Hire from Anywhere

Work-from-Home Offering and Firms' Labor Market Access

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Motivation

- Perennial problem for firms, policy makers, job seekers: finding good worker-firm matches
  - Current conditions indicate high labor shortage across Europe and in the US (European Employment Services, 2024; Handel, 2024)
  - Geographic misallocation of job seekers and firms exacerbates this
- Potential solution: offering work from home (WFH)
  - WFH relaxes geographic constraint and reduces spatial frictions
- This paper: Investigate if and to what extent WFH can help alleviate hiring shortages and spatial frictions

Research Questions

[1] To what extent does working from home change labor market access?

- More interaction / applications for WFH vacancies?
- Greater geographic area accessed?

[2] How does the type of job seekers change when offering WFH?

- Change in the quality of the applicants?
- Change in the demographic composition?

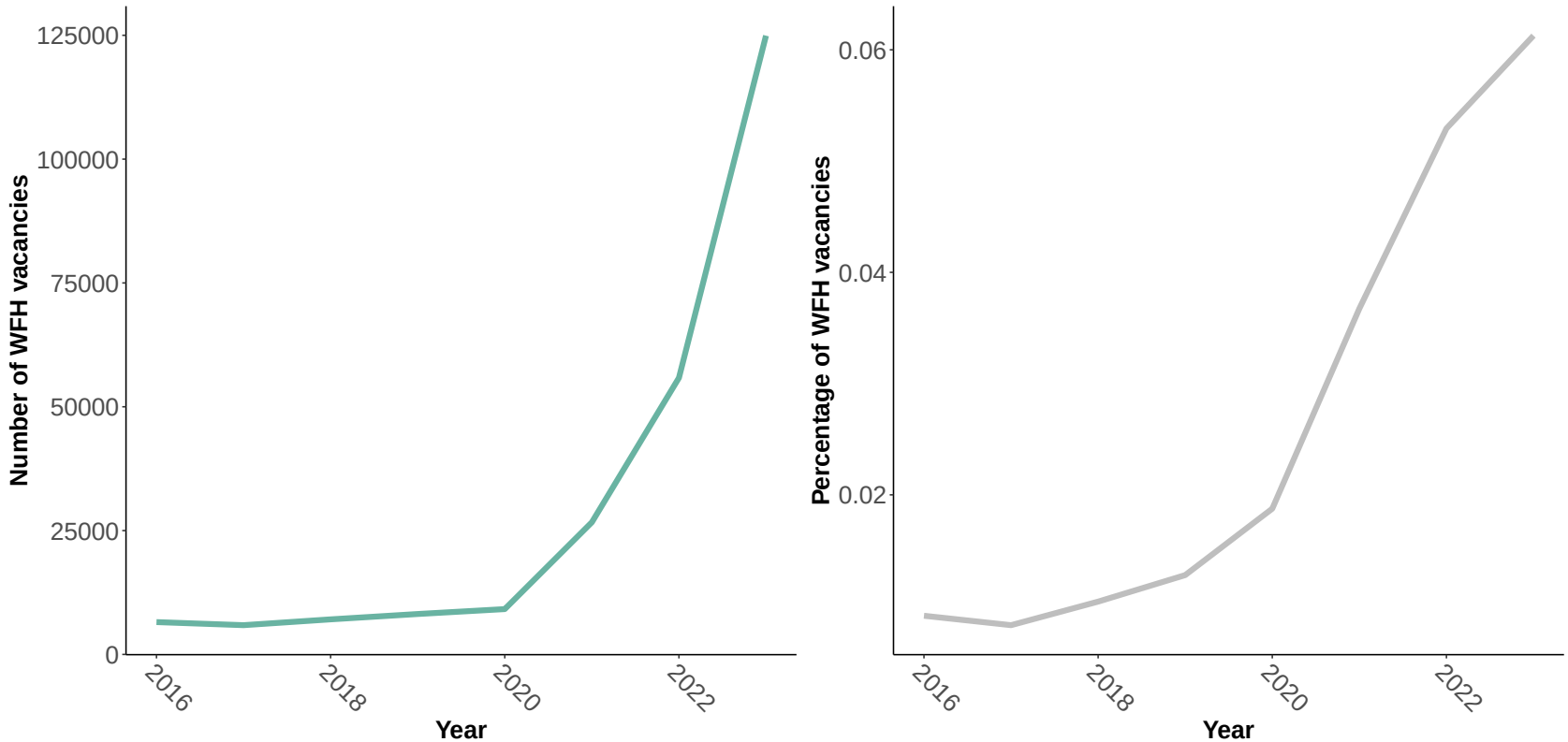
Data Description

- Swedish Vacancy data (*Platsbanken*) from 2016-2023
  - about 10 million vacancies
  - Vacancies categorized as "WFH" (fully remote and hybrid separately) using generative AI model (2.3% of all vacancies are WFH)
  - Vacancy data has addresses of the listed location of the job ad $\rightarrow$ coordinates
- Data on applications (May 2020-September 2022) and views (June 2019-September 2022) by individuals
- Registry data on the universe of firms including incumbent employees, wages, firm characteristics, etc.
- Demographic information for subsample (unemployed)

