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# The Direct and Indirect Effects of Online Job Search Advice

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30 August 2023

# Digital tools to facilitate job search

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## **Information frictions are a pervasive feature of the job search process**

- Understanding incentives, rules, and regulations (Chetty and Saez 2013, Altmann et al. 2021).
- Returns to occupational and geographical flexibility (e.g., Sahin et al. 2014, Belot et al. 2018).
- Overoptimism (e.g., Spinnewijn 2015, Bandiera et al. 2020, Mueller et al. 2021).

## **Digital services may be an ideal instrument to tackle lack of information**

- Ability to disseminate information at low cost
- Ability to tailor information to different worker groups

 How does the provision of personalized information about labor demand influence job seekers' employment prospects and labor market outcomes?

# What we do

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- We conduct a large-scale field experiment with Danish unemployment benefit recipients
  - Participants = all registered unemployment benefit recipients in Q1 2019
- Make use of a new information dashboard on the online platform of the Danish Agency for Labor Market and Recruitment
- Exogenously vary content of dashboard across treatment groups
  - Information on number of vacancies fitting job seeker's search profile
  - Information on alternative occupations that might be a “good match”
- Apply a two-stage randomized design to test for treatment externalities
- Evaluate the impact on labor market outcomes, using administrative data on individuals' employment and earnings

# Outline

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- Motivation
- Setup and Design of the Experiment
- Empirical Results
- Conclusions

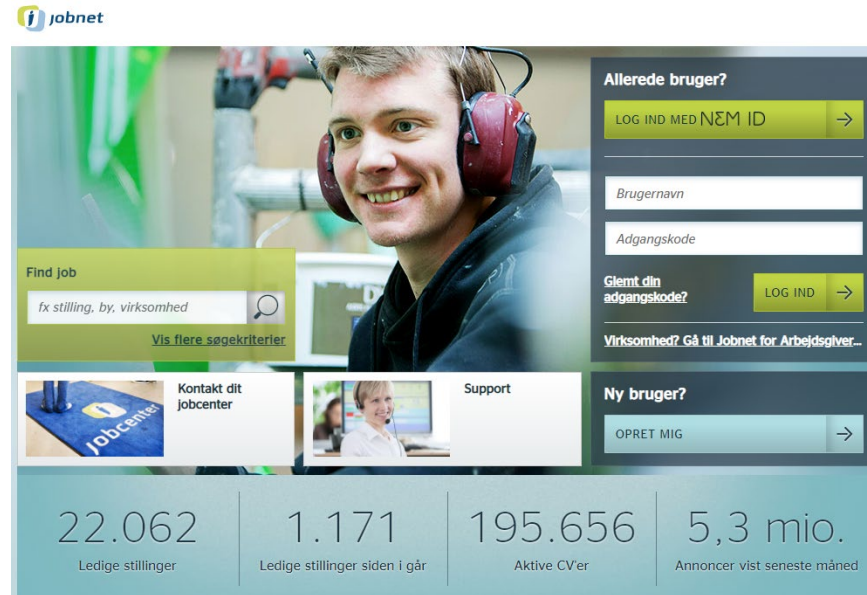
# A countrywide laboratory

## Jobnet.dk platform

- Large job search platform
- (De-)register unemployed
- Manage caseworker meetings
- Upload CV, log applications
- Mandatory log-in once per week

## Core features

- Possibility to *personalize*
- Possibility to *experiment*
- Possibility to *match* data with administrative records



The screenshot shows the Jobnet.dk homepage. At the top left is the Jobnet logo. Below it is a search bar with the text "Find job" and a search icon. To the right of the search bar are two buttons: "Kontakt dit jobcenter" and "Support". Below the search bar are four statistics: "22.062 Ledige stillinger", "1.171 Ledige stillinger siden i går", "195.656 Aktive CV'er", and "5,3 mio.annoncer vist seneste måned". On the right side, there is a login section with the text "Allerede bruger?" and a "LOG IND MED NEM ID" button. Below that are input fields for "Brugernavn" and "Adgangskode", and a "LOG IND" button. There is also a "Glem din adgangskode?" link and a "Ny bruger?" section with an "OPRET MIG" button.



