Centre for Economic Performance

Discussion Paper ISSN 2042-2695

No.1835

March 2022

A few Euro more: benefit generosity and the optimal path of unemployment benefits

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Abstract
In this paper, we exploit the provision of higher UB at different points of the unemployment spell to shed light on the relative cost of insurance at different horizons after the job loss. First, we exploit a double cap system in an RDD setting to study the effect of higher benefit levels in the early part of unemployment spell on time on benefits and non-employment. We find that higher benefits increase the time spent on benefits and in non-employment, with no impact on new job quality. Second, we exploit an age-based discontinuity in benefit duration, which determines higher benefits later in the spell, to compare the behavioural and mechanical costs of these two variations in benefits. We find that the moral hazard costs are greater for higher benefit levels early in the spell. In addition, we provide evidence of a slight negative selection in long term unemployment and argue that the long-term unemployed face higher uncertainty in their employment prospects. These findings suggest that higher benefits later in the unemployment spell generate lower costs and would provide higher insurance. Our results question the optimality of strongly declining schedules for unemployment benefit levels.

Key words: unemployment insurance; benefit level; benefit duration; regression discontinuity design; optimal pattern
JEL: E24; H24; H55; J65

This paper was produced as part of the Centre's Labour Markets Programme. The Centre for Economic Performance is financed by the Economic and Social Research Council.

The data were made available by the Italian Social Security Institute (INPS) under the VisitINPS program. We would like to thank Daniele Checchi, Luca Citino, Edoardo di Porto, Paolo Naticchioni, and all the participants to the University of Bologna internal seminar, Bank of Italy/INPS Workshop "Labour market analysis: new opportunities with administrative data", Brucchi-Luchino, EALE 2020, AIEL 2020, SIE 2020 and INPS work in progress seminar. We are the sole responsible for any remaining omission or mistake.

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Published by
Centre for Economic Performance
London School of Economics and Political Science
Houghton Street
London WC2A 2AE

1 Introduction

Unemployment benefits (UB) play a key role in modern welfare systems and represent the main policy tool to sustain workers' consumption (Chetty, 2008) after layoff and support their search for better jobs (Burdett, 1979; Marimon and Zilibotti, 1999). However, more generous benefits lead workers to reduce their search effort and this generates negative fiscal externalities on the government budget. The schedule of benefit plays a crucial role in their design: indeed, while a strongly declining schedule would maximize search incentives, it would also lead to lower insurance. Despite the relevance of this issue, we have so far limited evidence on how costly it is to provide additional benefits at different points in the spell.

In this study, we aim to contribute to this debate in a twofold direction: first, by studying the effect of higher benefit generosity and, second, by assessing the moral hazard cost of providing unemployment insurance at different points in the unemployment spell. We start by looking at the effect of higher benefit level. We exploit a unique policy provision of Italian UB that generated a discontinuity in the relationship between pre-unemployment wage and the amount of unemployment benefit. Indeed, the rules for the Ordinary Unemployment with Normal Requirements ("Sussidio di Disoccupazione Ordinaria a Requisiti Normali", OUNR) foresaw two different caps for the maximum amount of the unemployment benefit, depending on whether pre-unemployment wage was above a given threshold. Being above the threshold caused the subsidy to increase from 951 to 1,119 Euro per month, i.e., a 17.7% change in the monthly amount of the benefit in the first six months of the unemployment spell. This implied an increase in the overall potential maximum amount of the benefit by 13%. Such a double cap system provides the ideal setting for the identification of the causal effects of higher benefits levels by exploiting the random allocation of individuals around the cutoff in a sharp Regression Discontinuity Design: in practice, we compare job market outcomes of individuals with pre-unemployment wages that are just above and below the pre-unemployment wage threshold.

We combine the insights of this exercise with those emerging from the analysis of a discontinuity in benefit duration based on age at layoff. Indeed, within the same regime, workers who were laid off after turning 50 years of age were entitled to a maximum of 12 months of benefits, while potential benefit duration was limited to 8 months for workers laid off at a younger age. In monetary terms, this implied about a 40% difference in the total value of unemployment benefits. We consider this change in duration as equivalent to a change in benefit generosity in the later months of the spell. Hence, by comparing the effects of the change in benefit determined by the age discontinuity and by the wage discontinuity, we assess the behavioural responses and moral hazard costs of increasing

benefit generosity at different points in the unemployment spell - immediately or after 8 months since layoff.

Our analysis is based on Italian population-level administrative data on unemployment benefits and individual workers' histories. We use flows into unemployment taking place in 2012, the year in which the policy was fully operational.

Our results show, first, that more generous unemployment benefits lead to longer time on benefit and in non-employment before finding a new job. An additional 1,013 Euro of maximum amount of benefits lead to an additional week spent on benefit and an additional two weeks in non-employment before finding a new job, with an implied elasticity of non-employment to benefits of about 0.30. These effects operate mainly during the first months of the unemployment spell, when workers on the two sides of the cutoff actually experience different benefits levels, in line with the predictions of Mortensen (1977) and van den Berg (1990). We do not find any discernible average effects of greater UB generosity on post-unemployment job quality. The results, however, display remarkable heterogeneity. UB generosity drives women to experience longer non-employment spells, but also to become more likely to find permanent jobs. Workers on temporary contracts and from larger firms appear to trade off lower wages for longer post unemployment matches. These results are robust to a variety of robustness tests.

Then, we assess the marginal cost of increasing the benefit level or duration by comparing the behavioral costs (i.e. the extra expenditure arising from changes in search behavior by workers after the policy change), and the mechanical costs (i.e. the extra expenditure arising from the change in the policy, holding the behavior of the workers constant) associated with each discontinuity, in the spirit of Gerard and Gonzaga (2021) and Schmieder and von Wachter (2017). The corresponding ratio of behavioral cost to mechanical cost (BC/MC ratio) describes how much the government has to transfer to workers as a consequence of their change in behaviour if it wants to increase transfers by one euro. We find that moral hazard costs are greater for changes in benefit generosity at the beginning of the unemployment spell: the higher level of benefit in the early part of the spell leads to a 0.41 BC/MC ratio, while the longer duration leads to a 0.21 BC/MC ratio. The absence of data on consumption prevents us to explicitly assess the different consumption smoothing implications of these two policy features. To provide some indicative evidence in this perspective, we study selection in long-term unemployment. We find mild evidence of negative selection over the spell with a more pronounced pattern emerging for workers previously on temporary contracts. In addition, many workers exiting unemployment in the early part of the spell go back to their previous employer, which decreases their uncertainty and could help them in planning their consumption more efficiently.These elements suggest that the long-term unemployed might suffer from higher levels of uncertainty and, consequently, be less able to smooth

consumption and benefit more from additional unemployment benefits. These results question the optimality of the declining benefit schedule which characterizes most of the existing UB designs and provides important evidence on the possible interactions between dual labour markets and unemployment benefits.

This paper contributes to two streams in the literature on the effects of unemployment benefits.

First, it provides additional evidence on the effect of higher benefit generosity. A wealth of studies investigated the effects of longer benefits (Lalive, 2007; Schmieder et al., 2012; Le Barbanchon, 2016; Nekoei and Weber, 2017). As for Italy, Scrutinio (2019) examined the medium term consequences of longer unemployment benefits by exploiting the age-based discontinuity of the OUNR, while Brunello and Miniaci (1997),Paggiaro and Trivellato (2002), and Paggiaro et al. (2009) analyzed the effects of longer UB benefits by focusing on Mobility benefit ("Mobilità Ordinaria", unemployment benefits applied to collective dismissals in specific sectors) and an age based discontinuity in duration. However, fewer works provided evidence on the effects of changes in benefit level. Early works, such as Carling et al. (2001), Lalive et al. (2006), and Rosolia and Sestito (2012), exploited changes in generosity across years in a difference-in-difference setting. More recent contributions, instead, exploited kinks in the schedule of benefit level in a regression kink design framework to provide causal estimates of higher generosity (Landais, 2015; Card et al., 2015; Britto, 2016; Kolsrud et al., 2018). This is, to our knowledge, the first study to exploit a sharp discontinuity in benefit levels. Our elasticity is in line with the elasticity found in (Landais, 2015), close to the lower bound with respect to estimates from (Card et al., 2015), and generally lower than results in (Kolsrud et al., 2018).

Second, this paper contributes to the small but growing literature on the optimal timing of unemployment benefits. The slope of the relationship between benefits levels and time in unemployment has been a highly debated topic in Public Economics for a long time. Seminal work by Shavell and Weiss (1979) showed that optimal generosity should be declining over the unemployment spell to maximize job search incentives, whereas later theoretical works, such as Pavoni (2009) and Shimer and Werning (2008), highlighted how constant or even increasing benefits could generate higher insurance benefits and could be preferred. The recent empirical evidence by Kolsrud et al. (2018) support the arguments in favour of non-declining benefit profiles. Indeed, they show that a declining schedule can entail larger consumption losses for the long-term unemployed and that the higher benefits early in the unemployment spell generate larger non-employment duration costs. Our paper contributes to this literature and further shows that providing more generous benefits in the first part of the spell, under the assumptions that longer duration can be assimilated to a flatter benefit profile and that treatment effects are

linear, is more costly with respect to higher benefits in the later part of the spell. In addition, we provide tentative evidence of negative selection in long-term unemployment which suggests that higher benefits could provide larger consumption gains.

The rest of the paper is structured as follows: Section 2 describes the institutional framework; Section 3 presents the data; Section 4 discusses our estimation strategy; Section 5 shows our results for the effect of benefit levels; Section 6 estimates and compares the moral hazard costs of more generous benefits at different point in the spell; Section 7 extends our basic framework by investigating the effects of benefit generosity for job quality and the heterogeneity in the treatment effect; finally, Section 8 concludes.

2 Institutional Context

This study is based on the Ordinary Unemployment benefit with Normal Requirements ("Indennità di Disoccupazione Ordinaria a Requisiti Normali", OUNR throughout the rest of the paper). This was the main unemployment benefit in Italy until 2013. It was introduced at the eve of World War II (Regio Decreto 14th April 1939) and later progressively extended in both coverage and generosity. By the start of the new millennium, all employees in the non-agricultural sector were eligible, conditional on two requirements: first, the first social security contribution of the employee had to predate the layoff by at least 2 years; second, the employee needed to have worked for at least 52 weeks in the 2 years prior to the layoff. In addition, not all job terminations allowed workers to claim benefits. Entitlement was granted to workers laid off for economic reasons, quitting for a "just cause" (i.e., harassment or unpaid wage), or at the end of a temporary contract. Instead, workers who voluntarily left their job for other reasons (differently from other countries such as Austria, as shown in Jäger et al., 2018) and those fired for a just cause were generally not eligible.

The potential duration of the benefit was fully determined by age at layoff.Workers fired before turning 50 years of age were eligible to 8 months of coverage, while workers aged 50 or above were eligible to up to 12 months. The monthly amount of the benefit was proportional to the wages in the three months preceding the layoff.[1] The replacement rate followed a declining schedule: 60% for the first 6 months, 50% for the following 2 months, and 40% for the remaining period (if any).

Since 1980, the law (law no. 427, 13/08/1980) had imposed a cap on the monthly amount of the benefit for distributive purposes. The ceiling was determined yearly based

[1]Technically, the benefit was computed based on the so-called "theoretical earnings" of the last three months, i.e., the average earnings in the last 92 days worked, weighted to account for the actual number of months paid to the worker over the year, including thirteenth and fourteenth month salaries if applicable.

on the consumer price index computed by the National Statistical Institute (ISTAT). The law providing for the double cap, which is the key feature of our identification strategy, was introduced in 2009. However, due to the gradual implementation of the law, the provision was not fully operational until 2012. Hence, our analysis can only draw on workers who were laid off in this last year.

The threshold in "theoretical earnings" that made workers eligible to the higher cap was 1866 Euro/month in 2012. The so-called "low ceiling" amounted to 931.28 Euro a month, while the "high ceiling" amounted to 1,119.32 Euro a month (INPS, 2012). Hence, crossing the threshold implied a differential of about 188 euro in the monthly benefit amount. The double cap provision also applied to the other two key income support measures featuring in the Italian system at the time, i.e. the *Cassa Integrazione Guadagni* (CIG) and the Ordinary Mobility Benefit ("Mobilità Ordinaria"). These benefits aimed respectively at supporting employees in firms facing temporary difficulties (CIG) or laid off in collective dismissals ("Mobilità Ordinaria"). Our data reveal that the empirical "low" and "high" ceilings applying to the OUNR amounted respectively to 951 and 1,119 Euro a month in 2012. In what follows, we refer to the empirical caps. As of January 2013, a new unemployment benefit, the "Assicurazione Sociale per l'Impiego" (ASpI), replaced the OUNR and the double cap system was abandoned. This leaves us only with one year to study the effect of this provision when it was fully operational.

Figure 1 describes the generosity level and time pattern of benefits. Panel (a) reports the monthly amount of the benefit (in the first 6 months of the spell) depending on the average past wages of the worker. The structure of the benefits generates both a kink in the schedule and a discontinuity. Our analysis relies only on the discontinuity in benefit amount.[2] It is also worth pointing out how the caps influence the difference in benefits over time due to the declining replacement rate. Indeed, being slight below or above the threshold matters substantially for the benefit level in the first six months in the spell but it is much less relevant in later periods when caps are at best marginally binding. The cap induces only marginal differences after 6 months and it is immaterial in the last 4 months of the spell for workers older than 50 years of age at layoff. The time pattern of the level of the benefit is reported in Panel (b). The overall effect of the caps on the total maximum amount of the benefit is nontrivial. Over the entire duration of the benefit, the difference in total potential benefits between two workers on the two sides of the cutoff amounts to about 1,013 Euro, i.e., between about 9% and 13% of the total benefits —depending on whether the worker was laid off after turning 50 or not. In the first six months of the spell, when the cap is binding for workers below the threshold and the replacement rate is at 60%, crossing the threshold implies a 17.7%

[2] A brief analysis of our variables at the kink suggest that the baseline assumption of the smoothness in the relationship between the running variable and the controls at the kink is violated and we do not explore this margin further. Main graphs are reported in Appendix B.

change in monthly benefits.

It should be noted that the discontinuity occurs at a relatively high level of pre-unemployment salary. In 2012, a worker laid off with pre-unemployment earnings at the threshold value would locate slightly above the 70th percentile of the wage distribution for workers claiming unemployment benefits in that year. Hence, our analysis involves individuals with relatively high earnings among the unemployed. Resulting estimates of higher benefit generosity might be a lower bound, given the lower liquidity constraints of these workers compared to the general population of unemployment benefits recipients.

3 Data

Our work relies on rich administrative data from the Italian Social Security and we exploit two main data sources.

First, we draw the information on unemployment benefits and the recipients' characteristics from the *Sistema Informativo Percettori* (SIP). This dataset collects data on all benefits received by employees who lost their jobs after February 2009. It reports the duration and the amount of the benefit together with a few demographics, such as age at layoff and gender, as well as characteristics of the workers' pre-unemployment job, such as the type of contract, and the identifier of their last firm. Most importantly, this dataset reports the average salary in the three months before layoff, which is relevant for the computation of the amount of the unemployment benefit and the eligibility to the high or low cap. This information is of paramount importance as it allows us to precisely define our running variable and correctly classify workers around the cutoff. This data source, however, does not provide any detail concerning the new job of the worker in terms of timing (if the workers finds her job after the end of unemployment benefits) or characteristics.

