2020). The current study and the studies reported in the following consistently build on this established measurement approach.3

3 In fact, some studies challenge the idea of measurable and/or stationary RWs (e.g. Kiefer and Neumann, 1979; Blau, 1991). However, the scientific community, to a large extent, does not share these doubts as indicated by the numerous studies that rely on this survey measure.
Numerous studies on RWs deal with the (non)stationarity of RWs with a focus on the causal effect of unemployment duration on RWs. These studies conclude that the dynamics are rather limited. In most modern labor markets, RWs decrease only moderately over the unemployment spell (Addison et al., 2013; Brown and Taylor, 2013; Krueger and Mueller, 2016; Deschacht and Vansteenkiste, 2021), with a slightly more accentuated decrease associated with benefit exhaustion (Fishe, 1982; Belzil, 1995). Some studies find no significant association between unemployment duration and RWs (Addison et al., 2009; Pannenberg, 2010; Axelrad et al., 2017). To the best of our knowledge, the only study that overcomes the focus on unemployment and investigates the effect of different institutional states on RWs is that of Bender et al. (2008). The study shows that the RWs of UIB recipients and WB recipients do not differ significantly. However, due to the study’s cross-sectional design, causal interpretations of these findings are not warranted due to potential unobserved heterogeneity.

In addition, research has investigated various further determinants of RWs within recent decades. These studies show that income is positively associated with RWs (Jones, 1989; Hogan, 1999; Prasad, 2003). In line with that, the amount of received social transfers (e.g. UI) is a major component of income for unemployed individuals and is positively associated with RWs (e.g. Feldstein and Poterba, 1984; Shimer and Werning, 2007; Faberman and Ismail, 2020). This association seems to explain the higher RWs of unemployed social transfer recipients compared to unemployed non-recipients (e.g. Sandell 1980; Faberman and Ismail, 2020). However, these studies tend to reduce the effects of social transfer receipt on RWs to their effect on household income. At the same time, other factors that might play a role in the effect of benefit receipt on RWs have been neglected by this line of research. Empirical studies that disentangle the income effects of social transfers on RWs from other socioeconomic influences, such as social status or social integration, are rare (for an exception, see Vishwanath, 1989).

Concerning activation measures of the respective benefit schemes, a part of the literature deals with the impact of benefit sanctions on reemployment probability (Abbring et al., 2005; Lalive et al., 2005; Svarer, 2011; Boockmann et al., 2014; Van den Berg et al., 2014). Despite that, the impact of benefit sanctions (or their sheer possibility or threat) on the RW as the outcome has not yet been investigated. A rare exception is the study by Schneider (2010) for Germany’s WB after the social reforms of 2005. The study shows that although benefit sanctions increase reemployment probability, they do not decrease the RW or job search intensity. Due to the use of cross-sectional data, however, the results should not be causally interpreted. Moreover, the results contradict the methodologically more advanced study by Hohmeyer and Wolff (2018), which shows that activation measures that are far more moderate than benefit sanctions already have a negative effect on RWs. Even the sheer announcement of such a moderate measure by the employment agency, in concrete terms the ‘One-Euro-Job’ workfare measure (for an overview, see Gundert and Hohendanner, 2015), has a significant effect on hourly RWs. However, this study does not investigate intraindividual changes in RWs. Nonetheless, this evidence of the effectiveness of a comparatively moderate activation measure suggests that individuals anticipate potential benefit sanctions. In line with that, it appears likely that other activation measures are also anticipated and priced into RWs after a transition into a respective institutional state such as UIB or WB receipt.
In summary, we can derive the following main results from the literature:

- Unemployment duration has a weak, negative effect on RWs, while there is limited evidence on differences in the effect of UIB and WB receipt duration on RWs.
- Income has a positive effect on RWs. In line with this, benefit generosity has a positive effect on RWs among unemployed and other benefit recipients.
- Evidence on the effects of activation measures on RWs among unemployed and other groups of benefit recipients is mixed.

