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Katja Hillmann, Ingrid Hohenleitner

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Katja Hillmann
University of Hamburg
Department of Economics
katja.hillmann@wiso.uni-hamburg.de

Ingrid Hohenleitner
University of Hamburg and
Hamburg Institute of International Economics (HWWI)
hohenleitner@hwwi.org

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Katja Hillmann[†]   Ingrid Hohenleitner[‡]

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Abstract

Similar to numerous other European countries, Germany's unemployment policy went through a paradigm shift towards activation policy by tightening their monitoring and sanction regime. In our study we examine the impact of benefit sanctions on the probability of getting employed or leaving the labor force. Using a mixed proportional hazard model, we draw causal inference of sanction enforcements on unemployment exit hazards. Based on a novel survey sample, covering the first three years after implementation of the "Hartz IV" law in 2005, we provide evidence for a positive impact of sanctions on employment entrance, but also on leaving the labor market.

JEL classification: J48, J63, J64, J68, I38

Keywords: unemployment benefit sanctions, unemployment duration, employment, non-employment, mixed proportional hazard estimation

[†]University of Hamburg, Department of Economics, `katja.hillmann@wiso.uni-hamburg.de`

[‡]University of Hamburg and Hamburg Institute of International Economics (HWWI), `hohenleitner@hwwi.org` (corresponding author)

1 Introduction

During the last two decades, many European countries went through a paradigm shift in unemployment policy from welfare towards workfare, referred to as "activation policy". In Germany, a comprehensive labor market reform, based on so-called "Hartz-Laws", lead to a substantial restructuring of the unemployment and social benefit system.[1] More than 6 millions of persons were immediately affected by the implementation of the last reform step in January 2005. 4.5 millions of them became recipients of the new unemployment benefits II (UB II), commonly known as "Hartz IV". The "Hartz laws" entailed an extensive monitoring and sanction regime and, moreover, work requirements have been strengthened radically. All kinds of job offers have to be accepted to almost all conditions involving the risk of a downgrade in occupational skills and further unwelcome external effects.[2] Hence, we have to look beyond the imperative of getting people employed at any price.

As a step towards this direction, we examine the impact of benefit sanctions on unemployment outflow. To be more specific, our analysis complements employment entrance with the alternative of leaving the labor market as another probable response to unemployment benefit sanctions.[3] We aim to provide causal evidence, whether sanctions on unemployed UB II recipients (or on their household members) speed up their employment entrance, or rather encourages them to leave the labor market. The idea behind is that we assume sanctioned persons beeing more likely to accept worse job conditions. Also, they may increase their search efforts for jobs and for alternatives, too.

There is a strand of empirical studies analyzing the impact of sanctions on reemployment rates. Two prominent studies for the Netherlands should be mentioned first: van den Berg et al. (2004) estimate a mixed proportional hazard model and find sanction enforcements to have a significantly positive effect on the unemployment-to-employment hazard. In figures, a sanction

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[1]The reforms are named after Peter Hartz, the chief of the commision that set up the design of the four reform laws. For a comprehensive overwiew of each reform step, see Ebbinghaus and Eichhorst (2006).

[2]Unwelcome (long-term) effects of benefit sanctions might be unstable employment and low wages, even below the subsistence level.

[3]Leaving the labor market towards non-employment implies neither being employed nor receiving unemployment benefits. Non-employment may stand for living on parents', children's or partner's income, on assets, student's assistance, disability pension, early retirement pay - or in any other way like illicit work, begging, or crime.

raises the transition rate to work by 140%. Moreover, they find a substantially negative effect on the probability an individual becomes long-term unemployed if the sanction is imposed at a relatively early stage in the respective unemployment spell. Also, Abbring et al. (2005) estimate a positive and significant effect of sanctions on reemployment in the metal and banking sector for both males and females separately, whereas the effect for female unemployed with an increased transition rate by 98% for the metal industry and 85% for the banking sector turns out to be considerably higher than for males.

Based on a Swiss data sample, Lalive et al. (2005) find that both warnings and enforced sanctions have a positive impact on unemployment exit rates. Their estimates of a model, which allows for selectivity, reveal a 28% shift in the unemployment exit rate after a warning. Once a sanction has been given, the transition out of unemployment increases again by 23%.

The results indicate that compared to the actual imposition of a sanction, already the warning exhibits a fairly similar and quantitatively important effect. Using the same administrative data sources, a similar but amplified analysis for Switzerland is provided by Arni et al. (2009). Employing a multivariate mixed proportional hazard model for competing risk, Arni et al. (2009) explore how both warnings and imposition of sanctions in Switzerland affect the unemployment exit hazard to either regular employment or non-employment (out of labor force) as two competing risks. They find a positive impact of warnings and sanction enforcements on unemployment exit rates to either of the two competing risks, whereas the announcement of a sanction causes a remarkable rise in the exit to non-employment. Beyond examining the unemployment exit hazard, Arni et al. (2009) extend their approach allowing for an analysis of the post-unemployment employment spells with respect to job stability and earnings. They find significant evidence that a sanction during the unemployment spell reduces the duration of the first employment and non-employment period. With regard to wages, sanction warnings as well as impositions clearly exhibit a negative effect on post-unemployment earnings.

Svarer (2010) exploits a large Danish register dataset to investigate the effect of sanctions on reemployment rates in the period from January 2003 to November 2005. Svarer (2010) obtains positive estimates for the sanction coefficient verifying the result of a positive impact of sanctions on the unemployment exit rate in previous studies. The estimates of the time-varying effect of

sanctions suggest a remarkably high effect for the first four weeks after a sanction had been imposed. However, in the eight consecutive weeks the effect drops sharply and finally loses significance after thirteen weeks.

Müller and Steiner (2008) explore the ex-post effect of unemployment benefit sanctions on unemployment-to-employment transitions between 2001 and 2004 for West and East Germany separately. They restrict the sample to inflow cohorts in the years 2001 and 2002 entitled to unemployment insurance (UI) or unemployment assistance (UA) benefits[4] at the beginning of the unemployment spell. Employing a discrete time hazard rate model, they find the reemployment probability to be postively affected by sanctions.

The results had been verified by Hofmann (2012), who investigates the ex-post effect of sanctioned individuals who entered unemployment insurance receipt between April 2000 and March 2001 in West Germany on their reemployment probability. By applying a dynamic matching approach, sanctions turn out to affect the exit to work positively. In a follow up study, Hofmann(2010) exploits German register data of an inflow sample into UI receipt between 2001 and 2003 to study the impact of increased sanction rates on exit to work due to a policy change becoming effective in January 2003. Based on a proportional hazard model, she confirms her former result of a positive ex-post sanction effect.

Using a unique combined data set of German administrative and survey data for unemployed in UB II receipt between 2006 and 2007,[5] Boockmann et al. (2009) estimate the effect of benefit sanctions on the exit to employment and from welfare dependency. Assessing the potential bias due to sanction endogeneity, Boockmann et al. (2009) employ an instrumental variable regression with both the reported sanction strategy and the sanction frequency rates of 154 German welfare agencies as instruments to measure the effectiveness of an intensified sanction regime in terms of the local average treatment effect (LATE). Based on their results, they support a tighter use of benefit cuts as it is supposed to increase the probability of leaving welfare dependency and the transition to employment. This is the first study for Germany based on data after the accomplishment of the Hartz reform package in 2005.

