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Abstract

This study investigates the employment effects of a large-scale wage subsidy programme for the young unemployed that was introduced in 2016, during a period of recovery in the Polish economy. The focus is on the question of whether the effects differed between men and women. The study employs a large population administrative data set from the unemployment register, and exploits for identification the fact that firms were only eligible to participate in the wage subsidy programme if the newly recruited worker was below age 30 and was previously unemployed. A challenge in this research is that before 2016, standard packages of active labour market programmes for all unemployed and specific programmes for unemployed below age 30 had been in place. Exploiting the long period and broad data coverage, we estimate the differential impact of the new programme using a difference-in-discontinuities design. The main finding is that over the medium term, the new wage subsidy programme was effective for low- and middle-skilled eligible young women, but not for men. We discuss the policy implications of such programmes targeting young unemployed people.

Keywords: wage subsidy; youth unemployment; gender differences; difference-in-discontinuities; register data

JEL: J08, J64, J68

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1. Introduction

Research has shown that the young face severe labour market challenges during recessions. Compared to older labour market participants, they are more likely to suffer in economic downturns, as they have higher job loss risks and lower chances of finding a job. Thus, the young may experience difficulties in entering the labour market (Gielen & van Ours, 2006; Kahn, 2010; Oreopoulos et al., 2012), higher risks of long-term unemployment, scarring effects (Bell & Blanchflower, 2011; Nilsen & Reiso, 2014), and adverse effects on employment and wages (Altonji et al., 2016; Brunner & Kuhn, 2014; Kahn, 2010). Given the current and future costs of youth unemployment and inactivity, there is a strong need for policy interventions to assist young people in overcoming the difficulties they face in entering employment.

Several countries offer a wide range of policy interventions to young people. The most common interventions include intensive job search assistance, training (including on-the-job training), wage subsidies, and public sector programmes. The empirical literature on the evaluation of active labour market programmes for youth has found mixed evidence regarding their effectiveness. For example, positive employment outcomes of youth active labour market policies (ALMP) have been reported by Blundell et al. (2004). In contrast, Martin and Grubb (2001), Kluve et al. (2008), Kluve (2010), and Card et al. (2010) all found that selected youth measures are less effective than measures aimed at the general population. Caliendo and Schmidl (2016) have also emphasised that the findings of the effectiveness of ALMP for adults are most likely not valid for youth.

In this paper, we investigate the effectiveness of a large wage subsidy programme for young unemployed people that was introduced in Poland during a period of economic recovery in 2016. Our focus is on the question of whether the effects have varied between men and women.

Our study contributes to three strands in the literature: effects of wage subsidies on youth (un)employment; ALMP and the business cycle; and group differences (heterogeneity) in the effectiveness of wage subsidies, particularly between young men and young women. Here, we review the predictions and empirical evidence from these literatures. In general, we expect the intervention to increase the likelihood of young people entering employment and remaining in the labour market – and thus to decrease youth unemployment – for three reasons. First, a wage subsidy leads to a relative decrease in the labour cost paid by the employer, holding reservation wages constant, which should increase labour demand. Second, we expect the positive employment effect to last even after the subsidy expires because the young workers will have gained experience and thus become more productive, which should improve their chances of getting and keeping a job even when the employer no longer receives subsidies for employing them. Finally, employers may be willing to keep the workers after the subsidy period has expired to reduce the costs of filling vacancies and needing to hire new employees.

So far, the existing empirical evidence provides inconclusive results regarding the effectiveness of wage subsidies in increasing the employment levels of young people. Martin and Grubb (2001) argued that while wage subsidies are among the promising programmes for increasing youth employment, such subsidies should be of short duration, targeted, and closely monitored. In a comparison of different options available through the UK's New Deal for Young People (NDYP, a youth measure introduced in the UK in 1998), Dorsett (2006) showed that the wage subsidy was the measure that was most effective in reducing unemployment. Speckesser et al. (2019) concluded that the work experience young people gained through wage subsidy programmes helped to lower youth unemployment in Europe. An analysis of a wage subsidy programme targeting vulnerable youth in Chile

found that while it was effective in increasing employment and the participation rate, the effects decreased with time (Bravo & Rau, 2013). Levinsohn, Rankin, Roberts, & Schöer (2014) showed that a wage subsidy voucher programme in South Africa significantly increased employment even after the voucher was no longer valid. At the same time, a number of studies have reported zero effects of wage subsidies for youth, such as a meta-analysis of European studies by Caliendo and Schmidl (2016). Even if hiring subsidies help their participants, these policies are likely to suffer from large dead-weight loss and substitution effects (Martin and Grubb, 2001; Caliendo and Schmidl, 2016). The variation in the design and the effectiveness of wage subsidies across countries calls for further analyses. It has, for example, been suggested that analyses should take into account the business cycle and the institutional settings (Speckesser et al., 2019).

Indeed, from a theoretical perspective, the treatment effects of ALMP are likely to vary with the business cycle. In the short run, the negative lock-in effects are reduced in the recession, as the cost of forgone search time is lower in the recession (Forslund et al., 2011; Lechner & Wunsch, 2009). In the medium to long run, the role of the business cycle in the effects of ALMP is unclear. To resolve this issue, researchers may consult the empirical evidence on the effects of labour market entry during a recession on employment and earnings (Raaum & Røed, 2006). These findings indicate that individuals who become unemployed in a recession and do not enter ALMP are likely experiencing negative effects on their earnings, whereas individuals who become unemployed and enter ALMP during a recession have a better chance of entering or re-entering employment once the economy recovers (Forslund et al., 2011). Thus, this evidence suggests that ALMP have larger positive treatment effects during recessions.

Predictions regarding the role of economic contractions and expansions in the success of ALMP are complicated, given that the eligible population might change over the business cycle, and that if there are heterogeneous treatment effects, the average treatment effects of ALMP might vary (Forslund et al., 2011). In recessions, the eligible population is drawn from a higher end of the wage distribution than it is in booms (Forslund et al., 2011; Mueller, 2017). If these unemployed individuals have less to gain from the programme, the treatment effects during recessions are likely to be lower.

Empirical evidence on the link between the business cycle and ALMP effectiveness is scarce, and is non-existent for youth. Lechner and Wunsch (2009) studied the 1984-2003 period, which included the economic downturn after the second oil shock, German unification, and the post-September-11 economic slowdown. In line with the theoretical predictions, they found that the treatment effects of a training programme are more likely to be positive if the prevailing unemployment rate at the start of the programme was high: i.e., the negative lock-in effects are smaller and the positive long-run effects are larger during periods of relatively high unemployment.

The effects of various policy interventions are also likely to be heterogeneous across different groups of unemployed individuals (Kluve et al., 2019). For the purposes of our study, it is interesting to note that until recently, only a few researchers paid attention to the gender dimension of ALMP and its role in their effectiveness. However, these studies provided evidence that women benefit more than men from ALMP in general, especially in contexts in which the labour force participation of women is relatively low compared to that of men (Bergemann & van den Berg, 2008; Card et al., 2017).

A few explanations for why women benefit from ALMP more than men can be put forward. The empirical estimates in the literature show that women's labour supply is more responsive to wage changes than men's labour supply, which can be interpreted as a long-run outcome based on the neoclassical theory (see the survey

by Bergemann and Van den Berg (2008)). This effect is larger if the female labour force participation rate is relatively low. In the short and medium run, wage subsidy programmes may affect outcomes because of labour market friction. Women's reservation wages may be relatively high, especially if they are mothers of small children. Thus, some women may not be willing to accept job offers even though they register as unemployed. Being registered as unemployed does not necessarily mean that the unemployed person is searching for a job. However, ALMP often require participants to engage in a job search and monitor their efforts; e.g., the number of job applications and interviews. If participants are not engaged in a job search, sanctions may be used. Therefore, participation in ALMP programmes that efficiently increase matching may lead to unemployed individuals receiving acceptable new job offers or achieving an optimal job search intensity. This effect is arguably stronger for young women than for young men. Another potential reason why ALMP may be more effective for women than for men is that women might underestimate their job opportunities and be unaware of the non-pecuniary utility of employment, which is often higher for women than it is for men (Kaplan & Schulhofer-Wohl, 2018). ALMP participation, especially in programmes providing work experience, might change women's attitudes and willingness to work. If employers discriminate against young women, they may be underestimating young women's productivity. ALMP that provide a wage subsidy may induce employers to recruit women at lower wages, which might, in turn, give them the opportunity to learn about the actual individual productivity of female workers.

In the empirical ALMP literature, there are a few studies that considered the gender dimension among young people. Larsson (2003) found that the negative effects of subsidised jobs were smaller among women. Blundell et al. (2004) showed that the positive effect of the NDYP is not present among women. Card et al. (2017) found larger positive effects for women in their meta-analysis of recent evaluations, whereas Kluve et al. (2019) observed no gender differences in the effectiveness of the youth programmes that they investigated.

The variation in the results of ALMP evaluations, particularly regarding the young unemployed, suggests that there is a need to collect new evidence and to provide it to policymakers. The uncertainty about the extent to which previous "know-how" is still applicable reinforces this need. The relevance of existing studies is weakened by new challenges, some of which differ by gender, and which are most acute among young people. Decreased job stability (Baranowska & Gebel, 2010; Dolado et al., 2002); changes in labour market prospects due to technological change, automation, and artificial intelligence (Dauth et al., 2021; Lewandowski et al., 2020); and increasing mental health problems (Vancea & Utzet, 2017) may call for new youth policy interventions and additional research on policy effectiveness by gender.

This paper seeks to estimate, separately for men and women, the effects of a large-scale wage subsidy programme introduced in 2016 for young unemployed people in Poland. The target population of our study are young workers with some work experience who became unemployed. The programme was introduced in response to the uncertain labour market opportunities for young people. The programme operated from 2016 to 2018, and offered a wage subsidy up to the minimum wage plus social contributions to unemployed individuals under 30 years of age. The subsidy was paid to an employer for employing a qualified individual under a full-time job contract for 12 months. The employer was then obliged to prolong the job contract for another 12 months after the subsidy expired. The programme had an unprecedented scale: 18.9% of ALMP participants aged 18-29 participated in this programme in 2016, and it accounted for 15% of total spending on ALMP for all unemployed individuals by the Polish government in 2016-2018.

Given the high cost of the programme, it is important to investigate the question of whether the programme was effective; that is, whether it improved youth employment outcomes. It is challenging to estimate the direct effect of receiving a wage subsidy on youth labour market outcomes since the employers involved needed to be willing to hire subsidised workers. The participants in wage subsidy programmes were selected not only by caseworkers, but also by potential employers. This determines our empirical strategy: rather than looking at the group who took up the wage subsidy, we focus on the group who were eligible for the wage subsidy, and compare them with a group of youth who were similar but not eligible for the subsidy. Hence, we estimate an intention-to-treat (ITT) effect. We exploit the sharp discontinuity in eligibility for the wage subsidy at age 30. A challenge we face in our analysis is that even before 2016, standard packages of active labour market programmes for all unemployed individuals as well as specific programmes for those below age 30 through the European Youth Guarantee (YG) Programme had been in place in Poland. In order to distinguish the effects of the new programme in 2016 from those of policies that were already in place, we use a "difference-in-discontinuities" (diff-in-disc) design (Grembi et al., 2016). It exploits the sharp discontinuity created through the 2016 reform around age 30 using a regression-discontinuity design (RDD) while also exploiting the different contexts before and after the introduction of the 2016 reform using a difference-in-differences design (DiD). Other studies have addressed similar challenges, such as Schünemann et al. (2015) and Sjögren & Vikström (2015), who evaluated wage subsidies for other groups of unemployed individuals, Chetty et al. (2013) and Lindner & Reizer (2020).

This study contributes to the existing literature in three ways. First, it evaluates a wage subsidy programme broadly targeting unemployed youth. All the aforementioned studies evaluated programmes targeting a subpopulation of unemployed youth: e.g., youth who had been unemployed for some time (Blundell et al., 2004 for the UK; Larsson, 2003 for Sweden) or youth from disadvantaged backgrounds (Bravo & Rau, 2013 for Chile). Second, it assesses the gender differences in the effectiveness of a wage subsidy programme. Third, we present estimates of the effectiveness of a wage subsidy programme introduced during a period of high GDP growth and improving labour market performance.

2. Economic and institutional context

Poland has experienced sharp fluctuations in GDP growth and unemployment over the past three decades. As Figure 1 shows, in Poland, like in the rest of Europe, the financial crisis in 2008 led to dramatic increases in youth unemployment. In 2013, youth unemployment reached 18.9% in the EU-28 countries and in Poland. While youth unemployment rates increased more among women than among men (Figure 2), since 2013, youth unemployment rates among women have declined quickly, and have converged with those among men. The past experiences of the youth unemployment rate being higher than 30 percent and compositional changes in the young unemployed population during the 2000s make the period we study in this paper different from previous periods of high unemployment in Poland.

[Figure 1 and 2]

As a policy response to these trends, the EU countries have expanded ALMP, mainly within the framework of the pan-European Youth Guarantee (YG) programme (Tosun et al., 2019), which was introduced in 2013. Within the YG framework, people under age 30 were guaranteed access a high-quality offer of employment, further

education, an apprenticeship, or a traineeship within four months of leaving formal education or becoming unemployed. The programme was backed up by a significant expansion of EU financing.

The Polish government also responded to the rise in youth unemployment and the implementation of the YG programme by introducing new measures for young unemployed people (under age 30) in 2014. The programme made several training and employment measures available to young people registered with a local labour office, including on-the-job training vouchers, classroom training vouchers, employment vouchers, and reallocation vouchers.

2.1 The wage subsidy programme in 2016

The programme we investigate is a new youth wage subsidy programme targeting young unemployed individuals under age 30 that was introduced in January 2016, and that lasted for three years. This programme came in the wake of the presidential election campaign, which paid particular attention to the challenges young people face in entering the labour market. The new programme was much larger and more costly than previous measures. Total spending on the programme accounted for 15% of the total spending of local labour offices on ALMP between 2016 and 2018. More young people participated in the new subsidy programme (18.9% of young ALMP participants in 2016) than in previous ALMPs, and the new programme was more generous than the "standard" wage subsidy programmes available to all unemployed workers, which offered a subsidy equal to up to half of the minimum gross wage plus the social security contributions.

While the 2016 wage subsidy programme was implemented to address high youth unemployment, it was introduced at a time when the economy was expanding and the labour market was improving. The labour market started recovering from the post-2008 downturn in 2014. The youth unemployment rate had reached its lowest level in the decade when the programme was introduced in 2016 (11.8% among 15-29-year-olds), and continued to decline thereafter, reaching 7.6% in 2018 (Figure 1). International studies have found that wage subsidies are the most effective measures among the ALMP offered to youth, but are dependent on business cycle and seasonality effects (Speckesser et al., 2019). We therefore expect that the gradual improvement of labour market opportunities weakens the effectiveness of ALMP generally, including of the large wage subsidy programme we are evaluating. Most labour market programmes are introduced to counteract the effects of a recession, and less is known about their impact during an economic boom.

