JRC TECHNICAL REPORT

JobsPlus evaluation

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Abstract

The aim of this evaluation is to provide evidence on the effectiveness of JobsPlus, a financial incentive launched in 2013 and consisting of employment subsidies for long-term unemployed. The JobsPlus scheme provides two treatment types: a subsidy of €7,500 for employees who had been unemployed for between one and two years, and a subsidy of €10,000 for employees who had been unemployed for more than two years. This analysis covers entrants from the scheme inception in July 2013 to April 2016. The effect of JobsPlus is estimated separately for the two types of subsidy exploiting the detailed information on unemployed past working histories, available in the Jobseekers Longitudinal Dataset (JLD) administrative database, applying a matching approach. The results point to a positive impact of the subsidy on JobsPlus participants who, after the programme, are less likely to be in receipt of unemployment-related benefits and show a higher probability to earn more and to work for more weeks in a year. For those we can observe over the longest duration subsequent to their JobsPlus start (four years), the difference between the two groups in their probability of receiving unemployment benefits is between 11.1 percentage points (unemployed for at least one year) and 16.4 percentage points (unemployed for at least two years).

Collaboration between DEASP and JRC

This evaluation is the final output of the collaboration between Irish Government Economic and Evaluation Service (IGEES) economists and Irish Government Statistical Service (IGSS) statisticians in the Statistics and Business Intelligence Unit in the Department of Employment Affairs and Social Protection (DEASP), and researchers of the Centre for Research on Impact Evaluation (CRIE), part of the Competence Centre on Microeconomic Evaluation (CC–ME) of the Joint Research Centre (JRC) of the European Commission.

This study was carried out within the Data Fitness Initiative for Counterfactual Impact Evaluation (CIE), launched in February 2016 by the Directorate General Employment, Social Affairs and Inclusion (DG EMPL) and the CRIE to promote the use of CIE for the evaluation of European Social Fund (ESF) interventions.

This collaboration has strengthened interactions between governmental institutions and the European Commission and makes scientific contribution to the evidence on the impact of ESF interventions.

Executive Summary

Context
JobsPlus is one measure used by the Irish Public Employment Service (Intreo) to address the labour market disadvantage of people who are long-term unemployed by means of a hiring subsidy. Over the period of analysis, there were two subsidy amounts paid in respect of JobsPlus employees: those who were unemployed for at least one year (attracting a subsidy of €7,500) and those who were unemployed for at least two years (attracting a subsidy of €10,000).
This evaluation of JobsPlus covers those in receipt of the subsidy from its inception in July 2013 to April 2016 and measures outcomes subsequent to the two-year maximum duration in receipt of the subsidy (i.e. from July 2015 to April 2018).
The evaluation was completed in early 2020, prior to the emergence of Covid-19 and the introduction of the related public health measures and restrictions on economic activity that have had a substantial impact on the labour market in Ireland.[1] While the long-term impact on the labour market is as yet uncertain, large inflows to unemployment typically lead to increases in long-term unemployment approximately one year later. Thus, long-term unemployed people, who this study focuses on, represent a cohort whose number may grow if employment prospects do not improve in the medium term.

Key points on the impact of JobsPlus
The study compared the cohort of people who benefited from JobsPlus with a matched control group of people (i.e. people with similar characteristics) who did not avail of the subsidy. In summary, it found a positive impact of 11.1 and 16.4 percentage points, equivalent to a 57% reduction in the likelihood of unemployment. The probability of receiving unemployment payments drops to 9% from 20%. For people unemployed for a longer period, the probability of receiving unemployment payments drops to 13% from 29%. This decrease of 16.4 percentage points equates to a 56% improvement in outcome.

At a simple level, by comparing those who benefited from JobsPlus with all of those who were eligible but who did benefit from JobsPlus, we can get an initial (albeit, somewhat crude) estimate of the impact of JobsPlus. Four years after commencing receipt of JobsPlus, the difference in the probability of receiving unemployment benefits was 20 percentage points lower than for those who did not benefit from the subsidy.

When we compare outcomes to the carefully matched control group, the impact – although lower – is still highly positive and, although it tends to decrease over time, a statistically significant effect is still found after 48 months. This result indicates that JobsPlus is a valuable and effective labour market intervention to help people who are long-term unemployed to secure employment.
For those we can observe over the longest duration subsequent to their JobsPlus start (four years), the difference between the two groups in their probability of receiving unemployment benefits is between 11.1 and 16.4 percentage points:

JobsPlus eligibility category	Unemployed for at least 1 year	Unemployed for at least 2 years
Difference in probability of receiving unemployment benefits, four years after a JobsPlus start	11.1 percentage points	16.4 percentage points
	56.6% reduction compared to control group	55.9% reduction compared to control group

The impact of JobsPlus is seen not just in the difference in the probability of receiving unemployment benefits but also in the number of weeks of insurable employment in subsequent years. Three and four years after starting JobsPlus, depending on when they start the programme, participants work an average of 14.3 weeks more than the matched group of eligible non-participants. The difference is slightly larger for those who qualify for the subsidy at the higher rate, at 16.6 weeks.

JobsPlus eligibility category	Unemployed for at least 1 year	Unemployed for at least 2 years
Difference in mean number of weeks of insurable employment, four years after a JobsPlus start	14.3 weeks	16.6 weeks
	51.5% increase compared to control group	72.4% increase compared to control group

The effect is confirmed by the difference between the two groups in respect of earnings from employment. Four years after the start of JobsPlus, those who benefitted from the subsidy have annual earnings from employment approximately €6,000 higher than the matched group of eligible non-participants. For those who were unemployed for at least one year, earnings from employment increased to €28,000 from €€22,000 while the increase for those who were unemployed for at least two years was to €€26,000 from €20,000. These are increases of 27% and 29% respectively.

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[1] For context, see: https://www.cso.ie/en/csolatestnews/presspages/2020/labourforcesurveyquarter22020andlabourmarketinsightseries1/

Does the impact vary across different cohorts?

One of the important considerations in an evaluation is whether mean values obscure the fact that a subsidy may work well for some cohorts and not at all for others. In other words, the overall effect may be positive but this may be due to a positive effect for one particular (large) group and negative effects for other (smaller) groups. To probe this, we examine results by age group and previous earnings.

Most importantly, the positive impact of JobsPlus is visible across all age categories. There are slight differences in how the subsidy affects different age categories, and this varies according to the outcome variable examined.

JobsPlus eligibility category	Unemployed for at least 1 year	Unemployed for at least 2 years
Age group with the largest difference in probability of receiving unemployment benefits, four years after a JobsPlus start	36-45 years	26-35 years

JobsPlus eligibility category	Unemployed for at least 1 year	Unemployed for at least 2 years
Age group with the largest difference in number of weeks of insurable employment, four years after a JobsPlus start	Under 25 years	46-55 years

JobsPlus eligibility category	Unemployed for at least 1 year	Unemployed for at least 2 years
Age group with the largest absolute difference in earnings from employment, four years after a JobsPlus start	36-45 years	46-55 years

When we group people by their earnings from employment prior to becoming unemployed, and then measure the probability of receiving unemployment benefits as well as the number of weeks of insurable employment, the effect of JobsPlus is strongest for those with the highest earnings prior to becoming unemployed. This is true for people unemployed for at least one year and for those unemployed for at least two years. The absolute difference in earnings four years after a JobsPlus start is greatest for those in the third quartile (as measured by earnings from employment prior to becoming unemployed).

Once again, the mean value does not hide a negative impact for particular cohorts when we group people by their earnings prior to becoming unemployed. While the impact varies across different age groups and quartiles of earnings, the impact of the subsidy is positive for all cohorts.

1 Introduction

JobsPlus is a financial incentive designed to encourage employers to recruit people from the count of jobseeker claimants, i.e. the Live Register, who are long-term unemployed. Employers who hire a long-term unemployed person and complete the JobsPlus application process can receive a subsidy of €7,500 for employee who has been unemployed for between one and two years, and €10,000 for an employee who has been unemployed for more than two years (payment levels have changed since January 2018; see appendix for details).

The incentive is tipically paid to employers from the date the new employee starts to work for them. Payments are made each month in arrears over a two-year period. JobsPlus is operated by the Department of Employment Affairs and Social Protection (DEASP) and commenced in July 2013.

This evaluation estimates the impact of JobsPlus by modelling the counterfactual, i.e. what would have happened to long-term unemployed people if the subsidy had not been available.

The outline of the report is as follows. Firstly, we describe the policy background together with the Irish institutional framework and labour market. Secondly, we describe the JobsPlus programme, the data available for the evaluation, and our methodological approach with reference to the related literature. Finally, we present the estimated results, and discuss on potential modifications of policy design and future developments of data structure and empirical analysis.

2 Policy Background

JobsPlus was created as part of the Irish Government's twin labour market activation and employment strategies. These include the Pathways to Work and the Action Plan for Jobs[2], which were first developed in 2012, as the Public Employment Service moved from passive income support to more active engagement with jobseekers. As well as engaging with jobseekers through the activation process, and referring jobseekers to retraining opportunities, the strategies aimed to make it more attractive for employers to hire jobseekers on the Live Register.

JobsPlus is referenced in Action 33 of Pathways to Work 2013 "Develop and implement the JobsPlus recruitment incentive. Review take-up and develop process systems and promotional capability as required to encourage and support significant take-up of the new initiative amongst employers and the Action Plan for Jobs" (Disruptive Reform 5: Make it attractive for businesses to hire additional employees from the Live Register through the JobsPlus Initiative).

As recovery took hold and economic prospects improved, subsequent labour market strategies under the Pathways to Work umbrella placed greater emphasis on those who had not yet returned to work, i.e. the long-term unemployed.

Pathways to Work 2016-2020 emphasised both the target group of JobsPlus, the long-term unemployed, and the mechanism by which it works, incentivising employers to hire the long-term unemployed. Strand 1 of Pathways to Work 2016-2020 focused on enhanced engagement with unemployed people of working age and identified long-term unemployed people as requiring additional supports to return to work. Strand 4 of Pathways to Work 2016-2020 outlined the objective of "Incentivising employers to provide more jobs for those who are unemployed", reflecting the barriers faced by those who are long-term unemployed in returning to the workforce.

JobsPlus drew on the design of the two existing schemes it was set up to replace: the Revenue Job Assist Scheme and the Employer Job (PRSI) Incentive Scheme, both of which ceased permanently in respect of all employments commencing on or after 1 July 2013. Uptake of these schemes was low relative to the number of unemployed people who could have been hired, with only 1,454 employers supported by the schemes in 2011.

The PRSI Incentive Scheme was somewhat similar to what transpired when JobsPlus was designed but its eligibility criteria reflected the larger share of unemployed people with shorter durations. It exempted employers from liability to pay their share of PRSI for certain employees for 12 months, once the employee had been in receipt of Jobseeker's Benefit, Jobseeker's Allowance, One-Parent Family Payment or Disability Allowance for at least six months. Time spent on the JobBridge internship programme or the Work Placement Programme also counted towards eligibility.

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[2]There have been iterations of Pathways to Work in 2012, 2013, 2015 and 2016-2020, with the publication of the next strategy imminent.

JobsPlus commenced in July 2013 with an initial pilot phase of 2,500 sanctioned employee places. This was expanded to 3,000 places in June 2014 and then to 6,000 places in Budget 2015. Changes were also made to the scheme in 2015, deeming Programme Refugees and lone parents in receipt of Jobseekers Transition Payment to be eligible with no qualifying period.

2.1 JobsPlus and the Youth Guarantee

In February 2015 "JobsPlus Youth" was added to the scheme under the EU Youth Guarantee. This meant that the qualifying period for those aged under 25 was reduced from 12 months to four months, corresponding to the target under the Youth Guarantee to offer a young person training course, apprenticeship, traineeship, placement or employment within four months of leaving school or losing a job. Young people are provided with certification that they qualify for the subsidy at the lower rate of payment and are in a position to use this certification in job applications with employers.

Primary legislation was required to allow positive discrimination on age grounds in the provision of employment services and supports. The Social Welfare and Pensions Act 2014, which allows positive discrimination, was passed in June 2014. The Act allows the full implementation of the Youth Guarantee and, in particular, the process of earlier engagement with under-25s.

Funding for JobsPlus Youth places is provided by a tripartite arrangement whereby one-third of the cost is met by each of the DEASP, the European Social Fund (ESF) and the Youth Employment Initiative (YEI). The ESF is Europe's main instrument for supporting jobs, helping people get better jobs and ensuring fairer job opportunities for all EU citizens.

The YEI is one of the main EU financial resources to support the implementation of Youth Guarantee schemes. It provides support to young people living in regions where youth unemployment was higher than 25% in 2012, with the criteria updated in 2017 to refer to regions with youth unemployment higher than 25% in 2016. Funding for the YEI comes from a dedicated Youth Employment budget line and ESF national allocations.

Places on JobsPlus are funded initially by the DEASP. Subsequently, applications for ESF rebates are made in respect of all compliant JobsPlus applications for participants who were under 25 years of age at the commencement of the employment.

3 Irish Institutional Framework

The DEASP administers over 70 separate schemes and services throughout Ireland to promote active participation in society by providing income supports and employment services through its Public Employment Services (PES) function, and other services. These services comprise administration of a wide range of social insurance and social assistance schemes, including pensions, benefits, allowances and grants for children, people of working age, carers, people with disabilities, and older people. Additional services include activation, employment and community services and programmes to promote development, progression, participation, and social involvement of clients. Overall, the Department is responsible for:

— advising the Government and formulating appropriate social protection policies;

— designing, developing and delivering effective and cost-efficient income supports, activation and employment services, advice to customers and other related services; and

— working towards seamless service delivery in conjunction with other Departments, Agencies and bodies in the delivery of Government policies.

The current structure of the DEASP is a result of incremental policy reforms beginning in the mid-1990s, in part driven by a broader recognition that the welfare state needed to adapt to changing labour market dynamics. The current process of reforms was initiated in 1996 by the European Employment Strategy (EES), requiring all EU member states to set out actions for the implementation of EES guidelines, through the development of national action plans. Starting with the National Employment Action Plans (NEAPs) in the 1990s, through to the National Employment and Entitlements Service (NEES) in 2011, and finally through to the introduction of the first Intreo pilots in 2012, each subsequent stage in employment policy evolution introduced a discrete set of reforms.

These reforms have gradually shifted the PES towards a model that is underpinned by a pro-active activation approach. Labour market activation policies are designed to give jobseekers a better chance at finding employment through engagements such as education or training schemes, employment support schemes, or internships. DEASP activation efforts involve engaging working-age adults with a focus on moving into employment, in line with broader social protection reforms that operate from a social contract approach to receipt of welfare payments.

The DEASP delivers its services through Intreo centres, which are now single points of contact for all employment and income supports throughout Ireland. In Ireland, the PES is managed by the DEASP and is delivered via two main channels: directly through Intreo centres and through contractors.

At present, contracted services are provided by the following contractors:

— EmployAbility;

— Local Employment Services;

— Job Clubs;

— JobPath.

EmployAbility
EmployAbility provides an employment support service for people with a health condition, injury, illness or disability and a recruitment advice service for the business community.

Local Employment Service The LES is a one-to-one career path planning and placement service, on a case management basis, for unemployed people. The LES engages primarily with long-term unemployed jobseekers who are referred directly to the LES by Intreo offices for activation. The LES also provide services to other client groups including people with a disability, lone parents, early school leavers, qualified adults, ex-offenders, members of the travelling community and refugees.

Job Clubs Job Clubs provide structured support to job ready jobseekers (with the necessary training, education and motivation) to secure and retain paid employment in the open labour market and is a final transition mechanism for jobseekers.

JobPath JobPath, a contracted, payment-by-results employment service, provides additional resources to enable the provision of a high-quality case managed employment support service to people who are long-term unemployed.

Figure 1 outlines the process by which jobseekers engage in activation, subsequent to registering a claim, having the claim processed and receiving payment. An initial group information session identifies the service and what is expected from the client. This is followed by a one to one meeting with a case officer, at which the jobseeker agrees a Personal Progression Plan (PPP). At an Activation Review Meeting (ARM), the PPP is reviewed and new goals and actions agreed. The case officer works with the jobseeker for 12 months or until the jobseeker commences employment or education.
Where engagement with Intreo identifies a training requirement, provision is primarily the responsibility of SO-LAS, i.e. the State organisation with responsibility for funding, planning and co-ordinating further education and training (FET) in Ireland.

Finally, the Employer Relations function is an area of increasing importance in the Irish PES and has a clear role to play in the promotion of incentives such as JobsPlus.

4 The Irish labour market

4.1 Employment levels

Between Q1 2007 and Q1 2012, the total number of people unemployed in Ireland more than tripled from 115,000 to 351,800, with the unemployment rate increasing from 5% to just under 16% in the same period.

