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Stepping Stone or Exit Path: Experimental Evidence on Training the Long-Term Unemployed

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Abstract

This study estimates the effects of an employment programme for disadvantaged unemployed individuals. The programme emphasized on-the-job training and contracting the unemployed for a few paid work hours as a stepping stone into the labour market. Evaluated through a randomised controlled trial, the programme was found to accelerate transitions into part-time work. Contrary to its intention, it permanently increased the share of participants receiving disability pensions among the most disadvantaged groups. To explain this finding, we suggest that training, while enhancing productivity for some, simultaneously provided information of employability used in the assessment of disability pension eligibility.

JEL classification

J14, J15, J64, D61

Keywords

unemployed, active labour market policy, disability pension, immigration

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* *Data Availability*: We use administrative register data from Statistics Denmark, which cannot be made publicly available. Access can be obtained through Statistics Denmark as described here: https://www.dst.dk/en/TilSalg/Forskningsservice/Dataadgang

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I. Introduction

In most countries, preventing long-term unemployment is a major policy priority. Yet the limited knowledge of effective interventions for the most disadvantaged individuals hinders success in achieving this goal (Heckman et al. 1999; Greenberg et al. 2003; Card et al. 2018). This is unfortunate not only for the unemployed themselves, but also costly for society, as the long-term unemployed often end up receiving disability benefits (OECD 2022).

This study addresses the knowledge gap by examining whether an active labour market programme (ALMP) can help a particularly disadvantaged group of long-term unemployed individuals with health and social problems to gain a foothold in the labour market. Unlike many rehabilitation programmes for unemployed people with health conditions, which focus primarily on healthcare support, this initiative targeted employment barriers. The programme, entitled *Job-First*, lasted for one year and comprised intensive job counselling followed by periods of on-the-job training in regular workplaces. To ease entry into regular employment, the programme encouraged firms to contract participants for even just a few paid working hours while they continued to receive welfare benefits.

At entry, participants in *Job-First* were on average 44 years old, 58% had not been employed at all during the five years preceding the programme, and 49% had been hospitalised. Given this group's very weak labour market attachment, the programme also aimed to prevent their permanent withdrawal from the labour force and subsequent transition to disability pensions. In Denmark, as e.g. in the United States, Australia, and Canada, disability pensions are determined by both the permanence of ill-health and a poor employment history[1].

The *Job-First* programme was evaluated in a randomised controlled trial (RCT) in 15 Danish job centres in 2016. We exploit this experiment to assess its intended impact on labour market outcomes as well as unintended outcomes such as health care utilization and labour force exit. Since the RCT had no pre-analysis plan, the results for unintended outcomes must be interpreted as exploratory, and we discuss potential effects based on

[1] The rules for the US are described here: https://www.ssa.gov/disability/step4and5.htm. Rules for Australia: https://www.disabilitysupportguide.com.au/information/article/what-medical-conditions-qualify-for-disability-support-pension-in-australia. Rules for Canada: https://www.canada.ca/en/services/benefits/publicpensions/cpp/cpp-disability-benefit/eligibility.html

previous research. We find that the programme accelerated transitions to employment among a subset of the disadvantaged target group: the proportion of time spent in employment increased by 5.5 percentage points after two and a half years, a rise of 32% relative to the low mean in the control group. The effect then diminished and was no longer statistically significant after five years. A similar pattern emerged for labour income, with a peak effect of around USD 100 per month, corresponding to a present value of approximately USD 3,100 in accumulated additional income over the five-year post-programme period. While the programme facilitated limited-hours employment among welfare claimants, it did not generate substantial transitions into full-time work. Hence, it fell short of serving as a stepping stone to sustained employment and welfare exit.

Looking at unintended outcomes, the programme had no effects on health care utilization, but increased labour force exits by raising disability benefit receipt from 6% to 9% within three years, though this effect later faded. Although a few pre-treatment imbalances favoured the control group, robustness checks suggest that these do not drive the results.

Active labour market policy (ALMP) has traditionally aimed to raise the productivity of the unemployed sufficiently to meet minimum-wage requirements or to boost employment by reducing job-search frictions. We argue that the divergent outcomes of *Job-First*—both faster transitions into employment and higher entry into disability pensions—may arise because ALMPs serve a dual role for disadvantaged long-term unemployed: enhancing employability through training while simultaneously providing caseworkers (and the unemployed) with better information about participant's employability. We corroborate this conjecture by results from qualitative studies based on caseworker interviews.

If the programme provided additional information to caseworkers, as conjectured, we would expect disability pension effects to be concentrated among those closest to the margin of disability pension, with the lowest pre-programme productivity. We test this proposition by examining heterogeneous effects across natives and immigrants, and between individuals with and without employment experience during the preceding five years. As expected, employment effects are larger among those with relatively stronger labour-market attachment (natives and those with a work history), whereas disability pension effects appear

long-lasting among the most disadvantaged groups, suggesting that the affected individuals would not have entered disability pensions without participating in the program.

We also examined alternative explanations, finding that effects did not differ by gender or by groups with varying economic incentives (e.g. single providers with higher benefits). While subgroup-specific findings must be interpreted cautiously, they support the hypothesis that programme outcomes were more closely related to participants' pre-existing productivity than to their economic incentives.

Finally, we demonstrate that despite generating positive employment effects for a very disadvantaged group, the programme produced a net societal as well as a net fiscal deficit. The marginal value of public funds (MVPF) is applied to highlight the trade-off between gains and costs faced by decision-makers: immigrants gained 76 cents for every dollar spent, whereas natives lost 20 cents for every dollar saved. The *Job-First* programme may thus be justified where decision-makers prioritise vulnerable recipients highly or are willing to tolerate modest participant losses against fiscal savings.

The study contributes to the literature on active labour market policies (ALMPs) by focusing on a group with a very weak attachment to the labour market. Several training programmes evaluated through RCTs in the United States during the 1980s and 1990s found that interventions emphasising a Job-First approach—on-the-job training combined with better financial incentives—generated substantially larger effects than classroom-based training aimed at human capital production (Riccio et al. 1994; Freedman et al. 2000). A later re-evaluation, however, overturned these conclusions (Hotz et al. 2006). The broader literature suggests that while most ALMPs yield short-term gains, training programmes—whether classroom or on-the-job—appear particularly effective in the longer run (Heckman et al. 1999; Greenberg et al. 2003; Card et al. 2018). Yet few studies have been conducted on groups facing multiple disadvantages beyond unemployment or skills deficits, which may explain why our findings diverge from the mainstream literature. An exception is Bækgaard et al. (2024) who examine long-term effects of intensive consultations and early activation for a similar target group as in the current study, and find no labour market effects but an increase in the use of prescriptive medicine.

A related body of research examines interventions for unemployed individuals with specific health conditions. Reviews indicate that job training, especially when combined

with mental-health support, has a positive impact on employment outcomes for unemployed individuals with mental illness (Bond et al. 2008; Crowther et al. 2010; Probyn et al. 2021). Such studies, however, typically focus on narrow groups defined by a single diagnosis, in contrast to the present study, which addresses broader categories of disadvantaged long-term unemployed.

To our knowledge, no prior studies have explored how training for disadvantaged groups influences transitions into disability pensions. Our findings therefore provide new evidence on outcomes for individuals at risk of disability-benefit eligibility and contribute to ongoing debates on rising disability costs. Many countries have recognised that entry into disability schemes is influenced by the eligibility criteria for other transfer programmes (Burkhauser & Daly 2022). However, the literature offers limited and mixed evidence on whether stricter eligibility criteria for disability pensions benefit those at the margin (Maestas, Mullen & Strand 2013; OECD 2022; Madsen & Holm 2024).

Finally, as immigrants account for a sizeable share of the program participants, this study also contributes to the literature on immigrant integration. Previous work has largely focused on interventions targeting refugees during their early years after arrival (Edin et al. 2003, 2004; Joona et al. 2016; Sarvimäki & Hämäläinen 2016; Arendt 2022, 2023; Arendt & Bolvig 2023; Arendt, Dustmann & Ku 2023; Foged et al. 2022, 2023). By contrast, our study considers immigrants who failed to assimilate successfully during their initial settlement period and who have spent many subsequent years largely outside the labour market.

II. Institutional Settings

This study focuses on unemployed individuals in Denmark who are not covered by unemployment insurance and are eligible for means-tested welfare benefits. This section describes the institutional settings that they face, which includes active labour market policies, benefit levels and access to disability pension. This is followed by a description of the *Job-First* program and its expected effects.

II.A Active Labour Market Policy

All welfare benefit claimants must register with their local job centre, actively participate in offered active labour market programmes (ALMPs), search for jobs, and accept any suitable employment offered. Failure to comply can result in financial sanctions.

Welfare recipients receive support from job centres through ALMPs, either in the form of classroom training or on-the-job training. Classroom training covers a wide range of activities, from basic skills and health interventions to job-search assistance (see e.g. Amilton et al. 2022). On-the-job training typically consists of subsidised employment or internships in regular workplaces. Internships, the most common option for the long-term unemployed, usually last 13 weeks. Participants receive welfare benefits during these internships, without additional pay.

An important feature of the Danish welfare benefit system is that all welfare benefit claimants must have their employability assessed by job-centre caseworkers at mandatory quarterly meetings. A claimant was categorised as having limited employability (referred to as "activity-ready") if the caseworker deemed that social or health-related problems would prevent employment within the following three months. These claimants were the target group for the *Job-first* programme. If employability is permanently limited, welfare claimants may be eligible to disability pensions (like arrangements in other countries, cf. the introduction).