Second, we exploit the *UNIEMENS* declarations archive, which provides information on working histories and job characteristics for all non-agricultural private sector employees. This source is based on mandatory communications that firms file monthly to social security for social security contributions purpose. We use this source to compute the time spent in non-employment before a finding a new job (see below for details) and assess its characteristics.

For the analysis, we restrict the main analysis to OUNR recipients with monthly gross pre-unemployment earnings within a 200 Euro radius around the threshold (from 1,666 to 2,066 Euro in average earnings in the three months before layoff) and below 50 years of age (thus, eligible to 8 months of benefits). We exclude observations with missing end date for the unemployment benefit, with implausibly high benefit amount (i.e.

exceeding the maximum monthly amount attainable by law) and for whom it is not possible to identify the pre-unemployment employer in the UNIEMENS data. This last group usually includes workers in schools, postal workers or workers from firms partly belonging to the public sector. Finally, we do not consider workers suspended for a temporary slowdown in the economic activity as, in their case, the benefit had a different structure and they still keep a close relationship with their previous employer.

Throughout the paper, we use as our main outcome time in non-employment and we compute it by counting the number of days between the date of the layoff originating the unemployment benefit spell and the date of reemployment in the private sector.[3] We take as a valid date for re-employment the first employment date after the reported end of the benefits. In absence of that, we take the first reemployment date after the end of the last job. Hence, non-employment duration refers to the time that the worker spent after the end of her previous job and before finding a new job in the private sector. Time in unemployment is not reported in the data and time in non-employment duration has the further advantage that it allows to ignore issues related to transitions outside the labour force which are common at exhaustion of unemployment benefits (Card et al., 2007b).

Our final sample contains 137,602 spells for 132,767 workers. Summary statistics are reported in Table 1. Average earnings amount to 1,825 Euro, workers spend on average 24 weeks on unemployment benefits and about 47 weeks in non-employment before finding a job in the private sector. About 36% of the workers are recalled by the same firm after the end of the non-employment spell, and 23% of them do not appear in the private sector within 2 years after the loss of the employment. We censor non-employment at 2 years after layoff. Workers in the sample are mostly male and they were on average about 38 years of age. In terms of geographic area, about 45% of them worked in the North of the country, another 38% worked in the South and the remaining in the Centre. They mostly come from blue collar jobs (74%) and have overwhelmingly (97%) full time contracts. Interestingly, half of the workers were on temporary contracts at the time of layoff. They earned on average 72 Euro per day in the six months prior to the layoff, which corresponds to about 1,880 Euro per month.[4] They spent about 16 years on the labour market before the layoff originating the unemployment spell and about 3.5 years within their last firm. About half of the workers were employed in small firms (defined as firms with less than 15 employees), one fifth in medium-sized firms (between 15 and 49 employees), and 27% in larger firms (50 employees or more), which is coherent with the large fraction of workers employed in small firms in Italy.

[3] Social Security archives do not provide information on reemployment in the public sector.

[4] Daily wages are computed from the Uniemens workers' history and do not necessarily correspond to the measure reported in the SIP data. The monthly figure is obtained by multiplying the average daily wage by 26 days, which is the number of paid days per month according to the social security.

4 Estimation Strategy

The double cap provision in the law, which induces a sharp discontinuity in the benefit level at the wage cutoff, configures a quasi-experimental variation in the generosity of the benefit. Under the assumption of random allocation of the individuals around the earnings threshold, this can be exploited in a Regression Discontinuity Design (RDD) approach. Comparing individuals with earning levels just below and just above the threshold, hence, allows us to derive a causal estimate of the impact of greater benefit generosity on labour market outcomes. In our baseline specifications, we consider individuals with gross earnings ranging from 200 Euro before the cutoff up to 200 Euro after the cutoff.

In practice, we estimate the following regression model:

$$y_{irt} = \beta_0 + \beta_1 \mathbb{1}(\widetilde{w}_i \geq 0) + \sum_{j=1}^{k} \gamma_j \widetilde{w}_i^j + \sum_{j=1}^{k} \delta_j \widetilde{w}_i^j \mathbb{1}(\widetilde{w}_i \geq 0) + \\ + X_i'\pi + Z_i'\zeta + \eta_t + \theta_r + \epsilon_{irt} \tag{1}$$

where i is the worker, r is the region, and t is the calendar month of 2012. The variable y_{irt} is our outcome of interest. We then include a dummy for having a pre-unemployment monthly wage above the wage cutoff and a k-th order polynomial in the running variable which allows for different slopes on the two sides of the cutoff. We denote the distance between the pre-unemployment wage and the cutoff as $\widetilde{w}_i = w_i - T$ with w being the average wage of the worker in the three months before layoff and T the threshold for the eligibility to the "high ceiling". We further control for a wide range of pre-unemployment worker (X_i) and last firm (Z_i) characteristics. These include: gender and age at layoff of the worker, market experience, tenure, type of contract (permanent/temporary, full-time/part-time), whether the worker is in a white collar job, size of the firm, and NACE sector code.[5] The model also includes calendar month (η_t), and region (θ_r) fixed effects. Our coefficient of interest is β_1, which identifies the effect of the more generous unemployment benefit on the outcome y_{irt}. Standard errors are clustered at NUTS3 area level (i.e., province according to the European Nomenclature of territorial units for statistics), but conclusions are unaffected if we use robust standard errors.

We estimate the previous equation via kernel-based local polynomial regression. In this case, given a bandwidth h_n, our estimated treatment effect is $\tilde{\beta}_j(h_n) = \hat{\mu}_{+,j}(h_n) - \hat{\mu}_{-,j}(h_n)$, where $\hat{\mu}_{+,j}(h_n)$ and $\hat{\mu}_{+,j}(h_n)$ denote the intercepts at $\widetilde{w} = 0$ of two weighted jth-order polynomial regressions of y_{irt} on ω, X_i, Z_i, η_t and θ_r run on either side of the threshold.

[5] We use the letter, that is the highest level of aggregation to reduce estimation time.

Bias-corrected point estimates, optimal bandwidths and standard errors are obtained through the procedure described in Calonico et al. (2014b) and implemented in Stata with the `rdrobust` command (Calonico et al., 2014a, 2017). Optimal bandwidth is computed according to the mean squared error criterion. In what follows, we perform our analysis with this approach, while we also report corresponding OLS estimates as a robustness check.

The crucial assumption for our identification strategy is that workers are unable to sort around the cutoff to get higher benefits. We check this in two ways: first, we graphically verify the continuity of the distribution at the cutoff and then we directly assess the absence of jumps for pre-determined characteristics at the cutoff in a regression framework.

In Figure 2, we plot the density of the laid off workers by our running variable $\widetilde{w}_i$ in 5 Euro bins. The Figure does not reveal significant sorting around the cutoff. This is further assessed with a McCrary test (McCrary, 2008) which does not detect any discontinuity of the density at the cutoff. One of the key strengths of this identification strategy is that it is quite difficult for workers to precisely manipulate their earnings and it is even more difficult to manipulate their "theoretical earnings", on which the benefit calculation is based. Hence, self-selection on the side of the cutoff which gives access to higher benefits is difficult. In addition, this trait of the policy was much less well known with respect to other salient attributes such as the age-based rule for duration and eligibility.[6] This makes strategic behavior by workers less likely.

Then, we check for possible discontinuities in observables. We provide a graphical inspection of the behavior of these variables at the cutoff in Figure 3, where we plot the average characteristics by 5 Euro bins of pre-unemployment earnings. In most of the cases, observables are reasonably continuous at the threshold. In a few cases, some difference at the cutoff can be observed: the share of workers in the South shows a peak corresponding the the cutoff, a small jump can be observed for tenure, and the size of the previous firm appears to decline soon after the cutoff. We quantify possible discontinuities by replicating the model described in Equation 1. We run our RDD regressions with only the polynomial in the running variable and the dummy for the discontinuity at the cutoff, and we use our controls as dependent variables. Results are reported in Table 2. The evidence is consistent with the Figures just described: the main differences emerging from the balancing checks indicate that workers above the threshold are 7% less tenured and 17% more likely to work in the South.The change in log firm size is close to 13% but it is very imprecisely estimated. Otherwise, all differences in controls are quantitatively small and far from statistical significance. We also include in our checks the experience of worker on the labour market (i.e. years

[6]Evidence concerning manipulation in this setting is provided by Citino et al. (2019).

since the first contribution to the social security), to have an additional measure of time spent on the labour market before the layoff, and a dummy for the size of the firm being less than 15 employees. We consider this specific cutoff as it is relevant for Employment Protection Regulation in Italy in this period. Neither of these variables shows any discontinuity. Overall, the results of this exercise are encouraging and support the causal interpretation of our results.

5 Results

5.1 Previous Wages and Benefit Generosity

As a first step, we verify whether being on the right hand side of the cutoff is associated with higher unemployment benefit levels in the data. This exercise corresponds to what we could define as the "first stage" of our analysis. Given that the caps are defined for monthly benefits, we compute the monthly benefit level by taking the ratio between the total amount of the benefit received by the worker and the number of weeks during which the worker received it, and then multiplying the resulting number by a 4.33 factor (number of weeks per month). This corresponds to the actual computation of the monthly benefits at the Social Security Institute. For the sake of simplicity, we focus here on workers who received benefits for at most 6 months since these workers receive the same benefit level over their entire unemployment spell. The computation for this group is straightforward and it allows to identify to what extent the caps affect benefits at the beginning of the spell, when the difference in benefit amount is more marked.

We plot the average benefit level for each 5 euro bin within 200 euro on each side of the cutoff in Figure 4. The corresponding picture for the entire population of OUNR recipients is reported in Figure A1 in the Appendix.

The discontinuity is clearly visible. Workers with pre-unemployment monthly earnings exceeding the threshold receive a higher average monthly benefit payment and the plot shows a clear jump at the cutoff: the discontinuity corresponds to about 170 Euro. The average benefit received by workers on the left hand side of the cutoff, and thus only entitled to the "low" ceiling, amounts on average to 951 Euro, slightly higher than what is provided for by the policy (by about 20 Euro per month), while, for workers on the right hand of the cutoff, the average monthly benefit amounts to about 1,119 Euro. Hence, crossing the cutoff leads to a 17.7% increase in the unemployment benefit generosity, at least for the first six months. This is somewhat less than foreseen by the law but it still represents an important change in the level of the benefit and should provide workers with a sufficient margin to change their job search behaviour.

5.2 Benefits Generosity, Benefit Duration, and Time in Non-Employment

We now move to our main outcomes and assess the effect of higher benefit generosity on the duration of the benefit ("Time on Benefit") and of the non-employment spell ("Non-employment").

We start with a graphical inspection in Figure 5. Panel (a) reports the time on benefits. A small discontinuity can clearly be detected at the cutoff, with workers on the right side of the threshold spending about one additional week on benefits compared to workers with lower earnings. The time spent in non-employment shows a similar discontinuity. We then assess these discontinuities quantitatively by relying on the regression framework described in Section 4. Results are reported in Table 3. The first two Columns display the results for the two main duration outcomes without any additional control. Specifically, we consider the following outcomes: the duration of the benefit in weeks (Column 1), and the weeks spent in non-employment before finding a job (Column 2). We replicate the same set of regressions with the addition of controls (Column 3 and Column 4) for individual, previous contract and firm characteristics, and fixed effects for calendar month and region.

Our results indicate that more generous benefits lead workers to spend more time on benefits (about 1.33 week) and more time in non-employment (about 2.75 weeks). The inclusion of controls improves the precision of the estimates and reduces the magnitude of the coefficients (about 0.86 weeks and 1.87 weeks, respectively). The magnitudes of these effects are generally small: more generous benefits lead to an increase in benefit duration and non-employment by about 4% with respect to the baseline. Throughout the analysis, the baseline for the dependent variable is computed as the average for workers with average pre-unemployment earnings between 50 and 5 Euro before the cutoff. These effects correspond to an elasticity with respect to benefit generosity close to 0.30, which is lower with respect to other estimates for benefit level (Landais, 2015; Card et al., 2015; Kolsrud et al., 2018).

We perform several robustness checks to assess the stability of our estimates. First, instead of estimating our RDD coefficients via the `rdrobust` algorithm by Calonico et al. (2017), we employ a simple OLS estimator including a second-order polynomial, allowing for different slopes below and above the cutoff, of (re-centered) pre-unemployment wage. The sample for these estimates is limited to a 50-euro window around the cutoff to remain close to the sample selected by the non-parametric estimator. Results for both the balancing checks and the main estimates are reported in Appendix (Table A1 and A2) and are in line with our main findings. Second, we verify whether the order of the polynomial employed in the local RDD affects our coefficients. Table A3 in the Appendix,

which considers polynomials from 0 to 3 in the running variable, shows that the main coefficient is remarkably stable to this choice for our two main outcomes, especially for lower polynomial orders. The choice of the clustering also does not play a relevant role and, if anything, results are more precise with robust standard errors, as reported in Table A4 in the Appendix. Finally, we employ local RDDs at different points in the pre-unemployment wage distribution with a 50 Euro radius to check whether we find similar discontinuities in our outcomes at points in the distribution of pre-unemployment wage without any discontinuity in benefit generosity.[7] The results of these placebo checks, reported in Figure A2 in the Appendix, highlight that the coefficients at the cutoff stand out for both outcomes considered with respect to the other coefficients, which are often very close to zero and none of them is statistically significant at 5%.

We further characterize workers' behavioral responses by looking at the time pattern of the difference in reemployment between treated and control workers over the two years window of observation. We estimate the difference in survival in non-employment by running our regression model with dependent variable a dummy that takes value one if the duration of the non-employment spell exceeds a particular duration T_h. We perform this estimation for each month within the two years period and consider the coefficient of being eligible to higher benefits: the resulting estimates represent the difference in survival in non-employment between workers subject to different benefit levels in each period of our time horizon. In practice, we estimate the following equation and plot β_{1h} coefficients for each time horizon:

$$\begin{aligned}\mathbb{1}(d_{irt} > T_h) =&\beta_{0h} + \beta_{1h}\mathbb{1}(\widetilde{w}_i \geq 0) + \sum_{j=1}^{k} \gamma_{jh}\widetilde{w}_i^j + \sum_{j=1}^{k} \delta_{jh}\widetilde{w}_i^j \mathbb{1}(\widetilde{w}_i \geq 0) + \\ &+ X_i'\pi_h + Z_i'\zeta_h + \eta_{th} + \theta_{rh} + \epsilon_{irth} \end{aligned} \tag{2}$$

Resulting coefficients, together with 95% confidence intervals, are reported in Figure 6.

The higher level of generosity has its largest effect in the early part of the spell (where indeed the difference in monthly benefits is more marked): by the fifth month in the spell, the difference in the probability to exit non-employment towards employment exceeds 4 percentage points. The difference between the two groups reemployment rates starts declining after the sixth month. This suggests that workers with more generous benefits increase their search effort once experiencing a decline in the amount of benefits. Indeed, after the sixth month, the replacement rate declines to 50%, which induces a change in the benefit level for workers with more generous benefit levels, while workers

[7] We do not perform this exercise for placebo cutoffs that would include the true cutoff within their bandwidth.

subject to the lower cap do not experience any change in their benefit level .[8] By the tenth month, there is no longer any statistically significant difference between the two groups survival in non-employment and, by the end of the observation period, remaining discrepancies in the probability of having found a job are virtually zero.