Furthermore, there is very little research on the intraindividual dynamics of RWs caused by institutional states with varying degrees of activation. Neither do these studies address nonmonetary socioeconomic factors such as social status and social integration, which could mediate the relationship between different institutional states and RWs in addition to the obtained income. Our main contribution to the literature is to overcome these limitations and to generate evidence that is presumably less prone to bias than previous cross-sectional studies due to our focus on intraindividual RW dynamics.

4. Data and methods

4.1. Data

We use longitudinal data from the panel study ‘Labor Market and Social Security’ (PASS) (Trappmann et al., 2013). PASS is an ongoing large-sample household panel survey that has been conducted annually throughout Germany since 2006. In the first wave, the sample comprised 18,954 persons in 12,794 households, with roughly equal shares of a representative population sample and a representative sample of WB recipients. In each of the survey waves following 2006, the panel was replenished by an additional sample of approximately 1000 households of first-time WB recipients to avoid overrepresentation of long-term WB recipients. Replenishment samples were added in wave 5 for both the population and WB sample and in wave 11 only for the population sample. This sample design enables unique statistical power for analyses of WB recipients while at the same time providing representative coverage of the residential population. PASS furthermore contains rich information on the social and economic situation of the interviewed households and individuals above the age of 14 years.

To analyze the effects of institutional states on RWs, we use waves 1–12. Our analysis includes individuals aged 16–64 years. However, we removed respondents from our analysis who were 58 years or older prior to 2008. Due to a German special regulation, these UIB or WB recipients had the option to evade the activation instrument that requires proof of search efforts (Schneider, 2010). We also removed individuals without search obligations (e.g. caring for small children or relatives, illness), observations with missing values in the variables (listwise deletion) and individuals with only one observation due to our focus on intraindividual changes in fixed effects (FEs) panel regressions. As a result, our analytical sample consists of 47,645 observations from 11,216 individuals.

The dependent variable in our models is the surveyed RW. Current or former job seekers were asked for their expected net wage per month in the given or hypothetical job search process and their expected weekly working hours for a wage of that amount. Then, if the
current or former job seekers did not accept working for a lower net wage per month, we calculate the hourly RW from the expected net wage per month and expected weekly working hours. If the current or former job seekers accepted working for a lower net wage per month, they were asked for the lowest net wage per month they would accept as well as their approximated working hours per week for a wage of that amount. This information enables us to calculate the hourly RWs of the remaining current and former job seekers. In the next step, we removed outliers with RWs above the 99th percentile from our sample (i.e. net hourly RWs > €23.08) and deflated the RWs using the annual national consumer price index (period 2007–2018; reference year 2015) (Destatis, 2020). For further information on the distribution of the RW variable, see Supplementary Appendix Figure A1 and Table A1.

The RW measure in PASS provides a genuine advantage. To the best of our knowledge, PASS is the only large-scale panel survey that provides RWs not only for unemployed or job-searching respondents but also for all respondents who were looking for a job at least once in their lives (i.e. the vast majority of the adult population). Hence, PASS allows us to investigate the effect of all possible transitions between different institutional states on RWs.

To examine the effect of institutional states on RWs, we use a categorical measure that covers different institutional states with different degrees of activation (i.e. unemployed or employed). For unemployed individuals, who are all registered with the Federal Employment Agency, we differentiate between UIB recipients (1) and WB recipients (2). For the employed, we differentiate those who are gainfully employed and receive no UIB or WB (3) and those who are employed and additionally receive WB (in-work benefits) (4). While the first three categories do not include marginally employed individuals, the fourth category does. All four categories differ by their degree of activation. In addition to a categorical specification, we use the durations of UIB and WB receipt (both in years) to study the development of RWs over time.