The screenshot shows the Jobnet.dk user interface. At the top is a navigation bar with "MIN SIDE", "MIN JOBSØGNING", "FIND JOB", and "GODE RÅD TIL JOBSØGNINGEN". Below the navigation bar is a sidebar with a list of menu items: "MIN KALENDER", "MIN PLAN", "MINE MØDER", "MIN BESKEDBAKKE", "MIT FRAVÆR", "TIL- OG AFMELDING", "MIN PROFIL", and "MIN HISTORIK". The main content area has a heading "Velkommen Vidthdyan Her er dit overblik" and a "LEDIGE JOBS" section with a large green circle containing the number "117". Below this is a "LIGNENDE JOB" section with a list of job titles: "køkkenchef", "køkkenmedhjælper", and "kok". On the right side, there is a "Din status" section with the text "Du er meldt ledig i jobcentret (dagpenge)" and "Dit CV er søgbart". Below that is a "Se filmen om ... når du bliver ledig" section with a play button icon. At the bottom right is a "Kontakt din a-kasse" section with a speech bubble icon.

# Design of the experiment

As part of registration process on jobnet.dk, job seekers have to set up a **job search profile**. Select desired occupation(s) based on DISCO-08.

**Two main information dashes:**

## 1) Vacancy information

- Number of job ads on jobnet.dk fitting individual job seeker's search profile
- 50km radius around job seeker's place of residence

## 2) Recommended alternative occupations

- Up to 3 alternative occupations
- Based on individual job search profiles + data on occupational transitions and educational requirements (DST data)

Information is personalized and updated in real time upon log-in.

The screenshot shows two information dashes from the jobnet.dk interface. The top dash, titled 'LEDIGE JOBS', features a large green circle with the number '117' inside. Below the circle, it reads 'Ledige jobs indenfor de stillingsbetegnelser, hvor du søger.' At the bottom of this dash is a green button with the text 'JEG SØGER JOB SOM' and a right-pointing arrow. The bottom dash, titled 'LIGNENDE JOB' with an information icon, reads 'Du søger job som kantineleder. Følgende job kan også være relevante for dig:'. Below this text is a list of three alternative occupations: 'køkkenchef', 'køkkenmedhjælper', and 'kok'. At the bottom of this dash is another green button with the text 'JEG SØGER JOB SOM' and a right-pointing arrow.

# Treatments

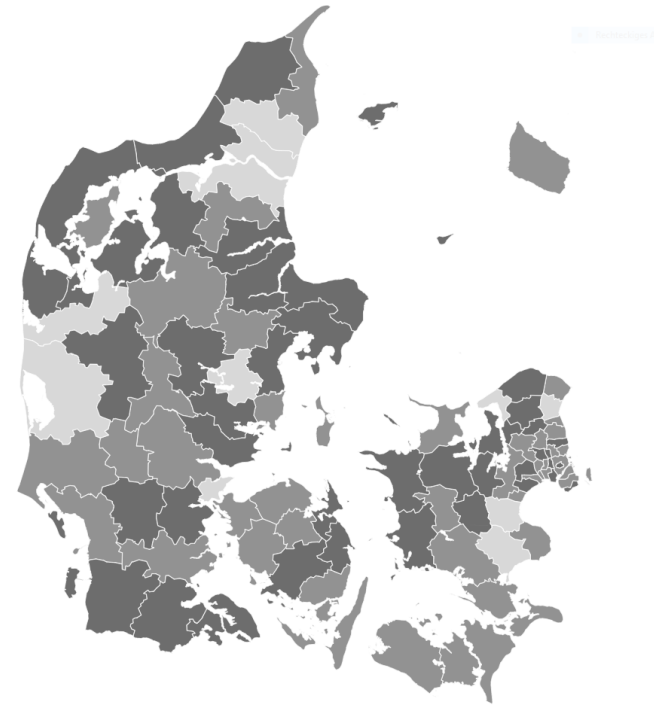
We exogenously vary whether job seekers' dashboard contains dashes with vacancy information and / or occupational recommendations (2 x 2 design)



- Dashboard filled up with generic dashes in treatments that contain <2 main dashes
  - Video with general information about jobnet.dk
  - Dash linking to individual's job search profile

# Implementation

- Sample: Universe of UI benefit recipients on March 15, 2019 (N=93,764)
- Two-stage randomization
  - Individual-level treatment assignment, based on regionally assigned treatment intensities
  - Allows to test for treatment spillovers (Crepon et al. 2013).
  - Vary treatment intensity at the municipal level (control group share = 10% / 40% / 100%)
  - Construct continuous measure of treatment intensity, accounting for inter-municipal commuting flows
- Treatment held constant throughout experiment
  - Participants who leave & re-enter UE return to originally assigned treatment
- Follow job seekers up to one year after the beginning of the intervention.