At the introduction of JobsPlus in 2013, the Irish labour market was beginning to recover. After the post-crisis drop in employment levels, reaching a low of 1,863,500 in Q1 2012, total employment continued on the path to recovery, passing the 2 million mark in Q3 2014 and overtaking the pre-crisis high point in Q2 2018. The most

Figure 1: From jobseeker claim to activation
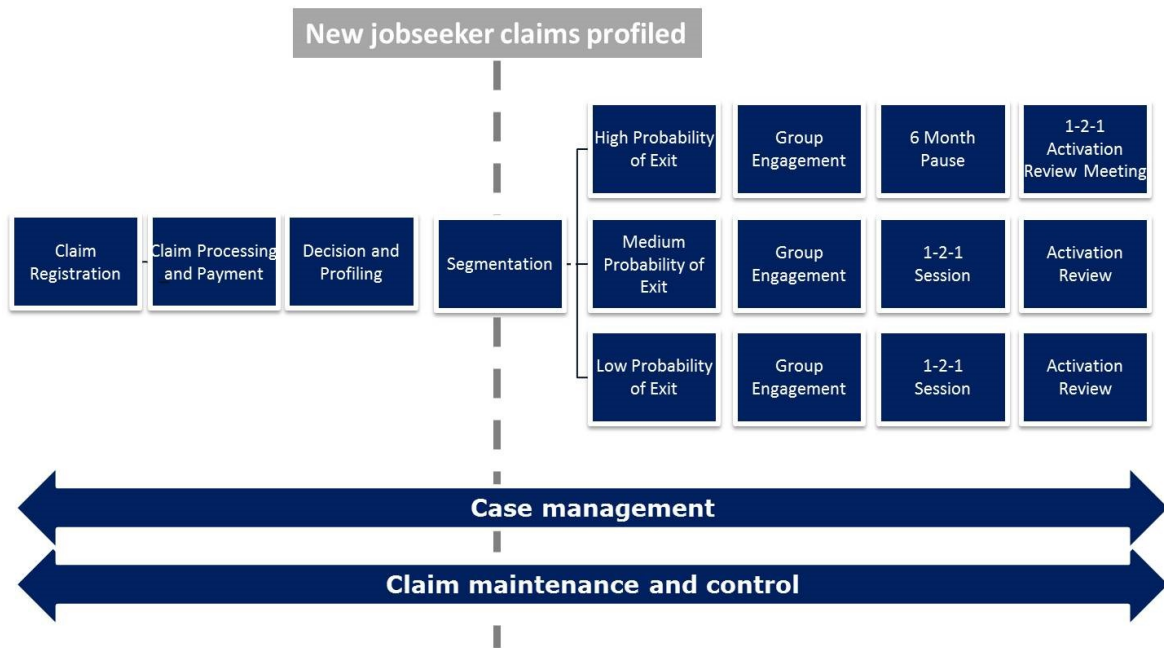
recent value, Q3 2019, is estimated at 2,326,900.

Although the absolute value for the number of people employed is higher, the employment rate, which measures proportion of the working age population in employment, has yet to return to previous levels. Q3 2007 represented the pre-crisis high for the Irish employment rate (72.5%). During the crisis, the employment rate reached its lowest point in Q1 2012, dropping to 59.3%. The recovery in the employment rate has continued since then, most recently measuring 69.6% in Q3 2019.

4.2   Long-term unemployment

Duration of unemployment is a key consideration for this evaluation, both in terms of the effects of long-term unemployment on likely re-entry to employment and as a qualifying criterion for benefiting from the JobsPlus subsidy during employment.

Following the initial onset of the economic crisis, widespread job losses led to an increase in short-term unemployment. This temporarily reduced the share of unemployment accounted for by those who are long-term unemployed (unemployed for one year or more). However, the absence of an immediate recovery meant that a proportion of the first wave of unemployed people became long-term unemployed.

The number of long-term unemployed people, as a percentage of all unemployed people, is now at 27.3% as of Q3 2019, having fallen from a high point of 61.9% in Q1 2011. The share of long-term unemployment, i.e. the number of people unemployed for one year or more as a percentage of the total labour force (aged 15–74), increased consistently from the onset of the crisis and reached a peak of 9.8% in Q1 2012. The current value is 1.4% (Q3 2019).

The increase in long-term unemployment applied to both men and women. In Q1 2007, long-term unemployment as a percentage of the labour force stood at 1.6% for men and 1% for women, dramatically increasing to 12.3% and 6.7%, respectively, by Q1 2012. Since then, values for men and women have been on a downward trend, with Q3 2019 values at 1.7% for men and 1% for women.

Figure 2: Quarterly unemployment (000s), Q3 2013 – Q2 2018, source: QLF01, LFS, CSO

Source : QLF01, Labour Force Survey, CSO
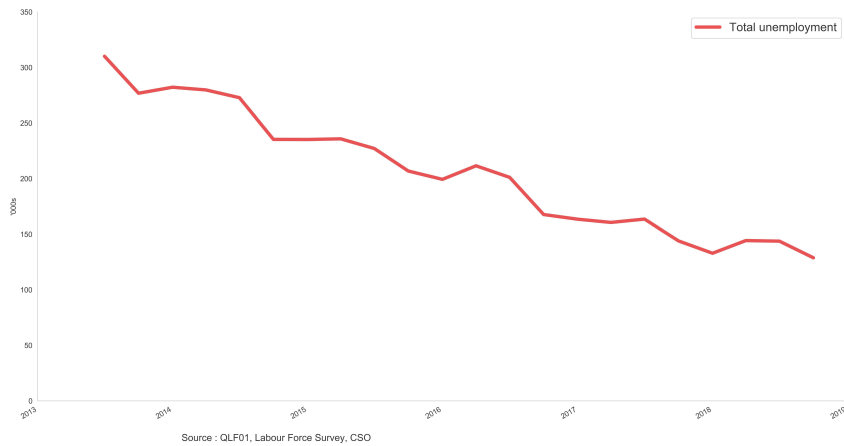
4.3   Population and labour force

Along with an increasing population in the period since the crisis, the labour force has also increased, from 2,256,300 in Q2 2013, when JobsPlus was launched, to 2,454,900 in Q3 2019. This has largely been a function of the increase in the working age population, as the participation rate remains somewhat lower than its 2007 peak. The overall participation rate was 64% in 2007 but dropped to 60% in 2012, reflected depressed demand for labour. The participation rate has been relatively stable at about 60% since 2012 and currently stands at 62.5% in Q3 2019. The ongoing fall in participation among the young is being offset by a recovery in participation rates among older men.

Figure 3: Labour force by age group, Q3 2013 – Q2 2018, source: LFS, CSO
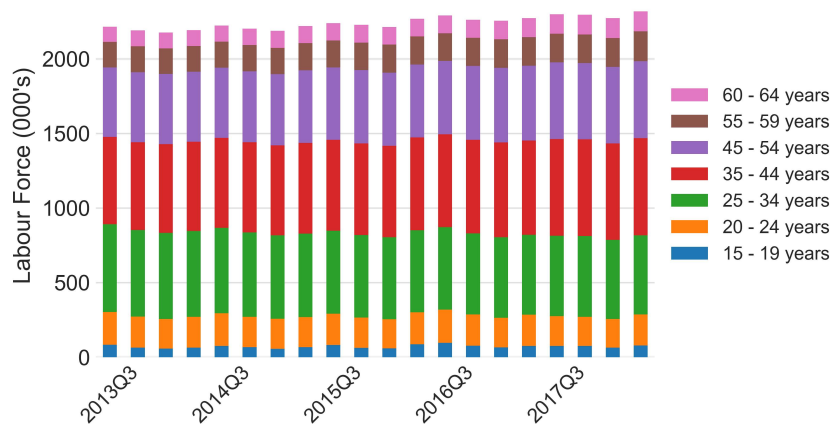
Source : QLF18, Labour Force Survey, CSO

4.4   Sectoral shifts

There have been sectoral changes in the Irish labour market over the period, with changes in levels and shares of various sectors.

The retail sector represented the largest NACE sector of employment in 2010, at over 14%, while administrative services represented the smallest at under 4%. Over the decade that followed, significant shifts have occurred in the sectoral distribution of employment. Retail remains the largest contributor to total employment and its share has reduced only slightly. The smallest sector in the economy in terms of the number of people employed is currently agriculture, forestry and fishing, accounting for 4.4% of jobs.

ICT, administration and support services grew strongly, while, the construction sector decreased sharply in 2008 and 2009. However it increased by 35% between Q1 2010 and Q2 2018, even though employment is still 90,000 units below where it was prior to the crisis, in Q1 2007.

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Figure 4: Economic Sectors in Q3 2013 and Q2 2018.

Source : EHQ03 & QLF03, Statbank Services, CSO
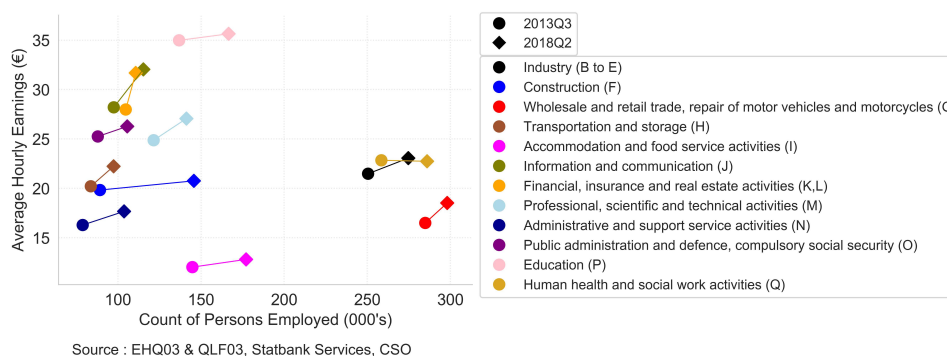
Source: EHQ03 & QLF03, Statbank Services, CSO

4.5   Jobseekers register: Live Register

Ireland's count of registered jobseekers is called the Live Register (see Appendix for more information). It counts claimants for Jobseeker's Benefit (Ireland's insurance-based unemployment payment) and applicants for Jobseeker's Allowance (Ireland's means-tested unemployment payment) and those signing for credited social insurance contributions. Once seasonal fluctuations are taken into account, the Live Register has been on a downward trend throughout the operation of JobsPlus. More specifically, the composition of the Live Register is changing such that the share of long-term unemployed people has decreased to under 40% in 2019 (see table and figure below). The pool of potential recipients of the JobsPlus subsidy is a declining share of an ever-decreasing Live Register. This is an important point in assessing whether the subsidy has an impact across a time of increasing employment and, consequently, a Live Register population that is changing in composition over time. The table below shows the share of long-term claims that have durations greater than three years. It has increased over the time frame considered in this analysis. Similarly, within a specific age cohort, those aged more than 50, the proportion of long-term unemployed people whose claims are greater than three years has increased. This highlights the ongoing challenge of addressing the labour market disadvantage of particular cohorts even as the overall number of people receiving jobseeker payments decreases.

Live Register claims, excluding casual claims	July 2013	April 2016	August 2017
Durations of one year or more (LTU)	197,472	138,183	111,799
Of which, durations of three years or more	103,595	79,483	64,768
Durations of three years or more, as share of LTU	0.52	0.58	0.58
Over 50 years, durations of one year or more	52,844	50,512	42,769
Over 50 years, durations of three years or more	30,053	32,246	28,533
Over 50 years and durations of three years or more, as share of LTU	0.57	0.64	0.67

It is also worth noting the significant number of part-time workers (or casual claimants) who are signing on the Live Register but are not unemployed. This group numbered 90,000 in early 2013 and has fallen to just over 35,000 as of October 2019, representing almost 20% of the total Live Register.

Year	2014	2015	2016	2017	2018
Live Register population with duration greater than 12 months (average of 52 weekly values)	179,464	159,551	136,870	110,796	91,102
Share of the Live Register population with duration greater than 12 months	46.7%	46.3%	45.0%	42.6%	41.2%

5   Description of the intervention: how JobsPlus operates

5.1   Eligibility

JobsPlus is targeted at long-term jobseekers. A grant of €7,500 is payable over two years for the following categories of jobseekers:

— jobseekers under 25 years of age and on the Live Register for at least 4 months (104 days) in the previous 6 months. This element of the incentive is co-funded by the ESF;

Figure 5: Live Register long-term unemployed

Source : LRM11, CSO
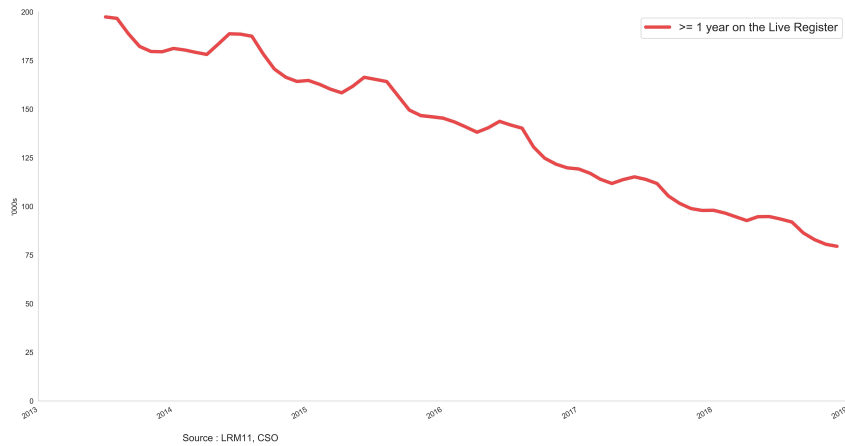
— jobseekers over 25 years of age who are on the Live Register and have been at least 12 months (312 days) unemployed in the previous 18 months;

— former One-Parent Family Payment recipients whose youngest child is seven years of age or over and are now in receipt of Jobseekers Allowance Transitional (JST) payment, in which case no qualifying periods applies; and

— persons with refugee status and in receipt of Jobseekers Allowance, in which no qualifying period applies.

A grant of €10,000 is payable over two years for the category of jobseekers over 25 years of age who are on the Live Register and have been at least 24 months (624 days) unemployed in the previous 30 months.

People who are signing for credited contributions rather than in receipt of a jobseekers payment are eligible once they meet the eligibility requirement of the number of days on the Live Register. Persons who were in receipt of qualifying jobseeker payments or credited contributions, who spent time on the programmes listed below may count this time towards the qualifying period. To do so, the jobseekers re-establish entitlement to a qualifying jobseekers payment prior to commencing employment or the employee can verify that their financial/family circumstances have not changed during the period they were participating on one of the initiatives listed below: Community Employment, the Rural Social Scheme, Jobseekers Transitional Payment, Tús, Gateway, Back to Education Allowance, Back to Work Enterprise Allowance, Short-term Enterprise Allowance, Springboard courses and short duration training courses provided by SOLAS/ETB.

JobsPlus is not open to the following cohorts:

— those on non-Live Register payments such as illness and disability payments and One-Parent Family Payment (excluding JST);

— those in receipt of a payment under systematic short-time working; and

— persons in receipt of the Wage Subsidy Scheme.

The incentive is not open to persons on apprenticeships or in training or work experience.

In this evaluation we focus on the categories of jobseekers over 25 years of age who are on the Live Register and have been unemployed at least 12 months in the previous 18 months, or 24 months in the previous 30 months.

5.2   The typical JobsPlus process

5.3   Employer verification procedure and registration

JobsPlus is available to all employers in the private (including commercial semi-state), community, not-for-profit and voluntary sectors. It is not open to public service employers. Employers can avail of JobsPlus when filling new positions or positions that arise as a consequence of natural turnover and must meet the following conditions:

— the businesses must be registered as a Pay As You Earn(PAYE) employer with Revenue;

Figure 6: JobsPlus Process

The Typical JobsPlus Process

1

Looking to recruit a new employee? Yes?
Then register for JobsPlus – it's easy.
- Go to **www.gov.ie** and enter **JobsPlus** in the search bar to register.
- Your eligibility will be confirmed by email.

2

Then… identify your candidates.
- Advertise your job as normal.
- For help finding suitable, eligible candidates we recommend you contact:
- Your local Intreo Centre/Employment Service Office.
- Include your vacancy on **www.jobsireland.ie.**

3

Shortlisted Candidates?
- Candidates must verify their eligibility by going to
- **www.gov.ie** and enter **JobsPlus** in the search bar to register. Eligible candidates will receive confirmation and a JP1 form for you to complete.

4

Found your new employee? Then just tell us.
- Return the JP1 form to the JobsPlus Team.

5

And we do the rest!
- Your new employee must close their jobseekers claim before starting work for the Jobsplus payment to be made.
- Payments to your company will be made by Electronic Fund Transfer (EFT) monthly in arrears, over a two year period, whilst the employee remains in your employment.

— the employers must be compliant with Irish tax and employment laws. Employers are asked to give an officer of the DEASP permission to check their status with Revenue and to obtain a tax clearance certificate using Revenue's online service;

— the employers must offer full-time employment of over 30 hours per week, spanning at least four days per week. The eligible employee must be on payroll and subject to PAYE and Pay Related Social Insurance (PRSI); and

— the employers must give details of their workforce prior to application. Where an increase in the work force is not evident, employers are asked to provide additional information to the Department to support the application.