As part of our mediation analysis, we use the equivalized net household income per month (in €1000) to examine income-related consequences of benefit receipt. The income measure is based on the modified OECD (Organisation for Economic Co-operation and Development) equivalence scale (Hagenaars et al., 1994). To test for nonmonetary mechanisms, we use two measures of subjective social status and subjective social integration that have been previously used in the literature (e.g. regarding social status, see Kelley and Evans, 1995; Krug and Eberl, 2018; for an example regarding social integration, see Gundert and Hohendanner, 2015). For the measurement of subjective social status, the PASS respondents were asked to classify their social status on a scale from 1 to 10, with 1 indicating at the ‘bottom’ and 10 indicating at the ‘top’ of the society (Q: ‘There are groups in our society, which tend to be rather at the top and other groups, which are at the bottom. How would you rank yourself (…)?’). Our examination of the second social mechanism also relies on self-classification: The respondents were asked to assess their degree of social integration on self-classification: The respondents were asked to assess their degree of social integration on

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4 In Germany, neediness is determined on the household level (see an overview of the institutional background in the online appendix). Accordingly, PASS measures UIB receipt on the individual level and WB receipt on the household level. If respondents live in a needy household (i.e. with WB receipt) and receive UIBs at the same time, we classify them as WB recipients. As a robustness check, we classified those respondents as UIB recipients. Our results have not changed.
a 10-point scale, with 1 indicating ‘excluded’ and 10 indicating ‘integrated’ (Q: ‘To what extent do you feel a part of society, or do you feel rather excluded?’).

In our regression analysis, we control for the following time-varying covariates: age groups, marital status, number of children, household size, residence in West or East Germany, general school or vocational education in years, work experience and survey waves. In pooled ordinary least squares (POLS) regression models, we additionally control for gender, migration background and PASS subsample. Supplementary Appendix Table A2 shows the descriptive statistics of the variables used in our analysis.

4.2. Analytical approach

To investigate Hypotheses 1–3, we estimated POLS and FEs panel regressions. The results from POLS serve as a benchmark for results previously reported in the literature, which were mainly based on cross-sectional data. However, similar to cross-sectional regressions, POLS might suffer from bias due to unobserved heterogeneity. In particular, individuals embedded in different institutional states, such as gainful employment, UIB receipt, and WB receipt, might systematically differ with respect to RWs as well as their determinants, such as educational background, occupation and labor market experience.

Hence, the focus of our interpretation is on the results from FEs models, which control for unobserved time-constant confounders at the person level (Bruederl and Ludwig, 2015). Specifically, we estimate the following regression model:

$$Y_{it} = \alpha_i + \beta X_{it} + \epsilon_{it}$$

where $\alpha_i$ are individual FEs, $X_{it}$ is a set of covariates and $\epsilon_{it}$ is an idiosyncratic error term. Due to the inclusion of individual FEs, the approach solely takes into account intrapersonal changes (within variation), for example, the change of the hourly RW associated with an intrapersonal change from employment to UIB receipt.

Using FEs models, we first investigate the effects of institutional states ($X$) on hourly RWs ($Y$) (H1–H2). In addition to a categorical specification of institutional states, we explore how the duration of UIB and WB receipt affects RWs (H3). Since a linear specification of the association between duration and RWs might impose too strong parametric restrictions, we additionally estimate models with time-distributed FEs, also known as dummy impact functions (Allison, 1994):

$$Y_{it} = \alpha_i + \gamma_t + \beta X_{it} + \epsilon_{it}$$

where $\gamma_t$ are indicator variables that measure the duration of UIB and WB receipts (grouped). By that, person-years without UIB or WB receipt serve as a reference.

In a second step, also based on FEs models, we conduct mediation analyses (Wu and Zumbo, 2008) to test which mechanisms ($M$) explain the effects of institutional states on hourly RWs (H4–H6). Our approach follows the procedure proposed by Baron and Kenny (1986), which is also employable with multicategorical independent variables (Hayes and Preacher, 2014). In the first step, we estimate the total effects of institutional states on hourly RWs

5 Experimental evidence shows that minimum wage introductions can lead to higher RWs (Falk et al., 2006). Against the background of the minimum wage introduction in 2015, adjusting for period effects is of particular importance.
RWs (X → Y). To identify a mediation effect, three conditions must be fulfilled. First, the mediator is affected by the institutional state (X → M); second, the mediator affects hourly RWs (M → Y); and third, the indirect effect of X on Y via M is of substantial size and statistically significant. The indirect effect is the product of the coefficient that reflects the effect of the institutional state (X) on the mediator variable (M) and the coefficient that reflects the effect of the mediator variable (M) on RWs (Y). In other words, it reflects the difference between the effect of the institutional state on hourly RWs with and without controlling for the analyzed mediator variable. To test the indirect effects, we use Sobel tests (Sobel, 1982).

