Hiring subsidies for low-educated unemployed youths are ineffective in a tight labor market

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Abstract

We evaluate the impact of hiring subsidies for unemployed jobseekers in Wallonia, the French-speaking region in Belgium, focusing on low-educated youths who gain earlier access to subsidies. Using a regression discontinuity design, we find that prioritizing subsidies for them leads to deadweight losses during the pre-pandemic economic boom. Positive job-finding effects are observed for high school graduates in areas with lower labor market tightness, supporting the hypothesis that this factor drives inefficiency. For high school dropouts, no effects are detected. This may reflect loose targeting—such as lack of a minimum unemployment duration—but other group differences could also play a role.

JEL-Codes: C21, J08, J23, J24, J38

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1. Introduction

In July 2017, the government of Wallonia (Belgium) introduced new hiring subsidies for unemployed jobseekers, replacing previous federal measures. This program—the Impulsion plan—provides a degressive wage subsidy starting at €500 a month for at most 3 years to employers recruiting unemployed people with poor employment prospects. The specific feature of this plan is that the eligibility conditions for the subsidies are much more favorable for youth with low levels of education than for other groups. High school dropouts[2] under 25 years of age are eligible from their first day of registration as a jobseeker, while those with a high school diploma only are entitled after 6 months of registered unemployment. All others must have been unemployed for at least 12 months. In this paper, we aim to evaluate whether earlier access to hiring subsidies for young people with little formal education has enhanced their job prospects or, on the contrary, whether it generates a deadweight loss. To this aim, we implement a regression discontinuity design (RDD) around the 25-age threshold. Our analysis uses administrative individual data on all low-educated youths who registered as unemployed jobseekers in Wallonia between July 2017 and December 2019, a period that was marked by substantial economic growth and falling unemployment.

In the empirical analysis, we follow the more recent strand of the literature on hiring subsidy impacts and estimate intention-to-treat (ITT) effects for a sample of newly registered unemployed youths with low educational attainment (see, for example, Boockman et al., 2012; Schünemann et al. 2015; Sjögren and Vikström, 2015). Identification is based on the discontinuity in subsidy take-up rate occurring at the 25-year threshold because of a different targeting strategy. As expected, the ITT estimate on the probability of benefiting from a subsidy within one year of entry is highly significant at age 25, reaching 19.8 (9.3) percentage points (pp) for high school dropouts (graduates). The higher point estimate for the least-educated youths reflects their eligibility for the subsidy from their first day of registration. We then analyze, separately for each schooling group, whether the discontinuity in treatment intensity at age 25 translates into a discontinuity in the job-finding rate and the cumulative number of months in employment. In this way, we provide evidence on the effectiveness of the policy.

Giving youths without higher education priority access to wage subsidies is a response to their much higher risk of unemployment. In 2022, the unemployment rate for young Walloon people aged 15 to 24 with no more than a high school degree was 25%, whereas it was 34% for high school dropouts (Eurostat, 2023). By way of comparison, the unemployment rate for those over 25—all educational levels included—stood at 8%, i.e., three to four times lower than that of the low-educated youths (Eurostat, 2023). The situation of youths with little schooling in the Walloon Region is far worse than the European average and comes close to that of certain neighboring regions in Northern France (Nord-Pas-De-Calais, Lorraine).[3] The empirical literature has demonstrated that unemployment at the beginning of one's career can have a negative impact on future employment prospects, earnings, and mental health (Bell and Blanchflower, 2011; Cockx and Ghirelli, 2016; Glatt and Wunnava, 2016; Schmillen and Umkehrer, 2017). By intervening very early in the unemployment spell of low-educated youths, the Impulsion plan aims to prevent these youths from drifting into long-term unemployment.

Behind this priority strategy is the idea that real work experience can help low-qualified young workers acquire vocational skills that they have not been able to learn in the conventional school system. By reducing the cost of hiring them, the government wants to incentivize private firms to increase their demand for this type of worker (see, for example, Brown and Koettl, 2015). As they acquire experience and develop new skills on the job, beneficiaries are expected to become more productive and

[2] High school dropouts are considered to be those who dropped out of school without a higher secondary education diploma.
[3] These regions are characterized by a heavy industrial past that left a profound mark on local labor markets for decades (Bodart et al., 2018; Leboute, 2009).

employable, even after the subsidy has run out. However, there are some doubts in the literature as to whether "work-first" policies—as opposed to "train-first" strategies—are effective for low-educated workers, for at least two reasons. First, the skill requirements of jobs that are available to them are often too low to generate sufficient human capital development (see, for example, Autor et al., 2017; Autor and Houseman, 2010; Neubäumer, 2012). Second, accumulating work experience, even in the market sector, is not necessarily sufficient to convince future employers to hire unskilled workers. By sending fictitious resumes to real job postings in France, Cahuc et al. (2021) show that the certification of skills at the end of the work experience is needed to improve the callback rates of high school dropouts. We therefore contribute to this literature by evaluating whether targeting hiring subsidies from the start of the unemployment spell, rather than later in the spell, enhances the employment opportunities of low-educated youths.

While there is a considerable literature on the evaluation of hiring subsidies for long-term unemployed people, relatively few studies focus on young unemployed people, and even fewer that evaluate the impact of wage subsidies for young jobseekers with (very) low schooling attainment.[4] One exception is a recent study by Albanese et al. (2024), which evaluates the employment effects of a temporary reinforcement of a hiring subsidy targeted at low-educated unemployed youths during the recovery from the Great Recession in Belgium.[5] The groups targeted by this scheme were similar to those targeted by the Impulsion plan, with the exception that high school dropouts had to be unemployed for a minimum of 3 months to be eligible. The scheme's design was drastically different, however, since it was implemented for a limited period of 2 years while the Impulsion plan was designed to last over time. The temporary nature of the former program also allowed higher amounts of wage subsidies for low-educated youths as compared to the long-term unemployed. Based on the same evaluation method applied in our paper, the authors show that the subsidy reinforcement for the youngest accelerated job-finding in the short run by about 10 pp, for both high school dropouts and graduates. However, the subsidy generated persistent employment effects in the private sector for high school graduates only, suggesting that a minimum skill level is a condition for the effectiveness of "work-first" policies. In our paper, we contribute to the literature by evaluating the impact of a similar hiring program but in a much more favorable economic context than the one that prevailed at the outset of the financial crisis. Our results could therefore provide useful insights about the opportunity to implement such programs on a permanent basis, irrespective of the economic conditions.

The link between the effectiveness of active labor market policies (ALMPs) and the economic context has received particular attention in the literature and should be of interest to public authorities seeking to implement cost-effective policies. In their meta-analysis, Card et al. (2018) provide suggestive evidence that ALMPs work better in recessionary markets, without being able to explain the mechanisms involved. Various papers have estimated job-search models and simulated the implementation of hiring subsidies under different circumstances. The model of Cahuc et al. (2019) provides evidence that such policies are most effective if they are *exclusively* targeted at short periods of high unemployment. This result can be explained by the fact that the cost of job creation is lower in these periods, as the number of unemployed per vacancy is higher. Kitao et al. (2011) come to the same conclusion. Kline and Moretti (2013) build a job-search model with different local labor markets and simulate the effects of place-based hiring subsidies. They also demonstrate that labor market tightness can moderate the effectiveness of hiring subsidies. In a tight labor market, where there is excessive job creation, subsidizing hires is

[4] For a meta-analysis of recent active labor market policy (ALMP) evaluations, including private sector employment subsidies, see Card et al. (2018). For a survey discussing impact evaluations of ALMPs for youth, including wage subsidies, see Caliendo and Schmidl (2016).

[5] The recent paper of Bermudez et al. (2025) also evaluates the effect of hiring subsidies for low-educated youths in Flanders, the Flemish-speaking region located in the north of Belgium. However, these are targeted at all new hires and not solely at unemployed jobseekers.

inefficient because vacancies crowd each other out. In the above-mentioned study, Albanese et al. (2024) empirically demonstrate this prediction. They show that labor market tightness induced by the economic hub of Luxembourg decreases the impact of the hiring subsidy in the Belgian area near the border. Based on these studies, we expect a smaller effect of the Impulsion plan implemented prior to the COVID-19 crisis in a context of an increasingly tight labor market overall (OECD, 2020).

Our main findings confirm that giving priority to low-educated unemployed youths in accessing hiring subsidies generates deadweight losses under favorable labor market conditions. Indeed, at the level of Wallonia, earlier access to subsidies does not significantly improve either the job-finding rate within one year of unemployment or cumulative time spent in employment within two and a half years of unemployment. To support the interpretation that subsidizing hires was inefficient because of a tight labor market, we conduct a heterogeneity analysis based on local labor market conditions, proxied by the job-finding rate in the control group in the district of residence. We distinguish between districts with low labor market tightness—below-median job-finding rate—and those with high tightness—above-median job-finding rate. This analysis highlights some significantly positive effects on the job-finding rate in areas characterized by lower labor market tightness, but only for high school graduates. Even though the effects are less precisely estimated than for the overall sample of graduates, the elasticity of the hiring probability to a change in labor costs is estimated to be -2 in below-median job-finding districts, which lies within the upper range of elasticities reported in the literature (Albanese et al., 2024, p. 8).

The lack of effect for high school dropouts, irrespective of labor market conditions, may be related to the loose targeting of this group. The absence of unemployment duration criterion grants subsidies even to those who would have found employment without subsidy. However, differences between dropouts and graduates, such as productivity or other observed or unobserved characteristics, could also contribute to the heterogeneous treatment effects.

As a side effect, we show that the policy impacts the recruitment process of low-educated youths, with smaller numbers being recruited through temporary staffing agencies. The probability of transiting to a first job with the intermediary of a staffing agency decreases by 15.5% and 6.6%, respectively, for high school dropouts and graduates. Rent extraction by temporary work agencies is likely common practice in the sense that they presumably take full advantage of the labor cost reduction at the expense of client firms. This explains why some employers, who would have otherwise used the services of staffing agencies, might have hired eligible workers directly. This also explains the prevalence of deadweight losses among staffing agencies, which do not make decisions on new hires. This is confirmed by the absence of effect of the subsidy on transitions to temp jobs, even for graduates in low job-finding rate districts.

The outline of this paper is as follows. The next section summarizes the institutional background. Section 3 describes the data and the outcome variables. The empirical strategy and the evaluation sample are presented in Section 4. Section 5 presents and discusses the empirical findings. Some robustness analyses are reported in Section 6. The last section offers some concluding remarks.

2. Institutional framework

Belgium is a federal state that has, over time, transferred responsibility for labor market policies to regional authorities (Brussels, Flanders, and Wallonia). The most recent institutional reform, in 2014, relocated competence and resources related to targeted employment subsidies to the regions. Following this reform, the minister in charge of employment consulted with employers and trade unions to achieve a comprehensive overhaul of employment subsidies and training policies. It is within this context that, after several months of consultations, the Impulsion plan was designed by the regional government of

Wallonia, the French-speaking region in the south of Belgium. Entering into force in July 2017, this plan provides temporary wage subsidies for the hiring of young, low-educated, and long-term unemployed workers living in the Walloon region. These subsidies replaced older ones previously administered at the federal level, which consisted of deductions from employers' social security contributions (SSC) targeting similar disadvantaged groups of unemployed jobseekers.

The new hiring subsidies were implemented at a time when the Belgian economy was expanding strongly, leading to employment growth and a decline in unemployment across all regions. Between 2017 and 2019, the unemployment rate in Wallonia for those aged 15–64 decreased from 9.8% to 7.2% (Eurostat), the lowest level in many decades in a region marked by high structural unemployment (Bodart et al., 2018). The trend was similar for youth, with the unemployment rate of those aged 15–24 declining from 29.0% to 21.9% in three years. After their implementation, the wage subsidies under the Impulsion plan remained unchanged and available until the end of our study period in December 2021.

In this paper, we evaluate the impact of the Impulsion plan on the hiring of low-educated youths under 25 years of age. Under the so-called "Impulsion –25" scheme, the age requirement of being under 25 is verified on the day before the first hire under an Impulsion subsidy. Consequently, once they become beneficiaries, young people targeted by the scheme remain eligible even after they turn 25. However, there is a maximum age limit of 28 years. Private-sector firms[6] that recruit eligible youths benefit from a wage subsidy of €500 per month for two years, followed by €250 (€125) in the first (last) 6-month period of a third year.[7] Therefore, three years is the maximum period during which the subsidy can be granted for a given worker, either through one or more (discontinued or not) employment contracts. If the full subsidy is not utilized before the individual turns 25, they can continue to benefit from it either until the entire subsidy is exhausted or until they turn 28, whichever comes first.

High school dropouts are eligible after just 1 day of registration as jobseekers at the Walloon public employment service (PES), while high school graduates become eligible after 6 months of registration.[8] Eligibility for Impulsion subsidies does not require recipients to be receiving unemployment benefits. Other jobseekers (aged 25 and over, or highly educated) are also eligible for a similar subsidy, but only if they have been registered as jobseekers for at least 12 months. This so-called "Impulsion 12+" subsidy provides €500 per month during the first year, and €250 (€125) in the first (last) 6-month period of a second year. As a result, eligibility is one year shorter than for the Impulsion –25 scheme. However, the key difference between the two subsidies lies in the required period of registered unemployment for eligibility.

Impulsion subsidies are not automatically awarded to all eligible individuals. Jobseekers (or their potential future employers) can verify eligibility for the subsidy through an online application to the Walloon PES. The employer must then draft an appendix to the employment contract, specifying the type of Impulsion subsidy requested (–25 or 12+). Afterward, based on this appendix and a completed personal data form, jobseekers must request approval from the federal Public Unemployment Agency (PUA), which is typically in charge of the unemployment insurance (UI) system. Only after this approval can the subsidy payments be made.[9] The subsidy—called the "work allowance"—is paid directly by the PUA to the beneficiary worker, and the employer can deduct the subsidy amount directly from the net wage. The work allowance can be cumulated with the pre-existing structural reduction of employers'

[6] Some public companies and local administrations are also eligible if they hire contract workers.
[7] In the case of part-time work, the amount is adjusted on a pro-rata basis.
[8] The counter is not reset to zero if the jobseeker has worked fewer than 31 days in the past six months.
[9] The administrative procedure can be cumbersome, especially for the worker. A survey (FOREM, 2018) revealed that some errors in the process have led to delayed or insufficient subsidy payments.

SSC, which has remained under the competence of the federal government. The deduction amounts to €133 per month, with an additional supplement for low wages.

To evaluate the effect of the Impulsion –25 subsidy, we exploit the discontinuity in the eligibility criterion created by the Impulsion plan at age 25 for youths who have never benefited from the subsidy. For high school dropouts, only 1 day of registration as a jobseeker is required to be eligible if they are under 25, while they must wait 12 months if they have just turned 25 and have not yet received the subsidy. For high school graduates, the difference is smaller—6 versus 12 months—but still significant. We therefore expect a discontinuity in the take-up of Impulsion subsidies at the age threshold of 25, as access is much easier to the left of this cutoff than to the right.

At the federal level, there is another policy that uses the 25-year age cutoff. Young labor market entrants are eligible for non-means-tested UI—referred to as the "activation allowance"—after a one-year waiting period.[10] This waiting period begins upon labor market entry, either at first registration as a jobseeker with the regional PES or at the start of their first employment spell, whichever occurs first. Only youths under 25 at the time of their first claim, and thus under 24 at labor market entry, can benefit from the allowance. Once claimed, the benefit can be received for a maximum of 36 months, even after the age of 25. There may be a concern that the measured impacts of Impulsion –25 could be confused with the effects of this UI scheme for youths. However, we do not believe this is the case, as our analysis focuses on young jobseekers with at most a high school degree. Most of them enter the labor market well before the age of 25 and are therefore not at risk of losing their eligibility for the activation allowance due to age: they complete their waiting period and secure eligibility for the activation allowance well before turning 25. And if they have not exhausted their 36-month benefit period, they can continue to receive the activation allowance beyond this age. Therefore, while there is a theoretical cutoff at age 25 in the UI scheme for young school-leavers, it is not binding for our population. This policy, as a result, is not a threat to our identification strategy.

The Impulsion –25 subsidy was widely used from the outset. Between July 2017 and September 2018, approximately 15,000 young people received the subsidy at least once, of whom 40% were high school dropouts and 60% were high school graduates (FOREM, 2018). During the same period, 21,000 individuals benefited from the Impulsion 12+ subsidy, which is also targeted at long-term unemployed individuals but without any education or age restrictions. Among them, 6,000 were young adults under 30 years of age. Since its introduction in 2017, the Wallonia government has spent on average, €48 million per year to finance the Impulsion –25 subsidies evaluated in our study. This amount must be set against a labor force of about 1.5 million people.[11]

3. Data

The empirical analysis is based on individual administrative data provided by the Walloon PES. The dataset contains information on the unemployment spells of young high school dropouts and graduates who entered registered unemployment between July 2015 and June 2019.[12] Each spell is defined by the month of entry into unemployment and several individual characteristics: the month and year of birth, the month and year of first registration at the PES, and socio-demographic variables measured at the time of entry into unemployment (gender, nationality, type of secondary education, number of months spent in registered unemployment, unemployment rate by district of residence). The dataset also

[10] This scheme aims to support young unemployed school-leavers who are not eligible for regular UI benefits because they have not contributed sufficiently. For further details, we refer the reader to Cockx et al. (2023).
[11] Labor Force Survey (2022); see https://www.iweps.be/indicateur-statistique/structure-dactivite-de-population-wallonne/.
[12] We consider multiple spells for the same individual as independent.

provides monthly information on the labor market status and the granting of an Impulsion subsidy from the start of the unemployment spell until December 2021.

In the evaluation sample, we select unemployment spells that started in the first two years of the Impulsion plan, i.e., between July 2017 and June 2019. This selection allows us to analyze employment outcomes up to 30 months after entry into unemployment for the entire sample. This corresponds to a slightly shorter time horizon than the maximum duration of the subsidy (36 months). Moreover, since the age threshold of 25 applies solely to individuals who have never previously benefited from the subsidy (see Section 2), we only retain in the sample unemployment spells related to individuals who have never received Impulsion subsidies.[13] By applying this restriction, we ensure that all individuals aged 25 or over at entry into unemployment are not eligible for the Impulsion –25 subsidy. After restricting the population to those aged 21 to 28 years at entry into unemployment (see Section 4 for details about the empirical strategy), the sample consists of 55,136 spells of young adults with at most a high school degree.[14]

Note that the data do not provide information on whether a high school graduate satisfies the unemployment duration requirement (at least 6 months) to be eligible for a subsidy. This duration criterion is not measured from the beginning of the unemployment spell but rather within the last 6 calendar months, with beneficiaries allowed to have worked for a maximum of 31 days (consecutive or not).[15] As a result, some high school graduates included in the sample may be hired with a subsidy from the very beginning of their unemployment spell if they had worked in the previous month and registered as an unemployed jobseeker in the five preceding months.

We estimate the impact of the Impulsion –25 subsidy on two main employment outcomes: the cumulative transition rate to employment during the first year of unemployment, and the number of accumulated months in employment up to 30 months after entry into unemployment. More specifically, the first outcome is defined as the share of entrants who find at least one job within 12 months of the start of their unemployment spell. We exclude transitions to very short employment spells that start and end within the same month, as a transition is only counted if the person remains employed at the end of the month. According to this definition of employment, the second outcome tracks the number of months a person remains employed over a period of two and a half years following unemployment entry. This outcome measures the effect of the subsidy on employment duration. However, the data do not include variables that would allow us to assess the quality of the jobs found (e.g., salary, working hours, etc.). Nonetheless, we also consider a third outcome: the number of *consecutive* months an individual remains employed with stable firm characteristics in terms of size, sector of activity, and district of the company's headquarters.[16] Unfortunately, the absence of firm identifiers prevents us from tracking whether an individual stays with the same employer from one month to the next.

As shown in Panel (A) of Table A1 in Appendix A, among youths aged 21 to 24, 29% of high school dropouts received an Impulsion –25 subsidy within one year of entry into unemployment. Take-up of the subsidy drops to 18% for high school graduates. Take-up rates below 100% reflect the conditions

[13] Recall from Section 2 that individuals who first benefit from the subsidy before the age of 25 remain eligible until the age of 28, provided they have not exhausted the full 36 months of subsidy.
[14] Without excluding individuals who had already benefited from the subsidy before, the sample would have consisted of 65,151 spells (an increase of 18%). In Section 6, we analyse the robustness of our results to the inclusion of these individuals.
[15] The number of months spent in registered unemployment provided in the database does not correspond to this definition. It measured the total elapsed time in registered unemployment and is reset to 0 if there is an exit of at least 3 months.
[16] Size is categorized into large intervals: (1-49), (50-199), >200). Following the classification used in national accounts, the NACE sectors are grouped into seven main categories: (1) Industry; (2) Agriculture, forestry, and fishing; (3) Construction; (4) Trade (wholesale and retail), transport, accommodation, and food services; (5) Information and communication, financial and insurance activities, real estate activities, professional, scientific, and technical activities, and administrative services; (6) Public administration, education, human health, and social work activities; and (7) Other service activities, including culture, sports, associations, and personal services. Finally, the districts of the headquarters are 44 in total.

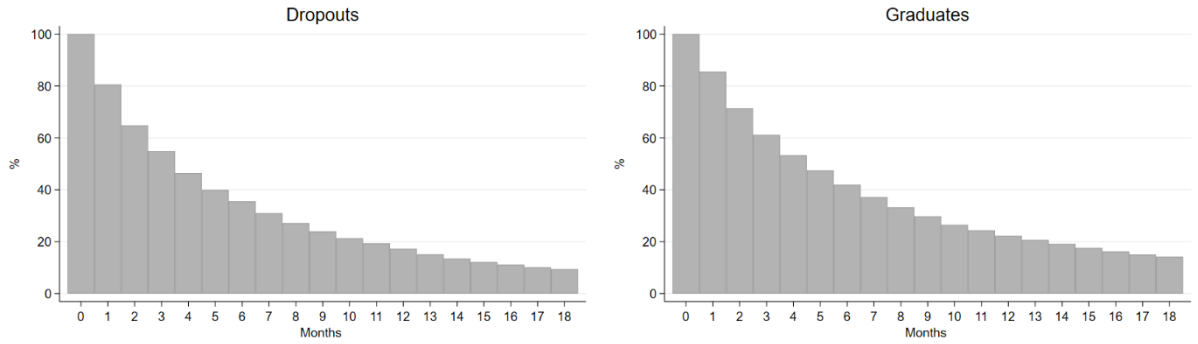
required to access the subsidy: the person must (i) find a job, (ii) apply for the subsidy and receive their employer's consent and approval from the PUA, and, for high school graduates only, (iii) meet the unemployment duration criterion of 6 months. A lower take-up rate for high school graduates is expected, as they must fulfil the additional condition (iii). Among the eligible age group (21–24), 71% of high school graduates found a job within one year of unemployment, compared to only 57% of dropouts. Similarly, graduates worked an average of 14.7 months over the 2.5 years after entry into unemployment, while dropouts worked only 10 months on average. For both education levels, this outcome is higher among the subpopulation of subsidy recipients than in the overall population. However, this does not demonstrate the effectiveness of the subsidy, as receiving the subsidy automatically associates with an employment spell.