The wage subsidy introduced in 2016 was provided to employers who hired a new worker who was unemployed and was under 30 years old. The wage subsidy was paid for a period of 12 months, with the condition that the employer continued to employ the new worker for another 12-month-period after the subsidy had expired. The subsidy covered up to the full minimum gross wage plus social security contributions. In 2016, the general minimum monthly gross wage was PLN 1850 (~EUR 420) and PLN 1480 (EUR 340) for workers during their first year of work after their initial entry into the labour market (80% of the standard minimum wage). For comparison, the average monthly gross wage was PLN 4050 (~EUR 930) in 2016. The subsidised social security contributions (old-age pension contributions, disability pension contributions, accident insurance and contributions to the Labour Fund) accounted for about 20% of the monthly gross salary. The subsidy accounted for 79% of the minimum wage for workers in their first year of work and between 79% and the full minimum wage for all other workers. Since most employers used the wage subsidy to employ workers in jobs with

compensation near the minimum wage, they bore only a small wage cost for the young employees during the first 12 months of employment.

In practice, eligible employers applied for the subsidy through the Public Employment Services (PES). All employers were eligible except those who had reduced their employment levels during the six months before their application to the programme. The PES opened a call for proposals from all employers who wanted to employ a registered unemployed person at the minimum wage or above. If the application was accepted, the PES and the employer signed a contract that outlined the details regarding the wage subsidy level, the period of employment, and the requirements of the position. Then, the PES suggested an unemployed person to be considered for the position. There were no official guidelines for the selection of a potential candidate. If an employer decided to hire an unemployed young person recommended by the PES, the employer was obliged to offer a full-time work contract that covered both the 12 months when the wage subsidy was being received and the following 12 months. From interviews with the PES workers, we know that the employers could suggest a specific person they wanted to hire.

The programme started operating in January 2016 and ran until the end of 2017. We confirmed this timeline through the reported number of entries into the programme across calendar months, as shown in Figure 3. While the contracts between employers and the PES could be signed up to the end of 2017, the PES may have closed the call earlier if the funds had been used up. Figure 3 shows that contracts were signed during the entire programme period, and that the last contracts were signed in December 2017. The wage subsidies were paid out until December 2018, or three years after the start of the programme.

The PES did not collect information on wages paid by the employers to the unemployed in the subsidised jobs. However, the PES required documentation that the labour contract was signed and the social security contributions were paid. The qualitative information collected from the PES workers suggests that virtually all of the subsidised jobs in this programme were jobs paid at the minimum wage. Therefore, in the following analysis, we focus on unemployment and employment as the main outcome of interest to evaluate the direct effects of the programme.

[Figure 3]

3. Empirical framework

3.1. Identification strategy

We attempt to estimate the effect of the wage subsidy programme starting in 2016 on the likelihood of exiting unemployment. We estimate the effect in the medium term and separately by gender. To identify the effect, we exploit the sharp discontinuity of eligibility for the programme between individuals just below and just above age 30. The challenge we face is that before the implementation of the programme in 2016, the European YG programme and the Polish ALMP for youth introduced in 2014 were already in place. In the following, we refer to these as potentially confounding policies. To address the identification challenge, we first estimate the marginal effect of the 2016 programme at the threshold by comparing 30-year-olds with 29-year-olds. Next, we estimate the marginal effect in the most recent period before the implementation, i.e., in 2015; and at the corresponding threshold, i.e., between individuals under age 30 (and thus eligible for existing ALMP youth

programmes) and individuals just over age 30 (and thus not eligible for these programmes). Then, we combine the regression-discontinuity design with the difference-in-differences design to specify a difference-in-discontinuities regression to estimate the reform's effect (see Grembi et al., 2016).

There are several underlying identification assumptions that we need to address. Since we can observe eligibility for these programmes in the administrative data of the PES, the design leads us to identify an intention-to-treat framework (ITT). Moreover, since selection into the programmes is arguably not random and is driven by individual decisions, the case workers at the PES, and employers, we prefer this parameter to a treatment on the treated parameter estimate.

To derive the main regression that we estimate, we define two treatments that change sharply at the age threshold A_c = 30 years. We define D_{it} as the first treatment for unemployed *i* at time *t*. It is equal to one if the unemployed are eligible for the wage subsidy introduced in 2016 and to zero otherwise:

$$D_{it} = \begin{cases} 1 \;\; if \; Age_{it} < A_c \; and \; t \geq 2016 \; and \; t < 2018 \\ 0 \;\; otherwise \end{cases}$$

The second treatment (P_{it}) is equal to one if the unemployed are younger than the threshold A_c (and are thus eligible for additional employment policies in every year since 2014):

$$P_{it} = \begin{cases} 1 \;\; if \; Age_{it} < A_c \\ 0 \;\; otherwise \end{cases}$$

Individuals of a specific age (Age_{it}) below the threshold A_c are eligible for employment policies available since 2014, while the new wage subsidy programme we evaluate was introduced at time *t* = 2016 for individuals below the age threshold A_c. It was available until the end of 2017.

We define $Y_{it}(d,p)$ as the potential labour market outcome if $D_{it} = d$ and $P_{it} = p$, with *d = 0,1* and *p = 0,1.* The observed outcome is thus equal to $Y_{it} = D_{it}P_{it}Y_{it}\,(1,1) + D_{it}(1-P_{it})Y_{it}\,(1,0) + (1-D_{it})P_{it}Y_{it}\,(0,1) + (1-D_{it})(1-P_{it})Y_{it}\,(0,0)$. We consider three labour market outcomes to measure exit from unemployment.

We attempt to identify the causal effect of D_{it} on the outcome Y_{it} , taking into account the fact that there is a potentially confounding policy P_{it}. In other words, we want to identify the impact of eligibility for the wage subsidy on being outside the unemployment register, in the absence of other confounding policies.

We fit local linear regression functions (Gelman & Imbens, 2019) to the observations within a bandwidth *h* on each side of A_c, both in 2015 and 2016. We restrict the sample to individuals within the age range $Age_{it} \in [A_c - h, A_c + h]$ measured at the point in time of registration, where *h* is equal to one year in the main specification. Formally, this means restricting the sample to the unemployed 29 to 30 years old.

We estimate the following difference-in-discontinuities model:

$$Y_{it} = \beta_0 + \beta_1 Age^*_{it} + S_i(\gamma_0 + \gamma_1 Age^*_{it}) + T_t[\alpha_0 + \alpha_1 Age^*_{it} + S_i(\delta_0 + \delta_1 Age^*_{it})\,] + X_{it} + \varepsilon_{it}\,, \quad (1)$$

where all variables are defined as before, and S_i is a dummy variable equal to 1 if the individual is below 30 years of age and equal to 0 otherwise (treatment indicator), T_t is an indicator variable for a post-treatment

period when the wage subsidy was introduced and $Age^*_{it} = Age_{it} - A_c$ is the re-centred age at the moment of registration. X_{it} are the control variables, which include a rich set of potential determinants of employment status: individual characteristics, human capital indicators, unemployment histories, and regional characteristics. The coefficient δ_0 is the difference-in-discontinuities estimator, and identifies the differential treatment effect of being eligible for the wage subsidy introduced in 2016. In the estimations, we use only individuals eligible during the first four months of the programme to exploit variation shortly after the introduction of the new policy and to exclude learnings effects. We also do so in order to follow the young individuals for up to 36 months, and thus to estimate medium-term effects. We estimate the model separately for men and women to test whether the effectiveness of the programme differed by gender. We supplement our main results with robustness tests of our results to multiple bandwidths *h*, first the predefined *h* = 2, and then optimally computed, following Calonico et al. (2014b, 2014a) in Section 4.1.

3.2. Data

We use administrative data from the Polish PES register, which includes information on all unemployed individuals registered at the PES between 2011 and 2018, and their complete histories of unemployment registrations and ALMP participation from 2005 until 30 April 2019. The register contains daily information about the beginning and the end of each unemployment spell and participation in labour market programmes. It also includes information that we use as control variables. Individual characteristics include age, gender, the presence of a child under six years old, and place of residence (urban/rural). Human capital is measured by level of education, vocational qualifications, and work experience. We capture the unobserved heterogeneity in motivation and employability indirectly in two ways. First, we include pre-treatment outcomes, such as cumulated unemployment, and eligibility for unemployment benefits. Second, we use the information on whether the jobseeker declares that s/he is able to take a job in another EU country, and on whether the jobseeker has a disability. All characteristics are reported at the beginning of each unemployment spell. In addition, we merge data collected by Statistics Poland on local labour markets with the individual dataset. These data include the local unemployment rate and the local average wage as a percentage of the country average at the regional NUTS-4 level and a distance to the NUTS-4 city from the municipality of residence (at the NUTS-5 level). Because of the sample size and the richness of the data available, these data have considerable advantages over survey data, which usually contain much smaller samples, which increases the risk of bias in the data.

Our main dataset consists of two groups of 29- and 30-year-old individuals who are followed for at least 36 months after registration. We select a group of 29- to 30-year-old individuals who all started an unemployment spell during the period of January to April in 2016. Among these individuals were 29-year-olds who were eligible for the newly introduced subsidy. As a second group, we select 29- to 30-year-old individuals who registered as newly unemployed during the period of January to April 2015, when none of them was eligible for the new wage subsidy programme. Figure 4 presents the average participation rate in the 2016 wage subsidy programme as a function of age. It confirms that none of the non-eligible individuals entered the programme.

[Figure 4]

To select our sample, we start with a larger sample that consists of all 267,389 unemployment spells of individuals who were 29-30 years old at the time of entry into unemployment. Then, we limit the sample to

unemployment spells starting between 1 January 2016 and 30 April 2016 for the reform period and between 1 January 2015 and 30 April 2015 for the pre-reform period in order to be able to observe the outcomes for 36 months after registration (95,485 observations left). We exclude individuals who were registered as unemployed or were participating in an ALMP during the six months before registration to ensure that we are analysing a new entry and not the continuation of a longer unemployment spell (62,678 observations left). After excluding observations with missing values in any of the control or outcome variables, the final sample consists of 61,801 observations, 32,134 from 2015 and 29,667 from 2016.

Our main labour market outcome used to proxy labour market success is being out of the unemployment register (outcome 1). An advantage of the register data is that they report the start and the end date of each unemployment spell. Thus, for each individual in our samples, we can accurately measure the transitions out of unemployment. We measure these transitions every 30 days for 36 consecutive periods since the registration.

In our data, being out of the unemployment register did not necessarily mean that the person was in employment. There were, however, strong incentives for an unemployed individual to register as unemployed. While it is possible that an unemployed person did not register with the labour office because, for example, s/he had a lack of faith in the effectiveness of PES support or s/he was inactive and caring for family members at home, the institutional design of labour market policies in Poland provides strong incentives to register with the PES even if an individual is not interested in or able to take up work. In Poland, an unemployed person must register as unemployed to be covered by health insurance, as the health insurance contributions of registered unemployed individuals are paid from the Labour Fund's budget. This strengthens the coverage of the unemployment register and of our outcome variables. We argue that the entire estimated effect at the threshold is the employment effect due to the wage subsidy. There is no reason why the propensity to leave the labour force would differ at the age threshold except due to the wage subsidy programme. If the programme did not change the propensity to exit the labour force, then our estimated effect is precisely the employment effect. If the wage subsidy programme decreased the propensity to exit the labour force, then our estimated effects are the lower bound of the true employment effects.

Individuals are dropped from the unemployment register if they participated in an ALMP. To take account of this in our outcome variables, we also construct another outcome variable measuring whether an individual was not registered as unemployed and was not enrolled in an ALMP (outcome 2).

Employers participating in the wage subsidy programme had an obligation to retain the wage subsidy programme participants as employees for at least 12 months after the subsidy expired. The PES registry data does not include an indicator variable that distinguishes between the status of an individual during the ALMP and during the following period of obligatory employment. As a result, during the obligatory employment period linked to the ALMP individuals are counted as ALMP participants. While this feature of the data does not affect the first outcome "being out of the unemployment register", it has an impact on the second outcome "being out of the unemployment register and not in ALMP". Individuals in the obligatory employment period, during which they received no support from the PES, are counted as ALMP participants, which results in a downward bias in the effect on the second outcome. To measure the cumulative effect of the programme, we construct the third outcome: the cumulative number of days out of the unemployment register (outcome 3).

Table 1 presents first statistics on our three outcome variables measured 36 months after the registration. Means are reported separately for individuals who were eligible to receive the wage subsidy (29-year-olds) and

individuals who were non-eligible (30-year-olds). The comparisons are simple test statistics of whether the 2016 wage subsidy programme was effective. Statistics are presented separately for men and women. Eligible women had a higher probability than non-eligible women of being out of the unemployment register (outcome 1) and being out of the unemployment register and not on an ALMP (outcome 2) 36 months after the registration. We observe no differences between eligible and non-eligible men in the probability of these outcomes. Both eligible men and eligible women were out of the unemployment register longer than their non-eligible counterparts 36 months after registration (14 and 35 days, respectively – outcome 3). A possible explanation for the differences in the employment outcomes of men and women is that their composition differed. Registered unemployed women were better educated: compared to men, they were twice as likely to have tertiary education and were half as likely to have low educational attainment. The second important gender gap among the registered unemployed concerns parenthood: women were more than twice as likely as men to have a pre-school child. Furthermore, the shares of individuals who were eligible to receive unemployment benefits were much higher among women than among men.

There were also differences in the composition of eligible and non-eligible individuals. The eligible individuals were better educated but had less work experience than the non-eligible individuals. The eligible individuals also had a lower number of earlier registrations and of days in the unemployment register. The non-eligible women were more likely to be eligible to receive unemployment benefits, which is a signal of recent job loss. The eligible women had a higher probability than the non-eligible women of living in a region with an above-average unemployment rate and a below-average income level. However, these raw differences in the employment outcomes of men and women, as well as the differences between eligible and non-eligible individuals, are unconditional on control variables, and do not account for the confounding employment policies. Hence, they may not identify the direct effects of the wage subsidy programme.

[Table 1]

3.3. Identifying assumptions

In our setting, we can identify the causal effect of the wage subsidy introduced in 2016 among those individuals who were also eligible for the confounding employment policies in place since 2013/2014 under two assumptions (Grembi et al., 2016; Leonardi & Pica, 2013). First, all potential outcomes (in t = 2015 & t = 2016) must be continuous at the age threshold of 30 (A_c). We test this assumption by verifying that each potential determinant of employment is continuous at the age threshold of 30. These are listed in Table 1, where we report the means for each variable together with the t-test testing whether the differences in means are significantly different from zero between the eligible and the non-eligible. The t-test statistics reveal that the means of several of the characteristics are significantly different below and above the threshold of 30 years of age for both men and for women. Additionally, for each of the variables, we graphically assess how the control variables vary with age when we consider the age groups 25 to 29 years old and 30 to 35 years old (the results are presented in Figures 9 and 10 in the Appendix). We draw on a RDD to test whether the analysed characteristics are continuous at the age threshold of 30 years of age and find that many are not. We take this into account by controlling for all of the variables listed in Table 1 in our main regression in the empirical analysis.

We also perform placebo tests to test whether the reform effects vanish if we move the year of the reform. We estimate a difference-in-discontinuities model at arbitrarily chosen age thresholds: namely, 26 and 31 years of age. Tables 3 and 4 in the Appendix provide the results. There are no differences at the thresholds in any of the analysed outcomes, which confirms our estimation strategy.