5. Results

5.1. The effect of benefit receipt on RWs

Model POLS1 of Table 1 shows how benefit receipt correlates with RWs. Compared to gainful employment, all three states of benefit receipt—UIB receipt, WB receipt and working with supplementary WB receipt (in-work benefits)—lead to a significant reduction in RWs in the range of 8.7–10.7%. Wald tests (results available on request) indicate that only the effects of WB receipt and in-work benefit receipt are significantly different. FEs estimates are similar to the POLS results (see FE1 of Table 1). However, the coefficient for WB receipt halves in magnitude, while the coefficients for UIB receipt and in-work benefit are only approximately one-third of the POLS estimates. This result clearly indicates that POLS is biased by unobserved heterogeneity. Therefore, we do not report any further POLS results for the remainder of this section (see Supplementary Appendix Tables A3, A4 and A5 for POLS estimates).

The FEs results show that receiving UIB compared to gainful employment significantly reduces hourly RWs by 3.1% \(= 100 \cdot (e^{-0.032} - 1)\) percent on average (see FE1 of Table 1). This means that an individual with an RW at the median level (see Supplementary Appendix Table A1) is expected to reduce her hourly RW from €8.91 to €8.63 when confronted with UIB receipt. Similarly, WB receipt (4.9%) and the receipt of in-work benefits (3.6%) significantly reduce hourly RWs compared to gainful employment.

The order of the point estimates by their effect strength (see FE1 of Table 1) suggests that the reductions in RWs are in line with the respective degree of activation. To examine which of the coefficients in Table 1 are significantly different, we conducted Wald tests (results available on request). The tests show significant differences for the coefficients of UIB and WB receipts \((P < 0.05)\) and the coefficients of WB receipt and in-work benefits \((P < 0.10)\). This means that benefit receipt leads to reductions in RWs compared to gainful employment and that differences between different types of benefit receipt exist.\(^6\)

\(^6\) We conducted several robustness and sensitivity checks: First, we checked if currently non-sanctioned and sanctioned welfare benefit recipients differ in RWs. As the differences are small and statistically insignificant, we decided to classify them as one group. Second, we restricted the sample to individuals with a high probability of changing from UIB to WB receipt. This analysis, based on individuals with WB experience before or after their period of UIB receipt, has produced qualitatively similar results compared to the results of our main analysis. Third, we explored whether the direction of the respective transitions is of importance for our results. For example, we checked if the effect of a transition from gainful employment into WB receipt is different from the effect of a transition from UIB receipt into WB receipt. Qualitatively, the effects were similar in terms of effect sizes; however, due to low transition numbers from UIB into WB receipt and a related lack of statistical power, not all these effects turned out to be statistically significant despite similar effect sizes. Finally, gender-
### Table 1: Effect of benefit receipt on net hourly RWs (ln)