▸ WFH Class ▸ WFH Occs

Growth of WFH in Sweden

Figure 2: WFH Vacancy Trends in Sweden



- Hybrid
- Fully remote

Data Description

- Swedish Vacancy data (*Platsbanken*) from 2016-2023
  - 7,052,457 vacancies
  - Vacancies categorized as "WFH" (fully remote and hybrid separately) generative AI model (2.3% of all vacancies are WFH)
  - Vacancy data has addresses of the listed location of the job ad $\rightarrow$ coordinates
- Data on applications (May 2020-September 2022) and views (June 2019-September 2022) by individuals
- Registry data on the universe of firms including incumbent employees, average wages, firm characteristics, etc.
- Demographic information for subsample (unemployed)

▸ WFH Class ▸ WFH Occs

Geographic and Quality Measurement

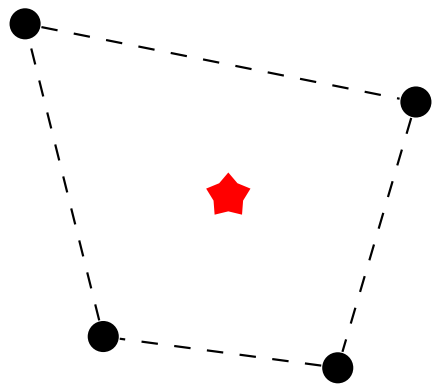
Geographic

- Construct "workplace location preference" measures for job seekers when they would have to commute
- Use centroid of the polygon from the in-person job ads applied to
- Compare the distance of the job seekers that apply between the WFH and in-person job ads

Quality

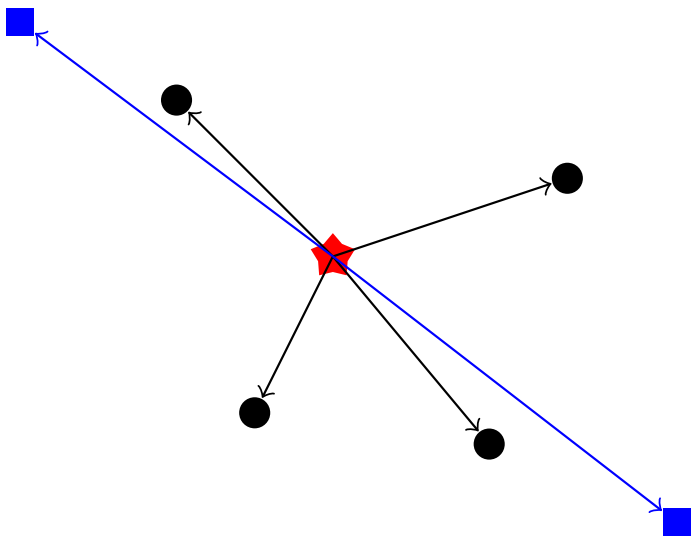
- Estimate AKM for firms
- Use leave-one-out mean of applications for job seeker quality
- Average applicant quality at job ad level

Measurement - Job Seeker Workplace Location Preference



- = In-person vacancy

Measurement - Job Seeker Workplace Location Preference



- $\bullet$ = In-person vacancy, $\square$ = WFH vacancy

Geographic and Quality Measurement

Geographic

- Construct "workplace location preference" measures for job seekers when they would have to commute
- Use centroid of the polygon from the in-person job ads applied to
- Compare the distance of the job seekers that apply between the WFH and in-person job ads

Quality

- Estimate AKM for firms
- Use leave-one-out mean of applications for job seeker quality
- Average applicant quality at job ad level

Methodology

- **Job-ad level analysis**:

$$\text{Outcome}_{i,f,z,o,t} = \beta_0 + \beta_1 \mathbf{1}[\text{WFH}{=}1]_i + \boldsymbol{\gamma}\mathbf{X}_i + \boldsymbol{\alpha}\mathbf{Z}_f + \theta_{o,z} + \theta_{o,t} + \theta_{z,t} + \epsilon_{i,f,z,o,t}$$

- Include:
  - Vacancy-level controls ($\mathbf{X}_i$)
  - Firm-level controls ($\mathbf{Z}_f$)
  - Local-labor-market fixed effects ($\theta_{o,z}$)
  - Occupation-by-time fixed effects ($\theta_{o,t}$)
  - Commuting-zone-by-time fixed effects ($\theta_{z,t}$)

- **Alternative specification** - within-firm analysis:

$$\text{Outcome}_{i,f,z,o,t} = \beta_0 + \beta_1 \mathbf{1}[\text{WFH}{=}1]_i + \boldsymbol{\gamma}\mathbf{X}_i + \theta_{o,z} + \theta_{o,t} + \theta_{z,t} + \theta_f + \epsilon_{i,f,z,o,t}$$

  - Firm F.E.s (θ_f)

Job Attractiveness

Job Attractiveness - Main Results

Table: Effect of WFH on applications

	Baseline	Occupation and Time F.E.s	Main Specification	Firm F.E.s
WFH offering	-0.344^{***}	0.096^{***}	0.039^{**}	0.028^{***}
	(0.044)	(0.024)	(0.017)	(0.010)
Occupation and Time F.E.s	N	Y	N	N
Vacancy Controls	N	N	Y	Y
Firm Controls	N	N	Y	N
Local labor Market F.E.	N	N	Y	Y
Commuting zone × month-year F.E.	N	N	Y	Y
Occupation × month-year F.E.	N	N	Y	Y
Firm F.E.	N	N	N	Y
Sample mean	28.78	28.78	28.78	28.78
N	1,531,314	1,531,314	1,060,687	1,428,685