6 Benefit Level, Benefit Duration, and the Behavioural Cost of Insurance

We then assess the relative cost of providing insurance at different points in the non-employment spell by comparing the moral hazard costs generated by two different policy variations. The first is the higher benefit level based on the wage discontinuity, which we discussed in the previous sections. The second is a change in benefit duration generated by an age-based discontinuity in potential duration: at the age of 50, UB recipients are eligible to 4 additional months of UB duration. Both discontinuities imply higher total transfers to workers but act on different points of the unemployment spell: the former increases the level of the monthly benefit at the beginning of the spell; the latter flattens the benefit profile by increasing the number of months over which the unemployment might keep collecting benefits.

In order to have a standardized measure of the moral hazard cost of insurance associated with both discontinuities, we follow Gerard and Gonzaga (2021) and Schmieder and von Wachter (2017). For both policy changes, we rescale the behavioural cost (i.e. the extra expenditure coming from a change in search effort by workers) by the mechanical cost (the extra expenditure entailed by the change in the policy without any behavioral response by the workers) and compute the BC/MC ratio.

For the change in UB level, we compute the BC/MC ratio as follows:

$$\frac{BC}{MC} = \frac{\sum_{j=1}^{8}(S_j^H - S_j^L)b_j^H}{\sum_{j=1}^{8} S^L(b_j^H - b_j^L)} \tag{3}$$

Where S_j^H is the probability to remain in non-employment at month j after the layoff for individuals above the wage threshold; S_j^L is the probability to remain in non-employment at month j after the layoff for individuals below the threshold; b_j^H and b_j^L are the levels of the benefit at month j for individuals above and below the cutoff, respectively.

[8] The implied level of UB is above the lower cap both with a 60% and 50% replacement rate.

For the change in UB duration, we employ the following computation:

$$\frac{BC}{MC} = \frac{\sum_{j=1}^{12}(S_j^H - S_j^L)b_j}{\sum_{j=9}^{12} S_j^L b_j} \tag{4}$$

Where S_j^H is the probability to remain in non-employment at month j for a worker on longer benefit duration; S_j^L is the probability to remain in non-employment at month j after the layoff for a worker on a shorter benefit duration; b_j is the levels of the benefit at month j calculated at the left of the threshold of pre-unemployment wage for the change in generosity. Notice that the mechanical component at the denominator only includes months covered by the longer benefit duration, from the ninth to the twelfth.

This formulation does not include the additional costs arising from lower collected taxes. Indeed, the longer time spent in non-employment not only leads to more expenses from the government through higher benefits paid but also reduces its revenues through lower payroll taxes. To include the loss in revenues in the behavioural costs, we apply a 3% tax rate, as common practice in the literature (Schmieder and Von Wachter, 2016), to the pre-unemployment salary and compute the total loss in revenue over two years.

We provide a graphical intuition of these two components for the two policy changes in Figure A3 in the Appendix. The continuous line represents the survival in non-employment under the baseline regime and the dashed line represents the survival curve under the more generous regime. Since workers decrease their search effort under the more generous regime, the survival curve is shifted upward with respect to the curve under the baseline scheme. The light-grey shaded area is proportional to the mechanical cost, since it represents the time on the more generous regime (longer duration in Panel a and higher benefit level in Panel b) without any change in the search behaviour of the worker. The dark grey shaded area, instead, is proportional to the behavioural cost, since it represents the increase in time on unemployment benefits coming from how individuals respond to the more generous benefits.

6.1 Sample Definition

To perform our analysis, we split the sample in three groups: first, we define the control group for both empirical exercises as all workers below 50 years of age and below the wage cutoff; then, we define the treatment group for higher generosity as those workers with less than 50 years of age but above the wage cutoff; finally, we define the treatment groups for longer duration as the group of workers who are above 50 years of age but below the wage cutoff. Ideally, this allows us to estimate what would happen to individuals in the control group (below 50 years of age at the moment of layoff and below the wage cutoff of 1,866 Euro per month) if they were to receive either treatment,

and the implied moral hazard cost.

We restrict the sample to individuals between 40 and 60 years of age to remain reasonably close to our age discontinuity, and within the 200 Euro radius from the wage threshold, as in the analysis above. Then we perform two separate RDD estimations: the first, in line with previous estimates, to assess the effect of higher benefit generosity in our subsample, and the second one to investigate the effect of longer benefit duration by exploiting the age discontinuity in potential benefits, as in Scrutinio (2019).

Given our definition of treatment groups, we compute the change in overall benefit levels implied by each treatment. In the first case, as we discussed earlier, changing benefit levels implies an overall change in benefit generosity of about 13% of the total benefit amount (1,013 Euro with respect to a maximum at baseline of 7,569 Euro). In the second case, changing benefit duration determines an increase in the maximum attainable benefits of about 42% (3,200 Euro with respect to a maximum benefit transfer of 7,569 Euro for those below 50 years of age). Ideally, we would like to have a setting where the overall amount of unemployment benefit would not be different under the two policies but this is unfortunately not the case. Given this limitation, to be able to compare the behavioral changes implied by the two policy variations, our analysis crucially relies on the assumption that treatment effects are linear.

6.2 Treatment Effects and Moral Hazard Costs Comparison

To compare the effects of the two policies in terms of their insurance cost, we start by validating our main effects of interest, a higher benefit generosity on non-employment duration for our subsample. Results, reported in Table A6 in the Appendix, are consistent with those from our main sample although somewhat smaller in magnitude and less precisely estimated.[9] In order to compare survival curves of individuals on the two sides of the cutoff, we perform our regression discontinuity analysis similarly to Equation 2,[10] and we estimate the survival curves by projecting the local polynomial at the cutoff from the two sides of the threshold.[11] Panel (a) in Figure 7 reports the estimated survival curves. Reassuringly, the observed survival pattern shows a more marked difference in job finding rates in the first six months of the unemployment spell. The resulting BC/MC ratio is 0.41, which implies that providing an additional Euro of insurance through higher benefit generosity costs an additional 0.41 Euro due to changes in workers' search effort.

[9] This suggests that our results on this subsample would represent a lower bound with respect to what would be obtained with the overall sample. This estimate is also close to the one for the overall sample after accounting for controls.

[10] We include only a wage polynomials and the dummy for being over the wage cutoff.

[11] We approximate this by using the command `rdplot` and taking the predicted values of the polynomial for the individual closest to the cutoff on each side.

We then move to assess the behavioural cost of the change in benefit duration. To this purpose, we exploit the duration discontinuity determined by the age-at-layoff cutoff rule: individuals who are laid off before turning 50 are entitled to 8 months of benefits, while individuals laid off at a later age are entitled to 12 months of benefits. As classical identification checks highlight local manipulation in the frequency of layoff around the cutoff, in line with evidence of Citino et al. (2019), we implement a donut RDD (Barreca et al., 2011) excluding a radius of 6 months around the cutoff. After accounting for manipulation, standard balancing checks do not reject the absence of discontinuity in observables at the cutoff for any control variables except for a difference in the share of white collar workers.[12] To provide an initial quantitative assessment of the effect of longer duration, Table A7 in the Appendix reports the estimates of the impact of a four months benefit duration extension on our main outcomes: it leads to an additional 8 weeks in unemployment benefits, and to 5 additional weeks in non-employment within two years since layoff. Then, similarly to the previous case, we estimate survival curves for individuals above and below the age cutoff and compute the BC/MC ratio. We plot the resulting survival curves in Figure 7, Panel (b). The resulting BC/MC ratio is 0.21, smaller than the one estimated for the change in benefit levels. This implies that the policy costs in terms of behavioral responses are greater for increases in benefit levels occurring from the very start of the non-employment spell.

The discussion, so far, only concerned the cost part of the analysis for optimal unemployment benefit generosity without referring to the consumption gains. Indeed, if consumption smoothing effects were stronger for one of the two treatments, then the government might be faced with a trade off between higher cost and, possibly, higher insurance. In our setting the lack of actual or proxy data on consumption prevents us from explicitly investigating directly this important aspect of the analysis. We can, however, provide some tentative assessment by studying the selection of the unemployed over the non-employment spell. This would allow us to characterize who is going to benefit from the two different policy variations and to understand who is more likely to benefit from the provision of additional insurance.

In this perspective, the presence of savings plays a crucial role. Indeed, if workers are less likely to save, they might run out faster of resources to fund their consumption and higher benefits could then be particularly beneficial for them. We proxy available financial resources and ability to smooth consumption through savings by computing the cumulative pre-unemployment wages over the 5-years preceding unemployment (2006-2011) for our control group (i.e., workers below 50 and below the wage cutoff). Then, we plot the average of this measure for workers still non-employed at each point of our two years time horizon in Figure 8. First, Panel (a), which reports the average

[12] Results are reported in Table A5 in the Appendix.

for all workers, shows that on average these workers, despite having high wages with respect to the other unemployed, still have low overall earnings: at the start of the spell, they earned 80,000 Euro, about 1,000 net Euro per month.[13] Thus these workers might have limited ability to save in order to sustain their consumption during unemployment. Second, results provide some evidence of negative selection in long term unemployment, which seems to be reversed after the first six months of non-employment. Panel (b) and Panel (c) shed light on this dynamic by showing the same measures for workers previously on permanent and temporary contracts, respectively. For UB recipients previously on permanent contracts, the average level of earnings in the 5 years before layoff declines from about 87,000 to about 85,000 over the first 5 months of the unemployment spell, and then stabilizes. For UB recipients previously on temporary contracts, the decline in average earnings over the past 5 years persists over the whole observation period. The graph implies that the average level of past earnings over 5 years is almost 5,000 Euro less for temporary workers that are still unemployed after 5 months than at the beginning of the spell, it remains relatively stable until 10 months of non-employment, and then takes a permanently declining trend.

The figure for the whole population of non-employed in Panel (a) reflects these dynamics and the changing composition of the unemployed pool over the spell. Indeed, as we show in Figure A4 in Appendix, the share of workers with permanent contracts stably increases over the spell, indicating that workers with temporary contracts tend to exit unemployment earlier. Since these workers have lower earnings, when they exit unemployment the average earnings for those still unemployed increase. This compositional change offsets the decline in average earnings for both groups of workers and explains the increase in Panel (a) of Figure 8 between month 5 and 10.

These figures suggest that the uncertainty about employment prospects affects workers previously on permanent contracts relatively more strongly, and that, on the contrary, the negative selection on earnings affects temporary workers relatively more. Indeed, many workers, especially workers on temporary contracts, experience unemployment cyclically due to their activity and tend to exit early from unemployment (Scrutinio, 2019). These workers can predict fairly well their time without a job and plan their consumption accordingly. Hence, offering a higher benefit to these workers early in the spell may have distortionary effects. On the other hand, these workers experience a more marked negative selection over earnings, making a stronger case for a greater generosity by the end of the unemployment spell. The negative selection on earnings is milder for previously permanent workers, but is still present.

[13]For comparison, the 2012 poverty line for a single worker was about 970 Euro in the North, 940 Euro in the Centre and 720 Euro in the South. Source:https://www.istat.it/it/dati-analisi-e-prodotti/contenuti-interattivi/soglia-di-poverta

Overall, this analysis suggests that some negative selection in long-term unemployment is present and, consequently, higher benefits in the later part of the unemployment spell might provide additional consumption gains. In addition, they would also target workers who experience more uncertainty in their job prospects. According to our results, these will typically be workers who lost a permanent contract and had difficulties in finding a job in the short term, or workers previously on temporary contracts who might be facing unexpectedly longer unemployment spells.

These considerations lead us to two conclusions: first, in presence of dual labor market, it would be appropriate to consider separately workers with a more continuous relationship with their employer and workers subject to more cyclical employment patterns; second, more generous unemployment benefits in the latter part of the spell are likely to target individuals with lower income and more unpredictable duration of unemployment and who might, hence, benefit more from additional insurance. This suggests that a flatter benefit profile could provide better insurance against unexpected income shocks.

Such reasoning, which leads policy makers to provide more generous benefits later in the spell, could be also supported by distorted belief in terms of exit from unemployment. Indeed if job seekers are overoptimistic about their probability of finding a job (Spinnewijn, 2015; Mueller et al., 2018), they might over consume in the early months of their unemployment spell and experience larger consumption drops in later months. This conclusion is in line with recent results based on rich administrative data from Sweden by Kolsrud et al. (2018). The authors show that unemployed workers respond more to early changes in unemployment benefits with respect to changes later in the spell, and that long term unemployed suffer from consumption losses in their unemployment spell. As longer benefits can be assimilated to higher benefits in a later part of the unemployment spell, our results contribute to this seminal evidence by showing that costs in the early part of the spell seem to be larger with respect to providing benefits later, while selection into long term unemployment suggests larger consumption smoothing effects.

Our results are characterized by a few limitations. First, our regression analysis exploits only local variation in eligibility rules which concern individuals with relatively high wage among the unemployed and in a late part of their work career. This should call for some caution in extending our conclusions to the overall workforce. This is a common limitation to studies applying our methodology and additional evidence would be necessary for a wider application. Due to the characteristics of our institutional setting, we cannot extend the analysis in this sense. A possible second concern is that the two treatment groups (the one for higher benefit generosity and the one for longer duration) are characterized by a few differences in observables, which might lead to heterogeneity in the underlying structural parameters for the treatment effects. As shown in Table A8 in the Appendix, workers in the age treatment have slightly lower

salaries, are older, as we could expect from the definition of the two groups, more likely to be women and have contracts of slightly lower quality. All these elements suggest that, if anything, their treatment effect for higher UB should be larger than what we would get with a comparable group: first, as they are more liquidity constrained (lower salary), they might experience larger liquidity effects; second, we show in Section 7.2 that women tend to be more responsive to more generous benefits. Hence, we may consider the BC/MC we estimated for longer benefit duration as an upper bound for the one we would get in presence of perfectly overlapping groups. Finally, our analysis relies on linear treatment effects, as the two variations entail different changes in the overall amount of the benefits paid to workers. Also in this case, however, we might believe that this leads our estimates for the effect of longer benefit duration to be an upper bound. Over-optimistic workers might apply a higher discount to benefits received later in their unemployment spell or consider them less relevant for their early search choices. Hence, a higher level of the transfer, which would make these quantities more salient, would generate larger responses than an equivalent change in later months (1,013 Euro change in total generosity). These consideration further reinforce our conclusions.

7 Extensions for the Effect of Benefit Generosity: Job Quality and Heterogeneity

7.1 Effects on Job quality

The differences in the reemployment probability identified for the early months of the non-employment spell may indicate that workers eligible to more generous benefits are less subject to liquidity constraints. This allows them to be more likely to reject suboptimal job offers, and to better match their next job with their profile or expectations (Marimon and Zilibotti 1999; Acemoglu and Shimer 1999). In addition, higher benefits might increase reservation wage and lead to higher wages in the new jobs for workers under the more generous scheme. Results in the literature are ambiguous for benefit duration, with Nekoei and Weber (2017) finding small positive effects and Schmieder et al. (2016) finding small negative effects. Much less is known concerning the impact of higher benefit level. In this section we look at these effects by studying the impact of higher benefits levels on job quality. To do so, we look at differences in the characteristics of the first job found after the non-employment spell.

We study different dimensions of job quality. First of all, job quality is usually proxied by wage (e.g. Ehrenberg and Oaxaca, 1976; Tatsiramos and van Ours, 2014; Card et al., 2007a; Nekoei and Weber, 2017). However, if labour market rigidities in wage setting limit the ability of employers to offer heterogeneous contracts and the possibility

of workers to bargain on wages, workers may seek to improve their job along other dimensions, e.g. they might look for more a stable contract. Hence, a second proxy for job quality that we include is the probability to get a permanent or a full-time contract. Third, in line with Centeno (2004), we include job tenure in weeks as a proxy for the match quality as a whole. Indeed, if match quality is an experience good (Jovanovic, 1979), in the sense that the quality of the match is not known ex ante and can only be experienced, and if non-pecuniary aspects affect the probability of individual quits (Akerlof et al., 1988), "good matches will endure" (p. 840). Fourth, we compute total earnings in the new job over a horizon of one year, which should combine the effects on wage and on tenure. Finally, we look at mobility across firms, and we study whether greater generosity increases the probability that the worker searches over a large set of firms and is less likely to go back to the firm that originally laid off the worker.