II.B Disability Pension

Disability pension applications can be initiated either by the welfare recipient or by their caseworker but are conducted outside the job centre, by a municipal rehabilitation team that also collect all necessary documentation[2]. This team typically includes a job-centre caseworker (not necessarily the claimant's regular one), a representative from the municipal social services department, a health coordinator from the public hospital system, and, if relevant, other specialists. The team evaluates employability based on interviews, medical documentation, and proof that rehabilitation efforts have been attempted, usually through participation in ALMPs. The law stipulates that all means to assess employability should have been attempted before disability pension can be granted, and caseworkers' assessments

[2] The rules on disability pension eligibility are described here (in Denmark): https://star.dk/ydelser/pension-og-efterloen/folkepension-tidlig-pension-foertidspension-og-seniorpension/foertidspension-ny-ordning/tilkendelse-af-foertidspension/ and Guide on Disability Pension Eligibility Assessment (http://www.socialjura.dk/content-storage/regler/2023/vejl-9288-af-174-2023/#c143896)

form an important part of the documentation. The rehabilitation team may recommend either further initiatives or referral to the municipal pension board, which makes the final decision on granting a pension. In clear-cut cases, the health coordinator may recommend disability pension directly, without convening the full team[3].

II.C Benefit Levels

Welfare benefit levels in Denmark are relatively high: In 2016, monthly welfare benefits for recipients over 30 years of age were approximately USD 2,100 for single providers and USD 1,600 for non-providers, with many also eligible for housing and childcare supplements. By comparison, a full-time minimum-wage worker earned around USD 3,500 per month, and the monthly disability pension amounted to approximately USD 2,700 for couples and USD 3,200 for single individuals. To encourage employment, claimants were permitted to earn USD 5 per hour of paid work without deductions from welfare benefits, despite the means-tested nature of the scheme. In addition, a cap on total benefit receipt was introduced shortly after the launch of the *Job-First* programme (Act no. 296 of 22/03/2016). This cap was gradually reduced as claimants worked more hours[4].

II.D The Job-First Programme

The *Job-First* programme was targeted welfare benefit recipients aged 30 and above, who had been unemployed for at least one year, and was assessed as having limited employability by their caseworker at the compulsory assessment.

The aim of the *Job-First* programme was to increase regular employment through intensified use of internships. Prior to initiation of internships, the programme involved more frequent meetings with caseworkers over six weeks, focused on preparing CVs and clarifying employment goals. (Rambøll and Metrica 2018a; 2018b; 2018c; 2018d; 2018e).

[3] The exception to the general assessment is described here (in Danish): https://star.dk/media/17928/skema-til-brug-for-sager-om-foertidspension-som-kommunen-behandler-uden-forelaeggelse-for-rehabiliteringsteamet.pdf

[4] Examples are provided here (in Danish): https://flereskalmed.star.dk/media/19514/guide-og-beregner-til-borgerens-oekonomi.pdf. These examples show that a single parent with two children may increase her disposable income by USD 174 per month if she works 2 hours per week and earns USD 163 per month. At 10 hours of work, with earnings of USD 726 per month, disposable income may increase by USD 700. Beyond 10 work hours per week, earnings are gradually reduced until they exceed the total benefits. For non-providers, the net gains in disposable income for similar amounts of work (2 and 10h) are USD 31 and USD 125, respectively. For a couple with two children, the net gains were USD 156 and 250. Net gains may vary for other family circumstances, as they vary according to the level of supplemental support received prior to work, including housing benefits and childcare support for providers.

Following this stage, caseworkers arranged multiple meetings between participants and employers. By broadening the range of contacts, the programme sought to improve matching from both the claimant's and the firm's perspective. If a suitable match was identified, an internship contract was signed. An innovation was encouraging firms to offer even few contracted, paid work in addition to the internship. This was supported by benefit rules providing financial incentives to work a few hours per week (see Section II.C).

The programme required any supplementary training be delivered concurrently with on-the-job training, rather than before it, to avoid delaying the transition to paid employment. To maintain workplace relationships and to identify supplementary needs or barriers, mentors from job centres and contact persons within firms held regular meetings with participants.

The *Job-First* programme was implemented as an RCT across 15 job centres. National government funding, including resources for supplementary activities, was provided through legislation in late 2015, and amounted to approximately USD 8 million[5]. Between March and December 2016, 3,727 eligible claimants were individually randomised into treatment and control groups, where the control group continued to receive standard employment services. The randomisation was conducted by the Ministry of Employment, but without a pre-analysis plan (Decree 246, 2018).

The trial was evaluated in terms of short-term labour market impacts, organisation, and fidelity (Rambøll and Metrica 2018a–e). Eight core components were identified, and fidelity was rated as medium-high to high (Rambøll and Metrica 2018d), see appendix B. Although precise details of the randomisation process are unavailable, the additional resources underpinning the intensified activity were strictly tied to the treatment group, making spill-overs to controls unlikely.

II.E Unintended effects of the Job-First Programme

While the intended effect of the program was to increase regular employment, it may generate unintended effects. We conjecture that *Job-First* may affect disability pension

[5] The announcement and funding of the trial is described in The Ministry of Employment (2015): Announcement no. 1773 of 16/12/2015 about employment trials. The participating municipalities include Aalborg, Aarhus, Haderslev, Hedensted, Hillerød, Jammerbugt, København, Lolland, Odense, Ringsted, Skanderborg, Sorø, Syddjurs, Vallensbæk-Ishøj, and Viborg.

assessments by providing caseworkers with additional information on participants' employment limitations and their permanence. Consequently, the programme may function as documentation that rehabilitation efforts have been conducted in compliance with disability pension regulations. This hypothesis is qualified from examination of qualitative studies of disability pension assessments.

Caswell et al. (2012) summarize earlier Danish studies of disability pension assessments. They highlight that a more passive approach toward welfare recipients may reduce the number of disability pensions granted (Bengtsson 2002; Hansen, Hansen, and Krassel 2010). This interpretation is consistent with Danish and international evidence showing that administrative capacity strongly affects the take-up of social benefits (Hansen et al. 2009; Deshpande and Li 2019; Homonoff and Somerville 2021). Based on 11 focus group interviews across four municipalities each with 4-8 caseworkers, Caswell et al. (2012) conclude that caseworkers often assess disability eligibility informally long before initiating formal procedures. Active labour market programs play a key role by generating documentation for disability pension cases.

Later reports independently highlight that two cases of national funding aimed at reducing caseloads, reassessing long-term cases among disadvantaged long-term unemployed individuals has led caseworkers to identify previously passive recipients as eligible for disability pension (AE 2008; Ankestyrelsen 2025)[6]. Two reports, also partly based on interviews with caseworkers, specifically mention that intensive job-training help clarify the participants employability, and has been a driver of increases in disability pension awards (Arendt et al. 2018; Ankestyrelsen 2025) [7].

A reason why a more active approach may affect disability pension awards is that it is difficult to assess whether employability is permanently reduced. Several studies document errors in disability pension eligibility assessments in Denmark (Ankestyrelsen 2007; 2009; 2012; 2015; 2025) and elsewhere (Benítez-Silva et al. 2004; Low and Pistaferri 2015). Additional time and resources may therefore reduce errors and uncertainty about whether individuals on the margin are able to work. In this respect it may be important not only that

[6] The initiatives were called "*Ny chance til alle*" ("A new chance to everyone") from 2006 and "Afklaring af aktivitetsparate kontanthjælpsmodtagere" ("Clarification of activity-ready cash benefit recipients") from 2023.

[7] Arendt et al. (2018) evaluates the programme called "Integrationspålæg" ("Mandatory integration") from 2016, and Ankestyrelsen (2025) highlight the later the programme "Flere skal med" ("More people should join") from 2017 and 2019.

the *Job-First* programme takes place at regular workplaces, reduced entry barriers, but also that it included meetings between the companies and the caseworker, providing the latter with a potential second opinion of the participant's motivation and employability.

Finally, given participants' poor health (see Table 1), increased time in active labour market programs and work may also unintentionally affect the participants health, as found in a recent study (Bækgaard et al. 2024). This relates to a broader literature linking unemployment and work to mental health (Jahoda 1982; Fryer 1986; Warr 1987). The program may improve health through greater engagement, social interaction, and structure, or through increased health screening. Conversely, it may be stressful if it pushes participants to their limits and reduces autonomy. We assess these effects indirectly using health care utilization as outcome measure.

III. Data

We employ administrative data from Statistics Denmark, covering employment, income, public transfers, ALMP participation, healthcare utilisation, municipality of residence, and country of origin for all individuals in the *Job-First* trial. The dataset spans five years prior to programme start, with follow-up until mid-2021 – thus covering a five-year post-programme period.

III.A Active Labour Market Policy Measures

We measure ALMP participation within the trial, distinguishing between on-the-job training and classroom training. Participation is recorded as the proportion of weeks engaged in ALMP activities within each month following randomisation into treatment or control groups. Information is drawn from the Danish Register for Evaluation of Marginalisation (DREAM).