Table A2 in Appendix A reports descriptive statistics for the whole group of youths aged 21–24 and for those who benefited from an Impulsion –25 subsidy. There is little difference between the two groups, except that actual recipients of the subsidy have less often experienced a first-ever registration as a jobseeker.

Panel B of Table A1 shows that subsidy take-up is, as expected, much lower for youths aged 25–28 than for their younger counterparts. This difference in take-up reflects the easier access to Impulsion –25 subsidy compared to Impulsion 12+ subsidy. Both employment outcomes are higher for the older age group for both education levels. However, the difference in means for the two age groups cannot be interpreted causally due to the direct effect of age on the job-finding rate.

Before turning to the empirical strategy, it is useful to examine the duration of actual subsidy receipt. To this end, we calculate the proportion of youths who, after a first transition to a subsidized job, continue to benefit from the Impulsion –25 subsidy each month, continuously, up to 18 months after the first month of receipt. We focus on high school graduates and dropouts aged 21 to 24 who benefited from the scheme at least once within one year of unemployment. In Figure 1, month 0 represents the month of the first transition to subsidized employment, which is by construction equal to 100%. Then, for each subsequent month, we calculate the proportion of youths who still receive the subsidy and have done so each month until then.[17] Figure 1 shows that the subsidy tends to be used for relatively short periods. The probability of continuing to receive the subsidy decreases rapidly over time for both education-level groups, with the decline being sharper for high school dropouts. Nearly half of high school dropouts and graduates who benefited from the subsidy are no longer in subsidized employment after 4 months. After 18 months, only 9.5% of high school dropouts and 14.2% of high school graduates are still receiving the Impulsion –25 subsidy on an uninterrupted basis.

Figure 1. Duration of subsidized employment under the Impulsion -25 scheme



Note: Analyses based on individuals who entered registered unemployment between July 2017 and June 2019, aged 21 to 24,

[17] Even if youths receive the subsidy every month, it can be interrupted by very short periods of unemployment (or even unsubsidized employment) and may be associated with different contracts with various employers.

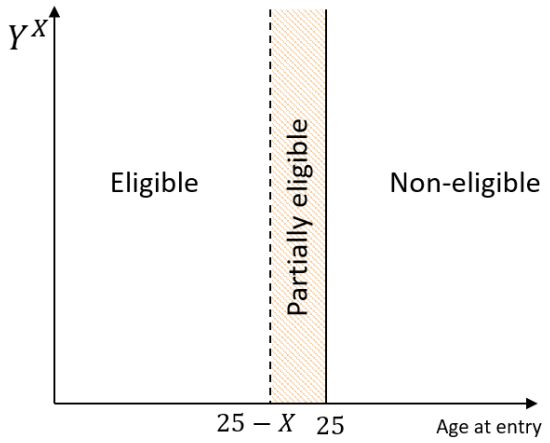
and who had never benefited from an Impulsion subsidy in the past but received an Impulsion –25 subsidy at least once within one year of entering unemployment.

4. Empirical strategy

The main objective of the Impulsion –25 hiring subsidy is to enhance the transition from unemployment to employment among low-educated youths under 25 years of age. In the empirical analysis, we aim to identify the causal impact of the subsidy on employment outcomes for this target population and estimate intention-to-treat (ITT) effects. To achieve this, we exploit the age eligibility criterion for Impulsion –25 in a regression discontinuity design (RDD).[18] Identification relies on the discontinuity in the treatment probability that occurs at the 25-year age threshold. Once youths reach this age, they become eligible for the more restrictive Impulsion 12+ subsidy, which requires an unemployment duration of at least 12 months. Thus, the counterfactual we estimate is not the absence of eligibility, but rather eligibility for a less accessible hiring subsidy.

The forcing variable is the individual's age at entry into registered unemployment, measured in months. However, we cannot implement a standard RDD based on this variable because the age requirement for the Impulsion –25 subsidy is determined not at the time of unemployment registration, but at the first subsidy claim (i.e., just before being hired for the first time with the Impulsion –25 subsidy). Youths just under 25 will lose their eligibility for the subsidy shortly after they register as jobseekers. Therefore, standard RDD is not appropriate because eligibility is partial for young entrants who turn 25 within the outcome variables' time window, for instance, one year from unemployment entry for the job-finding rate. In the canonical RDD graph shown in Figure 2, where Y^X is a particular outcome measured after X months of entry into unemployment, these partially eligible individuals are located just to the left of the 25-year age cutoff. Their probability of receiving the subsidy within X months after unemployment decreases gradually from age $25-X$ to 25 (which is not included).[19]

Figure 2. The eligibility rule for Impulsion –25 subsidies, with age measured at unemployment entry



[18] Due to data limitations (see Section 3), we are unable to exploit the eligibility thresholds for unemployment duration applicable to high school graduates under 25 (6 months) and to youths aged 25 or older (12 months). Moreover, a difference-in-differences (DiD) estimation cannot be used to test robustness, as a similar federal subsidy existed prior to the implementation of the Impulsion plan. As a result, a DiD strategy would capture the impact of the shift from the federal subsidy to the regional one, rather than the effect of eligibility for the Impulsion subsidy itself.

[19] For instance, if the outcome, $Y^{X=3}$, is measured within 3 months of unemployment entry, individuals who reach the age of 25 within this period are partially eligible. Partially eligible individuals are those aged between 25 minus 3 months and 25 at the time of entry into unemployment.

To address the issue of partial eligibility, we follow Albanese et al. (2024) and apply a "donut hole" RDD, wherein observations of partially eligible individuals are excluded from the RDD model estimation (see also Gerard and Gonzaga, 2021).[20] Since the transition rate to employment is measured during the first year of unemployment, we drop observations of youths aged between 24 and 25, creating a one-sided "donut hole" of 12 months to the left of the 25-year age threshold. In a sensitivity analysis in which transition rates are measured for periods shorter than one year, we decrease the size of the donut hole from 12 to 1 month, depending on the time window used. For the outcome measuring the number of accumulated months employed up to 2.5 years after unemployment entry, the donut size is set at a maximum of 12 months. A larger size would threaten the comparability of observations on each side of the hole—the central hypothesis of our identification strategy. For this long-run outcome, the treatment is therefore eligibility for the Impulsion –25 subsidy for at least one year.

In the estimated model, the outcomes of the partially eligible units are predicted linearly using the observations from the left of the one-sided donut hole. The prediction from the left of the age cutoff is then used to identify the ITT effect of the Impulsion –25 subsidy. Within the bandwidth on both sides of the 25-year cutoff, outcomes are assumed to vary linearly with age. Formally, the one-sided donut RDD involves estimating the following linear regression:

$$y_i^X = \alpha^X + \delta^X \cdot 1(age_i < 25) + \beta_1^X \cdot (age_i - 25) \cdot 1(age_i < 25)$$
$$+\beta_2^X \cdot (age_i - 25) \cdot 1(age_i \geq 25) + \gamma^X \cdot C_i + \varepsilon_i^X$$

$for\ age_i < 25 - \min_X(X, 12)\ \ or\ \ age_i \geq 25$, where

y_i^X is the outcome for individual (spell) i measured within x months of entry into unemployment;[21]

α^X is the constant for outcomes measured within x months of entry;

$1(.)$ is an indicator variable equal to 1 if the condition is true and 0 otherwise;

age_i is the age of individual i at the month of entry into unemployment, i.e., the forcing variable;

$\beta_1^X \cdot (age_i - 25) \cdot 1(age_i < 25)$ represents the linear relationship between age and the outcome to the left of the cutoff;

$\beta_2^X \cdot (age_i - 25) \cdot 1(age_i \geq 25)$ represents the linear relationship between age and the outcome to the right of the cutoff;

δ^X is the intention-to-treat effect at the cutoff within x months of entry;

C_i is a vector of controls, comprising variables mentioned in Section 3 and detailed in Table A2, as well as the months and years of unemployment entry. These variables are included to increase the precision of the estimates but are omitted in a sensitivity analysis (see Section 6);

ε_i^X is the idiosyncratic error term (with zero conditional mean).

Due to the presence of the donut hole, the bandwidth size cannot be determined using data-driven selectors. As a result, we set the bandwidth at three years on each side of the donut hole. In Section 6, we test the sensitivity of the results to wider and narrower bandwidths. We estimate the model using

[20] The donut hole RDD is a widely used method in the literature to test for manipulation of the running variable around the threshold (Cattaneo et al., 2019). In that context, a donut hole is typically required on both sides of the discontinuity, not just on the left-hand side, as in our case.

[21] If an individual has multiple spells, they are treated as independent. In the sample, only 21% of individuals experienced more than one spell, and 5% had more than two. In the text, an individual refers to a specific unemployment spell.

triangular kernels, which assign greater weight to observations closer to the donut hole. Finally, following Lee and Card (2008), we cluster the standard errors by age in months to account for the grouped nature of the forcing variable. This results in 72 clusters for the benchmark analysis.

5. Results

In this section, we report and discuss the empirical findings of our analysis. In the first stage, we present the main results of our empirical analysis, starting with evidence of a discontinuity in the treatment intensity at the age of 25, followed by the impact of the Impulsion –25 subsidies on short-run transitions to employment and on cumulative employment within 30 months of entry into unemployment. In the second stage, we investigate the mechanism behind the effects of the subsidy on employment outcomes. Finally, in the last stage, we examine the role of temporary work agencies in driving some of the estimated effects. The results are presented graphically for high school dropouts and graduates separately. Additional graphs are available in Appendix B. The main econometric estimates and associated statistics underlying these graphs are reported in various tables in Appendix C.

5.1. Main results

5.1.1. Subsidy receipt

Panel (a) of Figure 3 below illustrates the donut RDD for the take-up of either type of Impulsion subsidy.[22] The take-up rate corresponds to the fraction of unemployment entrants who benefit from a subsidy within one year of entry. Each circle represents the average take-up within a six-month age interval.[23] The donut excludes the empty circles reporting take-up rates for youths aged between 24 and 25 at the time of entry into unemployment. These youths are excluded from the estimation sample because they are only eligible for the Impulsion –25 subsidy for part of the year (i.e., until they turn 25). The predicted take-up rates around the age of 25 are based on the estimated linear splines to the left and right of this age threshold.

For high school dropouts, the take-up to the left of the age discontinuity (just under 25) is 31.8%, while to the right of the discontinuity (just over 25), it is only 12.0%. The ITT estimate on subsidy receipt at the threshold is therefore 19.8 percentage points (pp) and is highly significant. This confirms that unemployed high school dropouts have greater access to the Impulsion subsidies if they are slightly younger than 25, compared to those who are slightly older. As mentioned in Section 3, only one day of registered unemployment is required for the younger group, while the older group cannot apply for the subsidy if they have been in registered unemployment for fewer than 12 months.

As expected, the ITT estimate is smaller for the high school graduates, since for those under 25, the requirement is only reduced to 6 months (rather than just one day). For high school graduates, the take-up rate is 17.8% to the left of the age cutoff and 8.1% to the right, resulting in a difference of 9.3 pp. This is about half the ITT estimate for dropouts but remains statistically significant.

Take-up rates for the subsidies are affected by the hiring opportunities available to low-educated youths. A more direct way to represent the discontinuity in the treatment probability at age 25 is to estimate the attention rate, which is the share of workers hired with a subsidy among all first transitions to employment in the year following unemployment entry. According to Panel (b) of Figure 3, the attention

[22] Recall that two types of subsidies are available: Impulsion –25 for youths under the age of 25, and Impulsion 12+ for the long-term unemployed, with no age restriction.
[23] The six-month age range was chosen for visualization purposes. A narrower range would introduce too much noise into the graphical evidence. Estimations are made on all observations, not on means.

rate is estimated at 48.6% to the left and 19.2% to the right of the age cutoff for high school dropouts, resulting in an ITT estimate of 29.4 pp.

It is worth noting that the attention rate below age 25 is not 100% for this group, even though they are not required to meet a minimum unemployment duration criterion. This suggests that some young people, or their employers, may not comply with the administrative formalities, may find them too burdensome (see Section 2), or may simply be unaware of the hiring subsidy. A linear regression analysis (see Table A3 in Appendix A) reveals that certain individual and firm characteristics significantly influence the attention rate. These findings are consistent with the idea that information barriers and administrative challenges play a role in the relatively low attention rate.[24]

For high school graduates, the attention rate is 23.7% to the left and 10.8% to the right of the age cutoff, with an ITT effect estimated at 12.9 pp. For this group, as with the take-up rate, the attention rate is also influenced by the 6-month unemployment criterion. Nevertheless, the barriers to take-up discussed earlier likely affect graduates as well.

A final way to examine the discontinuity in treatment assignment is to report the average subsidy amount conditional on hiring. This is calculated by multiplying the exogenously fixed subsidy (€500 per month in full-time equivalent) by the attention rate. It provides an indication of the discontinuity in treatment intensity at the age cutoff of 25. As shown in panel (c) of Figure 3, the average subsidy amount conditional on hiring is €242 to the left and €95 to the right of the cutoff for high school dropouts, while it is €118 and €55, respectively, for high school graduates. The differential expected monthly subsidy at age 25 is therefore estimated to be €147 for dropouts and €63 for graduates, both of which are highly significant. These ITT effects are relatively small due to the small differential take-up rates at the age cutoff. However, for employers, it is precisely the opportunity to more easily access the full subsidy amount (€500) by hiring a low-educated youth just below 25 rather than just above that is likely to influence their hiring decision.

Our data do not provide information on wage costs, so we cannot estimate the proportional reduction in labor costs caused by the subsidy at the 25 cutoff. As an approximation, we compare the differential expected monthly subsidy at age 25 to the average monthly labor cost for young workers without and with a high school diploma. According to Statbel data, these amounts are €2,140 and €2,318, respectively.[25] Recruiting low-educated jobseekers below the age of 25 is therefore associated with an approximate proportional decrease in labor costs of 6.9% on average for those without a high school diploma, and 2.7% on average for high school graduates. These figures suggest that the increase in the employment transition rate at the cutoff due to the reduced hiring cost of low-educated youths may not be large. The employment elasticity reported in studies evaluating the impact of hiring subsidies on the re-employment probabilities of disadvantaged jobseekers ranges from –0.2 to –2.5 (Albanese et al., 2024, p. 8). The proportional increase in the hiring rate for dropouts could therefore be expected to range from 1.4% to 17.25%, and from 0.5% to 6.75% for graduates.

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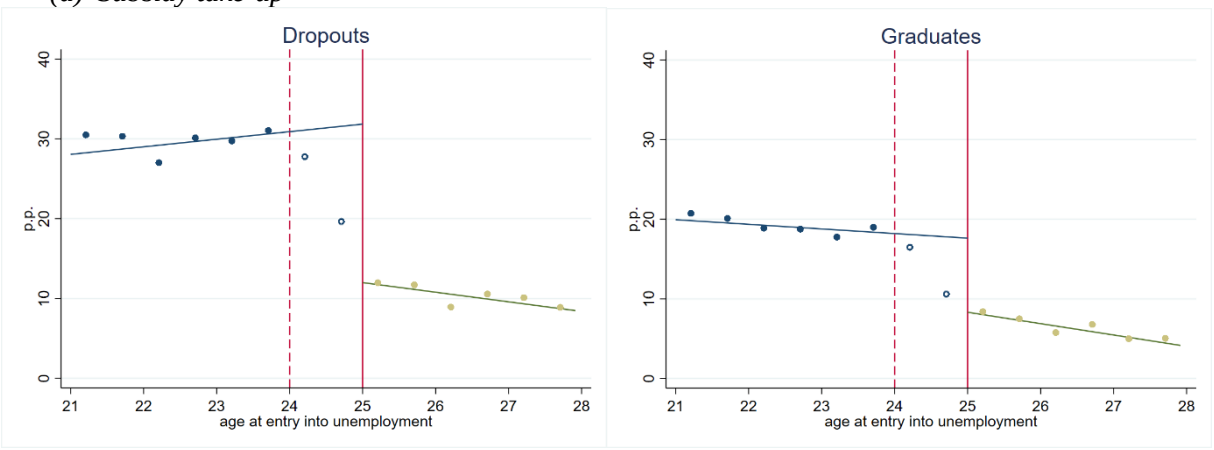
[24] We estimated a linear regression using the attention rate as the dependent variable and certain individual and firm characteristics as independent variables. The estimated parameters of this regression are available in Table A3 of Appendix A separately for high school dropouts and graduates. A few variables significantly determining the attention rate confirm that information issues or administrative burdens likely contribute to the relatively low attention rate. For example, non-European jobseekers are less likely to be hired with a subsidy, while first-time PES registrants (who may receive more support and information) and temporary workers (whose employers are more familiar with available aids) are more likely to benefit from one. For graduates, only the latter effect is significant.

[25] According to Statbel, in 2017 the average monthly gross wage of a full-time worker without a high school diploma was €1,876, while for a full-time worker with a high school diploma, it was €2,004. These data are available upon request from Statbel. Considering the employer social security contribution rules at that time, we estimate the monthly wage costs for a full-time high school dropout and a high school graduate to be €2,140 and €2,318, respectively. Details of the calculations are available upon request.

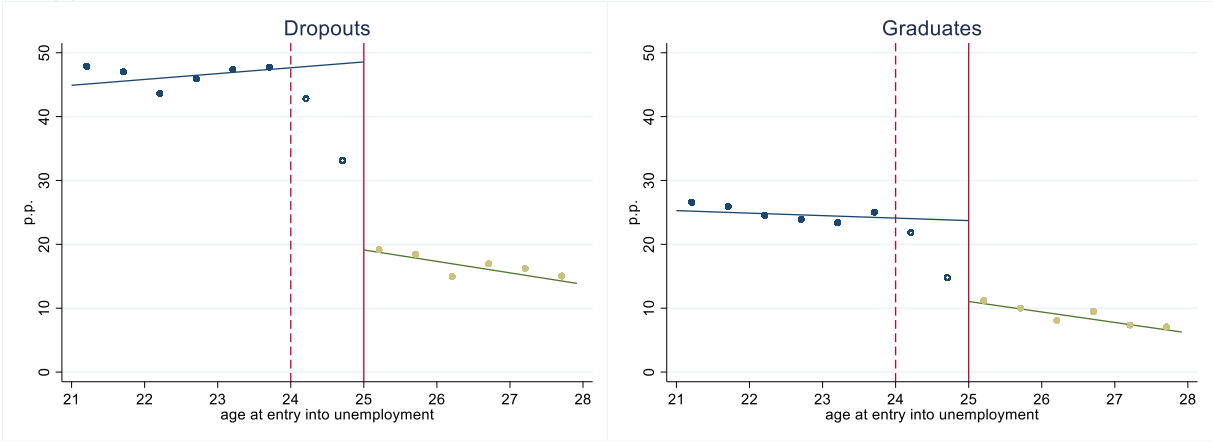
In Figure B1 of Appendix B, we present the evolution of the donut RDD estimates for three alternative measures of subsidy receipt—take-up rate, attention rate, and subsidy amount—over the first 12 months following entry into unemployment (see also Tables C1 to C3 in Appendix C). For all three measures, we observe an increasing discontinuity at age 25 from month 1 to month 11 for high school dropouts, and up to month 10 for graduates. After this period, the discontinuity stabilizes.

Figure 3. Discontinuity at age 25 in subsidy receipt within one year of entry into unemployment

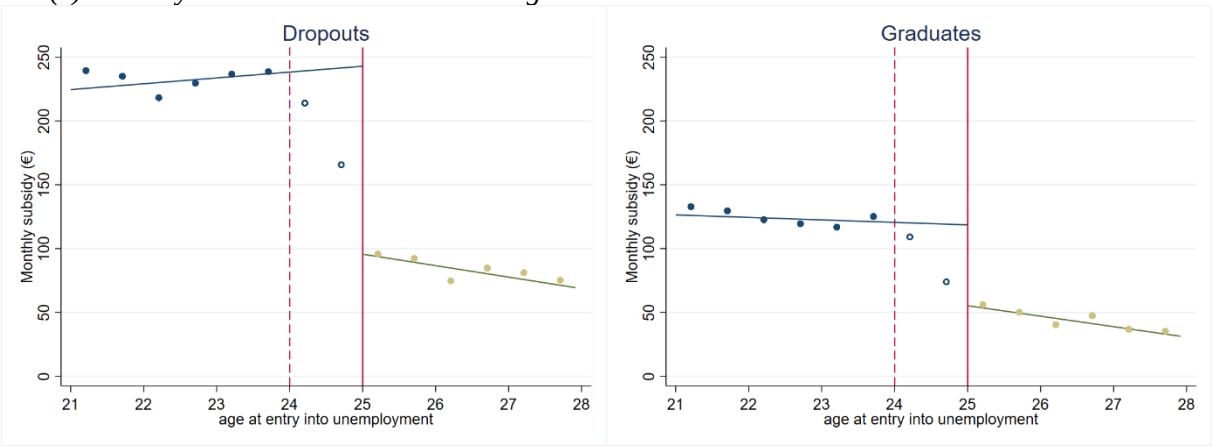
(a) Subsidy take-up



(b) Attention rate



(c) Subsidy amount conditional on hiring



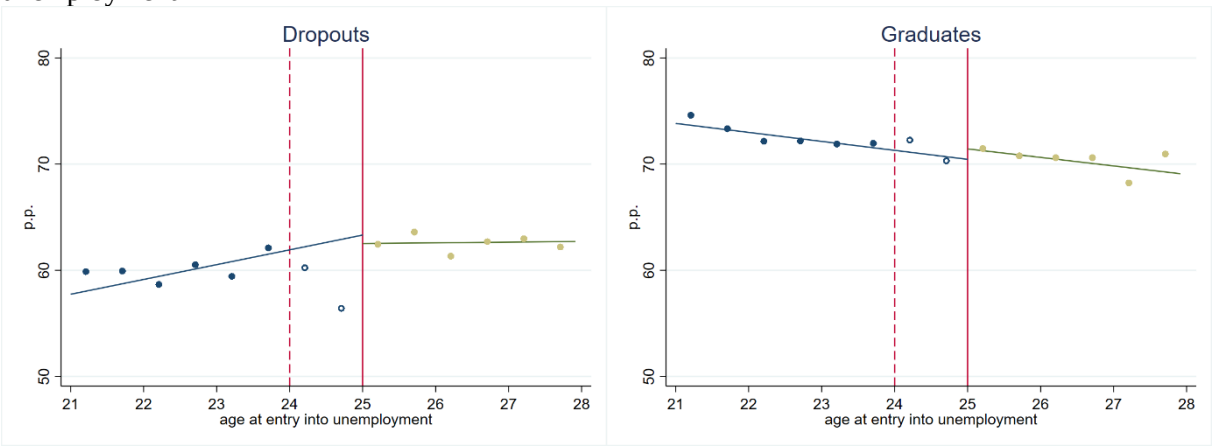
Note: The graphs depict the one-sided donut RDD estimates based on the sample of youths entering unemployment between July 2017 and June 2019 without having ever received an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff age is 25. The bandwidth is set to 3 years on each side of the donut hole. The outcomes, measured within one year of unemployment entry, are (a) the subsidy take-up rate; (b) the attention rate, i.e., the share of subsidized hires

among all hires; and (c) the amount of subsidy received (in full-time equivalent), conditional on hiring. Mean values of outcomes are plotted over a six-month age interval. To estimate the linear splines, observations are weighted using a triangular kernel, excluding those within the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level. For high school dropouts (graduates), the estimated ITT effects at 25 are the following: for (a), 19.8 (9.7) pp with a p-value of 0.000; for (b), 29.4 (13.7) pp with a p-value of 0.000; for (c), 147 (63) euros with a p-value of 0.000. For (a), N= 15,417 (39,719); for (b) and (c), N= 9,227 (27,952).