Overall, the results, reported in Table 4, show only negligible effects on job quality.[14] Most of the estimates are close to zero and all coefficients are far from being statistically significant.[15] Note that these coefficients are not affected by selection into employment as long run differences in reemployment probability are negligible by the end of our observation period (see Figure 6).

7.2 Heterogeneity

Then, we explore how different groups of workers according to individual and pre-unemployment job characteristics respond to higher benefit levels.

Available evidence suggests that the same policy can have very different effects depending on the target population. Card et al. (2010), for example, show that the effectiveness of active labour market policies varies considerably across groups of individuals, and Nekoei and Weber (2017) present similar evidence for the effect of longer unemployment benefits on non-employment duration and job quality. In this spirit, we investigate whether the generosity of unemployment benefits impacts differently on various groups of workers. We consider several worker and past job characteristics such as: gender, type of contract, age, firm size, and geographic areas.

Results of our estimation are reported in Table 5. The effects of benefit generosity on the duration of the time on benefit (Panel a) and on the non-employment duration

[14] Results are robust when implementing classical parametric OLS estimates of our specification (Table A9).

[15] In Appendix Table A10, we study the effects of increasing benefit levels on a set of additional job quality characteristics. The results broadly confirm the result that greater generosity does not affect job quality. The only exception in this respect seems to be that unemployed workers with more generous benefits tend to target firms with larger shares of white collar workers. There also appear to be a small effect on the probability that workers claim disability benefits, which suggests that workers may be seeking for jobs that require less physical effort.

(Panel b) indicate larger effects of benefit generosity for women, workers previously with permanent jobs, coming from larger firms and residing in the North-Centre.

We also look at possible differences in the effectiveness of more generous benefits in aiding workers to find a better job. Table 6 shows that being eligible to more generous benefits generally has a negative effect on post-unemployment wages (reported in Panel (a)), which could be as high as a 4% wage loss in the case of workers coming from larger firms. No effect is detected on the characteristics of the new contract in terms of working hours (not reported for brevity). For what concerns job stability, our analysis indicates that the greater benefit generosity makes a difference in women ability to get a permanent job, while it drives no significant changes in the behaviour of men (Panel (b)). Several groups appear to be gaining in terms of tenure in the new job (Panel (c)), with positive effects (3 weeks) for males, workers previously on temporary contracts (4 weeks), and workers in larger firms (above 15 employees), who register the largest increase in future job duration (6 weeks). Males and workers previously on a temporary contract show some tenure gains while experiencing little or no wage penalties, which suggests that they are overall benefiting from higher UB amount. Workers coming from larger firms, instead, seem to implement a trade-off between wages and job duration, with a wage decline of about 4%, but a gain in job duration of about 6 weeks. Panel (d) offers an overall assessment of the effects on of the more generous benefits on future careers by looking at overall take-home pay in the new firm within one year since reemployment. It is interesting to notice that by accounting for both effects on tenure and on wages, most groups seem to benefit from more generous benefits, although estimates are often imprecise.

8 Conclusions

The identification of the optimal structure of unemployment benefits is a long-standing concern in public economics. So far, however, relatively few studies were able to provide causal estimates concerning the effects of changes in the level of unemployment benefits and to compare the fiscal costs of higher generosity at different points in the non-employment spell. This is, however, a crucial concern from a policy perspective, especially in the current circumstances in which many countries are registering large inflows into unemployment due to the labour market effects of the COVID-19 pandemic.

In this paper we exploit a double cap system on the amount of unemployment benefits based on pre-unemployment wage to study the effects of higher benefit generosity on workers' career. By comparing individuals just below and just above the wage cutoff in a regression discontinuity design, we find that an increase in benefit generosity leads to longer time on benefits (about one week) and in non-employment before finding a

new job (about 2 weeks). Then, we exploit a change in benefit duration based on age at layoff (+4 months of potential duration if workers are laid off after turning 50 years of age) to compare the relative cost of providing insurance at different points in the spell. To obtain comparable measures of the behavioral costs of insurance, we normalize the expenditure arising from workers' change in search strategy responses by the additional costs of changing the benefit structure without changes in workers' job finding rates over the spell (BC/MC ratio). We find that the moral hazard costs are greater if higher benefits are provided at the beginning of the spell rather than at the end, with a BC/MC ratio for the effect of higher benefit level being twice as large with respect to the one for longer duration (0.41 and 0.21 Euro per Euro of insurance, respectively). In addition, though we cannot provide direct evidence on consumption we provide evidence of a mild negative selection over the spell and that the long term unemployed might be facing more uncertain job prospects. These elements suggest that higher benefits later in the spell might be also providing additional insurance value. Our findings further question the optimality of declining UB schedules which are common to many countries.

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Tables

Table 1: Summary Statistics for the Sample

Variable	Average	Standard Deviation	Minimum	Maximum
Pre-unemployment earnings (average last 3 months)	1,824.88	109.44	1,666.01	2,065.98
Weeks of benefits	23.61	11.73	0.14	34.29
Duration Nonemployment (censored at 2 years)	46.72	36.55	0.00	104.00
Recall	0.36	0.48	0	1
No job within 2 years	0.23	0.42	0	1
Female	0.29	0.45	0	1
Age	37.76	6.69	25	50
North	0.45	0.50	0	1
Center	0.17	0.38	0	1
South	0.38	0.48	0	1
White Collar	0.26	0.44	0	1
Full time	0.97	0.16	0	1
Permanent contract	0.50	0.50	0	1
(log) Daily wage	4.28	0.31	-3.95	9.13
Market Potential Experience	16.14	8.18	2.00	50.00
Tenure (years)	3.53	3.92	0.08	30.00
(log) Average Firm Size	3.27	2.48	0.00	10.75
Size between 1 and 14 employees	0.54	0.50	0	1
Size between 15 and 50 employees	0.19	0.39	0	1
Size above 50 employees	0.27	0.45	0	1
Spells	137,602			
Workers	132,767			
Avg spells per individual	1.036			

Note: Summary statistics at spell level for individuals receiving unemployment benefits and pre-unemployment earnings within a radius of 200 Euro around the cutoff. The sample excludes individuals coming from the public sector, individuals with seasonal contracts. Weeks of non-employment defined as the distance between the layoff originating the unemployment benefit and the first hiring date after the end of unemployment benefit. Market potential experience defined as the number of years since the first contribution to the social security. Tenure defined as the number of years, even with breaks, spent with the same employer with any contract.

Table 2: Balancing Regressions for Discontinuity in Observable Characteristics at the Cutoff.

Variables	(1) Female	(2) Age	(3) South-Islands	(4) Permanent	(5) Tenure	(6) Mkt Pot. Exp.	(7) Full Time	(8) White Collar	(9) (log) Firm Size	(10) Size:≤15
Above Cutoff	-0.012	0.049	0.065***	0.02	-0.256**	-0.115	-0.008**	0.021	-0.133	0.026
	(0.013)	(0.170)	(0.019)	(0.023)	(0.102)	(0.304)	(0.003)	(0.018)	(0.082)	(0.023)
Observations	137,602	137,602	137,602	137,602	137,602	137,602	137,602	137,602	137,602	137,602
Obs. used	17,584	45,680	29,119	40,303	27,192	29,989	17,584	14,485	34,914	35,580
Mean	0.248	39.011	0.37	0.536	3.818	16.402	0.975	0.216	3.248	0.556
Clustered p-value	0.332	0.772	0.001	0.378	0.012	0.706	0.015	0.236	0.105	0.241
Robust p-value	0.494	0.788	0.004	0.456	0.034	0.816	0.009	0.178	0.297	0.301
Order Poly	1	1	1	1	1	1	1	1	1	1
Order Bias (q)	2	2	2	2	2	2	2	2	2	2
Bandwidth	27.84	69.08	45.46	61.64	42.83	46.68	27.73	22.4	53.75	54.35

Note: Results of local polynomial Regression Discontinuity Design with procedure developed by Calonico et al. (2014a, 2017). The regression includes the running variable with a polynomial of degree one and a dummy for being on the right-hand side of the cutoff. The coefficient for the dummy is reported. Estimation based on triangular kernel and optimal bandwidth. Standard errors clustered at province level. Level of significance: *** p<0.01, ** p<0.05, * p<0.1.

Table 3: Effect of higher Benefit Generosity on Benefit and Non-employment Duration

Variables	(1) Benefit	(2) Non-employment	(3) Benefit	(4) Non-employment
Above Cutoff	1.325***	2.748**	0.863***	1.871**
	(0.376)	(1.386)	(0.289)	(0.825)
Observations	137,602	137,602	137,602	137,602
Obs. used	29,989	29,119	29,989	28,388
Mean	23.239	46.296	23.239	46.296
Controls	NO	NO	YES	YES
Month FE	NO	NO	YES	YES
Region FE	NO	NO	YES	YES
Clustered p-value	0.000	0.048	0.003	0.023
Robust p-value	0.002	0.068	0.007	0.035
Order Poly	1	1	1	1
Order Bias (q)	2	2	2	2
Bandwidth	46.65	45.47	46.56	44.72

Note: Results of local polynomial Regression Discontinuity Design with procedure developed by Calonico et al. (2014a, 2017). Estimation based on triangular kernel and optimal bandwidth. Total number of observations in the sample reported. Columns (1) and (3) report the effect of more generous benefits on benefit duration; Columns (2) and (4) report the effect of more generous benefits on time spent in non-employment before finding a new job (censored at 2 years). Regression includes a first-order polynomial in wage before layoff, a dummy for being on the right side of the wage cutoff (higher benefits), and, from Column (3) to Column (4), fixed effects at region and month level, and controls. Controls include age at layoff, contract and firm characteristics, tenure and experience. Baseline for dependent variable computed as the average for workers laid off within 50 Euro before the cutoff. Standard Errors clustered at province level. Level of significance: *** p<0.01, ** p<0.05, * p<0.1.

Table 4: Effect of Higher Benefit Generosity on New Job Quality

VARIABLES	(1) (log) Daily wage	(2) Full time	(3) Permanent	(4) Tenure	(5) (log) earnings 1 year	(6) Recall
Above Cutoff	-0.010	0.007	0.009	1.978	0.012	-0.002
	(0.013)	(0.009)	(0.012)	(1.389)	(0.026)	(0.014)
Observations	116,123	117,597	117,597	117,595	117,869	117,597
Obs. used	31,094	38,320	23,781	27,959	48,772	24,862
Mean	4.166	0.847	0.252	44.931	8.892	0.351
Controls	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES
Clustered p-value	0.453	0.448	0.457	0.155	0.635	0.886
Robust p-value	0.365	0.520	0.360	0.107	0.633	0.813
Order Poly	1	1	1	1	1	1
Order Bias (q)	2	2	2	2	2	2
Bandwidth	56.03	68.35	43.01	50.72	85.55	45.79

Note: Results of local polynomial Regression Discontinuity Design with procedure developed by Calonico et al. (2014a, 2017). Estimation based on triangular kernel and optimal bandwidth. Regression sample includes only workers finding a job within two years since layoff. Regression includes a first-order polynomial in wage before layoff, a dummy for being on the right side of the wage cutoff (higher benefits), fixed effects at region and month level, and controls. Controls include age at layoff, contract and firm characteristics, tenure and experience. Standard errors clustered at province level reported in parenthesis. Level of significance: *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Heterogeneity: Effects of Benefit Generosity on Duration Outcomes

Variables	(1) Male	(2) Female	(3) Temporary	(4) Permanent	(5) Size>15	(6) Size<=15	(7) North-Centre	(8) South-Island
Panel (a): Benefit Duration								
Above Cutoff	0.750**	0.928**	0.834**	0.966***	0.916**	0.817**	0.857**	0.660**
	(0.372)	(0.468)	(0.408)	(0.361)	(0.372)	(0.336)	(0.402)	(0.268)
Observations	97,665	39,937	68,372	69,230	63,386	74,216	85,954	51,648
Obs. used	20,457	7,754	11,223	17,072	14,040	17,983	21,494	9,719
Mean	23.506	22.426	19.641	26.359	20.578	25.360	21.402	26.366
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES	YES	YES
Clustered p-value	0.044	0.048	0.041	0.007	0.014	0.015	0.033	0.014
Robust p-value	0.045	0.114	0.042	0.025	0.031	0.050	0.083	0.041
Order Poly	1	1	1	1	1	1	1	1
Order Bias (q)	2	2	2	2	2	2	2	2
Bandwidth	40.49	53.95	39.86	47.96	50.92	48.94	53.46	38.76
Panel (b): Non-employment Duration								
Above Cutoff	1.313	3.681***	1.647	1.937*	1.905**	1.927*	2.778***	0.971
	(0.932)	(1.280)	(1.103)	(1.088)	(0.917)	(1.099)	(1.061)	(1.141)
Observations	97,665	39,937	68,372	69,230	63,386	74,216	85,954	51,648
Obs. used	21,931	9,489	11,745	15,562	14,040	21,079	19,652	12,174
Mean	46.375	46.055	34.505	56.524	38.399	52.594	42.549	52.675
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES	YES	YES
Clustered p-value	0.159	0.004	0.136	0.075	0.038	0.080	0.009	0.395
Robust p-value	0.155	0.017	0.132	0.162	0.064	0.170	0.014	0.610
Order Poly	1	1	1	1	1	1	1	1
Order Bias (q)	2	2	2	2	2	2	2	2
Bandwidth	43.14	62.55	41.65	43.80	50.97	56.28	49.57	48.41

Note: Results of local polynomial Regression Discontinuity Design with procedure developed by Calonico et al. (2014a, 2017). Estimation based on triangular kernel and optimal bandwidth. Estimation based on full sample of workers within a 200 Euro radius from the cutoff. Panel (a) reports the effect of higher benefit level on benefit duration across different groups; Panel (b) reports the effect on time in Non-employment before finding a new job. Estimates include controls for age at layoff, contract and firm characteristics, tenure and experience, as well as month and region FE. Polynomial order is 1, order bias is 2. Standard errors clustered at province level. Level of significance: *** p<0.01, ** p<0.05, * p<0.1.