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[4]In contrast to UI, UA was tax based. Both existed until the end of 2004. Since 2005 the unemployment benefit system has basically changed. Further information is given in Section 2.

[5]This data set is neither available to external researchers nor to other research institutes.

With this paper, we conduct a first approach in analyzing the causal ex-post effects of unemployment benefit sanctions (namely UB II sanctions) on the hazard rates to both exit options, employment and non-employment, after the "Hartz IV" reform was implemented in 2005. Hereby we focus on the effects after the imposition of benefit sanctions (ex-post effects) and abstract from the general effects of tightening up the sanction regime, as well as from the effects caused by warnings before a sanction is actually imposed (ex-ante effects).[6]

Our investigation period covers the first three years after the implementation of "Hartz IV", from 2005 to 2007. Relying on the timing-of-events approach of Abbring and van den Berg (2003a,b), we estimate a discrete multivariate mixed proportional hazard model.

In contrast to all previous studies on benefit sanctions, we estimate the effect on all (employable) household members, and not only on the person who caused the sanction, as we assume and hence treat the other household members to be affected as well. Although using survey data entails some difficulties, as discussed in Section 3, we decide to use a novel German panel survey, which is especially designed for research on employable welfare recipients (namely UB II recipients) and their household members. One of the advantages of this data is that it is publicly availabe to external researchers and not restricted to members of the IAB.[7] Using this special survey data sample enables us to provide a first approach on the effects of benefit sanctions in the household context.

The remainder of the paper is organized as follows: The next section outlines the institutional structure of the German unemployment benefit system as well as the sanction scheme implemented with the labor market reform "Hartz IV". A detailed description of the vast data set, in particular of the group differences between sanctioned and non-sanctioned unemployed in UB II receipt is provided by Section 3. Section 4 introduces the econometric model, the results are presented and discussed in Section 5, followed by a conclusion in Section 6.

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[6]This wording is common in the literature, although the effects after a sanction, strictly spoken, are no pure ex-post effects, but rather a mixture of ex-ante and ex-post effects.

[7]The German Institute for Employment Research (IAB) is an independent institute of the German Federal Employment Agency (FEA). The Research Data Centre (FDZ) at the IAB is responsible for the access of micro data for non-commercial empirical research in the fields of social security and employment.

2 Unemployment Benefit and Sanction Scheme in Germany

Before the fourth and last step of the "Hartz" reform was accomplished in January 2005, there were three types of benefits that unemployed could be eligible for: unemployment insurance (UI) benefits, unemployment assistance (UA), and social assistance. Whereas UI benefits were not means-tested, both unemployment and social assistance were tax based and means-tested. The "Hartz IV" law as the core of the reform merged unemployment and social assistence to the unemployment benefit II (UB II). Hence, two types of benefits for unemployed in Germany remained: unemployment insurance benefits, called UB I, and the tax financed and means-tested UB II.[8]

Due to the high proportion of UB II recipients, and in light of the new dimension of the extensive sanction scheme initiated by "Hartz IV", we focus our analysis to unemployed UB II recipients.

2.1 The Means-tested Unemployment Benefit System after the Reform

The means-tested UB II provides a basic social security for "needy job-seekers" and their (related) household members. In general, every person, who lives in Germany and is in an employable age of 15 to 64 years and is able to work at least three hours per day, but not able to cover the basic needs of its household, satisfies the eligibility criteria for UB II.[9] As UB II is means-tested, claimants and their household members are classified as "needy" but do not necessarily have to be unemployed.

In contrast to the insurance benefit UB I, which is granted individually, the means-tested UB II applies to households, or more precisely, to so-called "need units".[10] A "need unit", sometimes also referred to as "need community" ("*Bedarfsgemeinschaft*"), consits of at least one person capable to work. The partner, regardless of married or not, and children younger than 25 years belong to the "need unit", given they share the same household.[11]

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[8]Social assistance is left only for persons who are unabled to work.

[9]The eligibility requirements of UB II are codified in the Social Code II.

[10]We use the terms "household" and "need unit" synonymously, whereas the latter term is used officially.

[11]Persons who live together as a merely flat-sharing community do not belong to the same household in the sense of the Social Code II.

The heterogenous group of UB II recipients includes persons who either are unemployed but not entitled to the insurance benefit UB I, or whose UB I or earned income is below the household's subsistence level. Normally, individuals end up in UB II receipt after they have exceeded their maximum period of UB I receipt (6-12 months), henceforward classified as long-term unemployed. Another group of UB II recipients are represented by persons who did not pay (sufficient) contributions to unemployment insurance, such as former pupils, students, self-employed persons or employees who worked for less than 12 months within the eligibility period of three years (before 2007) or two years (since January 2007), respectively.

In comparison to the former UA, UB II is granted under tightened acceptance regulations, prescribing which jobs UB II recipients are obliged to accept. The acceptance regulations of the former UA provided protection against loss of job quality and income to a certain extent. Now, UB II recipients are obliged to accept or hold any jobs they are physically, intellectually, and mentally able to. Hence, there is hardly any protection against a loss of job quality in terms of professional skill level, type of contract, and wages.[12]

Key tools of the comprehensive monitoring scheme in Germany are the "integration contract" ("*Eingliederungsvereinbarung*"), which UB II recipients must sign and the appointments with the "personal case manager". To be more explicit, the integration contract typically specifies the duties of the client with respect to job search activities. Moreover, it can determine further oligations, e.g. more or less specified commitments to a participation in a program of active labor market policy (ALMP).

2.2 Sanctions

A crucial part of the "Hartz IV" implementation is the comprehensive sanction scheme. Compared to the former social assistance or UI benefits, the scope of reasons for imposing UB II sanctions had been widened severely. Furthermore, case managers are in charge of applying UB II sanctions rather strictly. Already twice repeated non-compliant behavior can lead to a total cut of UB II,

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[12]These regulations do not only apply to unemployed UB II recipients but also to low-income earners receiving supplementary UB II (the so-called *"Aufstocker"*) who as well are obliged to search for additional or better paid jobs in order to reduce their means dependent benefits.

including accomodation benefits.[13] Generally, the duration of benefit cuts lasts three months.

Recipients of UB II are exposed to sanctions for a broad bundle of occasions such as insufficient job search effort, refusing to sign an "integration contract", non-acceptance of job offers or an offer for an integration measure, and employee's quitting (by the unemployed herself) or provocating a dismissal from a regular job or an integration measure. All these types of failures are valued as *major* "breaches of duty" and cause a 30% reduction of the base benefit in the first step. Repeated major breaches within one year increase the penalty: The second failure is sanctioned with a 60% cut, and the third one with a total cut of UB II, including housing benefits. Further justifications for sanctions are fails to meet the case manager and missing a medical or psychological appointment. These *minor* non-compliances are sanctioned initially by a 10% reduction of the base benefit. Each repeated minor failure increases the benefit reduction by additional 10 percentage points. Young UB II recipients, in the age of 15 to 24 years, are sanctioned even harder. Apart from minor mistakes (missed appointments), already the first failure is sanctioned by a cut of 100% of the base benefit. The second sanction step for so-called "young adults" already comprises a total cut of UB II, including housing benefits.