<table>
<thead>
<tr>
<th>DV: net hourly RWs (ln)</th>
<th>POLS1</th>
<th>FE1</th>
<th>FE2</th>
<th>FE3</th>
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<tr>
<td>Gainfully employed (ref.)</td>
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<tr>
<td>UIB receipt</td>
<td>0.104***</td>
<td>-0.032***</td>
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<tr>
<td></td>
<td>(0.009)</td>
<td>(0.007)</td>
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<tr>
<td>WB receipt</td>
<td>-0.113***</td>
<td>-0.050***</td>
<td></td>
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<tr>
<td></td>
<td>(0.006)</td>
<td>(0.007)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed and WB receipt</td>
<td>-0.091***</td>
<td>-0.037***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>(0.007)</td>
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<tr>
<td>UIB duration (months)</td>
<td>-0.0005</td>
<td></td>
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<tr>
<td></td>
<td>(0.0007)</td>
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<td></td>
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<tr>
<td>WB duration (months)</td>
<td>-0.0005***</td>
<td></td>
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<tr>
<td></td>
<td>(0.0001)</td>
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<tr>
<td>No UIB receipt (ref.)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>UIB receipt 1–3 months</td>
<td>-0.010</td>
<td></td>
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<tr>
<td></td>
<td>(0.010)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>UIB receipt 4–6 months</td>
<td>-0.025*</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(0.012)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>UIB receipt 7–9 months</td>
<td>-0.025</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(0.016)</td>
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<tr>
<td>UIB receipt 10–12 months</td>
<td>-0.055**</td>
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<tr>
<td></td>
<td>(0.020)</td>
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<tr>
<td>UIB receipt &gt; 12 months</td>
<td>-0.011</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.019)</td>
<td></td>
<td></td>
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<tr>
<td>No WB receipt (ref.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WB receipt 1–3 months</td>
<td>-0.060***</td>
<td></td>
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<td></td>
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<tr>
<td></td>
<td>(0.013)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>WB receipt 4–6 months</td>
<td>-0.044***</td>
<td></td>
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<tr>
<td></td>
<td>(0.013)</td>
<td></td>
<td></td>
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<tr>
<td>WB receipt 7–9 months</td>
<td>-0.067**</td>
<td></td>
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<tr>
<td></td>
<td>(0.025)</td>
<td></td>
<td></td>
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<tr>
<td>WB receipt 10–12 months</td>
<td>-0.028*</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(0.013)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WB receipt &gt; 12 months</td>
<td>-0.041***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Controls included? Yes Yes Yes Yes
(Within) $R^2$ 0.280 0.051 0.050 0.051
Observations 47 645 47 645 47 645 47 645
Number of persons 11 216 11 216 11 216 11 216

Notes: Robust standard errors in parentheses. Significance levels:

*** $P < 0.001$;
** $P < 0.01$;
* $P < 0.05$.

Estimates are based on POLS and FEs panel regressions. Full regression tables can be found in the Supplementary Appendix Tables A3 and A5. Controls: work experience (decades), work experience (decades)*work experience (decades), general education and vocational school (years), residence in West Germany, household size, number of children, marital status, age, survey waves, gender (POLS), migration background (POLS), PASS subsample (POLS).

Data source: Waves 1–12 of the panel study ‘Labor Market and Social Security’ (PASS), own calculations.
Model FE2 of Table 1 illustrates the effect of the durations of UIB and WB receipt on RWs. This model shows that only the duration of WB receipt significantly affects RWs, whereas the linear effect of the duration on UIBs is insignificant (see FE2 of Table 1). WB receipt on average reduces hourly RWs by 0.6% per year \[ \frac{12}{C1} \times \frac{100}{C1} \times \frac{e}{C0} \% \]. However, a linear effect specification might be overly restrictive.

The dummy impact function in Figure 1 (see also model FE3 of Table 1) confirms this assumption and reveals that the linear specification provides misleading results in two ways. First, the effect of the duration of WB receipt does not follow a clear time trend. In contrast, the effect of WB receipt varies unsystematically over time and, depending on the exact duration, reduces RWs by 2.8–6.5%. Second, the dummy impact function reveals a nonlinear relationship of UIB receipt duration and RWs. Compared to gainful employment, UIB receipt reduces RWs by 2.5% in months 4–9 (joint test for these months: \( P < 0.05 \)). The reduction then becomes markedly stronger in months 10–12, with an average reduction in RWs of 5.4%. This suggests that beneficiaries reduce their RW in anticipation of the ending of UIB receipt, which is usually limited to 12 months.

In summary, our results indicate that benefit receipt leads to changes in RWs and suggest that the intensity of activation plays an important role (support for H1 and H2).

Specific analyses (results available on request) reveal that UIB has a stronger impact on the RWs of women, while the RWs of men are not affected by UIB. Further research is needed to elucidate this difference.
Furthermore, the results show that RWs are not completely stationary but rather depend on the duration of benefit receipt in complex ways, such as nonlinear associations and anticipation effects (support for H3).

5.2. Mediation Analysis

In the following, we examine the mechanisms of household income, subjective social status and social integration. In contrast to social status and integration, income is a leverage point of activation policies. However, negative effects on subjective social status and social integration might be unintended consequences of activation that can lead to lower RWs. As illustrated in Supplementary Appendix Figure A2 (see also Supplementary Appendix Table A6), household income, subjective social status and subjective social integration decrease significantly during UIB and WB receipt. Next, we investigate whether these declines in household income, subjective social status, and subjective social integration translate into changes in RWs.

