Benefit Duration and Job Search Effort: Evidence from a Natural Experiment*

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Abstract

Findings of prolonged unemployment spells due to more generous unemployment insurance (UI) schemes are commonly interpreted as an indication of reduced job search effort and UI-induced moral hazard. This paper exploits quasi-experimental variation in the potential benefit duration for older workers in Germany paired with individual-level data on job search behavior to provide direct evidence of this relationship. The results of the study provide substantial support for the existence of UI-induced moral hazard, increases in the potential benefit duration leading to a significant decrease in job search effort, while reservation wages remain unaffected by the change in the PBD. When testing for heterogeneous treatment effects, responses are particularly pronounced for low- and medium-skilled workers whereas the treatment effect for the high-skilled is small and insignificant.

JEL Classification: D83, I38, J64, J68
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1 Introduction

A central challenge of unemployment insurance (UI) systems is to allow unemployed individuals to actively search for suitable reemployment opportunities by partly compensating for income losses while repressing incentives to lower search intensity. Disincentive effects of unemployment insurance systems, triggered by both the level of benefits as well as the potential benefit duration (PBD), have been, however, well identified by empirical research. In a nutshell, extensions of the PBD have been shown to significantly extend individuals' unemployment duration, irrespective of personal characteristics or institutional regulations of the labor market (see, for example, Katz and Meyer, 1990; Card and Levine, 2000; Lalive et al., 2006; Van Ours and Vodopivec, 2006; Schmieder et al., 2012)[1], whereas evidence of beneficial effects of the PBD on post-unemployment outcomes is scarce (see, among others, Böheim and Taylor, 2002; Card et al., 2007; Van Ours and Vodopivec, 2008).

While standard job search theory shows that increases in the duration of unemployment spells due to the extension of the PBD can be attributed to lower search effort and/or higher reservation wages, empirical evidence of the direct effect of the PBD on job search behavior is scarce. Findings of prolonged unemployment spells (and unaffected post-unemployment outcomes) are rather commonly interpreted as suggestive evidence in favor of reduced search effort and the presence of moral hazard.[2] Two recent studies by Baker and Fradkin (2015) and Marinescu (2015) aim to fill this gap by relating state-level variation in the PBD in the US to changes in state-level internet job search intensity, providing evidence of less job search in response to increases in the PBD during the time of the recent recession.

This paper adds to the existing evidence by using quasi-experimental variation in the PBD for one specific age group of the unemployed paired with detailed direct information about individuals' search effort choices to provide causal evidence of the effect of benefit duration on job search behavior. Variation in the PBD comes

[1] Note that Card et al. (2007) show that reemployment hazards increase significantly less than unemployment exit rates at the time of benefit expiration. Given that unemployment registration after benefit exhaustion is not mandatory in many countries, the authors argue that spikes in unemployment exit rates may overstate the degree of UI-induced moral hazard.

[2] Chetty (2008) shows that not the entire increase in unemployment duration due to more generous UI can be attributed to moral hazard, highlighting the role of liquidity effects instead.

from the outcome of an exceptional two-month political process in Germany in late 2007. On December 11 2007, the then acting coalition of the Christian and Social Democrats issued a law that ruled the extension of the PBD for old-aged workers, while benefits for younger workers remained unaffected. The reform had been preceded by a short but remarkable episode of political disputes among and across the ruling parties after the acting party leader of the Social Democrats, motivated by concerns of social injustice, had called for an extension of unemployment benefits for old-aged workers in early October 2007. After weeks of heavy disputes, the coalition reached a general agreement about the reform in a nightly meeting on November 12 2007 and issued the law to parliament few weeks later. It was passed by the parliament on January 26 2008 and was retroactive to January 1 2008.

Using data from the IZA Evaluation Dataset Survey, which covers a large sample of individuals registering as unemployed at the Federal Employment Agency between June 2007 and May 2008, the present paper exploits this policy reform for one specific age group of workers to investigate the effects of the PBD on job search behavior by applying simple difference-in-differences techniques. The short-term nature of the political process and the reform's detachedness from labor market conditions limit the scope of adaptive behavior and eliminate endogenous policy bias to allow comparison of job search behavior prior to and after the reform.

The results of this study offer substantial evidence that longer PBD causes job search effort to significantly decrease. Individuals subject to longer PBD show substantially lower job search effort at the beginning of the unemployment spell compared to their untreated counterparts, filing less job applications and being less likely to apply for jobs in distant areas. The effects are robust to the inclusion of a variety of personal and regional control variables and of significant magnitude; the increase in the PBD by three months causes job applications to decrease by around 40% of a standard deviation, on average. Treatment effects are similar for females and males but substantially differ by skill. Whereas treated low- and medium-skilled individuals show significantly less job search effort in response to the reform, there is no treatment effect for the high-skilled. In contrast, the increase in the PBD has no effect on reservation wages, which is in line with evidence demonstrating limited

responsiveness of the reservation wage with respect to changes in UI parameters (see, among others, DellaVigna and Paserman, 2005; Card et al., 2007; Krueger and Mueller, 2015; Schmieder et al., 2015).

Overall, the results of this study provide evidence of UI-induced moral hazard and strategic search behavior. Unemployed individuals respond to more generous UI by significantly reducing job search effort. The findings relate to early work by Barron and Mellow (1979), who report a negative relationship between UI payments and the time devoted to job search. Moreover, the results correspond to less direct evidence of moral hazard by Arni and Schiprowski (2015), who show that externally imposed changes in search effort affect job seekers' outcomes, and Black et al. (2003), who show that individuals leave unemployment upon receiving notice of participation in reemployment services, i.e., in case costs of unemployment increase.

The rest of the paper is structured as follows. Section 2 provides the theoretical foundation of this study by highlighting expected changes in job search behavior in response to an extension of the PBD. Section 3 offers a short overview about the key institutional characteristics of the German labor market and highlights the key features of the reform of interest. Information on the dataset are presented in Section 4, Section 5 provides the empirical model and details the underlying identification strategy. The results of this analysis are presented in Section 6, while Section 7 concludes.

2 Job search theory

The discrete-time model presented in Schmieder et al. (2015) provides valuable insights about job seekers' expected changes in search behavior and reservation wages in response to an increase in the potential benefit duration. In the model, risk-neutral workers are assumed to become unemployed in period $t = 0$ and to maximize the present discounted value of income. Workers receive benefits (b_t) and choose search effort (λ_t) in each period, the latter variable being normalized to match the individual's job arrival rate. UI benefits (b) are limited to P periods and replaced by an indefinite second tier payment $\underline{b}$, with $b > \underline{b}$, for all periods $t > P$, generating

non-stationarity in spirit of van den Berg (1990). Once re-employed, workers are, however, assumed to indefinitely stay with their new job.[3] The value of being employed (V^e) thus satisfies: $V^e(w^*) = \frac{1}{p}w^*$; with ρ indicating the common subjective discount rate and w^* the wage offer drawn from distribution $F(w^*, \mu_t)$.