In fact, unemployed in the last sanction step are almost threatened to become homeless. Hence, it can be expected that such a sanction scheme increases compliance and concessions on the expected job quality, particularly of unemployed who already experienced a sanction.

3   Data

Our analysis is based on a novel German panel survey, called "Labour Market and Social Security" (PASS).[14] The PASS is a new annual household survey in the field of labor market and welfare state research, conducted upon request of the Institute for Employment Research (IAB). Its design is especially appropriate to research on UB II and to comparisons between benefit recipients and the total population.

Nevertheless, there are two disadvantages of using the PASS in stead of administrative data:

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[13]UB II consists of the base benefit, housing or accomodation costs and social security contributions. The legal basis of the UB II sanction scheme is regulated in §§31, 31a, 31b, and 32 SC II.

[14]The German title of the study is "*Panel 'Arbeitsmarkt und Soziale Sicherheit'* " (PASS).

Benefit sanctions are mis- and particularly underreported in survey data - due to recall errors and because they could indicate non-compliant behaviour which people might rather not are willing to reveal. Moreover, the FEA sample[15] of the PASS bases on a stock sample of UB II recipients and therefore overrepresents long-term recipients. This bias leads to a negative selectivity concerning the probability of leaving unemployment status. Hence, long-term unemployed are overrepresented in the PASS.[16]

We decide to take this drawback because of the following advantages: The PASS survey provides detailed information about the household context for periods with as well as without UB II receipt, information about the reasons for UB II sanctions, begin and end date of sanctions, and - unlike administrative data - the PASS is available also to external researchers.[17] Additionally, we think that - although our sample gives a biased picture of UB II recipients and of sanction quotes in Germany - analysis based on it, nevertheless, can indicate whether sanctions lead to significantly different transition rates out of unemployment.

3.1 General Description of the Survey Data

The PASS study consists of annual panel data on individual and household level as well as of several spell datasets comprising the entire employment history of individuals and the episodes of households' UB II receipt.[18] We use the first two waves of the survey.[19] For the first wave approximately 18954 individuals belonging to 12794 households were interviewed between December 2006 and July 2007. The second wave, conducted between December 2007 and July

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[15] As mentioned below in Section 3, the PASS survey consists of two main samples: a cross-section sample of the whole population and a sample of households in which at least one person was receiving UB II benefits within the appointed month.

[16] As mentioned above in Section 2, UB II recipients do not only cover unemployed persons, but also low-income earners and their household members if their income is below the subsistence level of the houshold.

[17] The IAB also provides a sample of administrative data for external research institutes, but these strongly anonymized data miss exact information on sanction periods and the household context which is indispensable for our analysis.

[18] The PASS survey comprises the employment histories of individuals and the episodes of UB II receipt of households in several separate datasets. The most important spell datasets are the employment and unemployment spells, the gap spells with periods out of the labor force, and the measure spells with periods of participation in ALMP measures. The spell data generally are recorded for individuals, except for the UB II spells that are recorded on the household level. In order to get an integrated dataset of individuals' employment histories, users of the PASS survey have to merge the relevant spell datasets and control for plausibility by themselves.

[19] An extensive documentation on the first two waves of PASS is provided by Christoph et al. (2008) and Gebhardt et al. (2010).

2008, covers 12487 persons in 8429 households. Summing up, there are over 10000 employable individuals in the age of 15 to 64, living in more than 7300 households, who had been interviewed in both waves.[20]

As the PASS is targeted towards low-income households and unemployed, the survey is built as follows: There are two sub-samples, the "*FEA-sample*", which covers households and individuals entitled to UB II, and the so-called "*Microm-sample*" that covers households and individuals registered as German residents. The latter one is a stratified sample where the probability of a low-income (medium-income) household to be interviewed is 4 times (2 times) the probability of a high-income household. Consequently, UB II recipients and low-income earners are disproportionately represented in the PASS study. This is one of the PASS study's great advantages, as this segment of the population is more difficult to reach and follow up over time, and hence is normally underrepresented in surveys.

Besides the unemployment spells the survey comprises employment spells and - in comparison to administrative data - contains "gap spells", recording the periods out of labor force. The detailed information in the various spell datasets enables us to follow households' UB II receipt and individuals' transitions out of unemployment. Both unemployment and employment episodes are reported on a monthly frequency since January 2005. The UB II spells, reported on household level, cover detailed information on imposed sanctions, such as the type of violation, the date of the sanction enforcement and its duration. The study further comprises annually panel data with a large variety of information on socio-demographic characteristics like individuals' household structure, labor market status, earned income, and households' net income including any kind of social benefits. Moreover, there are several subjective indicators like employment orientation and experienced social status.[21]

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[20]Persons aged 65 and older were interviewed using a reduced questionnaire, the so-called "senior citizens' questionnaire".

[21]There are some special subjects which are not inquired annually but only in certain waves, such as the questions about working motivation.

3.2 Sample Selection

Our analysis covers the period from January 2005 until December 2007, thus the first three years since the Hartz IV implementation. We select those individuals who had been unemployed in UB II receipt at least once within the period of interest. In order to cover the employment biographies over the observation period, we restrict our sample to individuals who had been interviewed in both waves and were in the employable age between 15 and 64 years.

As the spell dataset of UB II receipt is recorded on household level, the information on imposed sanctions is reported on household level as well. Even though it is possible to assign sanctions to household members who caused it, we consider all household members as affected by sanctions as it appears reasonable that in the end the entire household is exposed to the budget cut. Hence, since the imposition of the first sanction, we classify all employable household members as sanctioned.

3.3 Description of the Sample

Our final sample consists of 3996 unemployment spells, whereas 742 end with a transition into employment, 601 with a transition out of labor force, and 2653 are right censored, i.e. the persons remained unemployed until December 2007. The final sample records 3599 unemployed persons from 15 to 64 years, who had received UB II at least for one month in the respective period from January 2005 to December 2007. 391 of them (that is 10.86%) had been sanctioned.

Table 1: Sanction Rates of Selected PASS Data (2005-2007)

Sex/Age Group	Individuals	Sanction Rate[1]
All	3599	10.86
Men	1533	11.29
Women	2066	10.55
15-24 years	605	12.56
25-49 years	2067	11.66
50-64 years	927	7.98

Source: Own calculations based on selected data of the PASS survey. [1]Percentage sanction rates, calculated as share of sanctioned unemployed UB II recipients in the period between January 2005 and December 2007.

Table 1 depicts the ratios of sanctioned unemployed UB II recipients who had been affected

by at least one sanction between January 2005 and December 2007 in relation to all unemployed persons who received UB II at least for one month within this period.[22]

12.56% of "young adults", here individuals in the age of 15 to 24 years, had been sanctioned. The sanction rate of 7.98% for persons above 50 years is notably lower than for the whole sample.