An employer who decides to recruit an additional employee must provide basic information such as the name of company, size of workforce, bank details and economic sector through an online application form. The employer must also provide permission for the Department to check tax clearance certificates online. The Department reviews the application, verifies the data and checks the tax clearance certificate. If in order, the employer receives a confirmation e-mail. The employers can proceed with recruitment once eligibility confirmation from the Department is received.

After eligibility has been checked, the jobseeker completes the JobsPlus1 form and sign a declaration (part A). This is forwarded to prospective employers outlining the incentive that comes with hiring that person. On successfully securing employment, the employer completes part B and returns the form to the Department (having registered at www.jobsplus.ie).

6 Data and sample selection

6.1 The data

Data used for the analysis is taken from the Jobseekers Longitudinal Dataset (JLD), an administrative database managed by the DEASP. The database tracks social welfare claims, activation, training, and employment histories over time, covering individuals with jobseeker or one parent family claims since 2004. It draws together payment and administrative data from the DEASP – largely, but not limited to, the payments that comprise the Live Register – as well as data from the SOLAS and the Revenue Commissioners. It has its origins in efforts to make best use of the sizeable volume of data collected or generated by the Department and to structure the recording of episodes of unemployment and training in a meaningful way.

The data is structured in a way that bears some relation to a panel dataset but with important distinctions. To reflect the individual experience of employment and unemployment, the data are re-arranged as a series of episodes, with one episode beginning when the person begins a spell of unemployment and ending when the person moves to employment or another activation or training programme. Importantly, the beginning of an unemployment spell coincides with the time an individual starts claiming unemployment-related benefits, namely Jobseekers Benefit and Jobseekers Allowance.

The next episode begins when the person's status changes again. In this way, JLD data differs from panel data since observations are not recorded at a fixed point in time but at points of transition from one status to another. One of the advantages of restructuring the administrative data of the Department in this way is that it retains some element of the individual's experience of unemployment. When a client of the DEASP moves from Jobseekers Benefit to Jobseekers Allowance, this change of status is treated as an exit from the former and an entry to the latter on the Live Register. In the JLD, contiguous periods on Jobseekers Benefit and Jobseekers Allowance can be linked and represented as one episode of unemployment, which is arguably a better representation of the experience of the absence of work, regardless of whether it is on a social insurance or social assistance programme of income support.

Jobseekers Benefit is a weekly payment from the DEASP to people who are out of work, who are fully unemployed or are in part-time employment because their working week was reduced by the employer. It is applicable to jobseekers who have paid pay-related social insurance (PRSI) at the appropriate class and who have sufficient contributions in the relevant tax year and have a total of 104 contributions paid. Jobseeker's Allowance is a means-tested payment made to jobseekers who are unemployed and do not qualify for Jobseeker's Benefit or whose entitlement to Jobseeker's Benefit has expired.

For the purposes of the analysis, the JLD has been enhanced with social insurance contributions and earnings data.[3] These data are collected on behalf of the DEASP for the purposes of administering the Social Insurance Fund.

The full database consists of 11,185,001 episodes for 1,805,084 individuals from January 2004 to April 2018. Each episode has a start and an end date, and an operational code allowing to identify the state of an individual during time-span corresponding to the spell. There are more than 250 different codes in the original database, each of them corresponding to a different combination of activation/training activities, welfare claims, and time spent in employment. It is also important to stress that episodes defined this way can overlap in time. Additional information is also available at individual level, including gender, date of birth, county where claims are made, and the last recorded occupation.

For individuals who participated in JobsPlus, DEASP also provided a separate monitoring database, linkable to the JLD using individual identifiers, containing treatment-specific information, including: i) JobsPlus start/end dates ; ii) the number of days on the Live Register at the beginning of JobsPlus, i.e. the recorded eligiblity count; and iii) the treatment type (12/18 and 24/30).

6.2 Selection of the treatment group

For the purpose of this analysis, individual episodes in the JLD have been aggregated using their operational codes, into two mutually exclusive categories: "eligibility" and "non-eligibility" episodes. Eligibility episodes are those that count towards eligibility according to the JobsPlus rules, i.e. Live Register episodes corresponding

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[3]Annual earnings are defined as total taxable earnings, or gross earnings less employee contributions to health insurance, superannuation (including contributions to the spouse's scheme, additional voluntary contributions, purchased notional service), the pension levy, union subscriptions, and the travel pass scheme.

to jobseekers payments. After having re-classified episodes and solved overlapping issues, individual labour market histories have been re-arranged in an individual-level monthly panel dataset containing information for each individual i in each month m from January 2004 to April 2018 about the number of days spent in eligibility episodes, according to the two eligibility criteria. This allows us to re-construct the eligibility condition, each month we count backward 18 (30) months and check if i accrued 12 (24) months on the Live Register. A month is counted as valid for the eligibility condition if in that month the number of days spent in the eligibility condition is higher than 15.[4]

We then check if the eligibility computed ex-post at the time of transition into JobsPlus, matches the eligibility recorded in the administrative database. To this aim we link the information contained in the JobsPlus monitoring database for treated units to the monthly panel dataset derived from JLD. The results of this check are summarised in Figure 7. Reassuringly, the ex-post computed and the recorded eligibility coincide in the vast majority of cases – 11,914 out of the 14,838 treated individuals in the monitoring database. This is to say treated units for whom the recorded number of days on the Live Register is between 312 and 623 (more than 624) and the ex-post computed eligibility is equal to 12 months over 18 (24 months over 30).

Figure 7: Eligibility: Computed (CE) vs Recorded (RE)
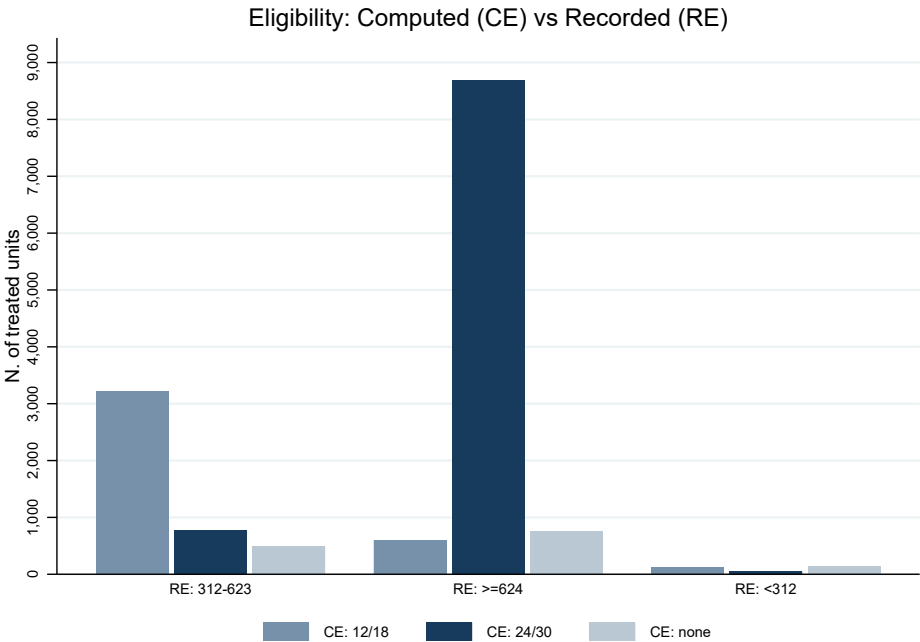
Note: The computed eligibility (CE) is obtained using only information from the JLD database, counting backward the time spent in eligibility episodes in the 18 (30) months before the time of transition into JobsPlus. Recorded eligibility (RE) is the information provided in the monitoring database

The treated units to be considered for analysis are selected according to the following procedure.

— The first step of the sample selection is to exclude from the group of treated individuals those for whom the recorded eligibility does not match the one computed ex-post. The rationale for this selection is that the computed eligibility is the key criteria used to identify individuals in the control group.

— As second step, since the objective of the analysis is to measure the impact of the policy after the end of the subsidy, we also exclude from the treatment group individuals who started JobsPlus after April 2016, i.e. those who can be observed for less than the full duration of the subsidy.

Figure 8 shows the cumulative distribution of the number of months available after the end of the subsidy. The proportion of individuals who can be observed for at least one month after the end of the full subsidy is roughly 60% in the 24/30 group, and 75% in the 12/18 group. For earlier participants, we can observe labour market outcomes for almost three years, whereas the observation window for later starters is much reduced.

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[4]In the vast majority of cases, the number of days spent in the eligibility condition is equal to 30.

Figure 8: Months available after JP
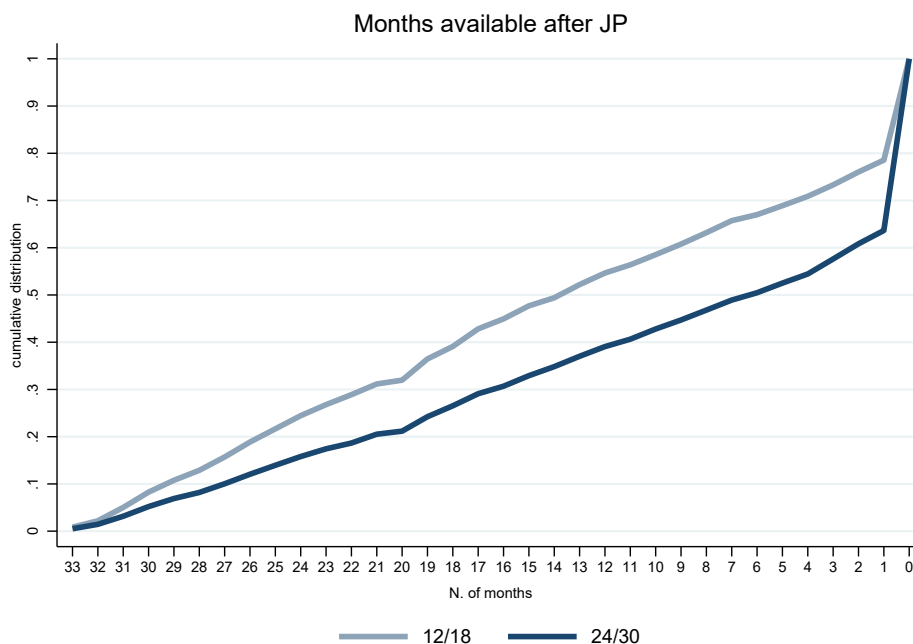
Note: Number of months observable after the end of the full subsidy (24 months) - cumulative distribution for the two treatment groups

For the 7,967 treated individuals under analysis, the information contained in the monthly panel dataset has been subsequently used to determine the month of entry in the eligibility condition. The time elapsed between the entry in eligibility and the start of JobsPlus is another important element to consider.

— We finally exclude from the sample those individuals for whom the distance, in months, between entry in eligibility and exit to JobsPlus is higher than 100.

The cumulative distribution of this distance is shown in Figure 9. The lighter blue curve shows the distribution for those who started JobsPlus on the basis of being eligible for 12 of the previous 18 months, while the darker blue curve shows the distribution for those who started JobsPlus on the basis of being eligible for 24 of the previous 30 months. It is evident that for individuals in the 12/18 group the transition between eligibility and JobsPlus happens much faster than for those in the 24/30 group. After one year in eligibility, roughly 90% of the individuals in the 12/18 group start working under the JobsPlus subsidy, while for the 24/30 group, this transition from eligibility to JobsPlus work happens for only 15% of the individuals. This means that individuals in the 12/18 group started JobsPlus so fairly quickly after reaching eligibility, while individuals in the 24/30 group started JobsPlus a long time after the beginning of their prior eligibility episode.

The JobsPlus incentive is slightly higher for the 24/30 month group (€10,000 rather than €7,500). In the case of those nearing eligibility for the higher rate, waiting for the incentive may have affected the take-up rate for the 12/18 months variant. However, if waiting for the higher incentive was the main reason for individuals starting JobsPlus based on 24/30 months instead of 12/18 months eligibility, we would expect most to have commenced JobsPlus within 24 months, but this is not the case. The distance between the entry in eligibility and the JobsPlus start was three years for approximately half of those individuals. This may reflect the greater difficulty associated with finding employment after a long period of unemployment. To take up JobsPlus, an individual has to both qualify and find a job, which gets harder as unemployment duration increases.
In the following two figures, the sample of treated units selected for the analysis is represented.

Figure 10 shows the JobsPlus starting months between August 2013 and April 2016, separately for the two treatment groups. The total participation has remained fairly flat but there is considerable variability between months. Some of this may be seasonal; communication initiatives may also have had an impact. Over the time period, the numbers starting based on 24/30 months eligibility have risen, while those based on 12/18 months eligibility have fallen. Over the same time period, the size and composition of the Live Register changed. The number of those on the Live Register for one year or more fell by 43%. Of those on the Live Register for one

Figure 9: Distance between month of inflow in eligibility and beginning of JobsPlus

Distance between inflow and JP start
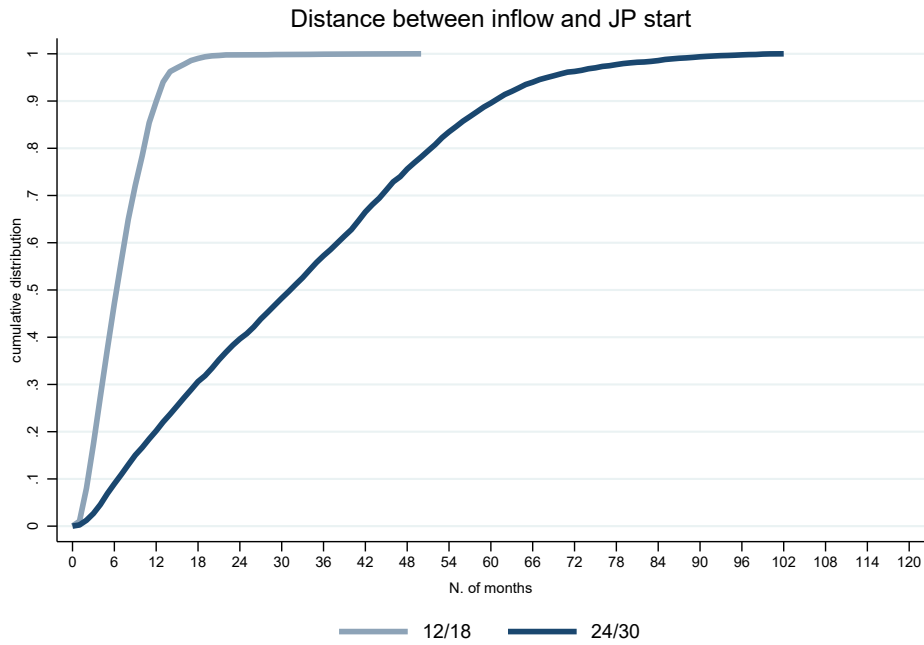
Note: Cumulative distribution for the two treatment groups

year or more, 58% were on it for 3 years or more in August 2017 and in April 2016.

The plot in Figure 11 shows the age-sex composition of the treated individuals, separately for the two treatment groups. The figure reflects the breakdown on the Live Register, with many more men than women on the Live Register for more than one year.