We also investigate potential manipulation at the threshold of 30 years of age. While it is difficult to manipulate one's age, individuals could manipulate the age at entry into unemployment by speeding up their registration. If this was the case, we would technically expect the number of registrations to increase significantly among people just below the 30-year threshold in comparison to that among people just above the threshold. Non-random selection to registrations could also violate our identification strategy regarding the RD around the 2016 reform if some eligible individuals who would otherwise not register as unemployed started to register at the PES only in order to receive the subsidy after the programme became available. However, Figures 5A and 5B suggest that no such manipulations are present. Figure 5A and 5B compare the number of registrations among the two age cohorts we study: the 29-year-olds and the 30-year-olds. In Figure 5A, we split the number of registrations by age cohort and gender, and in Figure 5B, we plot the ratio of the registered 30-year-olds relative to the registered 29-year-olds. As can be seen, the ratio is quite constant across time. Thus, there is no jump upward in the ratio in 2016 when the subsidy was introduced. These statistics support the interpretation that individuals were unlikely to have manipulated their age at registration and were unlikely to have started registering in greater numbers. We argue that this is because of the strong incentives for people to register as unemployed as soon as possible in order to receive free health insurance. Another reason is that we analyse the unemployment inflows during the first four months of the programme. Hence, the information about the programme had not yet had a chance to spread, since it is usually only after they register with the PES that the unemployed learned about the programmes.

[Figure 5]

The other assumption that is crucial for identification is that the effect of the second treatment (P_{it}), that is, the potentially confounding policy at A_c in the case of no D_{it} treatment (eligibility to the wage subsidy), is constant over time. In other words, individuals aged just below and just above A_c should have been on parallel trends in the absence of the wage subsidy. To provide a test for this assumption, we estimate the pattern of discontinuities in Y_{it} before 2016 to show that observations just below and just above A_c were not on differential trends before the introduction of the wage subsidy. Figure 6 shows the differences at the threshold of 30 years of age in the analysed employment outcomes before the introduction of the wage subsidy programme in 2016 estimated by the RDD for those who registered from 2012 to 2015. As the confidence bands clearly show, all of the point estimates for both men and women are not significantly different from zero. Therefore, the test confirms that there are no differential trends before the introduction of the wage subsidy in 2016.

[Figure 6]

An additional assumption for which we may need to estimate the effect among those who were not eligible for confounding policies is that the effect of the wage subsidy at A_c does not depend on the confounding policy (P_{it}) (Grembi et al., 2016). In our setting, this assumption would be violated if an unemployed 30-year-old reacted differently to being eligible to the wage subsidy than a 29-year-old who was simultaneously affected by the confounding policy. It is not possible to test this assumption, but the constant zero effect of the confounding

policy shown in Figure 6 suggests that the confounding policy and the wage subsidy are not correlated in this way.

Under this set of assumptions – that is, continuous co-variates at the threshold, no non-random selection to registration, and no correlation of the main and the confounding policies at the individual level – we can identify the employment effect of the introduction of the wage subsidy programme targeting the young unemployed population.

4. Results

We present two sets of results in this section. First, we show the results when we estimate the effect of the wage subsidy programme in 2016 by a regression discontinuity design. Hence, this is a first estimate that does not take into account contaminating factors through the previous confounding policies. Alongside these results, we also present RD estimates of the effect among newly unemployed individuals in 2015, who were not yet eligible for the new wage subsidy programme, but were only eligible for existing ALMP for the young unemployed. The results of the new wage subsidy are graphically presented in Figure 7. The diff-in-disc regression results are presented in Figure 8, which are our main results. We supplement the results with further heterogeneity analysis and some additional discussion of robustness.

Figure 7 presents point estimates of the difference in employment outcomes at the threshold of 30 years of age for men and women separately. Panels A-C show a separate graph for each of the three outcomes. We use the RD design and compare the employment outcomes of eligible individuals (i.e., those below the age threshold) to the employment outcomes of ineligible individuals (i.e., those above the age threshold). To include information on statistical significance at the 5% significance level in the graphs, we use markers on the lines at a particular point in time.

For men in panel A, we find that eligible men were about 3 p.p. more likely to be out of the unemployment register shortly after registration than non-eligible men. Still, shortly thereafter, the effects fell to zero. Women who were eligible for the wage subsidy were more likely to be out of unemployment registers than non-eligible women throughout most of the 36 months after registration. This effect fluctuated between 1.2 and 4.9 percentage points. (Figure 7, panel A). When we look at panel B, we see that the effects for women were reduced, most likely because they remained in ALMP programmes for some time. Among men, we observe a negative effect of wage subsidy eligibility on the probability of being out of the register and not in an ALMP between months 15-26, when the wage subsidy participants were still in obligatory employment and were treated as participating in an ALMP (Figure 7, panel B). Eligible women also spent a higher number of cumulative days out of unemployment registers than non-eligible women throughout most of the 36 months after registration. For men, the increase was significant only in the first 12 months after registering as unemployed (Figure 7, panel C).

These observations point to gender differences in the effects of the wage subsidy programme on labour market outcomes that have not been previously investigated in empirical research.

Figure 7 on the left-hand side presents the corresponding analysis results when we use 2015 as the period of estimation and entries into unemployment during the first four months. When looking at panels A-C, we observe that the results for men and women are now very similar. Hence, we do not find gender differences in the effects

of other employment policies available in 2015 for the unemployed under age 30. For our first outcome, being out of unemployment, we observe a declining trend in the differential effect, from a slightly positive effect during the first 12 months to a slightly negative effect. In panel B, we find an effect close to zero throughout the 36 months after entry into unemployment. The effect on the accumulated number of days out of unemployment is solidly around zero. Hence, we find no statistically significant differences at the threshold of age 30 and no gender differences (Figure 7, left panels).

The comparison of 2016 and 2015 in Figure 7 suggests that the divergence in the 2016 results is driven by the marginal effect of the new wage subsidy under evaluation.

[Figure 7]

To quantify the direct effect of the new wage subsidy programme in 2016 from the effect of the previous policies, we now turn to the results from the diff-in-disc estimator as specified in equation (1). The estimation results are presented in Figure 8 and Table 2 for each of the three employment outcomes. Figure 8 reports the point estimates, and Table 2 reports point estimates with standard errors and significance in six-month intervals since registration.

Figure 8 plots, for the three employment outcomes in panels A-C, the key coefficient δ_0 which is the difference-in-discontinuities estimator. It identifies the treatment effect of being eligible for the wage subsidy introduced in 2016 month by month and separately for men and women. The diff-in-disc results show that the wage subsidy positively impacted employment outcomes for young eligible women, but not for men. Among women, being eligible for the wage subsidy raised the probability of being out of the unemployment register 25 to 35 months after the registration by 2.7 to 4.5 percentage points. However, the effects are not statistically significant for some periods (see panel A). Once we consider ALMP participation and look at the probability of being out of the register but not in ALMP, we see no effect of eligibility for women up to 30 months after registration. Still, eligibility later increases the probability of being out of the register and not in ALMP by 2.8 to 4.8 percentage points. Only the last two periods are statistically insignificant (panel B). The effect is quite large given that it is an ITT estimate. Among men, being eligible for the wage subsidy did not affect the probability of being out of the register (panel A). It reduced the probability of being out of the register and not in ALMP in the second year after registration (panel B). While the 12-month point was when the subsidy expired, the employer was obliged to retain the employee for an additional 12 months. This period is treated as ALMP participation. The effect disappears in the third year after registration, suggesting the presence of a "lock-in" effect of the wage subsidy for men in the second year.

The effect of eligibility for the wage subsidy programme on the number of days out of the unemployment register accumulated over time after registration (panel C), which is consistent with the effects on the probability of being out of the register. On average, eligible women spent 34 more days out of the unemployment register than non-eligible women during the 36 months after registration. We see no statistically significant effect among men (panel C).

[Figure 8]

[Table 2]

The main result from our analysis is that young unemployed women were positively affected by the wage subsidy programme, while young unemployed men were not. Hence, women's employment was positively

affected, which suggests that the expansive ALMP introduced during a period of economic upswing in 2016 was successful. This result is based on an analysis of individuals who entered unemployment during the first four months of the wage subsidy programme and who could be followed for up to 36 months. Hence, during a period when the youth labour market was improving (Figure 1), we observe that women were more likely to exit unemployment owing to the new wage subsidy programme. This is our interpretation of the intention-to-treat effect that we can identify with our data. The question arises, however, as to whether the gender differences in the marginal effect are related to heterogeneity in other characteristics.

Heterogeneity analysis

In supplementary estimates of our model, we test whether the results differ depending on the educational level of unemployed individuals. As the summary statistics in Table 1 show, the unemployed women were better educated than the unemployed men: e.g., 41% of the women compared to 18% of the men had tertiary education. We present the results in Table 5 in the Appendix, separately for men and women, and separately for individuals who completed secondary education or less and individuals with tertiary education. Among men, the partial effects of the wage subsidy are insignificant regardless of the level of completed education (Appendix, Table 5). Among women, the effects are larger and more precisely estimated among women with lower levels of education. This result may reflect the fact that more women than men work in low-paid jobs with compensation close to minimum wage. Hence, the likelihood of transitioning out of unemployment reflects this match.

We also investigate heterogeneity concerning regional differences in unemployment rates by dividing our sample of unemployed individuals into those living in regions with unemployment above and below the country median. For our sample of men, the results remain unchanged, and we find no significant effects for both sub-groups (Appendix, Table 6). For our sample of women, we now find relatively strong effects in the regions where the unemployment rate was below the country's median unemployment rate of 6.0%. The size of the marginal effects is similar to that for the relatively low-skilled.

4.1 Robustness checks

Our main results on gender differences are also robust to other tests we have conducted. The results remained unchanged when we estimated the difference-in-discontinuities model without covariates compared to our main specification with the full set of covariates. While the point estimates of the coefficients changed slightly, the results and the interpretations were unchanged (Appendix, Figure 11).

We also estimated the difference-in-discontinuities model modifying the bandwidths around the threshold. We used a predetermined bandwidth of two years, and thus included 28-31-year-olds in the sample (Appendix, Table 7). We found that the results are robust. We also estimated optimal bandwidths h following the algorithm developed by Calonico et al. (2014a, 2014b) (Appendix, Table 8). The general pattern of the results remained unchanged, and some estimates gained statistical significance.

We also estimated the difference-in-discontinuities model using “donut-RDD” (Barreca et al., 2016) so after dropping observations in the vicinity of the treatment threshold. This accounts for the fact that the age threshold of the subsidy eligibility was determined at programme entry, not at the start of unemployment.

Individuals slightly younger than 30 at unemployment entry quickly aged out of eligible group so that they can be considered "partially treated". We estimated a model with a 1.5-month "hole" dropping the unemployed individuals who had 1.5 months or less to their 30th birthday as they have smaller chances to get the wage subsidy. The sample consisted of unemployed individuals aged 28.875-29.875 and 30-31 years old at the start of unemployment. The 1.5-month "hole" corresponds to the median time from registration to the wage subsidy start among the 26-28 years old. While the standard errors are slightly larger, the points estimates and the interpretations were unchanged (Appendix, Table 9).

5. Discussion

We studied a large-scale wage subsidy programme for young unemployed people in Poland that started in 2016 during an upswing of the economy and lasted for three years. We identified the effects of the policy using a difference-in-discontinuities estimator that purged the marginal effects of the policy from other effects through existing active labour market policies for the young and selection into eligibility for the wage subsidy. Particularly for identification, we exploited the threshold of eligibility at age 30 and rich administrative data on unemployment for Poland during that period. We found that the wage subsidy programme positively affected eligible women in terms of their probability of being out of the unemployment register and their accumulated days out of unemployment. This is strong evidence of positive employment effects in the medium run. By contrast, we found no statistically significant effects on employment among men.

Most evidence on wage subsidy programmes in the literature comes from recessions, while the programme we studied was introduced when Poland was undergoing a period of economic expansion. As we show, unemployment rates decreased and the labour market recovered during that period. Our results suggest that a significant number of firms and of unemployed women benefitted from the wage subsidy programme, which implies that there was a group of young women who could not enter or re-enter employment despite a general recovery in the labour market. The heterogeneity analysis reveals that, in particular, low- to medium-skilled women and women in regions with below-the-median unemployment rates benefitted from the wage subsidy programme.

A potential explanation for this finding could be related to wage rigidities resulting from minimum wages. A study by Cahuc, Carcillo, and Le Barbanchon (2019) found that wage subsidies targeted at low-wage workers effectively increase employment. However, they studied a period of recession. In Poland, young women are more likely than men to work in jobs that pay no more than the minimum wage (27% and 22%, respectively). This may explain the higher effectiveness of the 2016 wage subsidy among women with lower levels of education, as they were more likely to be working in a job with rigid, low wages.

The result that the positive employment effects were relatively high for women living in areas with relatively low unemployment levels seems surprising. This could reflect a mix of labour demand and supply factors. Employers may have preferred to retain female employees at previously subsidised workplaces in a labour market that was becoming relatively tight, and women may have preferred to remain in these workplaces, partly due to the non-pecuniary benefits of employment. Our findings suggest that there is a need for more research on the effects of ALMP during the economic recovery and on the gender differences among young unemployed individuals, including in their transitions from unemployment to employment.

Our study does not account for potential substitution and displacement effects at the expense of older workers, who were not eligible to the subsidy. If such externalities exist, we would overestimate the net effectiveness of the programme. Such displacement effects were shown for job-search assistance programs targeted at young jobseekers in France (Crépon et al., 2013) but in case of wage subsidies there is little evidence on negative spill over effects on ineligible workers or non-participating firms (Blundell et al., 2004; Cahuc et al., 2019; Kangasharju, 2007). Furthermore, we are unable to estimate the potential deadweight losses associated with the wage subsidy – likely some of the unemployed would have found jobs on their own, given the improving labour market in the period we study.

The results of our study have important policy implications. Our findings highlight that the evaluation of labour market policies is enriched by accounting for heterogeneity across gender and age. Economic incentives, costs and benefits associated with labour market entry and labour supply, and net returns to educational investment are likely to differ by gender, particularly among the young. Therefore, incorporating these differences into conceptual and empirical policy analysis leads to more informative estimates of policy effects and labour market performance. More particularly, our results suggest that wage subsidies should be targeted at women with lower levels of education, since they are more likely to benefit from such supports than highly educated women, or than men. This might be because these subsidies provide steppingstones to entering firms, and reduce the costs of matching lower-skilled unemployed women and jobs. Overall, there is a clear need for more micro-econometric evaluations of ongoing active labour market programmes and the heterogeneity of their impacts. Large randomised control trials could be suitable as pilots to test new policy designs prior to their introduction (Kreiner & Svarer, 2022).