5.1.2. Short-run transitions to employment

In this section, we examine whether the discontinuity in subsidy receipt at age 25 translates into a corresponding discontinuity in the transition rate to employment within one year of entering unemployment. Figure 4 shows that there is no significant difference in the donut RDD estimates of the hiring rates around the age cutoff for the two education groups (see also Table C4 in Appendix C). For high school dropouts, the job-finding rate increases slightly with age, more notably to the left of the age threshold. From age 25 to a slightly younger age, this rate improves marginally from 62.6% to 63.1%. As a result, the estimated ITT effect is +0.5 pp, a proportional increase of 0.8% relative to the counterfactual hiring rate (=0.5/62.6).[26] However, this increase is not statistically significant. Nevertheless, if we compare this percentage change with the approximate proportional decrease in labor costs induced by the Impulsion –25 subsidy (–6.9%), the corresponding employment elasticity (-0.1) is close to 0. Compared to other studies, this estimate is at the very low end of the spectrum (see Section 5.1.1). For jobseekers with a high school diploma, the transition rate to employment is 10 pp higher overall compared to that of dropouts and decreases slightly with age. However, just like dropouts, there is no discontinuity in the probability of finding a job around age 25 for high school graduates. This probability is estimated to be 71.3% at 25 and drops to 70.5% just below this age. Unexpectedly, the ITT effect is negative (–0.8 pp) but not statistically different from 0 (p-value=0.414).

Figure 4. Discontinuity at age 25 in the transition rate to employment within 12 months of entry into unemployment



Note: The graphs depict the one-sided donut RDD estimates based on the sample of youths entering unemployment between July 2017 and June 2019 without having ever received an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff age is 25. The bandwidth is set to 3 years on each side of the donut hole. The outcome is the cumulative transition rate to employment within one year of unemployment entry. Mean values of the outcome are plotted over a six-month age interval. To estimate the linear splines, observations are weighted using a triangular kernel, excluding those within the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level. For high school dropouts (graduates), the estimated ITT effect at 25 is 0.5 pp (–0.8 pp) with a p-value of 0.844 (0.414); N= 15,417 (39,719).

[26] Figure 4 shows a decline in the job-finding rate for high school dropouts within the donut. Conducting additional analyses that include in the sample individuals who had previously benefited from Impulsion (cf. the sensitivity analysis reported in Section 6), we conclude that this decline is driven by data noise. These analyses are available upon request.

Based on these results, we can calculate the local average treatment effect (LATE), which measures the effect of the Impulsion –25 subsidy on the job-finding rate for the subpopulation of *actual recipients* of this subsidy (Albanese et al., 2024). In the standard RDD literature, the LATE is estimated using a Wald estimator: the ITT on the transition rate to employment divided by the ITT on subsidy take-up. For high school dropouts, the ITT estimate at the threshold is 19.8 pp for take-up and 0.5 pp for the transition rate to employment. The Wald estimate of the LATE is therefore 2.2 pp (=0.5/19.8). This means that only 2.2% of jobseekers hired with an Impulsion –25 subsidy would not have been recruited in the absence of this specific scheme. Symmetrically, this implies that 97.8% of actual recipients of the subsidy would have found a job even without it. This is referred to as the "deadweight loss" of the subsidy. Given the insignificant ITT effect on employment transitions, we cannot reject the possibility that the Impulsion –25 subsidy creates a full deadweight loss for dropouts, as is the case for graduates, for whom the estimate of this ITT effect is negative but not statistically different from 0.

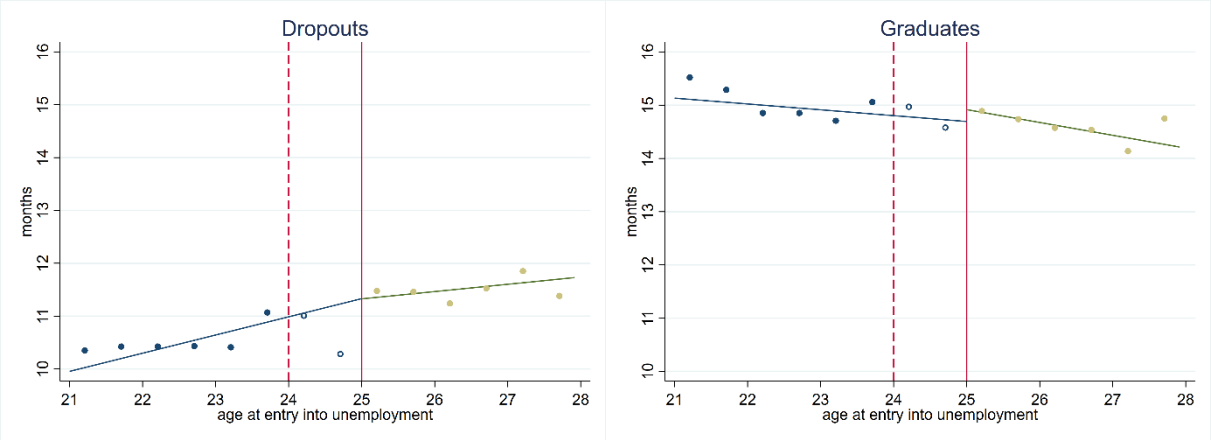
In Figure B2 in Appendix B, we report the evolution of the donut RDD estimates on the transition rate to employment from 1 to 12 months after entry into unemployment (see also Table C4 of Appendix C). The results confirm the absence of any significant effect of the Impulsion –25 subsidy on short-run transitions to employment. The evolution of the point estimates is quite erratic for dropouts, alternating between negative and positive values. This may be due to a much smaller sample size for this group compared to high school graduates.

5.1.3. Cumulative employment in the longer run

In the previous section, we provided evidence that employers collected the Impulsion –25 subsidies but hired the same individuals they would have recruited even without this subsidy. Despite this lack of impact on the recruitment process of low-educated jobseekers, a lower wage cost available for up to 3 years may incentivize employers to retain subsidy recipients for longer periods than they would have without the subsidy. In this case, we would expect longer work experience on average for jobseekers slightly younger than 25 relative to those slightly older, since the subsidy take-up is much higher for the former. However, from Figure 1 in Section 3, we already know that most recipients do not complete their full eligibility period for subsidies.

Figure 5 shows the donut RDD estimate on the number of months in employment within a 30-month period from entry into unemployment, by educational attainment. We observe that there is no discontinuity in this outcome around the 25-year age cutoff for either high school dropouts or graduates. This indicates that the higher subsidy take-up to the left of the cutoff did not affect the time spent in employment within 2.5 years of unemployment entry. In the counterfactual of scenario of less-accessible hiring subsidies, high school dropouts (graduates) spent, on average, 11.5 (15.0) months in employment, and these numbers were not significantly altered for youths younger than 25. Figure B3 in Appendix B shows that regardless of the time horizon considered, the donut RDD estimates are very close to zero and never statistically significant. Regression results are available in Table C5 of Appendix C for selected time windows, including 30 months.

Figure 5. Discontinuity at age 25 in the number of months in employment within 30 months of entry into unemployment



Note: The graphs depict one-sided donut RDD estimates based on the sample of youths entering unemployment between July 2017 and June 2019 without having ever received an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff age is 25. The bandwidth is set to 3 years on each side of the donut hole. The outcome is the number of months a person has been registered in employment within a period of 30 months of unemployment entry. Mean values of the outcome are plotted over a six-month age interval. To estimate the linear splines, observations are weighted using a triangular kernel, excluding those within the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level. For high school dropouts (graduates), the estimated ITT effect at 25 is 0.0 pp (–0.2 pp) with a p-value of 0.992 (0.560); N= 15,417 (39,719).

In order to verify whether the absence of positive employment effects persists over an even longer period, we restrict the sample to low-educated youths who entered unemployment between July 2017 and June 2018. This enables us to measure the number of months in employment up to 42 months after entry into unemployment. However, since the sample size is significantly reduced, these long-term effects are estimated with considerable imprecision. Despite this, the point estimates show only minor differences compared to the benchmark estimates (see Figure B4 in Appendix B).

Eligibility for the subsidy could also affect the quality of the job secured. Due to data constraints (see Section 3), we are unable to provide a comprehensive answer to this question. To investigate the possibility that earlier access to subsidies may influence employment stability, we examine the impact of earlier access to subsidies on the number of consecutive months of employment, potentially with the same employer. Our analysis focuses on the first employment spell after entry into unemployment. Since our data lack firm identifiers, we approximate employer continuity by considering cases with no changes in firm size, sector, or the district of the headquarters. We found no positive effect of earlier access to subsidies on the number of consecutive months spent in the first employment spell after entry into unemployment. Donut RDD estimates at age 25 are available in Figure B5 in Appendix B. We also show and discuss in Section 5.3 below that the subsidy has the side-effect of increasing direct hiring by regular employers and reducing their reliance of temporary agencies for eligible workers. This effect may have, in theory, contributed to employment stability, an important aspect of job quality.

5.2. Mechanisms

Based on our results, we cannot reject the hypothesis that the more accessible Impulsion –25 subsidies have no direct effect on job finding and time spent in employment for low-educated young jobseekers. Even though this policy does not cause a significant decline in expected wage costs at hiring, the elasticity of the hiring probability to a change in labor costs is estimated to be only –0.1 for high school dropouts, and even slightly (but not significantly) positive for high school graduates. Drawing on the insights of the literature review, we attempt to identify key factors in the policy design and context that might explain the ineffectiveness of the scheme.

First, it is now well established in the literature on hiring subsidies that sensible targeting is crucial to limit deadweight losses (see, for example, Brown, 2015; Cahuc et al., 2019; Sjögren and Vikström, 2015). At first glance, it seems that the Impulsion –25 plan targets those most in need of assistance: young unemployed individuals who lack post-secondary education. However, even within this group, there may be significant heterogeneity in the way workers integrate into the labor market, due to differences in personal skills or education. For example, young people who were previously enrolled in vocational or technical programs in high school may find a job more easily, even if they did not graduate, compared to general-track high school graduates who did not pursue further education (Forem, 2022; OECD, 2020). For high school dropouts, the Impulsion –25 subsidy can be granted from the first day of registration as a jobseeker. The absence of any unemployment duration criterion implies that subsidies could be disbursed for the recruitment of jobseekers who would have been employed even without the subsidy, thereby amplifying the potential for deadweight loss. It is important to note, however, that a 6-month duration criterion applies to high school graduates, and for this group, the Impulsion –25 subsidies do not impact job finding either. This factor, therefore, cannot be the main cause of the scheme's ineffectiveness.

The second factor is the economic context, specifically the tightness of the labor market (the vacancies-to-unemployment ratio). We assess the effectiveness of the Impulsion plan for the first beneficiaries of the subsidies, who entered unemployment in 2017 and 2018, and made their first transition to employment in the three years preceding the pandemic. During this period, the economy experienced relatively strong growth and increasing employment. A number of indicators suggest that labor demand was relatively buoyant in the Walloon job market. Annual growth in domestic employment ranged from 1.2% to 1.7%, and the unemployment rate declined by 2.4 percentage points over three years (from 9.6% in 2017 to 7.2% in 2020). The labor market was tight, as evidenced by the low number of unemployed individuals per vacancy. While this number fluctuated between 9 and 11 in 2014–2015, it was estimated to be 4.6 in the third quarter of 2017 and only 3.9 in the second quarter of 2019 (the period corresponding to our evaluation sample).[27] Job opportunities were therefore relatively abundant.

In such a context, financial support for hiring is likely to generate significant deadweight losses, as the expected cost of creating new job opportunities increases when the labor market is tight, and congestion externalities make recruitment more difficult. This relationship has been highlighted in search and matching models (see Kline and Moretti, 2013 and Cahuc et al., 2019, for example). In Cahuc et al. (2019), the authors conclude that the effectiveness of targeted hiring subsidies is maximized when they are limited to short periods of high unemployment (and when they are not permanent, as in the case of the Impulsion plan). Several empirical studies have confirmed the countercyclical nature of hiring subsidies, showing that they are more effective during recessions or the early stages of economic recovery (Batut, 2021; Neumark, 2013; Neumark and Grijalva, 2017; Pasquini et al., 2019; Sjögren and Vikström, 2015).

In a recent study, Albanese et al. (2024) demonstrated the effectiveness of hiring subsidies for low-educated unemployed youth[28] in Belgium during 2010 and 2011. At that time, the labor market had not yet recovered from the 2008 financial crisis, and firm recruitment decisions were still subject to considerable uncertainty. The authors show that the subsidies increased job finding in the private sector for the target group by 10 percentage points within one year of unemployment. While the 2010–2011 scheme was more generous, offering double the amount of the Impulsion program, we believe this is not the primary reason for the differences in impact between their study and ours. We find a zero effect despite a smaller but still significant reduction in the wage cost of hiring. In our opinion, the labor market

[27] This ratio is calculated with figures from the Labor Force Survey (LFS) and the Job Vacancy Survey.
[28] High school dropouts (graduates) became eligible after 3 (6) months of registration as jobseekers within the last 4 (9) calendar months.

situation and the timing of the schemes are the main reasons for this discrepancy. The 2010–2011 scheme was limited to two calendar years, during which the degree of labor market tightness was much lower. These are precisely the two conditions necessary for hiring subsidies to be effective, according to Cahuc et al. (2019).

Interestingly, Albanese et al. (2024) also confirmed the importance of labor market tightness in shaping the effectiveness of hiring subsidies. They found that the policy had no effect in the Belgian region near the Luxembourg border, where a high share of workers cross into Luxembourg daily due to the very attractive employment opportunities there. This led to a tighter labor market near the border, precisely where the hiring subsidies failed to stimulate job creation. To support our argument that the lack of effect of the subsidy can be explained by the tightness of the labor market, we conduct a heterogeneity analysis based on labor market tightness in the district of residence. We use the job-finding rate within one year of unemployment entry in the control group as a proxy for labor market tightness and divide our evaluation sample at the median rate. Individuals living in districts with a job-finding rate below the median are assigned to the low labor market tightness subsample, while individuals living in districts with a job-finding rate above the median are assigned to the high labor market tightness subsample.[29]

Since we only know the district of residence at unemployment entry and cannot assume that labor market conditions remain constant over long periods, we focus on short-term employment outcomes for this heterogeneity analysis. Figure 6 presents the evolution of the donut RDD estimates on the transition rate to employment from 1 to 12 months after entry into unemployment for both educational groups in districts with (a) low labor market tightness and (b) high labor market tightness (see also Tables C6 and C7 in Appendix C). In Figure B6 of Appendix B, we also present the evolution of the donut RDD estimates for the subsidy amount conditional on hiring over the first 12 months following entry into unemployment for these four categories (see also Tables C8 and C9 in Appendix C). Regardless the state of the labor market, the discontinuity at age 25 shows an increasing trend from month 1 to 12 for high school dropouts, with only minor declines. For graduates, it increases until month 10, then slightly decreases.

This heterogeneity analysis reveals positive and significant effects on employment transition in geographical areas characterized by lower labor market tightness, but only for high school graduates. Starting from the 7th month after entry into unemployment, the estimated ITT effect turns around +3 pp (statistically significant in months 7 to 9), representing a proportional increase of 4.8% relative to the counterfactual hiring rate (=3/62.1).[30] If we compare this percentage change with the approximate proportional decrease in labor costs induced by the Impulsion –25 subsidy for high school graduates in areas of low labor market tightness (around –2.1% from month 7), the corresponding employment elasticity (-2.3) falls within the upper the range of values found in the literature (see Section 5.1.1). Although the timing is not measured precisely, these positive effects appear to emerge around the six-month eligibility threshold, which may help explain the near-zero and non-statistically significant effects

[29] Table A4 in Appendix A presents the job-finding rate of the control group by district, separately for dropouts and graduates. As in the benchmark analysis, the job-finding rate is defined as the share of individuals who find at least one job within 12 months of unemployment. The job-finding rate is calculated at the district level for the control group, consisting of individuals aged 25 to 28 at unemployment entry. In total, the Walloon region comprises 22 districts. The table also specifies which districts belong to the low labor market tightness sample and which are part of the high labor market tightness sample.

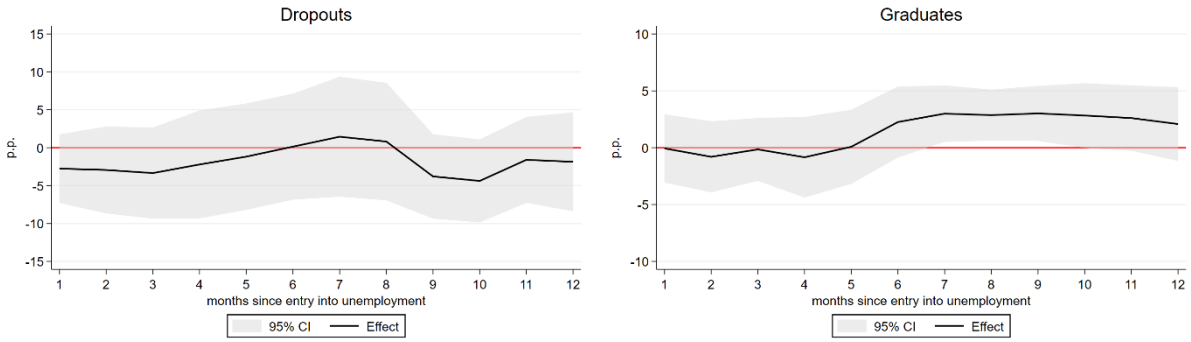
[30] Figure B7 in Appendix B shows the discontinuity in the 8-month transition rate to employment at age 25 for high school graduates in low-tightness areas. Panel (a) uses six-month age bins, as in Figure 4, but these are not ideal for outcomes measured over 8 months, as the final bin before the cut-off mixes treated and partially treated individuals. Panel (b) uses four-month bins for a more precise view. Both graphs clearly show a discontinuity at the age-25 threshold.

observed in the preceding months.[31] For high school dropouts, the estimates are less precise, with wider confidence intervals, and we do not observe a similar effect.

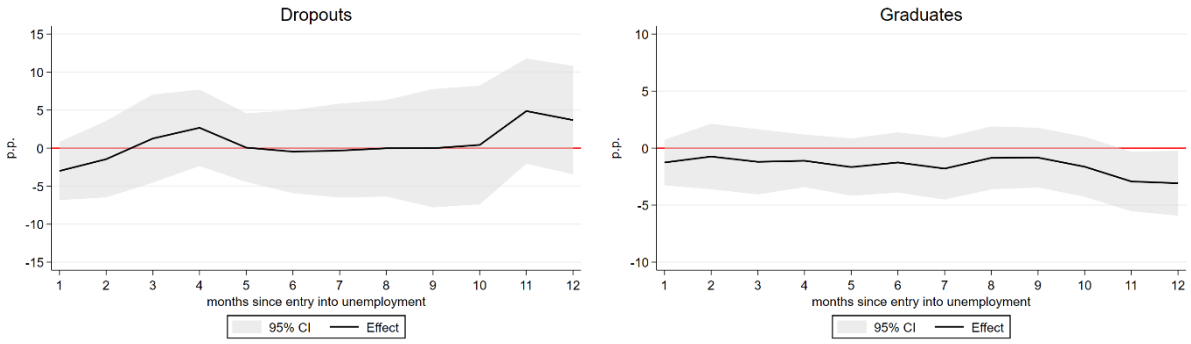
This lack of effect for high school dropouts may be attributed to the loose targeting of this group. As noted earlier, the absence of an unemployment duration criterion means subsidies are granted even to jobseekers who would have found employment without the subsidy. While this broad targeting could limit the program's effectiveness, other factors—such as group differences in productivity or motivation—may also contribute. The study by Albanese et al. (2024) found that hiring subsidies contributed to an increased job-finding rate for high school dropouts in a depressed economic context, where a minimum unemployment duration of 3 months was required to qualify for the subsidy.

Figure 6. Evolution of the discontinuity at age 25 in the transition rate to employment up to 12 months after entry into unemployment, by labor market tightness

(a) Districts with low labor market tightness



(b) Districts with high labor market tightness



Note: The graphs depict one-sided donut RDD estimates for two subsamples from the benchmark analysis: (a) individuals living in districts with low labor market tightness at entry into unemployment (b) individuals living in districts with high labor market tightness at entry into unemployment. Age at unemployment entry is used as the forcing variable, with a cutoff at 25. The outcome is the cumulative transition rate to employment within 1 to 12 months after entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted using a triangular kernel, excluding those within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at the time of unemployment entry. The bandwidth is

[31] For graduates in low-tightness areas, we also examine whether the increase in transition rates leads to longer employment spells within this short 12-month window. We find a slight rise in cumulative months in employment from month 7, but the effect is not statistically significant at the 5% level. This may reflect limited statistical power and follow-up duration. We also conduct a complementary analysis focusing on the number of consecutive months in the first employment spell that begins within 12 months of unemployment entry, and find no evidence of an increase in employment duration. Results available upon request.

set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

5.3. Rent extraction by temporary work agencies

5.3.1. Side-effect on the recruitment process

In recent years, there have been discussions within the Walloon government regarding the design of the Impulsion plan, which has been regularly criticized for generating windfall effects for companies. These criticisms are based on field feedback carried out by the Walloon public employment service rather than on impact evaluations like the one conducted in our study. In particular, the government sought ways to eliminate the "pure" windfall effect believed to be induced by temporary work agencies ("temp agencies").

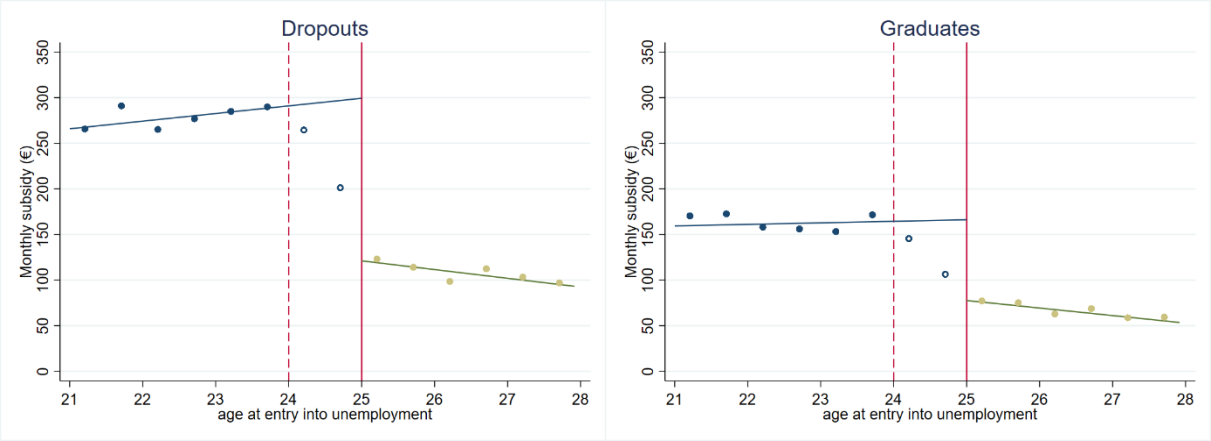
A temp agency is a recruiting firm that acts as an intermediary between jobseekers and companies in need of temporary workers. The agency does not fill a vacancy for its own internal needs but on behalf of its client company, the "user company". The recruited worker (known as the "interim" or "temp" worker) signs an employment contract with the agency, which specifies the wage rate, while the agency enters into a commercial contract with the user company for the provision of temporary labor. If the worker is eligible for a subsidy, the temp agency receives the subsidy and takes the money off the worker's wage as a profit, unless it renegotiates the commercial contract with the user company. Consequently, if commercial contracts are not adjusted, hiring subsidies do not incentivize user firms to create new jobs and may result in deadweight losses. We have indications that temp agencies may exploit the subsidy, benefiting from the financial incentive without effectively passing on any cost savings to the hiring firms or workers.[32] In Belgium, temporary work agencies play a key role as a recruitment channel for young jobseekers. In our evaluation sample, almost half of the young individuals make their first transition to employment with the help of a temp agency within a year of becoming unemployed. The presence of these agencies could therefore also reduce the effect of the Impulsion –25 subsidies on job finding. To explore this issue further, we examine whether earlier access to hiring subsidies has a differential impact on job-finding rates, depending on whether the employment is secured directly by a firm or through the intermediation of a temp agency.