Table 2: Summary Statistics of Selected Variables[1]

Variable	Non-Sanctioned	Sanctioned
PANEL DATA[2]		
woman	0.576	0.564
east***	0.399	0.364
age***	40.28 (0.032)	37.91 (0.088)
age24-**	0.152	0.201
age50+***	0.293	0.199
couple***	0.311	0.262
child6	0.188	0.201
med skilled	0.595	0.561
high skilled	0.081	0.084
migrated*	0.267	0.226
non-monetary	0.800	0.816
monetary	0.534	0.511
social**	0.887	0.869
SPELL DATA[3]		
exit to employment**	0.109	0.130
exit to non-employment	0.098	0.094
d4-6***	0.117	0.111
d7-12***	0.210	0.208
d13-36***	0.546	0.565

Source: Own calculations based on selected data of the PASS survey. [1]Means are calculated over 93913 person months of unemployed UB II receipt within January 2005 and December 2007, comprising 3996 UB II spells, 3586 non-sanctioned and 410 sanctioned persons. Standard deviations are given in parantheses. Two-sided mean comparison tests (t-tests) give significance levels of *10%, **5%, ***1%. [2]Individual characteristics derived from panel data as reportet in the first wave of the PASS (conducted between December 2006 and July 2007): [3]Characteristics derived from spell data as reported for the period from January 2005 to December 2007: Current unemployment durations (measured in months) are represented by the dummies *d1-3, d4-6, d7-12*, and *d13-36*.

Table 2 provides summary statistics of the basic explanatory variables of our final sample,

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[22]The sanction rates, depicted in our study, are hardly comparable to others, especially to administrative ones. Firstly, they depend on the observation period: the longer considered unemployment episodes last, the longer unemployed are at risk to be sanctioned, and hence are more likely to be sanctioned within the observation period. Secondly, the official sanction quotas, reported by the FEA, are based on the share of *currently* sanctioned persons within a month. In contrast, we consider a person as sanctioned also *beyond* the sanction period. And finally, we consider all (employable) household members as sanctioned and not only the person who caused the sanction.

differentiated according to persons with or without a sanction enforcement and distinguished between individual data (PANEL) and spell properties (SPELL). The means of the individual characteristics are derived from panel data of the first PASS wave. The characteristics of the unemployment spells are derived from several spell datasets of the PASS study, as reported for the period from January 2005 to December 2007.

At first glance, the mean values of the selected variables in Table 2 for sanctioned and non-sanctioned unemployed reveal a fairly homogenous picture. In both groups, the proportion of *women* is negligibly higher than the proportion of men. The variable *east* indicates the fraction of unemployed who live in the Eastern part of Germany. From the continous variable *age* we derive three age-group dummies, whereby *age24-* contains all unemployed individuals with an age between 15 and 24 years. Correspondingly, *age50+* takes the value one if an unemployed in the sample has an age between 50 and 64 years.[23] Two-sided mean comparison tests of *east*, *age*, *age24+*, *age50+* and *couple* are highly significant. The share of the two age cohorts (*age24+* and *age50+*) in the non-sanctioned and sanctioned group reflects the legal regulations and the common practice of sanction enforcement. Case managers are obliged to sanction young adults below 25 years explicitely stronger, whereas persons above 50 years are treated less strictly. In contrast the younger UB II recipients, the major part of the elder UB II recipients haven't been sanctioned in the observation period.

Considering the variable *couple*, it becomes apparent that the larger proportion of sanctioned and non-sanctioned unemployed are either single, unmarried, or not living with their (unmarried) partner in the same household. Households with children aged six years or younger (*child6*) account for a quite similar part of around 20% in both groups. With respect to the (vocational) qualification level, we compose three skill groups. The level *high skilled* refers to unemployed holding a university degree and *med skilled* comprises individuals with a secondary or high school certification or any type of successfully accomplished apprenticeship.[24] Detailed information about the migrational status of each survey participant are also given by the PASS data. The

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[23]In total, our sample comprises persons in the employable age from 15 to 64 years. The age group of persons between or equal 25 and 49 years we take as the reference category in the subsequent estimation.

[24]The remaining fraction of unemployed who have not finished school successfully and have no vocational degree (non-skilled and semi-skilled) serves as a reference.

dummy variable *migrated* indicates individuals who are either migrated by themselves (first generation of immigrants) or who have at least one parent, who is migrated (second generation).

The first wave of the PASS survey, furthermore, provides some information about working motives. The dummies *non-monetary*, *monetary* and *social* report the announced importance of several working motivations. The answers are not mutually exclusive, say individuals may report that more than one (or none) of the three inquired working motives is important to her. The means of persons who reported that working is important for them in order to participate in society (*social*), differ significantly between non-sanctioned (88.7%) and sanctioned (86.9%) UB II recipients.

SPELL data provide a first impression about the probable effect of benefit sanctions on (re-) employment and leaving the labor market. Here we see a higher share (13.0%) of sanctioned unemployed exiting unemployment for employment compared to the the non-sanctioned group (10.9%). Concerning the duration of beeing unemployed while receiving UB II, the group with durations of more than a year is considerably the largest (54.6% for non-sanctioned, 56.5% for sanctioned).

4 Multivariate Duration Analysis

With this paper we examine the effects of sanctions on the transition rates of unemployed UB II recipients into employment or non-employment. In particular, we focus on the effect after the imposition of a benefit sanction (ex-post effect).[25] For our analysis we set up a model that accounts for individual's unemployment duration dependence. From the beginning of each unemployment spell, the individuals are at risk to switch to one of the two probable states in time T: become employed (e) or exit the labor market and enter non-employment (ne). If neither occurs, the individual remains unemployed and the respective spell is classified as censored ($c = 0$). Let t_e be the corresponding duration until exiting unemployment for a job, and let t_{ne} be the time until the unemployed leaves the labor market.

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[25] After a sanction is imposed, indeed a mixture of ex-ante and ex-post effects occurs. As people are not only backward-looking but also forward-looking, there are also ex-ante effects which are caused by the threat to be sanctioned repeatedly. Nevertheless, the effects after the imposition of a sanction are commonly regarded to as ex-post effects in the literature, see Lalive et al. (2005) and Arni et al. (2009).

For each unemployment spell we observe the point in time T_s of a sanction enforcement and the respective time t_s until the individual experiences its first sanction.[26] Even though our final sample is already restricted to unemployed UB II recipients, there are still numerous observed and unobserved components, causing a non-negligible correlation between the probability of a sanction and unemployment duration. In consequence, we cannot treat the effect of a sanction and, in particular, the time until a sanction is given t_s as exogenous.

In order to disentangle the effects of an unemployment benefit sanction from other observable or unobservable factors influencing the exit from unemployment, Abbring and van den Berg (2003a,b) have developed the "timing of events" approach, which enables the causal identification of dynamic treatment effects of sanctions imposed on the exit hazard of unemployed. The elaborate technique reveals the causal from the selection effect of an imposed benefit sanction on unemployment duration.

To analyze the duration t_o with $o \in \{e, ne\}$ until the point of transition in T_o, we employ a discrete mixed proportional hazard (MPH) framework. The exit rate to either destinations $o \in \{e, ne\}$, conditioned on the months elapsed until the sanction enforcement t_s is given by:

$$\theta_o(t_o|x, v_o, t_s) = \lambda_o(t_o)exp[x'\beta_o + \delta I(t_s < t_o) + v_o], \tag{1}$$

where $\lambda_o(t)$ represents the baseline hazard (duration t until exit to state o). x is a vector of observables, describing individual characteristics and controlling for local labor market conditions. The dummy variable $I(t_s < t)$ indicates whether a sanction has been enforced during the unemployment spell. Hence, $I(\cdot)$ takes the value one if the time interval until a sanction has been imposed t_s is shorter than the interval until exit t_o or shorter than the entire unemployment spell in case of a censored record. v is a random variable, controlling for the unobserved components presumably affecting the hazard rates.