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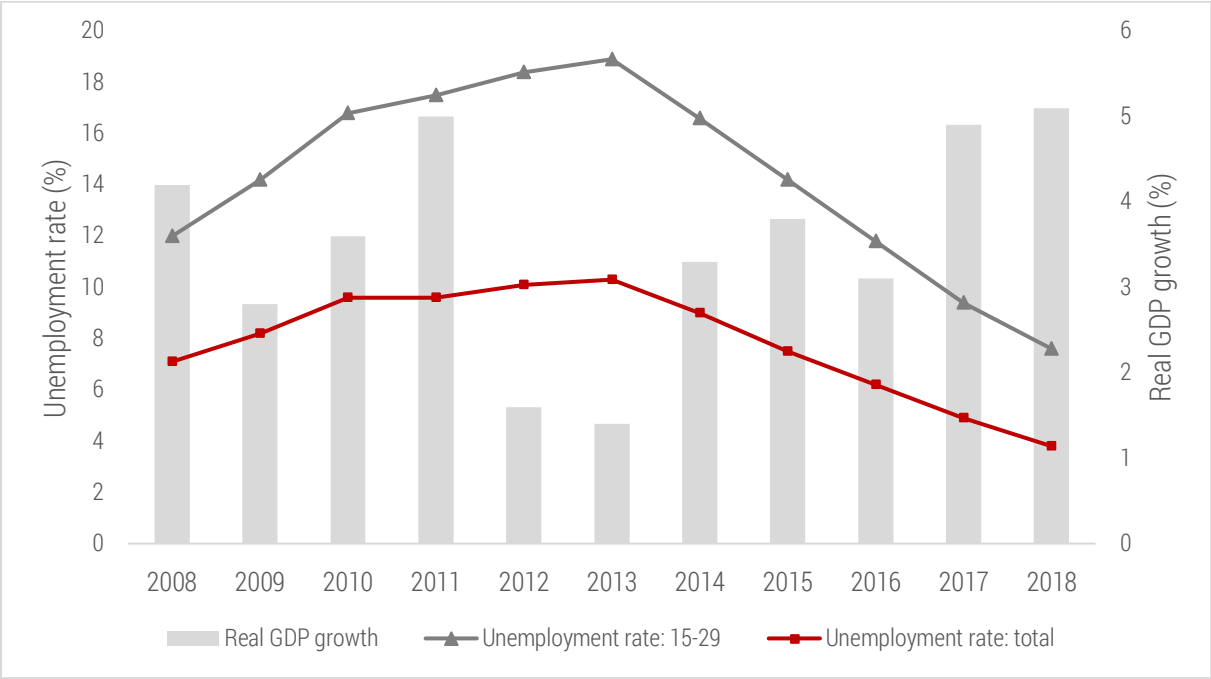
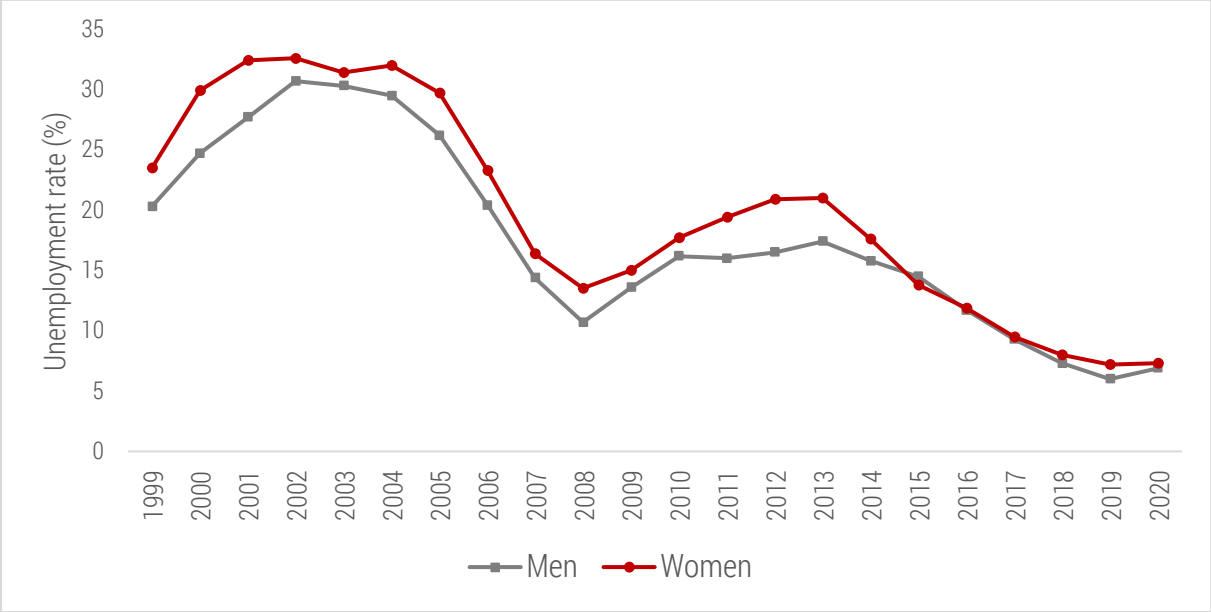
Figure 1. Unemployment and real GDP growth in Poland during the period 2008 to 2018



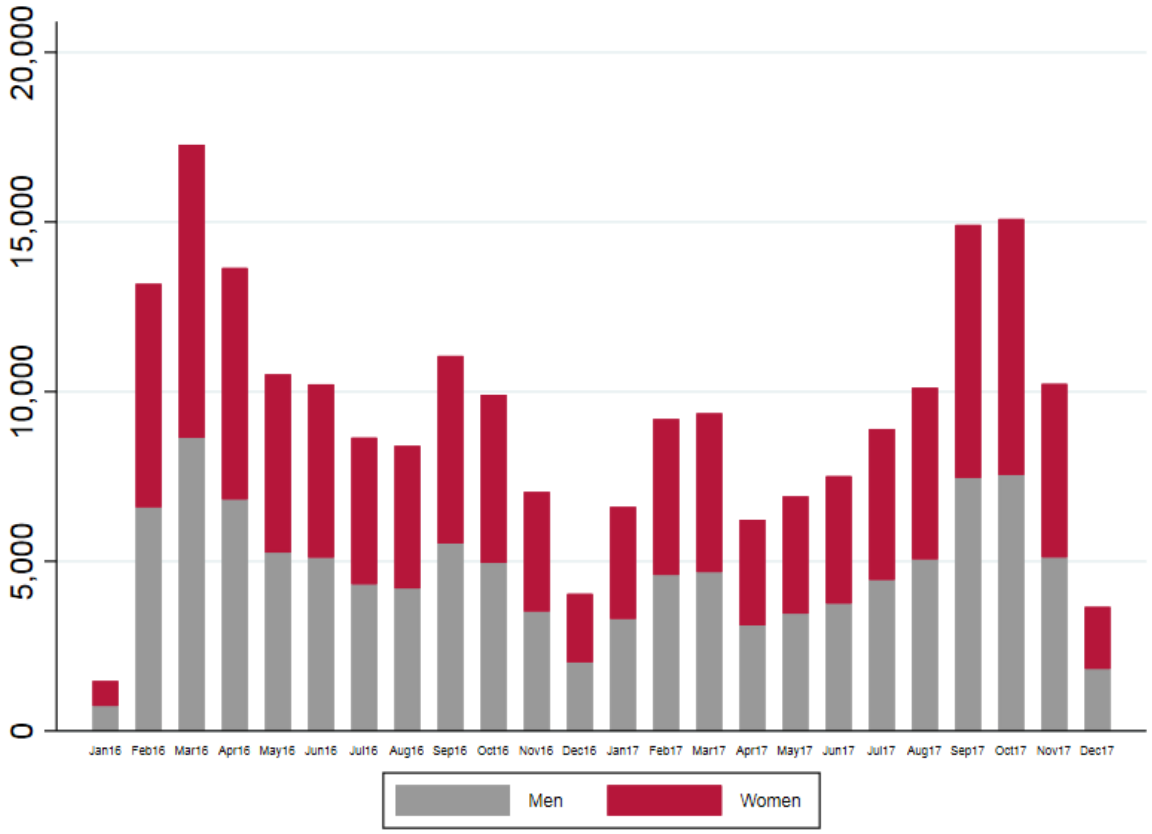
Source: Unemployment rates (Statistics Poland); Real GDP growth (Eurostat).

Figure 2. The youth unemployment rate (age 15 to 29) in Poland during the period 1999-2020, in percent



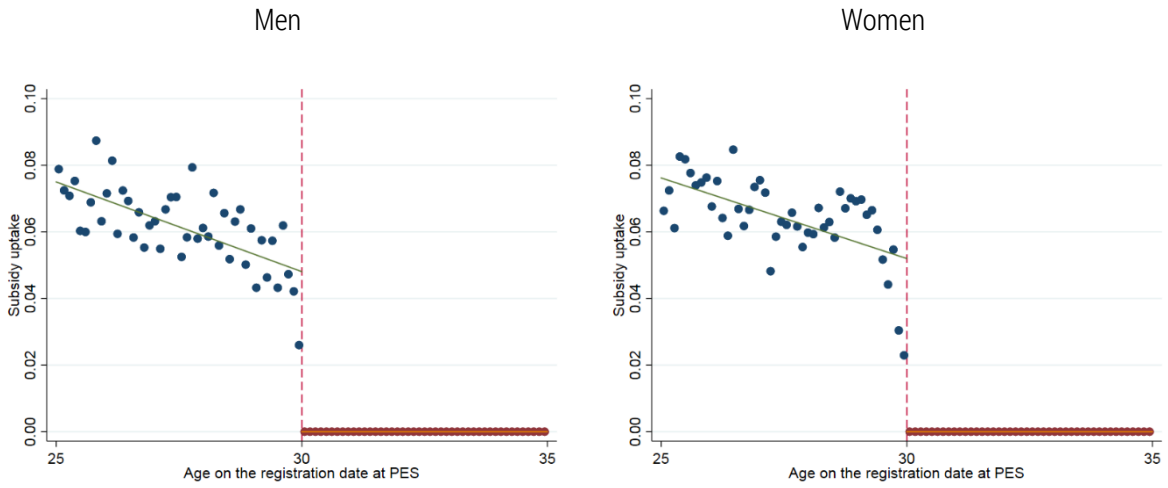
Source: Own calculations based on the Polish Labour Force Survey (LFS).

Figure 3. The number of new entries into the 2016 wage subsidy programme, by year and gender



Note: The figure includes all entries into the 2016 wage subsidy programme regardless of the individual's registration date.

Figure 4. The take up of the 2016 wage subsidy , percentage of registered unemployed by age and gender[1]



Note: [1]The period from 1st January to 30th April 2016. Dots represent the sample averages within bins; the lines represent the linear fit. Age is continuous and measured in days converted to years. Registrations are limited to registrations of individuals who were not registered as unemployed and had not participated in an ALMP during the six months before the current registration.

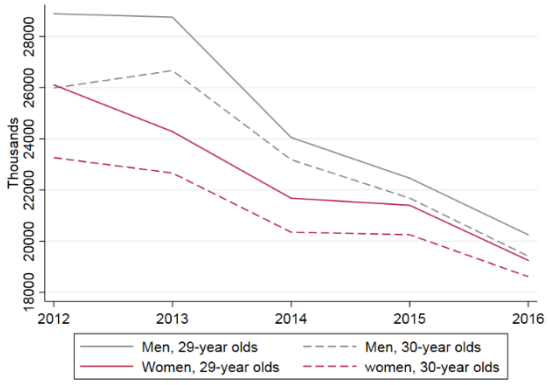
Table 1. Descriptive statistics for the control and outcome variables using the main analysis sample for the 2016 wage subsidy reform (2016), by gender

	Men					Women				
	Eligible (age=29)		Non-eligible (age=30)		Diff.	Eligible (age=29)		Non-eligible (age=30)		Diff.
	Mean	Std.	Mean	Std.		Mean	Std.	Mean	Std.	
Control variables										
Lower Education[1]	0.46	0.50	0.48	0.50	0.02**	0.21	0.40	0.22	0.41	0.02*
Secondary Education[1]	0.36	0.48	0.36	0.48	0.00	0.38	0.49	0.38	0.49	0.00
Tertiary Education[1]	0.18	0.38	0.16	0.37	-0.02***	0.41	0.49	0.39	0.49	-0.02*
No work experience	0.17	0.37	0.14	0.35	-0.03***	0.13	0.34	0.12	0.33	-0.01
Work experience (days)	1396	1092	1603	1189	207***	1404	1016	1661	1156	257***
Number of earlier registrations	3.56	2.88	4.04	3.17	0.48***	3.23	2.72	3.47	2.90	0.24***
Cumulated unemployment (days)	589	581	701	655	112***	658	703	762	792	103***
Disability	0.02	0.13	0.02	0.15	0.00	0.02	0.14	0.02	0.14	0.00
Child under 6 years old	0.17	0.38	0.19	0.39	0.02**	0.39	0.49	0.41	0.49	0.02*
City	0.58	0.49	0.60	0.49	0.01	0.60	0.49	0.62	0.49	0.01
Long-term unemployed	0.06	0.23	0.05	0.23	0.00	0.07	0.25	0.06	0.24	0.00
No qualifications	0.29	0.46	0.25	0.43	-0.04***	0.25	0.43	0.19	0.40	-0.05***
Eligible for unemployment benefits	0.22	0.41	0.22	0.42	0.01	0.36	0.48	0.39	0.49	0.02**
Interest in working in another EU country	0.18	0.38	0.18	0.38	0.00	0.07	0.25	0.07	0.25	0.00
Regional unemployment (NUTS 4, %)	6.18	2.58	6.14	2.55	-0.04	5.94	2.58	5.82	2.50	-0.12**
Income related to country average (NUTS 4, %)	88.30	14.32	88.46	14.16	0.16	88.90	14.47	89.65	15.36	0.74**
Average distance to city (NUTS 5, km)	9.25	10.84	9.07	10.82	-0.18	8.84	10.52	8.83	10.68	-0.01
Outcome variables										
Not in register (after 36 months)	0.90	0.30	0.90	0.30	0.00	0.84	0.36	0.82	0.38	-0.02**
Not in register and not in ALMP (after 36 months)	0.88	0.32	0.88	0.33	0.00	0.82	0.38	0.80	0.40	-0.02**
Cumulated days not in register (after 36 months)	859	226	845	227	-15***	757	313	724	323	-33***
Observations	7974		7758			7035		6900		

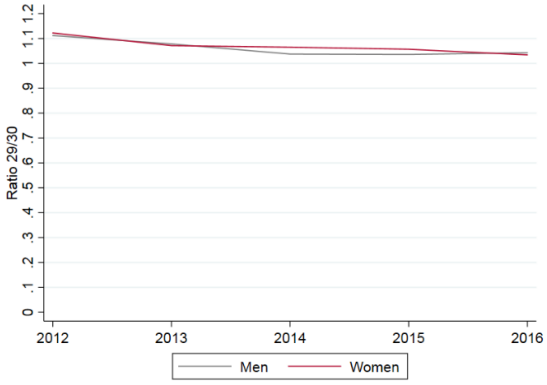
*Note: [1]Lower education is lower secondary education or lower, with upper secondary vocational education with no access to post-secondary or tertiary education (ISCED levels 0-2, and 3C according to ISCED 1997 classification). Secondary education is upper-secondary programmes (both vocational and general) which give access to tertiary education and post-secondary education (ISCED levels 3A and 4 according to ISCED 1997 classification). Tertiary education is ISCED levels 5 and 6 according to ISCED 1997 classification. We combined upper secondary vocational education (ISCED 3C) with the lowest category because the labour outcomes of this group differ from the other upper-secondary categories and the share of people with lower-secondary education or below is very small. ***/**/* indicate statistical significance at the 0.1%/1%/5%-level.*

Figure 5. The number and ratio of registrations of 29- and 30-year-olds in 2012-2016, by gender

A. Number of registrations (in thousands)



B. The ratio of registrations (age 29 to age 30)

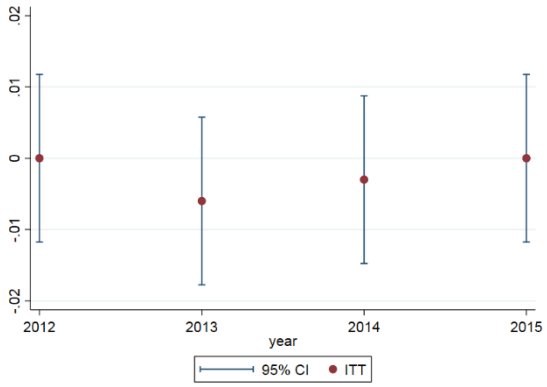


Note: Registrations are limited to registrations of individuals who were not registered as unemployed and had not participated in an ALMP during the six months before the current registration.