Our dataset allows us to distinguish between jobs directly obtained by a company and those obtained through a temp agency. As a first step, Figure 7 shows the subsidy amount conditional on hiring through a temp agency (similar to panel (c) in Figure 3). On average, across all ages, this amount is higher than for all hires. This does not reflect a higher take-up of the subsidies among temp agencies, but rather a higher attention rate, as illustrated by panels (a) and (b) of Figure B8 of Appendix B. It thus appears that temporary work agencies make greater use of Impulsion subsidies when recruiting eligible jobseekers (cf. also footnote 24 in Section 5.1.1). This observation has already been highlighted in the work of Cockx and Desiere (2022) and Bermudez et al. (2025), who evaluated the impact of hiring subsidies in the Dutch-speaking region of northern Belgium. According to these authors, temp agencies, being specialized in recruitment, are better informed about financial support instruments and the required administrative tasks to ensure subsidy payments. They are therefore more likely to utilize these subsidies, particularly since they receive the subsidies directly. In a study that examined the take-up behavior of hiring subsidies for long-term unemployed individuals and migrants in Sweden, Behrenz and Månsson (2021) confirmed that informational frictions are a major deterrent to using subsidies that workers are entitled to.

[32] This information has been gathered from informal discussions with contact persons at the Walloon PES. Commercial contracts between temp agencies and client companies are confidential and fall under business secrecy, so we cannot explore this issue further.

Figure 7 also shows a more pronounced decrease in the expected subsidy amount at the age of 25 when focusing exclusively on recruitment by temp agencies: €178 per month (compared to €147 for all hires) for high school dropouts and €88 per month (compared to €63 for all hires) for high school graduates. This is due to a larger discrepancy in the attention rate for Impulsion subsidies at the 25-year threshold for hires in temp agencies compared to all hires. We could therefore expect higher ITT effects on job finding within temp agencies, unless the incentive effect is absent for them, as discussed earlier.

Figure 7. Discontinuity at age 25 in the subsidy amount conditional on hiring through a temporary work agency within one year of entry into unemployment

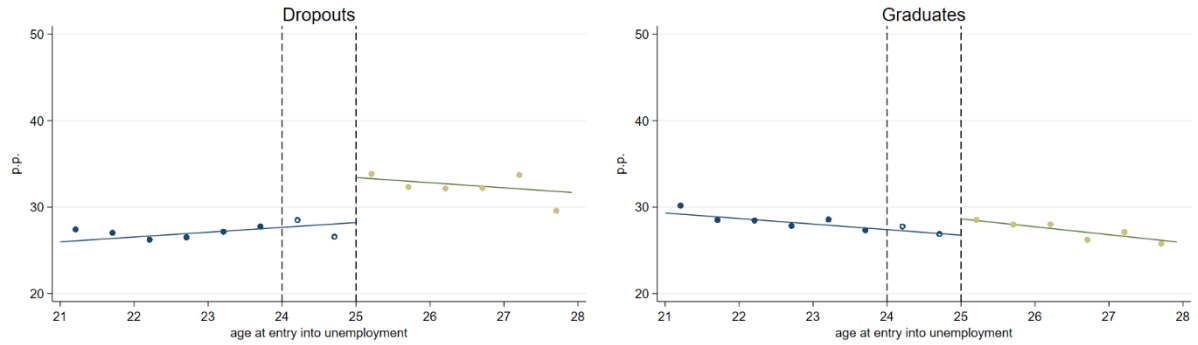


Note: The graphs depict one-sided donut RDD estimates for the sample of youths entering unemployment between July 2017 and June 2019, who had never received an Impulsion subsidy. Age at the time of unemployment entry is used as the forcing variable, with a cutoff age of 25. The bandwidth is set to 3 years on each side of the donut hole. The outcome, measured within one year of unemployment entry, is the amount of subsidy received (in full-time equivalent) conditional on being hired by a temporary work agency. Mean values of outcomes are plotted over a six-month age interval. To estimate the linear splines, observations are weighted using a triangular kernel, excluding those within the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level. For high school dropouts (graduates), the estimated ITT effect at 25 is €178 (€88) with a p-value of 0.000; N= 5,033 (12,527).

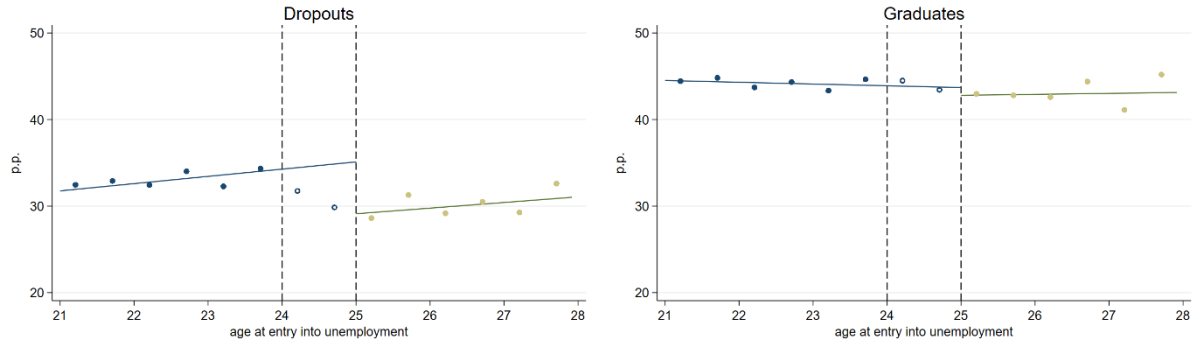
Panel (a) of Figure 8 shows the donut RDD estimate on the probability of making a first transition to employment as a temp worker within one year of becoming unemployed. This estimate is–5.2 pp for high school dropouts and –1.9 pp for graduates, representing a proportional decrease of 15.5% (resp. 6.6%) relative to the counterfactual. As expected, the presence of Impulsion –25 subsidies had no positive effect on employment opportunities for young jobseekers with low and medium levels of education in temp agencies; in fact, it slightly decreased job-finding in these agencies for this population. These negative effects are highly significant for high school dropouts and are significant at the 5% level (p-value of 0.032) for high school graduates. The finding that the Impulsion –25 subsidy has a negative impact on the hiring rate for temp jobs is robust to variation in the observation window, ranging from 1 to 12 months after unemployment entry (Figure B9 in Appendix B). For graduates, this estimate is even statistically significant at the 5% level for most of the considered time windows. Since the sample is smaller for dropouts, estimates are less precise for this group, but they are statistically significant at the 5th month and after the 9th month. The main regression results are available in Table C10 of Appendix C.

Figure 8. Discontinuity at age 25 in the transition rate to (a) temp jobs and (b) non-temp jobs within one year of entry into unemployment

(a) Temp jobs



(b) Non-temp jobs



Note: The graphs depict one-sided donut RDD estimates for the sample of youths entering unemployment between July 2017 and June 2019, who had never received an Impulsion subsidy. Age at the time of unemployment entry is used as the forcing variable, with a cutoff age of 25. The bandwidth is set to 3 years on each side of the donut hole. The outcome, measured within one year of unemployment entry is the cumulative transition rate to a first job (a) with the intermediation of a temporary work agency, i.e., a temp job (b) without the intermediation of a temporary work agency, i.e., a non-temp job. Mean values of outcomes are plotted over a six-month age interval. To estimate the linear splines, observations are weighted using a triangular kernel, excluding those within the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level. For high school dropouts (graduates), the estimated ITT effects at 25 are (a) –5.2 (–1.9) pp with a p-value of 0.002 (0.032) and (b) 5.6 (0.9) pp with a p-value of 0.010 (0.436); N= 15,417 (39,719).

Since the impact on the transition rate to all types of jobs is not significantly different from zero, this negative effect on the transition rate to temp jobs must be fully offset by a small positive effect on the transition rate to jobs found without the intermediation of a temporary work agency. Panel (b) of Figure 8 confirms this, depicting a positive donut RDD estimate on the probability of making a first transition to employment as a non-temp worker within one year of becoming unemployed. Figure B10 in Appendix B displays the donut RDD estimates for the latter outcome from 1 to 12 month after unemployment entry. One can see that the plot is the mirror image of that in Figure B10. The gain in job finding in all firms, except temporary work agencies, is completely offset by a corresponding decrease in the transition to temp jobs.

These findings reveal a change in the way hires of the targeted groups were made. There is substitution in recruitment methods: as a result of the subsidies and the above-rent extraction by temp agencies, the worker is more likely to be recruited by the company itself rather than via a temporary work agency. However, this does not mean that new job opportunities are being created in traditional companies. In the absence of subsidies, these companies would likely have hired through a temporary work agency; with subsidies, they prefer to hire the eligible workers themselves in order to benefit from the subsidy.

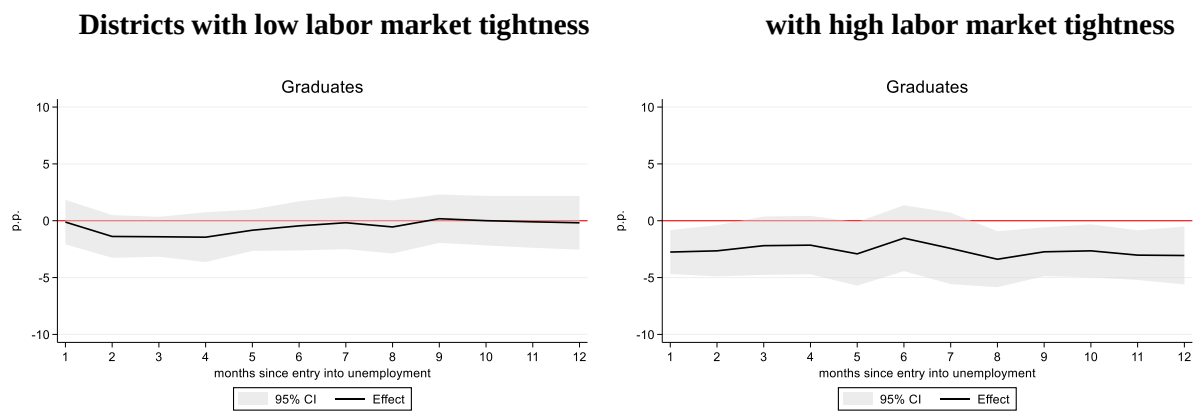
5.3.2. Deadweight losses irrespective of local labor market conditions

As mentioned just above, the pervasive use of temporary work agencies in the recruitment of young people in Belgium is not a mechanism that explains the lack of effect of hiring subsidies during our analysis period. Over the period studied, subsidies have resulted in a deadweight loss overall, as the economic context did not encourage companies to create new job opportunities (regardless of how these jobs are filled). However, if temporary work agencies exploit the subsidy without passing on the benefits to the worker or the hiring company, the risk of deadweight loss is significant in this sector, as they are not the ones making the decision to open a job position. We should therefore not expect easier access to subsidies to have a positive effect on the job-finding rate in the temporary work sector, even when labor market tightness is lower. In this section, we therefore reproduce the additional analysis conducted in Section 5.2 to explain the reasons behind the subsidy's ineffectiveness, distinguishing between transitions to temp and non-temp jobs. We focus on the sample of high school graduates, as it is only for this group that we observe a positive effect of the Impulsion -25 in areas with low labor market tightness.

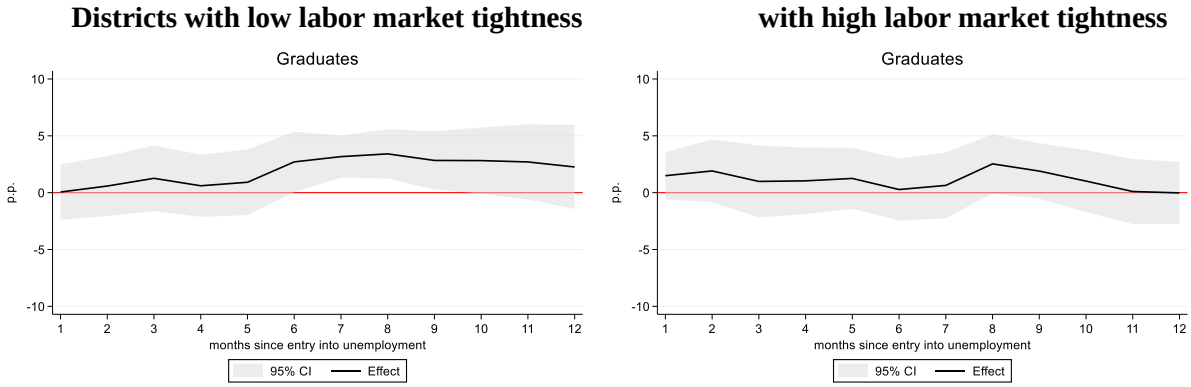
Figure 9 presents the evolution of the donut RDD estimates on the transition rate to employment from 1 to 12 months after entry into unemployment for districts with (i) low labor market tightness and (ii) high labor market tightness. Panel (a) focuses on the probability of making a first transition to employment as a temp worker, while panel (b) focuses on the probability of making a first transition to employment as a non-temp worker. The main regression results are available in Tables C12 and C13 of Appendix C. We clearly observe that where we find a positive effect of easier access to subsidies on the job-finding rate (high school graduates in areas with low labor market tightness), it does not manifest in the rate of transition to temporary jobs.

Figure 9. Evolution of the discontinuity at age 25 in the transition rate to (a) temp jobs and (b) non-temp jobs up to 12 months after entry into unemployment, by labor market tightness

(a) Temp jobs



(b) Non-temp jobs



Note: The graphs depict one-sided donut RDD estimates for two subsamples of high school graduates from the benchmark analysis: (a) individuals living in districts with low labor market tightness at entry into unemployment (b) individuals living in districts with high labor market tightness at entry into unemployment. Age at unemployment entry is used as the forcing variable, with a cutoff at 25. The outcome, measured within one year of unemployment entry is the cumulative transition rate to a first job (a) with the intermediation of a temporary work agency, i.e., a temp job (b) without the intermediation of a temporary work agency, i.e., a non-temp job. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted using a triangular kernel, excluding those within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25−X and 25 at the time of unemployment entry. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

6. Robustness analyses

In this section, we report the results of a series of tests conducted to check the validity of the (donut) RDD. We also examine whether our estimates are robust to using alternative definitions of the employment criterion and an alternative evaluation sample.

We begin by performing two tests to validate the key assumptions underlying the RDD design. First, we test whether the 6 predetermined characteristics (reported in Table A2) are smooth around the cutoff age of 25. The estimates are shown in Table C14 in Appendix C. The absence of a discontinuity cannot be rejected at the 5% level for most of the characteristics, suggesting that individuals are similar around the cutoff age. Only a few binary variables relating to the month of entry into unemployment show a significant jump at age 25. The months of May and August in the sample of high school dropouts are individually significant at the 5% level, even though the RDD estimates are low. Second, we assess the potential manipulation of the running variable, age. We tested whether there is a discontinuity at 25 in the density of age using the local polynomial density estimator developed by Calonico et al. (2017). The results of the test confirm that there is no statistically significant discontinuity in age density at 25, with p-values of 0.712 and 0.766 for dropouts and graduates, respectively. Figure B11 in the Appendix B illustrates these findings, providing evidence against manipulation of age around the threshold.

We then test the validity of the results by changing the model specification. First, we remove the control variables when computing the donut RDD estimates (see Figures B12 to B14 in Appendix B). Second, we examine the sensitivity of the donut RDD estimates to wider or narrower bandwidths. The benchmark bandwidth is set to three years on each side of the donut hole, and we use two and four years as alternative bandwidths (see Figures B15 to B17 in Appendix B). Third, we allow the spline on the right side of the donut (instead of the left) to predict the outcome inside the hole and estimate the ITT effect at age 24 (see Figures B18 to B20 in Appendix B). In all scenarios, the results are very close to the benchmark estimates. For high school dropouts, they differ slightly, but in all cases, we cannot reject

that the hypothesis that the ITT effect of the subsidy is equal to 0.[33] The absence of any statistically significant effect of the Impulsion –25 subsidies on job-finding and on the number of months spent in employment is thus robust to different model specifications. The conclusion of a displacement of hirings at the expense of temp agencies is also robust.[34]

We also conduct placebo tests on the statistically significant donut RDD estimates using false cutoff points for the forcing variable. Specifically, we focus on three outcomes with statistically significant donut RDD estimates: (i) the transition rate to a temp job for high school graduates, (ii) the transition rate to employment for high school graduates in areas with low labor market tightness, and (iii) the transition rate to non-temp jobs for high school graduates in those same areas. We test two alternative false cutoffs: 26 and 27 years. As shown on Figures B21 to B23 in Appendix B, these placebo tests yield non-significant estimates, further strengthening the reliability of the causal relationship we identify between eligibility for the Impulsion –25 subsidy and both the creation of employment opportunities in non-temp job in areas with low labor market tightness and the displacement away from temp agencies.

As an additional robustness check, we test the variability of donut RDD estimates based on alternative definitions of a transition to employment. In our benchmark definition (see Section 3), we consider only transitions to jobs that are still occupied at the end of the month. To assess whether the Impulsion –25 subsidies affected the transition to short-lived jobs, we relax our definition of employment by looking at the share of individuals who transit to a job that lasts at least one day, regardless of their status at the end of the month. Conversely, we also use two stricter measures of job finding to test whether the hiring subsidies impacted transitions to more durable employment. Under these definitions, a transition is counted only if (i) the individual is still employed at the end of the current month and the next, and (ii) the individual is still employed at the end of the month and the next two months. In Figure B24 in Appendix B, we report the donut RDD estimates on cumulative transition rates for the benchmark definition and the three alternatives in months 1 to 12 after entry into unemployment. For both high school dropouts and graduates, the donut RDD estimates for alternative outcomes are close to the benchmark estimates and are never significantly different from zero. Thus, the absence of an impact of earlier access to the subsidy on transitions to employment is robust to alternative measures of job finding.[35]

Finally, we expand our evaluation sample to include individuals who had already received an Impulsion subsidy before entering unemployment. As a reminder, they were initially excluded from the analysis because once individuals have benefited from an Impulsion –25 subsidy, they can receive it again after the age of 25, which could potentially dilute the discontinuity at age 25. With their inclusion, our overall evaluation sample increases by 18%. Figure B25 shows that their inclusion does not dilute discontinuity at age 25 in the take-up rate of Impulsion subsidies, as the donut RDD estimates on the take-up rate of the subsidies are close to the benchmark estimates.[36] Figures B26 to B28 present the donut RDD estimates for this alternative sample, alongside the benchmark estimates and their 95% confidence

[33] The only exception is the ITT effect on the transition rate to a temp job with a 4-year bandwidth, which is statistically significant at all time horizons, though the confidence intervals are large.

[34] To avoid overloading the appendices, we have not included the robustness analyses based on local labor market tightness (districts with low versus high tightness). Analyses excluding controls and using narrower bandwidths confirm that earlier access to hiring subsidies has statistically significant positive effects on the reemployment rate of graduates in low-tightness areas, excluding temp jobs. In contrast, analyses with wider bandwidths and those using the right side of the donut to predict the effect at 24 yield smaller estimates, although the confidence intervals are very wide. The results are available upon request.

[35] Conducting the same analysis on high school graduates in low labor market tightness areas, we verify that the positive effect on the transition to employment holds in these areas when using alternative measures of job finding. Our analysis confirms the robustness of this effect across different definitions of job finding. The results are available upon request.

[36] As expected, the inclusion of individuals who had already received an Impulsion subsidy before entering unemployment increase the take-up rate on both side of the cutoff. However, the magnitude of the discontinuities at age 25 are similar to those observed in the benchmark sample.

intervals. For our three main outcome variables, the results from the alternative sample align closely with the benchmark estimates, as they almost always fall within the 95% confidence interval of the benchmark. This confirms the robustness of our findings: the absence of a statistically significant effect of Impulsion –25 subsidies on job-finding and employment duration holds in this alternative sample. Regarding the negative impact on the transition to temp jobs, the RDD estimates for high school graduates in the later part of the study period (after month 9) shift closer to zero. This suggests that while displacement effects at the expense of temporary employment agencies persist, the effect becomes less pronounced after month 9.[37]

7. Conclusion

Hiring subsidies are commonly used to enhance job opportunities for specific groups that are disadvantaged in the labor market. In Wallonia, the French-speaking region in the south of Belgium, jobseekers under the age of 25 with at most a high school diploma have been eligible for a hiring subsidy of 500€ per month (for up to 3 years of employment) since July 2017. By temporarily reducing labor costs, the "Impulsion –25" plan aims to encourage employers to offer new employment opportunities to this target group, which is at risk of long-term unemployment. Apart from the age and schooling criteria, the eligibility requirements for this subsidy are fairly light. High school dropouts are eligible after just one day of registered unemployment, while high school graduates need to be registered as jobseekers for six months, though not necessarily continuously.

We evaluate whether this plan increases the transition to work of low-educated unemployed youths within one year of entering unemployment. To that purpose, we use the 25-year eligibility threshold in a regression discontinuity approach, corrected by a one-sided "donut hole" to account for the fact that age is measured at entry into unemployment and not at hiring as per the policy rules. Individuals very close to their 25th birthday at entry into unemployment (in the "donut hole") are excluded from the estimation, as they are only eligible for the subsidy for part of the year. We estimate an intention-to-treat effect, defined as the causal effect of being targeted by the Impulsion –25 plan at the time of unemployment entry, with the counterfactual being *not the absence of subsidies but a much more restricted access to them*. This is because people aged 25 and over are targeted by the Impulsion 12+ plan, which provides similar hiring subsidies but with the condition of at least 12 months of registered unemployment. The evaluation sample consists of young people entering unemployment between July 2017 and December 2019, with their employment outcomes measured for up to two and a half years after unemployment entry.