Given that $V^e(w^*)$ increases with w^*, the optimal strategy of a job seeker comprises choosing a reservation wage (ϕ_t) in each period such that all wage offers exceeding it are accepted:

$$V^u(t) = b_t + \max_{\lambda_t}\big[-\psi(\lambda_t) + (1-\lambda_t)\frac{1}{1+\rho}V^u(t) + \frac{\lambda_t}{1+\rho}\int_{\phi_t}^{\infty} V^e(w^*) - V^u(t+1)\; dF_t(w^*)\big].$$

In non-stationarity ($t < T$), it holds true that $\phi_t = \rho V^u(t+1)$. Exploiting this fact, the job seekers optimal strategy can be re-written as:

$$(1+\rho)\phi_{t-1} = (1+\rho)(b_t - \psi(\lambda_t)) + \phi_t + \lambda_t \int_{\phi_t}^{\infty} w^* - \phi_t \; dF_t(w^*),$$

and optimal search effort in $t-1$ can be deduced by lagging ϕ_{t-1} by one period and differentiating it with respect to $\lambda_t - 1$:

$$\rho(1+\rho)\psi'(\lambda_{t-1}) - \int_{\phi_{t-1}}^{\infty} w^* - \phi_{t-1}\; dF_t(w^*) = 0$$

Based on the latter two relations, a change in the PBD affects the reservation wage and search effort as follows:

$$\frac{d\phi_t}{dP} = \frac{dV^u(t+1)}{dP}\rho, \quad \text{given that} \quad \phi_t = \rho V^u(t+1) \tag{1}$$

and using

$$\frac{d\phi_{t-1}}{d\lambda_t} = (1+\rho)\rho\psi'(\lambda_t) - \int_{\phi_t}^{\infty} w^* - \rho V^u_{t+1}\; dF_t(w^*) = 0$$

$$\frac{d\lambda_t}{dP} = -\frac{dV^u(t+1)}{dP}\frac{(1-F(\phi_t))}{(1+\rho)\psi''(\lambda_t)}. \tag{2}$$

[3] Van den Berg (1990) acknowledges potential criticism regarding this assumption as rejecting a job offer may be suboptimal to accepting and quitting immediately after, given that the latter case may result in a new spell of unemployment and thus extended PBD. However, given legal boundaries prohibiting or punishing such behavior in reality, he argues for the validity of the assumption.

If there is a chance to remain unemployed after exhaustion of the PBD at $t = P$, increasing the PBD will increase the value of remaining unemployed for each period $t < P$, such that $\frac{dV^u(t+1)}{dP} > 0$. In this case, it follows from equations (1) and (2) that:

$$\frac{d\phi_t}{dP} > 0 \quad \text{and} \quad \frac{d\lambda_t}{dP} < 0.$$

In response to an extension of the PBD, the model shows reservation wages to increase and job search effort to decrease.

3 The institutional background

The German UI system covers all employees subject to social security contributions. Workers are entitled to receive unemployment benefits (*Arbeitslosengeld I*) in case they have contributed to UI for at least twelve months within the last two years preceding their job loss. The duration of benefits is subject to the number of months employed within a given time frame and increases with age. Monthly benefits amount to 60% (67% for recipients with children) of the last net wage, which is capped at the upper ceiling of the social security contributions. Payments are generally banned for up to twelve weeks in case workers terminate their job themselves, which lowers the maximum benefit duration accordingly. Each recipient of unemployment benefits is further obliged to actively search for a job and to be at the Employment Service's disposal, while failure to comply with these requirements may result in benefit cuts.[4] Individuals which are not entitled for or exhaust unemployment benefits may receive a basic income (*Arbeitslosengeld II*), which is open-ended and designed to assure living at subsistence level.

Dismissal of regular workers is subject to a variety of legal regulations. Advanced notice of layoff is required by law, with the period of notice increasing with workers' tenure (§622, German Civil Code). Additional rules apply for plants that employ at least ten workers[5] (*Kündigungsschutzgesetz*), essentially limiting reasons

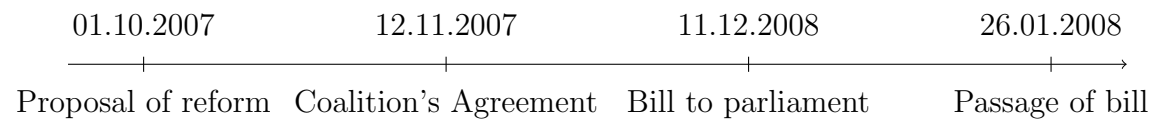
[4] Note that there is no general minimum number of applications required by law.

[5] More precisely, the law applies to all firms that employ ten full-time equivalent workers. Individuals working less than 20 (30) hours per week enter the calculation as 0.5 (0.75) full-time equivalents. Trainees and the managing director are not accounted for.

for terminations to be production-, conduct- or personal-related. Rates of job destruction and creation mirror these legislative features of the German labor market: job and worker flow rates are around 50% lower than in the US (Bachmann et al., 2013).

UI benefit extension for old-age workers in 2007 The extension of the PBD for old-aged workers was the result of a remarkable two-month legislative episode under the grand coalition of Christian and Social Democrats in late 2007. The short-term nature of the reform and its detachedness from the business cycle allows investigation of the effects of the PBD on job search effort absent avoidance behavior and endogenous policy bias. The political process up to the passing of the benefit extension in the German parliament is detailed below. Figure 1 summarizes the the key political decisions of interest.

Figure 1: Benefit Extension for Elderly Worker: The Political Process



Notes: The figure indicates the most important political steps concerning the reform of interest.

Since the implementation of the crucial labor market reforms (*Hartz IV, Agenda 2010*, among ohters) in the early 2000s, the Social democrats were heavily divided about the evaluation of their pursued reform path, which had marked a significant shift in the party's policy agenda, resulted in electoral defeats and challenged the Social democrats' identity. On October 1 2007, the then acting party leader of the Social Democrats marked the party's public turn from its (more) liberal policy by calling for an extension of the PBD for old-aged workers. The reform proposal was motivated on the grounds of social injustice concerns during times of stable macro-economic conditions (see Figure A.1 in the Appendix); long periods of UI contributions by old-age workers were ought to be rewarded by extended BPD.[6]

Over the following weeks, fierce debates about the proposal defined the political

[6] An initial reform proposal followed claims of the German Trade Union Confederation (*DGB*), which suggested the extension of the PBD for all workers aged 45 and above to up to 24 months.

agenda, with politicians from both the Christian Democrats and Social Democrats acting as opposing forces. The dispute about the PBD extension (accompanied by disagreements about the introduction of minimum wages in the postal sector, among others) lasted several weeks and raised rumors about the end of the acting coalition. To ease the growing tensions, both parties negotiated about the pending disputes in a nightly coalition meeting on November 12 and a decision in favor of an extension of the PBD was reached and announced by the end of this night. The law was eventually introduced to the parliament on December 11 2007 and passed on January 26 2008. It was retroactive to January 1 2008 and contained a transitional agreement, which extended the PBD of all workers whose eligibility period was not exhausted by December 31 2007.[7]

Table 1: Claimants' Age, Length of UI Contributions and PBD

Before January 1 2008							
Period of UI contribution (months)	12	16	20	24	30	36	
& Age of eligible person .. or above					55	55	
Potential Benefit Duration (PBD)	6	8	10	12	15	18	
Since January 1 2008							
Period of UI contribution (months)	12	16	20	24	30	36	48
& Age of eligible person .. or above					50	55	58
Potential Benefit Duration (PBD)	6	8	10	12	15	18	24

Notes: The table shows the relationship between the claimant's age, length of UI contributions and the potential benefit duration. Note that prior to the reform, the qualifying period determining the length of coverage was three years. It was extended to five years by January 1 2008.