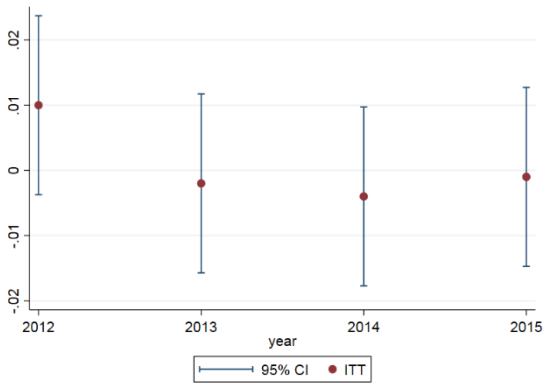
Figure 6. Pre-treatment trend: Regression discontinuity estimates at the 30-years of age threshold and their confidence intervals for outcomes 36 months after registration in the years 2012-2015, by gender

A. Outcome: Being out of the unemployment register 36 months after registration

Men



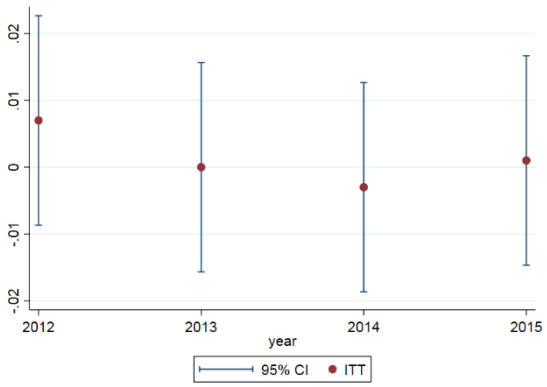
Women



B. Outcome: Being out of the unemployment register and not in ALMP 36 months after registration

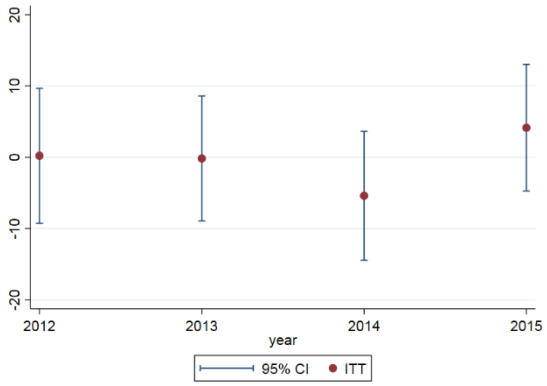
Men

Women

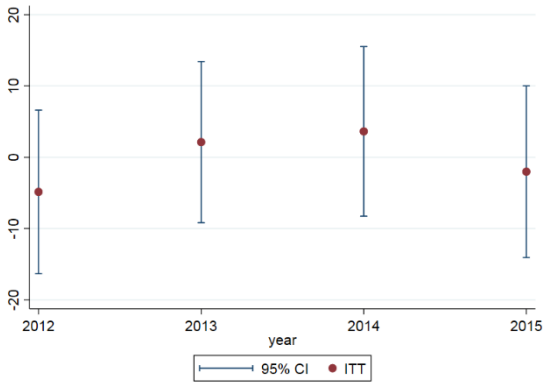


C. Outcome: Cumulative # of days out of unemployment register 36 months after registration

Men



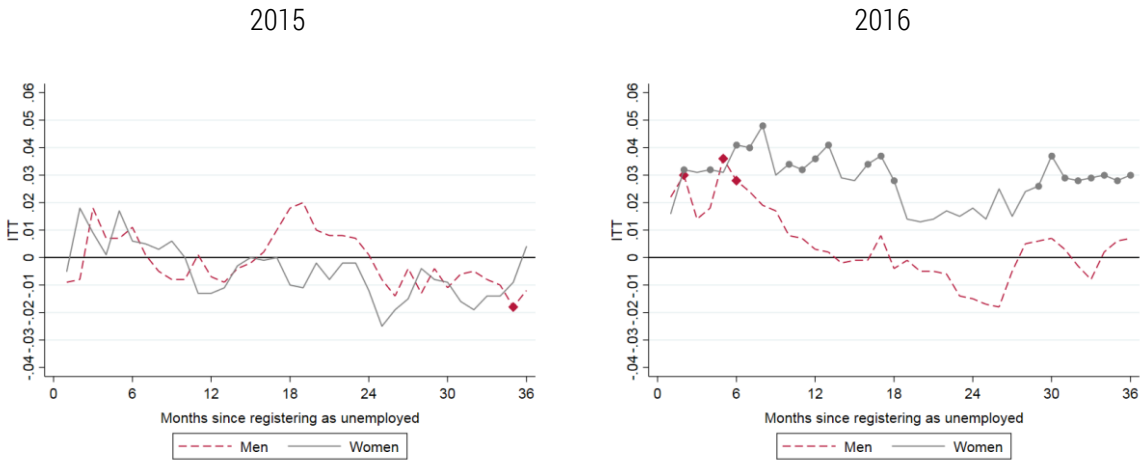
Women



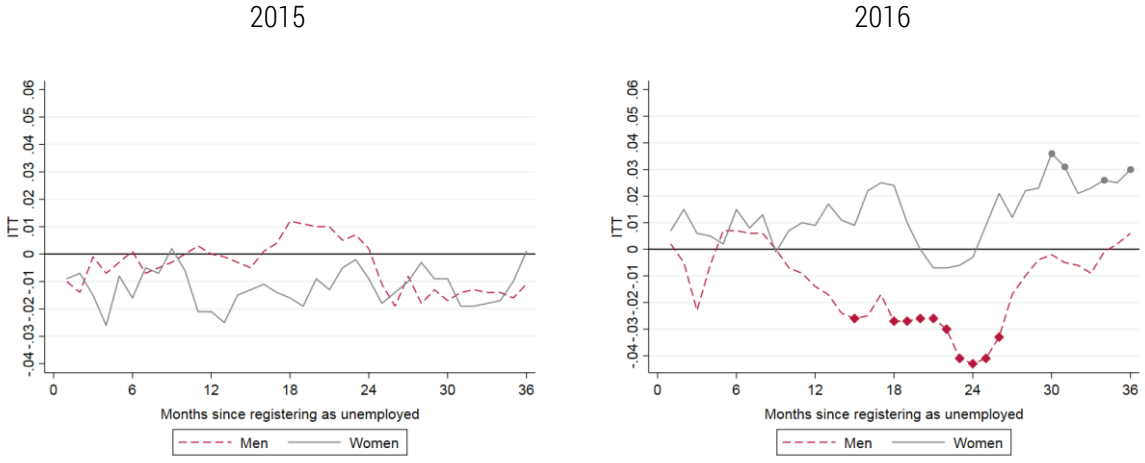
Note: The dots represent point estimates of the difference in the respective employment outcomes (presented in panels) at the 30-year threshold. The lines represent 95% confidence intervals.

Figure 7. Regression discontinuity estimates and their significance at the 30-years of age threshold 1 to 36 months after registration in 2015 and 2016, by gender

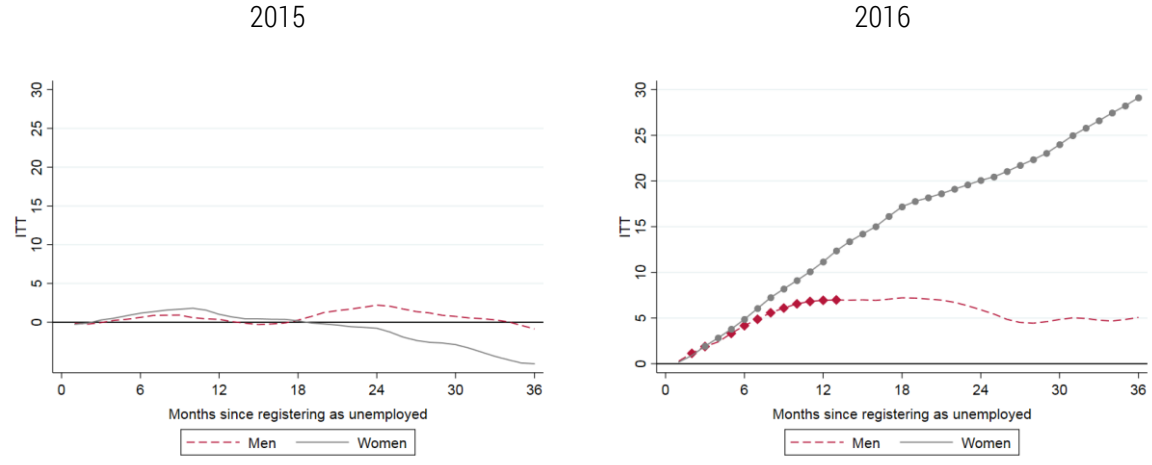
A. Outcome: Being out of the unemployment register



B. Outcome: Being out of the unemployment register and not in ALMP



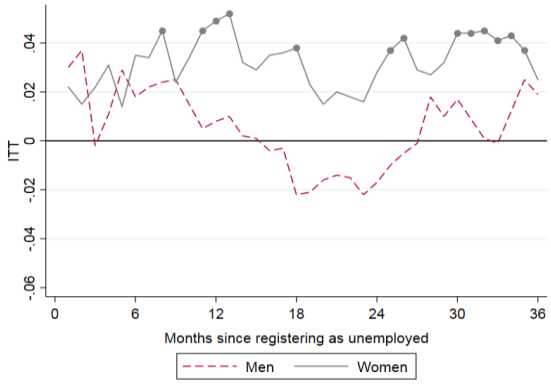
C. Outcome: Cumulative # of days out of the unemployment register



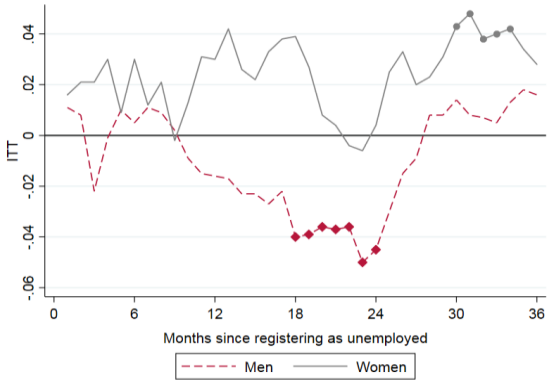
Note: This figure depicts the difference in outcomes at the 30-year threshold by months since registering as unemployed. The effects are estimated using regression discontinuity design. The sample includes all men (women) 29 and 30 years old who registered as unemployed from January to April 2015 (2016) and were not registered as unemployed and had not participated in an ALMP during the six months before the current registration. The marker on the line at a particular point in time indicates that the effect is statistically significant at the 5% significance level. The control variables include the level of education, place of residence (urban/rural), disability status, presence of children aged six or younger in the household, lack of qualifications, a dummy for long-term unemployment, total work experience, a dummy for having no work experience, total time in the unemployment register, the number of earlier registrations, a dummy for eligibility to receive unemployment benefits, and a dummy for declaring an interest in migrating to other EU countries, the local unemployment rate (at the NUTS 4 level), the local average wage as a percentage of the country average (at the NUTS 4 level), and a distance to the NUTS-4 city from the municipality of residence (at the NUTS-5 level).

Figure 8. The differential effect of eligibility to the 2016 wage subsidy (ITT) and their significance estimated by the difference-in-discontinuities approach 1 to 36 months after registration, by gender

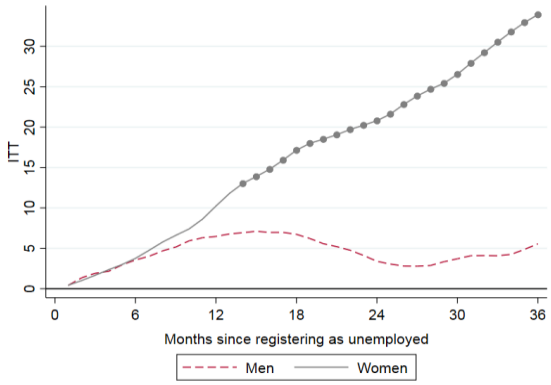
A. Outcome: Being out of the unemployment register



B. Outcome: Being out of the unemployment register and not in ALMP



C. Outcome: Cumulative # of days out of the unemployment register



Note: This figure depicts the marginal effects of being eligible to the 2016 wage subsidy by months since registering as unemployed. The effects are estimated using the difference-in-discontinuities approach. The sample includes all men (women) 29 and 30 years old who registered as unemployed during the periods January to April 2015 and January to April 2016 and were not registered as unemployed and had not participated in an ALMP during the six months before the current registration (the main analysis sample). The marker on the line at a particular point in time indicates that the effect is statistically significant at the 5% significance level. The control variables include the level of education, place of residence (urban/rural), disability status, presence of children aged six or younger in the household, lack of qualifications, a dummy for long-term unemployment, total work experience, a dummy for having no work experience, total time in the unemployment register, the number of earlier registrations, a dummy for eligibility to receive unemployment benefits, and a dummy for declaring an interest in migrating to other EU countries, the local unemployment rate (at the NUTS 4 level), the local average wage as a percentage of the country average (at the NUTS 4 level), and a distance to the NUTS-4 city from the municipality of residence (at the NUTS-5 level).