Table 2 shows the results of the mediation analyses based on FE regressions. The results illustrate that each state of benefit receipt leads to a significant reduction of the net logged equivalized household income in €1000 compared to gainful employment. UIB receipt, WB receipt, and in-work benefit receipt lead to a reduction in household income by 10.2, 16.7 and 12.8%, respectively (see \([X \rightarrow M]\) in column FE1 of Table 2). Moreover, household income has a significant positive effect on RWs (see \([M \rightarrow Y]\) in column FE1 of Table 2). A one percent increase in household income translates into an increase in RWs by 0.1% on average. Overall, the indirect effects explain more than a quarter but less than a third of the impact of benefit receipt on RWs (see the indirect effect in column FE1 of Table 2).

Table 2 also reveals that the different types of benefit receipt have a strong negative effect on subjective social status (see \([X \rightarrow M]\) in column FE2 of Table 2). Institutional states with a higher degree of activation have stronger effects on social status. However, at the same time, subjective social status has a small positive impact on hourly RWs (see \([M \rightarrow Y]\) in column FE2 of Table 2). The indirect effects of the different types of benefit receipt via subjective social status are statistically significant but small (see the indirect effect in column FE2 of Table 2). Thus, subjective social status partly mediates the effect of benefit receipt on RWs but seems of less relevance than income in terms of explanatory power.

In contrast, subjective social integration does not mediate the effect of benefit receipt on RWs at all. The indirect effects are small and insignificant (see the indirect effect in column FE3 of Table 2). The pathway from benefit receipt via subjective social integration to hourly RWs is incomplete: Like it is the case for social status, all states of benefit receipt have a marked negative effect on subjective social integration (see \([X \rightarrow M]\) in column FE3 of Table 2), and effect strength varies with the degree of activation. However, subjective social integration has no impact on hourly RWs (see \([M \rightarrow Y]\) in column FE3 of Table 2).

In summary, our results show that the effects of benefit receipt on RWs are partly explained by household income and subjective social status but not by subjective social integration. However, only household income explains a substantial part of the effects
Table 2 Mediation analysis for the effects of benefit receipt (X) on hourly RWs (ln) (Y)

<table>
<thead>
<tr>
<th>Institutional state (X)</th>
<th>Mediator (M): net equivalized household income in €1000 (ln) FE1</th>
<th>Mediator (M): subjective social status FE2</th>
<th>Mediator (M): subjective social integration FE3</th>
</tr>
</thead>
<tbody>
<tr>
<td>UIB receipt (ref.: gainfully employed)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total effect (X (\rightarrow) Y)</td>
<td>-0.032*** (0.007)</td>
<td>-0.032*** (0.007)</td>
<td>-0.032*** (0.007)</td>
</tr>
<tr>
<td>X (\rightarrow) M</td>
<td>-0.108*** (0.006)</td>
<td>-0.256*** (0.043)</td>
<td>-0.422*** (0.056)</td>
</tr>
<tr>
<td>M (\rightarrow) Y</td>
<td>0.087*** (0.010)</td>
<td>0.003** (0.001)</td>
<td>0.001</td>
</tr>
<tr>
<td>Indirect effect</td>
<td>-0.009*** (0.001)</td>
<td>-0.001* (0.000)</td>
<td>0.000</td>
</tr>
<tr>
<td>WB receipt (ref.: gainfully employed)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total effect (X (\rightarrow) Y)</td>
<td>-0.050*** (0.007)</td>
<td>-0.050*** (0.007)</td>
<td>-0.050*** (0.007)</td>
</tr>
<tr>
<td>X (\rightarrow) M</td>
<td>-0.183*** (0.005)</td>
<td>-0.788*** (0.039)</td>
<td>-0.988*** (0.049)</td>
</tr>
<tr>
<td>M (\rightarrow) Y</td>
<td>0.087*** (0.010)</td>
<td>0.003** (0.001)</td>
<td>0.001</td>
</tr>
<tr>
<td>Indirect effect</td>
<td>-0.016*** (0.002)</td>
<td>-0.003** (0.001)</td>
<td>-0.001</td>
</tr>
<tr>
<td>Employed WB receipt (ref.: gainfully employed)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total effect (X (\rightarrow) Y)</td>
<td>-0.037*** (0.007)</td>
<td>-0.037*** (0.007)</td>
<td>-0.037*** (0.007)</td>
</tr>
<tr>
<td>X (\rightarrow) M</td>
<td>-0.137*** (0.005)</td>
<td>-0.570*** (0.039)</td>
<td>-0.608*** (0.051)</td>
</tr>
<tr>
<td>M (\rightarrow) Y</td>
<td>0.087*** (0.010)</td>
<td>0.003** (0.001)</td>
<td>0.001</td>
</tr>
<tr>
<td>Indirect effect</td>
<td>-0.012*** (0.001)</td>
<td>-0.002** (0.001)</td>
<td>-0.001</td>
</tr>
</tbody>
</table>