Table 1 displays the mechanical relationship between the claimant's age, length of UI contributions and the PBD prior to (upper panel) and after the reform (lower panel). The reform affected unemployed individuals of age 50 or above that fulfilled given entitlement criteria. In detail, the law extended the PBD for workers aged 50 to 54 from 12 to 15 months in case having contributed to UI for at least 12 months within the last two years (eligibility constraint) and for 30 months within the last

[7] Hence, the reform subsequently extended the PBD for all eligible individuals, who had become unemployed before January 1 2008 and were entitled to receive benefit payments on December 31 2007, by three months (see §434r, SGB III). However, note that this only applied to those individuals, who fulfilled both criteria (above the age of 50 and sufficient contributions to UI) at the time of unemployment registration.

five years (coverage constraint).[8] Likewise, UI benefit duration was extended from 18 to 24 months for all workers aged 58 or above in case having had fulfilled the eligibility constraint and contributed to UI for at least four out of the last five years.

4 Data

The analysis in this paper is based on data from the IZA Evaluation Dataset Survey, which covers a large sample of individuals registering as unemployed at the Federal Employment Agency between June 2007 and May 2008, i.e., prior to and after the reform (see Arni et al. (2014) for details). Designed to allow the investigation of ALMP effects, the dataset surveys prime-aged workers (aged 16 to 54), who enter unemployment, search for reemployment opportunities and qualify for participation in ALMPs. Individuals close to (early) retirement and all recipients of the basic income, who are not entitled for participation in ALMPs, are in turn not covered by the survey.

In order to obtain a representative sample of the unemployed population and to account for seasonal effects over one year, a random sample of unemployed individuals was drawn from the monthly unemployment inflow statistics of the German Federal Employment Agency in each month between June 2007 and May 2008. In total, 17,396 individuals were first interviewed around two months after becoming unemployed and repeatedly questioned over time. For the present analysis, the first wave of the survey is exploited, providing detailed information on individuals' job search behavior at the beginning of the unemployment spell.

More precisely, the survey covers information on the number of applications, the filing of applications that require moving or the reservation wage. These information are supplemented by a large set of variables on the respondents' employment history, personal characteristics (e.g., the age, education or level of professional training) and personality traits, such as the locus of control or the Big Five. The data also include information on individuals' supervision intensity by the local Employment Agencies (the number of agency visits or received job offers, among others) and

[8] Note that the reform also extended the qualifying period from three to five years.

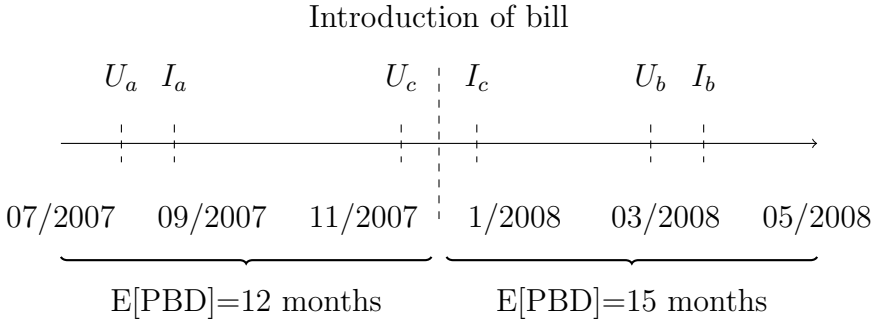
local labor market conditions, such as regional unemployment and vacancy rates.

For the empirical analysis presented below, all individuals who are already reemployed at the time of the first interview – around 25% of the observations - as well as all individuals who did not actively search for a new job are excluded.[9] Descriptive statistics for the estimation sample are provided in Table A.1 in the Appendix.

5 Identification

The dataset allows observing the job search behavior of unemployed individuals who were interviewed prior to or after the announcement of the reform on December 11 2007. Variation in the date of unemployment registration, the policy reform and the date of the interview provide a clear quasi-experimental setting to identify the effects of the PBD on job search effort. As detailed in Section 3, recall that the reform of interest affected two different age groups: unemployed workers aged 50 to 54 and aged 58 or above. Due to the dataset's focus on unemployed individuals aged 16 to 54, this study focusses on the reform for the younger of these two cohorts only.

Figure 2: Unemployment Entry, Interview Date and Expected Benefit Duration



Notes: The figure plots the setting of this analysis. Individuals $i \in \{a, b, c\}$ registered as unemployed at U_i and were interviewed at I_i. Expectations about the potential benefit duration change on December 11 2007; the day the bill was passed to the parliament.

Figure 2 illustrates the setting of the analysis. Individual a registered as unemployed (U_a) and was interviewed about her job search behavior (I_a) prior to the reform, choosing job search effort while expecting PBD of twelve months. In turn,

[9] Note that the probability of being reemployed at the time of the first interview as well as the probability of actively searching for a job are not affected by the reform of interest.

individual b became unemployed and chose job search effort while knowing about the extension of the PBD. For individual c, expectations about the PBD updated after unemployment registration but before the interview. Some part of the relevant job search period was thus subject to the new PBD regime, whereas initial job search effort was chosen while expecting PBD of 12 months. Job search effort of individual c may thus have converged towards the search effort level of individual b after the extension of the PBD became salient.[10]

Based on this setting and in line with the empirical strategies pursued by Kyyrä and Ollikainen (2008) as well as Van Ours and Vodopivec (2008), simple difference-in-differences is applied to compare pre- and post-reform outcomes. Unemployed workers aged 50 to 54, which were interviewed after the announcement of the reform and hence gained knowledge about the extension of the PBD, constitute the *treatment group*. Same-aged individuals interviewed prior to the introduction of the reform serve as the *comparison group*. Unemployed workers aged 45 to 49, interviewed prior to or after the reform, serve as *control groups* in order to account for any seasonal aggregate effects.

Identifying eligible individuals As highlighted before, the PBD in Germany is subject to the claimant's age and length of UI contributions within a given qualifying period. The reform of interest thus changed the PBD for a subset of individuals aged 50 to 54 only. Individuals were entitled to extended PBD in case having contributed to UI for at least 12 months within the last two years (eligibility constraint) and for 30 months within the last five years (coverage constraint). For the purpose of the analysis, all unemployed individuals that did not fulfill the contribution criteria were thus excluded, irrespective of the claimant's age. Unfortunately, the present dataset provides information on the respondents' last employment *period* only, which limits the analysis to those claimants who have fulfilled both entitlement criteria without any interrupting period of non-employment. Compared to the entire eligible population, the individuals in this sample are thus positively selected with regard to their labor market history, given that the sampled individuals were not subject to

[10] In the empirical analysis presented below, special attention is paid to those individuals whose expectations about the PBD updated after unemployment registration but prior to the interview.

unemployment in the recent past. In case the sampled individuals responded differently to the increase in the PBD compared to the eligible individuals not covered in the analysis, the estimates of this study may thus not provide the true treatment effect for the entire eligible population.