Note: Standard Errors are clustered at the local labor market level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Offering WFH gives a boost of 3.9% more applications (compared to a sample mean of 28.8 applications - about 1 more application)

▸ Extensive Margin ▸ Post COVID

Job Attractiveness - Main Results

Table: Effect of WFH on views

	Baseline	Occupation and Time F.E.s	Main Specification	Firm F.E.s
WFH offering	−0.231***	0.195***	0.099***	0.069***
	(0.067)	(0.033)	(0.021)	(0.013)
Occupation and Time F.E.s	N	Y	N	N
Vacancy Controls	N	N	Y	Y
Firm Controls	N	N	Y	N
Local labor Market F.E.	N	N	Y	Y
Commuting zone × month-year F.E.	N	N	Y	Y
Occupation × month-year F.E.	N	N	Y	Y
Firm F.E.	N	N	N	Y
Sample mean	217.54	217.54	217.54	217.54
N	2,377,730	2,377,730	1,793,449	2,236,208

Note: Standard Errors are clustered at the local labor market level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Offering WFH gives a 10% boost in views on average (compared to sample mean of 217.5 views - about 21 more views)

Job Attractiveness - Fully Remote

Table: Effect of fully remote WFH on applications

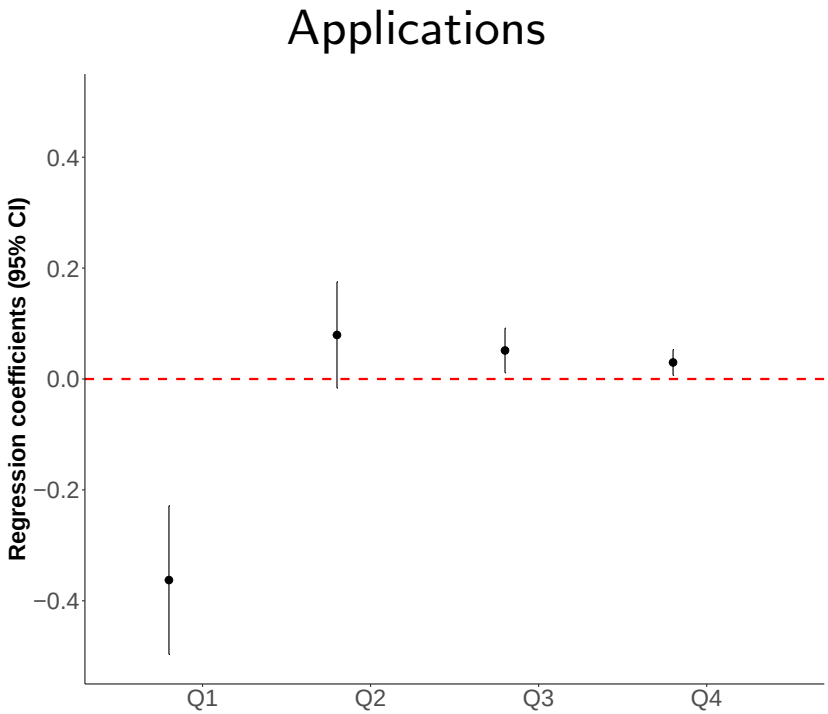
	Baseline	Occupation and Time F.E.s	Main Specification	Firm F.E.s
WFH offering	0.011	0.365***	0.240***	0.332***
	(0.058)	(0.124)	(0.084)	(0.055)
Occupation and Time F.E.s	N	Y	N	N
Vacancy Controls	N	N	Y	Y
Firm Controls	N	N	Y	N
Local labor Market F.E.	N	N	Y	Y
Commuting zone × month-year F.E.	N	N	Y	Y
Occupation × month-year F.E.	N	N	Y	Y
Firm F.E.	N	N	N	Y
Sample mean	29.2	29.2	29.2	29.2
N	1,480,275	1,480,275	1,028,283	1,379,066

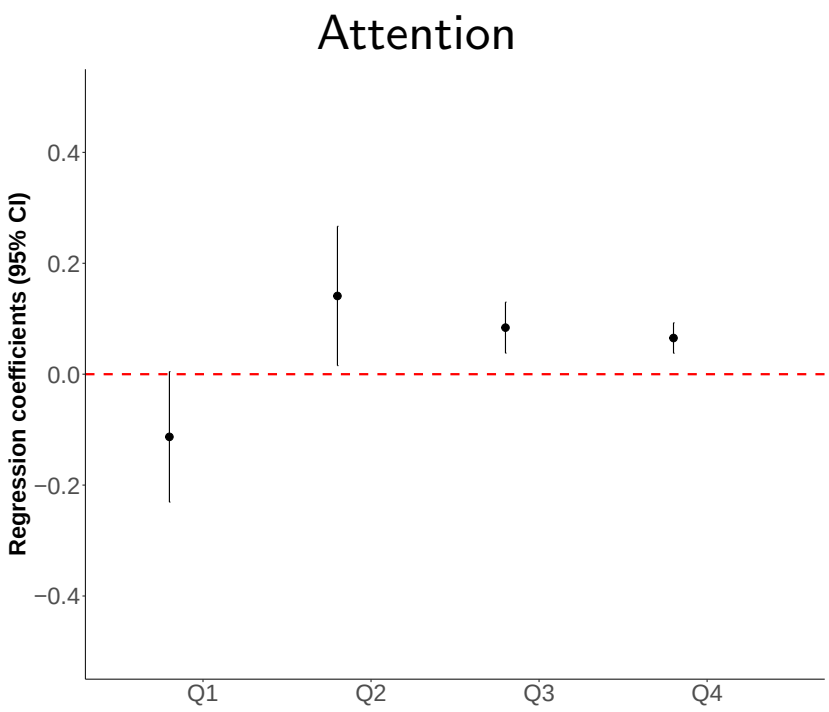
Note: Standard Errors are clustered at the local labor market level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Offering fully remote WFH gives a boost of 24.0% more applications (compared to a sample mean of 29.2 applications - about 7 more applications)