Notes: Robust standard errors in parentheses. Significance levels:
Analysis based on 47,645 observations of 11,216 persons. Estimates are based on FEs panel regressions. Total effect (X \(\rightarrow\) Y) reflects the effect of the respective institutional state (X) on RWs (Y) from a regression model without control for mediator variables (see Supplementary Appendix Table A3); (X \(\rightarrow\) M) reflects the effect of the respective institutional state (X) on the analyzed mediator (M) from a regression model (see Supplementary Appendix Table A4); (M \(\rightarrow\) Y) reflects the effect of the analyzed mediator (M) on RWs (Y) from a regression model (see Supplementary Appendix Table A3); indirect effect reflects the effect of (X) via (M) on (Y) and is the product of (X \(\rightarrow\) M) and (M \(\rightarrow\) Y), for the significance tests of the indirect effects and calculation of the standard errors we used an approach proposed by Sobel (1982). Controls: work experience (decades), work experience (decades)*work experience (decades), general education and vocational school (years), residence in West Germany, household size, number of children, marital status, age, survey waves.

***P < 0.001;
**P < 0.01;
*P < 0.05.

Data source: Waves 1–12 of the panel study ‘Labor Market and Social Security’ (PASS), own calculations.
the different types of benefit receipt have on RWs. Thus, our results provide support for H4, partial support for H5 and no support for H6. 7

6. Summary and conclusion

Based on microeconomic theory and sociological life-course theory, we proposed a socioeco-
nomic framework for analyzing the effects of institutional embeddedness on labor supply. 
Drawing on the notion that the welfare state’s life-course policy embeds individuals of work-
ing age into institutions with varying degrees of activation, this framework provides an inno-
vative conceptual basis that allows for the derivation of testable hypotheses on RW 
dynamics. Theorizing the link between labor market institutions and RWs in this 
framework, we mainly focus on two aspects: first, we expect RWs to react to transitions 
to institutional states such as UIB and WB receipt due to different degrees of activation, 
and second, our framework predicts that economic and social mechanisms regarding house-
hold income, social status and social integration drive these effects.

In the empirical part of our article, we used rich German longitudinal survey data to test 
these considerations. These data allowed us to contribute to the literature by investigating RW 
dynamics not only for unemployed individuals but also for all individuals who searched for a 
job at least once in their lives. Covering virtually the whole working-age population, our study 
goes beyond previous research by examining the effects of transitions from employment into 
unemployment and into welfare receipt. Moreover, the large sample size, the panel structure 
and the long observation window enabled us to track intrindividual transitions and RW dy-
namics over time. By that, we were able to conduct regression and mediation analyses with in-
dividual FEs as a data-intensive statistical technique that, in contrast to previous cross-
sectional studies, does not suffer from bias due to unobserved heterogeneity.