In general, heterogenous responses may be due to consequences and causes of prior unemployment experience. First, UI-induced moral hazard may be less (more) pronounced among the group of those eligible individuals who have experienced unemployment prior to the current unemployment spell in case individuals had net (dis)utility from unemployment and include past experiences in their current decision on job search effort. Second, unobservable and observable differences between both groups may have triggered prior unemployment and affect individuals' responses with respect to the reform of the PBD.

The analysis presented below, however, suggests that past unemployment experience does not affect current choices of job search effort. UI-induced moral hazard is of similar magnitude for those individuals in the sample who have been unemployed prior to the current spell and those not. Evidence of more pronounced UI-induced moral hazard among the low- and medium-skilled compared to the high-skilled unemployed further implies that the sample may underestimate the overall treatment effect for the entire eligible population in case the covered sample is positively selected on skills.

Empirical model Technically, the present setting allows estimation of the following equation:

$$y_i = \alpha + \beta T_i + \gamma A + \delta(T_i \times A_i) + X_i'\rho + \varepsilon_i, \tag{3}$$

with the dependent variable y_i indicating measures of job search effort or the reservation wage of individual i, T_i being a dummy variable indicating whether the individual was interviewed prior to or after the reform, and A_i indicating whether the individual is aged between 50 to 54. The treatment effect is given by δ, X_i' defines a vector of control variables and ε_i the error term.

Identification of the model rests upon the assumptions that (i) no observable or unobservable individual characteristics determined the allocation to the treatment

or comparison group and (ii) potential changes in labor market conditions over the sampling period affected treatment and control groups to equal extent. Put more precisely, except for differences in knowledge about the reform due to the timing of being interviewed/becoming unemployed, the comparison group should be highly similar compared to the treatment group. Moreover, changes in business cycle conditions should not have had asymmetric effects on treatment and control groups. The remainder of this section aims at validating these identifying assumptions.

Voluntary quits and strategic layoffs In order for the identifying assumptions to hold, layoffs have to be exogenous from the individuals' perspective. As some workers may, however, potentially opt to become unemployed in response to the extension of the PBD, the treatment group may be self-selected in this respect. To account for potential selection, all workers that voluntarily quit their job or became unemployed by mutual agreement are therefore excluded from the sample. Excluding these individuals from the analysis further accounts for the fact that payments of UI can be suspended for up to twelve weeks in case workers voluntarily opt out of employment, which lowers the PBD accordingly.

Strategic layoff decisions by firms may further violate the identifying assumption. If firms deliberately suspend dismissals of older workers (aged 50 or above) to allow for a longer PBD, allocation into treatment and comparison group would be non-random. Due to the short-term nature of the reform, adaptive behavior of firms is yet highly unlikely and strict dismissal laws impede strategic timing of layoffs in Germany. However, as a robustness check, the analysis is further limited to layoffs were strategic timing of terminations can be ruled out, focusing on those workers who became unemployed either due to plant closings or the expiration of a temporary contact. As detailed below, the results of the analysis remain unaffected in case the analysis is limited to the respective subgroups.

Concurrent ALMP reforms Estimates of this analysis would be biased in case simultaneous reforms had occurred that asymmetrically affected treatment, comparison and control groups. Concurrent with the extension of the PBD, the government indeed introduced "labor market integration vouchers" (*Eingliederungsgutschein*).

In a nutshell, these vouchers slightly modified eligibility criteria for unemployed individuals aged 50 or above in order to receive employment integration subsidies (*Eingliederungszuschuss*). Employment integration subsidies have long been used as an ALMP instrument in Germany and all unemployed individuals are allowed to file for integration subsidies in general. Approval, duration as well as the amount of the subsidy is subject to the discretion of the local Employment Agency and dependent upon applicants' work productivity limitations, with the scope and availability of integration subsidies being extended for individuals aged 50 or above (since May 2007).

The existence of integration vouchers and extended subsidies for unemployed aged 50 or above should, however, not impede the causal interpretation of the findings in this analysis. First, it is striking that the slight modifications in the eligibility criteria for subsidies invoked by the introduction of the integration voucher as of January 1 2008 only had a marginal, negligible effect on take up rates. In 2008, the Federal Employment Agency granted 3,000 vouchers only, compared to more than 1.5 million ALMP measures in total (Statistics of the Federal Employment Agency).[11] Second, the total number of subsidies granted was particulary constant over the period of interest; Figure A.2 in the Appendix showing the total number of recipients from 2006 to 2010. Given that all unemployed individuals in the treatment and the comparison group were further potentially eligible for extended subsidies, any potential effects arising from these subsidies should be captured by the parameter of the age group dummy and not affect the treatment effect of interest.

Observable characteristics by age group and interview period As highlighted above, besides differences in knowledge about the reform and the timing of becoming unemployed, comparison and treatment group should be highly similar in observable characteristics. Moreover, labor market conditions should be either constant over time or change at equal extent for treatment and control group. The IZA Evaluation dataset allows extensive testing of both identifying assumptions. Table 2 shows (differences in) mean characteristics by age groups and within treatment

[11] By April 2012, the voucher program was stopped. Over the course of its existence, a total of around 20,000 vouchers had been issued.

and control group prior to and after the reform.

Columns (1) to (3) show means for the two age groups and the results of a simple t-test (p-value) on the equality of the means for a large set of variables. Besides expected differences in age, it becomes apparent that both groups of individuals are not systematically different from each other. On average, individuals from both groups are married, completed an apprenticeship and generated a monthly net labor income of around 1400 Euro prior to unemployment, for example. Evaluated at the mean, both groups of workers further stem from comparable regions across Germany, differences in local unemployment and vacancy rates being small and insignificant. Moreover, the unemployed from both groups received equal supervision by local Federal Employment Agencies, for example, by means of the number of agency visits or job offers. Lastly, both groups are similar with respect to personality traits, measured by means of individuals' locus of control, extroversion or openness, among others.

It is further tested whether mean characteristics within one age groups differ before and after the reform. Columns (4) to (9) show the corresponding results. Both the two control groups as well as comparison and treatment group are highly similar in terms of observable personal characteristics, respectively. Most importantly, comparison and treatment group neither differ in terms of personal characteristics nor personality traits when being compared at the mean.