III.B Employment Measures

Given that the programme's aim was to increase working hours alongside receipt of welfare benefits, we employ two main measures of employment: 1) Weeks in regular employment – defined as having positive labour-market income (while possibly still receiving welfare benefits), and 2) Weeks in employment without welfare receipt – defined as having positive

labour-market income and no concurrent transfers, i.e. representing exit from welfare. In addition, we use registered working hours and labour-market income as supplementary indicators. Labour income is sourced from Statistics Denmark's Employed Income Earners database (BFL), while data on public transfers (including disability pension) is obtained from the DREAM register administered by the Danish Agency for Labour Market and Recruitment.

III.C Descriptive Statistics

Table 1 presents descriptive statistics for participants in the *Job-First* trial. On average, participants were 44 years old, 51% were women, and 25% were immigrants – primarily from MENAPT countries – who had resided in Denmark for nearly 19 years[8]. The sample displayed poor health and weak labour-market attachment in the five years preceding participation: 49% had been hospitalised, they had contacted general practitioners an average of 63 times (roughly once per month), and only 42% had been in work during that period. Differences between treatment and control groups were generally small and mostly statistically insignificant. No significant differences emerged in employment, welfare receipt, or participation in on-the-job training. A few minor, significant imbalances were observed: control group members were slightly older, more often of European origin, and somewhat more likely to have entered the programme later. These – and more detailed pre-program - imbalances are scrutinised in the results section below.

IV. Results

Figure 1 presents mean ALMP participation and employment rates from two years before until four years after programme start. The figure illustrates the findings for the intended outcomes, which are tested in detail below. Prior to treatment, both ALMP participation and employment rates were similar across treatment and control groups. Shortly after commencement, participation in ALMP increased sharply among treated individuals, followed by a more gradual rise in employment. The average employment rate of treated

[8] MENAPT countries are countries in the Middle East, North-Africa, Pakistan and Turkey.

individuals remained above that of controls after programme completion, though the difference declined over time.

The figure also highlights two important aspects of programme implementation. First, although *Job-First* increased the participation rate in job training from 10–12% in the control group to over 30% in the treatment group, this fell short of the intended full participation during the one-year programme. Second, participation in classroom training also increased, from about 15% in the control group to more than 40% among the treated, particularly in the first month. This may reflect the initial intensive meetings with caseworkers, enabling greater screening and referral to additional training or healthcare.

IV.A Main Results

Figure 2 reports estimated programme effects for four main outcomes, using linear regressions with treatment status as the sole explanatory variable. It shows that despite being small, some pre-treatment coefficients are significant at the 5% level. The differences occur mostly 21–24 months before programme start, which rules out the likelihood of caseworker manipulation. It is also worth pointing out that the differences are practically zero during the 18 months prior to treatment. Nevertheless, they do incur a risk of biasing employment effects downwards and disability effects upwards, a point addressed in robustness checks below.

Panel (a) of Figure 2 shows significant increases in on-the-job training during the programme year, with some effects afterwards, which could reflect that some training spells start towards the end or that other training spells are renewed. Panel (b) shows positive employment effects, defined as transitions from welfare into regular employment without benefits. Effects peaked around two years after programme start, with regular employment approximately two percentage points higher than in the control group – a 30–50% increase relative to the control mean. The effect then faded to zero. Panel (c) indicates that working hours peaked at about three additional hours per month (or 15 per month among those employed). Appendix Figure A1 shows that effects on any employment, (even with concurrent welfare) peaked at five percentage points after 1–2.5 years, before becoming insignificant after 3.5 years.

Labour income and welfare-benefit patterns mirror these results: income rose by about USD 100 per month at its peak level, while welfare receipt fell by up to 10 percentage points. Both effects, however, dissipated in later years. Overall, *Job-First* achieved its intended effect of facilitating limited-hours employment but did not create sustained exits from welfare.

Panel (d) of Figure 2 presents effects on disability pension take-up: once the programme ended, the proportion receiving disability benefits rose by nearly three percentage points, although this effect also diminished and became insignificant four years after programme start. The peak effect after three years corresponded to an increase of more than 50% relative to the level in the control group. As argued above, this finding can be rationalized from previous qualitative evidence of caseworker behaviour, showing that more intensive training can lead to higher disability take-up. We test the robustness of this and other results in the next section, followed by a heterogeneity analysis, where we examine whether *Job-first* accelerates take-up or increases long-term disability pension levels more among disadvantaged groups with higher prior risk.

Finally, no significant effects were observed for healthcare visits or hospitalisations (Appendix Figure A2).

IV.B Robustness to Pre-Treatment Differences

To address concerns about pre-treatment imbalances, we estimated two alternative models: 1) A dynamic event-study model with individual and time fixed effects, accounting for unobserved baseline differences[9], and 2) A regression model controlling directly for the starting time and observed pre-treatment differences at baseline at 21–24 months pre-randomisation[10].

Both approaches produced results similar to the baseline estimates: increased participation in on-the-job training, small but transient employment effects, and higher (though temporary) disability pension uptake (see Appendix Figures A3 and A4). This suggests that pre-treatment differences do not drive the main findings.

[9] The model is: $Y_{it} = \alpha_i + \gamma_t + \sum_{j=-24,\neq 0}^{60} \delta_j T_i * 1(t - s = j) + u_{it}$, where Y_{it} is outcome for individual *i* in calendar month *t*, *s* the program start month and *T* is a treatment dummy.

[10] Specifically, we include the following covariates in the model: start quarter, average monthly work hours 2, 1.5, 1 and 0.5 years prior to start, and employment and on-the-job training levels 18-24 months prior to program start.

IV.C Heterogeneity Analysis

We investigate the unintended finding that the Job-First programme increased disability benefit uptake by conducting a set of heterogeneity analyses. As the RCT was not accompanied by a pre-analysis plan, these results should be regarded as exploratory[11]. Specifically, we compare (1) participants with versus without employment during the preceding five years, and (2) natives versus immigrants[12]. These groups differ in their prior likelihood of disability receipt.

Figure 3 shows that employment gains were larger among natives and those with prior work experience, while transitions into disability pensions were stronger among immigrants and those without recent employment. Although group differences are not statistically significant, the pattern suggests that disability effects were concentrated among those with the weakest initial attachment. For these groups, disability transitions appear more permanent, with effects persisting after five years at the 10% significance level. This implies that some individuals would not have entered disability pensions absent participation in the programme.

Additional analyses show that the programme helped men exit welfare into employment more quickly than it did for women, but programme effects on disability did not vary by gender or by single-provider status (Appendix Figure A5). Hence, the disability effect does not appear to stem from economic disincentives or gendered labour-market behaviour.

IV.D Costs and Benefits of the Programme

Although *Job-First* generated some positive labour-market outcomes, it is important to assess these relative to its costs. We therefore evaluate both societal and fiscal impacts using cost–benefit analysis (e.g. Heckman et al. 2010; 2020; 2022) and the marginal value of public funds (MVPF, cf. Hendren & Sprung-Keyser 2020).

The main societal benefit is calculated as the discounted sum of additional pre-tax earnings, while costs are the programme's per-participant expenditure (see Appendix C). Participants also face a utility loss from increased time in programmes and work, offset partly by avoiding

[11] We do note that pre-analyses plans are rarely used in economics (Olken 2015) and do not always reduce the risk of false positives (Cuffmann and Niederle 2015).

[12] Immigrants from Non-Western countries have historically been overrepresented among disability pension recipients.

further programme participation upon entering disability pensions. Using methods from Greenberg (1997) and Boardman et al. (2006) (see Appendix C), we estimate a modest net loss of time use, reducing the net societal benefit by only USD 174 (Appendix Table A2).

Table 2 shows that average participants gained USD 3,193 in pre-tax income, while direct costs per participant were USD 4,560. The net societal benefit (NSB) was therefore –USD 1,367, falling further to –USD 1,836 when accounting for deadweight losses from taxation. The NSB is significant when accounting for the estimated uncertainty of the labour income effects and treating direct costs as fixed[13]. The fiscal impact was also negative (–USD 937 per participant).

The marginal value of public funds (MVPF) is based on participants' net income gain after taxes and transfers, which was –USD 430, again implying that the programme is not worthwhile[14]. However, the subgroup analyses based on the groups with differential prior attachment to the labour market, show a different picture. Immigrants and those without recent employment gained in net income, mainly driven by higher income from disability pension, but at a fiscal cost. Natives and those with prior work experience, on the other hand, generated fiscal savings but lost in net income, although the latter is not significant. Taken together, this implies a positive MVPF for all four groups, despite the overall negative value. We use the inverse ratio for groups with a net income loss to maintain ratios of gains over losses (public dollars saved per dollars lost), akin to the approach in cost-effectiveness analysis (e.g., O'Brien et al. 2002). The estimate based on a poor employment history align with the average of comparable US programmes at 0.4 dollar gained per dollar spend (Hendren and Sprung-Keyser 2020), while the MVPF for immigrants at 0.72 is higher.

From a methodological standpoint the results highlight that the MVPF, as other ratio-based decision criteria and in contrast to the NSB, is not additive across sub-groups. With this caveat, the advantage of the MVPF is that it highlights the trade-offs facing decision-makers: While *Job-First* is not cost-effective overall, it may be justifiable for decision-makers prioritising support for particularly vulnerable groups, or where modest participant losses can be offset against fiscal savings.

[13] Standard errors were bootstrapped using 200 bootstrap samples.

[14] There is an ongoing discussion about the theoretical differences between the MVPF and CBA, that we do not delve into here, see Garcia and Heckman (2022) and the response in Hendren and Sprung-Keyser (2022).