Table 2. The differential effects of eligibility to the 2016 wage subsidy (ITT) estimated by the difference-in-discontinuities approach 6, 12, 18, 24, 30, and 36 months after registration, by gender

	Men					
	M6	M12	M18	M24	M30	M36
Outcome 1	0.018	0.008	-0.022	-0.017	0.017	0.019
	(0.020)	(0.018)	(0.015)	(0.015)	(0.013)	(0.013)
Outcome 2	0.005	-0.016	-0.040*	-0.045**	0.014	0.016
	(0.021)	(0.020)	(0.017)	(0.016)	(0.015)	(0.014)
Outcome 3	3.565	6.471	6.732	3.391	3.708	5.556
	(2.595)	(4.673)	(6.228)	(7.476)	(8.626)	(9.698)
N	33077	33077	33077	33077	33077	33077
	Women					
	M6	M12	M18	M24	M30	M36
Outcome 1	0.035	0.049*	0.038	0.028	0.044*	0.025
	(0.023)	(0.021)	(0.020)	(0.018)	(0.017)	(0.017)
Outcome 2	0.030	0.030	0.039	0.004	0.043*	0.028
	(0.022)	(0.023)	(0.021)	(0.020)	(0.019)	(0.018)
Outcome 3	3.762	10.238	17.149*	20.799*	26.547*	33.925*
	(2.819)	(5.647)	(8.105)	(10.248)	(12.168)	(13.943)
N	28724	28724	28724	28724	28724	28724

*Note: The sample includes all men (women) 29 and 30 years old who registered as unemployed during the periods January to April 2015 and January to April 2016 and were not registered as unemployed and had not participated in an ALMP during the six months before the current registration (the main analysis sample). The table reports the marginal coefficients of being eligible to the 2016 wage subsidy. Standard errors are reported in parenthesis. Outcome 1 is being out of the unemployment register; Outcome 2 is being out of the unemployment register and not in ALMP; Outcome 3 is the cumulative number of days out of the unemployment register. The control variables include the level of education, place of residence (urban/rural), disability status, presence of children aged six or younger in the household, lack of qualifications, a dummy for long-term unemployment, total work experience, a dummy for having no work experience, total time in the unemployment register, the number of earlier registrations, a dummy for eligibility to receive unemployment benefits, and a dummy for declaring an interest in migrating to other EU countries, the local unemployment rate (at the NUTS 4 level), the local average wage as a percentage of the country average (at the NUTS 4 level), and a distance to the NUTS-4 city from the municipality of residence (at the NUTS-5 level). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.*

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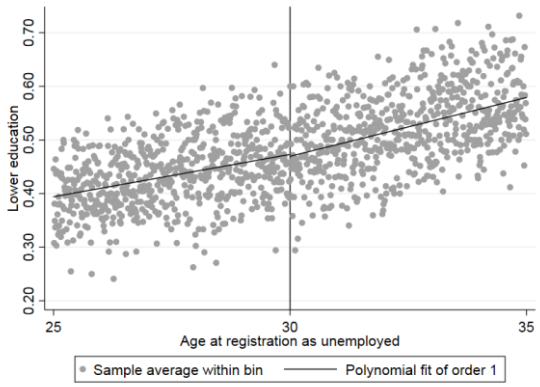
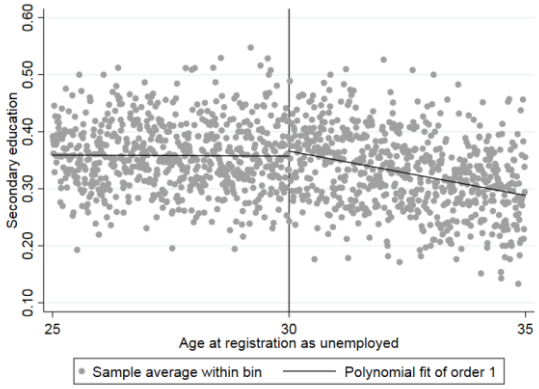
Appendix

Figure 9. Control variables as a function of age: men[1]

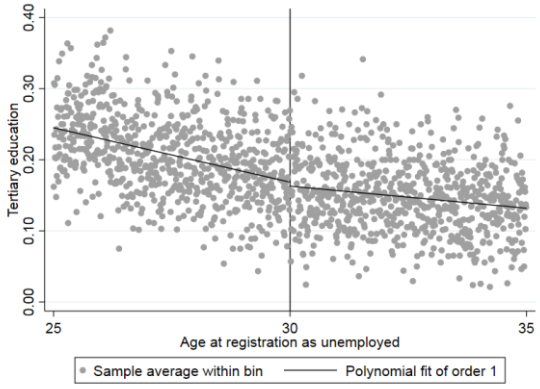
Lower education (ISCED 0-2, 3C)



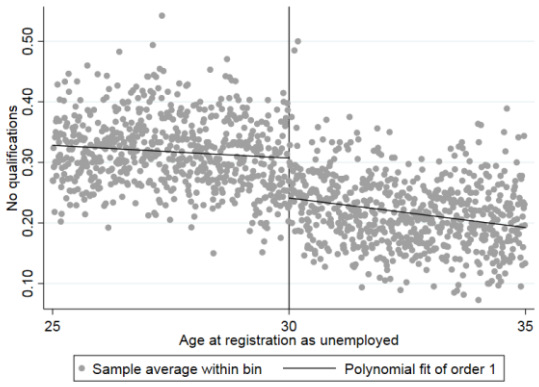
Secondary education (ISCED 3A and 4)



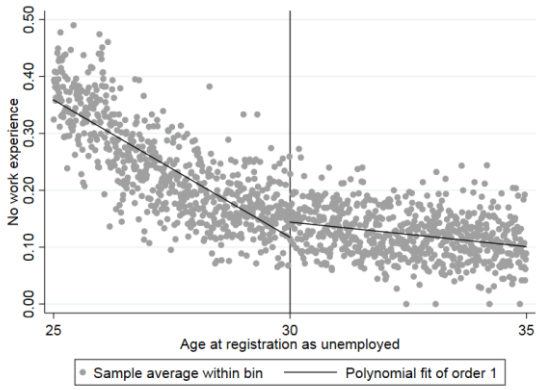
Tertiary education (ISCED 5 and 6)



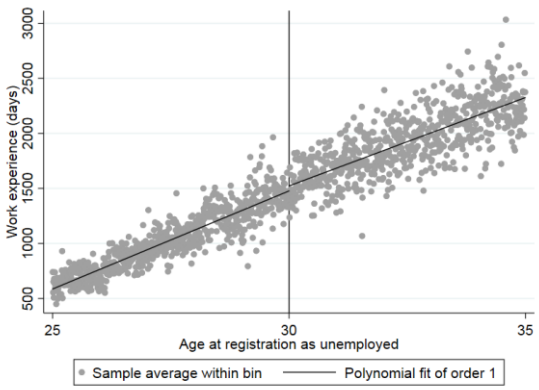
No qualifications



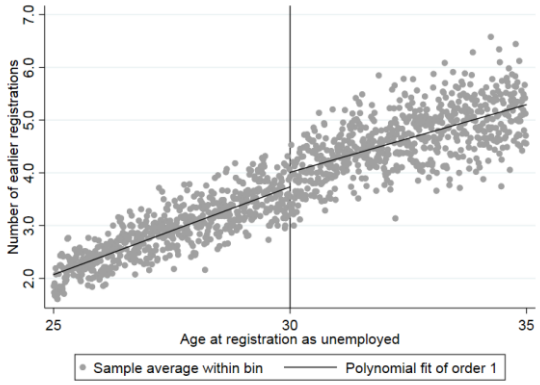
No work experience



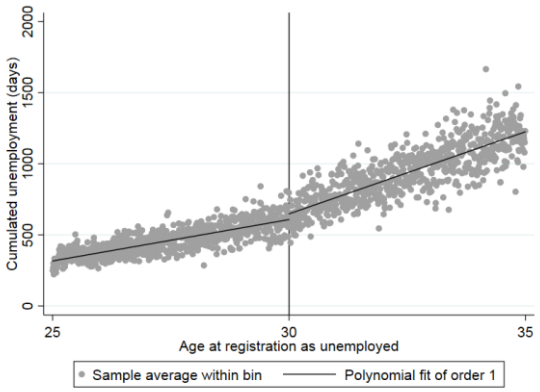
Work experience (days)



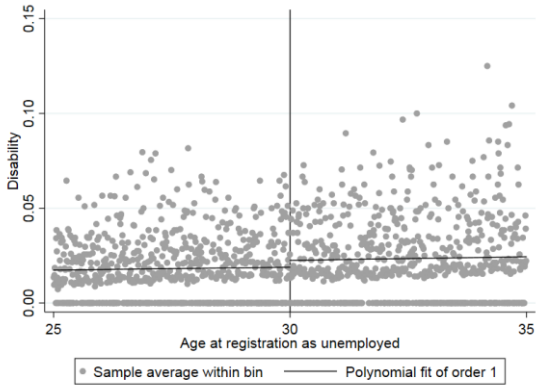
Number of earlier registrations



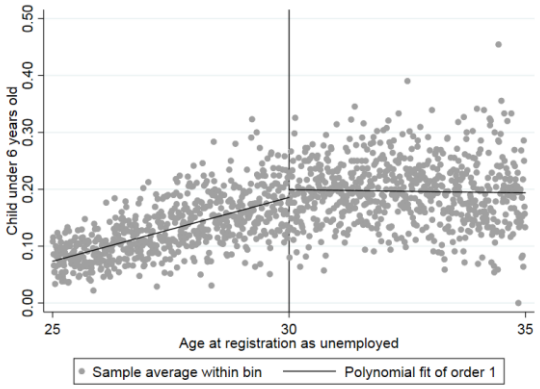
Cumulated unemployment (days)



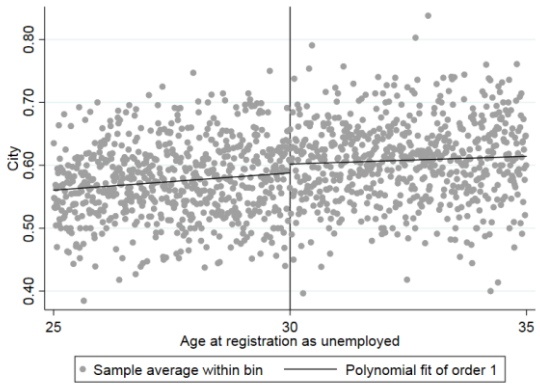
Disability



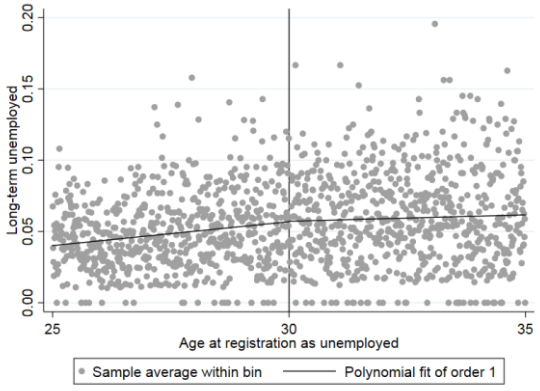
Child under 6 years old



City

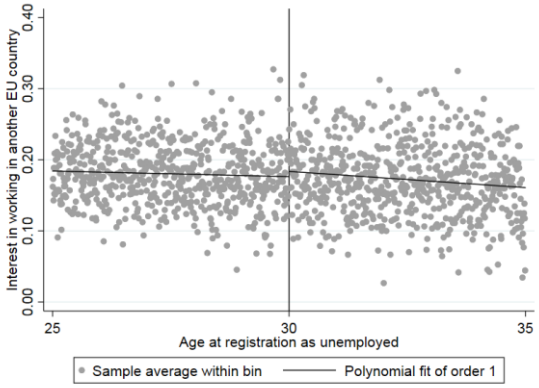


Long-term unemployed

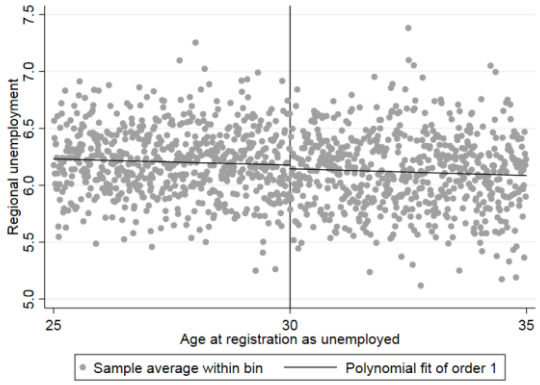


Eligibility for unemployment benefits

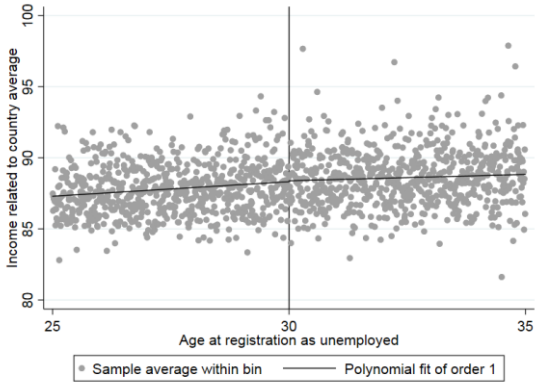
Interest in working in another EU country



Regional unemployment (NUTS 4)



Income related to country average (NUTS 4)

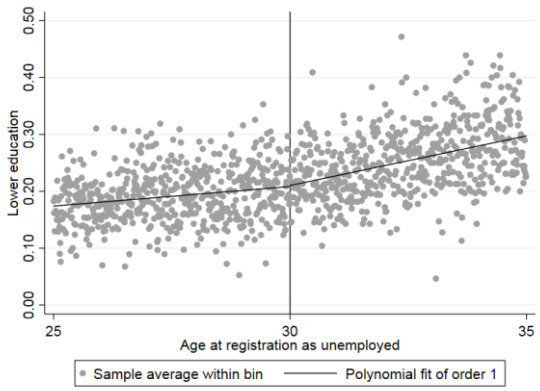


Average distance to city (NUTS 5)

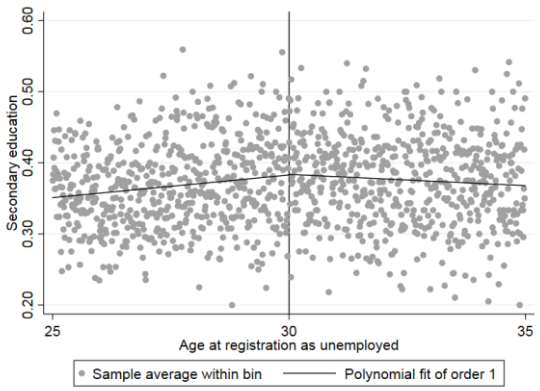
Note: [1] *The period from 1st January to 30th April 2016. Dots represent the sample averages within bins. The line is a linear fit. Age is continuous and measured in days converted to years.*

Figure 10. Control variables as a function of age: women[1]

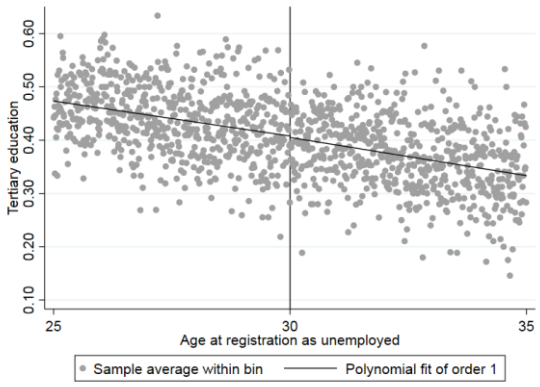
Lower education (ISCED 0-2, 3C)



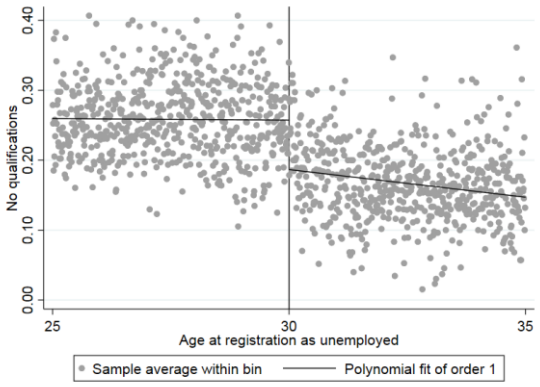
Secondary education (ISCED 3A and 4)



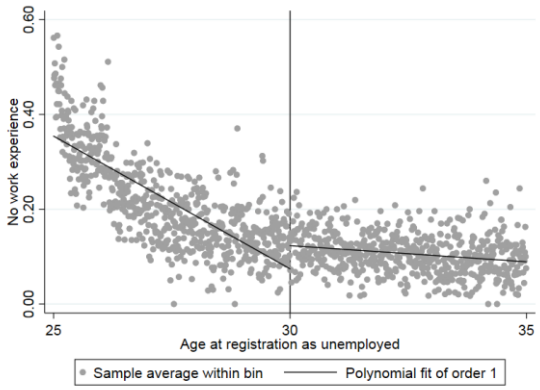
Tertiary education (ISCED 5 and 6)