When focusing on regional characteristics and individual ALMP measures, differences in some variables become apparent. However, changes over time occur for both age cohorts symmetrically and to similar extent. In detail, the data suggest local active labor market intensity, measured by means of the share of ALMP participants over the number of total unemployed individuals, to be higher after the reform, yet for both treatment and control group. Local unemployment rates, in turn, remain remarkably constant. The same pattern applies to individual-level measures of support by the local Federal Employment Agencies. On average, the number of visits at the local agency is slightly lower after the reform. These small difference may, however, be explained by the fact that the mean number of weeks elapsed between the individuals' unemployment registration and the interview de-

Table 2: Means and Differences in Observable Characteristics by Age and Unemployment Entry

	Individuals			Control Group			Comparison/Treatment Group		
	aged 45-49	aged 50-54	p-value	pre treatment	post treatment	p-value	pre treatment	post treatment	p-value
Personal characteristics									
Age	47.31	52.57	0.00	47.18	47.36	0.34	52.71	52.51	0.31
Male (no/yes)	0.46	0.42	0.44	0.39	0.48	0.14	0.39	0.44	0.47
Education	3.83	3.63	0.11	3.99	3.76	0.24	3.61	3.64	0.90
Skill level	2.09	2.11	0.62	2.12	2.08	0.54	2.16	2.09	0.31
Last log wage	7.07	7.10	0.56	7.10	7.06	0.56	7.10	7.10	1.00
Unemployed Before	0.65	0.62	0.45	0.60	0.67	0.25	0.52	0.66	0.04
Regional characteristics									
State of residence	8.11	8.36	0.46	7.57	8.33	0.13	7.94	8.54	0.23
Local unemployment rate	9.27	9.19	0.81	9.14	9.32	0.71	9.11	9.23	0.82
Local ALMP intensity	15.71	16.34	0.18	14.42	16.21	0.00	15.59	16.66	0.18
Individual ALMP measures									
Number of agency job offers	1.76	1.90	0.55	2.04	1.64	0.20	1.74	1.96	0.60
Number of agency visits	1.70	1.78	0.17	1.93	1.61	0.00	1.91	1.72	0.04
Personality traits									
Internal locus of control	5.90	5.90	0.98	5.88	5.90	0.84	5.99	5.86	0.29
Consciousness	6.39	6.26	0.10	6.38	6.39	0.91	6.41	6.20	0.09
Openness	4.95	4.91	0.73	4.91	4.97	0.66	4.97	4.89	0.64
Extraversion	5.00	5.03	0.70	4.90	5.03	0.34	5.13	4.99	0.31
Neuroticism	3.83	3.85	0.84	3.80	3.85	0.75	3.76	3.89	0.39
Weeks b/w UE and interview	7.67	7.83	0.41	9.32	7.04	0.00	9.95	6.93	0.00
Dependent variables									
Number of filed applications	14.39	16.65	0.21	12.96	14.95	0.35	21.95	14.39	0.04
Applying for distant jobs	0.15	0.15	0.94	0.10	0.17	0.08	0.24	0.11	0.01
Log reservation wage	7.00	7.00	0.93	7.01	6.99	0.78	7.00	7.00	0.94

Notes: The table provides information on (differences) in means for (a)control and treatment group; (b) the control group before and after the reform; and (c) the comparison and treatment group. The total number of observations is 597.

creased for both age groups, from nine weeks prior to the reform to seven weeks afterwards.

A simple comparison of job search measures for treatment, comparison and control groups already provides insights about the effect of the PBD on job search behavior. Whereas the number of filed applications and the probability of applying for jobs that require moving is of similar magnitude for the control group, both measures of job search effort are lower for the treatment than for the comparison group. In contrast, mean reservation wages for treatment, comparison and control group are highly similar, providing no indication of higher reservation wages in response to the reform.

6 Results

The results of this analysis are presented below. Table 3 provides the corresponding treatment effect estimates for the three outcomes of interest, the number of filed applications, the probability of applying for jobs that require moving and the reservation wage.

Column (1) of Panel A shows that the PBD has a negative and significant effect on the total number of applications. In this very simple model, the average number of filed applications drops by around 40% of a standard deviation in response to the reform. In columns (2) to (5), control variables are successively added to the model to check the robustness of this result. Adding personal characteristics, such as the individuals' gender, level of training or last wage prior to unemployment hardly changes the treatment effect (see Column (2)). The same conclusions arise when adding individual-level controls of ALMP intensity (Column (3)) or regional controls of the labor market to the model (Column (4)). As it has been shown that personality traits may affect job search behavior (Caliendo et al., 2015), information on individuals' personality traits are added in the most comprehensive specification. As displayed in Column (5), accounting for these variables, however, hardly changes the estimate.

Panel B of Table 3 presents the corresponding results when focusing on the

Table 3: The Effect of the PBD on Job Search

Panel A – Number of job applications					
	(1)	(2)	(3)	(4)	(5)
Date of Reform	1.993	4.933**	5.827**	6.242**	6.318**
	(2.124)	(2.382)	(2.562)	(2.551)	(2.511)
Age Group Dummy	8.996**	8.120*	8.563**	9.846**	9.252**
	(3.699)	(4.147)	(4.216)	(4.306)	(4.262)
Treatment Effect	-9.554**	-9.059**	-10.310**	-10.714**	-10.125**
	(4.220)	(4.096)	(4.358)	(4.388)	(4.301)
Adjusted-R^2	0.010	0.070	0.099	0.115	0.126
Panel B – Distant applications					
	(1)	(2)	(3)	(4)	(5)
Date of Reform	0.072*	0.085*	0.096**	0.077	0.072
	(0.040)	(0.046)	(0.046)	(0.047)	(0.047)
Age Group Dummy	0.144**	0.184**	0.193**	0.197**	0.193**
	(0.057)	(0.079)	(0.079)	(0.081)	(0.080)
Treatment Effect	-0.206***	-0.212***	-0.224***	-0.222***	-0.219***
	(0.066)	(0.064)	(0.064)	(0.065)	(0.065)
Adjusted-R^2	0.013	0.152	0.155	0.146	0.150
Panel C – (Log) reservation wage					
	(1)	(2)	(3)	(4)	(5)
Date of Reform	-0.017	0.008	0.011	-0.002	-0.002
	(0.061)	(0.034)	(0.035)	(0.035)	(0.035)
Age Group Dummy	-0.013	0.065	0.057	0.039	0.046
	(0.080)	(0.055)	(0.055)	(0.055)	(0.055)
Treatment Effect	0.022	-0.027	-0.027	-0.022	-0.020
	(0.092)	(0.049)	(0.050)	(0.050)	(0.050)
Adjusted-R^2	-0.005	0.707	0.710	0.709	0.710
Individual controls	No	Yes	Yes	Yes	Yes
ALMP measures	No	No	Yes	Yes	Yes
Regional controls	No	No	No	Yes	Yes
Personality traits	No	No	No	No	Yes
Number of observations	597	597	597	597	597

Notes: The table provides the baseline results of the analysis based on equation (1). Standard errors (in parantheses) are heteroscedasticity robust. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

probability of applying for jobs that require moving as the outcome variable of interest. The estimates show a statistically significant and robust negative effect of the PBD on the probability of applying for a job that requires moving. From the results of the simple model presented in Column (1), it can be inferred that the probability decreases by around 16% points, or about half of a standard deviation, in response to the reform. In line with the results of Panel A, the effect is very robust with respect to the inclusion of additional covariates. Estimates of the treatment effect provided in Column (2) to (5) hardly change when successively adding controls.