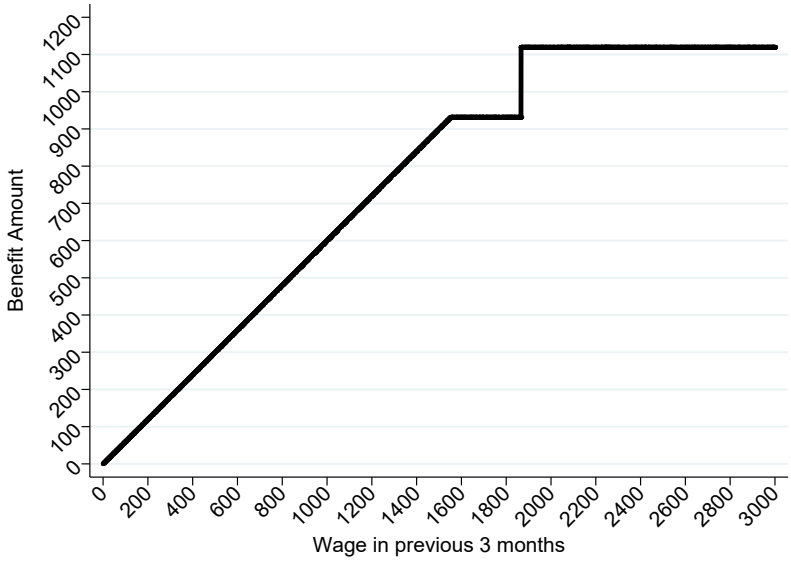
Table 6: Heterogeneity: Benefit Generosity and Quality of New Job

Variables	(1) Male	(2) Female	(3) Temporary	(4) Permanent	(5) Size>15	(6) Size<=15	(7) North-Centre	(8) South-Island
Panel (a): (log) Daily Wage								
Above Cutoff	-0.005	-0.010	-0.004	-0.011	-0.037*	0.004	-0.016	-0.003
	(0.012)	(0.025)	(0.020)	(0.012)	(0.020)	(0.014)	(0.015)	(0.015)
Panel (b): Permanent contract								
Above Cutoff	-0.002	0.032**	0.010	0.002	0.010	-0.006	-0.002	0.008
	(0.012)	(0.016)	(0.012)	(0.018)	(0.015)	(0.013)	(0.014)	(0.014)
Panel (c): Tenure new job in weeks								
Above Cutoff	3.012*	-0.767	4.333**	-0.190	6.421***	-1.497	2.757	0.824
	(1.731)	(2.271)	(1.944)	(1.758)	(2.377)	(1.704)	(1.780)	(1.861)
Panel (d): (log) Total earnings new job in one year								
Above Cutoff	0.008	0.009	0.057	-0.006	0.032	0.003	0.022	0.003
	(0.029)	(0.045)	(0.045)	(0.043)	(0.047)	(0.048)	(0.045)	(0.041)
Order Poly	1	1	1	1	1	1	1	1
Order Bias (q)	2	2	2	2	2	2	2	2
Controls & FE	YES	YES	YES	YES	YES	YES	YES	YES

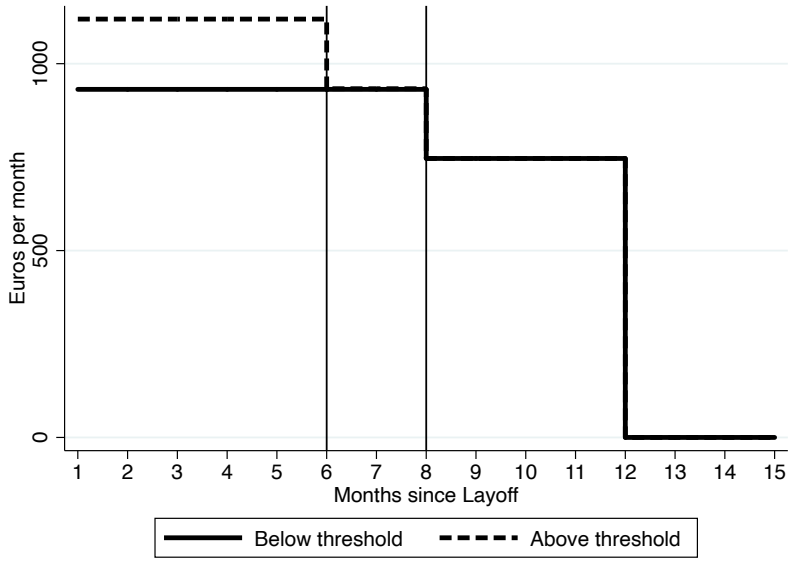
Note: Results of local polynomial Regression Discontinuity Design with procedure developed by Calonico et al. (2014a, 2017). Estimation based on triangular kernel and optimal bandwidth. Estimation based on workers finding a job within two years since layoff. Panel (a) reports the effect of higher benefit generosity on the log of the daily wage in the new job; Panel (b) reports the effect on the probability of getting a permanent contract; Panel (c) reports the effect on the number of weeks with the new employer; Panel (d) reports the effect on the log of total earnings in the new job within one year since reemployment. Regression sample includes only workers finding a job within two years since layoff. Regression includes a first-order polynomial in wage before layoff, a dummy for being on the right side of the wage cutoff (higher benefits), fixed effects at region and month level, and controls. Controls include age at layoff, contract and firm characteristics, tenure and experience. Standard errors clustered at province level. Level of significance: *** p<0.01, ** p<0.05, * p<0.1.

Figures

Figure 1: Benefit Level and Pattern



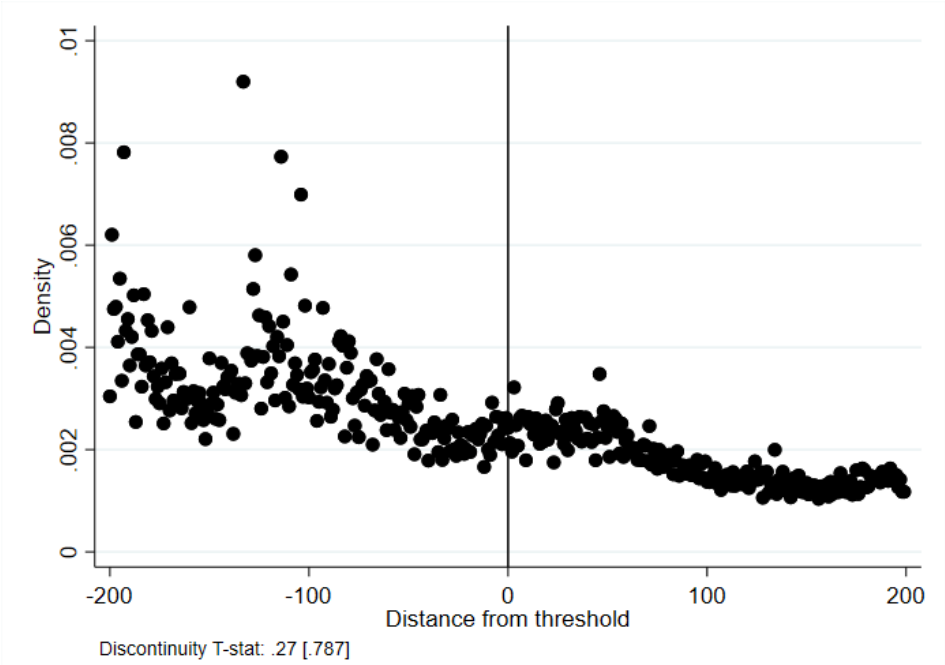
(a) Benefit Level and Past Wages



(b) Benefit Schedule over the Spell

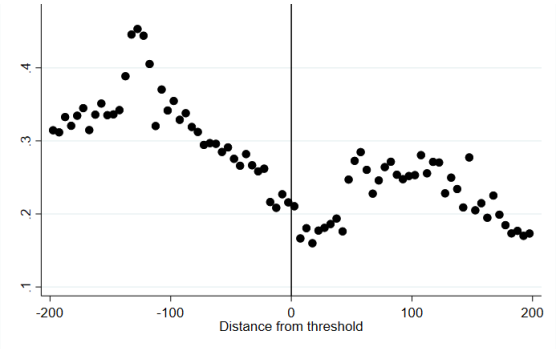
Note: Panel (a) reports the amount of monthly benefit in the first six months over the unemployment spell and average wage in the three months before layoff based on 2012 social security rules. Panel (b) reports the benefit amount for workers above 50 years of age and with wages below and above the 1866 threshold in past average wage over the unemployment spell. The same schedule applies to workers below 50 years of age at layoff but the level of the benefit goes to zero after the first 8 months on benefits.

Figure 2: Density of Unemployment Benefits Recipients by Wage (with respect to Cutoff)

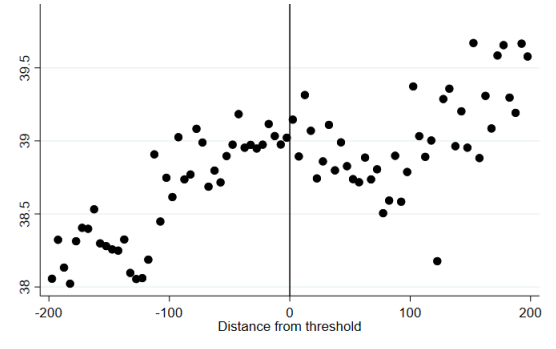


Note: Density of workers receiving unemployment benefits by 5 Euro bins of pre-unemployment wage, re-centered at the cutoff value. Computation includes only workers with a pre-unemployment wage within a 200 Euro radius with respect to the Cutoff. T-statistic for McCrary test for discontinuity reported at the bottom of the graph with the corresponding p-value in parenthesis.

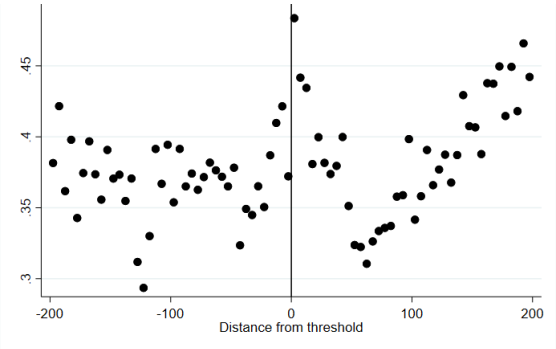
Figure 3: Balancing Checks: Discontinuity in Observable Characteristics at the cutoff.



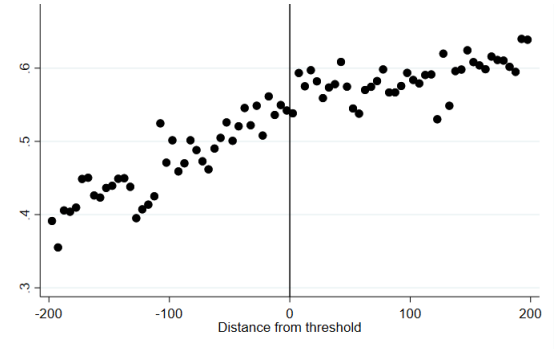
(a) Female



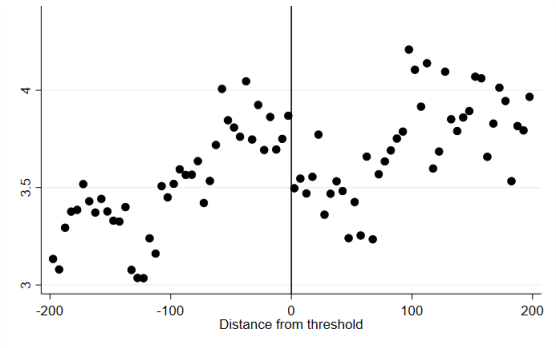
(b) Age at layoff



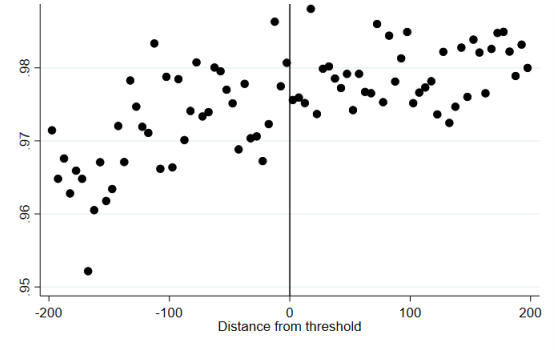
(c) South-Island



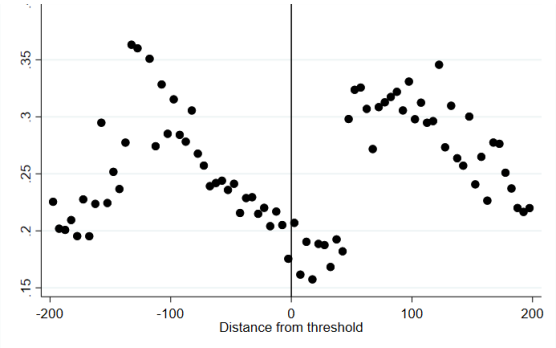
(d) Permanent Contract



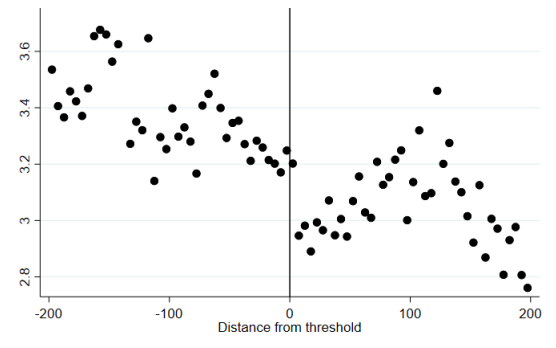
(e) Tenure (years)



(f) Full Time Contract



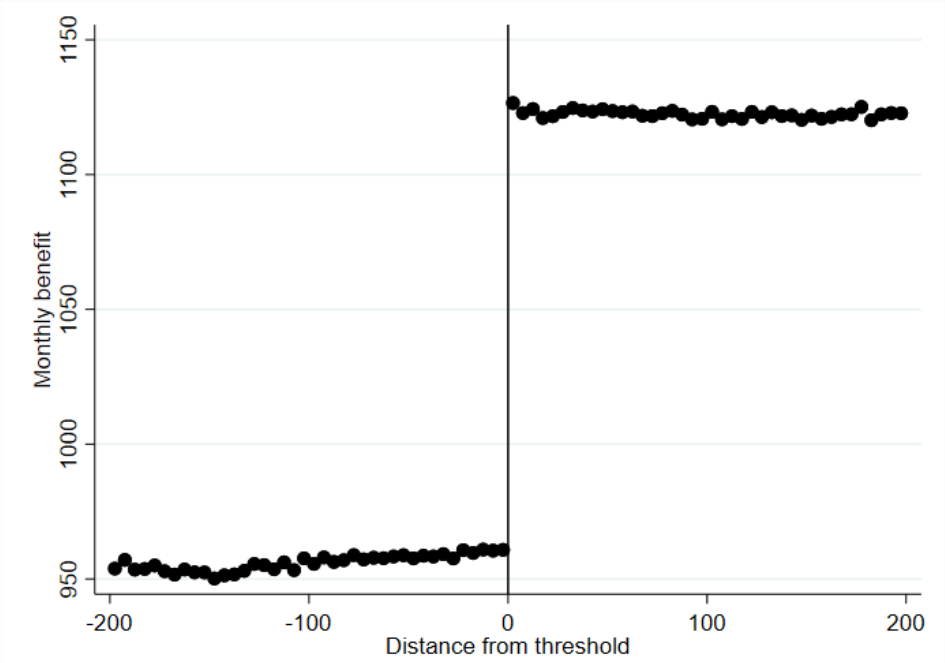
(g) White Collar



(h) (log) Firm Size

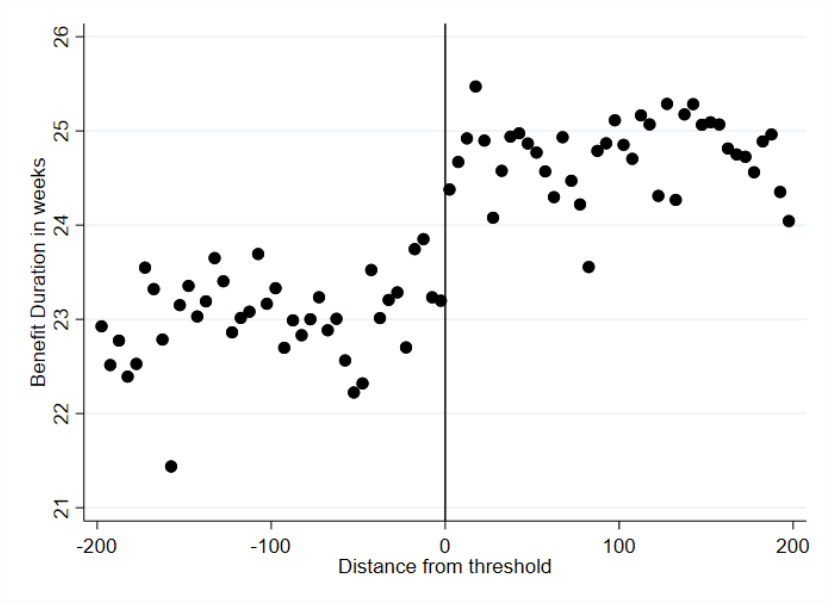
Note: Plots of average characteristics of recipients of unemployment benefits by 5 Euro bins. Computation includes only workers with a pre-unemployment wage within a 200 Euro radius with respect to the cutoff.