Figure 10: Distribution of the JobsPlus starting month

JP starting month
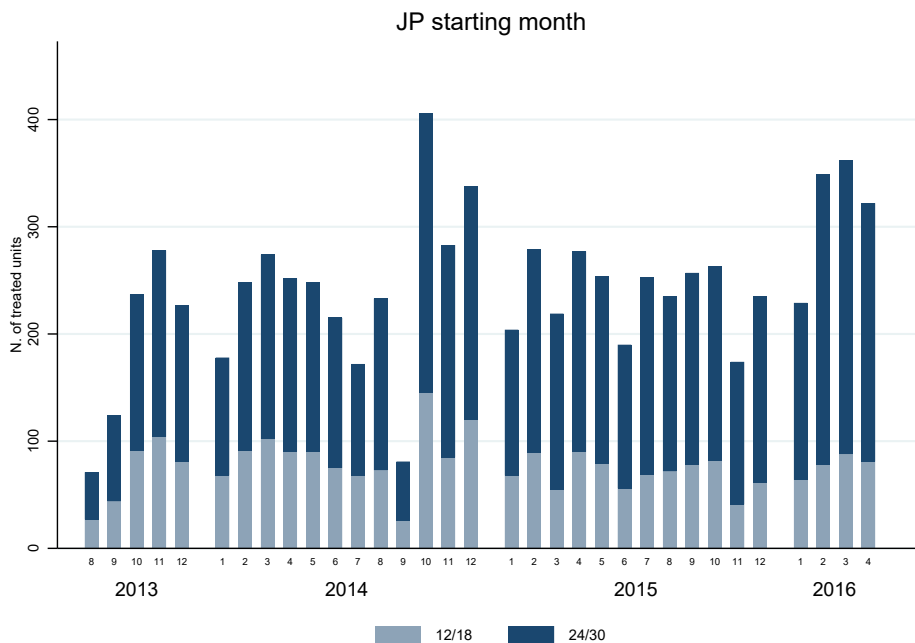
Figure 11: Age-sex composition of the treatment group
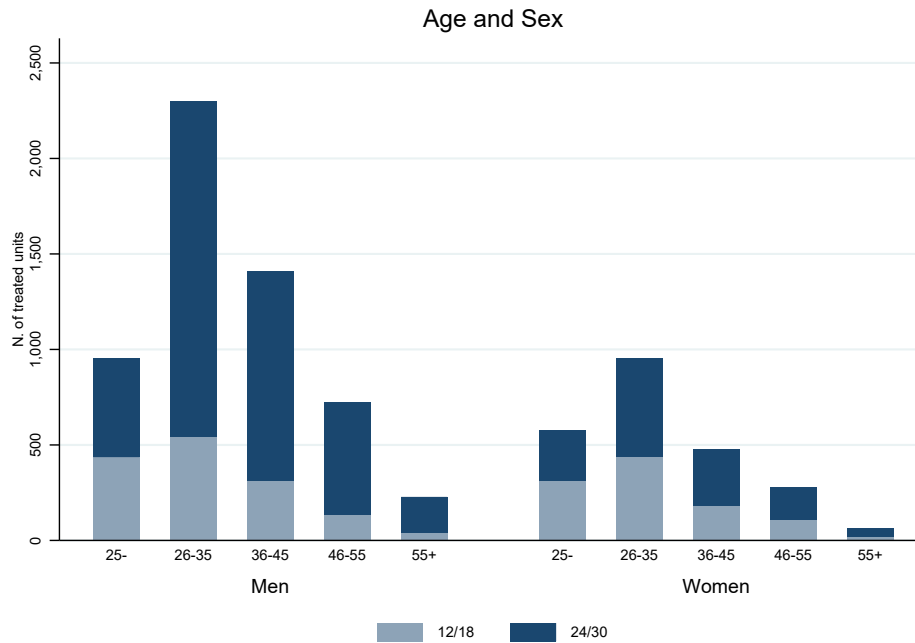
7 The evaluation framework

7.1 Background literature

Employment incentives or subsidies of similar type as JobsPlus have been widely investigated in the empirical literature to assess their impact on labour market prospects of unemployed both in terms of probability of finding a job and in terms of duration and stability of the new jobs. The evaluation of specific programmes of employment subsidies normally consider both private and public sector types of subsidy, targeted at different categories of unemployed such as young and long-term unemployed.

Based on meta-analysis of evaluations of active labour market policies (ALMP) carried between 1995 and 2007, Card et al. (2010) report that public sector employment programmes are relatively ineffective, with respect to other types of policies, such as job search assistance programmes and training programmes. Job search assistance programmes have generally favorable impacts, especially in the short run, while training, including classroom and on-the-job programmes, have more positive relative impacts after two years. These patterns emerge from an overview of different types of outcome such as employment probability, unemployment/employment duration and earnings.

This picture is confirmed also in the more recent meta-analysis performed by Card et al. (2018), where they point out that public sector employment subsidies tend to have small or even negative average impacts both in the short and the long run. Considering also possible heterogeneous effects from a wider sample of ALMP evaluations, they illustrate that ALMPs effects tend to be larger for females and participants drawn from the pool of long-term unemployed. This is valid especially for private sector employment subsidies.

From a methodological point of view, the studies that evaluate specific programmes of employment subsidies follow counterfactual approaches mainly based on Matching and Difference-in-Differences (DiD). Among the recent empirical works applying a Matching approach, there are Bellmann et al. (2018); Caliendo and Künn (2015); Caliendo et al. (2016); Deidda et al. (2015). Only few studies apply instrumental variables approaches [Eppel (2017); Saniter and Siedler (2014), among others]. Conversely, DiD method is more largely adopted and it is worth to mention Cammeraat et al. (2017); Kaiser and Kuhn (2016); Sestito and Viviano (2016).

In terms of the estimated impact, the evidence on subsidies is quite mixed if one considers programmes targeted specifically at long-term unemployed, such as JobsPlus. Forslund et al. (2004) analyse a programme of employment subsidy corresponding to 75% of total wage costs for 6 months and to 25% for another 18 months. This programmes was implemented in Sweden starting from 1998 and targeted the long-term unemployed registered at the PES as unemployed for at least 36 months (24 months from 2000). They rely on

exact covariate matching in a dynamic setting, accounting for all factors that jointly determine participation and outcome of participation. They also exploit variations in programme participation caused by budget cut-backs and changes to funding to apply instrumental variables methods in order to tackle selection issues. They show that the programme had a positive treatment effect for the participants and also point out that subsidised jobs in the private sector have larger dead-weight and substitution effects than other programmes. This evidence for the private sector is shown also by Calmfors and Hemstrom (2001); Martin and Grubb (2001).

The differential impact of job subsidies for long-term unemployed and other programmes for unemployed adults(such as labour market training, work experience programmes, public relief work, and trainee replacement) is the focus of the analysis carried out in Sianesi (2008) on the Swedish labor market. She makes use of a dynamic setting to estimate the effect of joining a programme compared to joining an alternative one, as well as compared to waiting longer in open unemployment. She shows that job subsidies perform better than the other available programmes both in terms of employment probabilities and in terms of benefit collection probability. Recipients are indeed significantly more likely to be in employment and less likely to be on unemployment benefits over time than participants of other programmes.

Following the same approach, Hujer and Thomsen (2010) evaluate a German Job Creation Scheme consisting of subsidised work for individuals having been long-term unemployed (more than one year) or unemployed for at least six out of the last 12 months prior to programme. Focusing on years 2000 and 2001, they show that the wage subsidies (30 to 75% of the worker's salary) in general do not prove to be effective for recipients in terms of improvement of the labour market situation, with less favorable employment chances in East Germany due to participation even 30 months after the start of programmes.

Other examples of evaluation of subsidies will be discussed in the following sections, while presenting different options of evaluation strategies.

7.2 The evaluation problem

The objective of this evaluation is to investigate whether JobsPlus improved the employment prospects of long-term unemployed individuals after the subsidy period. Identifying the causal relationship between the intervention and individual outcomes crucially depends on solving the endogeneity bias issue stemming from selection in the treatment.

In the potential outcomes framework based on the work by Rubin (1973a,b, 1974, 1977), the effect we are interested in is defined as follows:

$$
\begin{aligned}
ATT_{t+h} &= E[Y_i^{t+h}(1) - Y_i^{t+h}(0)|W_i = 1] \\
&= E[Y_i^{t+h}(1)|W_i = 1] - E[Y_i^{t+h}(0)|W_i = 1]
\end{aligned}
\tag{1}
$$

The Average Treatment Effect on the Treated (ATT) measures the average effect of the programme on those who participate. In the above equation $Y_i^{t+h}(1)$ is the generic potential outcome Y for individual i measured h months after the beginning of the subsidy in the actual scenario where the programme is in place. $Y_i^{t+h}(0)$ is its counterpart in the counterfactual scenario where the programme is not in place. $W_i = 1$ simply indicates that individual i participates in the programme. Conditioning on $W_i = 1$ means that the effect is estimated on the subgroup of treated individuals.

The fundamental problem of policy evaluation is that only one of these two scenario is observable in reality, i.e. the one in which the programme is in place. As a consequence, the quantity $E[Y_i^{t+h}(0)|W_i = 1]$, i.e. the average counterfactual outcome of participants in the absence of the programme, is not observable. If participation in the programme was randomly assigned, one could solve this "missing information" problem estimating the average outcome of participants by simply observing the average outcome of non-participants.[5]

In the context of JobsPlus, participation in the programme is far from being randomly assigned. The main challenge is that participation in JobsPlus is contingent on receiving a job offer, and eligible individuals who receive a job offer are not a random sample of the pool of long-term unemployed. One possible way to solve this selection problem is to isolate, among eligible non-participants, a subset of individuals who would have had, on average, the same probability of getting a job as treated individuals, had the subsidy not been in place.

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[5]If the treatment is randomly assigned the equation for the ATT reduces to $E[Y_i^{t+h}(1)|W_i = 1] - E[Y_i^{t+h}(0)|W_i = 0]$

In the evaluation literature this aspect is commonly referred to as "double selection issue". As illustrated by Schünemann et al. (2015), differently from training or job search assistance programmes, wage subsidies cannot be mandated, since they require the willingness of an employer to hire a subsidised worker.

For policy or programmes consisting of wage subsidies or hiring incentives, the policy-makers can only provide the option of granting this support, while actual take-up is the outcome of decisions that can only be influenced to some degree. This depends in the final instance by the fact that an unemployed individual could find a job in a firm eligible for the subsidy. In practice, in order to be able to benefit from the subsidy (selection into the treatment), the unemployed person will first have to be selected for the job (selection into employment).

We rely on matching approaches. These allow to deliver estimates of the ATT using matched treated and controls individuals, on the basis of the *unconfoundedness*[6] assumption. This requires that, given a set of observable characteristics X, participation is as good as randomly assigned. Under this assumption, the selection process that influences participation and potential outcomes is solely based on the observable characteristics in X:

$$E[Y_i^{t+h}(0)|W_i = 1, X] = E[Y_i^{t+h}(0)|W_i = 0, X] \tag{2}$$

The purest matching estimator is the one based on exact matching in which each treated individual is matched to one or more controls having exactly the same characteristics: if i is a treated unit, j is her match, and X contains K characterstics, then $x1_i = x1_j, x2_i = x2_j, ..., x1_K = x1_K$. Intuitively, the credibility of the *unconfoundedness* assumption crucially depends on the richness of information set in X. However, the downside of high dimensionality is that the likelihood of exact matches dramatically decreases with the dimension of X, and with the presence of continuous-valued characteristics.

This dimensionality problem can be solved using a *balancing score* $b(X)$, defined as *'a function of the observed covariates X such that the conditional distribution of X given $b(X)$ is the same in the treated and control units'* by Rosenbaum and Rubin (1983). They show that if unconfoundedness holds conditioning on X, it also holds conditioning on $b(X)$. The most common balancing score is the Propensity Score widely used in observational studies. Given $b(X)$, matched control units can be chosen using either exact matching, or nearest-neighbor using a distance measure D in the balancing scores metrics, e.g. the Euclidean distance.[7] Once each treated unit is matched with her best control(s), the ATT can be simply estimated with mean differences between the outcomes observed in the treated and control group.

In this study we estimate the ATT at different points in time after the end of the subsidy. We implement a combination of exact matching, and nearest-neighbor matching within cells using a long sequence of pre-treatment unemployment benefits. The nearest-neighbor component of our matching strategy builds on the work by Barban et al. (2017). As it will be described in the next section, the authors propose an extension of nearest neighbor matching estimators based on dissimilarities between sequences. These are measured by means of Optimal Matching Algorithm, a tool commonly used in sequence analysis. The use of this technique, non-standard in the evaluation literature, allows us to fully exploit the entire structure of pre-treatment individual trajectories.

7.3 Sequence Analysis and Optimal Matching Algorithm

The Optimal Matching Algorithm (OMA hereafter) method can be used to measure the dissimilarity between two different sequences. From a pure methodological perspective, an individual sequence is a string containing a finite number of characters, each representing the 'state' of an individual in a given moment in time. The OMA standard approach is used in sequence analysis, a stream of the sociological literature dealing with life-course studies in which the sequence, conceived as the representation of a longitudinal process by a series of states, is the object of primary interest.

To define a sequence two main elements are needed: i) the sequence length and its spacing (for instance, a 24-month monthly sequence); ii) the so-called state-space, i.e. a full list of states of the world mutually exclusive in time. In the OMA the distance between two sequences is defined as the cost associated to the edit operations required to transform the original sequences and make them identical. There are two separate types of edit operations that can be performed on sequences in the OMA framework: i) insertion/deletion operations in which a state is inserted or deleted in a specific portion of the sequence; ii) substitution operations in which a state is replaced by another. In order to derive a distance metric, specific costs must be assigned to each type of operation. This choice is generally justified on theoretical and empirical grounds and heavily depends

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[6]Or, alternatively, *selection on observables, conditional independence, ignorable treatment assignment.*

[7]Another common way to use balancing scores is to weight observations using functions of $b(X)$, typically kernel functions.

on the object of study. The method, originally developed in the field of information theory, was introduced in sequence analysis by Abbott (1995). In the context of sequence analysis, the distance is commonly used to group sequences into clusters based on their similarity, and identify patterns of life-course trajectories.

Barban et al. (2017) are the first to combine sequence analysis techniques with causal inference in an observational study. They propose a new matching approach to investigate the effect of the age at retirement on subsequent health outcomes. More specifically, they develop a nearest-neighbor matching estimator based on OM-computed distances using pre-retirement health trajectories. The core idea is that the entire structure of the pre-treatment (pre-retirement) trajectory, including the timing and sequencing of states, is informative about the decision to retire at a specific age, hence it provides a better way to mitigate issues of self-selection into the treatment.

The empirical approach in this analysis builds on the one proposed by Barban et al. (2017). More specifically, we match JobsPlus participants with eligible non-participants by means of exact matching and OMA, using their pre-JobsPlus sequence of unemployment-related benefits. We use this information also to identify the month of entry in eligibility. This is based on having received unemployment benefits i) for at least 12 months in the previous 18 months (€7,500 grant), or ii) for at least 24 months in the previous 30 months (€10,000 grant).

Since eligible non-participants have, by definition, no JobsPlus starting date, this type of information cannot be used to match individuals. Hence, we first group all individuals in the sample (of treated and potential controls) in cells defined by the month in which they become eligible for the subsidy. We select only those potential controls who enter the eligibility condition (separately for the two treatments) in a month corresponding to the entry of at least one treated individual.

Having constructed cells of treated and control units in this way, in each cell there might be more than one treated unit, with potentially different JobsPlus starting date. Suppose that in cell c there are N treated units with $K(<N)$ different JobsPlus starting dates. We create K 'copies' of each non-participant, and assign to each copy the Kth starting date.[8] Importantly, creating K copies of non-participants ensures that sampling of control units is done with replacement. This allows that in each cell each treated unit will have a match, i.e. a control unit with the same month of entry in the eligibility condition and the same imputed JobsPlus starting date.

Once each unit in the sample has a JobsPlus starting date, we construct individual sequences representing monthly individuals' trajectories in the 48 months before the beginning of JobsPlus. The same information used to compute eligibility is used to define mutually exclusive states: each month individual i can either receive or not receive unemployment related benefits. This binary classification produces sequences of the type '...0000001111001...', and mirrors the distinction between Live Register and non-Live Register episodes.

Receiving or not unemployment benefits is, therefore, the main information our matching approach builds on. Since individuals on unemployment related benefits are allowed to work, embedding this information too would provide a better characterization of the past working history of individuals. Unfortunately, information on earnings and weeks worked is only available on annual basis, and employment spells are imprecisely recorded in the original database.[9] To circumvent this issue, we exploit the information available on the annual number of weeks worked in the 4 years preceding the beginning of JobsPlus, and perform an exact match before applying OM. More specifically, we first classify the number of weeks worked each year in a 4-class category: $wks_{it-j} = \{0, 1-26, 27-51, 52\}$.[10] We then match exactly participants and non-participants within cells defined by: i) month of entry in eligibility; ii) JobsPlus starting month; iii) wks_{it-j} for each j in $\{1, 2, 3, 4\}$.

Finally, we perform the OMA within these same cells. We set substitution cost to 1 and insert/delete cost to 2.[11] Each treated unit is matched with the control units having the closest sequence, i.e. the sequence with the lowest overall cost of transformation. Denote with i the generic treated unit, and with j the generic control

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[8]This is different from what has been done in other studies based on matching estimators where non-participants are given a random starting date.

[9]Start/end dates do not provide an accurate representation of the true spell, and, more importantly, entire spells might be not recorded. See the following section on data limitations for more details.

[10]This classification is driven by the fact that the empirical distribution of weeks worked is bimodal with mass points at 0 and 52, and an almost-uniform distribution in the middle.

[11]This choice is driven by a number of reasons. We only consider two mutually exclusive states, hence any data-driven substitution cost (as suggested by Piccarreta and Billari, 2007) would produce the same result. What really matters in our analysis is the relative cost between the two types of operations. Since the analysed sequences are of equal length, and by construction all eligible non-participants exhibit both states in their sequences, we follow the advice in Aisenbrey and Fasang (2010) and assign a high cost to indel operations compared to substitutions. We performed several sensitivity checks using alternative cost schemes. The results are virtually identical. This is most likely due to the simple state-space definition, and the fact that both treated and controls exhibit by construction both states in some portions of their sequences.

unit matched with i using the proposed matching approach. If i is matched with more than one control unit, it implies that there are N_i individuals with the same closest sequence. The ATT measured h months after the beginning of JobsPlus is computed as:

$$\frac{1}{N_T} \sum_{i \in W=1} [w_i \cdot y_{1,i}^{t+h} - \sum_j w_{i,j} \cdot y_{0,j}^{t+h}]$$

(3)

In the above formula N_t is the total number of treated units, $y_{1,i}^{t+h}$ and $y_{0,j}^{t+h}$ are, respectively, the outcome of the treated unit i measured h months after the beginning of JobsPlus, and the outcome of the matched control j. $w_i = 1/D_i$ is the weight of unit i, and is an inverse function of the distance between her sequence and that of the matched controls. $w_{i,j} = 1/(N_i \cdot D_i)$ is the weight of j and also takes into account the fact the N_i controls are matched with unit i.