▸ Views ▸ WFH in Title

Job Attractiveness - Occupational quartile of WFH share (LFS)



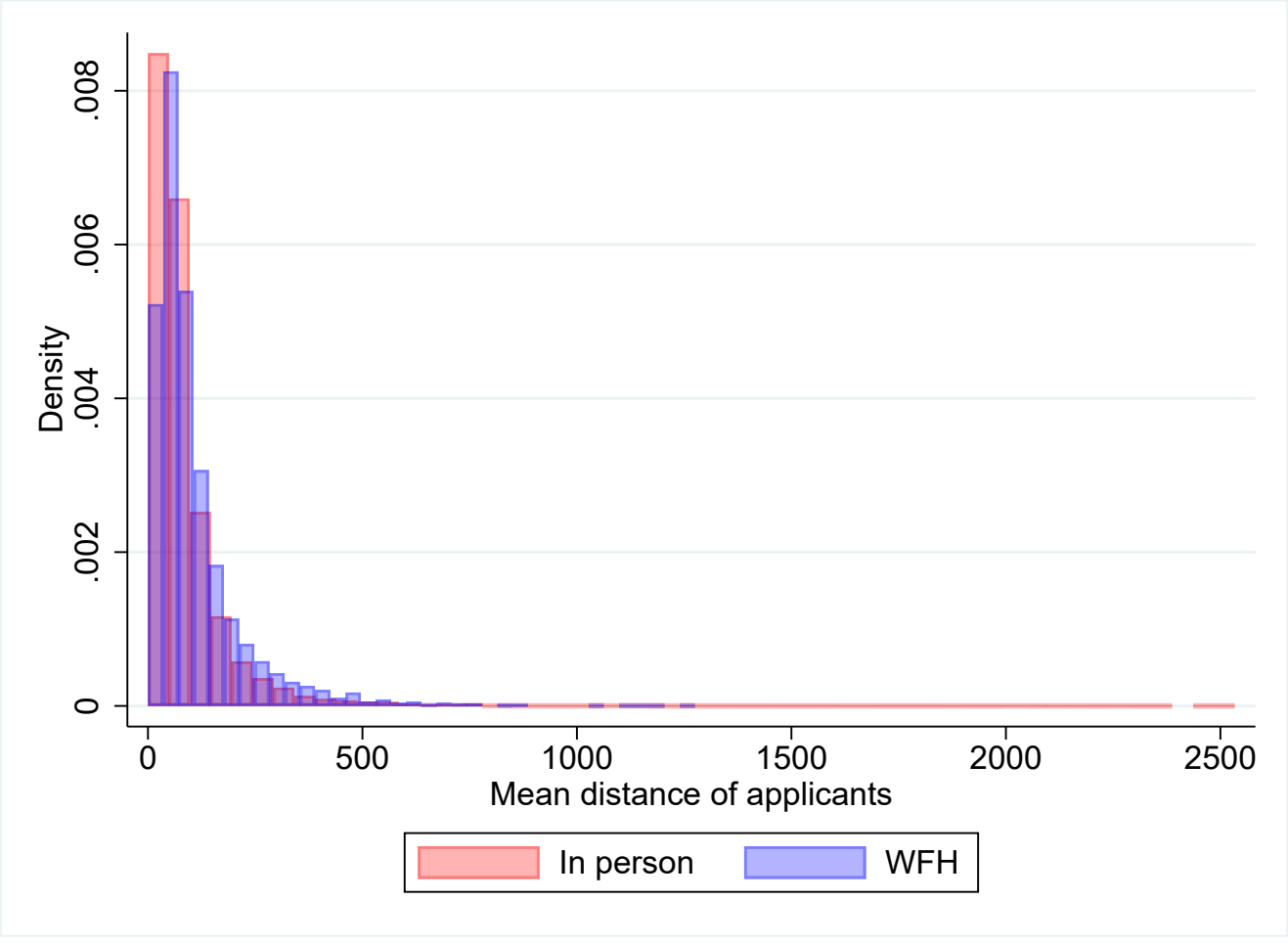


Quartiles are determined by the share of WFH by occupation reported in the European Labor Force Survey 2021.