Figure 4: Monthly benefit Generosity by Earnings

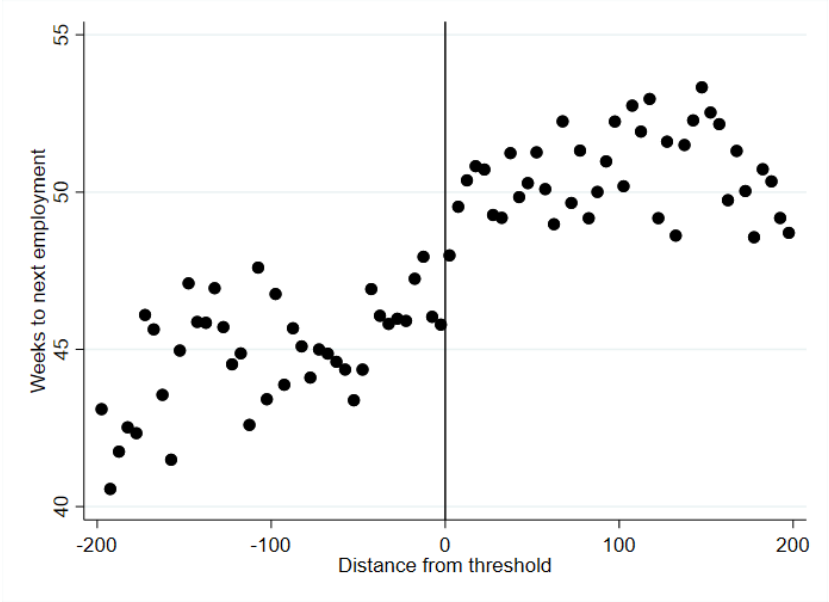


Note: Average monthly benefit level in the first six months of the spell for workers within a 200 Euro radius from the cutoff for pre-unemployment wage. Workers are grouped according to previous wage in 5 Euro bins.

Figure 5: Time on Benefit and Non-Employment by Earnings



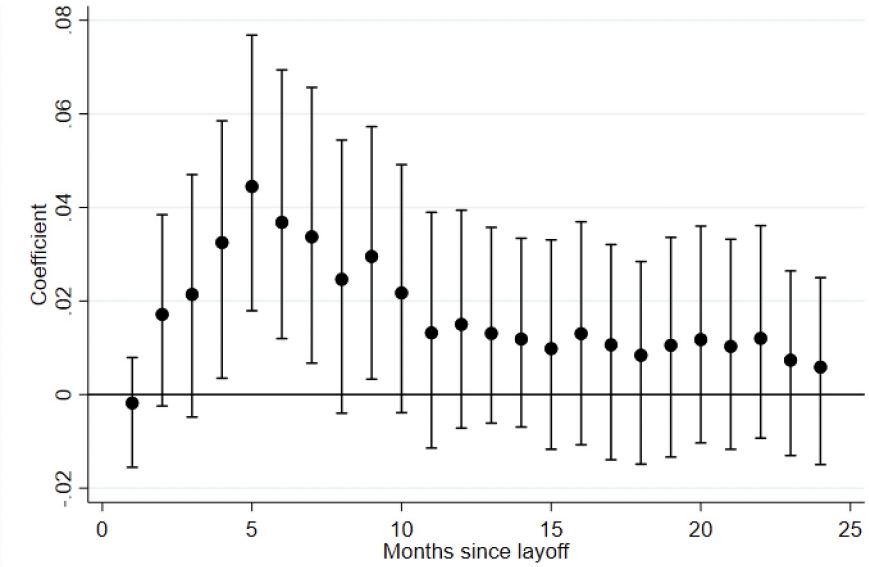
(a) Benefit Duration



(b) Non-Employment Duration

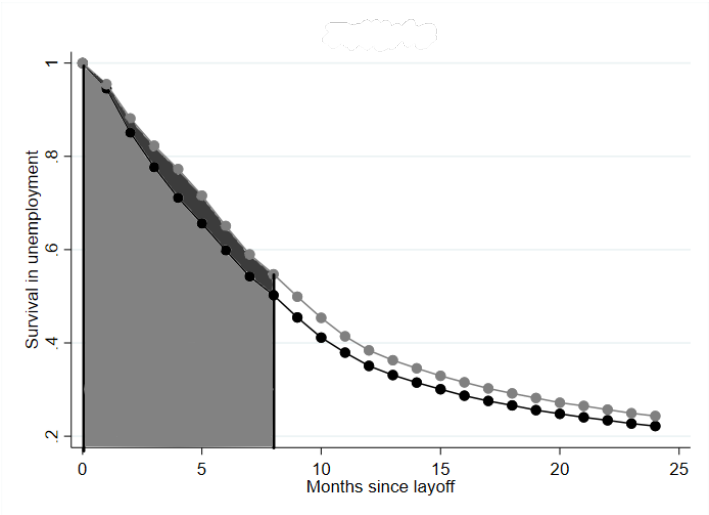
Note: Weeks on benefits and weeks in non-employment before finding a new job in the private sector reported in panel (a) and panel (b), respectively. Workers are grouped in 5 Euro bins in a radius of 200 Euro with respect to the cutoff.

Figure 6: Difference in Cumulative Probability of not Finding a Job between Workers with Higher and Lower Unemployment Benefits

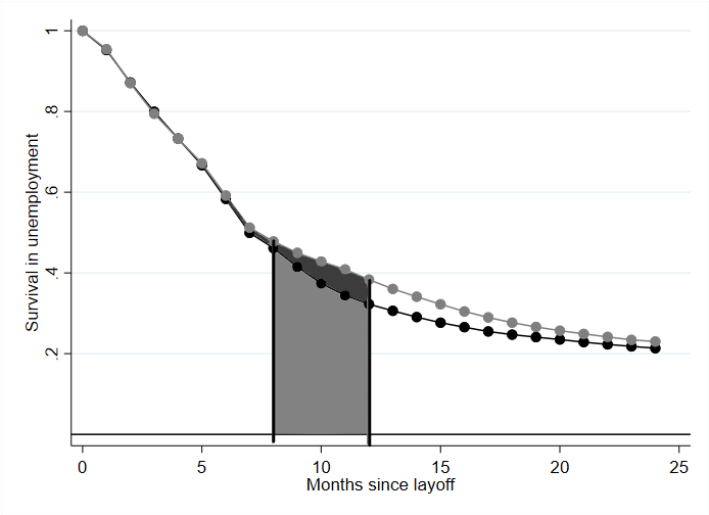


Note: Coefficients for the difference in probability that the non-employment spell is longer than t months for each month within two years since layoff. Each coefficient is estimated with a separate regression. Results of local polynomial Regression Discontinuity Design with procedure developed by Calonico et al. (2014a, 2017). Estimation based on triangular kernel and optimal bandwidth. Regression includes a first-order polynomial in wage before layoff, a dummy for being on the right side of the wage cutoff (higher benefits), fixed effects at region and month level, and controls. Controls include age at layoff, contract and firm characteristics, tenure and experience. Standard errors clustered at province level. Coefficient of the dummy for receiving more generous benefits reported together with confidence intervals at 95%.

Figure 7: Survival Function in Non-Employment for Treatment and Control Group: Longer Duration and Higher Benefits.



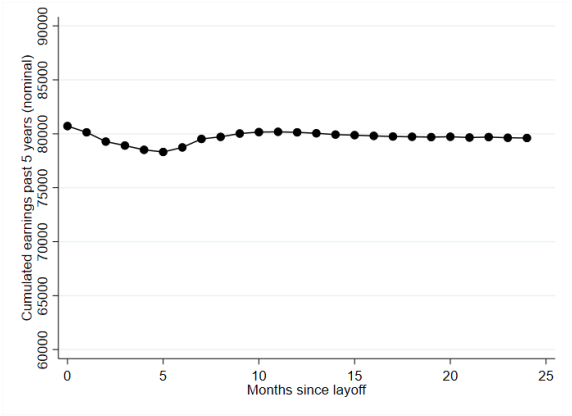
(a) Treatment: Higher Amount



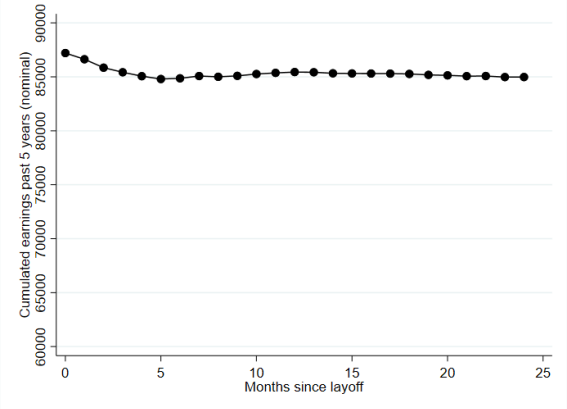
(b) Treatment: Longer Duration

Note: Coefficients for the probability that the non-employment spell is longer than t months for all months within two years since layoff estimated for the increase in benefit duration (Panel a) and amount (Panel b), for individuals above and below the relevant cutoff. Results of local polynomial Regression Discontinuity Design with procedure developed by Calonico et al. (2014a, 2017). Estimation based on triangular kernel and optimal bandwidth. Dark line reports the survival probability in non-employment for the baseline group while the light grey line reports the survival probability for the treatment group. Levels estimated by projecting the local polynomial at the cutoff from the two sides of the threshold. We compute this by using the command `rdplot` and taking the predicted values of the polynomial for the individual closest to the cutoff on each side. The implied BC/MC ratios are 0.41 for Panel (a) and 0.21 for Panel (b).

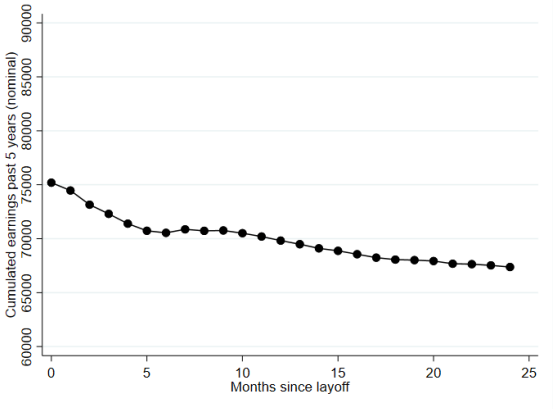
Figure 8: Selection over the Spell: Cumulative Earnings in 5 years before Layoff by Months of Non-Employment



(a) Full Sample



(b) Permanent Contracts



(c) Temporary Contracts

Note: Mean of the cumulative earnings in the five years preceding the layoff (2006-2011) for workers still in non-employment at month t. Panel (a) reports the values for the whole sample, Panel (b) reports the values for individuals previously on permanent contracts, Panel (c) reports the values for workers previously on temporary contracts. Sample includes all recipients of unemployment benefits laid-off between 40 and 50 years of age (at the time of layoff) and with an average wage in the three months before layoff within a 200 Euro radius with respect to the cutoff.

APPENDIX

A Tables

Table A1: Balancing Regressions for Discontinuity in Observable Characteristics at the Cutoff: OLS estimates

Variables	(1) (log) Firm Size	(2) Size: <16	(3) Permanent	(4) Full Time	(5) Female	(6) Age	(7) Mkt. Pot. Exp.	(8) Tenure	(9) White Collar	(10) South-Island
Above Cutoff	-0.119	0.028	0.018	-0.006*	-0.015	0.155	0.093	-0.188	0.000	0.045*
	(0.103)	(0.027)	(0.029)	(0.004)	(0.016)	(0.234)	(0.333)	(0.117)	(0.018)	(0.023)
Observations	46,121	46,121	46,121	46,121	46,121	46,121	46,121	46,121	46,121	46,121
R-squared	0.004	0.002	0.004	0.000	0.009	0.000	0.002	0.002	0.008	0.005

Note: Results of OLS regressions including a squared polynomial in the running variable, a dummy for being above the wage threshold, and interactions between the dummy and the polynomial. The coefficient for the dummy is reported. Sample restricted to observations in a 50 Euro radius from the cutoff. Standard errors clustered at province level. Level of significance: *** p<0.01, ** p<0.05, * p<0.1.

Table A2: Effect of higher Benefit Generosity on Benefit and Non-employment Duration: OLS estimates

Variables	(1) Benefit	(2) Non-employment	(3) Benefit	(4) Non-employment
Above Cutoff	1.411***	3.063*	1.002***	2.251**
	(0.522)	(1.711)	(0.369)	(1.064)
Observations	32,419	32,419	32,419	32,419
R-squared	0.005	0.003	0.144	0.146
Mean	23.239	46.296	23.239	46.296
Controls	NO	NO	YES	YES
Month FE	NO	NO	YES	YES
Region FE	NO	NO	YES	YES

Note: Note: Results of OLS regressions including a second-order polynomial for re-centered pre-unemployment wage and its interaction with the "Above Cutoff" dummy. Sample is bound to a 50-Euro window around the threshold. Columns (1) and (3) report the effect of more generous benefits on benefit duration; Columns (2) and (4) report the effect of more generous benefits on time spent in non-employment before finding a new job (censored at 2 years). Regression includes a first-order polynomial in wage before layoff, a dummy for being on the right side of the wage cutoff (higher benefits), and, from Column (3) to Column (4), fixed effects at region and month level, and controls. Controls include age at layoff, contract and firm characteristics, tenure and experience. Baseline for dependent variable computed as the average for workers laid off within 50 Euro before the cutoff. Standard Errors clustered at province level. Level of significance: *** p<0.01, ** p<0.05, * p<0.1.

Table A3: Effect of higher Benefit Generosity on Benefit and Non-employment Duration: Polynomial Order

	(1)	(2)	(3)	(4)
	Panel (a): Benefit Duration			
Above Cutoff	0.796***	0.863***	0.663**	0.974**
	(0.162)	(0.289)	(0.314)	(0.441)
	Panel (b): Non-Employment Duration			
Above Cutoff	1.774***	1.871**	2.097*	2.360*
	(0.571)	(0.825)	(1.126)	(1.350)
Observations	137,602	137,602	137,602	137,602
Controls	YES	YES	YES	YES
Month FE	YES	YES	YES	YES
Region FE	YES	YES	YES	YES
Order Poly	0	1	2	3
Order Bias (q)	1	2	3	4

Note: Results of local polynomial Regression Discontinuity Design with procedure developed by Calonico et al. (2014a, 2017). Estimation based on triangular kernel and optimal bandwidth. Total number of observations in the sample reported. Panel (a) reports the effect Regression includes a polynomial in wage before layoff (order specified in the table for each column), a dummy for being on the right side of the wage cutoff (higher benefits), and fixed effects at region and month level, and controls. Controls include age at layoff, contract and firm characteristics, tenure and experience. Baseline for dependent variable computed as the average for workers laid off within 50 Euro before the cutoff. Standard errors clustered at province level. Level of significance: *** p<0.01, ** p<0.05, * p<0.1.