Three different outcomes are considered in the analysis. The first, measured on a monthly basis, is the probability of receiving unemployment related benefits. The other two are annual measures of the number of weeks worked and earnings from employment. All outcomes are measured starting from the first month of JobsPlus. The effect induced by JobsPlus on these outcome variables can be evaluated at the end of the programme, i.e. after the 24 months of JobsPlus duration.

8   Results

In this section the main results of the analysis are presented separately for the two treatment types: €7,500 grant for the 12/18 months eligibility group and €10,000 grant for the 24/30 group, and for the three outcomes considered: the probability of receiving unemployment-related benefits measured on monthly basis, annual weeks worked and annual earnings.

The unmatched control sample

The first evidence below in Figure 12 shows the results obtained using the unmatched sample. More specifically, the control group corresponds to the entire set of non-participants who enter the eligibility condition in a month equal to at least one treated unit. As such, the control group is already selected over one of the dimensions entering the matching design explained earlier. Importantly, controls are not matched using the set of pre-treatment outcomes.
Figures suggest that treated and non-treated individuals with a similar unemployment continuity exhibit a different trend in the probability of being on the Live Register before and after JobsPlus. It is interesting to highlight that this is even more marked for those longer-term unemployed. In both panels of Figure 12 there is a decrease in the y variable in proximity to a JobsPlus start.

These differences indicate that treated and controls are not comparable directly, because they might differ for some characteristics in addition to JobsPlus participation. The matching procedure helps to cope with this issue by identifying a proper control group for treated individuals, accounting for some observable characteristics.

8.1   Overall results

The average difference between individuals who benefited of the JobsPlus 12/18 treatment and the respective controls on the probability of receiving unemployment-related benefits is plotted in Figure 13. The horizontal axis represents the distance in months from the JobsPlus starting date. It is worth highlighting that individuals treated by JobsPlus are less likely to be back on the Live Register in the 24 months after the commencement of the programme. The three lines distinguish between those observed only for 24 months after JobsPlus start(solid line), those observed for 36 months (dashed line) and those observed for 48 months (dotted line).

Overall, results show that the differences tend to decrease over time, even though a statistically significant effect is still found after 48 months. Interestingly, the result is similar also for the 24/30 treatment, as shown in Figure 14, albeit less marked. Moreover, for those individuals that were long-term unemployed the lines appear steeper, suggesting that the gap in the probability of returning to the Live Register narrows more quickly than in the other case. In terms of magnitude (Tables 1 and 2), the effect decreases over time and is higher for those observed for four years. On average, two years after the JobsPlus start date, treated individuals (JobsPlus 24/30) have a lower probability to be on the Live Register of about 0.21 percentage points respect to their matched controls. The effect is similar for those receiving JobsPlus 12/18, but the reduction over time is less pronounced.

Figure 12: Average difference between treated and controls in the probability of receiving unemployment-related benefits.
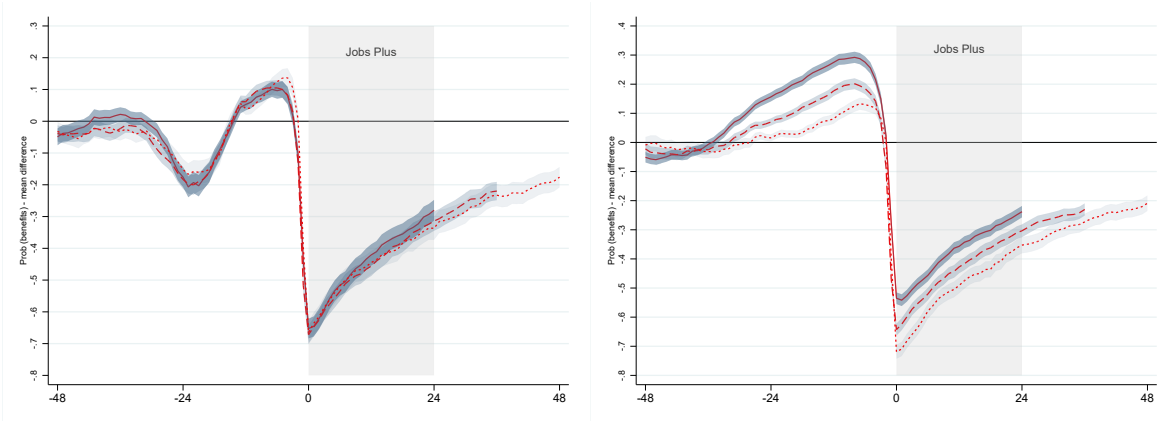
The x axis represents the monthly timeline centered on the beginning of JobsPlus. The left panel refers to the treatment 12/18, the right panel to the treatment 24/30. The solid, dashed, and dotted lines refer to individuals observable for, respectively, 24-35, 36-47, and more than 48 months after the beginning of JobsPlus

Table 1: Average difference between treated and controls in the probability of receiving unemployment-related benefits: 12/18 group

ys avail.	N treated	1y. after JP-start			2y. after JP-start			3y. after JP-start			4y. after JP-start		
		T	C	Diff.	T	C	Diff.	T	C	Diff.	T	C	Diff.
2	846	.075	.366	-.292***	.098	.282	-.184***						
3	980	.059	.354	-.294***	.094	.29	-.196***	.086	.234	-.148***			
4	696	.076	.419	-.343***	.084	.346	-.262***	.093	.259	-.166***	.085	.196	-.111***

Notes: The results are presented separately for individuals whose trajectory can be observed for 2,3, and 4 years after the beginning of JobsPlus (column 1 in the table). T and C indicate, respectively, Treated and Controls.
*, **, and *** denote significance at the 10, 5, and 1 percent level,respectively.

Table 2: Average difference between treated and controls in the probability of receiving unemployment-related benefits: 24/30 group

ys avail.	N treated	1y. after JP-start			2y. after JP-start			3y. after JP-start			4y. after JP-start		
		T	C	Diff.	T	C	Diff.	T	C	Diff.	T	C	Diff.
2	2257	.111	.429	-.318***	.132	.348	-.216***						
3	1964	.135	.427	-.291***	.144	.357	-.213***	.125	.292	-.167***			
4	1181	.15	.527	-.377***	.181	.451	-.27***	.161	.36	-.199***	.129	.293	-.164***

Notes: The results are presented separately for individuals whose trajectory can be observed for 2,3, and 4 years after the beginning of JobsPlus (column 1 in the table). T and C indicate, respectively, Treated and Controls.
*, **, and *** denote significance at the 10, 5, and 1 percent level,respectively.

Analogously, Figures 15 and 16 and Tables 3 and 4 show the average difference between treated and controls in terms of weeks worked. In this case, the time elapsed since JobsPlus start is expressed in years due to a different structure of the dataset. Once more, the difference is greater for those receiving the treatment 24/30. The effect is decreasing over time and it is higher for those that are observed up to four years after JobsPlus start. For the latter, the difference ranges from a maximum of 22 weeks one year after JobsPlus start, to a minimum of 13 weeks three years after.

Figure 13: Average difference between treated and controls in the probability of receiving unemployment-related benefits: 24/30 group.
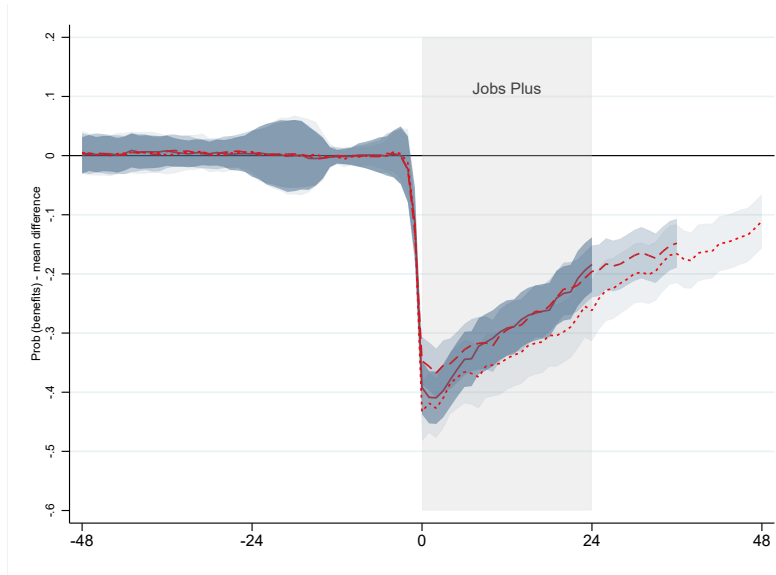
The x axis represents the monthly timeline centered on the beginning of JobsPlus.The solid, dashed, and dotted lines refer to individuals observable for, respectively, 24-35, 36-47, and more than 48 months after the beginning of JobsPlus.

Figure 15: Average difference between treated and controls in the number of annual weeks worked: 12/18 group.
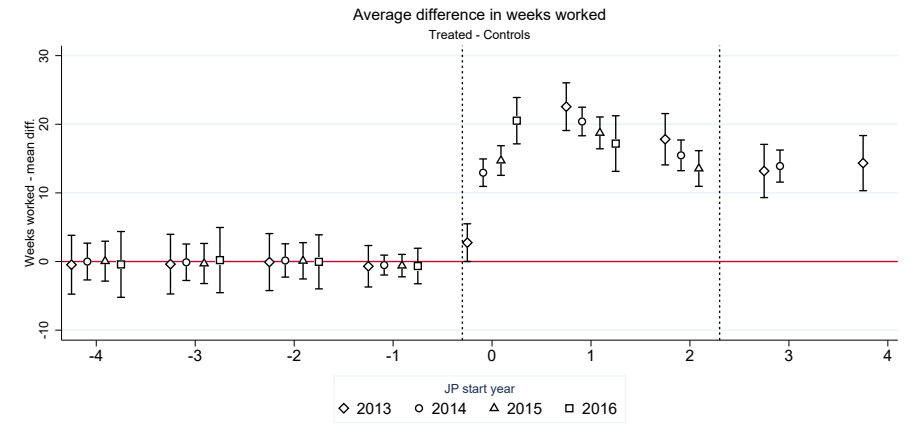
Note: The x axis represents the yearly timeline centered on the beginning of JobsPlus.

Figure 14: Average difference between treated and controls in the probability of receiving unemployment-related benefits: 24/30 group.
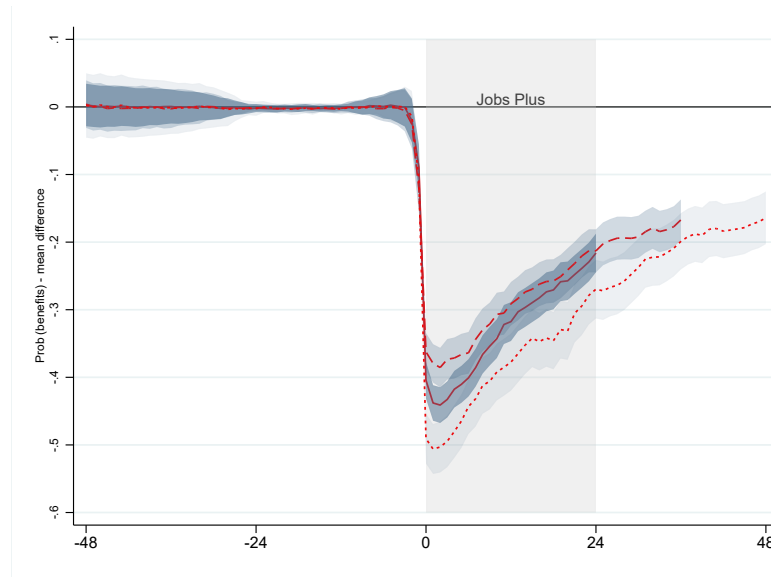
The x axis represents the monthly timeline centered on the beginning of JobsPlus.The solid, dashed, and dotted lines refer to individuals observable for, respectively, 24-35, 36-47, and more than 48 months after the beginning of JobsPlus.

Figure 16: Average difference between treated and controls in the number of annual weeks worked: 24/30 group.

Note: The x axis represents the yearly timeline centered on the beginning of JobsPlus.

Table 3: Average difference between treated and controls in the annual number of weeks worked: 12/18 group

		1y. after JP-start			2y. after JP-start			3y. after JP-start			4y. after JP-start		
ys avail.	N treated	T	C	Diff.	T	C	Diff.	T	C	Diff.	T	C	Diff.
1	311	42.896	25.711	17.186***									
2	835	45.526	26.781	18.745***	41.095	27.54	13.554***						
3	1030	46.566	26.162	20.404***	44.198	28.726	15.472***	42.382	28.477	13.906***			
4	346	46.533	23.97	22.563***	44.639	26.821	17.818***	42.499	29.307	13.191***	42.174	27.833	14.34***

Notes: The results are presented separately for individuals whose trajectory can be observed for 1,2,3, and 4 years after the beginning of JobsPlus (column 1 in the table). T and C indicate, respectively, Treated and Controls.
*, **, and *** denote significance at the 10, 5, and 1 percent level,respectively.

Table 4: Average difference between treated and controls in the annual number of weeks worked: 24/30 group

ys avail.	N treated	1y. after JP-start			2y. after JP-start			3y. after JP-start			4y. after JP-start		
		T	C	Diff.	T	C	Diff.	T	C	Diff.	T	C	Diff.
1	946	42.815	22.354	20.46***									
2	1984	44.854	23.142	21.713***	41.586	22.569	19.017***						
3	1888	43.804	21.707	22.097***	42.104	24.048	18.056***	39.922	23.127	16.795***			
4	584	43.974	18.366	25.607***	41.487	20.802	20.685***	40.676	23.666	17.01***	39.681	23.008	16.673***

Notes: The results are presented separately for individuals whose trajectory can be observed for 1,2,3, and 4 years after the beginning of JobsPlus (column 1 in the table). T and C indicate, respectively, Treated and Controls.
*, **, and *** denote significance at the 10, 5, and 1 percent level,respectively.

Reassuringly, the previous findings are also confirmed when the effect is assessed in terms of earnings from employment. Figures 17 and 18 show that treated individuals exhibit higher earnings from employment with respect to the controls after the inception of JobsPlus. This is confirmed for both types of JobsPlus treatments and, as showed in tables 5 and 6, it is higher for those receiving the 24/30 subsidy.

Namely, a long-term unemployed person who has been on the Live Register for at least 24 months in the past 30 months and enters JobsPlus with the larger subsidy, could benefit, three years after she has started the programme, of earnings on average higher of about €10700 with respect to her controls.

Figure 17: Average difference between treated and controls in the number of annual earnings: 12/18 group.

Note: The x axis represents the yearly timeline centered on the beginning of JobsPlus.

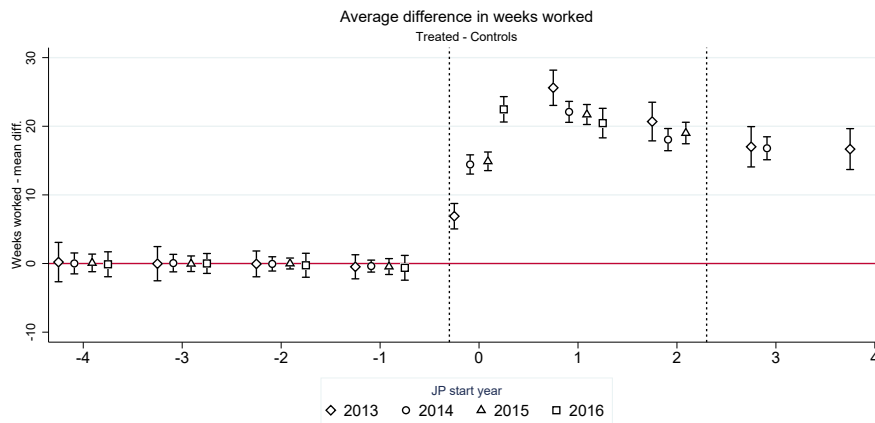**Figure 18:** Average difference between treated and controls in the number of annual earnings: 24/30 group.
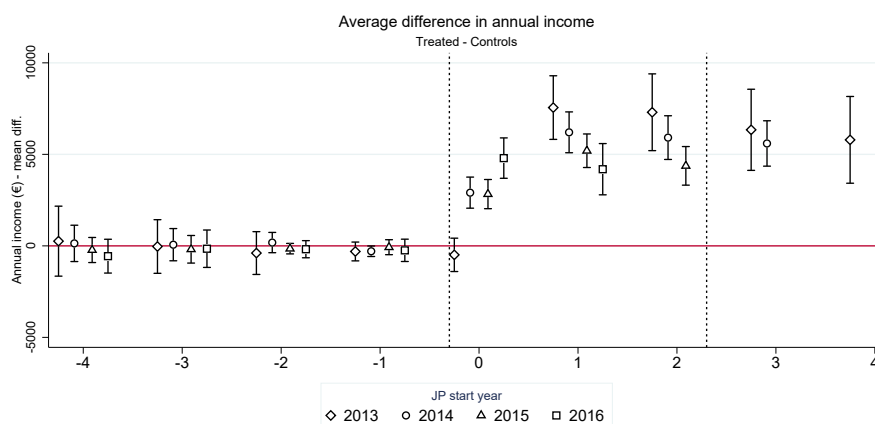
Note: The x axis represents the yearly timeline centered on the beginning of JobsPlus.