The estimated models show considerable support for most of the derived hypotheses, 
pointing to the importance of embeddedness in activating labor market institutions for RWs. 
According to our estimates, the transition from gainful employment to UIB receipt leads to an 
average decrease of 3.1% in RWs, while the transition from gainful employment to WB re-
ceipt is associated with an average decrease of 4.9%. In addition, looming UIB exhaustion is 
associated with a significant drop in RWs, suggesting that UIB recipients anticipate tightening 
activation measures of a potential succeeding WB receipt. In sum, the results point to the 
picture of an activating labor market regime in Germany that, at least as concerns its effects on 
the wage aspirations of benefit recipients, works as intended by policy makers.

Our mediation analyses demonstrate that household income is the predominant mecha-
nism that mediates the relationship between institutional states and RWs. We also identified 
social status as a relevant mediator, demonstrating that social mechanisms are simulta-
neously at work. Social integration, however, has not turned out to be a significant

7 These results suggest that other relevant mechanisms are simultaneously at work. Hence, we addi-
tionally tested whether material deprivation and self-rated health explain the effects of benefit re-
cipient on RWs. Our results show that benefit receipt has negative effects on subjective health and 
positive effects on the material deprivation index [X→M]. However, similarly to the results for social 
integration, the potential mediators were unrelated to RWs [M→Y]. Furthermore, analyses by gender 
show some relevant effect heterogeneity: first, indirect effects via household income are stronger 
for men, explaining half of the effects of WB receipt and employed WB receipt, and second, the indi-
rect effects via social status only hold for men.
mediator. As a critical result, the analyses show that all investigated benefit schemes have strong negative effects on social status and social integration. Another related critical point made by previous research is the practical desirability of RW decreases as such. Wage concessions can lead to hasty job take-up with suboptimal employer–employee matches, destabilizing subsequent employment careers over the life course (Gangl, 2004). Job insecurity and unstable employment trajectories are known to cause lasting scars on the subjective well-being of individuals (Knabe and Rätzel, 2011; Eberl et al., 2021). It should thus be carefully considered whether activation truly leads to improved long-run societal outcomes. Therefore, the main policy implication of our study is that decreasing RWs through activation is an ambiguous tool for increasing labor supply that should only be used in conjunction with effective measures that prevent negative side effects.

There are also limitations of our study that should be addressed in future research. First, we cannot rule out reverse causality between institutional states and RWs, as studies report the effects of RWs on benefit receipt. This points to the possible selection of individuals with low RWs into employment (e.g. Prasad, 2000; Bloemen and Stancanelli, 2001). While our FEs approach controls for bias due to unobserved time-constant differences between individuals, the method is no silver bullet against issues of reverse causality (Leszczensky and Wolbring, 2019).

Second, we did not disentangle the effects of specific activation measures: Since one focus of our study was generalizability, we did not further differentiate our independent variable into numerous single activation measures. Instead, we used a more general and compact measure of four main institutional states that individuals of working age can obtain not only in the German but also in many modern labor market regimes. Therefore, the effects of institutional states revealed by our study should be replicated in other countries. At the cost of less generalizability, however, further research can also, and should, focus on a specific institutional state and then investigate the effects of the activation measures specific to this state, contributing to a more fine-grained picture of activation instruments (e.g. Hohmeyer and Wolff, 2018).

Third, we did not investigate the behavioral effects of embeddedness in activating labor market institutions. Since the focus of our study was RW dynamics, we did not investigate the relationship between activating labor market institutions and observed labor market behavior such as job search intensity or job take-up. Many studies, which, however, did not include RWs in their empirical analyses, do suggest substantial behavioral effects: benefit sanctions, for instance, as the arguably most rigorous activation measure, are associated with increased reemployment probability (Abbring et al., 2005; Svarer, 2011; Van den Berg et al., 2014). Future research should establish the link between this line of studies and our results, investigating RWs as the mediator of the relationship between activating labor market institutions and reemployment. However, concerning policy implications, the results of these studies are consistent with our study. They show that benefit sanctions lead to the take-up of comparatively unstable employment relationships with corresponding risks of welfare recidivism, underlining our main conclusion regarding the ambiguity of activating social policy.

Supplementary material
Supplementary material is available at SOCECO Journal online.
Conflict of interest

The author(s) declared no potential conflicts of interest with respect to research, authorship, and/or publication of this article.

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References