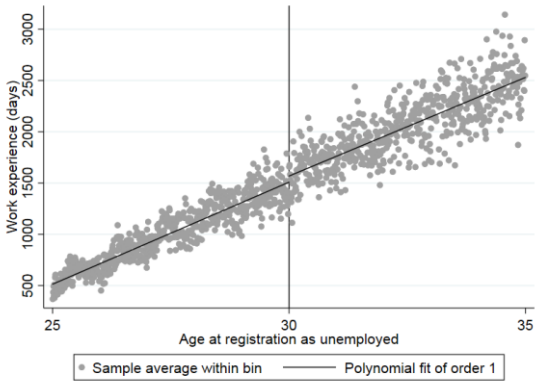
No qualifications



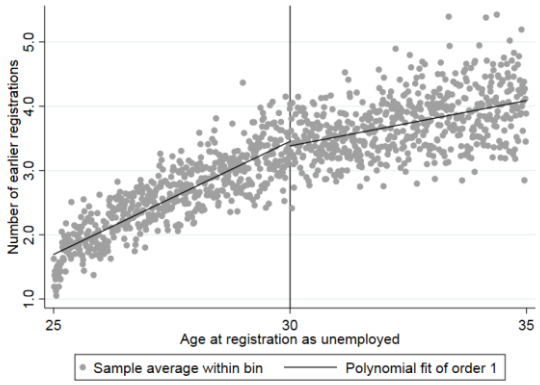
No work experience



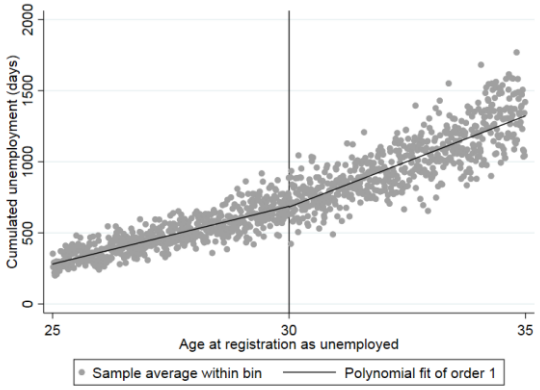
Work experience (days)



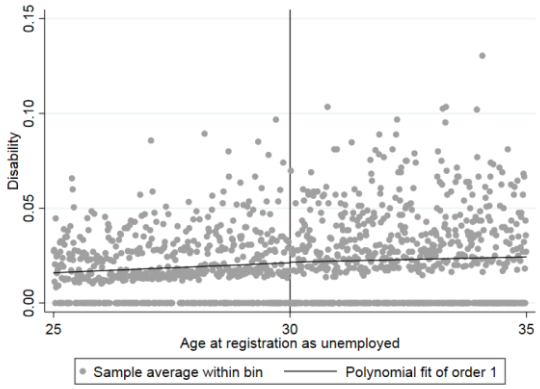
Number of earlier registrations



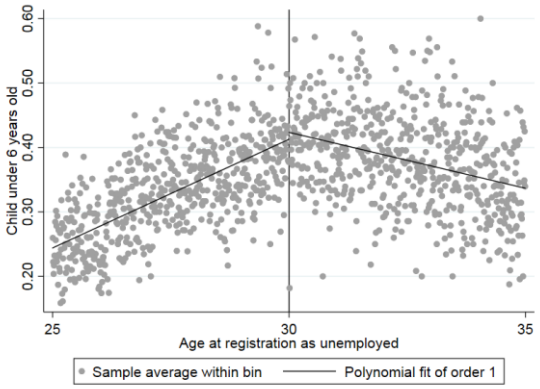
Cumulated unemployment (days)



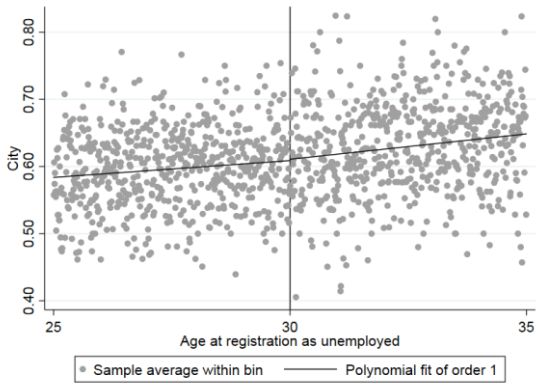
Disability



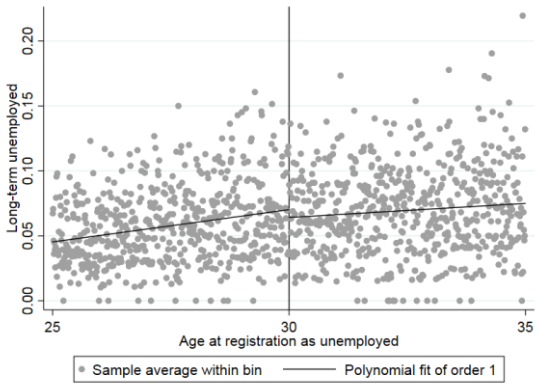
Child under 6 years old



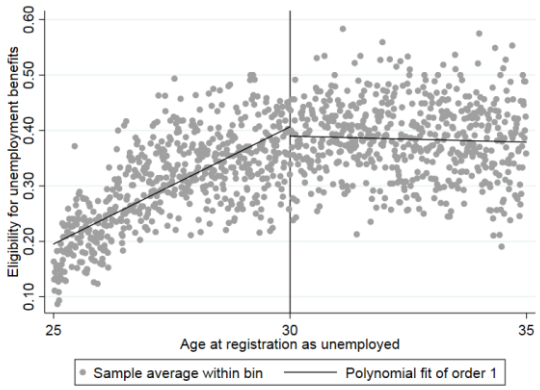
City



Long-term unemployed

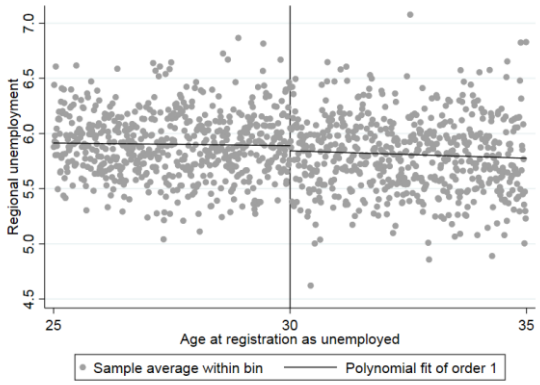


Eligibility for unemployment benefits

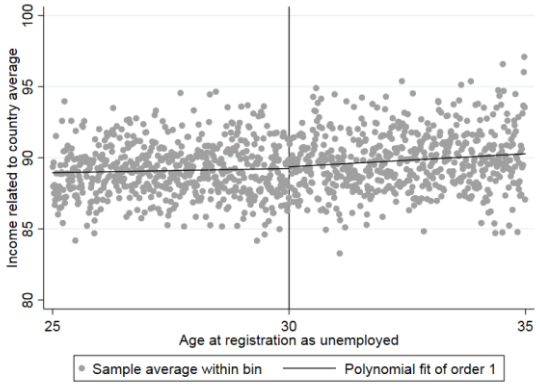


Interest in working in another EU country

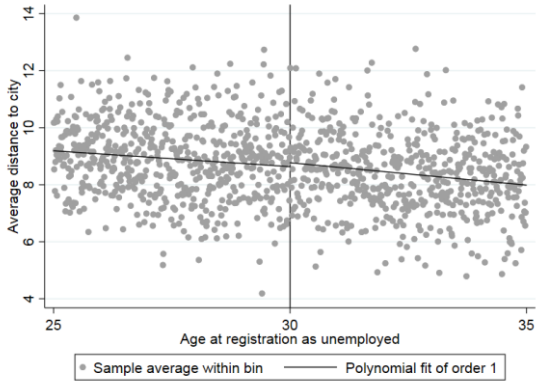
Regional unemployment (NUTS 4)



Income related to country average (NUTS 4)



Average distance to city (NUTS 5)



Note: [1] *The period from 1st January to 30th April 2016. Dots represent the sample averages within bins. The line is a linear fit. Age is continuous and measured in days converted to years.*

Table 3. Placebo test: the effects on the analysed outcomes at a false threshold of 26 years estimated by the difference-in-discontinuities approach (bandwidth *h*=1) 6, 12, 18, 24, 30, and 36 months after registration, by gender

	Men					
	M6	M12	M18	M24	M30	M36
Outcome 1	0.007	-0.009	-0.007	-0.000	-0.007	0.016
	(0.016)	(0.014)	(0.012)	(0.012)	(0.010)	(0.010)
Outcome 2	-0.015	-0.013	-0.009	-0.005	-0.015	0.003
	(0.018)	(0.017)	(0.015)	(0.014)	(0.013)	(0.012)
Outcome 3	-0.918	-1.892	-2.599	-1.838	-1.449	-0.440
	(2.205)	(3.813)	(4.997)	(5.926)	(6.785)	(7.558)
N	43051	43051	43051	43051	43051	43051
	Women					
	M6	M12	M18	M24	M30	M36
Outcome 1	0.027	0.005	0.005	-0.005	0.004	0.011
	(0.018)	(0.017)	(0.015)	(0.014)	(0.014)	(0.014)
Outcome 2	0.019	-0.006	-0.024	-0.012	0.011	0.018
	(0.019)	(0.019)	(0.018)	(0.017)	(0.016)	(0.015)
Outcome 3	4.190	6.408	7.693	8.695	6.811	7.310
	(2.382)	(4.506)	(6.322)	(7.927)	(9.390)	(10.772)
N	38887	38887	38887	38887	38887	38887

Note: The sample includes all men (women) 25 - 26 years old who registered as unemployed during the periods January to April 2015 and January to April 2016 and who were not registered as unemployed and had not participated in an ALMP during the six months before the current registration. The table reports the marginal coefficients at the arbitrarily chosen threshold of 26 years old. Standard errors are reported in parenthesis. Outcome 1 is being out of the unemployment register; Outcome 2 is being out of the unemployment register and not in ALMP; Outcome 3 is the cumulative number of days out of the unemployment register. The control variables include the level of education, place of residence (urban/rural), disability status, presence of children aged six or younger in the household, lack of qualifications, a dummy for long-term unemployment, total work experience, a dummy for having no work experience, total time in the unemployment register, the number of earlier registrations, a dummy for eligibility to receive unemployment benefits, and a dummy for declaring an interest in migrating to other EU countries, the local unemployment rate (at the NUTS 4 level), the local average wage as a percentage of the country average (at the NUTS 4 level), and a distance to the NUTS-4 city from the municipality of residence (at the NUTS-5 level). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.*

Table 4. Placebo test: the effects on the analysed outcomes at a false threshold of 31 years estimated by the difference-in-discontinuities approach (bandwidth *h*=1) 6, 12, 18, 24, 30, and 36 months after registration, by gender

	Men					
	M6	M12	M18	M24	M30	M36
Outcome 1	0.011	0.006	0.001	0.011	-0.001	-0.005
	(0.020)	(0.018)	(0.015)	(0.015)	(0.013)	(0.014)
Outcome 2	0.027	0.017	-0.006	0.017	0.019	0.002
	(0.021)	(0.020)	(0.017)	(0.016)	(0.015)	(0.015)
Outcome 3	-0.779	-0.004	0.387	1.115	1.184	0.721
	(2.648)	(4.808)	(6.436)	(7.736)	(8.935)	(10.031)
N	32274	32274	32274	32274	32274	32274
	Women					
	M6	M12	M18	M24	M30	M36
Outcome 1	-0.017	0.007	0.024	0.007	0.018	-0.005
	(0.023)	(0.022)	(0.020)	(0.019)	(0.018)	(0.017)
Outcome 2	-0.023	-0.005	0.006	-0.013	0.005	-0.014
	(0.022)	(0.023)	(0.021)	(0.020)	(0.019)	(0.018)
Outcome 3	-0.106	0.444	1.699	3.477	5.909	9.481
	(2.818)	(5.716)	(8.224)	(10.423)	(12.407)	(14.228)
N	27730	27730	27730	27730	27730	27730

Note: The sample includes all men (women) 30 - 31 years old who registered as unemployed during the periods January to April 2015 and January to April 2016 and who were not registered as unemployed and had not participated in an ALMP during the six months before the current registration. The table reports the marginal coefficients at the arbitrarily chosen threshold of 26 years old. Standard errors are reported in parenthesis. Outcome 1 is being out of the unemployment register; Outcome 2 is being out of the unemployment register and not in ALMP; Outcome 3 is the cumulative number of days out of the unemployment register. The control variables include the level of education, place of residence (urban/rural), disability status, presence of children aged six or younger in the household, lack of qualifications, a dummy for long-term unemployment, total work experience, a dummy for having no work experience, total time in the unemployment register, the number of earlier registrations, a dummy for eligibility to receive unemployment benefits, and a dummy for declaring an interest in migrating to other EU countries, the local unemployment rate (at the NUTS 4 level), the local average wage as a percentage of the country average (at the NUTS 4 level), and distance to the NUTS-4 city from the municipality of residence (at the NUTS-5 level). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.*

Table 5. The effects of eligibility to the 2016 wage subsidy (ITT) estimated by the difference-in-discontinuities approach 6, 12, 18, 24, 30 & 36 months after registration, by education level and gender

	Men											
	Secondary education or less						Tertiary education					
	M6	M12	M18	M24	M30	M36	M6	M12	M18	M24	M30	M36
Outcome 1	0.011	0.011	-0.026	-0.023	0.014	0.018	0.055	0.003	0.002	0.020	0.035	0.024
	(0.022)	(0.020)	(0.016)	(0.016)	(0.015)	(0.015)	(0.048)	(0.040)	(0.033)	(0.031)	(0.028)	(0.027)
Outcome 2	0.008	-0.005	-0.045*	-0.050**	0.008	0.013	-0.003	-0.068	-0.016	-0.019	0.045	0.035
	(0.023)	(0.022)	(0.019)	(0.018)	(0.016)	(0.016)	(0.051)	(0.048)	(0.042)	(0.037)	(0.032)	(0.030)
Outcome 3	4.216	5.465	4.969	0.341	-0.746	0.567	1.013	13.386	17.811	21.498	28.884	33.351
	(2.849)	(5.132)	(6.843)	(8.224)	(9.499)	(10.695)	(6.283)	(11.284)	(14.988)	(17.902)	(20.552)	(22.956)
N	27342	27342	27342	27342	27342	27342	5687	5687	5687	5687	5687	5687
	Women											
	Secondary education or less						Tertiary education					
	M6	M12	M18	M24	M30	M36	M6	M12	M18	M24	M30	M36
Outcome 1	0.038	0.060*	0.040	0.032	0.057*	0.038	0.034	0.035	0.037	0.025	0.026	0.007
	(0.029)	(0.029)	(0.027)	(0.026)	(0.025)	(0.024)	(0.035)	(0.032)	(0.028)	(0.025)	(0.024)	(0.022)
Outcome 2	0.026	0.015	0.033	0.012	0.045	0.028	0.040	0.052	0.048	-0.005	0.041	0.028
	(0.028)	(0.029)	(0.028)	(0.027)	(0.026)	(0.025)	(0.035)	(0.035)	(0.032)	(0.029)	(0.027)	(0.025)
Outcome 3	4.560	12.332	20.268	25.507	32.483*	42.261*	2.586	7.523	13.231	14.905	18.882	22.763
	(3.589)	(7.356)	(10.708)	(13.704)	(16.450)	(19.053)	(4.541)	(8.796)	(12.345)	(15.294)	(17.818)	(20.013)
N	17059	17059	17059	17059	17059	17059	11640	11640	11640	11640	11640	11640