Despite a greater effective access to hiring subsidies for those below the age of 25, we do not find any impact of the Impulsion –25 plan on the rate of return to employment of low-educated youths within one year of entry into unemployment, regardless of whether they are high school graduates or not. The same conclusion applies if we consider the number of months observed in employment over a period of two and a half years from unemployment entry. A key determinant of the absence of effect at the aggregate level seems to be the favorable overall job market conditions observed during the study period in Belgium and its regions. From 2017 until the pandemic, a positive trend in employment growth was recorded, leading to a steady decrease in unemployment rates. In a tight labor market, employers struggle to find workers with the right skills and qualifications to fill open positions, resulting in labor shortages. In that context, employers may be reluctant to open new vacancies in response to wage cost reductions

[37] Again, to avoid overloading the appendices, we have not included the robustness analyses based on local labor market tightness (areas with low versus high tightness). However, analyses including individuals who had already received an Impulsion subsidy confirm that earlier access to hiring subsidies has a statistically significant positive effect on the reemployment rate of graduates in low-tightness areas, excluding temp jobs. The results are available upon request.

targeted at disadvantaged youths, especially as those in this group who are still unemployed in a period of economic vitality are likely to be the least productive.

To provide more insights into the role played by the state of the labor market, we estimate the treatment effect separately for individuals residing in districts with below- and above-median job-finding rates in the control group. This heterogeneity analysis reveals a significantly positive effect on job-finding of about 3 percentage points 7 to 9 months after unemployment entry for high school graduates in low job-finding rate districts. While the effect on graduates supports the hypothesis that market tightness contributes to deadweight losses, the absence of effect on dropouts regardless of labor market conditions suggests that loose targeting (such as eligibility from day 1) may limit the effectiveness of hiring subsidies. However, we cannot exclude the possibility that other factors, such as differences in motivation or productivity, also contribute to this heterogeneous treatment effect. The policy also had the side effect of changing the way some youths were recruited. We find that the less-restrictive access to hiring subsidies for those below the age of 25 decreases the probability of transitioning to a first job through a temporary work agency by 15% and 7% for high school dropouts and graduates, respectively. This suggests that the greater access to subsidies for those below the age of 25 incentivized some firms to recruit young jobseekers directly, rather than through a temp agency, to take full advantage of reduced labor costs. Temp agencies have no incentives to reflect these lower costs in the contract they negotiate with their clients long before any recruiting. This explains the prevalence of deadweight losses among staffing agencies, which do not make decisions on new hires. This is confirmed by the absence of an effect of the subsidy on transitions to temp jobs even for graduates in low job-finding rate districts.

Our results therefore provide empirical evidence that in a tight labor market, subsidizing hires is inefficient (see, for example, Cahuc et al. 2019; Kline and Moretti, 2013). In a recent empirical study, Albanese et al. (2024) demonstrated the effectiveness of hiring subsidies for low-educated unemployed youths in enhancing their transition to employment in Belgium, at least in the short run. Contrary to the program evaluated in our paper, those subsidies were implemented over a limited period of two years as the economy emerged from the Great Recession in 2010–2011. Targeting the Impulsion subsidies exclusively in a context of high unemployment would therefore be a better strategy for enhancing the cost-effectiveness of the program.

Although this aspect is undoubtedly not the primary determinant of the program's ineffectiveness, the absence of conditions in terms of minimum unemployment duration for high school dropouts is also a factor likely to generate deadweight loss effects. In the above-mentioned study, at least three months of registered unemployment were required to determine eligibility for this group. A final factor that would be useful to explore further is the way temporary work agencies are handled in designing hiring subsidies. In some countries, such as Belgium, temp agencies play an important role in providing young people with their first job experience. The presence of these private intermediaries on the job market creates a decoupling between the firm that makes the hiring decision and the firm that receives the subsidy, which can also be a source of inefficiency in the context of hiring subsidies.

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Appendix

A. Descriptive statistics

Table A1. Descriptive statistics on outcomes

	(A) 21 – 24		(B) 25 – 28
	All	Impulsion –25	All
	(1)	(2)	(3)
High school dropouts			
Take-up of Impulsion within 1 year	0.29	1	0.11
	(0.45)	(0.00)	(0.32)
Employment in any month within 1 year	0.57	0.93	0.66
	(0.49)	(0.25)	(0.47)
Total months in employment within 30 months	10	15.80	12
	(9.9)	(9.0)	(10.5)
N	8,115	2,310	7,302
High school graduates			
Take-up of Impulsion within 1 year	0.18	1	0.08
	(0.39)	(0.00)	(0.27)
Employment in any month within 1 year	0.71	0.93	0.73
	(0.45)	(0.26)	(0.44)
Total months in employment within 30 months	14.7	17.50	15.2
	(10.7)	(8.7)	(10.7)
N	25,893	4,722	13,826

Note: Mean and standard deviation (in brackets) of the outcome variables. Descriptive statistics are computed by education level and for different groups. Panel (A) concerns youths aged between 21 and 24 at unemployment entry: column (1) refers to all of these, and column (2) to only those that benefited from an Impulsion –25 subsidy within one year of unemployment. Panel (B) concern all youths aged between 25 and 28 at unemployment entry. For group (2), the variable employment in any month within one year of entry into unemployment is not equal to 1 because a transition is counted only if the youth is still employed at the end of the month.

Table A2 reports descriptive statistics for the evaluation sample measured at unemployment entry. The first panel (A) refers to high school dropouts. The second panel (B) refers to high school graduates. In each panel, descriptive statistics are presented by age group. All individuals in the evaluation sample aged between 21 and 24 constitute the treatment group, while individuals aged between 25 and 28 belong to the control group. The treatment group is therefore comprised of youths who are potentially eligible for the Impulsion –25 subsidy for at least one year following unemployment entry. For both education levels, descriptive statistics on the beneficiaries of this subsidy among the youngest age group are also presented. In Table A2, the unemployment duration refers to the number of months of registration as a jobseeker. According to the Eurostat definition, the counter is reset to zero only after three consecutive months out of the unemployment registers. For this reason, the variable is not always equal to zero at the beginning of the unemployment spell. We use this variable as a proxy of recent employment history since the longer the last employment spell is, the higher are the chances of an unemployment duration of zero. However, note that young people who register for the first time as unemployed jobseekers after leaving school will also have a zero duration. This is the reason for the use of another variable indicating

the share of entrants with a first-ever registration. The unemployment rate (15–64 years) is measured at the district of residence level, based on register data.

The comparison of the age groups shows that the composition of the population varies slightly across age groups. In particular, the mean unemployment duration is 4 months higher for the older jobseekers, on average, and the proportion of first registrations is much larger for the younger ones, as expected. With regard to the other variables, the composition across age groups is very similar. In Section 6, we formally test whether individuals are similar around the age cutoff.

Comparing the overall youngest group with the actual beneficiaries of the subsidy[38] among them, we must be mindful of selection into employment. By nature, beneficiaries are employed whereas the overall group may consist of both employed and unemployed individuals. We observe a slightly higher prevalence of women among the Impulsion –25 beneficiaries. For both education levels, women also tend to have a weaker recent employment history and are less likely to register unemployment for the very first time. Individuals with a technical education are slightly overrepresented among high school dropout beneficiaries. Regarding high school graduates, individuals from apprenticeships and vocational education are also overrepresented among beneficiaries.

[38] Within one year of entry into unemployment.

Table A2. Descriptive statistics for pre-determined characteristics

	(A) Dropouts			(B) Graduates		
	21–24 years		**25–28 years**	**21–24 years**		**25–28 years**
	All	Impulsion –25	All	All	Impulsion –25	All
Age at entry into unemployment (in years)						
Mean	22.3	22.4	26.5	22.3	22.4	26.4
(sd)	(0.87)	(0.87)	(0.86)	(0.85)	(0.86)	(0.86)
Gender						
Women	35.7%	33.8%	35.1%	44.3%	40.3%	47.4%
Nationality						
Belgian	93.7%	95.0%	93.9%	96.1%	96.6%	95.1%
EU	3.7%	3.6%	4.0%	2.6%	2.4%	3.2%
Unemployment duration (in months)						
Mean	8.7	10.3	12.1	5.0	6.4	10.2
(sd)	(13.7)	(14.5)	(17.8)	(9)	(10.3)	(15.3)
Highest level of education						
HS dropouts (1)						
Primary school	30.6%	28.0%	34.9%			
Basic HS	8.0%	7.6%	7.0%			
Lower general HS	10.0%	9.3%	9.2%			
Lower technical HS	37.5%	40.6%	35.3%			
Lower vocational HS	13.9%	14.5%	13.6%			
HS graduates						
Apprenticeship						
General				4.5%	9.1%	6.5%
Technical				20.6%	13.3%	22.5%
Vocational				37.6%	31.4%	36.8%
				34.2%	46.2%	34.2%
Unemployment rate of the district (in %)						
Mean	13	13.1	13	12.8	13	13.8
(sd)	(3.7)	(3.7)	(3.7)	(3.6)	(3.6)	(3.7)
First-ever registration at the PES	27%	19.9%	3.8%	39%	32%	8.5%
N	8,115	2,310	7,302	25,893	4,722	13,826

(1) The category "Primary school" refers to individuals who at maximum have the final primary school degree. The category "Basic HS" refers to individuals who at maximum passed the first two years of high school. The category "Lower/general/technical/vocational HS" refers to individuals who passed more than the first two years of high school but did not graduate high school.

Note: Descriptive statistics for the sample used in the benchmark analysis: youths entering registered unemployment between July 2017 and June 2019 at age 21 to 28 without ever having benefited from an Impulsion subsidy. All variables are measured

at entry into unemployment. For categorical variables, the proportion of individuals by category is given. For other variables, the mean and standard deviation are given.

Table A3. Impact of individual and firm characteristics on the attention rate

	Dropouts	**Graduates**
_constant term	0.251	0.066
Personal characteristics		
Women	0.056 (0.000)	0.010 (0.100)
Nationality (1)		
EU	-0.056 (0.124)	-0.014 (0.393)
Other	-0.128 (0.009)	0.007 (0.776)
Unemployment duration	0.000 (0.657)	0.001 (0.029)
Unemployment rate of the district	0.004 (0.018)	0.003 (0.000)
Higher education level		
HS dropouts (2)		
Lower general HS	-0.037 (0.118)	/
Lower technical or vocational HS	-0.002 (0.904)	/
HS graduates (3)		
Apprenticeship, vocational or technical	/	0.054 (0.000)
First registration at the PES	0.047 (0.013)	-0.003 (0.585)
Firm characteristics		
Temporary work agency	0.047 (0.002)	0.045 (0.000)
Sector (4)		
*Agriculture, forestry, and fishing	-0.144 (0.062)	-0.020 (0.539)
*Construction	-0.049 (0.102)	-0.019 (0.115)
*Trade (wholesale and retail), transport, accommodation, food services	-0.046 (0.028)	0.004 (0.610)
*Information and communication, financial and insurance activities and real estate activities, professional, scientific, and technical activities, and administrative services	-0.043 (0.102)	-0.013 (0.214)
*Public administration, education, human health, and social work activities	-0.196 (0.000)	-0.076 (0.000)
*Other service activities (culture, sports, associations, personal services, etc.)	-0.069 (0.064)	0.004 (0.746)
Firm size (4)		
50 to 199	0.018 (0.343)	-0.022 (0.004)
>200	0.028 (0.085)	-0.030 (0.000)
Observations	**4,547**	**18, 034**

(1) The reference category is Belgian; (2) The reference category for dropouts is individuals who completed the first two years of high school. The category "Lower/general/technical/vocational HS" refers to individuals who completed more than the first two years of high school but did not graduate. (3) The reference category for graduates is individuals graduating from a general high school. (4) The reference category is the industrial sector. (5) The reference group is a firm with 1 to 49 employees.

Note: Results of a linear regression using the take-up conditional on finding a job within the first year of unemployment – the attention rate – as the dependent variable, and several individual and firm characteristics as independent variables. P-values are reported in parentheses. The sample consists of individuals in the treatment group (ages 21-24) who transitioned to employment at least once in the year following unemployment entry. The outcome is the take-up of Impulsion within one year of unemployment. The regression is estimated separately for dropouts and graduates.

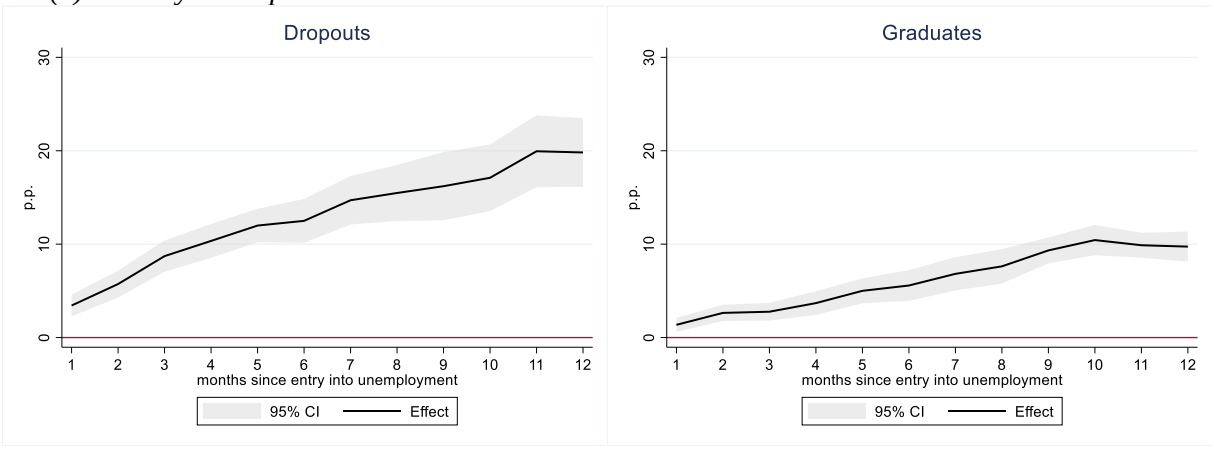
Table A4. Job finding rate within one year of unemployment entry in the control group

Dropouts		**Graduates**	
(a) Districts with low labor market tightness			
Arlon	57.53	Arlon	52.32
Neufchâteau	59.89	Bastogne	60.81
Thuin	60.7	Virton	65.1
Mons	60.94	Mons	71.14
Charleroi	61.73	Charleroi	71.23
Bastogne	62.1	Nivelles	71.77
Philippeville	62.44	Thuin	72.55
Soignies	64.24	Marche-en-Famenne	73.08
Nivelles	64.52	Neufchâteau	73.49
Namur	64.65	Huy	73.93
N	**8,043**		**17,047**
(b) Districts with high labor market tightness			
La Louvière	64.94	La Louvière	74.13
Virton	65.38	Namur	74.2
Dinant	65.68	Tournai	74.38
Marche-en-Famenne	65.78	Soignies	74.61
Verviers	66.3	Liège	74.77
Liège	66.8	Philippeville	75.43
Tournai	67.59	Ath	75.79
Waremme	68.18	Waremme	76.1
Ath	68.82	Dinant	76.3
Huy	69.75	Verviers	77.04
Mouscron	73.9	Mouscron	78.02
N	**7,039**		**21,862**

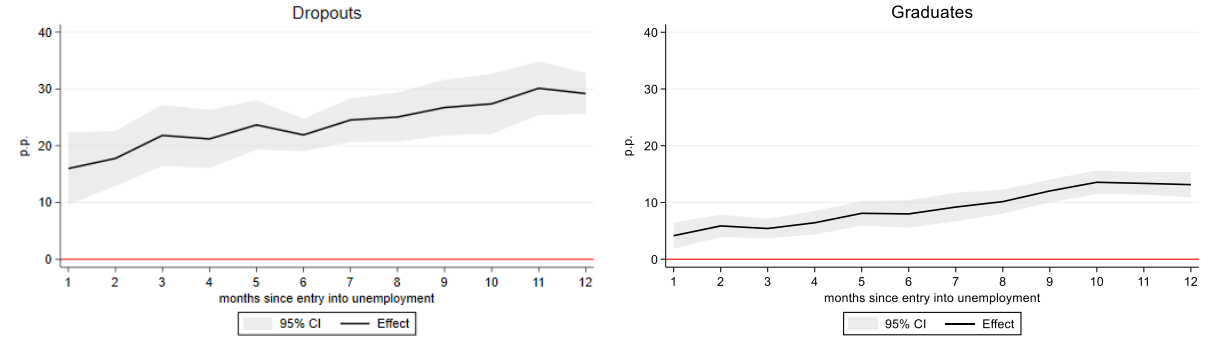
B. Donut RDD estimates: additional figures

Figure B1. Evolution of the discontinuity at age 25 in subsidy receipt within one year of entry into unemployment

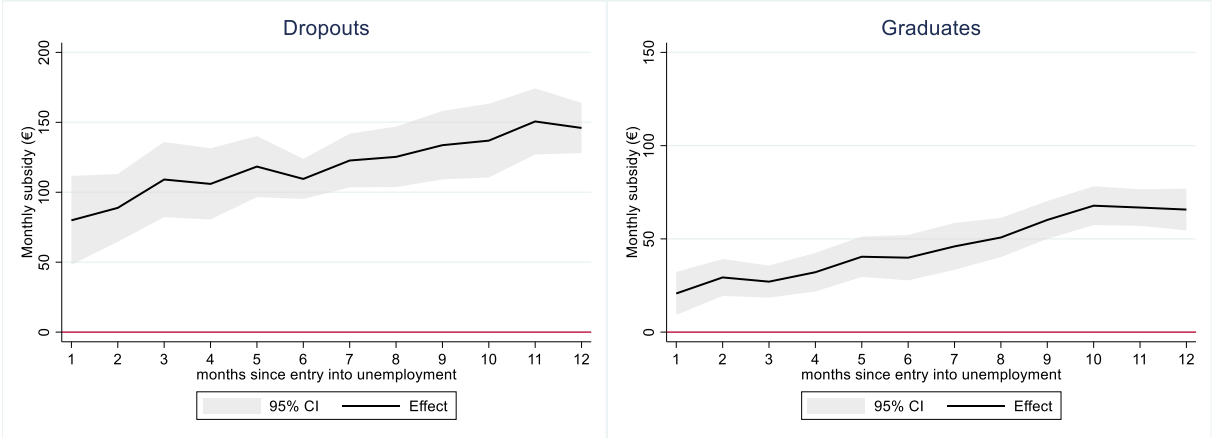
(a) Subsidy take-up



(b) Attention rate



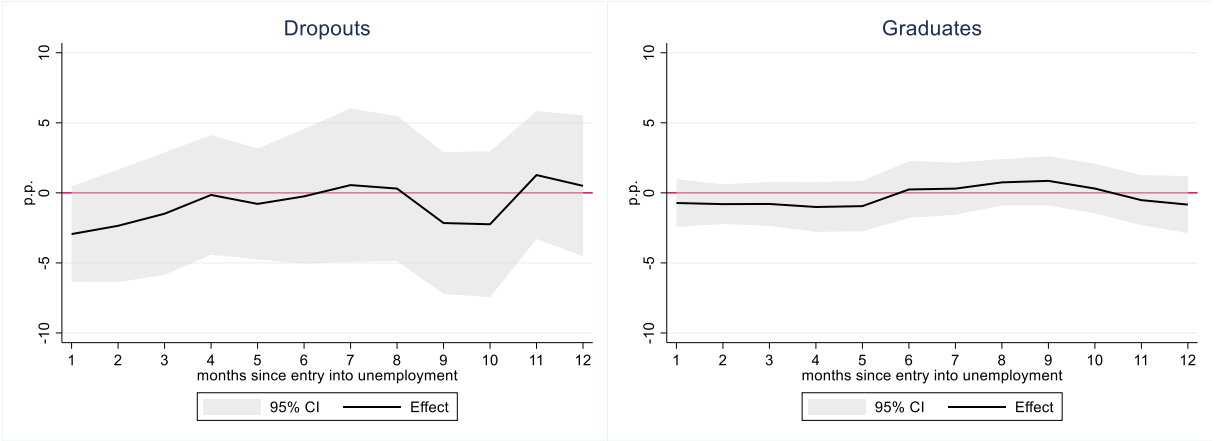
(c) Subsidy amount conditional on hiring



Note: The graphs depict one-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcomes are (a) the subsidy take-up rate; (b) the attention rate, i.e., the share of subsidized hires among all hires; and (c) the amount of subsidy received (in full-time equivalent), conditional on hiring within 1 to 12 months after entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without

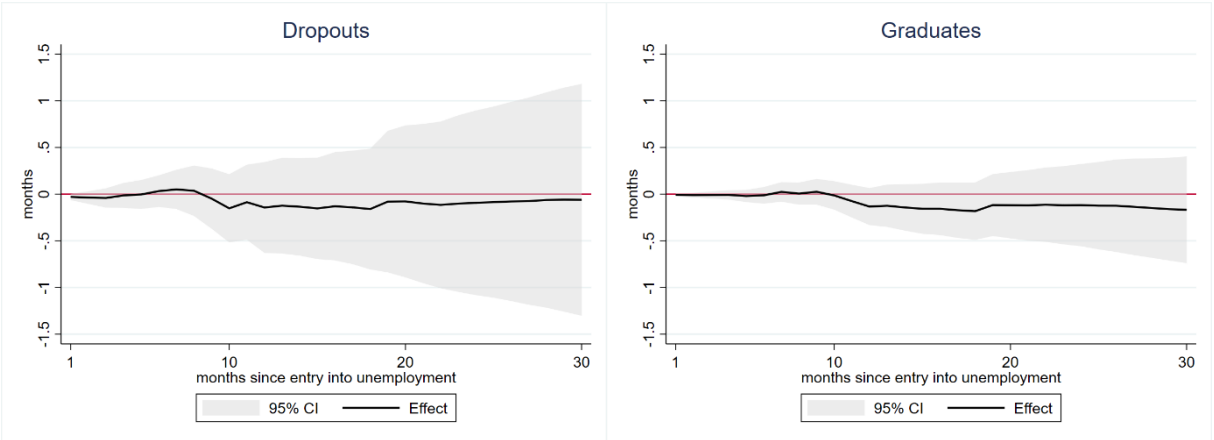
considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25−X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Figure B2. Evolution of the discontinuity at age 25 in the transition rate to employment up to 12 months after entry into unemployment



Note: The graphs depict one-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the cumulative transition rate to employment within 1 to 12 months after entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25−X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

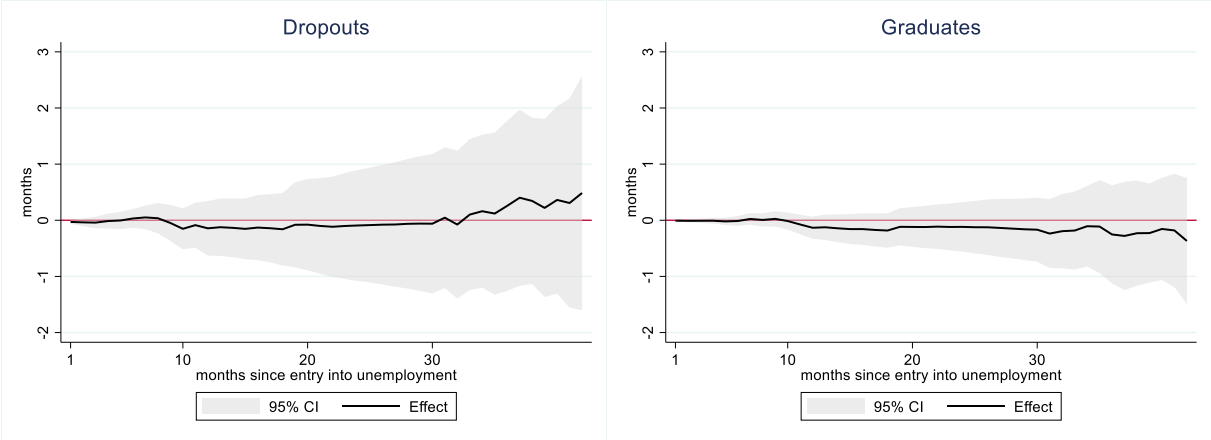
Figure B3. Evolution of the discontinuity at age 25 in the number of months in employment up to 30 months after entry into unemployment