Table 5: Average difference between treated and controls in annual earnings: 12/18 group

		1y. after JP-start			2y. after JP-start			3y. after JP-start			4y. after JP-start		
ys avail.	N treated	T	C	Diff.	T	C	Diff.	T	C	Diff.	T	C	Diff.
1	311	22682.58	18594.63	4087.955**									
2	835	21529.17	17811.59	3717.58***	23528.56	20133.66	3394.904***						
3	1030	22176.45	17423.7	4752.755***	24283.88	19654.34	4629.544***	26139.76	22132.72	4007.045***			
4	346	21837.9	14921.35	6916.554***	23669.68	17671.63	5998.052***	25844.31	19953.93	5890.383***	28267.31	22181.71	6085.606***

Notes: The results are presented separately for individuals whose trajectory can be observed for 1,2,3, and 4 years after the beginning of JobsPlus (column 1 in the table). T and C indicate, respectively, Treated and Controls.
*, **, and *** denote significance at the 10, 5, and 1 percent level,respectively.

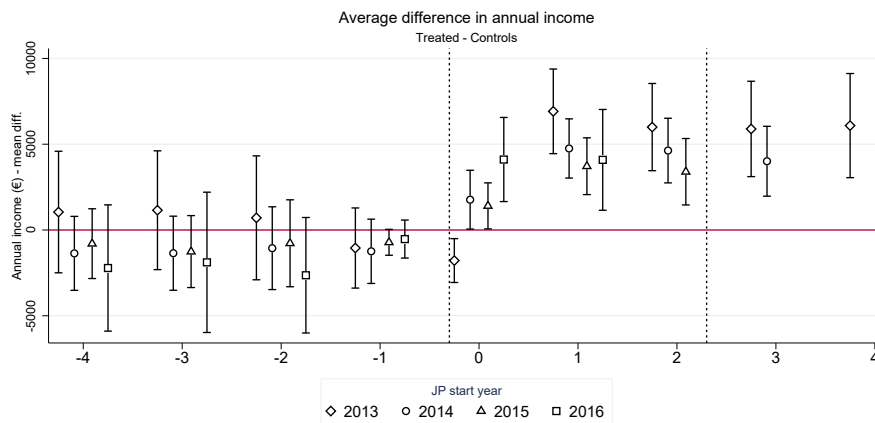**Table 6:** Average difference between treated and controls in annual earnings: 24/30 group

		1y. after JP-start			2y. after JP-start			3y. after JP-start			4y. after JP-start		
ys avail.	N treated	T	C	Diff.	T	C	Diff.	T	C	Diff.	T	C	Diff.
1	946	21400.66	17212.69	4187.975***									
2	1984	21304.3	16106.98	5197.325***	22730.15	18359.32	4370.831***						
3	1888	21534.63	15331.01	6203.613***	23449.29	17534.02	5915.273***	25195.08	19600.26	5594.82***			
4	584	20174.15	12618.47	7555.674***	22271.65	14971.44	7300.208***	23997.78	17656.85	6340.933***	25825.74	20033.13	5792.613***

Notes: The results are presented separately for individuals whose trajectory can be observed for 1,2,3, and 4 years after the beginning of JobsPlus (column 1 in the table). T and C indicate, respectively, Treated and Controls.
*, **, and *** denote significance at the 10, 5, and 1 percent level,respectively.

To sum up, workers under JobsPlus are less likely to claim unemployment benefits after the conclusion of the programme. This effect is even bigger for those individuals that had been unemployed for a longer period when they started the programme. These findings are corroborated by a positive difference in terms of weeks worked and income.

8.2   Results by cohort: age and income

In order to investigate whether the effect is heterogeneous according to some additional characteristics, the previous analyses were run separately for different cohorts of individuals, defined on the basis of age classes and previous income quartiles.

Heterogeneity by age

Treated individuals are grouped into five age classes (25-, 26-35, 36-45, 46-55,55+)[12]. The following tables present the effect of JobsPlus disaggregated by age class, on each of the three outcomes, and for the two JobsPlus treatments. The number of the treated units per class decreases with age and is smaller for the 12/18 treatment group. Tables 7, 9 and 11 refer to JobsPlus 12/18 treatment, while Tables 8, 10 and 12 show the results for JobsPlus 24/30.

In terms of probability to be in unemployment-related benefit recipiency (Tables 7 and 8), results show that the difference decreases over time for both JobsPlus 12/18 and JobsPlus 24/30 both in magnitude and significance, independently by the age of the treated units in the class. When looking at the age classes, results show that the difference tends to be higher for those in the 26-35 class and in particular for the individuals observed for four years after the inception of JobsPlus 12/18 treatment. The picture is slightly different for the long-term unemployed who receive the JobsPlus 24/30 treatment. In this case the difference is bigger for older people (55+, albeit the sample size of the class is smaller).
As far as the number of weeks worked in a year is concerned, Tables 9 and 10 confirm that the effect sharply declines over time, especially for those aged 26-35 years for both types of treatment. Those aged 26-45 benefited the most in terms of weeks worked from JobsPlus 12/18, while those aged under 25 benefited the most from JobsPlus 24/30.

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[12]Cells with less than 20 individuals were dropped. The controls are assigned to the age class of their respective treated unit.

Table 7: Treatment 12/18. Average difference between treated and controls in the probability of receiving unemployment-related benefits. Heterogeneity by age

category	ys avail.	N treated	1y. after JP-start			2y. after JP-start			3y. after JP-start			4y. after JP-start		
			T	C	Diff.	T	C	Diff.	T	C	Diff.	T	C	Diff.
25-	2	248	.071	.364	-.293***	.089	.296	-.207***						
25-	3	284	.076	.332	-.256***	.099	.265	-.166***	.102	.218	-.116**			
25-	4	218	.074	.468	-.394***	.097	.367	-.27***	.103	.283	-.18***	.091	.204	-.113**
26-35	2	301	.071	.381	-.31***	.102	.286	-.184***						
26-35	3	418	.053	.397	-.344***	.086	.328	-.242***	.074	.257	-.183***			
26-35	4	255	.054	.432	-.378***	.056	.381	-.325***	.067	.277	-.21***	.088	.211	-.123**
36-45	2	178	.074	.358	-.283***	.067	.245	-.178***						
36-45	3	182	.037	.31	-.273***	.114	.275	-.162**	.062	.211	-.148**			
36-45	4	132	.068	.341	-.273***	.063	.281	-.219***	.051	.221	-.17***	.044	.177	-.133**
46-55	2	94	.113	.356	-.243**	.158	.29	-.131*						
46-55	3	73	.053	.304	-.252**	.006	.233	-.227***	.058	.204	-.146**			
46-55	4	74	.128	.344	-.216**	.145	.271	-.126	.178	.182	-.005	.099	.157	-.059
55+	2	25	.019	.314	-.295**	.107	.267	-.159						
55+	3	23	.132	.446	-.314**	.273	.308	-.035	.307	.334	-.026			
55+	4													

Notes: The results are presented separately for individuals whose trajectory can be observed for 2,3, and 4 years after the beginning of JobsPlus (column 2 in the table). T and C indicate, respectively, Treated and Controls.
*, **, and *** denote significance at the 10, 5, and 1 percent level,respectively.

Table 8: Treatment 24/30. Average difference between treated and controls in the probability of receiving unemployment-related benefits. Heterogeneity by age

category	ys avail.	N treated	1y. after JP-start			2y. after JP-start			3y. after JP-start			4y. after JP-start		
			T	C	Diff.	T	C	Diff.	T	C	Diff.	T	C	Diff.
25-	2	329	.115	.404	-.289***	.115	.328	-.212***						
25-	3	282	.106	.412	-.306***	.14	.342	-.202***	.151	.268	-.117**			
25-	4	168	.147	.6	-.453***	.148	.496	-.348***	.136	.368	-.232***	.136	.301	-.165**
26-35	2	880	.116	.409	-.292***	.13	.342	-.212***						
26-35	3	852	.15	.422	-.272***	.153	.357	-.205***	.109	.3	-.191***			
26-35	4	524	.154	.525	-.371***	.181	.457	-.276***	.148	.37	-.222***	.13	.303	-.174***
36-45	2	610	.105	.445	-.34***	.121	.356	-.235***						
36-45	3	494	.139	.424	-.285***	.137	.354	-.217***	.12	.293	-.173***			
36-45	4	280	.123	.514	-.39***	.164	.43	-.266***	.164	.342	-.177***	.131	.279	-.149***
46-55	2	331	.078	.469	-.391***	.136	.367	-.231***						
46-55	3	262	.126	.44	-.313***	.138	.36	-.221***	.169	.286	-.117**			
46-55	4	163	.197	.473	-.276***	.245	.415	-.17**	.224	.34	-.116**	.124	.268	-.145**
55+	2	107	.198	.449	-.25***	.238	.341	-.102						
55+	3	74	.081	.508	-.427***	.117	.407	-.29***	.09	.304	-.215**			
55+	4	46	.09	.57	-.481***	.174	.484	-.31**	.133	.401	-.268**	.11	.336	-.226**

Notes: The results are presented separately for individuals whose trajectory can be observed for 2,3, and 4 years after the beginning of JobsPlus (column 2 in the table). T and C indicate, respectively, Treated and Controls.
*, **, and *** denote significance at the 10, 5, and 1 percent level,respectively.

Table 9: Treatment 12/18. Average difference between treated and controls in annual number of weeks worked. Heterogeneity by age

category	ys avail.	N treated	1y. after JP-start			2y. after JP-start			3y. after JP-start			4y. after JP-start		
			T	C	Diff.	T	C	Diff.	T	C	Diff.	T	C	Diff.
25-	1	78	38.525	23.052	15.473***									
25-	2	246	44.056	24.321	19.735***	38.853	25.133	13.72***						
25-	3	311	44.544	23.834	20.711***	43.663	25.864	17.799***	41.538	25.799	15.739***			
25-	4	115	46.547	19.978	26.569***	44.772	23.432	21.339***	41.422	25.254	16.168***	42.486	23.432	19.055***
26-35	1	124	42.28	24.484	17.796***									
26-35	2	312	46.684	27.337	19.348***	42.143	28.539	13.604***						
26-35	3	412	47.471	24.816	22.655***	44.137	28.218	15.919***	41.596	27.9	13.696***			
26-35	4	126	45.564	23.413	22.151***	43.684	26.089	17.595***	40.05	29.206	10.844**	39.018	27.993	11.025**
36-45	1	69	48.457	28.426	20.031***									
36-45	2	172	45.704	28.826	16.878***	41.677	28.313	13.365***						
36-45	3	192	48.815	30.46	18.355***	46.452	32.689	13.762***	47.025	31.459	15.565***			
36-45	4	59	47.384	26.801	20.583***	45.771	29.13	16.641***	47.703	31.456	16.247***	46.11	30.653	15.458***
46-55	1	34	47.822	32.363	15.459**									
46-55	2	79	44.281	30.16	14.12***	41.97	31.738	10.232**						
46-55	3	91	48.533	29.755	18.777***	46.44	31.877	14.563***	43.002	33.828	9.174**			
46-55	4	37	46.996	29.469	17.527***	44.765	31.887	12.878**	47.851	35.054	12.797**	47.27	32.908	14.362**
55+	1													
55+	2	26	51.516	24.464	27.052***	47.727	25.655	22.072***						
55+	3	24	37.818	31.504	6.314	28.068	33.67	-5.602	28.516	31.394	-2.878			
55+	4													

Notes: The results are presented separately for individuals whose trajectory can be observed for 2,3, and 4 years after the beginning of JobsPlus (column 2 in the table). T and C indicate, respectively, Treated and Controls.
*, **, and *** denote significance at the 10, 5, and 1 percent level,respectively.

Table 10: Treatment 24/30. Average difference between treated and controls in annual number of weeks worked. Heterogeneity by age

category	ys avail.	N treated	1y. after JP-start			2y. after JP-start			3y. after JP-start			4y. after JP-start		
			T	C	Diff.	T	C	Diff.	T	C	Diff.	T	C	Diff.
25-	1	108	41.894	20.19	21.704***									
25-	2	306	43.83	21.316	22.514***	39.688	21.456	18.232***						
25-	3	274	44	18.518	25.481***	40.589	21.602	18.987***	37.663	21.742	15.92***			
25-	4	91	44.291	16.465	27.826***	40.817	19.862	20.954***	39.94	22.802	17.138***	39.619	22.064	17.555***
26-35	1	368	43.296	22.798	20.498***									
26-35	2	804	44.574	22.927	21.647***	40.985	22.676	18.309***						
26-35	3	831	43.96	21.509	22.451***	42.543	23.836	18.707***	40.686	23.093	17.592***			
26-35	4	253	44.354	16.975	27.379***	41.244	19.368	21.876***	40.998	22.311	18.687***	38.463	21.919	16.544***
36-45	1	273	43.538	22.225	21.313***									
36-45	2	504	44.754	23.231	21.523***	42.471	22.501	19.97***						
36-45	3	464	44.011	21.626	22.385***	43.535	23.854	19.682***	41.223	22.489	18.734***			
36-45	4	143	44	20.302	23.698***	42.598	22.444	20.154***	40.257	25.861	14.396***	40.008	23.839	16.169***
46-55	1	145	41.774	22.341	19.433***									
46-55	2	280	47.062	24.98	22.082***	44.211	23.63	20.581***						
46-55	3	256	43.093	24.997	18.096***	40.437	26.411	14.027***	38.398	25.328	13.07***			
46-55	4	75	41.844	20.609	21.234***	39.333	21.958	17.374***	40.269	23.584	16.685***	43.258	24.427	18.831***
55+	1	52	40.01	23.696	16.315***									
55+	2	90	43.884	24.414	19.47***	39.174	22.055	17.119***						
55+	3	63	42.264	24.471	17.793***	38.359	28.732	9.627*	35.281	25.037	10.244**			
55+	4	22	46.176	22.335	23.841**	48.933	27.526	21.407**	44.917	30.033	14.883*	38.735	30.141	8.594

Notes: The results are presented separately for individuals whose trajectory can be observed for 2,3, and 4 years after the beginning of JobsPlus (column 2 in the table). T and C indicate, respectively, Treated and Controls.
*, **, and *** denote significance at the 10, 5, and 1 percent level,respectively.

Tables 11 and 12 present the JobsPlus estimated impact on earnings from employment. Here, the effect is less clear than in the previous cases as the decreasing pattern over time is not confirmed. In terms of magnitude, three years after JobsPlus start, the effect is higher for those aged 36-45 under JobsPlus 12/18 and ranges between €10,000 and 15,000 for those who are observed for three or four years, respectively. Differently, for those under JobsPlus 24/30, there is a difference of about €12,000 for those included in the sample for three years and €11,000 for those observed for four years. This suggests that the positive effect on earnings is more persistent over time, especially for younger individuals (under 35 years).

Table 11: Treatment 12/18. Average difference between treated and controls in annual earnings. Heterogeneity by age

category	ys avail.	N treated	1y. after JP-start			2y. after JP-start			3y. after JP-start			4y. after JP-start		
			T	C	Diff.	T	C	Diff.	T	C	Diff.	T	C	Diff.
25-	1	78	17467.74	15484.55	1983.189									
25-	2	246	17918.9	15136.38	2782.517**	19710.89	18013.46	1697.431						
25-	3	311	18818.33	13918.03	4900.3***	21914.6	16697.22	5217.377***	23370.59	18892.03	4478.558**			
25-	4	115	18395.62	12560.2	5835.422***	20486.88	15858.25	4628.627**	22080.3	18346.78	3733.52*	25309.84	20407	4902.835**
26-35	1	124	23250.89	17620.22	5630.67**									
26-35	2	312	22690.16	18473.25	4216.915**	25686.45	20327.32	5359.136**						
26-35	3	412	22574.54	16893.63	5680.903***	23975.37	19199.87	4775.499***	26589.68	21917.73	4671.951**			
26-35	4	126	21594.71	14207.24	7387.479***	23845.69	16693.94	7151.747***	25656.48	19195.86	6460.621**	29469.99	22076.22	7393.766**
36-45	1	69	27904.94	21765.81	6139.124									
36-45	2	172	23749.66	19511.63	4238.025**	25205.62	21993.35	3212.272						
36-45	3	192	26137.77	21591.83	4545.939*	28322.9	22984.69	5338.212*	29646.29	24666.51	4979.79			
36-45	4	59	25875.78	16259.6	9616.182**	27545.46	18761.82	8783.64**	31366.63	19969.76	11396.87**	32267.54	22399.66	9867.885**
46-55	1	34	25480.82	23683.3	1797.522									
46-55	2	79	23128.34	20813.91	2314.43	24586.59	22952.73	1633.858						
46-55	3	91	25638.19	23280.61	2357.576	25622.38	24311.57	1310.813	27920.88	28832.7	-911.814			
46-55	4	37	23758.36	18759.95	4998.403	25966.76	21787.32	4179.445	27625.95	24322.5	3303.446	29024.07	24957.09	4066.979
55+	1													
55+	2	26	28657.54	18017.38	10640.16**	26656.25	18501.29	8154.959						
55+	3	24	18837.68	15041.88	3795.794	23903.14	18416.96	5486.176	22945.1	20502.63	2442.46			
55+	4													

Notes: The results are presented separately for individuals whose trajectory can be observed for 2,3, and 4 years after the beginning of JobsPlus (column 2 in the table). T and C indicate, respectively, Treated and Controls.