The corresponding conditional density function of $\theta_o(t_o|x, v_o, t_s)$ is

$$f_o(t_o|x, v_o, t_s) = \theta_o(t_o|x, v_o, t_s) \exp(-\int_0^{t_o} \lambda_o(\tau|x, v_o, t_s)d\tau). \tag{2}$$

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[26]It's a common approach in the literature to evaluate the effect of the first sanction solely (van den Berg et al. (2004), Abbring et al. (2005), Lalive et al. (2005) and Svarer (2010).

As unemployment duration is measured in months, we specify a discrete MPH for both probable states $o \in \{e, ne\}$ and adopt the common flexible piecewise-constant step function for the baseline hazard

$$\lambda_o(t_o) = exp[\sum_k \lambda_{o,k} D_k(t_o)] \tag{3}$$

for $k = 1, ..., 4$ fixed time intervals. $D_k(t_o)$ denotes time-varying dummy variables equal unity in the corresponding interval and $\lambda_{o,k}$ the estimated parameters for the specific interval k. According to the distribution of the unemployment duration, we define the following intervals (in months): $[0 - 3]; (3 - 6]; (6 - 12]; (12 - 36]$. We set $\lambda_{o,1} = 0$ for the first time dummy ($k = 1$) to avoid collinearity in an estimation with a constant term.

Again, the probability of a sanction during a period of unemployment among UB II recipients is likely to be endogeneous. Unemployed who do not complain with the entitlement requirements or do not behave according to compliance commitments are at risk to experience a sanction. Here we can expect that this type of behavior in turn affects unemployment duration of the individuals, entailing a correlation between the unobserved components of the two processes. Hence, both hazards of being sanctioned and exiting unemployment to one of the two states e, ne must be estimated jointly.

Similar to the unemployment exit hazard, also the hazard rate of being sanctioned $\theta_s(t|x, v)$ is assumed to follow a MPH specification

$$\theta_s(t_s|x, v_s) = \lambda_s(t_s) exp[x'\beta_s + v_s], \tag{4}$$

with $\lambda_s(t_s)$ as duration dependence. For a parsiminous but flexible estimation, we specify $\lambda_s(t_s)$ as a quadratic function of log-time. The respective conditional density of $t_s|x, v_s$ is

$$f_s(t_s|x, v_s) = \lambda_s(t_s|x, v_s) \exp(- \int_0^{t_s} \lambda_s(\tau|x, v_s)d\tau). \tag{5}$$

Based on the modeling framework so far, the joint distribution of the processes $t_o|t_s, x, v_o$ and $t_s|x, v_s$ can be fully described by the proposed mixed proportional hazard specification. Thus, the hazard of the latent failure (either unemployment exit or the hazard beeing sanctioned) depends

on the duration t_o, t_s until this event occurs in T_o, T_s, on the observable characteristics comprised by x, and the unobservable components in v_o, v_s capturing the unobserved heterogeneity. The MPH model allows for the simultaneous modeling of the two failures T_o, T_s. To ensure that the MPH framework is applied appropriately, we verify that the following assumptions have been met. Controlling for x and v, we ensure that the shape of the hazard of an unemployment exit θ_o is not influenced by the hazard of a sanction unless a sanction occurs in T_s implying $\theta_o | t_s, x, v_o$ for $t_o > t_s$.

Unemployed in Germany are warned about the possibility of sanctions in case of non-compliant behaviour, immediately after they have entered unemployment. These instructions about legal consequences are constantly repeated with every official letter that includes any request or invitation to the benefit recipient. Such permanent warnings, as well as explicitely warnings of case managers who assess non-compliant behaviour, can already cause so-called ex-ante effects.[27]

But our study focusses on the ex-post effects of sanctions. Nevertheless, we might expect a moderate change in behavior, immediately before a sanction is imposed, as the unemployed could expect that a sanction is going to be applied if she or he does not behave according to the compliance commitments. However, whether sanctions indeed are enforced, depends primarily on the case managers and how strict they follow the sanction regulations and whether they are willing to accept possible reasons that could justify the seemingly non-compliant behaviour. Furthermore, Boockmann et al. (2009) find that the probability to be sanctioned varies considerably across welfare agencies, according to their sanction policies which depend on the region, the entire economic situation that makes it either more or less difficult to find a job, regardless of the search intensity and the willingness to accept worse job conditions, and probably on the attitudes of the chief officers. Altogether, it is very difficult for unemployed to assess whether they will be sanctioned, and additionally, they do not know the exact point in time T_s at which a possible sanction will be imposed. Following the argumentation of Abbring and van den Berg (2003a,b), hence, we assume that the so-called no-anticipation assumption is satisfied. This assumption is important for our analysis in order to guarantee that individuals do not change their behavior

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[27]The effects of (explicitely) warnings are commonly referred to as ex-ante effects in the literature, see Lalive et al. (2005) and Arni et al. (2009). As outlined in Section 1, there are a handful of empirical studies which indeed provide significant evidence of ex-ante effects of explicitely warnings.

before the treatment occurs.

Moreover, it is assumed that the unobserved heterogeneity is independent from the time-varying covariates in x. The independency and no-anticipation assumption ensures that causal effects of a specific treatment on the hazard of exiting unemployment is identified by a MPH framework, hence conditional on the observed explanatory variables in x and the unobserved heterogeneity v_o and v_s. Thereby, selectivity is captured by the correlation between those two unobserved heterogeneity components v_o and v_s. Since we use discrete data, we identify the causal effect using a non-parametric setting, additionally assuming that the results are rather insensitive to a particular parametric model set-up.

The overall likelihood function $\mathcal{L}$ is then:

$$\mathcal{L} = \int_v \theta_s^{c_s}(t_s|\cdot) S_s(t_s|\cdot) \Theta^{c_o}(t_o|\cdot) S_o(t_o\cdot) dG(v), \tag{6}$$

where $\Theta(t_o)S(t_o) = \prod_o \theta_o^{c_o}(t_o|x, v_o, t_s) S_o(t_o|x, v_o, t_s)$ for $o \in \{e, ne\}$ and $G(v)$ as the joint distribution of both heterogeneous unobserved components v_o, v_s. c indicates whether an unemployment spell is censored with $c = 0$, namely no exit out of unemployment occurs, or not ($c = 1$).

5 Results

To assess to what extent sanctions affect the hazard of reemployment or an exit from labor force, we focus on two main specifications, one for the exit to employment θ_e and the other for the exit to non-employment θ_{ne}. We treat the imposition of sanctions as endogenous and control for the potential bias due to the endogeneity of the sanction treatment. Hence, all models are specified as discrete MPH models, where the hazards for both exit to employment (or non-employment) and sanction enforcement are estimated simultanously.