Geographic Distribution

Distribution of Distances

Figure: Distributions of mean distances of applicants by whether the job ad offers WFH



▸ Other distance measures

Geographic Dispersion - Main Results

Table: Effect of WFH on average applicant distance (log)

	All job ads			
	(1) Baseline relationship	(2) Within occupations	(3) Main analysis	(4) Firm fixed effects
WFH offering	0.209***	0.366***	0.367***	0.417***
	(0.028)	(0.019)	(0.019)	(0.019)
Occupation and Time F.E.s	N	Y	N	N
Vacancy Controls	N	N	Y	Y
Firm Controls	N	N	Y	N
Local Labor Market F.E.	N	N	Y	Y
Commuting Zone × month-year F.E.	N	N	Y	Y
Occupation × month-year F.E.	N	N	Y	Y
Firm F.E.	N	N	N	Y
Sample mean (km)	39.8	39.8	39.8	39.8
N	1,326,144	1,326,144	927,677	1,241,048

Note: Restrict to minimum distance < 20km. Standard Errors are clustered at the local labor market level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Offering WFH attracts applicants from 36.7% further away (compared to a sample mean of 39.8km - about 14.4km further)

▸ Dist Thresholds ▸ Max ▸ 75th ▸ Fully Remote

Labor Market Access - Results

Table: Effect of WFH on "close" and "far" applications

	Number of applications		Log applications	
	Far applications	Close applications	Far applications	Close applications
WFH offering	0.256***	−1.840***	0.078***	−0.188***
	(0.081)	(0.173)	(0.015)	(0.015)
Vacancy Controls	Y	Y	Y	Y
Firm Controls	Y	Y	Y	Y
Local labor Market F.E.	Y	Y	Y	Y
Commuting zone × month-year F.E.	Y	Y	Y	Y
Occupation × month-year F.E.	Y	Y	Y	Y
Sample mean (# of applications)	5.04	10.06	5.94	10.74
N	942,784	942,784	680,962	795,231

Note: Percentiles are constructed at the local-labor-market level. Standard Errors are clustered at the local labor market level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Suggests some reallocation from local applicants to distant applicants when offering WFH

Applicant Pool

Applicant Quality - Results

Table: Mean quality of applicants by WFH offering

	All WFH job ads	Fully remote job ads	Job ads with WFH in headline
WFH offering	−0.031***	0.089	−0.191***
	(0.008)	(0.043)	(0.067)
Vacancy Controls	Y	Y	Y
Firm Controls	Y	Y	Y
Local labor Market F.E.	Y	Y	Y
Commuting zone × month-year F.E.	Y	Y	Y
Occupation × month-year F.E.	Y	Y	Y
Sample mean (standardized mean quality)	0.00	0.00	0.00
N	492,262	476,181	492,262

Note: Standard Errors are clustered at the local labor market level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Average quality decreases a bit, suggesting that there is increased applications from the lower end of the quality distribution.

Applicant Quality - Results

Table: Quality of the top applicant by WFH offering

	All WFH job ads	Fully remote job ads	Job ads with WFH in headline
WFH offering	−0.009	0.115***	0.216**
	(0.007)	(0.043)	(0.097)
Vacancy Controls	Y	Y	Y
Firm Controls	Y	Y	Y
Local labor Market F.E.	Y	Y	Y
Commuting zone × month-year F.E.	Y	Y	Y
Occupation × month-year F.E.	Y	Y	Y
Sample mean (standardized maximum quality)	0.00	0.00	0.00
N	492,262	476,181	492,262

Note: Standard Errors are clustered at the local labor market level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- No effect on top-end quality for WFH in general, but large increases in top quality for job ads with more salient WFH signals

▸ Dem Comp ▸ Tightness

Summary

- Goegraphic mismatch - One potential remedy is WFH
- Workers do value WFH – they apply (and view) WFH job ads more
- Stronger WFH signals see larger effects
- WFH job ads further from commuting location preference of applicants
- Top applicants are of higher quality for WFH when signal is salient
- WFH can help alleviate hiring shortages and reduce geographic misallocation by improving matching and reducing spatial frictions

Thank you for listening!

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References I

Boehnke, J., Zhan, B., Wang, Q., You, Y., & Freeman, R. B. (2023). Job postings for working at home/remote work: Before, during, and after covid-19 [Presentation at NBER conference 'The Work-From-Home Shock to Labor Markets', Cambridge, MA, United States, November 3-4, 2023].

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Handel, M. J. (2024).Labor shortages: What is the problem. *Intereconomics: Review of European Economic Policy*, *59*(3), 136–142.

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Hansen, S., Lambert, P. J., Bloom, N., Davis, S. J., Sadun, R., & Taska, B. (2023).Remote work across jobs, companies, and space. *NBER Working Paper Series, No. 31007*. https://doi.org/10.3386/w31007

WFH Categorization

- OpenAI GPT-4 API – three step system[1]:

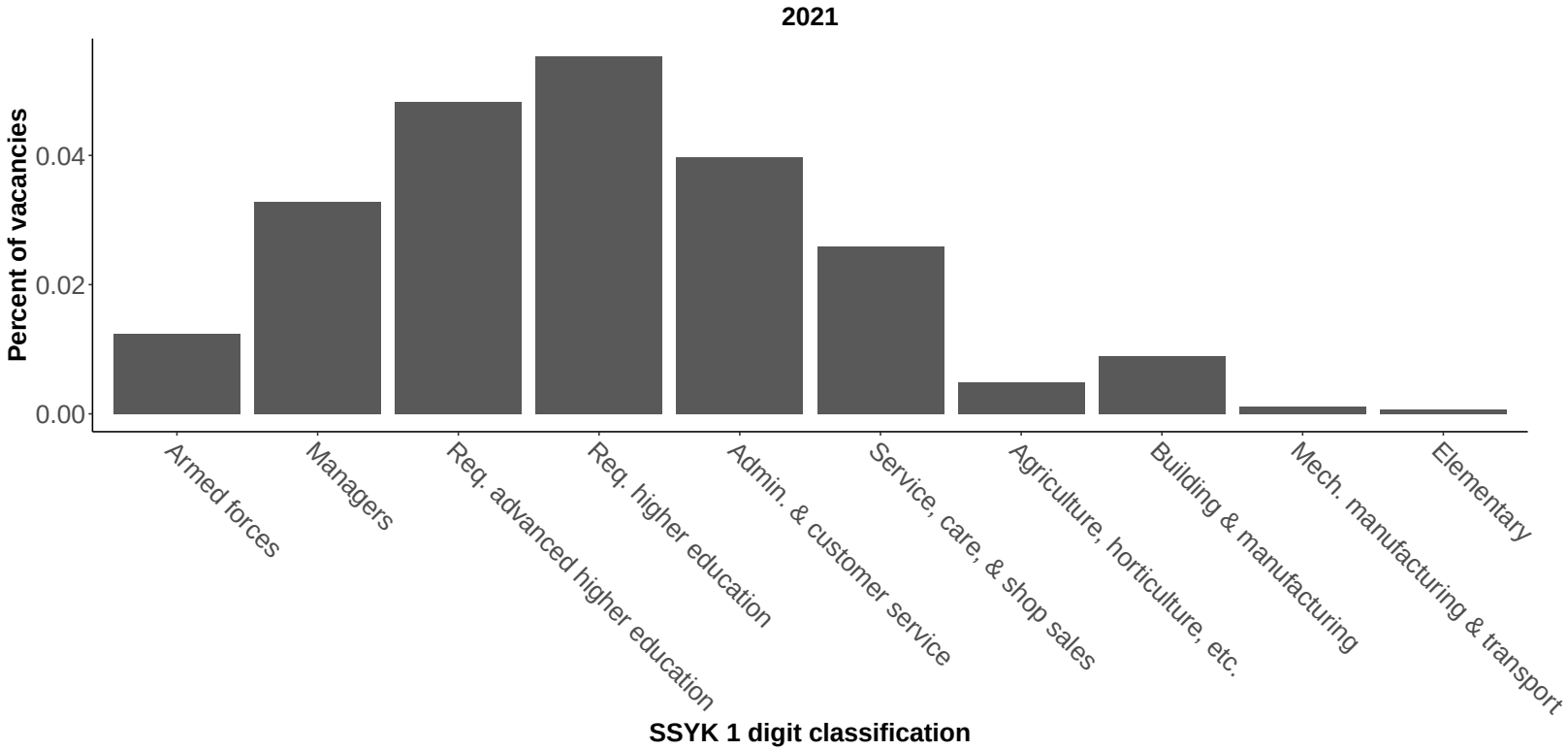
1. **Subsample Extraction (19,000 vacancies from 2006-2022)**
   - Classifies subsample into *hybrid*, *fully remote*, *in person*, or *WFH NA*
   - For *hybrid* and *fully remote* vacancies, also extracts the (broad) key words related to WFH
2. **Bag-of-Words Filtering**
   - Compile the extracted key words into a single list and (manual) prune the list for irrelevant or duplicate entries
   - Filter out all vacancies, removing any with text that does not contain a single word from the list (about 6% of vacancies remain)
3. **Final Classification**
   - GPT-4 classifies all remaining vacancies from 2016-2023 into the same four categories (but does not extract key words)
   - All vacancies that are filtered out or are classified as "WFH NA" are assumed to be in-person vacancies

[1] Based on a process used by Boehnke et al., 2023

Back

WFH Extraction Validation

Figure 5: WFH-by-occupation distribution (2021)