V. Discussion

This paper has presented causal estimates of the effects of the *Job-First* labour market programme targeting disadvantaged long-term unemployed individuals with health and social difficulties. Rather than addressing these problems directly, the programme sought to overcome employment barriers by prioritising on-the-job training and encouraging firms to offer contracted paid work.

In line with its objectives, the programme generated positive effects on employment and labour income. However, these gains faded after four to five years, and the intervention ultimately failed to act as a stepping stone towards sustained attachment to the labour market. Nevertheless, the positive effects are noteworthy, given the target groups disadvantaged background.

More unexpectedly, the programme accelerated transitions into disability pensions. As an explanation, we suggest that ALMPs may serve a dual function for the most disadvantaged: the traditional role of enhancing employability and limiting search frictions as well as a tool generating information and documentation on limited work capacity and thereby facilitating disability assessments. This interpretation is supported by stronger disability effects among groups with weaker prior attachment to the labour force (immigrants and those without recent work history), while gendered labour market behaviour and economic incentives do not explain the findings. Moreover, we find no significant effects on healthcare visits or hospitalisations, which suggests that the impact on disability pension is unlikely to reflect participants being pushed to their health limits by the programme. It cannot be ruled out, however, that it masks other effects e.g. on mental health, as found in Bækgaard et al. (2024).

These results are consistent with broader literature showing that the assessment of disability pension eligibility is often conducted with errors, and that administrative capacity to make the assessments strongly affects take-up. Caseworker interviews support our conjecture that when caseworkers devote more time to participants and obtain better information of employability through active labour market programs, this is used for documentation and the probability of granting disability pensions increases.

Finally, we showed that the programme was expensive, with negative societal and fiscal returns, and a negative MVPF overall. Nevertheless, subgroup analyses suggest a potential

trade-off facing decision-makers: groups with prior weaker labour market attachment gained financially but at fiscal cost, while the programme yielded small fiscal savings at the cost of a loss for participants with stronger prior attachment. Decision-makers may thus face a normative choice: whether to value the welfare of vulnerable participants highly enough to justify a negative fiscal return.

Despite the advantages of randomisation, the study has limitations. These include minor pre-treatment imbalances, lack of detailed information about caseworker assignment, and absence of a pre-analysis plan. Robustness checks suggest these limitations do not drive the findings, but they underline the need for caution in interpretation.

In sum, this study sheds light on a pressing challenge faced by many Western countries: how to support large numbers of unemployed individuals with complex health and social problems who are at high risk of transitioning to disability pensions. The findings underscore the importance of paying close attention not only to the intended effects of ALMPs but also to potential unintended consequences – particularly increased disability benefit uptake – and to the high fiscal costs involved. Policymakers designing interventions for the long-term unemployed with very weak labour-market attachment must therefore balance employment promotion with the risk of inadvertently facilitating permanent labour-force exit.

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References

Act no. 296 of 22/03/2016. Lov om ændring af lov om aktiv socialpolitik, lov om individuel boligstøtte, integrationsloven og forskellige andre love. Kontanthjælpsloft, 225-timersregel, ferie til uddannelses- og kontanthjælpsmodtagere m.v. The Ministry of Employment.

AE (2008). "Ny chance til alle" kom ikke i mål. AE-raadet.

Ankestyrelsen (2007). Ankestyrelsens praksisundersøgelser Førtidspension til personer med en psykisk lidelse

Ankestyrelsen (2009). Tema: Kommunal variation i tilkendelser af førtidspension i 2008.

Ankestyrelsen (2012). Ankestyrelsens praksisundersøgelse om Førtidspension til personer med en psykisk lidelse.

Ankestyrelsen (2015). Ankestyrelsens praksisundersøgelse om Førtidspension.

Ankestyrelsen (2025). Praksisundersøgelse om kommunernes tilkendelser af førtidspension.

Arendt, J. N., C. Kolodziejczyk, A. Gunst and D. Johansen (2018). Forsøg med integrationspålæg. Slutevaluering. VIVE and Marselisborg.

Arendt, J. N. (2022). Labor Market Effects of a Work-first Policy for Refugees. *Journal of Population Economics* 35, 169-196.

Arendt, J. N. and Bolvig, I. (2023). Trade-offs between work-first and language-first strategies for refugees. *Economics of Education Review* 92, 102353.

Arendt, J. N. (2023). Welfare benefit generosity and social integration of refugees. *International Migration Review*, doi.org/10.1177/01979183231160713

Amilton, A., K. Houlberg, J. K. Jensen, E. H. Jonsen, H. B. Kleif, C. H. Mikkelsen and E. H. E. Topholm (2022). Jobcentrenes beskæftigelsesindsats. København: VIVE.

Benetiz-Silva, H., M. Buchinsky and J. Rust (2004). How Large Are the Classification Errors in the Social Security Disability Award Process? NBER Working Paper No. 10219.

Bengtsson, S. (2002). Bestemmer forvaltningen, om du får førtidspension? Kommunens forvaltningspraksis og tilkendelse af førtidspension. SFI 02:15.

Boardman, A. E., D. H. Greenberg, A. R. Vining and D. L: Weimer (2006). Cost-Benefit Analysis. Concepts and Practice. 3rd edition. New Jersey: Pearson Prentice Hall.

Burkhauser, R. V. and M. C. Daly (2022). Lessons for US Disability Policy from other OECD countries. In Besharov, D. J. and D. M. Call (Eds.): *Work and the Social Safety Net: Labor Activation in Europe and the United States*. Oxford University Press.

Bækgaard, M., Nielsen, S. A., Rosholm, M., & Svarer, M. (2024). Long-Term Employment and Health Effects of Active Labor Market Programs. *Proceedings of the National Academy of Sciences (PNAS) 121*(50), Artikel e2411439121.

Card, D., Kluve, J. and A. Weber (2018). What Works? A Meta Analysis of Recent Active Labor Market Program Evaluations, *Journal of the European Economic Association* 16(3): pages 894-931.

Caswell, D., Kleif, H. B., Thuesen, S. L. and T. Dall (2012). Veje til førtidspension. En undersøgelse af fire kommuner i Region Midt. København: AKF.

Crowther R., Marshall M., Bond G.R. and P. Huxley (2010). Vocational rehabilitation for people with severe mental illness (Review). The Cochrane Collaboration.

Decree 246 (2018). BEK nr. 246 af 26/03/2018. Bekendtgørelse om forsøg på beskæftigelsesområdet.

Deshpande, M. and Y. Li (2019). Who Is Screened Out? Application Costs and the Targeting of Disability Programs. *American Economic Journal: Economic Policy* 11(4): 213–248.

Edin, P.-A., Fredriksson, P., & Åslund, O. (2003). Ethnic Enclaves and the Economic Success of Immigrants—Evidence from a Natural Experiment. *The Quarterly Journal of Economics*, 118(1), 329-357.

Edin, P.-A., Fredriksson, P., & Åslund, O. (2004). Settlement Policies and the Economic Success of Immigrants. *Journal of Population Economics* 17(1), 133-155.

Finkelstein, A. and M. J. Notowidigo (2019). Take-up and Targeting: Experimental Evidence from SNAP. *The Quarterly Journal of Economics,* 1505-1556.

Foged, M., Hasager, L., Arendt, J. N., Bolvig, I & G. Peri (2022). Language training and refugees' integration. *The Review of Economics and Statistics,* doi.org/10.1162/rest_a_01216

Foged, M., Hasager, L., Arendt, J. N., Bolvig, I & G. Peri (2023). Intergenerational Spillover Effects of Language Training for Refugees. *The Journal of Public Economics* 220, 104840.

Freedman, S., Knab, J. T., Gennetian, L. A., and D. Navarro (2000). The Los Angeles Jobs-First GAIN Evaluation: Final Report on a Work First Program in a Major Urban Center. Manpower Demonstration Research Corporation.

Fryer, D. (1986). Employment Deprivation and Personal Agency during Unemployment. *Social Behaviour* 1: 3-23.

Fujiwara, D. (2010). The Department for Work and Pensions Social Cost-Benefit Analysis framework. Methodologies for estimating and incorporating the wider social and economic impacts of work in Cost-Benefit Analysis of employment programs. Department for Work and Pensions, Working Paper No 86.

García, J. L, J .J. Heckman, E. L. Duncan and M . J. Prados (2020). Quantifying the life-cycle benefits of an influential early-childhood program. *Journal of Political Economy* 128(7):2502–2541.

Garcia, J. L. and J. J. Heckman (2022). Three Criteria for Evaluating Social Programs. *Journal of Benefit-Cost Analysis* 13: 3, 281–286.

Gray, C. (2019). Why leave benefits on the table? Evidence from SNAP. *Journal of Public Economics* 179, 104054.

Greenberg, D. (1997). The Leisure Bias in Cost-Benefit Analyses of Employment and Training Programmes. *Journal of Human Resources*, 32 (2), 413-439.

Greenberg, D. H., Michalopolous, C. and P. K. Robins (2003). A Meta-Analysis of Government-Sponsored Training Programs. *ILR Review* 57(1): 31-53.

Greenberg, D. and Robins, P. (2008). Incorporating Non-Market Time into Benefit Cost Analyses of Social Programs: An Application to the Self Sufficiency Project. *Journal of Public Economics*, 92, 766-794.