Note: The graphs depict one-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the cumulative number of months in employment within 1 to 30 months after entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without

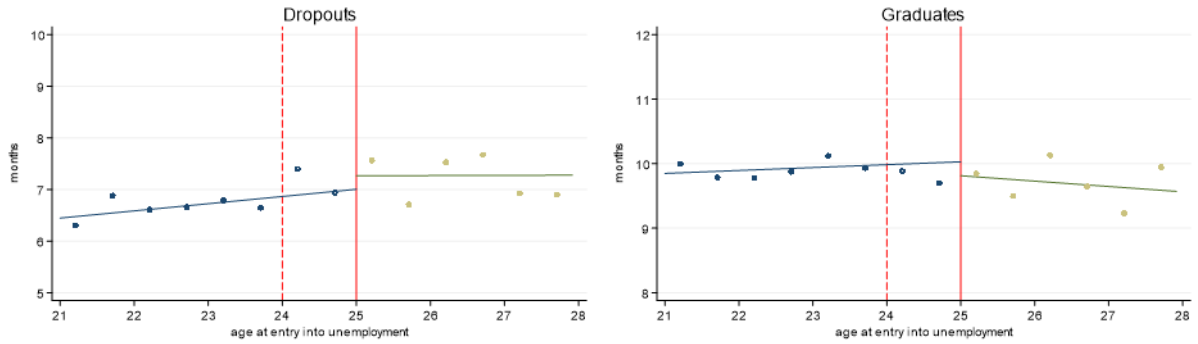
considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Figure B4. Evolution of the discontinuity at age 25 in the number of months in employment up to 42 months after entry into unemployment



Note: The graphs depict one-sided donut RDD estimates for youths entering unemployment between July 2017 and June 2018 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the cumulative number of months in employment within 1 to 42 months after entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

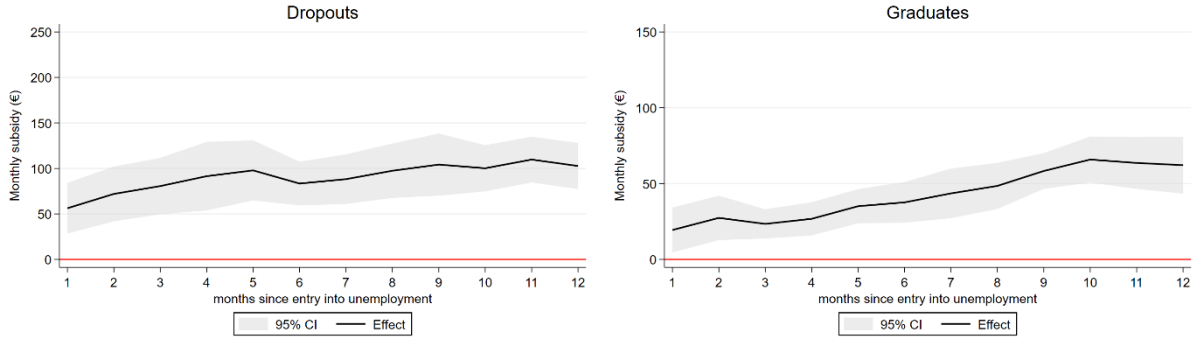
Figure B5. Discontinuity at age 25 in the number of consecutive months in employment within 30 months of entry into unemployment



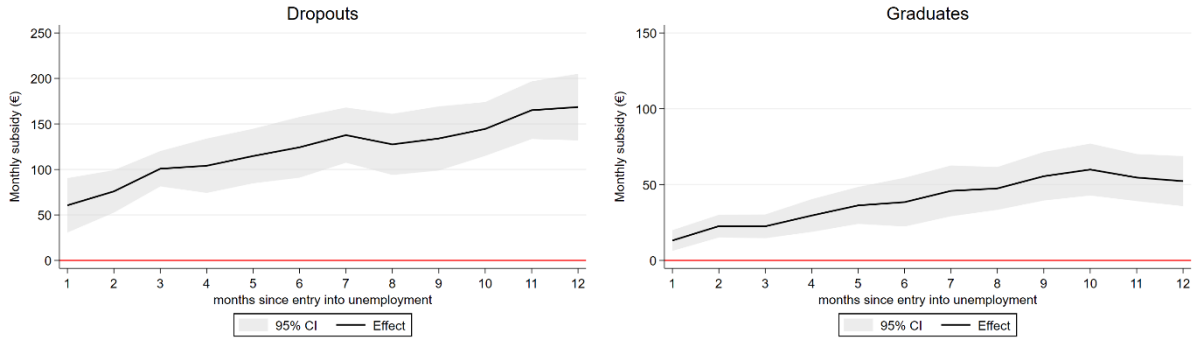
Note: The graphs depict one-sided donut RDD estimates for the sample of youths entering unemployment between July 2017 and June 2019 without having ever received an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff age is 25. The bandwidth is set at 3 years on each side of the donut hole. The outcome is the number of consecutive months spent in the first employment spell after entry into unemployment. Mean values of outcomes are plotted over a six-month age interval. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level. For high school dropouts (graduates), the estimated ITT effects at 25 are the following: for -0.26 (0.22) months with a p-value of 0.615 (0.571) N= 15,417 (39,719).

Figure B6. Evolution of the discontinuity at age 25 in subsidy amount conditional on hiring within one year of entry into unemployment

(c) Low labor market tightness



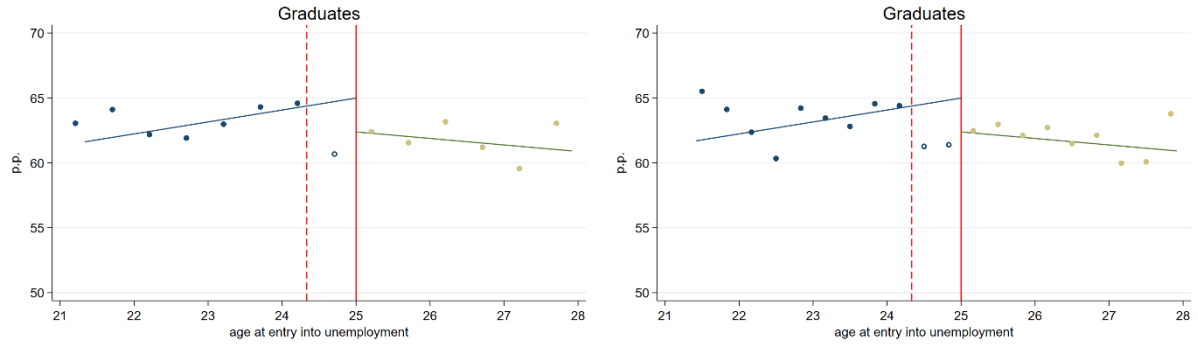
(d) High labor market tightness



Note: The graphs depict one-sided donut RDD estimates for two subsamples from the benchmark analysis: (a) individuals living in districts with low labor market tightness at entry into unemployment (b) individuals living in districts with high labor market tightness at entry into unemployment. Age at unemployment entry is used as the forcing variable, with a cutoff at 25. The outcome is the subsidy amount conditional on hiring within 1 to 12 months after entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted using a triangular kernel, excluding those within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25−X and 25 at the time of unemployment entry. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Figure B7. Discontinuity at age 25 in the transition rate to employment within 8 months of entry into unemployment in districts with low labor market tightness

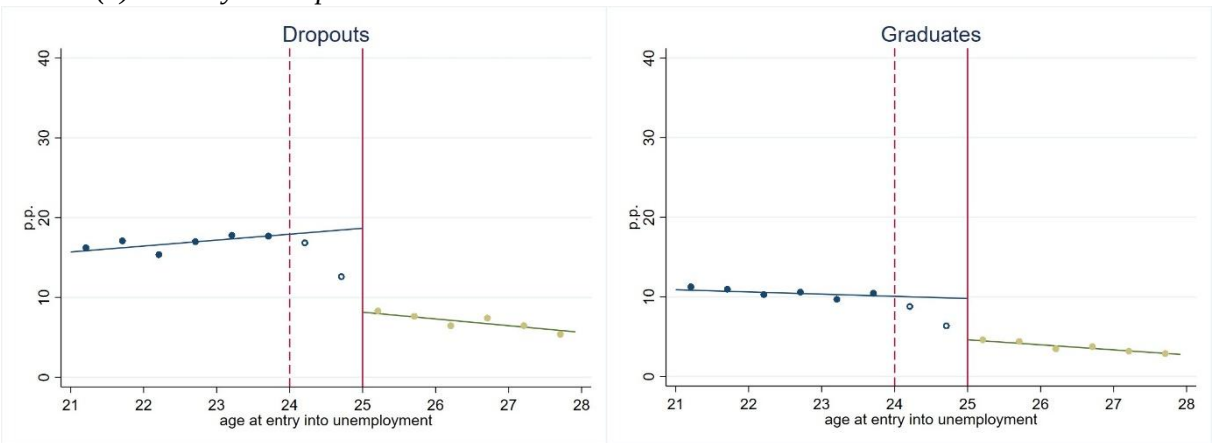
(a) Six-month age bins *(b) Four-month age bins*



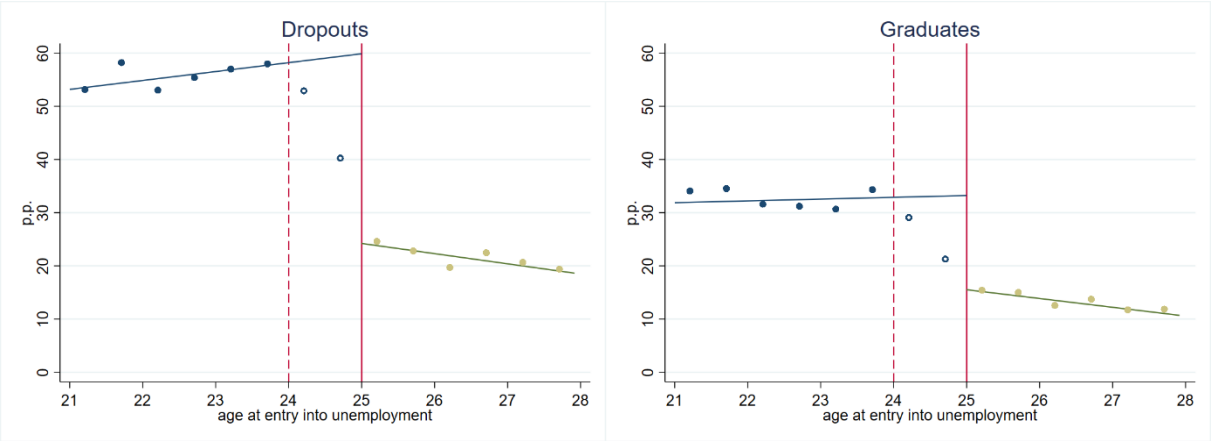
Note: The graphs depict one-sided donut RDD estimates for the sample of youths entering unemployment between July 2017 and June 2019 without having ever received an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff age is 25. The bandwidth is set at 3 years on each side of the donut hole. The outcome is measured within 8 year after unemployment entry. Mean values of outcomes are plotted over a (a) six-month age interval (b) fourth-month age interval. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level. The estimated ITT effects at 25 is 2.8pp with a p-value of 0.024. N= 15,417 (16,496).

Figure B8. Discontinuity at age 25 in subsidy receipt for a temp job within one year of entry into unemployment

(a) Subsidy take-up

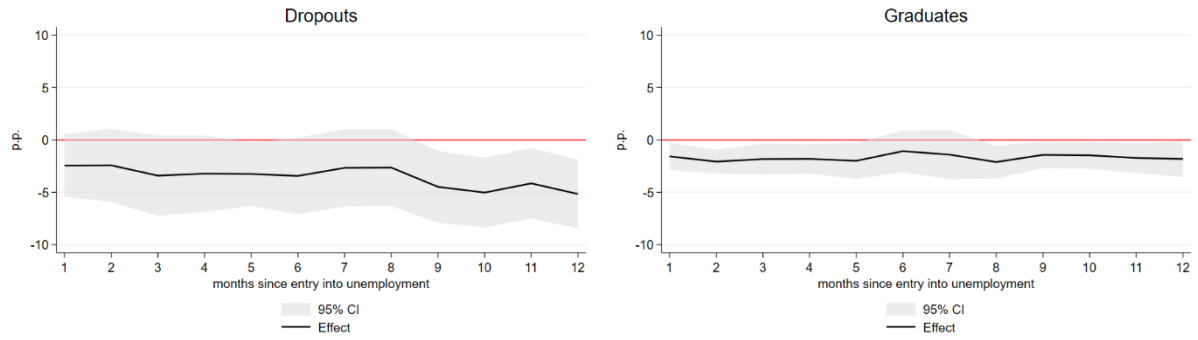


(b) Attention rate



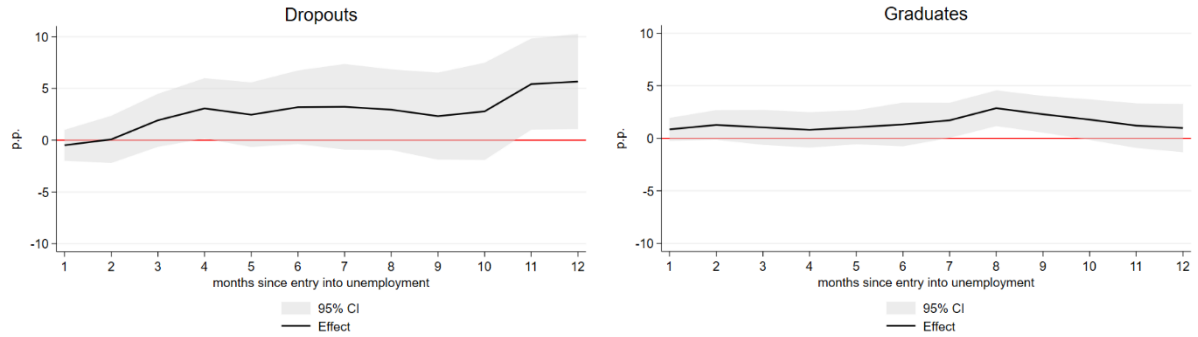
Note: The graphs depict one-sided donut RDD estimates for the sample of youths entering unemployment between July 2017 and June 2019 without having ever received an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff age is 25. The bandwidth is set at 3 years on each side of the donut hole. The outcomes, measured within one year after unemployment entry, are (a) the subsidy take-up in temp jobs and (b) the attention rate, i.e., the share of subsidized temp hires among all hires. Mean values of outcomes are plotted over a six-month age interval. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level. For high school dropouts (graduates), the estimated ITT effects at 25 are the following: for (a), 10.5 (5.4) pp with a p-value of 0.000; for (b), 35.6 (17.7) pp with a p-value of 0.000; N= 15,417 (39,719).

Figure B9. Evolution of the discontinuity at age 25 in the transition rate to a temp job up to 12 months after entry into unemployment



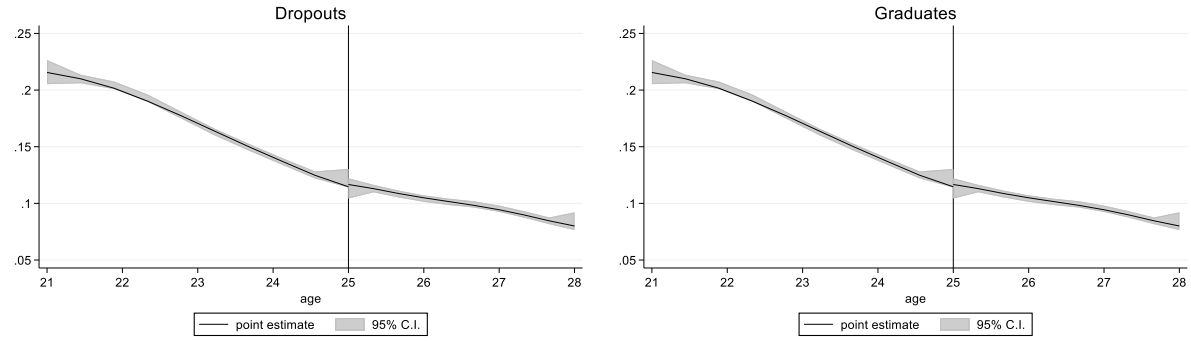
Note: The graphs depict one-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the transition rate to employment in a temp job within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Figure B10. Evolution of the discontinuity at age 25 in the transition rate to a non-temp job up to 12 months after entry into unemployment



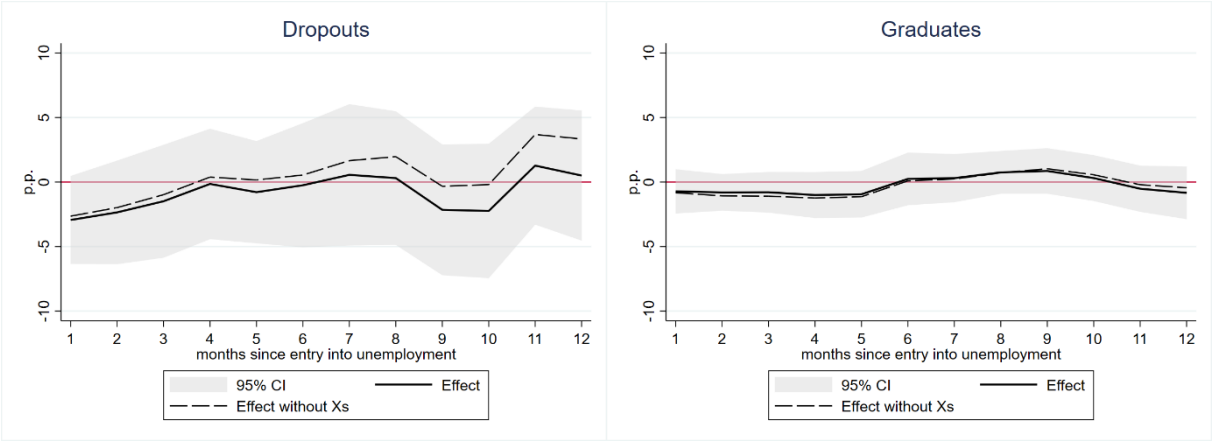
Note: The graphs depict one-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the transition rate to a first job without the intermediation of a temporary-work agency within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We present estimates with and without controlling for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Figure B11. Discontinuity at 25 in the age density function



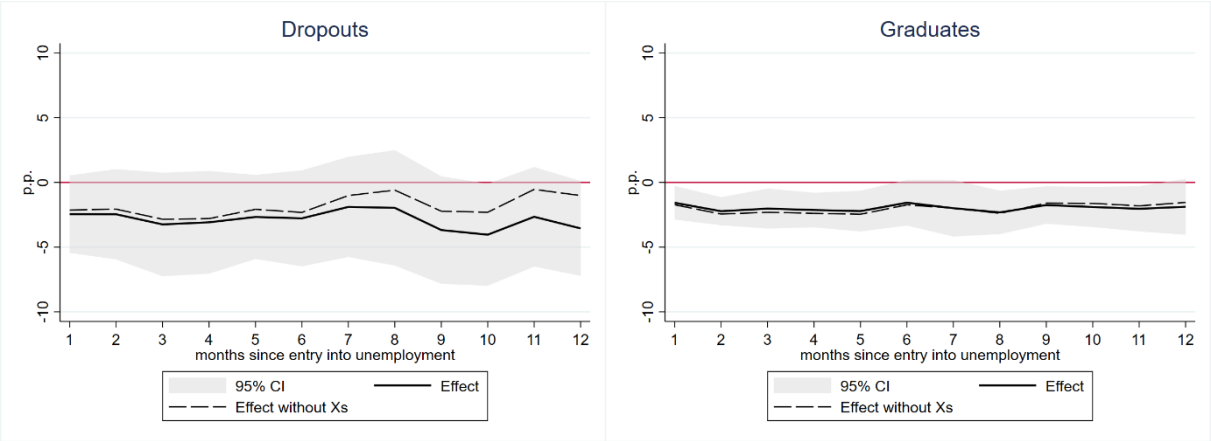
Note: The test and graph for discontinuity in the running variable were conducted using the local polynomial density estimator developed by Calonico et al. (2017). The p-values for the test of no discontinuity at age 25 are 0.712 and 0.766 for dropouts and graduates, respectively.