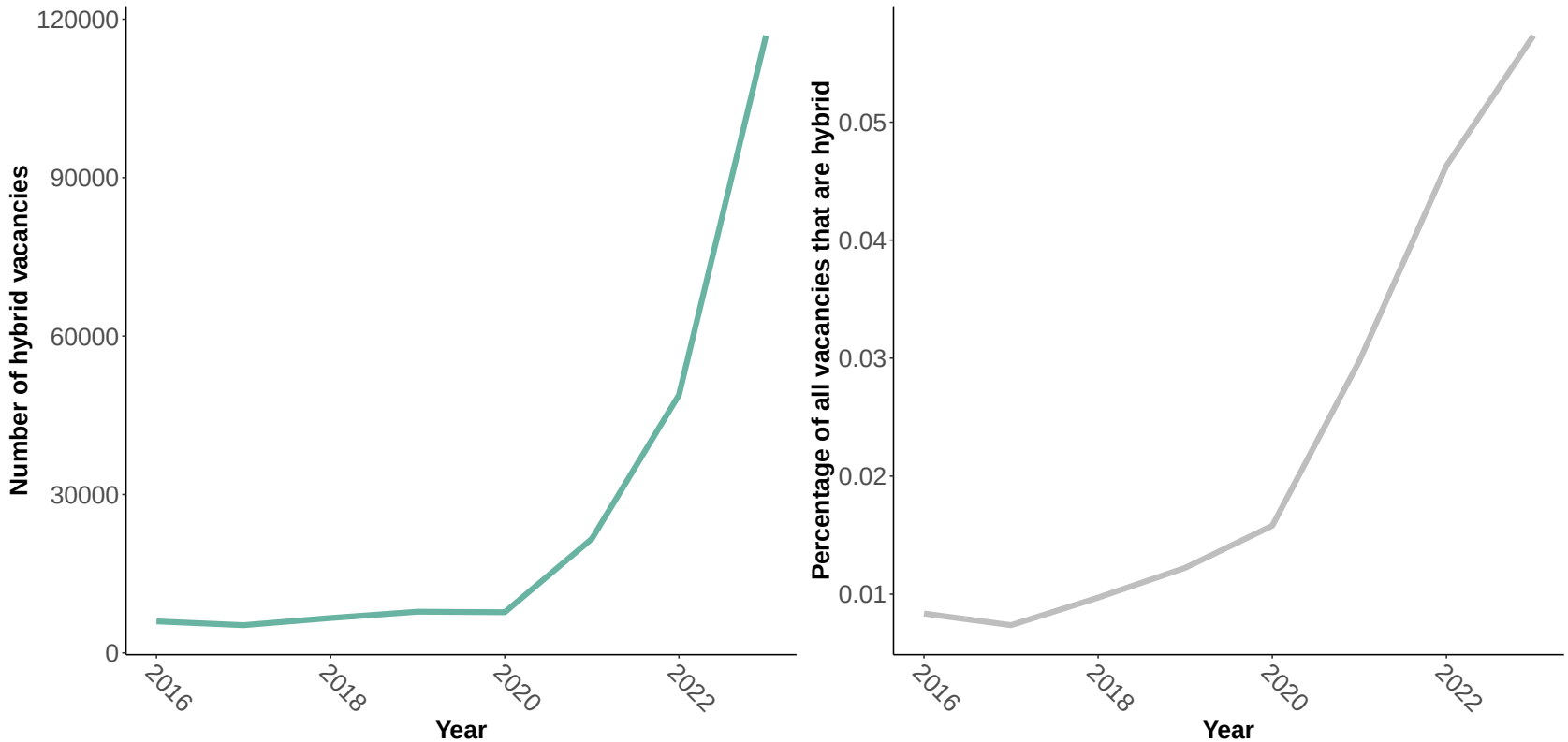


- Trends also aline with similar extraction in other work (e.g. Hansen et al., 2023; Boehnke et al., 2023)

▸ Back ▸ Occ Alt Years ▸ Common WFH Occs ▸ Word Cloud

Growth of WFH in Sweden - Hybrid vacancies

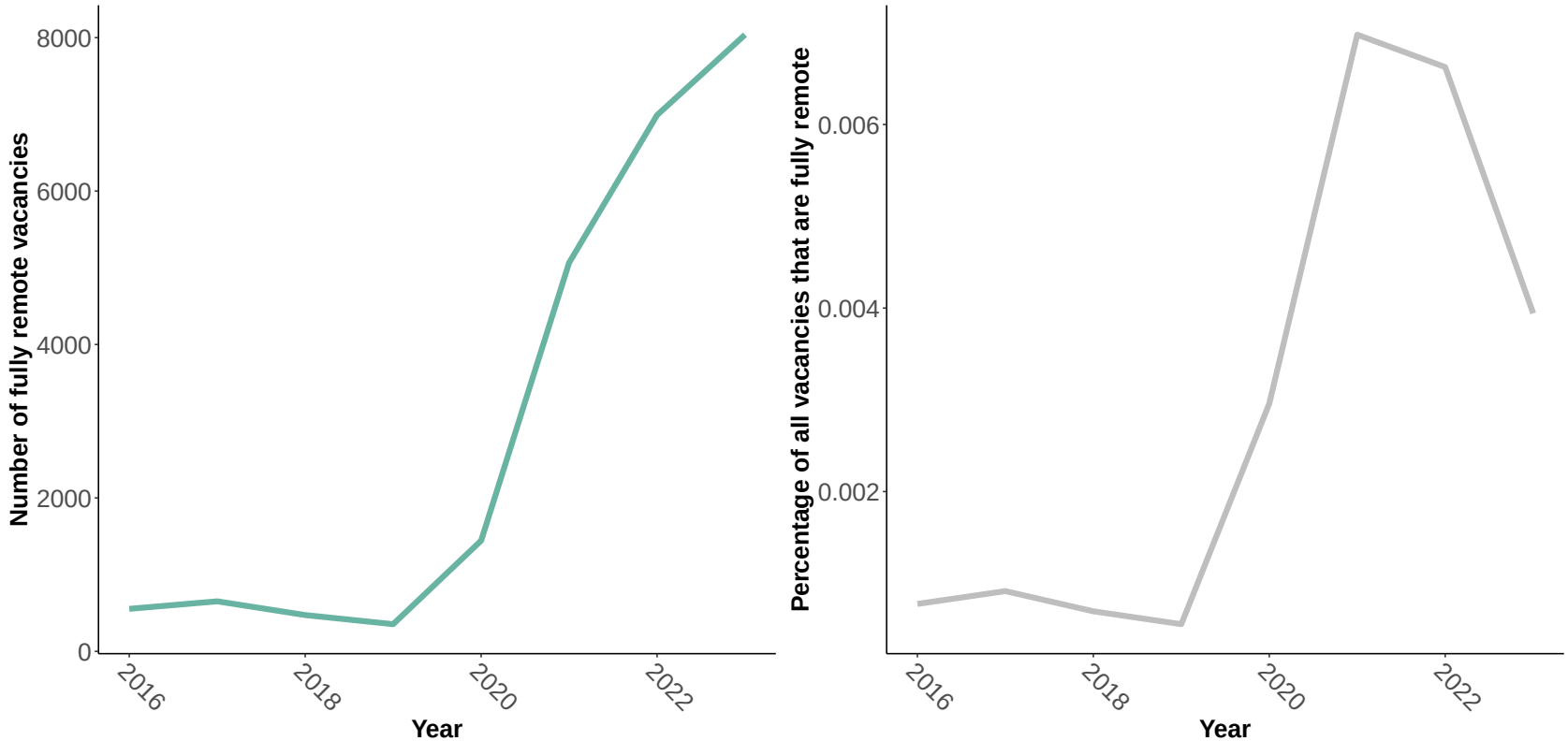
Figure: Hybrid WFH Vacancy Trends in Sweden