Hansen, E.B., Hjelmar, U. and T. S. Jørgensen (2009). Tildeling af førtidspension og fleksjob. En kvalitativ analyse af forskelle i kommunernes praksis. København: AKF

Hansen, E.B., Hansen, L.O.F. and K.F. Krassel (2010). Kommunernes tilrettelæggelse af sags forløb ved afgørelse af førtidspension og fleksjob. København: AKF.

Heckman, J. J., Lalonde, R. J. and J. Smith (1999). The Economics and Econometrics of Active Labor Market Programs, in Ashelfelter, O. and D. Card (Eds.): Handbook of Labor Economics, vol. 3A. Amsterdam: Elsevier Science.

Heckman, J. J., Moon, S. H., Pinot, R. Savelyev, P. A. and A. Yavitz (2010). The rate of return to the High-Scope Perry Preschool Program. *The Journal of Public Economics* 94: 114-128.

Hendren, N. and B. Sprung-Keyser (2020). A Unified Welfare Analysis of Government Policies. *The Quarterly Journal of Economics* 135(3): 1209–1318.

Hendren, N. and B. Sprung-Keyser (2022). The Case for Using the MVPF in Empirical Welfare Analysis. NBER Working Paper 30029.

Homonoff, T. and J. Somerville 2021. Program Recertification Costs: Evidence from SNAP. *American Economic Journal: Economic Policy* 2021, 13(4): 271–298

Hotz, V. J., G. W. Imbens and J. A. Klerman (2006). Evaluating the Differential Effects of Alternative Welfare-to-Work Training Components: A Re-Analysis of the California GAIN Program. *Journal of Labor Economics* 24(3): 521-566.

Hylland, A. and Zeckhauser, R. (1979). Distributional Objectives Should Affect Taxes but not Program Choice or Design. *Scandinavian Journal of Economics* 81, 264- 284.

Jahoda, M. (1982). Employment and Unemployment. A Socio-Psychological Analysis. Cambridge: Cambridge University Press.

Joona, P. A., Lanninger, A. W., & Sundström, M. (2016). Reforming the Integration of Refugees: The Swedish Experience. IZA Working Paper no. 10307.

Kreiner, C. T. and N. Verdelin (2012). Optimal Provision of Public Goods: A Synthesis. *The Scandinavian Journal of Economics* 114(2): 384-408.

Low, H. and L. Pistaferri (2015). Disability Insurance and the Dynamics of the Incentive Insurance Trade-Off. *American Economic Review* 105(10): 2986–3029

Madsen, J. E. and A. Holm (2024). Subsidized Jobs and Labor Market Barriers for Individuals with Disabilities: Evidence from a Danish Labor Market Reform. Chapter 2 in Madsen, J. E.:

Trade-offs in Social Insurance. Balancing Insurance and Work Incentives for Health Impaired Individuals. Phd-thesis. Department of Economics, University of Copenhagen.

Maestas, N., K. J. Mullen, and A. Strand (2013). Does Disability Insurance Receipt Discourage Work? Using Examiner Assignment to Estimate Causal Effects of SSDI Receipt. *American Economic Review* 103(5): 1797–1829.

O'Brien, B.J., Gertsen, K., Willan, A.R., Faulkner, L.A. (2002). Is there a kink in consumers' threshold value for cost-effectiveness in health care? *Health Economics* 11(2):175–180.

OECD (2022). *Disability, Work and Inclusion: Mainstreaming in All Policies and Practices*. Paris:OECD Publishing.

Rambøll og Metrica (2018a). Delrapport 1: Effekter. Evaluering af Jobfirst.

Rambøll og Metrica (2018b). Delrapport 2: Progression. Evaluering af Jobfirst.

Rambøll og Metrica (2018c). Delrapport 3: Organisering. Evaluering af Jobfirst.

Rambøll og Metrica (2018d). Fidelitetsrapport. Evaluering af Jobfirst.

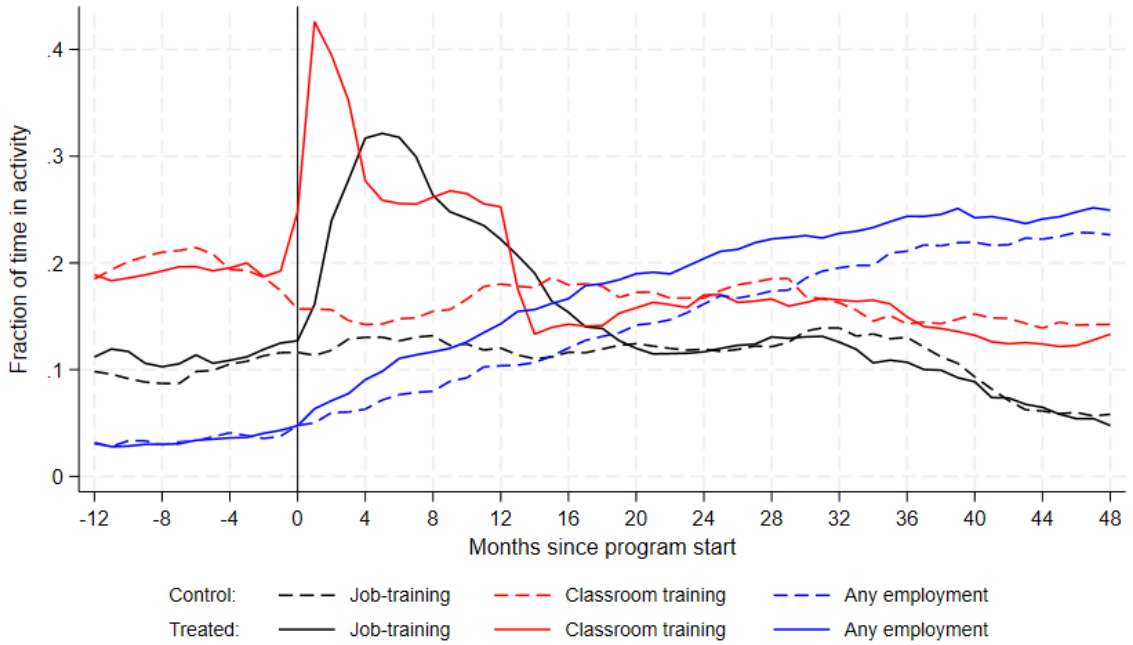
Rambøll og Metrica (2018e). Jobfirst. Slutevaluering. Bilagsrapport.

Riccio, J. A., D. Friedlander and S. Freedman (1994). GAIN: benefits, costs, and three-year impacts of a welfare-to-work program. Report on California's Greater Avenues for Independence (GAIN) Program. Manpower Demonstration Research Corporation.

Sarvimäki, M., & Hämäläinen, K. (2016). Integrating Immigrants: The Impact of Restructuring Active Labor Market Programs. *Journal of Labor Economics*, 34(2), 479-508.

Warr, P. (1987). Work, Unemployment and Mental Health. Oxford: Clarendon Press.

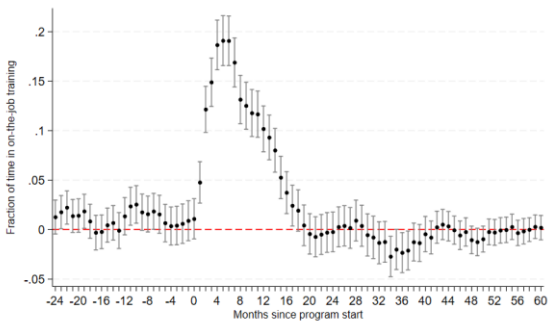
Figure 1. ALMP participation and employment for *Job-First* participants (treated) and controls, before and after program randomization (t = 0).



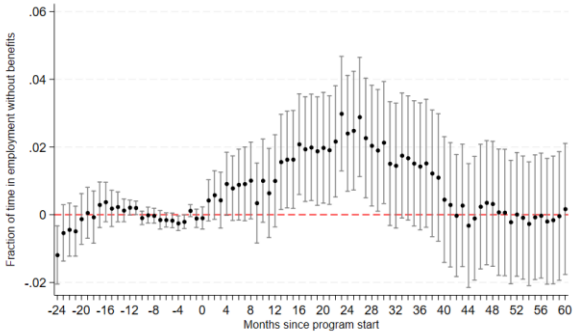
Notes: Mean monthly ALMP and employment rates.

Figure 2. Main effect of the *Job-First* program.