For our baseline models (Specification I) in Subsection 5.1, we assume the effect of a sanction as constant across the sample population. Thus, the impact of a sanction enters the unemployment hazard equation as a simple time-varying dummy variable δ, being 1 in t if a sanction already

has been imposed, zero otherwise. Besides δ, all models include a basic set of explanatory variables reflecting individual characteristics or habits as well as the unemployment rate (uq) for each federal state of Germany. The latter one is supposed to reflect arbitrarily the general labor market conditions. For the sensitivity analysis in Subsection 5.2, we allow the effect of a sanction to vary across the sample population. Hence, the expanded models (Specification II) let δ interact with selected explanatory variables used before, and outlined in Table 2 of Section 3.

Finally, Submodels (a) and (b) differ with respect to the specification of the baseline hazard. Submodels (a) assume a constant log combined with a log-quadratic impact of unemploymet duration, namely the month already spent in UB II receipt without beeing employed, on the unemployment exit hazard (θ_e, θ_{ne}). In contrast, Submodels (b) impose a piecewise-constant duration dependence as a more flexible approach in explaining how different unemployment periods might affect the exit to employment or non-employment.

5.1 Baseline Models

The results in Table 3 provide significant evidence of a positive impact (δ) of sanctions on (re-) employment for specifications (a) and (b) for both exit hazards. We find that sanctions enhance the transition to employment by 70% for the log-quadratic baseline hazard (a), and by 68% for the flexible piecewise-constant duration dependence (b). These results and the extent of the transition rates are in line with Müller and Steiner (2008), who estimated a timing of events model for West and East Germany separately, but found for both parts a signfcantly positive effect of benefit sanctions on the transition from unemployment to regular employment. The results of the studies by Lalive et al. (2005), Arni et al. (2009), Abbring et al. (2005), Svarer (2010) and van den Berg et al. (2004) also confirm the positive effect of benefit sanctions on the unemployment-employment transition.

At first sight, these results might support the application of sanctions, as they entail an enhanced (re-)employment probabaility of sanctioned individuals. But we obtain also a significantly positive impact of sanctions for the hazard out of labor force. According to the results of Table 3, we find that sanctions increase the transition factor to non-employment by 60% for

19

	Employment θ_e				Non-Employment θ_{ne}			
	Model Ia		Model Ib		Model Ia		Model Ib	
Variable	coef	z-stat	coef	z-stat	coef	z-stat	coef	z-stat
δ	0.528	2.45	0.520	3.75	0.469	2.04	0.583	3.44
lnt	0.285	1.69			0.972	4.01		
lnt^2	-0.121	-2.81			-0.237	-3.91		
d4-6			3.755	25.96			4.122	20.76
d7-12			2.692	19.74			3.438	19.75
d13-36			1.396	12.25			1.978	12.54
women	-0.591	-5.43	-0.454	-5.59	0.164	1.56	0.196	2.04
med skilled	0.613	4.65	0.394	3.65	0.341	2.66	0.050	0.45
high skilled	0.794	4.31	0.471	3.04	0.186	0.85	-0.175	-0.87
age24-	-0.540	-2.93	-0.698	-4.33	1.462	6.73	0.988	7.75
age50+	-1.168	-7.47	-0.751	-6.44	-0.031	-0.25	0.318	2.71
couple	-0.039	-0.36	-0.139	-1.48	0.840	6.08	0.603	5.88
child6	-0.338	-2.60	-0.186	-1.71	-0.262	-1.97	-0.093	-0.76
migrated	-0.083	-0.72	-0.024	-0.23	-0.220	-1.72	-0.158	-1.38
uq	-0.193	-6.69	-0.096	-5.06	-0.147	-5.00	-0.073	-3.23
non-monetary	0.366	2.70	0.280	2.39	-0.213	-1.65	-0.232	-1.98
monetary	-0.122	-1.31	-0.055	-0.67	-0.094	-0.91	-0.037	-0.40
social	0.021	0.14	0.089	0.68	0.257	1.51	0.272	1.76
regional dummies	yes		yes		yes		yes	

the log-quadratic specification (a) and by 79% for the piecewise-constant specification (b) of the baseline hazard. Apparently, there are two groups of unemployed who respond to sanctions differently. One group seems to find a job more quickly, perhaps by increasing the search efforts or by accepting worse working conditions, while the other group raises respond with a higher probability for an exit to non-employment.

Models Ia in Table 3 reveal a non-linear relation between the length of the unemployment spell and the hazard for an exit to employment θ_e, and to non-employment θ_{ne} respectively, as the log-quadratic term of unemployment duration enters with a negative sign for both hazards. Putting it differently, after a certain spell length, the probability of finding a job and of leaving

Table 3 (continued): Baseline Models, Sanction Equations (θ_s)

	Employment e				Non-Employment ne			
	Model Ia		Model Ib		Model Ia		Model Ib	
Variable	coef	z-stat	coef	z-stat	coef	z-stat	coef	z-stat
lnt	-0.351	-1.58	-0.350	-1.57	-0.350	-1.58	-0.334	-1.49
lnt^2	0.063	1.10	0.062	1.07	0.062	1.07	0.063	1.08
woman	-0.195	-1.63	-0.190	-1.60	-0.190	-1.59	-0.195	-1.64
med skilled	0.165	1.17	0.170	1.21	0.171	1.21	0.175	1.24
high skilled	0.051	0.20	0.076	0.31	0.077	0.31	0.090	0.36
age24-	0.253	1.37	0.271	1.48	0.272	1.48	0.278	1.52
age50+	-0.493	-3.16	-0.493	-3.18	-0.493	-3.18	-0.502	-3.24
couple	-0.009	-0.07	-0.014	-0.10	-0.013	-0.09	-0.008	-0.06
child6	-0.088	-0.59	-0.083	-0.55	-0.083	-0.55	-0.079	-0.53
migrated	-0.246	-1.65	-0.252	-1.69	-0.252	-1.69	-0.262	-1.77
uq	-0.076	-2.22	-0.076	-2.22	-0.076	-2.22	-0.071	-2.22
Log-Lik	-5551		-5221		-4828		-4519	
cases	3239		3239		3239		3239	
N	150204		150204		150204		150204	

the labor market declines the longer UB II recipients remain unemployed.