*, **, and *** denote significance at the 10, 5, and 1 percent level,respectively.

Table 12: Treatment 24/30. Average difference between treated and controls in annual earnings. Heterogeneity by age

category	ys avail.	N treated	1y. after JP-start			2y. after JP-start			3y. after JP-start			4y. after JP-start		
			T	C	Diff.	T	C	Diff.	T	C	Diff.	T	C	Diff.
25-	1	108	18636.17	16113.54	2522.634									
25-	2	306	17489.54	15143.86	2345.686**	18792.57	17720.11	1072.466						
25-	3	274	17423.44	14148.33	3275.106	18316.95	15910.89	2406.064*	19621.88	18881.36	740.517			
25-	4	91	16365.15	10398.2	5966.952***	17287.62	13646.14	3641.476*	18815.71	17576.17	1239.541	21286.85	19256.51	2030.332
26-35	1	368	20684.89	17559.81	3125.083**									
26-35	2	804	20901.91	15823.84	5078.065***	22607.2	18628.3	3978.904***						
26-35	3	831	21381.26	15735.86	5645.395***	23579.21	17699.63	5879.574***	25403.46	19882.78	5520.675***			
26-35	4	253	20323.78	12243.49	8080.292***	22390.02	14426.36	7963.661***	24863.66	16447.17	8416.488***	26170.79	18992.44	7178.349***
36-45	1	273	22313.53	17548.12	4765.408***									
36-45	2	504	22363.42	16907.08	5456.338***	24115.28	18416.59	5698.682***						
36-45	3	464	22776.24	14828.96	7947.282***	25383.88	17649.69	7734.194***	27184.32	19405.56	7778.759***			
36-45	4	143	21354.23	13104.84	8249.387***	25515.15	15026.91	10488.24***	26206.03	18658.52	7547.516**	27366.99	20964.79	6402.21**
46-55	1	145	22104.11	15688.01	6416.105***									
46-55	2	280	23939.85	16085.62	7854.233***	25154.54	17870.02	7284.512***						
46-55	3	256	23577.05	16012.46	7564.59***	24455.45	18498.55	5956.904***	26286.97	20300.03	5986.947***			
46-55	4	75	22082.62	14604.27	7478.353**	22933.91	15748.15	7185.757**	24592.5	18145.87	6446.628**	29877.63	20498.19	9379.442**
55+	1	52	24368.87	18767.93	5600.935									
55+	2	90	22181.22	17052.86	5128.359**	19618.44	19342.24	276.204						
55+	3	63	22751.35	15289.08	7462.273**	23893.97	16729.55	7164.417**	25617.48	17260.94	8356.533**			
55+	4	22	20119.73	14941.86	5177.865	18396.4	22901.88	-4505.478	18917.99	23173.65	-4255.655	15493.31	27382.78	-11889.47*

Notes: The results are presented separately for individuals whose trajectory can be observed for 2,3, and 4 years after the beginning of JobsPlus (column 2 in the table). T and C indicate, respectively, Treated and Controls.

*, **, and *** denote significance at the 10, 5, and 1 percent level,respectively.

Heterogeneity by previous income

Heterogeneity by income is assessed by considering quartiles of earnings from employment for the three calendar years preceding a JobsPlus start (or imputed start). Tables 13 and 14 show the results on the probability of receiving unemployment-related benefits. For JobsPlus 12/18, the higher was the previous income, the lower is the probability of receiving unemployment-related benefits. The effect is on average higher for the JobsPlus 24/30 and declines over time. The maximum difference is registered one year after JobsPlus starts, for those in the first quartile under JobsPlus 12/18 and one year after for those in the fourth quartile under JobsPlus 24/30. In both cases this effect refers to individuals observed for 4 years. The fact that the differential effect of JobsPlus across the income distribution varies by JobsPlus treatments might be related to the different amounts of subsidies received.

Table 13: Treatment 12/18. Average difference between treated and controls in the probability of receiving unemployment-related benefits. Heterogeneity by previous income

category	ys avail.	N treated	1y. after JP-start			2y. after JP-start			3y. after JP-start			4y. after JP-start		
			T	C	Diff.	T	C	Diff.	T	C	Diff.	T	C	Diff.
1st	2	182	.077	.39	-.313***	.111	.305	-.195***						
1st	3	195	.089	.381	-.291***	.088	.334	-.246***	.122	.273	-.151***			
1st	4	111	.066	.468	-.403***	.121	.408	-.286***	.115	.322	-.207***	.118	.235	-.116**
2nd	2	221	.071	.339	-.268***	.106	.274	-.168***						
2nd	3	262	.039	.385	-.347***	.098	.299	-.201***	.089	.25	-.161***			
2nd	4	182	.119	.485	-.366***	.09	.398	-.308***	.099	.275	-.176**	.093	.17	-.077
3rd	2	252	.051	.412	-.361***	.079	.323	-.245***						
3rd	3	286	.059	.375	-.315***	.096	.295	-.198***	.058	.226	-.167***			
3rd	4	196	.057	.434	-.377***	.062	.359	-.297***	.08	.262	-.181***	.077	.213	-.136**
4th	2	191	.096	.322	-.226***	.091	.223	-.132**						
4th	3	237	.047	.287	-.24***	.095	.237	-.142***	.069	.189	-.12***			
4th	4	207	.065	.335	-.27***	.071	.266	-.195***	.085	.209	-.125**	.066	.18	-.114**

Notes: The results are presented separately for individuals whose trajectory can be observed for 2,3, and 4 years after the beginning of JobsPlus (column 2 in the table). T and C indicate, respectively, Treated and Controls.
Categories are defined according to the quantile of the distribution: less than 629, between 629 and 5244, between 5244 and 14538, more than 14538.
*, **, and *** denote significance at the 10, 5, and 1 percent level,respectively.

Table 14: Treatment 24/30. Average difference between treated and controls in the probability of receiving unemployment-related benefits. Heterogeneity by previous income

category	ys avail.	N treated	1y. after JP-start			2y. after JP-start			3y. after JP-start			4y. after JP-start		
			T	C	Diff.	T	C	Diff.	T	C	Diff.	T	C	Diff.
1st	2	600	.11	.401	-.292***	.127	.338	-.211***						
1st	3	529	.133	.377	-.244***	.152	.336	-.184***	.141	.282	-.141***			
1st	4	245	.172	.529	-.356***	.208	.463	-.255***	.209	.384	-.175***	.156	.316	-.16***
2nd	2	847	.113	.438	-.325***	.134	.356	-.222***						
2nd	3	723	.153	.45	-.297***	.15	.363	-.213***	.112	.296	-.184***			
2nd	4	425	.151	.527	-.376***	.194	.456	-.262***	.159	.359	-.2***	.135	.296	-.162***
3rd	2	606	.116	.456	-.34***	.14	.352	-.211***						
3rd	3	505	.115	.493	-.378***	.124	.395	-.271***	.112	.314	-.202***			
3rd	4	314	.154	.535	-.381***	.166	.443	-.278***	.137	.355	-.218***	.115	.289	-.174***
4th	2	204	.099	.443	-.344***	.119	.341	-.222***						
4th	3	207	.123	.398	-.275***	.128	.332	-.204***	.137	.269	-.132**			
4th	4	197	.095	.512	-.417***	.12	.425	-.305***	.104	.318	-.214***	.083	.246	-.163***

Notes: The results are presented separately for individuals whose trajectory can be observed for 2,3, and 4 years after the beginning of JobsPlus (column 2 in the table). T and C indicate, respectively, Treated and Controls.
Categories are defined according to the quantile of the distribution: no income, less than 2600, between 2600 and 8543, more than 8543.
*, **, and *** denote significance at the 10, 5, and 1 percent level,respectively.

Tables 15 and 16 show the difference in terms of weeks worked. This evidence is consistent with the diachronic declining pattern presented in the previous tables, but the difference is higher for those in the first quartile of income for both JobsPlus 12/18 and JobsPlus 24/32. The effect (29 weeks) is higher for JobsPlus 24/30 respect to a difference of 24 weeks for JobsPlus 12/18.

Table 15: Treatment 12/18. Average difference between treated and controls in annual number of weeks worked. Heterogeneity by previous income

category	ys avail.	N treated	1y. after JP-start			2y. after JP-start			3y. after JP-start			4y. after JP-start		
			T	C	Diff.	T	C	Diff.	T	C	Diff.	T	C	Diff.
1st	1	58	37.659	19.952	17.707***									
1st	2	179	44.096	18.326	25.77***	37.413	19.212	18.202***						
1st	3	195	44.99	18.108	26.882***	42.174	21.121	21.053***	39.045	21.496	17.549***			
1st	4	56	47.08	14.537	32.542***	45.145	16.031	29.114***	43.707	18.915	24.792***	42.578	19.665	22.913***
2nd	1	89	42.102	23.639	18.462***									
2nd	2	225	45.066	27.132	17.934***	40.217	29.466	10.752***						
2nd	3	273	44.905	24.34	20.566***	43.529	26.772	16.757***	42.401	27.017	15.384***			
2nd	4	78	43.562	20.475	23.087***	42.137	24.03	18.107***	37.645	26.313	11.332**	39.247	23.459	15.788**
3rd	1	100	43.891	30.446	13.445**									
3rd	2	239	46.582	29.492	17.09***	42.515	30.971	11.545***						
3rd	3	314	47.662	27.521	20.141***	45.51	30.401	15.11***	44.549	29.652	14.897***			
3rd	4	81	45.232	26.528	18.705***	42.347	28.149	14.198**	40.214	31.727	8.487*	39.08	28.778	10.302*
4th	1	64	48.53	29.545	18.984***									
4th	2	192	46.642	33.756	12.887***	44.818	32.392	12.426***						
4th	3	248	48.494	33.86	14.634***	45.547	35.881	9.666***	43.686	35.053	8.633***			
4th	4	131	48.095	29.071	19.025***	46.403	32.751	13.652***	44.96	34.704	10.256***	44.491	33.347	11.145***

Notes: The results are presented separately for individuals whose trajectory can be observed for 2,3, and 4 years after the beginning of JobsPlus (column 2 in the table). T and C indicate, respectively, Treated and Controls.
Categories are defined according to the quantile of the distribution: less than 629, between 629 and 5244, between 5244 and 14538, more than 14538.
*, **, and *** denote significance at the 10, 5, and 1 percent level,respectively.

Table 16: Treatment 24/30. Average difference between treated and controls in annual number of weeks worked. Heterogeneity by previous income

category	ys avail.	N treated	1y. after JP-start			2y. after JP-start			3y. after JP-start			4y. after JP-start		
			T	C	Diff.	T	C	Diff.	T	C	Diff.	T	C	Diff.
1st	1	198	40.447	10.115	30.332***									
1st	2	533	44.696	15.712	28.985***	40.886	15.369	25.517***						
1st	3	508	43.419	14.842	28.577***	41.317	16.911	24.406***	39.187	16.28	22.907***			
1st	4	135	42.213	10.675	31.538***	38.125	12.827	25.299***	37.431	15.553	21.878***	36.586	15.679	20.907***
2nd	1	379	43.131	25.121	18.01***									
2nd	2	764	44.412	26.062	18.35***	40.449	25.772	14.677***						
2nd	3	671	42.58	24.903	17.677***	41.803	27.126	14.677***	39.378	26.511	12.866***			
2nd	4	181	43.606	19.487	24.119***	41.009	22.452	18.557***	39.353	24.972	14.38***	37.361	24.209	13.151***
3rd	1	293	44.153	28.78	15.373***									
3rd	2	506	44.913	28.396	16.517***	43.135	27.568	15.566***						
3rd	3	481	44.837	25.645	19.193***	42.665	28.762	13.903***	40.668	27.512	13.157***			
3rd	4	145	44.775	21.159	23.616***	43.305	22.475	20.83***	43.833	27.091	16.743***	43.719	25.81	17.909***
4th	1	76	45.564	31.474	14.09***									
4th	2	181	47.568	31.955	15.613***	46.633	29.55	17.083***						
4th	3	228	47.051	28.425	18.626***	44.737	30.683	14.054***	42.792	28.4	14.392***			
4th	4	123	46.759	26.738	20.02***	46.056	30.186	15.871***	44.798	31.679	13.12***	44.14	30.579	13.561***

Notes: The results are presented separately for individuals whose trajectory can be observed for 2,3, and 4 years after the beginning of JobsPlus (column 2 in the table). T and C indicate, respectively, Treated and Controls.
Categories are defined according to the quantile of the distribution: no income, less than 2600, between 2600 and 8543, more than 8543.
*, **, and *** denote significance at the 10, 5, and 1 percent level,respectively.

In terms of work-related earnings, results in (Tables 17 and 18) are more ambiguous and it is more challenging to identify a clear pattern. In particular, in the case of JobsPlus 12/18 the effect declines in magnitude up to three years after the inception of the programme and increases afterwards for all the previous income quartiles. Furthermore, the widest difference is found for those treated that were in the first and in the fourth quartiles. Similar findings are identified for JobsPlus 24/30, although not perfectly overlapping.

These results point to a differential impact of JobsPlus in relation to age and previous income classes: the programme had a more marked and long-lasting impact on younger participants and on those who previously had lower earnings from employment.

Table 17: Treatment 12/18. Average difference between treated and controls in annual earnings. Heterogeneity by previous income

category	ys avail.	N treated	1y. after JP-start			2y. after JP-start			3y. after JP-start			4y. after JP-start		
			T	C	Diff.	T	C	Diff.	T	C	Diff.	T	C	Diff.
1st	1	58	18563.89	14026.77	4537.125*									
1st	2	179	19259.76	12841.31	6418.448***	20512.63	15825.34	4687.292**						
1st	3	195	19133.2	11755.43	7377.773***	20943.56	14318.54	6625.024***	22274.11	16373.32	5900.79***			
1st	4	56	19384.1	10134.14	9249.959***	19344.22	12837.17	6507.042**	22785.42	15607.63	7177.782**	24301.35	18608.07	5693.272*
2nd	1	89	21179.97	15877.16	5302.813*									
2nd	2	225	19777.33	15478.35	4298.982**	21044.2	18353.24	2690.967*						
2nd	3	273	19843.73	12444.71	7399.023***	22964.08	15636.55	7327.527***	24722.36	19154.07	5568.283***			
2nd	4	78	18367.09	10520.7	7846.393***	21132.59	14126.53	7006.061**	21090.76	17393.98	3696.773	26668.53	19991.16	6677.367**
3rd	1	100	23855.66	20400.01	3455.648									
3rd	2	239	22471.99	18589.46	3882.532**	24573.43	20309.55	4263.885**						
3rd	3	314	22016.05	17305.52	4710.528**	24115.92	19779.11	4336.817**	26881.91	22134.27	4747.642**			
3rd	4	81	20054.22	15067.18	4987.035*	22196.63	16649.59	5547.037**	26428.85	19118.72	7310.125**	29518.62	21754.65	7763.972**
4th	1	64	27385.42	23213.46	4171.963									
4th	2	192	24752.67	22909.19	1843.487	27807.34	24864.07	2943.263						
4th	3	248	26841.27	24520.93	2320.339	28369.47	25684.88	2684.587	30158.88	27938.4	2220.481	30402.37	24217.54	6184.833**
4th	4	131	25247.04	18174.72	7072.312***	27392.7	20832.7	6560.005**	29163.48	22567.72	6595.761**	30402.37	24217.54	6184.833**

Notes: The results are presented separately for individuals whose trajectory can be observed for 2,3, and 4 years after the beginning of JobsPlus (column 2 in the table). T and C indicate, respectively, Treated and Controls.

Categories are defined according to the quantile of the distribution: less than 629, between 629 and 5244, between 5244 and 14538, more than 14538.

*, **, and *** denote significance at the 10, 5, and 1 percent level,respectively.