Figure B12. Evolution of the discontinuity at 25 in the transition rate to employment up to 12 months after entry into unemployment, with and without controls



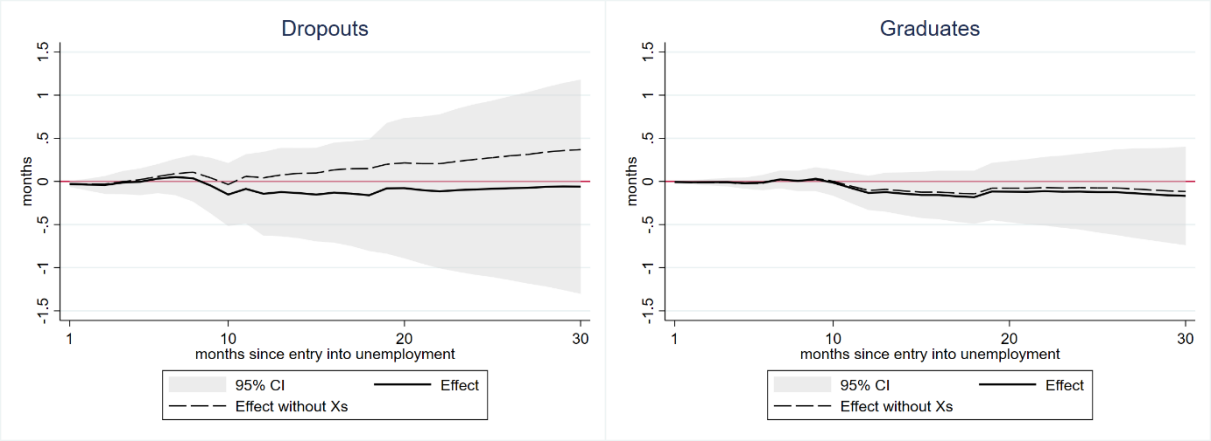
Note: The graphs depict one-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever had benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the transition rate to employment within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We present estimates with and without controlling for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Figure B13. Evolution of the discontinuity at age 25 in the transition rate to a temp job up to 12 months after entry into unemployment, with and without controls



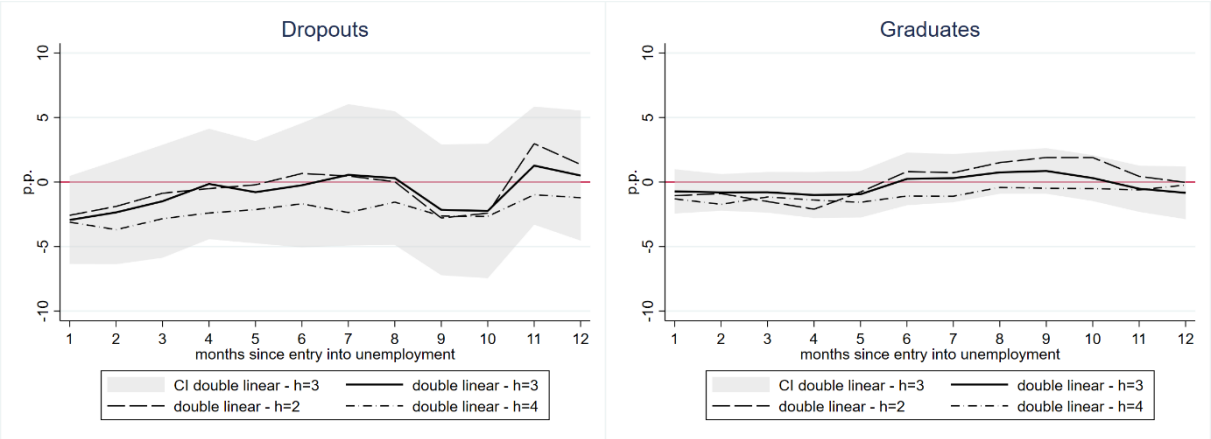
Note: The graphs depict one-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the cumulative transition rate to employment in a temp job within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We present estimates with and without controlling for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Figure B14. Evolution of the discontinuity at age 25 in the number of months in employment up to 30 months after entry into unemployment, with and without controls



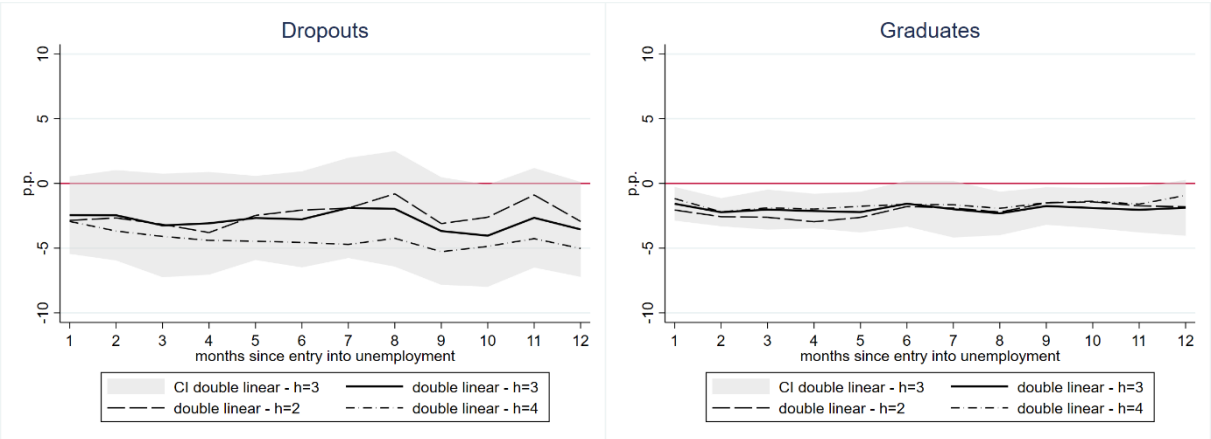
Note: The graphs depict one-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever had benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the cumulative number of months in employment within 1 to 30 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Figure B15. Evolution of the discontinuity at age 25 in the transition rate to employment up to 12 months after entry into unemployment, with alternative bandwidth sizes



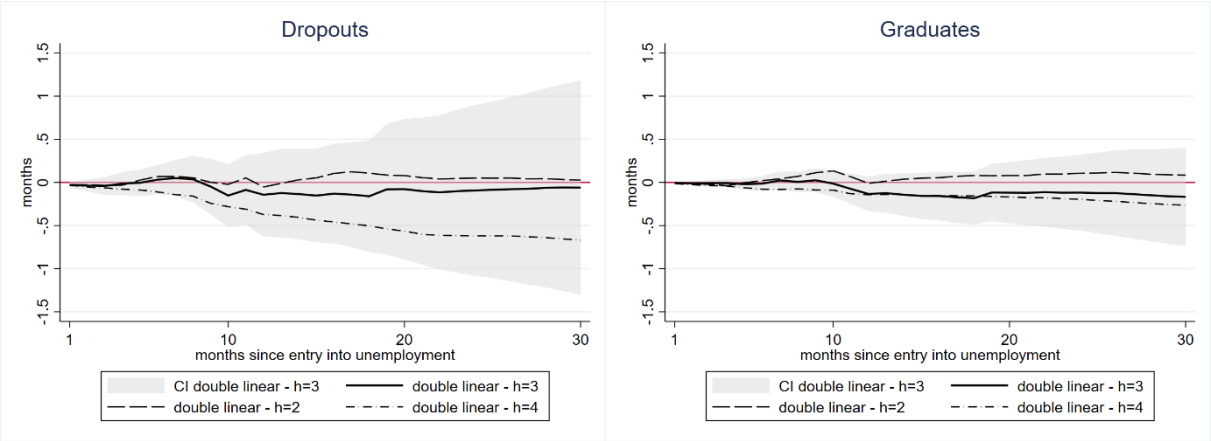
Note: The graphs depict one-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the cumulative transition rate to employment within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The benchmark bandwidth is set at 3 years on each side of the donut hole. For the two alternative specifications, we retain observations within a two- and four-year bandwidth on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Figure B16. Evolution of the discontinuity at age 25 in the transition rate to a temp job up to 12 months after entry into unemployment, with alternative bandwidth sizes



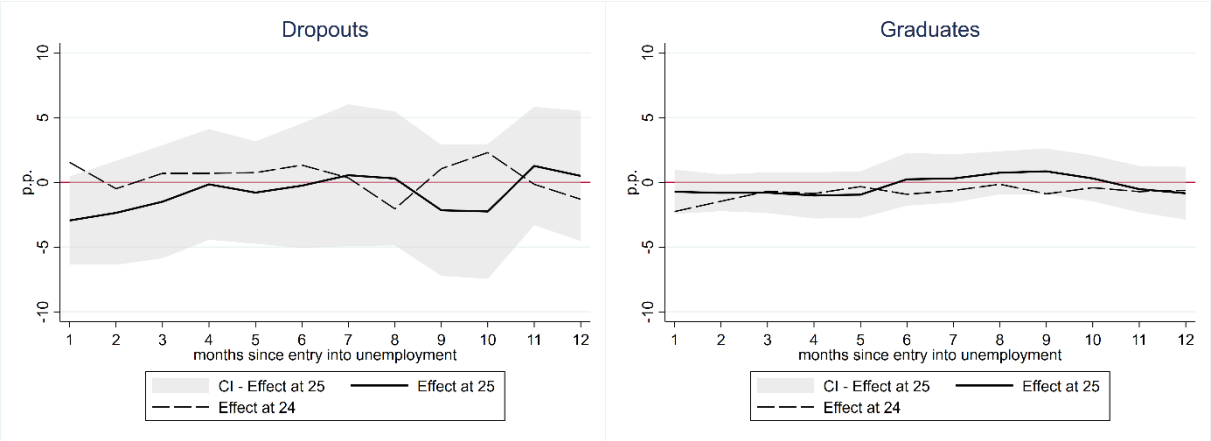
Note: The graphs depict one-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the cumulative transition rate to employment in a temp job within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The benchmark bandwidth is set at 3 years on each side of the donut hole. For the two alternative specifications, we retain observations within a two- and four-year bandwidth on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Figure B17. Evolution of the discontinuity at 25 in the number of months in employment up to 30 months after entry into unemployment, with alternative bandwidth sizes



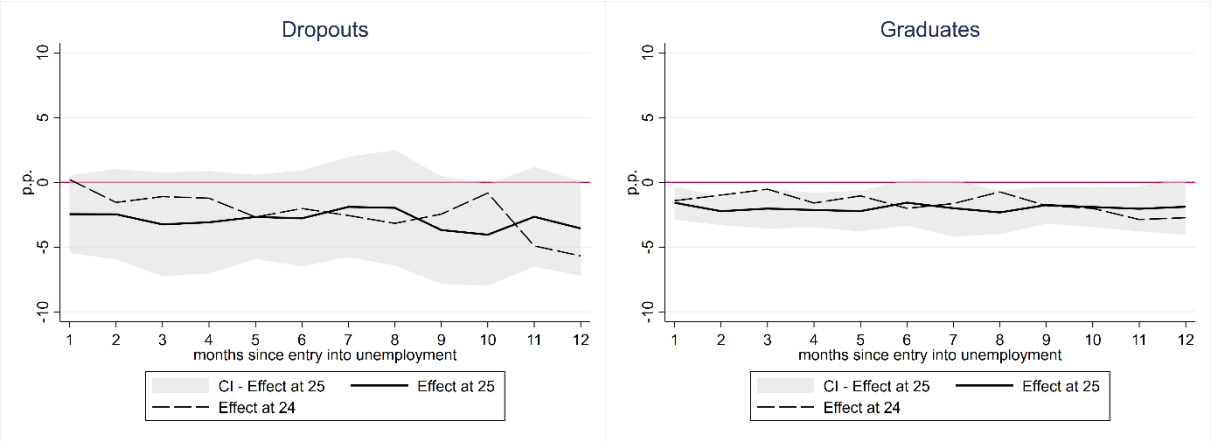
Note: The graphs depict one-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the cumulative number of months in employment within 1 to 30 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The benchmark bandwidth is set at 3 years on each side of the donut hole. For the two alternative specifications, we retain observations within a two- and four-year bandwidth on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Figure B18. Evolution of the discontinuity at 24 in the transition rate to employment up to 12 months after entry into unemployment



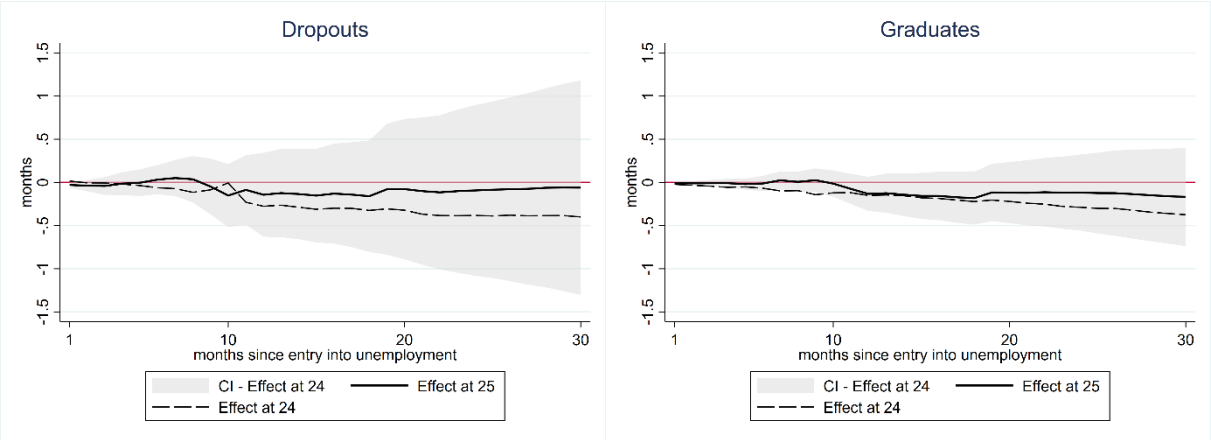
Note: The graphs depict one-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable. The cutoff is 25 in the benchmark specification and 24 in the alternative one. The outcome is the cumulative transition rate to employment within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Figure B19. Evolution of the discontinuity at age 24 in the transition rate to a temp job up to 12 months after entry into unemployment



Note: The graphs depict one-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable. The cutoff is 25 in the benchmark specification and 24 in the alternative one. The outcome is the cumulative transition rate to employment in a temp job within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

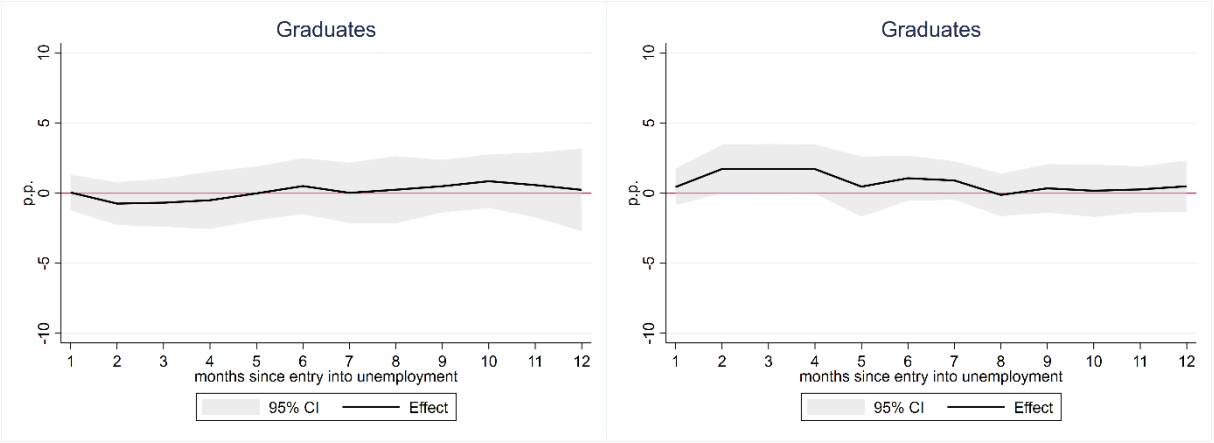
Figure B20. Evolution of the discontinuity at 24 in the number of months in employment up to 30 months after entry into unemployment



Note: The graphs depict one-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable. The cutoff is 25 in the benchmark specification and 24 in the alternative one. The outcome is the cumulative number of months in employment within 1 to 30 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Figure B21. Evolution of the discontinuity at age 26 and 27 (false cutoffs) in the transition rate to a temp job up to 12 months after entry into unemployment: false cutoffs

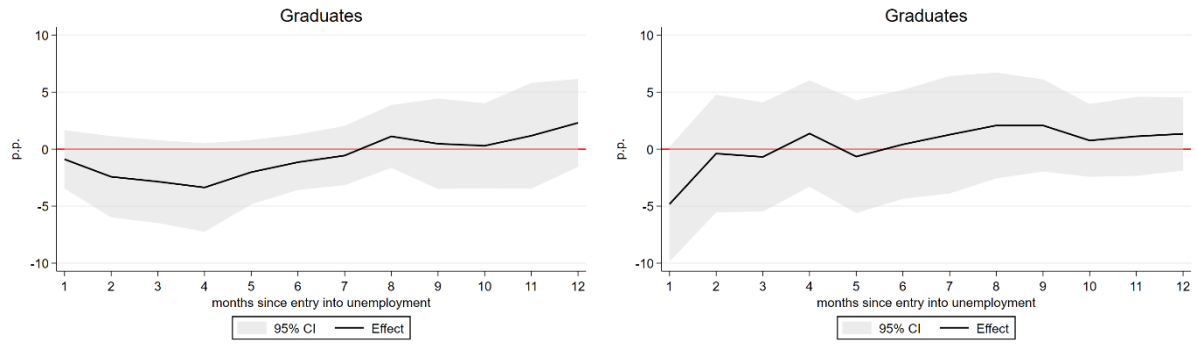
Age cutoff=26 Age cutoff=27



Note: The graphs depict one-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the alternative cutoff points are moved to 26 and 27. The outcome is the transition rate to a temp job within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

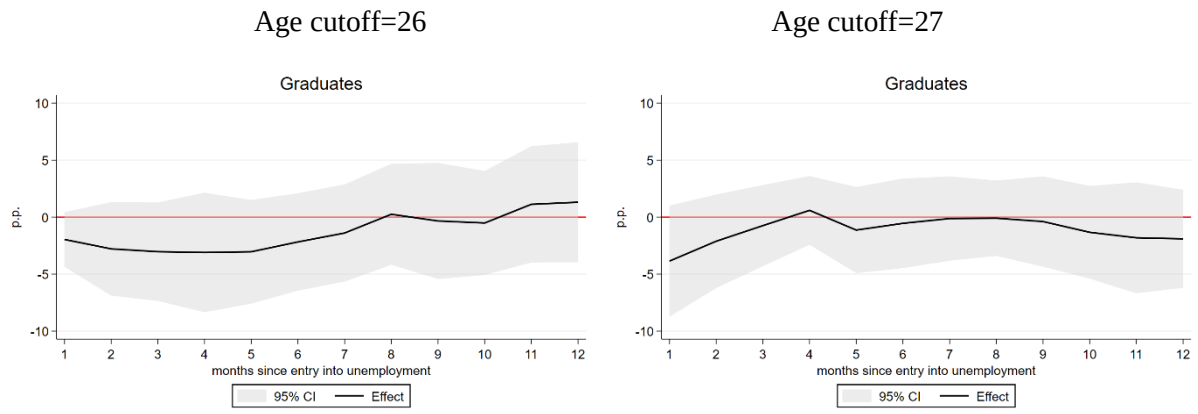
Figure B22. Evolution of the discontinuity at age 26 and 27 (false cutoffs) in the transition rate to employment up to 12 months after entry into unemployment: false cutoffs

Age cutoff=26 Age cutoff=27



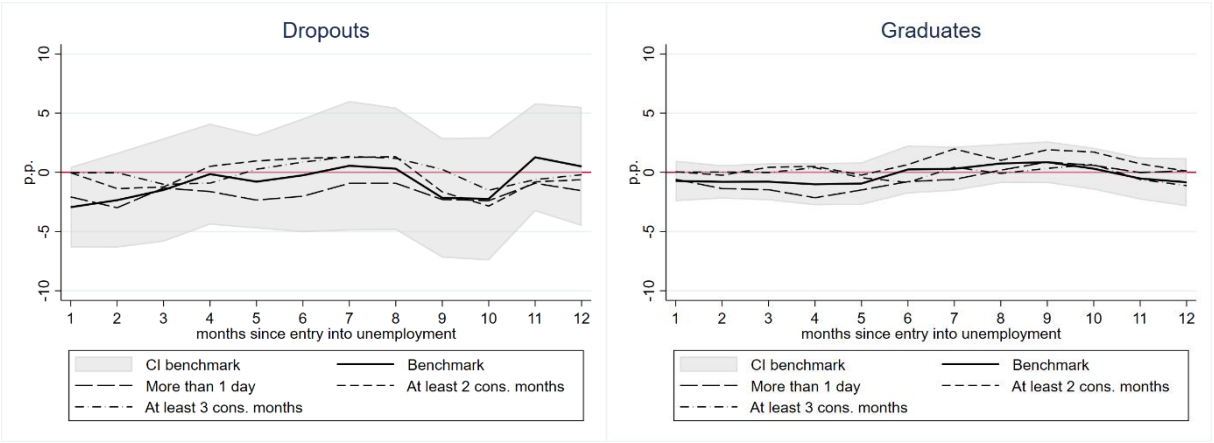
Note: The graphs depict one-sided donut RDD estimates for the sample of high school graduates living in low labor market tightness districts. Age at unemployment entry is used as the forcing variable, and the alternative cutoff points are moved to 26 and 27. The outcome is the transition rate to employment within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Figure B23. Evolution of the discontinuity at age 26 and 27 (false cutoffs) in the transition rate to a non-temp job up to 12 months after entry into unemployment: false cutoffs



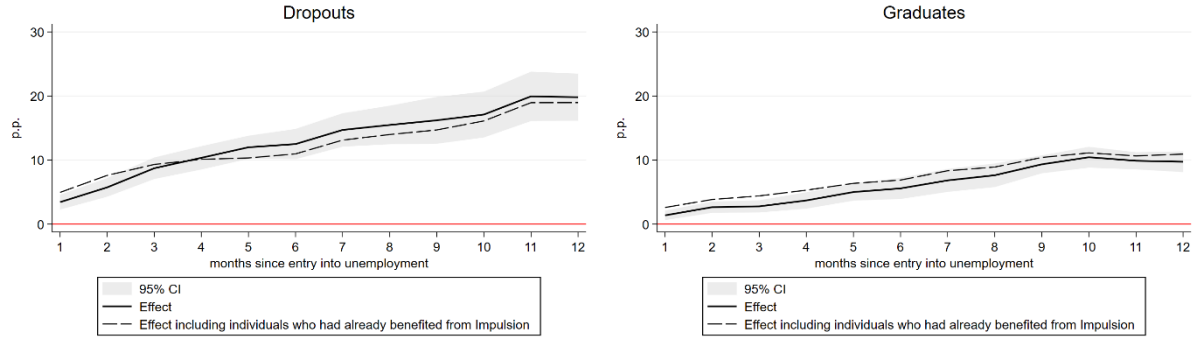
Note: The graphs depict one-sided donut RDD estimates for the sample of high school graduates living in low labor market tightness districts. Age at unemployment entry is used as the forcing variable, and the alternative cutoff points are moved to 26 and 27. The outcome is the transition rate to non-temp job within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Figure B24. Evolution of the discontinuity at age 25 on alternative measures of the cumulative transition rate up to 12 months after entry into unemployment



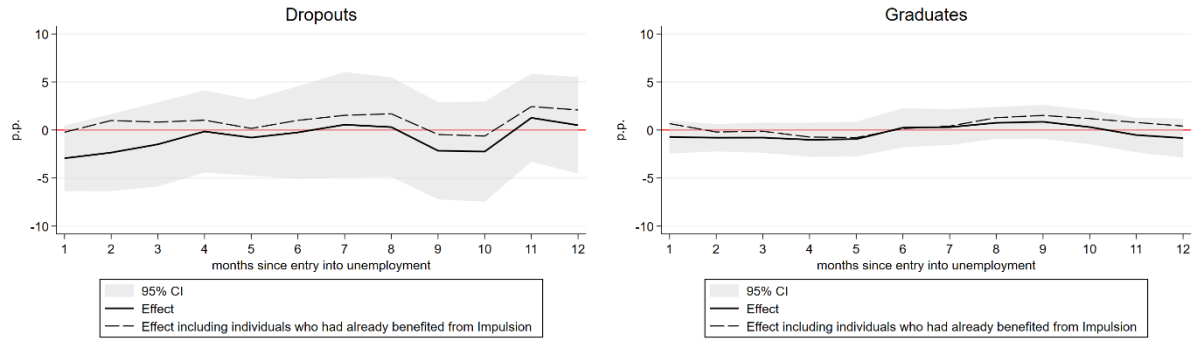
Note: The graphs depict one-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the cumulative transition rate to employment within 1 to 12 months of entry into unemployment. The benchmark definition of the outcome and three alternatives are presented. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Figure B25. Evolution of the discontinuity at age 25 in the subsidy take-up rate up to 12 months after entry into unemployment, including individuals who had already benefited from an Impulsion subsidy