The estimates presented in Panel C in turn provide no evidence in favor of higher reservation wages due to the increase in the PBD. The estimated treatment effect from the simple model presented in Column (1) is close to zero and statistically insignificant. This holds true when successively adding control variables to the model. Contrary to standard job search theory, this result is yet in line with evidence by DellaVigna and Paserman (2005), Krueger and Mueller (2015), and Schmieder et al. (2015), who show that reservation wages respond little to changes in UI parameters. Hence, the moderate increase in the PBD is found to lower job search effort but keeps reservation wages unaffected.

Adjustment of job search behavior Due to the setup of the reform, the treatment group comprises a subset of individuals who learned about the reform after registering as unemployed but prior to the interview. These individuals hence started initial job search while expecting PBD of 12 months but learned about the reform during the relevant search spell. In this paragraph, it is hence tested whether these individuals may have adjusted their job search behavior in response to the reform by accounting for heterogenous treatment effects among the fully and partly treated individuals. The estimates given in Table 4 provide suggestive evidence in favor of adaptive behavior. Treatment effects for the partly treated are negative and of significant magnitude (yet lower than the treatment effect for the fully treated) but insignificant.[12]

[12] Table A.2 shows that treatment effects are of same magnitude when using the probability of applying for jobs that require moving as a measure of job search effort.

Table 4: PBD and the Number of Applications - Treatment Duration

	(1)	(2)	(3)	(4)	(5)	(6)
Date of Reform	1.908	7.511***	1.908	6.836**	1.885	7.779 **
	(2.088)	(2.846)	(2.090)	(2.735)	(2.955)	(3.835)
Age Group Dummy	9.585***	6.926	9.585***	9.858**	9.602***	10.020 **
	(3.701)	(4.310)	(3.705)	(4.267)	(3.699)	(4.390)
Treatment Effect	-10.640 **	-10.480 **				
	(4.309)	(4.491)				
X UE after reform			-10.640 **	-10.314**		
			(4.314)	(4.428)		
X UE before reform			-8.283	-11.874**		
			(6.029)	(5.796)		
X Interview Dec-Jan					-9.732 *	-12.139 **
					(5.119)	(5.042)
X Interview Feb-Apr					-13.731***	-12.253***
					(4.555)	(4.408)
X Interview May-Jul					-6.721	-7.606
					(5.492)	(5.808)
Adjusted-R^2	0.016	0.127	0.014	0.124	0.010	0.124
Individual controls	No	Yes	No	Yes	No	Yes
ALMP measures	No	Yes	No	Yes	No	Yes
Regional controls	No	Yes	No	Yes	No	Yes
Personality traits	No	Yes	No	Yes	No	Yes
Number of observations	508	508	597	597	597	597

Notes: The table shows the regression results of equation (1), focusing on differential effects due to the timing/duration of the treatment. The dependent variable is the number of applications. Standard errors (in parantheses) are heteroscedasticity robust.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

6.1 Sensitivity of Results and Heterogenous Effects

The following section investigates the sensitivity of the previous results and tests for heterogenous treatment effects. Sensitivity of the results is studied by (i) accounting for adaptive behavior, (ii) assessing potential biases due to strategic layoff decisions of firms, and (iii) testing the unconfoundedness assumption by means of a pseudo treatment test. Moreover, heterogenous treatment effects for particular subgroups of the unemployed are provided, analyzing the extend of UI-induced moral hazard for males and females, different skill groups and individuals with and without prior unemployment experience.

Salience of the reform The short-term nature of this reform limits the scope of adaptive behavior. Knowledge about important aspect of the reform, such as the reform's date of inception and its retroactive implementation, became salient only two months after the first proposal and exact knowledge about the interview date allows the precise definition of treatment and control groups. However, as a general agreement about the reform was already reached by November 12 2007, adaptive behavior to this news cannot be entirely ruled out.

Although early adaption to the reform would blur the control group and cause an upward bias in the baseline estimates, given that control and treatment group would be more similar, the sensitivity of the results is tested when redefining treatment and control groups by November 12 2007. Table 5 provides the corresponding results for the three outcomes of interest, obtained from the most simple and most comprehensive version of the empirical model. The estimates highlight that all qualitative results of the analysis remain robust to the redefinition of the reform's date.

Strategic timing of layoffs As highlighted above, strategic timing of layoffs may impede the causal interpretation of the findings. Although strict firing laws in Germany limit the scope for strategic firing decisions of firms, the robustness of the findings is tested by limiting the analysis to those individuals who became unemployed due to plant closure, the termination of a mutual contract and alike; thus

Table 5: PBD and Job Search - Salience of reform

	Job applications		Distant applications		Reservation wage	
	(1)	(2)	(3)	(4)	(5)	(6)
Date of Reform	2.815	6.151***	0.070	0.051	-0.026	-0.023
	(2.173)	(2.317)	(0.044)	(0.046)	(0.069)	(0.039)
Age Group Dummy	9.364***	7.340	0.150**	0.171 *	0.026	0.048
	(3.467)	(4.690)	(0.068)	(0.091)	(0.093)	(0.059)
Treatment Effect	-8.924 **	-6.813 *	-0.191**	-0.178**	-0.029	-0.025
	(4.052)	(4.074)	(0.075)	(0.075)	(0.103)	(0.054)
Adjusted-R^2	0.005	0.120	0.007	0.141	-0.004	0.711
Individual controls	No	Yes	No	Yes	No	Yes
ALMP measures	No	Yes	No	Yes	No	Yes
Regional controls	No	Yes	No	Yes	No	Yes
Personality traits	No	Yes	No	Yes	No	Yes
Number of observations	597	597	597	597	559	559

Notes: The table shows the regression results of equation (1) when defining treatment and control groups by November 12 2007. Standard errors (in parantheses) are heteroscedasticity robust.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6: PBD and Job Search - Accounting for Selective Layoffs

	Job applications		Distant applications		Reservation wage	
	(1)	(2)	(3)	(4)	(5)	(6)
Date of Reform	2.642	6.518**	0.097	0.208**	-0.034	0.006
	(2.642)	(3.175)	(0.069)	(0.091)	(0.101)	(0.075)
Age Group Dummy	3.206	6.303	0.063	0.334**	-0.066	0.012
	(2.558)	(5.649)	(0.088)	(0.134)	(0.141)	(0.111)
Treatment Effect	-5.208	-8.133 *	-0.209**	-0.266**	0.097	0.008
	(3.608)	(4.244)	(0.103)	(0.112)	(0.160)	(0.108)
Adjusted-R^2	-0.007	0.180	0.025	0.135	-0.014	0.610
Individual controls	No	Yes	No	Yes	No	Yes
ALMP measures	No	Yes	No	Yes	No	Yes
Regional controls	No	Yes	No	Yes	No	Yes
Personality traits	No	Yes	No	Yes	No	Yes
Number of observations	199	199	199	199	190	190

Notes: The table shows the regression results of equation (1) when reducing the scope of strategic firm behavior. Standard errors (in parantheses) are heteroscedasticity robust.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

substantially reducing the scope of potential strategic behavior of firms. Although the number of observations decreases significantly, the results presented in Table 6 demonstrate that estimates remain robust to this constraint.