Imposing the unemployment duration dependence as a flexible piecewise constant baseline function (Models Ib) in terms of four intervals ($[0 - 4); [4 - 7); [7 - 13); [13 - 37)$, in months) brings up positive and significant estimates for all three intervals (given $[0-4)$-interval as reference group). This holds for both the employment hazard θ_e as well as the non-employment hazard θ_{ne}. Even though the estimated coefficients decline in their impact as unemployment duration elapses, they still remain positive. In principal, the impact of longer unemployment spells on employment and non-employment hazards is expected to turn negative compared to the first time interval in benefit receipt ($[0 - 4)$ months). Again, here we should emphasize that our sample is restricted to unemployed who are in UB II receipt. As mentioned in Section 1, also the German study by Boockmann et al. (2009) built their analysis on UB II recipients.[28] All other studies for Germany, however, refer to sanctions within the former unemployment insurance (UI) (which is called UB I since 2005). Whereas UI recipients must had been employed for a minimum

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[28]Instead of a multivariate mixed proportional hazard model, Boockmann et al. (2009) examined the impact of sanctions on unemployment exit rates by applying an instrumental variable estimation.

period in order to become eligible for UI, UB II recipients are a far more heterogenous group. As described in Section 2 long-term unemployed, persons who never had been employed before or and low income earners belong to the group of UB II recipients. Hence, on average they have lower chances on the labor market than recipients of UI. Thus, the difference between long-term UB II recipients and the reference group with up to three months of UB II receipt is smaller than a similar comparison within the group of unemployed UI recipients.[29]

A quick glance through Models Ia and Ib for the unemployment-to-employment hazard θ_e in Table 3 reveals the typical impacts on the length of the unemployment spell. Apart from the specific influence of the explanatory variables, there are almost all statistically significant with negligible variations in the size of the coefficients between models (a) and models (b). Except for the variables *migrated* and *couple*, and for two of the three variables of working motivation (*monetary* and *social*) all estimated coefficients enter significantly different from zero. Female, younger and elder UB II receipients, as well as households with children below six years exhibit negative transition rates to employment. The transition rate enhancing effects of high- and medium-skilled unemployed and unemployed, who reported that they would be motivated to work also if they did not require the money ("*non-monetary* working motivation"), support the common expectations, namely a positive impact on exit to employment. In fact, the significance of the explanatory variables is to a great extent robust against the different specifications with respect to duration dependence.

Considering Models Ia and Ib for the exit hazard to non-employment θ_{ne}, the estimated coefficients form a slightly different picture. Compared to the unemployment-to-employment hazard θ_e, the impact of living with a partner in the same household (*couple*) as well as the impact of being young (*age24-*) and *age50+* for Model Ib turns out to be positive significant on the hazard to non-employment. In other words, younger and elder (for Model Ib) unemployed UB II receipients are more likely to exit the labor market compared to the reference group of medium-aged unemployed. With respect to duration dependence, we find the similar inversed u-shaped impact on both exit options. The significantly negative estimate for the log-quadratic

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[29]To provide an example, UI recipients who are 0-3 months unemployed, spent indeed only up to 3 months in unemployment. In contrast, UB II receipt of 0-3 months may imply an unemployment duration of more than 12 months, for example if the persond received UI (till 2004) respectively UB I (since 2005) before.

time implies an increasing probability to remain unemployed after the individual exceeds a certain point in time. Also the estimates in Table 3 (continued) confirm a non-linear but insignificant impact of duration dependence on the sanction hazard θ_s.

Moreover, we can state that persons above 50 years (*age50+*) as well as *migrated* persons are less likely to be sanctioned, whereas the effect for younger (*age24-*), *medium* and *high skilled* unemployed as well as for *couples* and households with children younger than six (*child6*) years turns out to be insignificant. Finally, unemployed UB II recipients in regions with lower unemployment rates (*uq*) face a higher probability of being sanctioned than those in regions with high unemployment rates. This supports the common practice that job centers in regions with lower unemployment apply sanctions in a stricter manner.

5.2 Sensitivity Analysis

We expand the baseline models with selected interaction terms in order to analyze whether sanction effects vary across different subgroups of the sample population. First, we let the dummy for being sanctioned δ interact with either age groups (*24-* and *50+*), and additionally with two qualification levels (*medium* and *high skilled*). The results are presented in Table 4 for the employment hazard θ_e and in Table 5 for the exit hazard out of labor force θ_{ne}.

As shown in Table 4, we find strong evidence for a positive sanction effect. Considering interaction terms for the subgroups of elder and younger unemployed, we find the transition rate to be positively influenced by sanction for both age cohorts. Apparently, some sort of modified behavior, probably in terms of an intensified job search and an increased willingness to accept jobs below the attained skill level or with worse working conditions, leads to higher transition rates from unemployment to employment. In contrast, all elder and younger unemployed, regardless of being sanctioned or not, exhibit negative and highly significant transition rates for both θ_e and θ_{ne}.

Accounting for interaction with qualificational levels, the picture slightly changes as significance and impact for both age cohorts declines and becomes even insignificant for sanctioned high skilled unemployed. For elder unemployed UB II recipients, the transition rate to employment remains positively affected by sanction enforcements. Though, we find no consistent positive

23

Table 4: Exit to Employment θ_e

| | 2 Interaction Terms | | | | 4 Interaction Terms | | | |
| | Model IIa | | Model IIb | | Model IIa | | Model IIb | |
Variable	coef	z-stat	coef	z-stat	coef	z-stat	coef	z-stat
δ								
δ*med					0.396	1.97	0.296	1.63
δ*high					-0.105	-0.20	0.285	0.60
δ*age24-	0.834	1.79	1.097	2.51	0.733	1.56	1.010	2.29
δ*age50+	1.114	2.91	0.957	2.72	0.852	2.04	0.716	1.89
lnt	0.284	1.69			0.280	1.67		
lnt^2	-0.123	-2.87			-0.123	-2.88		
d4-6			3.747	25.91			3.754	25.93
d7-12			2.696	19.76			2.696	19.74
d13-36			1.396	12.25			1.394	12.23
women	-0.586	-5.56	-0.468	-5.77	-0.578	-5.49	-0.458	-5.63
med skilled	0.608	4.77	0.412	3.82	0.576	4.51	0.385	3.52
high skilled	0.794	4.45	0.486	3.14	0.798	4.40	0.465	2.93
age24-	-0.596	-3.16	-0.789	-4.65	-0.586	-3.12	-0.782	-4.60
age50+	-1.229	-7.94	-0.826	-6.82	-1.207	-7.80	-0.807	-6.62
couple	-0.041	-0.39	-0.144	-1.54	-0.037	-0.36	-0.140	-1.48
child6	-0.329	-2.59	-0.190	-1.74	-0.324	-2.55	-0.187	-1.72
migrated	-0.084	-0.75	-0.023	-0.23	-0.081	-0.72	-0.026	-0.25
uq	-0.193	-6.82	-0.100	-5.29	-0.191	-6.76	-0.098	-5.17
non-monetary	0.365	2.74	0.293	2.50	0.356	2.68	0.285	2.42
monetary	-0.118	-1.30	-0.055	-0.67	-0.120	-1.31	-0.053	-0.65
social	-0.001	0.00	0.070	0.53	0.005	0.03	0.079	0.60
regional dummies	yes		yes		yes		yes	

significance for the younger unemployed.

As opposed to Model IIb with the piecewise-constant duration dependence, Model IIa with the log-quadratic baseline hazard comes up with an insignificant estimate. To sum up, sanction effects do vary across different age cohorts of the sample population. The results shown in Table 4, in parts coincide with the findings of the baseline models shown in Table 3. Especially, the estimates of the control variables in Table 4 resemble the results of the baseline model.