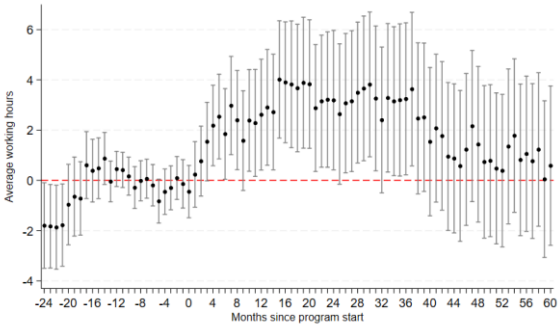
A. Job-training



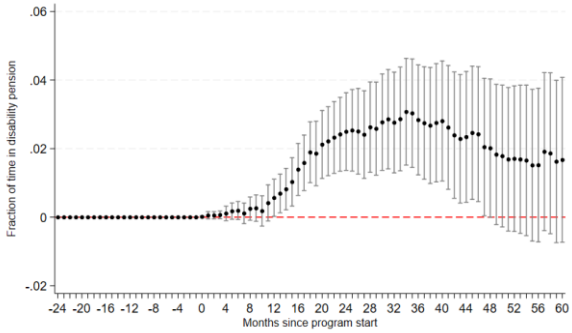
B. Employment without benefit



C. Work hours



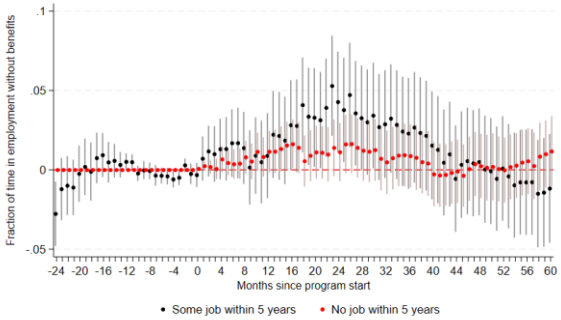
D. Disability pension



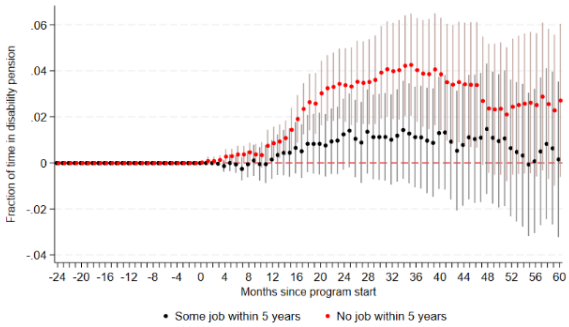
Notes: Period specific OLS estimates of differences between treatment and controls. The first axis is the number of months since the program started. Horizontal bars are 95%-confidence intervals.

Figure 3. Effect of the *Job-First* program by sub-groups.

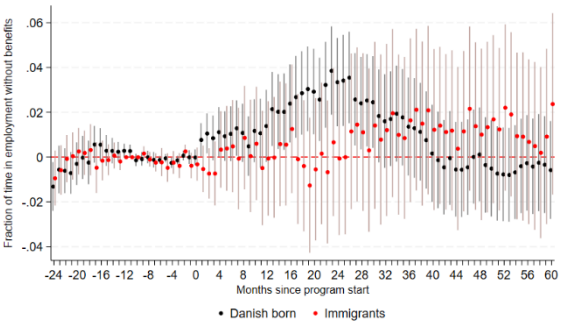
A. Employed without benefits, by previous work status



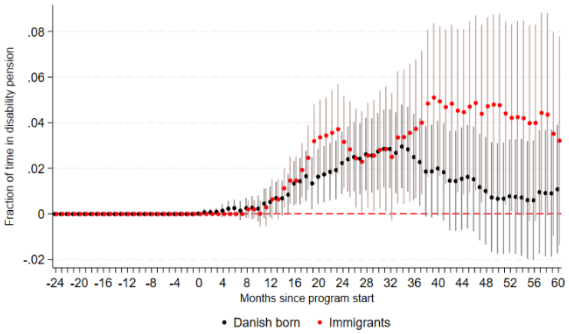
B. Disability pension, by previous work status



C. Employed without benefits, by immigrant status



D. Disability pension, by immigrant status



Notes: Period specific OLS estimates of differences between treated and controls. The first axis is the number of half-year periods from the start of the program. Horizontal bars are 95%-confidence intervals.

Table 1. Descriptive statistics

Variable	Treatment group	Control group	
Age in 2015	43.802	44.328	*
Female	0.510	0.512	
Children	0.410	0.380	
Married	0.190	0.175	
Immigrant	0.252	0.269	
MENAPT	0.180	0.183	
Europe	0.083	0.106	**
Number of years in Denmark (immigrants)	18.37	18.84	
Welfare benefit recipient at start of program	0.983	0.985	
Activity-ready at start of program	0.726	0.731	
Starts in 1. quarter 2015	0.354	0.324	*
Starts in 2. quarter 2015	0.215	0.215	
Starts in 3. quarter 2015	0.431	0.461	*
Percentage of weeks in previous year with:			
any employment	0.035	0.035	
employment without benefits	0.001	0.002	
on-the-job training	0.109	0.099	
Percentage of weeks in previous 5 years with:			
any employment	0.074	0.078	
employment without benefits	0.029	0.033	
social benefit	0.814	0.823	
Mean outcome in previous 5 years:			
any employment	0.415	0.421	
admitted to hospital	0.493	0.491	
number of consultations with PA	63.94	62.25	
Individuals	1,833	1,858	

Notes: Individual characteristics in the year prior to program start. The stars denote significance levels for a t-test for difference between the treatment and control groups. $^{\#}$ $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 2. Societal and fiscal analysis of the *Job-First* program (per participant, 2016 USD).

	All	Danish born	Immigrants	Some employment within 5 years	No employment within 5 years
A. Benefits (labour income)	3193	3189	3233	3264	3303
(s.e.)	(284)	(362)	(540)	(532)	(347)
B. Program funding	-4560	-4560	-4560	-4560	-4560
C. Net Societal Benefits (excl. DWL): A+B	**-1367**	**-1371**	**-1327**	**-1296**	**-1257**
D. Taxes	-128	-196	-196	-196	-200
E. Welfare Benefits	6405	7145	4244	6679	6314
(s.e.)	(204)	(244)	(420)	(324)	(264)
F. Disability Pension	-2654	-2055	-4289	-1043	-3802
(s.e.)	(154)	(176)	(276)	(195)	(215)
G. Net Fiscal Benefits: B+D+E+F	**-937**	**334**	**-4801**	**880**	**-2248**
H. Income gain after taxes and transfers (A-D-E-F)	-430	-1705	3474	-2176	991
I. MVPF: H/(-G)*	**-0.46**	**0.20**	**0.72**	**0.40**	**0.44**
J. Deadweight loss (DWL): 0.5 * G	-469	167	-2400	440	-1124
K. Net Societal Benefits (incl. DWL): A+B+J	**-1836**	**-1204**	**-3727**	**-856**	**-2381**

Notes: All numbers are per participant. All numbers are the present value over a 5-year horizon, discounted by a monthly discount rate of 0.25%. Bootstrapped standard errors in parentheses. See Appendix C for further details. * For the groups where the program provides fiscal savings and net income less (natives and previously employed), the MVPF is calculated as the inverse: Net fiscal savings as a ratio of the income loss for participants.

Appendix A: Additional tables and figures.

Appendix Table A1. Mean of outcomes in the control group in the *Job-First* program.

Years since program randomization:	On-the-job training (1)	Classroom training (2)	Any Employment (3)	Employment without benefits (4)	Welfare benefits (5)	Disability pension (6)	Labour income (DKK) (7)
-2	0.080	0.179	0.070	0.030	0.894	0.000	1639.6
-1.5	0.075	0.171	0.059	0.018	0.929	0.000	1402.3
-1	0.088	0.166	0.040	0.008	0.960	0.000	866.0
-0.5	0.091	0.201	0.031	0.001	0.990	0.000	392.9
0	0.107	0.195	0.037	0.002	0.995	0.000	506.2
0.5	0.123	0.150	0.059	0.012	0.968	0.000	1038.7
1	0.126	0.158	0.086	0.031	0.924	0.003	1548.7
1.5	0.114	0.180	0.112	0.046	0.876	0.006	2051.7
2	0.121	0.171	0.142	0.058	0.825	0.014	2476.6
2.5	0.120	0.178	0.169	0.070	0.779	0.027	2873.3
3	0.134	0.158	0.196	0.081	0.739	0.042	3309.4
3.5	0.107	0.146	0.216	0.088	0.697	0.061	3482.9
4	0.062	0.143	0.224	0.088	0.661	0.085	3589.9
4.5	0.051	0.137	0.229	0.088	0.621	0.106	3668.8
5	0.042	0.133	0.240	0.090	0.575	0.133	4088.3

Notes: The outcomes are averages within each half-year period of the percentage of weeks in the given state. The reference period is set at the half-year before the first program start in March 2016.

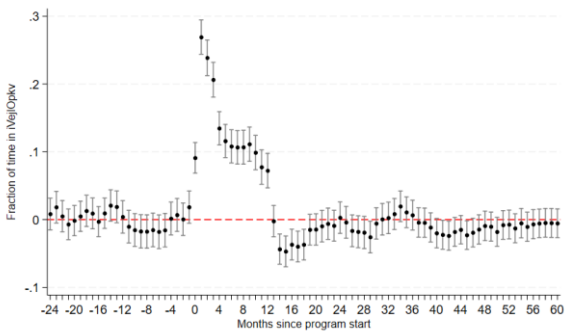
Appendix Table A2. The cost and benefits of time use.

Time use	
Cost of time in work	-216
Cost of time in ALMP	38
Benefit of time if disability	3
Total	-174

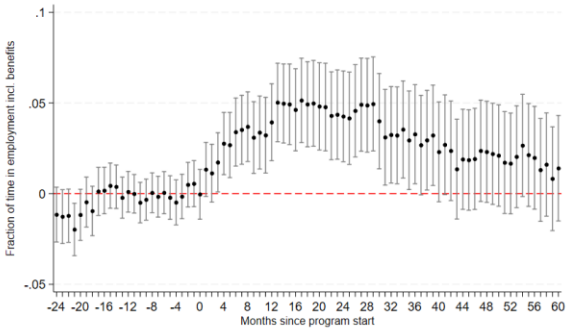
Notes: The cost of time in work is calculated as the net consumer value using the approach in Greenberg (1997) using control group mean wages as its price and time in work is the estimated hours of work. The cost of time in ALMP is the added time in any ALMP (internship and classroom training) times a reservation wage in absence of welfare programs, set at 70% of the minimum wage (Boardman et al. 2006). The benefit of time in disability is the estimated time in ALMP times the estimated effect on the likelihood of receiving disability

Appendix Figure A1. Effect of the *Job-First* program, additional outcomes.