Pseudo treatment Identification of the underlying model further relies on the assumption that individuals are randomly assigned to treatment and control group and are similar in terms of observable and unobservable characteristics. While observable characteristics are indeed similar among treatment, comparison and control groups (cf. Table 2), unobservable variables may still violate the unconfoundedness assumption. Following Rosenbaum (1987), this assumption is indirectly tested by estimating the causal effect of the treatment for two groups of individuals that were unaffected by the reform (workers aged 40 to 44 and 45 to 49, respectively); with one of the two groups (the older age group) being arbitrarily considered as pseudo-treated. No evidence of any pseudo treatment effect on the outcomes would strengthen the claim of unconfoundedness. Table 7 shows support for the identifying assumption, given that pseudo-treatment effects for all three measures of job search effort are small and statistically insignificant.

Heterogenous treatment effects Lastly, the presence of heterogeneous treatment effects is investigated, focusing on differential effects by gender, skill and prior unemployment experience. Estimates of the treatment effect on the number of job applications are provided for the most simple and most comprehensive specification, respectively. Corresponding results for the probability of applying for jobs that require moving are provided in Table A.3 in the Appendix of the paper.

Columns (1) and (2) of Table 8 show that both females and males respond similarly to the extension of the PBD. The number of filed job applications decreases by around 9 and 7 applications, respectively. When focusing on individuals' skills (see Columns (3) and (4)), treatment effects are strong and significant for low- and medium-skilled workers but insignificant and small for the high-skilled, suggesting that UI-induced moral hazard is absent for those individuals who have invested more time and resources in their education. Finally, when testing for heterogeneous effects by prior unemployment experience, the estimates provide no evidence that

Table 7: PBD and Job Search - Pseudo Treatment Effects

	Job applications		Distant applications		Reservation wage	
	(1)	(2)	(3)	(4)	(5)	(6)
Date of Reform	-0.880	1.205	0.057	0.053	-0.044	-0.052
	(2.354)	(2.230)	(0.045)	(0.044)	(0.058)	(0.041)
Age Group Dummy	-1.303	-5.634	-0.026	-0.066	-0.014	-0.012
	(2.646)	(4.000)	(0.049)	(0.068)	(0.072)	(0.053)
Pseudo Treatment	3.621	4.597	0.009	0.025	0.018	0.047
	(3.129)	(3.193)	(0.061)	(0.058)	(0.085)	(0.048)
Adjusted-R^2	-0.001	0.113	0.002	0.140	-0.004	0.716
Individual controls	No	Yes	No	Yes	No	Yes
ALMP measures	No	Yes	No	Yes	No	Yes
Regional controls	No	Yes	No	Yes	No	Yes
Personality traits	No	Yes	No	Yes	No	Yes
Number of observations	639	639	639	639	595	595

Notes: The table shows the regression results of equation (1) when focusing on two groups of workers that were unaffected by the reform. Standard errors (in parantheses) are heteroscedasticity robust. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

previously unemployed react differently to the reform. The treatment effect is of similar magnitude for both types of individuals.

7 Conclusion

A large literature has established that UI generosity significantly affects the duration of unemployment. While this finding is usually attributed to UI-induced moral hazard, evidence on the assumed relationship is scarce. Using quasi-experimental variation in the PBD due to an exceptional legislative episode in Germany in 2007 paired with direct information on the job search behavior of unemployed individuals, this paper complements the existing evidence by providing causal estimates of the effect of the PBD on job search effort and reservation wages.

The results of this analysis lend considerable support for the existence of UI-induced moral hazard, the extension on the PBD leading to a considerable decrease in job search effort, measured by the number of filed applications and the probability of applying for jobs that require moving. In line with recent evidnece (see, among

Table 8: Heterogenous Effect - PBD and the Number of Applications

Dep. Var.: Job applications	(1)	(2)	(3)	(4)	(5)	(6)
Date of Reform	1.540	6.293**	2.938	6.172**	2.028	6.304**
	(2.099)	(2.501)	(2.164)	(2.493)	(2.165)	(2.508)
Age Group Dummy	8.989**	9.216**	8.664**	9.200**	8.957**	9.601**
	(3.700)	(4.218)	(3.654)	(4.275)	(3.780)	(4.350)
Treatment X Female	-9.676**	-9.886***				
	(3.777)	(3.799)				
Treatment X Male	-8.893	-10.409*				
	(5.501)	(5.877)				
Treatment X Low-Skilled			-11.275**	-9.523*		
			(4.719)	(5.530)		
Treatment X Medium-Skilled			-11.207***	-12.203***		
			(4.083)	(4.309)		
Treatment X High-Skilled			-0.662	-1.334		
			(8.373)	(8.367)		
Treatment X Not UE before					-10.030**	-8.440
					(4.923)	(5.315)
Treatment X UE before					-9.258**	-11.105**
					(4.623)	(4.652)
Adjusted-R^2	0.021	0.124	0.028	0.130	0.007	0.125
Individual controls	No	Yes	No	Yes	No	Yes
ALMP measures	No	Yes	No	Yes	No	Yes
Regional controls	No	Yes	No	Yes	No	Yes
Personality traits	No	Yes	No	Yes	No	Yes
Number of observations	597	597	597	597	597	597

Notes: The table shows the regression results of equation (1), allowing for heterogeneous treatment effects by (a) gender, (b) education, and (c) prior unemployment experience. The dependent variable is the number of applications. Standard errors (in parantheses) are heteroscedasticity robust. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

others, Krueger and Mueller, 2015 and Schmieder et al. (2015)) but in contrast to standard job search theory, reservation wages, however, remain unaffected by the extension of the PBD.

Overall, the study provides clear evidence of strategic search behavior. Unemployed individuals respond to more generous UI by reducing search effort, which highlights the trade-off faced by policy makers when designing UI systems. While UI shall allow individuals to actively search for suitable reemployment, disincentive effects arising from generous UI shall be avoided. Based on the findings of this study, future research might aim at estimating effort choices and reemployment probabilities due to changes in UI in one integrated framework, which is beyond the scope of this paper.