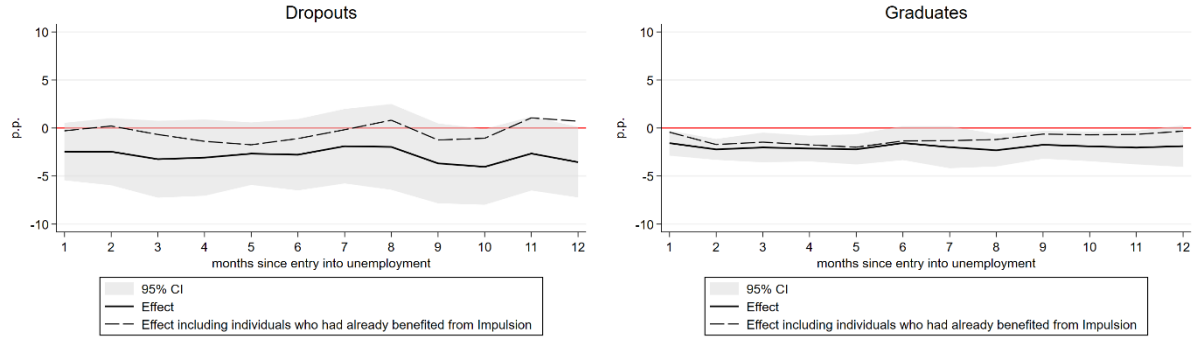
Note: The graphs depict one-sided donut RDD estimates for the two different evaluation samples. The first correspond to the benchmark analysis: youths entering unemployment between July 2017 and June 2019 who had never benefited from an Impulsion subsidy. The second is an alternative sample that includes individuals from the same period, including those who had already received an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, with a cutoff at 25. The outcome is the subsidy take-up rate within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted using a triangular kernel, excluding those within the donut hole. For a variable measured over X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We present estimates for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Figure B26. Evolution of the discontinuity at age 25 in the transition rate to employment up to 12 months after entry into unemployment, including individuals who had already benefited from an Impulsion subsidy



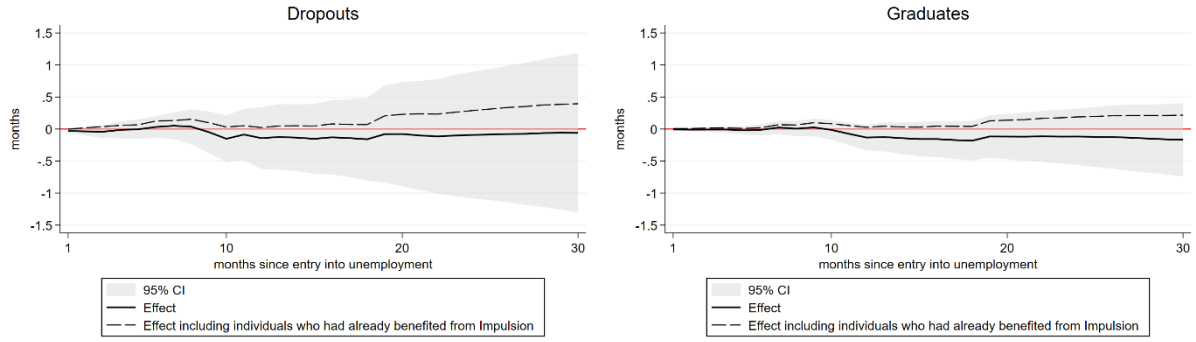
Note: The graphs depict one-sided donut RDD estimates for the two different evaluation samples. The first correspond to the benchmark analysis: youths entering unemployment between July 2017 and June 2019 who had never benefited from an Impulsion subsidy. The second is an alternative sample that includes individuals from the same period, including those who had already received an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, with a cutoff at 25. The outcome is the transition rate to employment within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted using a triangular kernel, excluding those within the donut hole. For a variable measured over X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We present estimates for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Figure B27. Evolution of the discontinuity at age 25 in the transition rate to a temp job up to 12 months after entry into unemployment including individuals who already benefited from an Impulsion subsidy



Note: The graphs depict one-sided donut RDD estimates for the two different evaluation samples. The first correspond to the benchmark analysis: youths entering unemployment between July 2017 and June 2019 who had never benefited from an Impulsion subsidy. The second is an alternative sample that includes individuals from the same period, including those who had already received an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, with a cutoff at 25. The outcome is the transition rate to a temp job within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted using a triangular kernel, excluding those within the donut hole. For a variable measured over X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We present estimates for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Figure B28. Evolution of the discontinuity at age 25 in the number of months in employment up to 30 months after entry into unemployment including individuals who had already benefited from an Impulsion subsidy



Note: The graphs depict one-sided donut RDD estimates for the two different evaluation samples. The first correspond to the benchmark analysis: youths entering unemployment between July 2017 and June 2019 who had never benefited from an Impulsion subsidy. The second is an alternative sample that includes individuals from the same period, including those who had already received an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, with a cutoff at 25. The outcome is the cumulative number of months in employment within 1 to 30 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted using a triangular kernel, excluding those within the donut hole. For a variable measured over X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We present estimates for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

C. Donut RDD estimates: summary tables

Table C1. Evolution of the discontinuity at 25 in the subsidy take-up rate up to 12 months after entry into unemployment

	(1) m=1	(2) m=3	(3) m=6	(4) m=9	(5) m=12
Panel A High school dropouts					
Effect	3.43***	8.72***	12.49***	16.21***	19.82***
p-value	0.000	0.000	0.000	0.000	0.000
CI	[2.28;4.58]	[7.05;10.39]	[10.14;14.85]	[12.56;19.86]	[16.14;23.49]
N (left)	7,071	7,203	7,512	7,782	8,115
N (right)	7,302	7,302	7,302	7,302	7,302
Panel B High school graduates					
Effect	1.36***	2.77***	5.57***	9.33***	9.74***
p-value	0.000	0.000	0.000	0.000	0.000
CI	[0.62;2.10]	[1.82;3.71]	[3.93;7.22]	[7.94;10.72]	[8.13;11.35]
N (left)	5,459	10,306	13,877	26,375	18,288
N (right)	3,902	6,864	8,613	9,592	9,664

Note: One-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the subsidy tale-up rate within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Table C2. Evolution of the discontinuity at 25 in the subsidy attention rate up to 12 months after entry into unemployment

	(1) m=1	(2) m=3	(3) m=6	(4) m=9	(5) m=12
Panel A High school dropouts					
Effect	15.98***	21.82***	21.90***	26.73***	29.41***
p-value	0.000	0.000	0.000	0.000	0.000
CI	[9.64;22.33]	[16.44;27.19]	[19.04;24.77]	[21.85 ;31.61]	[25.61;32.78]
N (left)	1,289	2,502	3,508	4,088	4,620
N (right)	1,673	3,007	3,925	4,448	4,782
Panel B High school graduates					
Effect	4.14***	5.41***	7.98***	12.03***	13.14***
p-value	0.001	0.000	0.000	0.000	0.000
CI	[1.83;6.45]	[3.69;7.13]	[5.55;10.42]	[10.0;14.06]	[10.9;15.37]
N (left)	5,459	10,306	13,877	26,375	18,288
N (right)	3,902	6,864	8,613	9,592	9,664

Note: One-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the attention rate, i.e., the share of subsidized hires among all hires within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the

observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Table C3. Evolution of the discontinuity at 25 in the subsidy amount conditional on hiring up to 12 months after entry into unemployment

	(1) m=1	(2) m=3	(3) m=6	(4) m=9	(5) m=12
Panel A High school dropouts					
Effect	79.93***	109.10***	109.57***	133,67***	147***
p-value	0.000	0.000	0.000	0.000	0.000
CI	[48.18;111.68]	[82.21;135.99]	[95.21;123.87]	[109,25;158,09]	[129.04;164.92]
N (left)	1,289	2,502	3,508	4,088	4,620
N (right)	1,673	3,007	3,925	4,448	4,782
Panel B High school graduates					
Effect	20.73***	27.06***	39.92***	60.15***	63.7***
p-value	0.001	0.000	0.000	0.000	0.000
CI	[9.19;32.27]	[18.47;35.62]	[27.76;52.08]	[50.01;70.29]	[52.53;74.88]
N (left)	22,418	23,607	24,071	24,971	25,893
N (right)	13,826	13,826	13,826	13,826	13,826

Note: One-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the amount of subsidy received (in full-time equivalent), conditional on hiring. within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Table C4. Evolution of the discontinuity at 25 in the transition rate to employment up to 12 months after entry into unemployment

	(1) m=1	(2) m=3	(3) m=6	(4) m=9	(5) m=12
Panel A – High school dropouts					
Effect	-2.94*	-1.49	-0.25	-2.15	0.50
p-value	0.090	0.499	0.918	0.399	0.844
CI	[-6.35;0.47]	[-5.86;2.88]	[-5.06;4.56]	[-7.22;2.91]	[-4.53;5.53]
N (left)	7,071	7,203	7,512	7,782	8,115
N (right)	7,302	7,302	7,302	7,302	7,302
Panel B – High school graduates					
Effect	-0.72	-0.79	0.24	0.86	-0.84
p-value	0.401	0.318	0.813	0.335	0.414
CI	[-2.43;0.99]	[-2.36;0.78]	[-1.79;2.28]	[-0.90;2.62]	[-2.87;1.20]
N (left)	22,418	23,607	24,071	24,971	25,893
N (right)	13,826	13,826	13,826	13,826	13,826

Note: One-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the cumulative transition rate to employment within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Table C5. Evolution of the discontinuity at 25 in the number of months in employment up to 30 months after entry into unemployment

	(1) m=5	(2) m=10	(3) m=15	(4) m=20	(5) m=25	(6) m=30
Panel A – High school dropouts						
Effect	-0.00	-0.15	-0.15	-0.08	-0.09	-0.05
p-value	0.962	0.408	0.576	0.849	0.868	0.922
CI	[-0.16;0.15]	[-0.52;0.21]	[-0.69;0.39]	[-0.89;0.74]	[-1.11;0.94]	[-1.30;1.18]
N (left)	7,405	7,896	8,115	8,115	8,115	8,115
N (right)	7,302	7,302	7,302	7,302	7,302	7,302
Panel A – High school graduates						
Effect	-0.02	-0.01	-0.16	-0.12	-0.12	-0.17
p-value	0.536	0.856	0.246	0.507	0.599	0.560
CI	[-0.08;0.04]	[-0.17;0.14]	[-0.42;0.11]	[-0.47;0.24]	[-0.59;0.34]	[-0.74;0.40]
N (left)	23,681	23,662	25,893	25,893	25,893	25,893
N (right)	13,826	13,826	13,826	13,826	13,826	13,826

Note: One-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the cumulative number of months in employment within 1 to 30 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Table C6. Evolution of the discontinuity at 25 in the transition rate to employment up to 12 months after entry into unemployment in districts with low labor market tightness

	(1) m=1	(2) m=3	(3) m=6	(4) m=9	(5) m=12
Panel A – High school dropouts					
Effect	-2.75	-3.35	0.14	-3.78	-1.86
p-value	0.227	0.270	0.969	0.178	0.571
CI	[-7.27;1.76]	[-9.35;2.65]	[-6.84;7.12]	[-9.35;1.76]	[-8.38;4.66]
N (left)	3,766	3,970	4,127	4,277	4,293
N (right)	3,615	3,615	3,615	3,615	3,615
Panel B – High school graduates					
Effect	-0.59	-0.15	2.26	3.01**	2.08
p-value	0.969	0.915	0.153	0.015	0.205
CI	[-3.05;2.94]	[-2.90;2.26]	[-0.08;5.36]	[0.60;5.42]	[-1.16;5.31]
N (left)	9386	9,997	10,419	10,812	11,253
N (right)	5,794	5,794	5,794	5,794	5,794

Note: One-sided donut RDD estimates for the sample of youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy and living in districts with low labor market tightness at entry into unemployment. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the cumulative transition rate to employment within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Table C7. Evolution of the discontinuity at 25 in the transition rate to employment up to 12 months after entry into unemployment in districts with high labor market tightness

	(1) m=1	(2) m=3	(3) m=6	(4) m=9	(5) m=12
Panel A – High school dropouts					
Effect	-3.00	1.26	-0.46	-0.15	3.78
p-value	0.121	0.664	0.867	0.997	0.306
CI	[-6.81;0.81]	[-4.52;7.05]	[-5.91;4.99]	[-7.78;7.75]	[-3.44;10.81]
N (left)	3,148	3,291	3,400	3,501	3,654
N (right)	3,385	3,385	3,385	3,385	3,385
Panel B – High school graduates					
Effect	-1.26	-1.20	-1.26	-0.83	-3.08**
p-value	0.210	0.403	0.344	0.528	0.034
CI	[-3.25;7.27]	[-4.05;1.64]	[-3.89;1.37]	[-3.44;1.78]	[-5.92;-0.24]
N (left)	11,866	12,666	13,200	13,747	14,234
N (right)	7,628	7,628	7,628	7,628	7,628

Note: One-sided donut RDD estimates for the sample of youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy and living in districts with high labor market tightness at entry into unemployment. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the cumulative

transition rate to employment within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Table C8. Evolution of the discontinuity at 25 in the subsidy amount conditional on hiring up to 12 months after entry into unemployment in districts with low labor market tightness

	(1)	(2)	(3)	(4)	(5)
	m=1	m=3	m=6	m=9	m=12
Panel A – High school dropouts					
Effect	56.27***	80.61***	83.39***	104.22***	102.69***
p-value	0.000	0.000	0.000	0.000	0.000
CI	[28.49;84.06]	[49.73;111.5]	[59.43;107.34]	[70.07;138.36]	[77.37;128.02]
N (left)	1,093	1,740	2,305	2,661	2,944
N (right)	1,119	1,807	2,309	2,578	2,762
Panel B – High school graduates					
Effect	19.40***	23.41***	37.61***	58.33***	62.17***
p-value	0.011	0.000	0.000	0.000	0.000
CI	[4.66;34.15]	[13.8;33.03]	[24.22;51.00]	[46.56;70.09]	[43.43;80.91]
N (left)	4,154	6,124	7,681	8,713	9,561
N (right)	2,477	3,620	4,323	4,727	4,956

Note: One-sided donut RDD estimates for the sample of youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy and living in districts with low labor market tightness at entry into unemployment. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the subsidy amount conditional on hiring within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Table C9. Evolution of the discontinuity at 25 in the subsidy amount conditional on hiring up to 12 months after entry into unemployment in districts with high labor market tightness

	(1) m=1	(2) m=3	(3) m=6	(4) m=9	(5) m=12
Panel A – High school dropouts					
Effect	60.55***	100.78***	124.32***	134.03***	168.55***
p-value	0.000	0.000	0.000	0.000	0.000
CI	[30.73;90.38]	[81.47;120.49]	[91.03;157.62]	[98.86;169.19]	[132.01;205.09]
N (left)	1,076	1,670	2,162	2,479	2,771
N (right)	1,121	1,808	2,262	2,516	2.665
Panel B – High school graduates					
Effect	13.13***	22.48***	38.43***	55.53***	52.28***
p-value	0.000	0.000	0.000	0.000	0.000
CI	[6.34;19.91]	[14.70;30,27]	[22.40;54.46]	[39.58;1.78]	[35.85;68.72]
N (left)	5,627	8,342	10,175	11,440	12,410
N (right)	3,423	4,951	5,832	6,337	6,669

Note: One-sided donut RDD estimates for the sample of youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy and living in districts with high labor market tightness at entry into unemployment. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the subsidy amount conditional on hiring within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Table C10. Evolution of the discontinuity at age 25 of the transition rate to a temp job up to 12 months after entry into unemployment

	(1) m=1	(2) m=3	(3) m=6	(4) m=9	(5) m=12
Panel A – High school dropouts					
Effect	-2.45	-3.25	-2.78	-3.68*	-3.55*
p-value	0.106	0.110	0.140	0.082	0.057
CI	[-5.44;0.53]	[-7.24;0.75]	[-6.48;0.93]	[-7.83;0.47]	[-7.22;0.11]
N (left)	7,071	7,203	7,512	7,782	8,115
N (right)	7,302	7,302	7,302	7,302	7,302
Panel B – High school graduates					
Effect	-1.57**	-2.02**	-1.57*	-1.75**	-1.88*
p-value	0.018	0.011	0.081	0.018	0.086
CI	[-2.87;-0.28]	[-3.56;-0.49]	[-3.33;0.20]	[-3.19;-0.31]	[-4.04;0.27]
N (left)	22,418	23,607	24,071	24,971	25,893
N (right)	13,826	13,826	13,826	13,826	13,826

Note: One-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the cumulative transition rate to employment in a temp job within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Table C11. Evolution of the discontinuity at age 25 of the transition rate to a non-temp job up to 12 months after entry into unemployment

	(1) m=1	(2) m=3	(3) m=6	(4) m=9	(5) m=12
Panel A – High school dropouts					
Effect	-0.49	1.92	3.19*	2.32	5.67**
p-value	0.514	0.138	0.077	0.273	0.016
CI	[-1.97;0.97]	[-0.63;4.47]	[-0.36;6.73]	[-1.87;6.52]	[-1.07;10.25]
N (left)	7,071	7,203	7,512	7,782	8,115
N (right)	7,302	7,302	7,302	7,302	7,302
Panel B – High school graduates					
Effect	0.85	1.04	1.32	2.28**	0.98
p-value	0.122	0.215	0.209	0.011	0.398
CI	[-0.23;1.93]	[-0.62;2.69]	[-0.75;3.39]	[0.55;4.02]	[-1.31;3.27]
N (left)	22,418	23,607	24,071	24,971	25,893
N (right)	13,826	13,826	13,826	13,826	13,826

Note: One-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the cumulative transition rate to employment in a temp job within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Table C12. Evolution of the discontinuity at 25 in the transition rate to a temp job up to 12 months after entry into unemployment for high school graduates

	(1) m=1	(2) m=3	(3) m=6	(4) m=9	(5) m=12
Panel A – Low labor market tightness					
Effect	-0.11	-1.41	-0.04	0.17	-0.18
p-value	0.906	0.113	0.679	0.868	0.878
CI	[-2.07;1.84]	[-3.16;0.34]	[-2.61;1.71]	[-1.94;2.29]	[-2.54;2.18]
N (left)	9386	9,997	10,419	10,812	11,253
N (right)	5,794	5,794	5,794	5,794	5,794
Panel B – High labor market tightness					
Effect	-2.75***	-2.19*	-1.53	-2.73**	-3.06**
p-value	0.006	0.093	0.295	0.013	0.019
CI	[-4.69;-0.82]	[-4.76;0.37]	[-4.43;1.36]	[-4.88;-0.58]	[-5.61;-0.51]
N (left)	11,866	12,666	13,200	13,747	14,234
N (right)	7,628	7,628	7,628	7,628	7,628

Note: One-sided donut RDD estimates for two subsamples of high school graduates entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy: (a) individuals living in districts with low labor market tightness at entry into unemployment (b) individuals living in districts with high labor market tightness at entry into unemployment. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the cumulative transition rate to a temp job within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the

donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Table C13. Evolution of the discontinuity at 25 in the transition rate to a non-temp job up to 12 months after entry into unemployment for high school graduates

	(1) m=1	(2) m=3	(3) m=6	(4) m=9	(5) m=12
Panel A – Low labor market tightness					
Effect	0.57	1.26	2.71**	2.84**	2.26
p-value	0.963	0.386	0.046	0.031	0.226
CI	[-2.37;2.49]	[-1.62;4.14]	[0.5;5.36]	[2.73;5.4]	[-1.43;5.94]
N (left)	9386	9,997	10,419	10,812	11,253
N (right)	5,794	5,794	5,794	5,794	5,794
Panel B – High labor market tightness					
Effect	1.49	0.99	0.27	1.90	-0.02
p-value	0.156	0.534	0.841	0.124	0.988
CI	[-0.58;3.57]	[-2.17;4.15]	[-2.45;3.01]	[-0.54;4.34]	[-2.74;2.70]
N (left)	11,866	12,666	13,200	13,747	14,234
N (right)	7,628	7,628	7,628	7,628	7,628

Note: One-sided donut RDD estimates for two subsamples of high school graduates entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy: (a) individuals living in districts with low labor market tightness at entry into unemployment (b) individuals living in districts with high labor market tightness at entry into unemployment. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The outcome is the cumulative transition rate to a non-temp job within 1 to 12 months of entry into unemployment. The estimates and their 95% confidence intervals (CI) are presented by education level. To estimate the linear splines, observations are weighted by a triangular kernel, without considering the observations within the donut hole. For a variable measured over a time window of X months, the donut hole consists of observations between 25–X and 25 at entry into unemployment. The bandwidth is set at 3 years on each side of the donut hole. We control for the set of variables presented in Table A2 in Appendix A. Standard errors are clustered at the age-in-months level.

Table C14. Continuity of the predetermined characteristics at 25

	Dropouts			Graduates		
	Discontinuity	CI	p-value	Discontinuity	CI	p-value
Man	0.007	[-0.031;0.045]	0.709	0.003	[-0.020;0.025]	0.808
Belgian	-0.008	[-0.020;0.005]	0.232	0.001	[-0.006;0.009]	0.685
EU	0.004	[-0.006;0.014]	0.399	-0.002	[-0.011;0.005]	0.458
Unemployment duration	0.58	[-0.830;1.991]	0.415	-0.279	[-0.822;0.263]	0.309
Unemployment rate of the district	-0.133	[-0.453;0.188]	0.412	0.066	[-0.093;0.226]	0.408
First registration	-0.004	[-0.026;0.018]	0.712	0.002	[-0.012;0.016]	0.777
Month of entry						
January	-0.001	[-0.021;0.019]	0.912	-0.012	[-0.028;0.002]	0.099
February	0.015	[-0.002;0.031]	0.076	0.008	[-0.004;0.018]	0.181
March	-0.004	[-0.025;0.017]	0.735	0.003	[-0.007;0.012]	0.534
April	0.004	[-0.010;0.019]	0.533	-0.001	[-0.012;0.012]	0.934
May	0.014	[0.001;0.028]	0.041	0.002	[-0.005;0.011]	0.510
June	-0.006	[-0.023;0.010]	0.439	-0.008	[-0.021;0.005]	0.242
July	0.002	[-0.027;0.029]	0.912	-0.007	[-0.021;0.006]	0.315
August	-0.019	[-0.038;-0.001]	0.039	0.004	[-0.009;0.018]	0.505
September	-0.001	[-0.021;0.021]	0.987	-0.002	[-0.016;0.011	0.718

October	0.005	[-0.010;0.021]	0.488	0.004	[-0.012;0.020]	0.644
November	-0.003	[-0.023;0.017]	0.763	0.010	[-0.002;0.022]	0.120
December	-0.006	[-0.023;0.009]	0.410	-0.000	[-0.016;0.014]	0.902
N	14,078			35,146		

Note: One-sided donut RDD estimates for the sample selected for the benchmark analysis: youths entering unemployment between July 2017 and June 2019 without having ever benefited from an Impulsion subsidy. Age at unemployment entry is used as the forcing variable, and the cutoff is 25. The estimates and their 95% confidence intervals (CI) are presented by education level. Given that predetermined characteristics are measured at entry into unemployment, no donut hole is needed. The RDD estimates for the control variables are obtained retaining observations within a three-year bandwidth on each side of the cutoff. Observations are weighted using a triangular kernel. Standard errors are clustered at the age-in-months level.