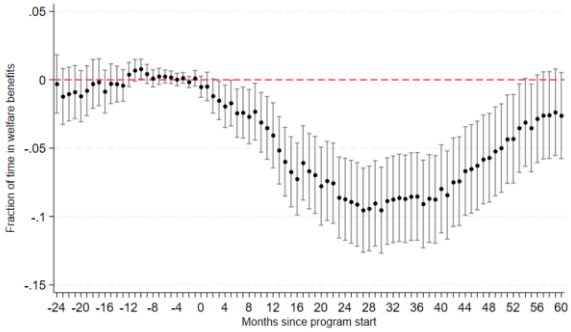
A. Class-room training



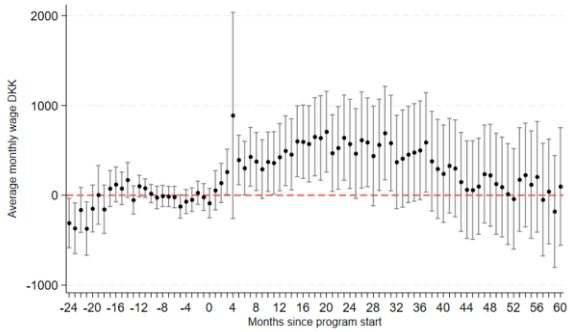
B. Any employment



C. Welfare benefits



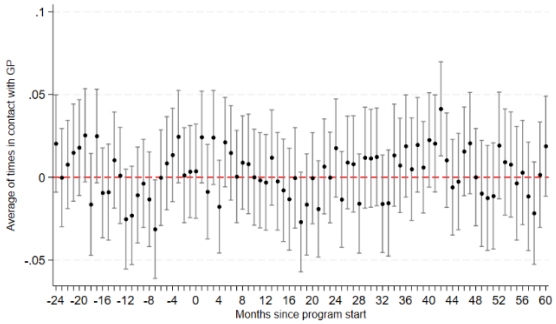
D. Earnings (DKK)



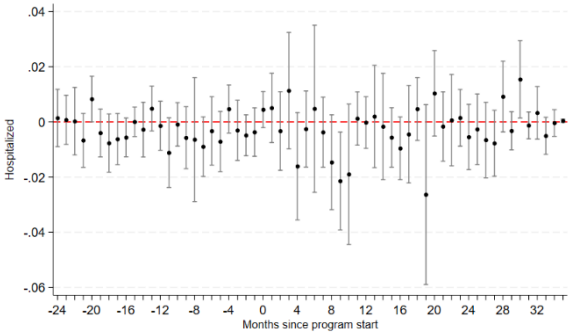
Notes: Period specific OLS estimates of differences between treatment and controls. The first axis is the number of months since the program started. Horizontal bars are 95%-confidence intervals.

Appendix Figure A2. Effect of the *Job-First* program on health care utilization.

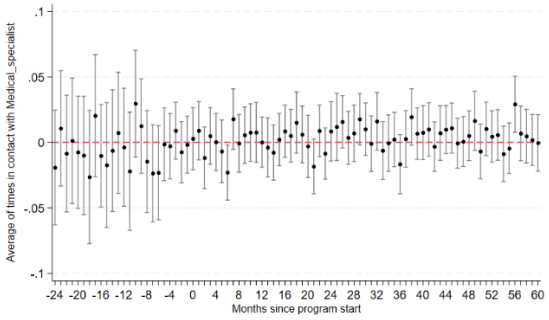
A. GP visits



B. Hospitalization



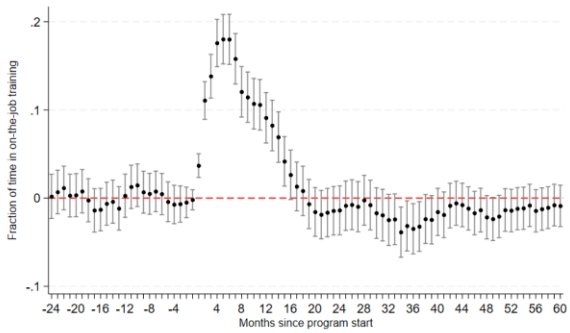
C. Specialist visits



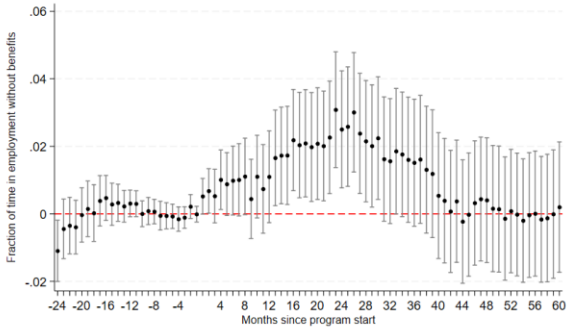
Notes: Period specific OLS estimates of differences between treatment and controls. The first axis is the number of months since the program started. Hospitalization is only observed until 2019 and therefore has fewer post-program periods. Horizontal bars are 95%-confidence intervals.

Appendix Figure A3. Dynamic estimates of the effect of the *Job-First* program

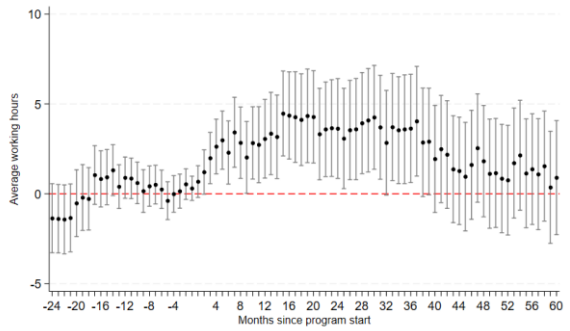
A. Job-training



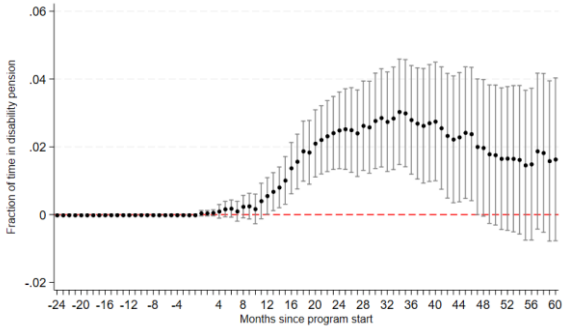
B. Employment without benefit



C. Work hours



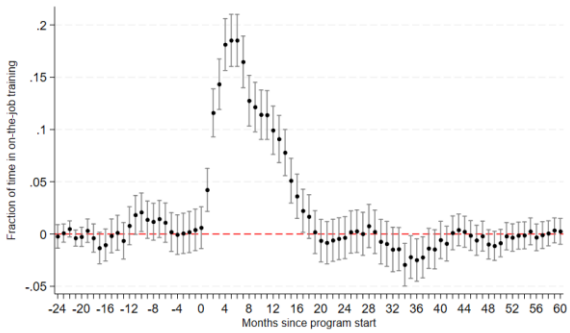
D. Disability pension



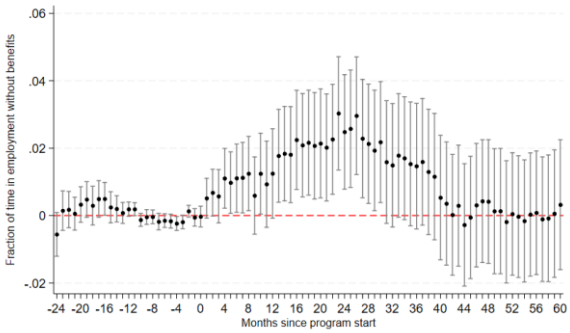
Note: Each figure contains estimates from a dynamic event-study model with treatment as the event and with individual- and time-specific fixed effects. The first axis is the number of months since the program start. Horizontal bars are 95%-confidence intervals.