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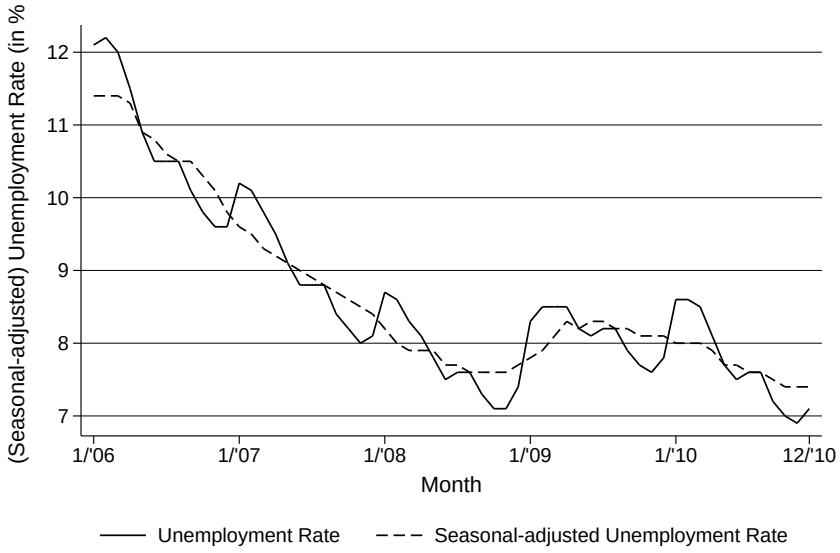
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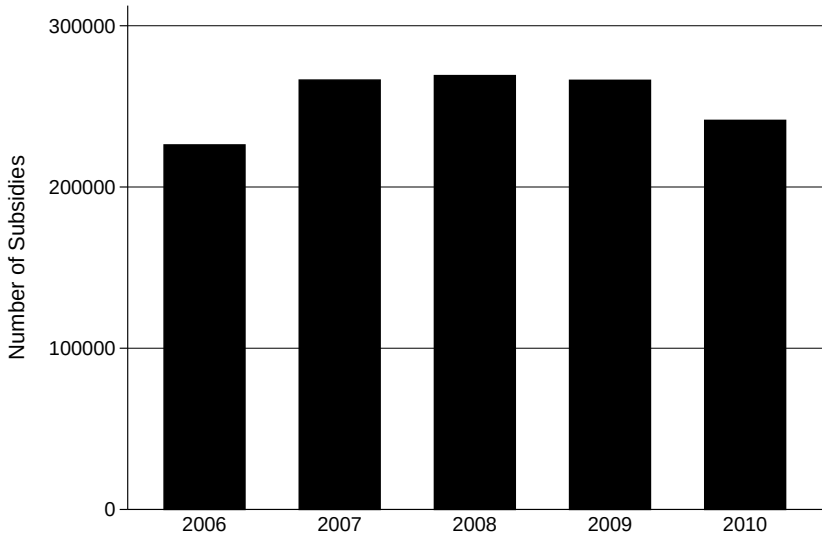
A Appendix

Figure A.1: (Seasonal-Adjusted) Unemployment Rate (2006-2010)



Notes: The graph plots monthly (seasonal-adjusted) unemployment rates from January 2006 to December 2010 for Germany. The data are provided by the German Federal Employment Agency.

Figure A.2: Number of Granted Employment Integration Subsidies (2006-2010)



Notes: The graph plots the annual number of granted employment integration subsidies. The data are provided by the German Federal Employment Agency.

Table A.1: Descriptive Statistics on Estimation Sample

	Mean	Std Deviation	Minimum	Maximum	Observations
Dependent variables					
Number of filed applications	15.43	21.75	0.00	223.00	597
Applying for distant jobs	0.15	0.36	0.00	1.00	597
Log reservation wage	7.00	0.47	5.30	8.99	559
Personal characteristics					
Age	49.72	3.00	45.00	55.17	597
Male (no/yes)	0.44	0.50	0.00	1.00	597
Education	3.74	1.50	0.00	7.00	597
Skill level	2.10	0.50	1.00	3.00	597
Last log wage	7.08	0.56	5.08	9.21	597
Unemployed Before	0.64	0.48	0.00	1.00	597
Regional characteristics					
Local unemployment rate	9.24	3.93	3.00	17.00	597
Local ALMP intensity	16.00	5.61	7.00	30.00	597
State of residence	8.23	4.07	1.00	16.00	597
Individual ALMP measures					
Number of agency job offers	1.82	2.85	0.00	25.00	597
Number of agency visits	1.74	0.70	0.00	4.00	597
Personality traits					
Internal locus of control	5.90	0.94	1.33	7.00	597
Consciousness	6.33	0.94	1.00	7.00	597
Openness	4.93	1.25	1.00	7.00	597
Extraversion	5.01	1.05	1.00	7.00	597
Neuroticism	3.84	1.20	1.00	7.00	597

Source: The table provides descriptive statistics for the underlying estimation sample. The number of observations is 597, expect for the reservation wage (N =559).

Table A.2: PBD and Applying for Jobs in Distant Areas - Treatment Duration

	(1)	(2)	(3)	(4)	(5)	(6)
Date of Reform	0.065	0.071	0.065	0.065	0.099	0.100
	(0.043)	(0.055)	(0.043)	(0.053)	(0.071)	(0.072)
Age Group Dummy	0.131 **	0.182 **	0.131 **	0.178 **	0.131 **	0.177 **
	(0.058)	(0.087)	(0.058)	(0.081)	(0.058)	(0.081)
Treatment Effect	-0.184***	-0.204***				
	(0.069)	(0.068)				
X UE after reform			-0.184***	-0.196***		
			(0.069)	(0.067)		
X UE before reform			-0.196 **	-0.204 **		
			(0.093)	(0.094)		
X Interview Dec-Jan					-0.128	-0.172 **
					(0.084)	(0.082)
X Interview Feb-Apr					-0.188 **	-0.200***
					(0.081)	(0.076)
X Interview May-Jul					-0.244***	-0.219***
					(0.083)	(0.084)
Adjusted-R^2	0.010	0.147	0.006	0.143	0.003	0.138
Individual controls	No	Yes	No	Yes	No	Yes
ALMP measures	No	Yes	No	Yes	No	Yes
Regional controls	No	Yes	No	Yes	No	Yes
Personality traits	No	Yes	No	Yes	No	Yes
Number of observations	508	508	597	597	597	597

Notes: The table shows the regression results of equation (1), focusing on differential effects due to the timing/duration of the treatment. The dependent variable is the number of applications. Standard errors (in parantheses) are heteroscedasticity robust.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A.3: Heterogenous Effect - PBD and Applying for Jobs in Distant Areas

Dep. Var.: Distant Applications	(1)	(2)	(3)	(4)	(5)	(6)
Date of Reform	0.062	0.073	0.098**	0.072	0.077**	0.072
	(0.040)	(0.047)	(0.041)	(0.047)	(0.039)	(0.047)
Age Group Dummy	0.144**	0.194**	0.142**	0.193**	0.138**	0.192**
	(0.057)	(0.080)	(0.058)	(0.080)	(0.058)	(0.081)
Treatment X Female	-0.200***	-0.225***				
	(0.066)	(0.068)				
Treatment X Male	-0.204**	-0.212***				
	(0.079)	(0.075)				
Treatment X Low-Skilled			-0.307***	-0.266***		
			(0.088)	(0.098)		
Treatment X Medium-Skilled			-0.191***	-0.218***		
			(0.066)	(0.065)		
Treatment X High-Skilled			-0.189*	-0.205*		
			(0.113)	(0.111)		
Treatment X Not UE before					-0.226***	-0.221***
					(0.078)	(0.074)
Treatment X UE before					-0.188***	-0.218***
					(0.071)	(0.071)
Adjusted-R^2	0.031	0.149	0.077	0.148	0.019	0.149
Individual controls	No	Yes	No	Yes	No	Yes
ALMP measures	No	Yes	No	Yes	No	Yes
Regional controls	No	Yes	No	Yes	No	Yes
Personality traits	No	Yes	No	Yes	No	Yes
Number of observations	597	597	597	597	597	597

Notes: The table shows the regression results of equation (1), allowing for heterogeneous treatment effects by (a) gender, (b) education, and (c) prior unemployment experience. The dependent variable is the probabilty of applying for jobs in distant areas. Standard errors (in parantheses) are heteroscedasticity robust. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$