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  - Employment and earnings over time
  - Treatment Spillovers
- Conclusions

# Job Search

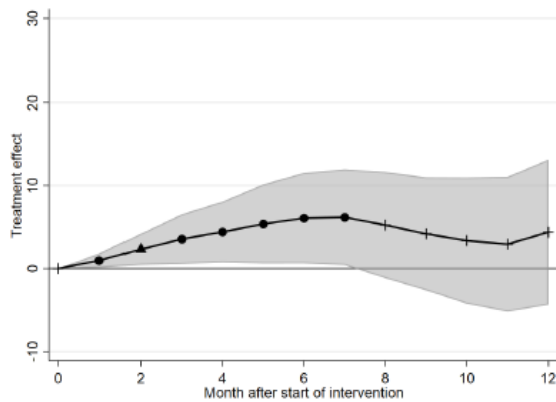
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How do treatments alter individuals' job search strategy?

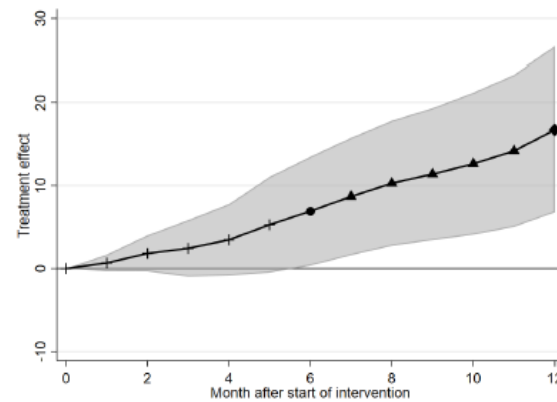
- Analyze data from registered job applications („joblog“)
- Key findings:
  - Job seekers receiving occupational recommendations apply to a broader set of occupations.
  - Job seekers receiving vacancy information are more likely to apply to „core“ occupations specified in their job search profile.
  - Job seekers in all treatments apply to occupations with higher labor market tightness

# Working hours

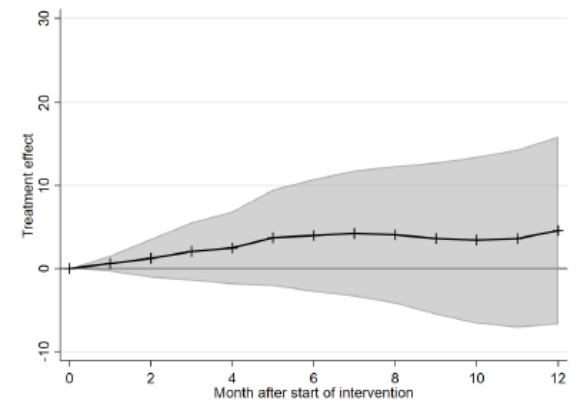
**A. Recommendation treatment**  
*Working hours*



**B. Vacancy treatment**  
*Working hours*



**C. Combined treatment**  
*Working hours*

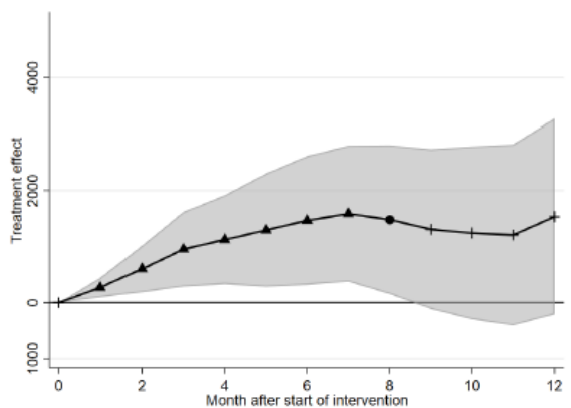


*Note:* Depicted are treatment effects (including 90% confidence intervals) for all three treatments relative to the control group on the average working hours accumulated over the first 12 months after the start of the intervention.