Table 18: Treatment 24/30. Average difference between treated and controls in annual earnings. Heterogeneity by previous income

category	ys avail.	N treated	1y. after JP-start			2y. after JP-start			3y. after JP-start			4y. after JP-start		
			T	C	Diff.	T	C	Diff.	T	C	Diff.	T	C	Diff.
1st	1	198	19637.38	13612.17	6025.208***									
1st	2	533	20799.74	15215.67	5584.07***	22102.67	17518.87	4583.799***						
1st	3	508	20926.22	14638.36	6287.857***	22948.45	16712.01	6236.442***	25118.87	18566.53	6552.337***			
1st	4	135	18577.33	11004.29	7573.038***	20859.13	13101.71	7757.422***	21357.22	14684.61	6672.612***	23780.92	17248.46	6532.458**
2nd	1	379	21278.12	17214.25	4063.864***									
2nd	2	764	20691.04	15578.28	5112.759***	21809.38	18121.7	3687.686***						
2nd	3	671	20728.28	15420.94	5307.333***	22699.77	17514.21	5185.554***	24036.55	19721.58	4314.973***			
2nd	4	181	19771.18	11549.43	8221.745***	21507.25	14502.01	7005.233**	24160.71	17569.65	6591.061**	24540.73	19219.65	5321.079**
3rd	1	293	22786.82	18068.21	4718.605***									
3rd	2	506	21913.26	17191.56	4721.7***	23852.37	19194.49	4657.875***						
3rd	3	481	21691.6	14589.4	7102.198***	23352.32	17222.25	6130.073***	24634.69	19491.16	5143.53***			
3rd	4	145	21249.38	13003.99	8245.385***	22935.41	13785.73	9149.678***	24941.89	16837.51	8104.385***	27951.67	20507.5	7444.17**
4th	1	76	23931.9	20269.13	3662.769									
4th	2	181	25063.71	18385.34	6678.364***	27026.05	19847.82	7178.235**						
4th	3	228	25749.87	17781.73	7968.141***	27523.47	19851.28	7672.193***	29932.62	21690.38	8242.241***			
4th	4	123	22283.96	15297.81	6986.144***	24965.71	18597.91	6367.792**	26805.7	21876.04	4929.658*	28356.25	23698.9	4657.349

Notes: The results are presented separately for individuals whose trajectory can be observed for 2,3, and 4 years after the beginning of JobsPlus (column 2 in the table). T and C indicate, respectively, Treated and Controls.
Categories are defined according to the quantile of the distribution: no income, less than 2600, between 2600 and 8543, more than 8543.
*, **, and *** denote significance at the 10, 5, and 1 percent level,respectively.

8.3   JobsPlus and the Youth Guarantee

The age distribution of those who participated in JobsPlus is outlined in Figure 11. While the number of participants in the period of the evaluation is approximately 3,000, relatively few of them had less than 12 months unemployment duration when they commenced JobsPlus. Given the scale of take-up under the four-month eligibility, it is not possible to estimate the difference made by the reduced eligibility threshold (allowing those under 25 years to be eligible after four months rather than 12). However, the Youth Guarantee eligibility threshold coincided with the 2015 expansion of the cap to 6,000 in receipt at any one time. Accordingly, it seems reasonable to assume that the ESF specific funding for the Youth Guarantee has allowed an additional number of people to participate. Furthermore, the evaluation suggests a reasonably substantial impact of a programme offered under the Youth Guarantee and one that works across all age ranges. There is indeed no evidence of a weaker impact for those under 25.

9   Potential policy design modifications

The analysis to this point is based on the initial policy design, which was modified in respect of all employments commencing after 01 January 2018, with those over 50 years of age attracting the higher amount even for the shorter qualifying period (12 months out of the previous 18). Those under 50 years but unemployed for longer durations (three years in the past three and a half years) also attract the higher amount.

This section considers possible policy modifications that can be made to a subsidy of this type, regardless of the impact estimated by the preceding counterfactual analysis.

With jobs subsidies such as JobsPlus, there is scope for varying three elements:

— eligibility criteria;

— duration of subsidy;

— amount of subsidy.

The subsidy adjusts the employer's incentive to hire candidates who, all else being equal, are at a disad-vantage compared to others. After a stark drop in domestic demand (as witnessed in Ireland during the Great Recession), a large number of people become newly unemployed. Unless a recovery is instantaneous, a share of these people will cross the threshold into long-term unemployed status. This status is typically used to identify those at considerable labour market disadvantage but in the aftermath of a recession, many of those with long-term unemployed status may have good sectoral knowledge, workplace skills, occupational qualifications and a strong track record of employment. In contrast, after a long period of recovery, those who remain long-term unemployed are likely to have lost many of the qualities that add value in a workplace.

Given that the stock of long-term unemployed people varies across the economic cycle, it is appropriate to vary at least one of the elements of the incentive over time to minimise deadweight and maximise the impact. This means that at least one of the eligibility criteria, the duration or the subsidy amount will vary, and this refinement of the subsidy should be aligned with the degree to which employers require an incentive to hire long-term unemployed people at a given point in time.

9.1   Eligibility criteria

The 2018 adjustments focus the programme on very long-term unemployed people and those over 50 by alter-ing the eligibility criteria. This makes sense where the programme has been in operation for a number of years and employers have presumably recruited those closest to the labour market and with the highest value to add to firms. When unemployment is falling, those whose disadvantage is particularly acute may find employers are reluctant to select them. At a time of increased focus on groups experiencing particular disadvantage, it makes sense to target the subsidy at those cohorts by adjusting the eligibility criteria and focusing on those who will be the focus of Pathways to Work 2020-2024, the labour market activation strategy.

There is also scope to vary the eligibility criteria with reference to the economic cycle. Emerging from a recession, firms will have a choice of relatively high quality candidates. After a sustained period of growth, or as the economy moves into recession, the most job-ready candidates will have been recruited and there is greater need for the subsidy to alter employers' perception of the net value of recruiting from the ranks of long-term unemployed people.

9.2   Duration of subsidy

It is worth recalling the channels by which the jobs subsidy is having an impact on the labour market. The candidates who are perceived by employers as being most capable of adding value to a firm relative to price are recruited without attaining the eligibility criterion of at least one year of unemployment. Those who reach the eligibility criterion are then made more attractive by reducing the cost to the employer for the duration of the subsidy (currently, two years). As they accrue experience, occupational skills, soft skills and sectoral knowledge, they become more attractive to other employers.

In a buoyant jobs market, there is scope for reducing the duration of the subsidy from two years (to, for example, one year). In practice, this means that, for a given allocation, more people could benefit from the positive impact of the subsidy. As subsidised employees gain experience, they become more attractive to new employers in the open market. To minimise the deadweight loss outlined in the preceding section, the objective is to set the payment at the minimum that will entice employers to hire those who they would otherwise not hire due to the duration of the unemployment spell (and, presumably, the interaction between duration of unemployment and age).

9.3   Subsidy amount

The final variation that can be made to a subsidy like JobsPlus is to alter the amount of the subsidy according to the economic cycle. The nominal value of the subsidy has not changed since 2013 (although, in practice, altering the eligibility criteria is equivalent to altering the subsidy). In the event of periods of higher inflation, it is worth considering whether, and how, it should be adjusted.

More significantly, the value to employers is different at various points in the business cycle, by sector and by location.

9.4   Determining when subsidy elements should be varied

If either of the elements of the subsidy (duration, amount, and eligibility criteria) are to be adjusted, this should be triggered by an identifiable labour market benchmark. This should be a selected indicator of labour market buoyancy referencing relative or absolute values that outline how long-term unemployed people are faring. Examples of triggers (all measured using Labour Force Survey data) include::

— when the number of long-term unemployed people exceeds 50,000 (25,700 in Q2 2020);

— when the number of long-term unemployed people exceeds 200,000 (last seen Q3 2012);

— when the number of long-term unemployed people exceeds 100,000 (last seen Q3 2016);

— when the long-term unemployed people make up more than half of all unemployed people (over the year to Q2 2020, this has varied from one third to one fifth).

10   Data limitations and further developments

10.1   Operational data

To this end, understanding exactly how prospective participants have eligibility determined is critical. Given the data limitations of the DEASP operational data, the qualification status for the 12-month or 18-month subsidy is defined as a dichotomous response in each case. From an analytic perspective, two data recording practices are suggested below, which would make the estimation of a counterfactual more straightforward and allow for a slightly wider range of techniques to be applied, without causing significant operational burden. It would be useful if the measurement of eligibility was recorded as the sum of different sequences of Live Register payment receipt rather than as a dichotomous response, and a record of ineligible jobseekers who requested to have eligibility checked was retained. This would allow non-participants to be matched with the greatest precision.

10.2   External data sources

The employment data provided by the Revenue Commissioners (Irish taxation authorities) to the DEASP is of variable quality in respect of its measurement of employment starts.Accordingly, the outcome measurement preferred in this evaluation is the absence of receipt of a jobseeker payment rather than the presence of an employment start in a precise period. Employment can be imputed from the contributions recorded in a given

period. However, since these are recorded as the sum of contributions in a year rather than attributed to individual weeks, it is not always possible to attribute weeks of insurable employment to periods coinciding with an absence of unemployment. This means that it is not always possible to define precisely weeks of employment, so as to be able to identify employment episodes over short periods as, for instance, on monthly basis.

This ambiguity about status over short periods is particularly acute where unemployed people are entitled to be in receipt of a payment while working (casual claims) for up to three days in a seven-day period. In such cases, it is difficult to disentangle i) periods where they are not receiving an unemployment payment and are working, from ii) periods where they are not receiving an unemployment payment and are inactive.

At the beginning of 2019 the taxation authorities' moved from a calendar year system to a requirement for employers to report their employees' pay and deductions as they are being paid. This system change provides an opportunity for data transfer at higher frequency (for instance, monthly) to the DEASP, who represent the Department with operational and policy responsibility for social insurance and, as such, is the co-owner of the data. Increasing the periodicity of data exchange in line with the requirements on employers will add significantly to the ability of the DEASP to estimate movements between unemployment and employment. This is an essential requirement to improve the precision of estimates of the programme impact on unemployed people.

11 Conclusion

This evaluation seeks to provide evidence on the effectiveness of JobsPlus by estimating its impact on long-term unemployed, who are the clients of the Irish PES. The evaluation approach is based on the estimation of the counterfactual scenario for JobsPlus participants, to gauge what would have happened in the absence of the programme.

The PES requires a flow of information about its clients, their outcomes and the extent to which certain programmes enhance the labour market outcomes of participants. Similarly, at the policy design stage, policy makers require robust evidence of what works to alleviate barriers to employment. They also need access to data that points to groups that could most benefit from certain interventions so that appropriate interventions can be designed with the minimum deadweight. Therefore, this evaluation attempts to provide an answer to what measures are suitable for deployment and what component parts of the subsidy (eligibility criteria, subsidy duration, and subsidy amount) can be adjusted to target particular groups or to align with the business cycle.

The impact of JobsPlus is estimated separately for the two treatment types: the €7,500 subsidy for employees who had been unemployed for between one and two years, and the €10,000 subsidy for employees who had been unemployed for more than two years.

The effect for those benefiting from the two types of subsidy is measured after the completion of the programme, on three different outcomes. The first is the probability of receiving unemployment related benefits, measured on a monthly basis. The other two are annual measures of the number of weeks worked and earnings from employment.

Data used for the analysis is taken from the Jobseekers Longitudinal Dataset (JLD) managed by the Department of Employment Affairs and Social Protection (DEASP). This is an administrative database covering unemployed individuals since 2004, which provides detailed information on employment, unemployment and training episodes they experienced during their working career.

The identification strategy exploits different matching approaches, based on the following information: i) month of entry in the eligibility condition to be able to receive the subsidy; ii) JobsPlus starting month; iii) number of weeks worked in the four years preceding JobsPlus; and (iv) past working histories measured by receipt of unemployment benefits.

The results point to a consistent estimate of the impact of JobsPlus, with participants faring better than matched non-participants. After the end of the subsidy period, workers under JobsPlus are less likely to claim unemployment benefits, with even bigger effects for those individuals who experienced longer periods in unemployment before starting the programme. This positive impact is shown also by estimated results in terms of weeks worked and earnings from employment.

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Appendix

Since the 1st of January 2018 the payment levels for JobsPlus are:

Under 25 years of age, on the Live Register and unemployed for at least 104 days in the previous 6 months.	€7,500
Over 25 years of age, on the Live Register and unemployed for at least 312 days in the previous 18 months.	€7,500
In receipt of jobseekers allowance transition payment (no qualifying period applies).	€7,500
Persons with refugee status and are in receipt of jobseekers allowance (no qualifying period).	€7,500
Persons less than 50 years of age, on the Live Register and unemployed for at least 936 days in the previous 42 months.	€10,000
Over 50 years of age, on the Live Register and unemployed for at least 312 days in the previous 18 months.	€10,000

For employments which commenced prior to 1st January2018 payment levels for JobsPlus are as follows:

Under 25 years of age, on the Live Register and unemployed for at least 104 days in the previous 6 months.	€7,500
Over 25 years of age, on the Live Register and unemployed for at least 312 days in the previous 18 months.	€7,500
In receipt of jobseekers allowance transition payment (no qualifying periods applies).	€7,500
Persons with refugee status and in receipt of jobseekers allowance (no qualifying period).	€7,500
Over 18 years of age, on the Live Register and unemployed for at least 624 days in the previous 30 months.	€10,000

Live Register

The Live Register is compiled from returns made for each local office to the Central Statistics Office by the Department of Employment Affairs and Social Protection (DEASP). It comprises persons under 65 years of age in the following classes:

— all claimants for Jobseeker's Benefit (JB) excluding systematic short-time workers;

— applicants for Jobseeker's Allowance (JA) excluding smallholders/farm assists and other self-employed persons;

— other registrants including applicants for credited Social Welfare contributions but excluding those directly involved in an industrial dispute.

The Live Register excludes claimants on jobseeker schemes who are 65 years of age and over. There was no change to this exclusion criterion with the removal of the State Pension (Transition) Scheme from 1 January 2014. Persons aged 65 years can remain on a jobseeker scheme up to their next birthday but are not included in the Live Register. Although they measure different labour market trends, there is a strong correlation between the ILO unemployment rate, as measured in the Labour Force Survey, and the number of claimants for jobseeker payments, who are not working part-time (ie excluding those on casual claims and credited contributions).

Table 19: JobsPlus monthly expenditure (€, '000s)

Month	Year			
	2016	2017	2018	2019
January	984.54	2,525.01	2,239.38	1,502.40
February		2,386.36	2,152.81	1,472.29
March		2,280.94	2,103.96	1,405.21
April	1,004.90	2,281.26	2,035.11	1,311.66
May	2,007.51	2,392.14	2,103.86	1,329.06
June	2,871.99	2,547.87	1,939.48	1,183.54
July	1,723.44	2,575.22	1,906.67	1,097.18
August	1,910.99	2,489.07	1,798.12	1,115.10
September	2,335.32	2,449.59	1,814.90	1,078.95
October	2,096.26	2,326.99	1,618.33	1,089.27
November	2,356.88	2,364.49	1,647.92	965.10
December	2,301.15	2,304.16	1,509.06	
Total	19,592.97	28,923.08	22,869.59	13,549.76

Table 20: JobsPlus employee

No of JobsPlus Employees in Payment				
	Year			
Month	2016	2017	2018	2019
January	4,046*	4765	5,062	3,281
February	4,401*	4,754	4,824	3,197
March	4,173*	4,837	4,665	3,102
April	2,590	4,851	4,507	2,962
May	3,616	5,077	4,563	2,873
June	4,470	5,246	4,413	2,720
July	3,507	5,365	4,301	2,566
August	3,745	5,434	4,211	2,526
September	4,253	5,435	4,029	2,406
October	4,317	5,307	3,782	2,333
November	4,562	5,252	3,659	2,233
December	4,624	5,217	3,528	
Total employees supported in each year	8,380	8,960	7,556	4,949**

Table 21: JobsPlus employers

No of JobsPlus Employees in Payment				
	Year			
Month	2016	2017	2018	2019
January	2,983*	3,571	3,811	2,633
February	3,222*	3,571	3,651	2,580
March	3,084*	3,641	3,534	2,505
April	1,913	3,648	3,445	2458
May	2,694	3,816	3,492	2,402
June	3,348	3,925	3,394	2,276
July	2,690	3,994	3,319	2,153
August	2,867	4,049	3,333	2,133
September	3,221	4,063	3,190	2,009
October	3,307	3,998	3,030	1,948
November	3,463	3,980	2,939	1,863
December	3,503	3,964	2,855	
Total employers supported in each year:	5,811	6,180	5,469	3,795**

Notes:

— Prior to transfer of JobsPlus data onto DEASP BOMi system, payments were made for a month in arrears, i.e. numbers indicated in January 2016 refers to payments for December 2015 and so on.

— Value indicates those supported from January – November 2019 only.

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