Focusing sanctioned unemployed UB II recipients with regard to their qualificational level,

| | 2 Interaction Terms | | | | 4 Interaction Terms | | | |
| | Model IIa | | Model IIb | | Model IIa | | Model IIb | |
Variable	coef	z-stat	coef	z-stat	coef	z-stat	coef	z-stat
lnt	-0.350	-1.57	-0.350	-1.57	-0.350	-1.57	-0.350	-1.57
lnt^2	0.062	1.07	0.062	1.07	0.062	1.07	0.062	1.07
woman	-0.190	-1.60	-0.190	-1.60	-0.190	-1.60	-0.190	-1.60
med skilled	0.170	1.21	0.170	1.21	0.170	1.21	0.170	1.21
high skilled	0.076	0.31	0.076	0.31	0.076	0.31	0.076	0.31
age24-	0.271	1.48	0.271	1.48	0.271	1.48	0.271	1.48
age50+	-0.493	-3.18	-0.493	-3.18	-0.493	-3.18	-0.493	-3.18
couple	-0.014	-0.10	-0.014	-0.10	-0.014	-0.10	-0.014	-0.10
child6	-0.083	-0.55	-0.083	-0.55	-0.083	-0.55	-0.083	-0.55
migrated	-0.252	-1.69	-0.252	-1.69	-0.252	-1.69	-0.252	-1.69
uq	-0.076	-2.22	-0.076	-2.22	-0.076	-2.22	-0.076	-2.22
regional dummies	yes		yes		yes		yes	
Log-Lik	-5553		-5222		-5551		-5221	
cases	3239		3239		3239		3239	
N	150204		150204		150204		150204	

the model do not provide any significant impact of sanctions on high skilled unemployed. For medium qualified persons Model IIa with the log-quadratic specification (a) indicates a significantly positive effect of sanctions on the transition to employment of medium skilled persons.

Concerning the hazard to non-employment in Table 5, the results for medium skilled sanctioned are more robust against different baseline hazards. Here both specifications of duration dependence result in a significant positive effect. In fact, the estimates in Table 4 and 5 suggest that sanctions applied to high skilled unemployed appear as ineffective, implying no change in behavior towards higher transition rates.

Summarized, sanction effects do not only vary across different age cohorts but also across different qualification levels. The results of a positive impact of sanctions on entering employment the baseline models as presented in Table 3, are only partially verified by the extented models controlling for interaction effects.

Table 5: Exit to Non-Employment θ_{ne}

	2 Interaction Terms				4 Interaction Terms			
	Model IIa		Model IIb		Model IIa		Model IIb	
Variable	coef	z-stat	coef	z-stat	coef	z-stat	coef	z-stat
δ								
δ*med					0.498	1.90	0.526	2.20
δ*high					-1.161	-1.09	-0.175	-0.17
δ*age24-	0.445	1.23	0.766	2.39	0.349	0.97	0.654	2.01
δ*age50+	1.171	3.37	1.037	3.39	0.905	2.24	0.687	1.93
lnt	0.974	4.02			0.968	4.00		
lnt^2	-0.237	-3.92			-0.238	-3.97		
d4-6			4.119	20.72			4.126	20.73
d7-12			3.442	19.77			3.442	19.75
d13-36			1.975	12.52			1.973	12.49
women	0.162	1.52	0.188	1.95	0.168	1.60	0.201	2.08
med skilled	0.346	2.69	0.055	0.49	0.306	2.39	0.009	0.08
high skilled	0.195	0.89	-0.169	-0.84	0.252	1.15	-0.174	-0.85
age24-	1.442	6.76	0.922	7.04	1.439	7.01	0.931	7.09
age50+	-0.113	-0.87	0.237	1.97	-0.093	-0.72	0.266	2.18
couple	0.847	6.15	0.604	5.89	0.845	6.32	0.608	5.91
child6	-0.267	-1.99	-0.099	-0.81	-0.262	-1.97	-0.090	-0.73
migrated	-0.227	-1.77	-0.150	-1.30	-0.220	-1.73	-0.148	-1.28
uq	-0.150	-5.08	-0.076	-3.39	-0.147	-5.06	-0.074	-3.30
non-monetary	-0.217	-1.68	-0.219	-1.86	-0.226	-1.76	-0.229	-1.95
monetary	-0.090	-0.87	-0.036	-0.38	-0.093	-0.91	-0.034	-0.36
social	0.253	1.48	0.265	1.70	0.254	1.50	0.277	1.78
regional dummies	yes		yes		yes		yes	

26

Table 5 (continued): Sanction equation θ_s

| | 2 Interaction Terms | | | | 4 Interaction Terms | | | |
| | Model IIa | | Model IIb | | Model IIa | | Model IIb | |
Variable	coef	z-stat	coef	z-stat	coef	z-stat	coef	z-stat
lnt	-0.350	-1.57	-0.350	-1.57	-0.350	-1.57	-0.350	-1.57
lnt^2	0.062	1.07	0.062	1.07	0.062	1.07	0.062	1.07
woman	-0.190	-1.60	-0.190	-1.60	-0.190	-1.60	-0.190	-1.60
med skilled	0.170	1.21	0.170	1.21	0.170	1.21	0.170	1.21
high skilled	0.076	0.31	0.076	0.31	0.076	0.31	0.076	0.31
age24-	0.271	1.48	0.271	1.48	0.271	1.48	0.271	1.48
age50+	-0.493	-3.18	-0.493	-3.18	-0.493	-3.18	-0.493	-3.18
couple	-0.014	-0.10	-0.014	-0.10	-0.014	-0.10	-0.014	-0.10
child6	-0.083	-0.55	-0.083	-0.55	-0.083	-0.55	-0.083	-0.55
migrated	-0.252	-1.69	-0.252	-1.69	-0.252	-1.69	-0.252	-1.69
uq	-0.076	-2.22	-0.076	-2.22	-0.076	-2.22	-0.076	-2.22
regional dummies	yes		yes		yes		yes	
Log-Lik	-4825		-4516		-4822		-4514	
cases	3239		3239		3239		3239	
N	150204		150204		150204		150204	

6 Conclusion

This paper analyzes the impact of benefit sanctions against unemployed UB II recipients (or against their household members) on their transition to employment and non-employment. Based on a mixed proportional hazard model, which treats sanctions as endogenous, we properly identify a twofold behavior: Sanctioned unemployed are more likely either to enter employment or to leave the labor force at least temporarily. The effect of an increased transition rate to employment is supposed to arise from enhanced job search or from accepting jobs they are overqualified for and is usually accompanied by lower wages and worse working conditions. So far, these results go in line with economic theory and the empirical literature on ex-post effects of benefit sanctions, summarized in Section 1.

We find evidence in our study that an intensified search effort for alternatives to UB II receipt substantially contributes to the increased exit from labor force.[30] At first glance, our findings coincide with political intention to reduce the individual's periods and amounts of benefit receipt in order to lower both unemployment and fiscal costs. However, the causal mechanism behind these results likely generates some effects that should have been considered for a more comprehensive economic evaluation of benefit sanctions. According to job search theory, the positive effect of benefit sanctions on unemployed's exit to work is quite probably due to the increased willingness of sanctioned to make concessions on job conditions. In other words, the increased transition rate to employment might be bought at the expense of job quality in terms of wages, qualification level and job stability. Therefore, future research should aim to analyze those side effects to obtain a full picture of the impact of benefit sanctions on the transition to employment and non-employment.

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[30]As mentioned in the introduction, alternatives to employment or receiving unemployment benefits (which we define as "non-employment") are e.g. living on income of relatives or friends, on assets, on other benefits like student's assistance and pensions.

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