Table A4: Effect of higher Benefit Generosity on Benefit and Non-employment Duration: Robust Standard Errors

Variables	(1) Benefit	(2) Non-employment	(3) Benefit	(4) Non-employment
Above Cutoff	1.316***	2.731***	0.830***	1.768**
	(0.291)	(0.962)	(0.259)	(0.770)
Observations	137,602	137,602	137,602	137,602
Obs. used	30,604	27,192	33,393	36,906
Mean	23.239	46.296	23.239	46.296
Controls	NO	NO	YES	YES
Month FE	NO	NO	YES	YES
Region FE	NO	NO	YES	YES
Clustered p-value	0.000	0.005	0.001	0.022
Robust p-value	0.000	0.010	0.007	0.053
Order Poly	1	1	1	1
Order Bias (q)	2	2	2	2
Bandwidth	47.74	42.34	51.85	56.22

Note: Results of local polynomial Regression Discontinuity Design with procedure developed by (Calonico et al., 2014a, 2017). Estimation based on triangular kernel and optimal bandwidth. Total number of observations in the sample reported. Columns (1) and (4) report the effect of more generous benefits on benefit duration; Columns (2) and (5) report the effect of more generous benefits on time spent in non-employment before finding a new job (censored at 2 years); Columns (3) and (6) report eh effect on the probability of finding a job within 2 years since layoff. Regression includes a first-order polynomial in wage before layoff, a dummy for being on the right side of the wage cutoff (higher benefits), and, from Column (4) to Column (6), fixed effects at region and month level, and controls. Controls include age at layoff, contract and firm characteristics, tenure and experience. Baseline for dependent variable computed as the average for workers laid off within 50 Euro before the cutoff. Robust standard errors reported in parenthesis. Level of significance: *** p<0.01, ** p<0.05, * p<0.1.

Table A5: Balancing Regressions for Discontinuity in Observable Characteristics at the Cutoff: Age Discontinuity

Variables	(1) (log) Firm Size	(2) Size: <16	(3) Permanent	(4) Full Time	(5) Female	(6) Mkt Pot. Exp.	(7) Tenure	(8) White Collar	(9) South-Islands	(10) Pay previous empl.
Above Cutoff	0.112	-0.005	0.008	0.002	0.008	0.745	0.261	-0.104***	-0.001	-1.429
	(0.105)	(0.026)	(0.023)	(0.009)	(0.022)	(0.520)	(0.281)	(0.037)	(0.025)	(6.728)
Observations	50,141	50,141	50,141	50,141	50,141	50,141	50,141	50,141	50,141	50,141
Obs. used	13,857	13,845	18,525	11,538	15,904	9,972	12,560	6,057	13,219	13,356
Mean	3.084	0.550	0.479	0.980	0.268	27.357	4.402	0.167	0.409	1,759.380
Clustered p-value	0.290	0.838	0.715	0.806	0.718	0.151	0.352	0.005	0.954	0.832
Robust p-value	0.241	0.763	0.714	0.893	0.744	0.142	0.368	0.005	0.748	0.775
Order Poly	1	1	1	1	1	1	1	1	1	1
Order Bias (q)	2	2	2	2	2	2	2	2	2	2
Bandwidth	3.023	3.019	3.887	2.605	3.406	2.312	2.793	1.591	2.912	2.935

Note: Results of local polynomial Regression Discontinuity Design with procedure developed by Calonico et al. (2014a, 2017). The regression includes the running variable with a polynomial of degree one in age and a dummy for being above 50 years of age at the time of the layoff. The coefficient for the dummy is reported. Estimation based on triangular kernel and optimal bandwidth. Standard errors clustered at province level. Level of significance: *** p<0.01, ** p<0.05, * p<0.1.

Table A6: Effect of higher Benefit Generosity on Benefit and Non-employment Duration: subsample of workers between 40 and 50 years

Variables	(1) Benefit	(2) Non-employment	(3) Benefit	(4) Non-employment
Above Cutoff	1.088	1.828	0.567	0.786
	(0.669)	(2.677)	(0.501)	(1.536)
Observations	51,917	51,917	51,917	51,917
Obs. used	13,035	12,796	14,354	16,943
Mean	23.746	47.729	23.746	47.729
Controls	NO	NO	YES	YES
Month FE	NO	NO	YES	YES
Region FE	NO	NO	YES	YES
Clustered p-value	0.104	0.495	0.258	0.609
Robust p-value	0.153	0.521	0.362	0.646
Order Poly	1	1	1	1
Order Bias (q)	2	2	2	2
Bandwidth	51.38	50.65	56.25	66.12

Note: Results of local polynomial Regression Discontinuity Design with procedure developed by (Calonico et al., 2014a, 2017). Estimation based on triangular kernel and optimal bandwidth. Sample restricted to the individuals aged between 40 and 49.5 years (i.e., the lower bound to of the donut). Total number of observations in the sample reported. Columns (1) and (3) report the effect of more generous benefits on the duration of the benefit, columns (2) and (4) report the same effect on time spent in non-employment before finding a new job. Controls include age at layoff, contract and firm characteristics, tenure and experience. Baseline for dependent variable computed as the average for workers aged between 40-50 years laid off within 50 Euro before the cutoff. Level of significance: *** p<0.01, ** p<0.05, * p<0.1.

Table A7: Effect of Longer Potential Duration on Benefit and Non-employment Duration

Variables	(1) Benefit	(2) Non-employment	(3) Benefit	(4) Non-employment
Above Cutoff	7.458***	4.438*	7.638***	5.204**
	(0.848)	(2.314)	(0.759)	(2.076)
Observations	50,141	50,141	50,141	50,141
Obs. used	12,499	10,859	12,868	10,820
Mean	23.466	44.714	23.466	44.714
Controls	NO	NO	YES	YES
Month FE	NO	NO	YES	YES
Region FE	NO	NO	YES	YES
Clustered p-value	0.000	0.055	0.000	0.012
Robust p-value	0.000	0.064	0.000	0.014
Order Poly	1	1	1	1
Order Bias (q)	2	2	2	2
Bandwidth	2.781	2.475	2.846	2.469

Note: Results of local polynomial Regression Discontinuity Design with procedure developed by Calonico et al. (2014a, 2017). Estimation based on triangular kernel and optimal bandwidth. A donut of 0.5 years on each side of the threshold is excluded due to evidence of manipulation at the cutoff (Citino et al., 2019; Scrutinio, 2019). Total number of observations in the sample reported. Columns (1) and (3) report the effect of more generous benefits on benefit duration; Columns (2) and (4) report the effect of more generous benefits on time spent in non-employment before finding a new job (censored at 2 years). Regression includes a first-order polynomial in age at layoff, a dummy for being on the right side of the age cutoff (longer benefits, 4 months), and, from Column (3) to Column (4), fixed effects at region and month level, and controls. Controls include age at layoff, contract and firm characteristics, tenure and experience. Baseline for dependent variable computed as the average for workers laid off within 50 Euro before the cutoff. Standard Errors clustered at province level. Level of significance: *** p<0.01, ** p<0.05, * p<0.1.

Table A8: Comparison of Workers in age Age and Wage Treatment Groups

Variables	(1) (log) Daily Wage	(2) Age	(3) Mkt Pot. Exp.	(4) Tenure	(5) Female	(6) Permanent	(7) Full time	(8) (log) avg Firm Size	(9) Size: > 15	(10) White Collar	(11) South-Islands
Treated Age	-0.015***	10.810***	11.361***	1.179***	0.048***	-0.031***	-0.004**	-0.046	-0.003	-0.014*	0.008
	(0.005)	(0.085)	(0.152)	(0.091)	(0.008)	(0.010)	(0.002)	(0.038)	(0.010)	(0.009)	(0.009)
Constant	4.313***	40.407***	18.316***	3.770***	0.182***	0.583***	0.979***	2.937***	0.596***	0.182***	0.416***
	(0.002)	(0.084)	(0.124)	(0.043)	(0.005)	(0.006)	(0.001)	(0.025)	(0.007)	(0.007)	(0.007)
Observations	23,556	23,556	23,556	23,556	23,556	23,556	23,556	23,556	23,556	23,556	23,556
R-squared	0.000	0.280	0.196	0.011	0.003	0.001	0.000	0.000	0.000	0.000	0.000

Note: OLS regressions for differences between workers eligible to higher benefit level or duration. Regression includes only a dummy taking value one if the workers are below the wage cutoff and above the age cutoff (Treated Age), which identifies the difference in observables between this group and workers above the wage cutoff and below the age cutoff. The former is group is eligible to longer duration while the latter is eligible to higher benefits in the first months of the unemployment spell. Sample includes individuals identified based on whether their pre-unemployment earnings or age at layoff are in the range computed by the optimal bandwidths for non-employment duration in Tables A6 and A7, respectively, and exceed the threshold value. Standard errors clustered at province level reported in parentheses. Level of significance: *** p<0.01, ** p<0.05, * p<0.1.

Table A9: Effect of Higher Benefit Generosity on New Job Quality: OLS estimates

Variables	(1) (log) Daily wage	(2) Full time	(3) Permanent	(4) Tenure	(5) (log) Tot. wage 1 year	(6) Recall
Above Cutoff	-0.011	0.011	0.003	2.278	0.022	-0.004
	(0.016)	(0.012)	(0.013)	(1.662)	(0.030)	(0.015)
Observations	38,821	39,359	39,359	39,362	37,656	39,359
R-squared	0.093	0.108	0.169	0.057	0.051	0.140
Mean	4.166	0.847	0.252	44.931	9.250	0.351
Controls	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES

Note: Results of OLS regressions including a second-order polynomial for re-centered pre-unemployment wage and its interaction with the "Above Cutoff" dummy. Sample includes workers with wage within a 50 Euro radius around the cutoff. New jobs included in the estimation sample if the workers finds a new job within two years since layoff. Controls include age at layoff, contract and firm characteristics, tenure and experience. Standard errors clustered at province level reported in parenthesis. Level of significance: *** p<0.01, ** p<0.05, * p<0.1.

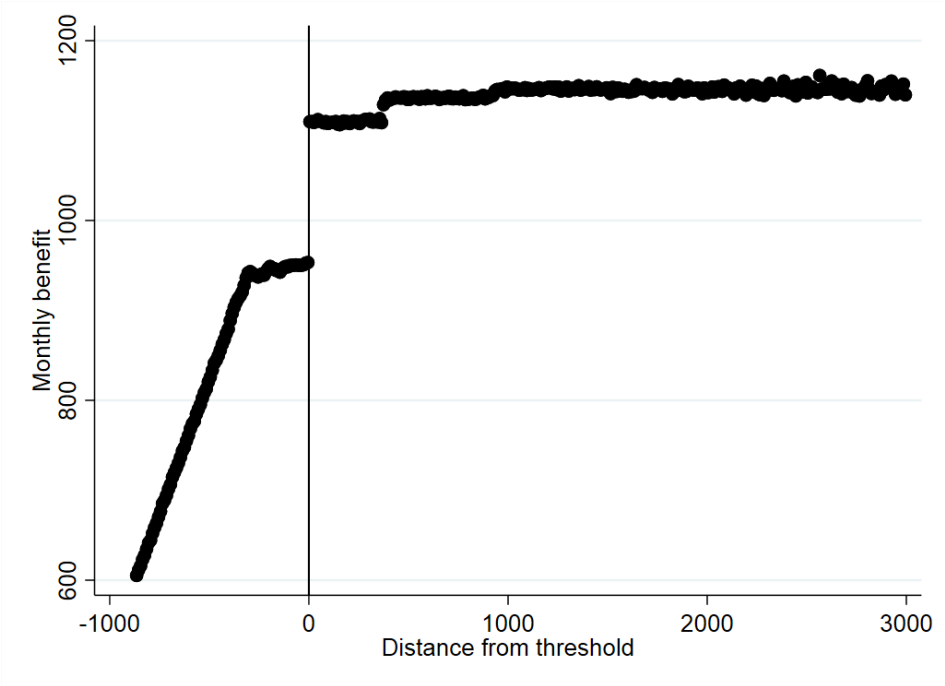
Table A10: Effect of Higher Benefit Generosity on New Job Quality: Additional Job Characteristics

Variables	(1) Daily wage 1 yr avg	(2) Days paid 1 year	(3) Tot. wage any firms 1 year	(4) Disability	(5) % White collars	(6) Avg. salary in new firm	(7) % Permanent	(8) Change sector
Above Cutoff	-0.000	0.207	0.014	0.003**	0.022***	0.017	0.008	-0.007
	(0.012)	(0.172)	(0.027)	(0.001)	(0.005)	(0.018)	(0.010)	(0.011)
Observations	117,825	118,314	112,733	137,602	111,609	111,652	111,932	117,517
Obs. used	26,825	32,773	23,783	29,119	13,228	25,864	25,408	42,003
Mean	4.183	19.386	9.25	0.004	0.209	7.051	0.547	0.288
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Month FE	YES	YES	YES	YES	YES	YES	YES	YES
Region FE	YES	YES	YES	YES	YES	YES	YES	YES
Clustered p-value	0.972	0.230	0.609	0.015	0.000	0.323	0.419	0.504
Robust p-value	0.844	0.176	0.461	0.017	0.000	0.246	0.344	0.49
Order Poly	1	1	1	1	1	1	1	1
Order Bias (q)	2	2	2	2	2	2	2	2
Bandwidth	48.66	58.28	45.82	45.64	25.38	49.35	48.44	74.76

Note: Results of local polynomial Regression Discontinuity Design with procedure developed by Calonico et al. (2014a, 2017). Estimation based on triangular kernel and optimal bandwidth. Regression sample includes only workers finding a job within two years since layoff. Regression includes a first-order polynomial in wage before layoff, a dummy for being on the right side of the wage cutoff (higher benefits), fixed effects at region and month level, and controls. Controls include age at layoff, contract and firm characteristics, tenure and experience. New jobs included in the estimation sample if the workers finds a new job within two years since layoff. Column (1) reports the effect of higher generosity on average daily earnings within the first hiring firm within one year; Column (2) reports the effect of higher generosity on the number of days paid within one year; Column (3) reports the effect of higher generosity on the total earnings within any firms during the first year after unemployment; Column (4) look at the effect on the probability of claiming disability benefits within 2 years since layoff; Column from (5) to (7) analyze the effect on coworkers by considering the share of white collars, the average salary, and share of workers with permanent contracts; finally, Column (8) look at the probability of moving to a different sector. Standard errors clustered at province level reported in parenthesis. Level of significance: *** p<0.01, ** p<0.05, * p<0.1.