*Note: The sample includes all men (women) 29 and 30 years old who registered as unemployed during the periods January to April 2015 and January to April 2016 and were not registered as unemployed and had not participated in an ALMP during the six months before the current registration (the main analysis sample). The table reports the marginal coefficients of being eligible and the 2016 reform. Standard errors are reported in parenthesis. Outcome 1 is being out of the unemployment register; Outcome 2 is being out of the unemployment register and not in ALMP; Outcome 3 is the cumulative number of days out of the unemployment register. The control variables include the level of education, place of residence (urban/rural), disability status, presence of children aged six or younger in the household, lack of qualifications, a dummy for long-term unemployment, total work experience, a dummy for having no work experience, total time in the unemployment register, the number of earlier registrations, a dummy for eligibility to receive unemployment benefits, and a dummy for declaring an interest in migrating to other EU countries, the local unemployment rate (at the NUTS 4 level), the local average wage as a percentage of the country average (at the NUTS 4 level), and distance to the NUTS-4 city from the municipality of residence (at the NUTS-5 level). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.*

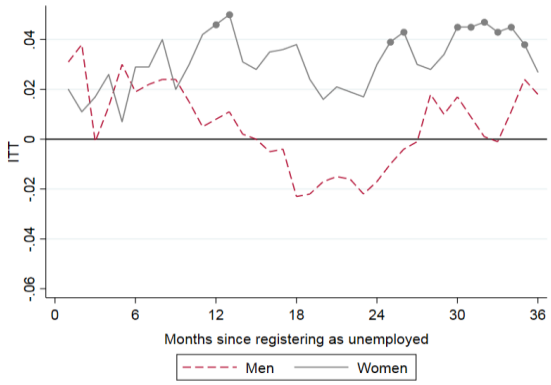
Table 6. The effects of eligibility to the 2016 wage subsidy (ITT) estimated by the difference-in-discontinuities approach 6, 12, 18, 24, 30 & 36 months after registration, by unemployment level and gender

	Men											
	Regions with unemployment below the median						Regions with unemployment above the median					
	M6	M12	M18	M24	M30	M36	M6	M12	M18	M24	M30	M36
Outcome 1	0.018	0.046*	-0.010	0.005	0.008	0.004	0.021	-0.026	-0.031	-0.032	0.024	0.029
	(0.028)	(0.024)	(0.019)	(0.019)	(0.017)	(0.017)	(0.028)	(0.026)	(0.022)	(0.022)	(0.019)	(0.020)
Outcome 2	-0.007	0.018	-0.029	-0.008	0.021	-0.002	0.018	-0.043	-0.047	-0.075**	0.006	0.028
	(0.031)	(0.027)	(0.024)	(0.022)	(0.019)	(0.018)	(0.029)	(0.028)	(0.025)	(0.024)	(0.022)	(0.022)
Outcome 3	7.895*	14.908*	18.154*	18.880	19.735	21.600	0.448	0.259	-2.141	-8.636	-8.950	-7.197
	(3.853)	(6.542)	(8.533)	(10.108)	(11.564)	(12.909)	(3.555)	(6.685)	(9.029)	(10.923)	(12.666)	(14.296)
N	14828	14828	14828	14828	14828	14828	18249	18249	18249	18249	18249	18249
	Women											
	Regions with unemployment below the median						Regions with unemployment above the median					
	M6	M12	M18	M24	M30	M36	M6	M12	M18	M24	M30	M36
Outcome 1	0.028	0.096***	0.052*	-0.006	0.053*	0.010	0.034	-0.000	0.024	0.057*	0.035	0.034
	(0.032)	(0.029)	(0.026)	(0.025)	(0.023)	(0.022)	(0.032)	(0.031)	(0.029)	(0.028)	(0.027)	(0.026)
Outcome 2	0.022	0.068*	0.051	-0.023	0.060*	0.024	0.035	-0.011	0.024	0.023	0.023	0.028
	(0.033)	(0.032)	(0.029)	(0.027)	(0.025)	(0.023)	(0.030)	(0.033)	(0.032)	(0.030)	(0.029)	(0.028)
Outcome 3	2.631	14.697	27.891*	30.758*	35.544*	41.439*	4.411	5.250	5.907	9.861	16.257	24.497
	(4.049)	(7.913)	(11.245)	(14.094)	(16.586)	(18.866)	(3.984)	(8.168)	(11.818)	(15.047)	(17.995)	(20.736)
N	14132	14132	14132	14132	14132	14132	14592	14592	14592	14592	14592	14592

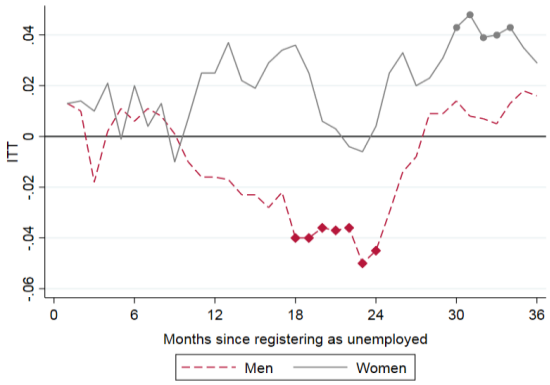
*Note: The sample includes all men (women) 29 and 30 years old who registered as unemployed during the periods January to April 2015 and January to April 2016 and were not registered as unemployed and had not participated in an ALMP during the six months before the current registration (the main analysis sample). The table reports the marginal coefficients of being eligible and the 2016 reform. Standard errors are reported in parenthesis. Outcome 1 is being out of the unemployment register; Outcome 2 is being out of the unemployment register and not in ALMP; Outcome 3 is the cumulative number of days out of the unemployment register. The control variables include the level of education, place of residence (urban/rural), disability status, presence of children aged six or younger in the household, lack of qualifications, a dummy for long-term unemployment, total work experience, a dummy for having no work experience, total time in the unemployment register, the number of earlier registrations, a dummy for eligibility to receive unemployment benefits, and a dummy for declaring an interest in migrating to other EU countries, the local unemployment rate (at the NUTS 4 level), the local average wage as a percentage of the country average (at the NUTS 4 level), and distance to the NUTS-4 city from the municipality of residence (at the NUTS-5 level). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.*

Figure 11. The effects of eligibility to the 2016 wage subsidy (ITT) estimated by the difference-in-discontinuities approach without control variables 1 to 36 months after registration, by gender

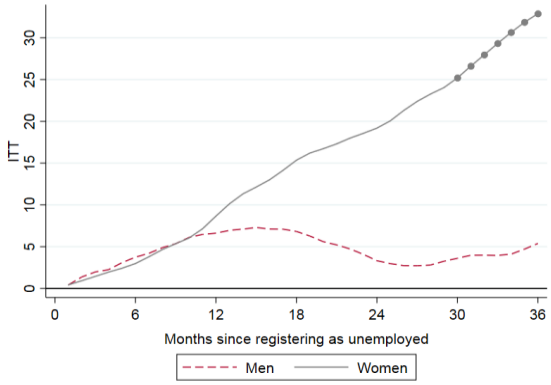
A. Outcome: Being out of the unemployment register



B. Outcome: Being out of the unemployment register and not in ALMP



C. Outcome: Cumulative # of days out of the unemployment register



Note: This figure depicts the marginal effects of being eligible to the 2016 wage subsidy by months since registering as unemployed. The effects are estimated using the differences-in-discontinuities approach without control variables. The sample includes all men (women) 29 and 30 years old who registered as unemployed during the periods January to April 2015 and January to April 2016 and were not registered as unemployed and had not participated in an ALMP during the six months before the current registration (the main analysis sample). The marker on the line at a particular point in time indicates that the effect is statistically significant at the 5% significance level.

Table 7. The effects of eligibility to the 2016 wage subsidy (ITT) estimated by the difference-in-discontinuities approach (bandwidth *h*=2) 6, 12, 18, 24, 30, and 36 months after registration, by gender

	Men					
	M6	M12	M18	M24	M30	M36
Outcome 1	0.022	0.020	-0.014	-0.019	0.007	0.012
	(0.014)	(0.012)	(0.010)	(0.010)	(0.009)	(0.009)
Outcome 2	-0.002	-0.012	-0.037**	-0.048***	0.002	0.008
	(0.015)	(0.014)	(0.012)	(0.012)	(0.010)	(0.010)
Outcome 3	2.770	7.526*	8.751*	6.859	6.787	8.245
	(1.847)	(3.318)	(4.421)	(5.301)	(6.112)	(6.868)
N	66504	66504	66504	66504	66504	66504
	Women					
	M6	M12	M18	M24	M30	M36
Outcome 1	0.029	0.037*	0.033*	0.028*	0.033**	0.019
	(0.016)	(0.015)	(0.014)	(0.013)	(0.012)	(0.012)
Outcome 2	0.011	0.002	0.006	-0.008	0.031*	0.020
	(0.016)	(0.016)	(0.015)	(0.014)	(0.013)	(0.013)
Outcome 3	3.864	10.638**	16.488**	20.589**	26.929**	31.910**
	(1.998)	(3.993)	(5.719)	(7.226)	(8.590)	(9.849)
N	57742	57742	57742	57742	57742	57742

Note: The sample includes all men (women) 28 - 31 years old who registered as unemployed during the periods January to April 2015 and January to April 2016 and who were not registered as unemployed and had not participated in an ALMP during the six months before the current registration. The table reports the marginal coefficients of being eligible and the 2016 reform. Standard errors are reported in parenthesis. Outcome 1 is being out of the unemployment register; Outcome 2 is being out of the unemployment register and not in ALMP; Outcome 3 is the cumulative number of days out of the unemployment register. The control variables include the level of education, place of residence (urban/rural), disability status, presence of children aged six or younger in the household, lack of qualifications, a dummy for long-term unemployment, total work experience, a dummy for having no work experience, total time in the unemployment register, the number of earlier registrations, a dummy for eligibility to receive unemployment benefits, and a dummy for declaring an interest in migrating to other EU countries, the local unemployment rate (at the NUTS 4 level), the local average wage as a percentage of the country average (at the NUTS 4 level), and distance to the NUTS-4 city from the municipality of residence (at the NUTS-5 level). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 8. The effects of eligibility to the 2016 wage subsidy (ITT) estimated by the difference-in-discontinuities approach (optimal bandwidths following Calonico et al. (2014a, 2014b)) 6, 12, 18, 24, 30, and 36 months after registration, by gender

	Men					
	M6	M12	M18	M24	M30	M36
Outcome 1	0.010	0.008	-0.019	-0.024*	0.013	0.019
	(0.016)	(0.015)	(0.012)	(0.012)	(0.010)	(0.010)
h	1.54	1.36	1.46	1.49	1.83	1.58
N	51293	45269	48568	49665	60663	52701
Outcome 2	-0.010	-0.018	-0.041**	-0.054***	-0.001	0.008
	(0.017)	(0.017)	(0.013)	(0.012)	(0.011)	(0.010)
h	1.62	1.28	1.74	1.93	1.63	2.00
N	53896	42716	57909	63994	54242	66666
Outcome 3	2.996	5.936	5.394	1.732	1.113	3.036
	(2.275)	(4.171)	(5.401)	(6.405)	(7.33)	(8.091)
h	1.32	1.27	1.35	1.38	1.40	1.45
N	43776	42195	44716	45820	46419	48106
	Women					
	M6	M12	M18	M24	M30	M36
Outcome 1	0.038	0.054**	0.033*	0.032	0.047**	0.028
	(0.021)	(0.019)	(0.015)	(0.018)	(0.018)	(0.015)
h	1.17	1.25	1.69	1.08	0.99	1.24
N	33943	36268	48443	31326	28423	35956
Outcome 2	0.028	0.023	0.018	0.003	0.044*	0.036*
	(0.018)	(0.018)	(0.016)	(0.018)	(0.019)	(0.016)
h	1.47	1.55	1.74	1.31	0.99	1.36
N	42378	44678	49819	37949	28504	39164
Outcome 3	4.474	11.491*	20.290**	25.509**	29.671**	34.555**
	(2.315)	(5.039)	(7.066)	(8.798)	(10.559)	(12.166)
h	1.50	1.26	1.31	1.35	1.33	1.31
N	43257	36333	37949	39073	38244	37805

*Note: The sample includes individuals who registered as unemployed during the periods January to April 2015 and January to April 2016 and who were not registered as unemployed and had not participated in an ALMP during the six months before the current registration. The optimal bandwidth h is estimated following Calonico et al. (2014a, 2014b). The table reports the marginal coefficients of being eligible and the 2016 reform. Standard errors are reported in parenthesis. Outcome 1 is being out of the unemployment register; Outcome 2 is being out of the unemployment register and not in ALMP; Outcome 3 is the cumulative number of days out of the unemployment register. The control variables include the level of education, place of residence (urban/rural), disability status, presence of children aged six or younger in the household, lack of qualifications, a dummy for long-term unemployment, total work experience, a dummy for having no work experience, total time in the unemployment register, the number of earlier registrations, a dummy for eligibility to receive unemployment benefits, and a dummy for declaring an interest in migrating to other EU countries, the local unemployment rate (at the NUTS 4 level), the local average wage as a percentage of the country average (at the NUTS 4 level), and distance to the NUTS-4 city from the municipality of residence (at the NUTS-5 level). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.*

Table 9. The effects of eligibility to the 2016 wage subsidy (ITT) estimated by the difference-in-discontinuities approach using "donut-RDD" 6, 12, 18, 24, 30, and 36 months after registration, by gender

	Men					
	M6	M12	M18	M24	M30	M36
Outcome 1	0.015	0.004	-0.020	-0.012	0.022	0.023
	(0.022)	(0.019)	(0.016)	(0.016)	(0.014)	(0.015)
Outcome 2	0.009	-0.011	-0.037	-0.045*	0.018	0.027
	(0.023)	(0.022)	(0.019)	(0.018)	(0.016)	(0.016)
Outcome 3	3.918	7.098	6.825	4.096	5.670	8.192
	(2.854)	(5.134)	(6.848)	(8.220)	(9.481)	(10.660)
N	33078	33078	33078	33078	33078	33078
	Women					
	M6	M12	M18	M24	M30	M36
Outcome 1	0.041	0.075**	0.051*	0.034	0.048*	0.023
	(0.025)	(0.023)	(0.021)	(0.020)	(0.019)	(0.019)
Outcome 2	0.036	0.033	0.037	-0.011	0.047*	0.030
	(0.024)	(0.025)	(0.023)	(0.022)	(0.021)	(0.020)
Outcome 3	3.510	13.247*	23.871**	29.520**	37.120**	43.222**
	(3.088)	(6.185)	(8.878)	(11.223)	(13.324)	(15.272)
N	28750	28750	28750	28750	28750	28750

Note: The sample includes all men (women) 28.875-29.875 and 30-31 years old who registered as unemployed during the periods January to April 2015 and January to April 2016 and who were not registered as unemployed and had not participated in an ALMP during the six months before the current registration. The table reports the marginal coefficients of being eligible and the 2016 reform. Standard errors are reported in parenthesis. Outcome 1 is being out of the unemployment register; Outcome 2 is being out of the unemployment register and not in ALMP; Outcome 3 is the cumulative number of days out of the unemployment register. The control variables include the level of education, place of residence (urban/rural), disability status, presence of children aged six or younger in the household, lack of qualifications, a dummy for long-term unemployment, total work experience, a dummy for having no work experience, total time in the unemployment register, the number of earlier registrations, a dummy for eligibility to receive unemployment benefits, and a dummy for declaring an interest in migrating to other EU countries, the local unemployment rate (at the NUTS 4 level), the local average wage as a percentage of the country average (at the NUTS 4 level), and distance to the NUTS-4 city from the municipality of residence (at the NUTS-5 level). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

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