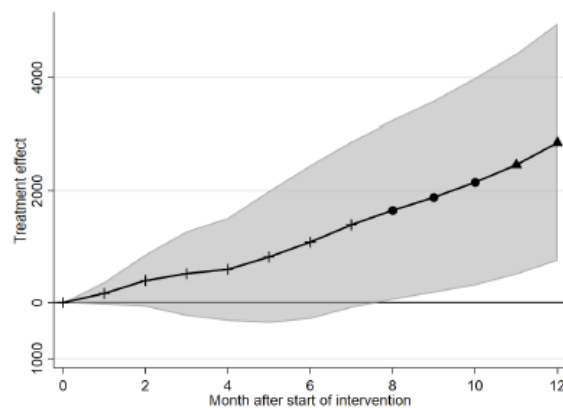
●/▲/◆ indicates statistical significance at the 10%/5%/1%-level.

# Earnings

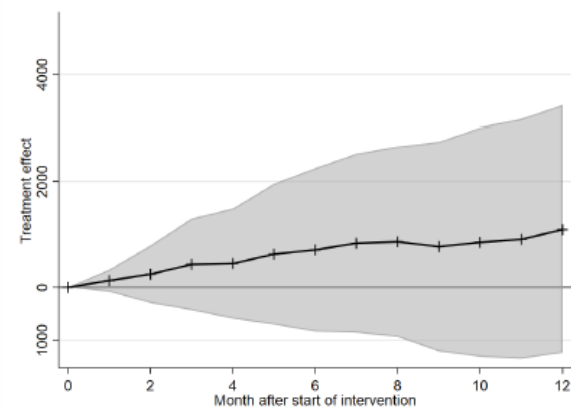
**A. Recommendation treatment**  
*Earnings in DKK*



**B. Vacancy treatment**  
*Earnings in DKK*



**C. Combined treatment**  
*Earnings in DKK*



Further results

# Spillover effects

Dependent variable	Outcomes measured within 12 months after start of intervention		
	Any job finding	Working hours	Labor earnings <sup>(a)</sup>
	(1)	(2)	(3)
Recommendation treatment	0.036* (0.021)	72.1** (35.0)	18,222** (8,264)
Vacancy treatment	0.036 (0.026)	93.2** (37.5)	19,577** (8,301)
Joint treatment	0.037 (0.026)	46.0 (43.3)	11,427 (8,551)
Local treatment intensity (cont.) <sup>(b)</sup>	0.003 (0.015)	-19.8 (23.2)	1,783 (4,619)
× Recommendation treatment	-0.048 (0.032)	-100.5* (52.2)	-25,346** (12,301)
× Vacancy treatment	-0.046 (0.038)	-112.5** (55.4)	-25,112** (12,388)
× Joint treatment	-0.051 (0.041)	-61.5 (64.7)	-15,946 (12,715)
No. of observations	92,098	92,098	92,098
Mean value dep. variable	0.791	779	146,214

# Nature of treatment externalities

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- The average untreated job seeker is not affected when more people are being treated
- Treated job seekers seem to crowd each other out
  - Evidence from applications data suggests that this results from increased competition in targeted occupations
- It seems impossible to improve employment prospects of *all* unemployed individuals in our setting (through full roll-out)
- Policymakers need to decide “whom to target”
- Analyze treatment heterogeneity
  - by job seeker’s elapsed unemployment duration
  - by labor market tightness



Applications



Aggregate



Heterogeneity

# Conclusions

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- Digital job search assistance can have positive impact on employment and earnings prospects of unemployed workers.
  - Low-cost instrument to overcome informational challenges
  - Possibility to provide tailored information
- Relevance of treatment externalities
- Instruments need to be carefully designed and evaluated
  - Personalization: which tools for which subgroups?
  - Timing: tailor assistance programs to unemployment duration?
  - Avoid information overload and negative externalities on other job seekers
  - Combination of online / offline policy instruments



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Thank you for your attention!