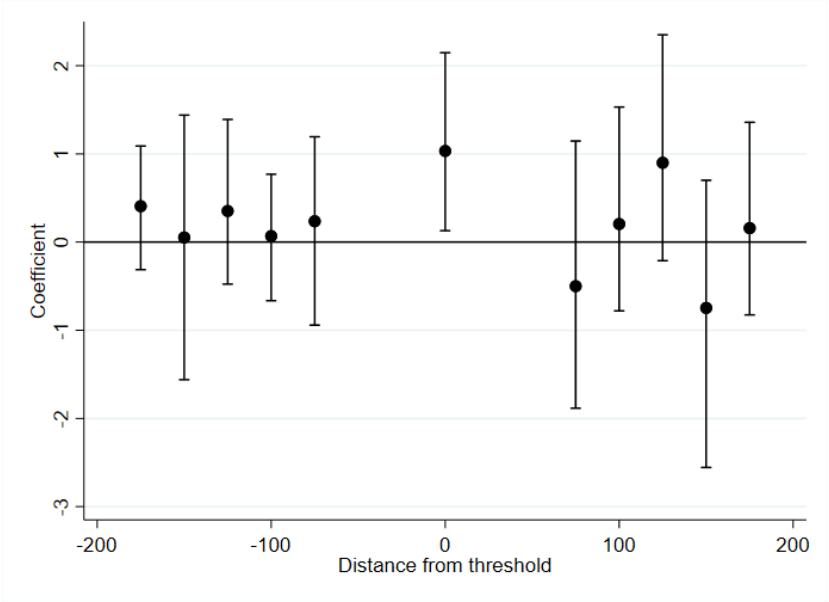
Figures

Figure A1: Monthly benefit Generosity by Earnings

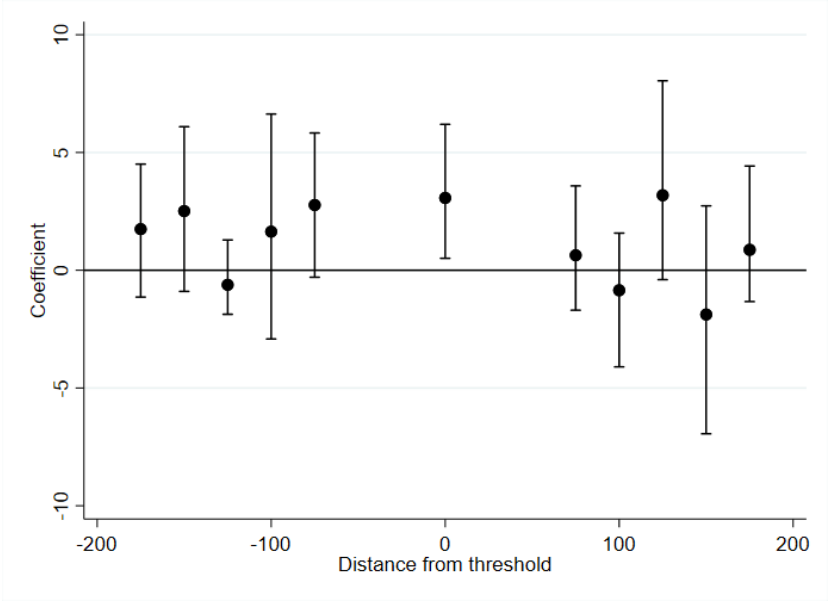


Note: Average monthly generosity of the benefit in the first six months of the spell by pre-unemployment wage. Pre-unemployment wage is normalized to the cutoff. Population data on the benefit recipients in 2012. Workers are grouped according to previous wage in 5 Euro bins. For the sake of simplicity, the sample restricted to workers who received unemployment benefits for at most 6 months to better capture the change generosity at the cutoff by exploiting the constant level of the benefits in the first six months.

Figure A2: Placebo Tests for Higher Generosity: RDD at different points of the Wage Distribution.



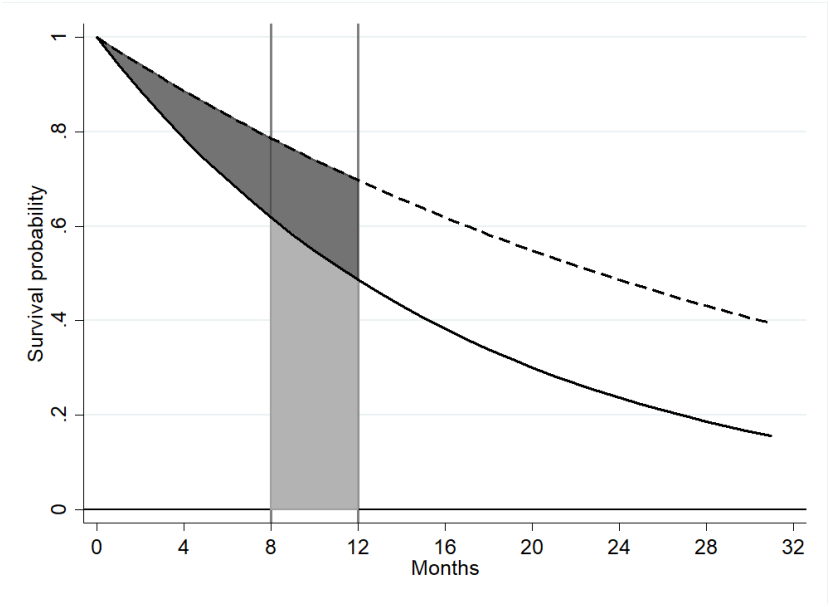
(a) Benefit Duration



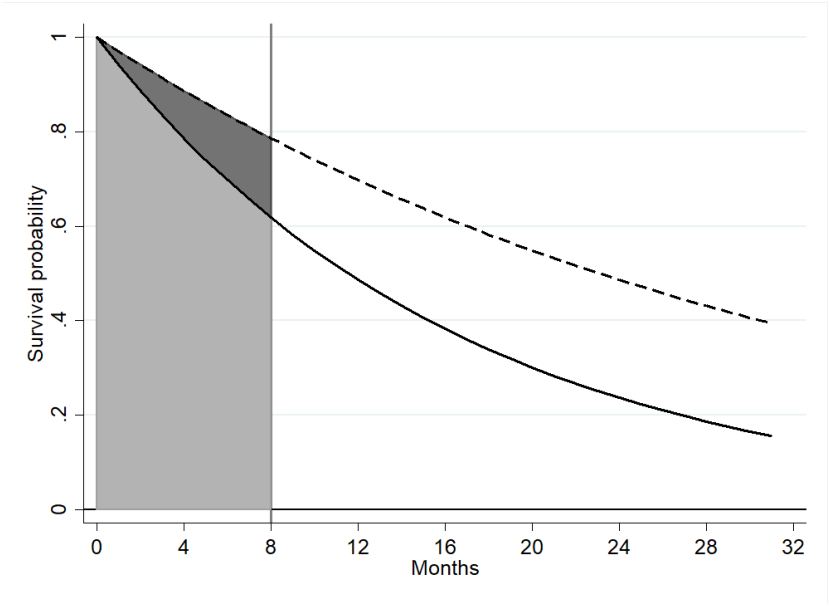
(b) Non-Employment Duration

Note: Figures report coefficients for regression discontinuities run at different point of the wage distribution. Dependent variable is benefit duration in Panel (a) and non-employment duration in Panel (b). The estimates are performed with a local polynomial Regression Discontinuity Design with procedure developed by Calonico et al. (2014a, 2017). Estimation based on triangular kernel and optimal bandwidth within a 50 $ window around each cutoff. Regression includes a first-order polynomial in wage before layoff, a dummy for being on the right side of the wage cutoff (higher benefits), fixed effects at region and month level, and controls. Controls include age at layoff, contract and firm characteristics, tenure and experience. Standard errors clustered at province level. Confidence interval at 95% reported.

Figure A3: Mechanical and Behavioural Effects: a Graphical Intuition



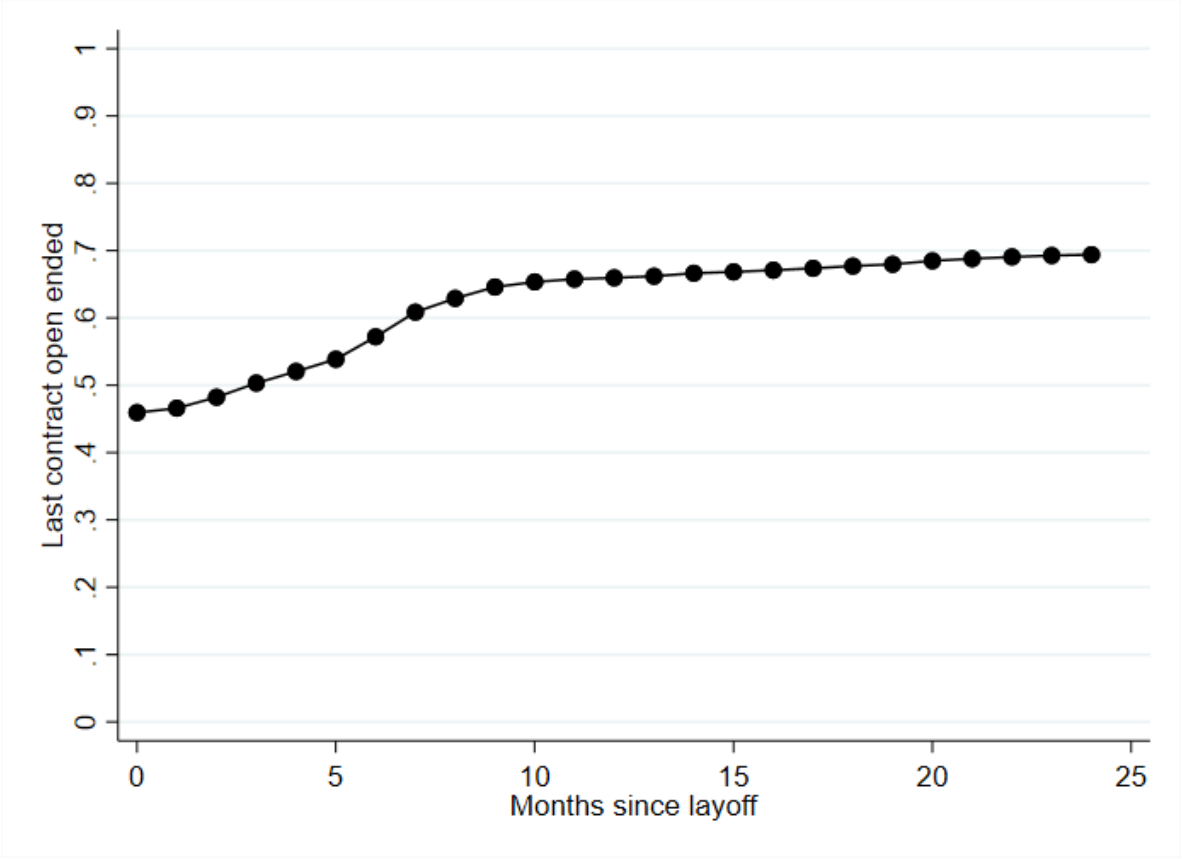
(a) Treatment: Longer Duration



(b) Treatment: Higher Amount

Note: The Figure provides a graphical representation of the difference in Non-Employment probability contributing to the Mechanical and Behavioral cost of more generous benefits. The Figure on the left highlights these elements for a change in the duration of the benefit from 8 to 12 months, while the Figure on the right describes them for a change in benefit generosity affecting the level of the benefit for the first 8 months of the unemployment spell. The continuous line represents the survival probability in non-employment for individuals under the baseline regime, while the dashed line represents the survival probability for workers under the alternative regime. The light-grey shaded area is proportional to the mechanical cost, as it represents the time on the more generous regime (longer duration on the left and higher benefit level on the right) without any change in the job finding rate of the worker. The dark grey shaded area is proportional to the behavioural cost, as it represents the increased duration on unemployment benefits coming from a change in the search behaviour of individuals.

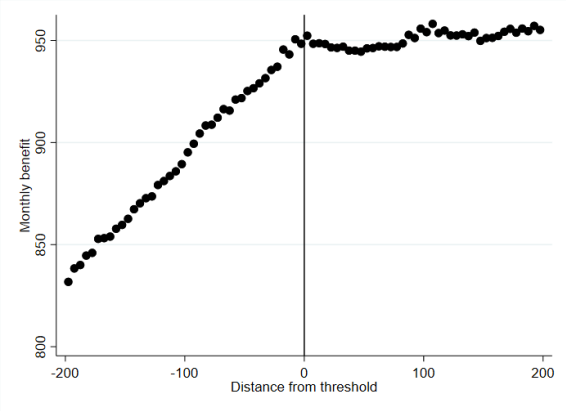
Figure A4: Selection over the Spell: Share of Open-ended Contracts by Months of Non-Employment



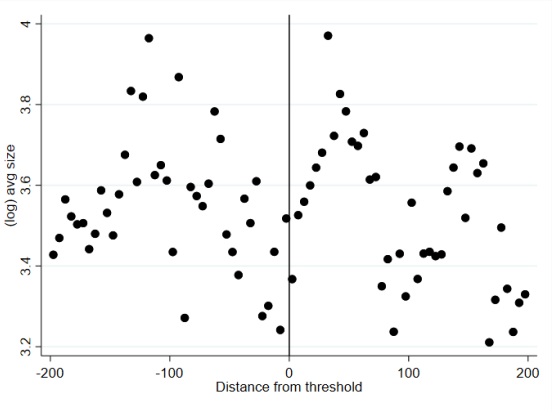
Note: Mean share of open-ended contracts for workers still in non-employment at month t. Sample includes all recipients of unemployment benefits laid-off between 40 and 50 years of age (at the time of layoff) and with an average wage in the three months before layoff within a 200 Euro radius with respect to the cutoff.

B Regression Kink Design: Validity checks

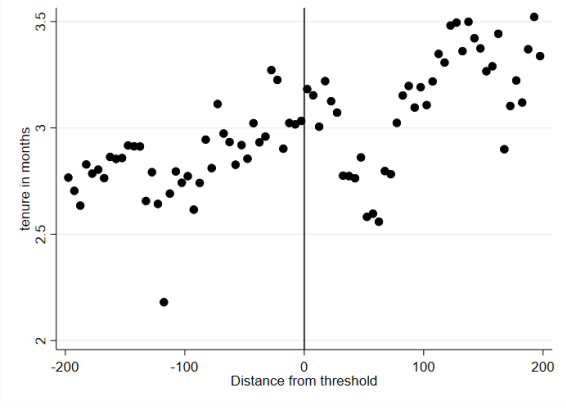
Figure B1: Smoothness Checks: Constant Slope around Cutoff



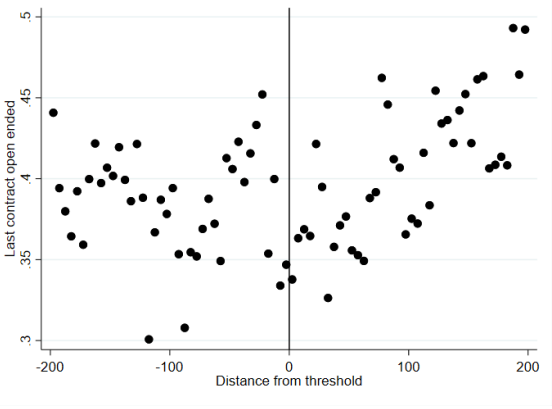
(a) Pre-unemployment wage and Benefit Generosity



(b) Firm Size (log)



(c) Tenure in past firm



(d) Permanent contract in past firm

Note: The graph report behavior of relevant variables within a 200 euros radius from the kink cutoff (about 1,552 Euro of average wage in the three months proceeding the layoff). Plots of average individual characteristics by 10 Euro bins around the kink cutoff. The graphs report the following elements: Panel (a) describes the level of the benefit in the first six months; Panel (b) reports the log of past firm size; Panel (c) reports the tenure in the previous firm; Panel (d) reports the share of workers with open-ended contracts before unemployment.

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