Appendix Figure A4. Estimates of the effect of the *Job-First* program, controlling for pre-treatment differences

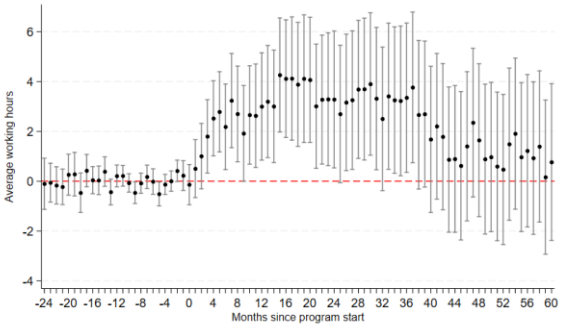
A. Job-training



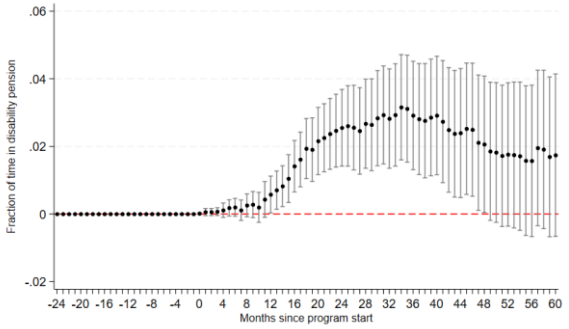
B. Employment without benefit



C. Work hours



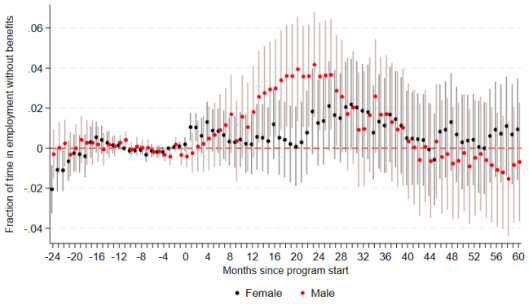
D. Disability pension



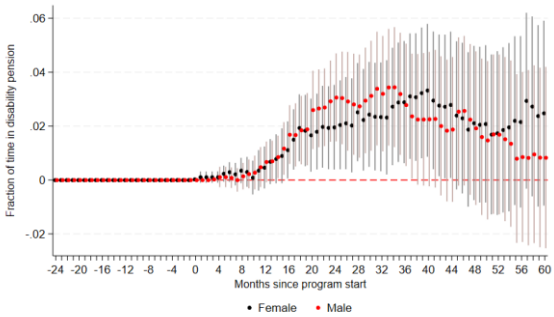
Note: Period specific OLS estimates of differences between treated and controls, controlling for start quarter, average monthly work hours 2, 1.5, 1 and 0.5 years before start, and employment on-the-job training levels 18-24 months prior to program start. The first axis is the number of months since the program start. Horizontal bars are 95%-confidence intervals.

Appendix Figure A5. Effect of the *Job-First* program by gender and provider-status.

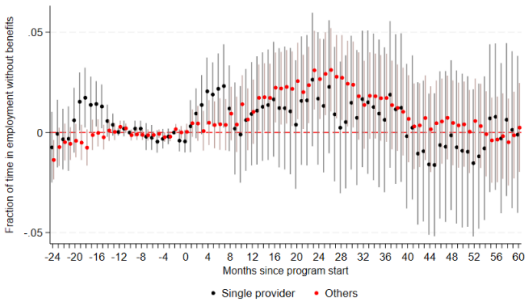
A. Employment without benefit, gender



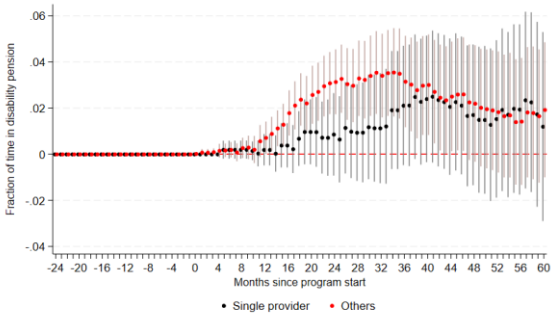
B. Disability pension, by gender



C. Employment without benefit, by provider status



D. Disability pension, by provider status



Notes: Period specific OLS estimates of differences between treatment and controls. The first axis is the number of months since the program started. Horizontal bars are 95%-confidence intervals.

Appendix B: *Job-First* components and Programme Fidelity

The *Job-First* program consists of eight core components (Rambøll and Metrica 2018c; 2018d). The components and summary of programme fidelity are described in Table B.1 below.

Table B.1. Core components of the *Job-First* program

Component	Description	Fidelity assessment
Clear task division	The municipalities have established a clear division of roles between JobFirst employees. The number and frequency of interviews have been determined and implemented as intended.	Middle
Job goal	Set specific job goals for the citizen and create a CV using the digital tool "Min plan".	Middle
Firm meetings	Establish activity plan with firm meetings	High
Goal adjustment	Adjust job goals in "Min plan"	High
Match and work contract	Sign contracts for internships with work agreements	High
Retention support	Meetings with a mentor and firm representative	Middle
Combination with regular work hours		Middle
Results implemented in future job plans		Middle

Source: Rambøll & Metrica (2018d).

Appendix C: The cost-benefit analysis

We evaluate the societal and the fiscal impact as well as the marginal value of public funds of the program (Heckman et al. 2010; Hendren and Sprung-Keyser 2020; 2022; Garcia and Heckman 2022). The three approaches are described below.

The net societal benefit (NSB) is defined as:

$$NSB = \boldsymbol{B - C - DWL} = \sum_{i=0}^{T} \frac{\boldsymbol{b_i - c_i - dwl_i}}{\boldsymbol{(1+r)^i}}$$

Where *B* are the benefits, *C* the costs, *r* is the societal discount rate, *T* is set to the measured time horizon of 5 years (i.e., 10 periods of six months), and *DWL* is the deadweight loss (or gain) from taxation because of the impact of the program on the fiscal budget (see below).

Studies in public finance argue that the inclusion of such a deadweight loss depends on strong assumptions and are likely to lead to under provision of public goods (Hylland and Zeckhauser 1979; Kreiner and Verdelin 2012). We therefore present results with and without a deadweight loss of taxation, using a deadweight cost of taxation of 50% (like the approach in Heckman et al. 2010). We use a discount rate of 0.003% per month (corresponding roughly to an annual rate of 3%). All prices are converted to 2016 levels using the consumer price index and Danish prices are converted to USD using an exchange rate of 6.4 DKK/USD.

The main effect included in *B* is the effects on pre-tax labour income. This is an estimate of the additional value of production generated by the program.

The direct costs of the program C is assessed as government funding for the *Job-First* program per participant. Since total funding amounted to USD 8.36 million for 1833 participants, the costs per participant is USD 4560.[15] The final part – the deadweight loss of taxation – is derived from the direct costs and the fiscal benefit, explained below.

This simple approach disregards potential effects: The cost of going to work, and potential health benefits for the participants. We examined if the program influenced health care utilization, but this was not the case (Appendix Figure A2), leaving some justification for disregarding health gains. We disregarded any production value during internships (when not paid), assuming, for instance, that these are balanced out by firm's costs of training.

In supplemental estimates we inspect the sensitivity of the results to the inclusion of the value of time. We estimate the value of lost time for work based on an approximation to the labour supply curve (Greenberg 1997). If the program participant spent (h_1-h_0) more hours at potentially higher (post-tax) wages, W_1, we use ½*(W_1-W_0)*(h_1-h_0)+W_0*h_1, as an estimate of the disutility from working (see Greenberg 1997, Figure 1). The multiplication by ½ is made under an assumption of a linear labour supply curve connecting (h_0, W_0) and (h_1, W_1).

We also include additional time used in ALMP, since welfare benefits are conditional on participating in active measures, and the program enforces more intensive ALMP (Boardman et al. 2006, p. 292). The value of the loss of leisure is given by the changed time due to ALMP (job-training and class-room training) use multiplied by the reservation wage in the absence of welfare benefits. This would be below the minimum wage, and we use 70% of the average level of minimum wages of 130 DKK as an (ad-hoc) approximation[16].

[15] This is from the press release when the program was released (in Danish): https://bm.dk/nyheder-presse/pressemeddelelser/2016/01/16-kommuner-faar-millioner-til-jobindsats-for-udsatte/

[16] See e.g. https://stadsrevisionen.dk/blog/mindstelon-i-danmark/

Finally, we examine the value from entering disability pension. Disability pension provides an income gain for most program participants, but since this is a transfer, it is not included. Entering disability pension also implies a gain from *not* having to participate in ALMP. We calculate this benefit as the effect on entering disability pension times the effect on ALMP (job-training and class-room training). As above, we value the times as 70% of the average minimum wage.

We only use these estimates in a sensitivity analysis, as they are estimated with great uncertainty and there is no general consensus for the inclusion of the value of time. For instance, Fujiwara (2010) argues that many unemployed may experience consumption value from finding a job, and this may balance out the disutility from working additional hours for others.

The fiscal impact

The fiscal impact is calculated as the sum of all transfers to and from the public sector. We include the main categories: changes in tax revenue, welfare benefits, disability benefits and the direct costs of the program. To derive changes in tax revenue, we assume an average income tax rate of 32% and calculate it as taxes from the effect on labour and transfer income[17]. Transfer income is calculated as the effect on welfare and disability benefits times average welfare and disability pension transfer levels in 2016 for providers and non-providers and singles and couples[18]. Let G be the net present value of the incremental effect on public taxes and transfers. Then the net fiscal impact is C - G.

The marginal value of public funds

Following Hendren and Sprung-Keyser (2020; 2022), the marginal value of public funds is calculated as post-tax and transfer income effect for the participants over the net fiscal impact: $(B+G)/(C-G)$. When the income effect for the participants is negative and there is a fiscal saving, we reverse this: $(C-G)/(B+G)$

[17] With a maximum employment deduction of DKK 45000, a municipal tax rate of 25% and the state tax rate for low incomes of 12%, an annual income corresponding to welfare benefits is taxed by 32%. Source: https://skat.dk/hjaelp/satser.

[18] The levels correspond to USD 2180 and 1640 per month in welfare benefits for providers and non-providers, see https://www.retsinformation.dk/eli/lta/2016/468#id04c71f80-bcce-44c8-a947-5ba65dec5831, and to 2705 and 3182 for couples and singles in disability pension.