Back

Growth of WFH in Sweden - Fully remote vacancies

Figure: Fully Remote WFH Vacancy Trends in Sweden



▸ Back

Occupation distribution of WFH vacancies (1 digit ssyk)

Figure: 2018

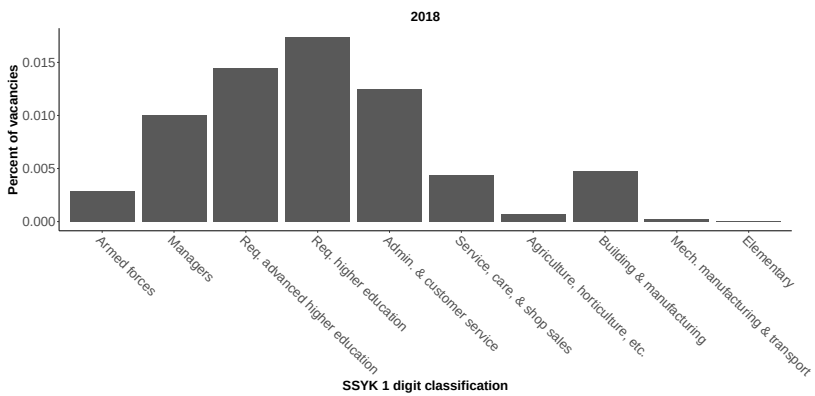
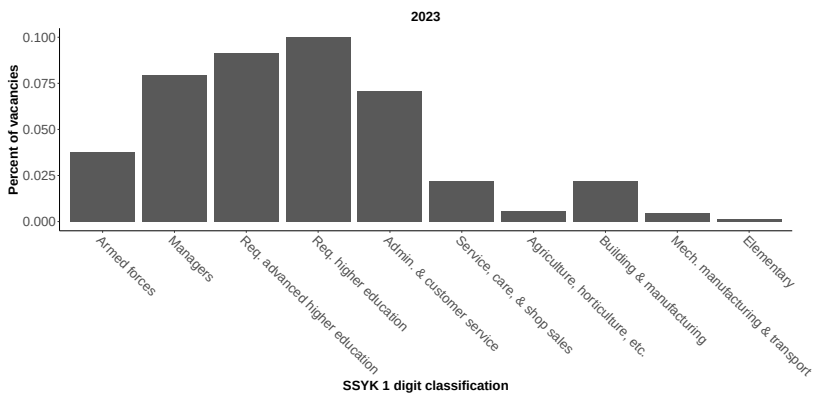


Figure: 2023



▸ Back

WFH validation by occupation type

Table: Most common WFH occupations

Year	Occupation (#)	Occupation (%)
2016	Student assistants Other trainers and instructors Business salesperson	Social security officer Other trainers and instructors Student assistants
2017	Business salesperson Software and system developers Support technician, IT	Market researchers and interviewers University and college lecturers Operations technician, IT
2018	Business salesperson Software and system developers Support technician, IT	Market researchers and interviewers Marketing and sales assistants Dietitians
2019	Business salesperson Software and system developers System analysts and IT architects	Other operating technicians and process supervisors System analysts and IT architects Market researchers and interviewers
2020	Software and system developers Business salesperson Telemarketers	Other university teachers Translators Image and broadcasting technicians
2021	Software and system developers Business salesperson Telemarketers	Translators Event and travel producers Other university teachers
2022	Software and system developers Customer service staff Business salesperson	Dietitians Developer in games and digital media Surveyors
2023	Software and system developers Business salesperson Employment agency	Employment agency Administrative and organizational lawyers Managers in forestry and agriculture

Notes: Occupations are the 4 digit SSYK code. For the percentage column, does not include any occupations that have less than 5 vacancies. Exceptions were:

- 2017: Air traffic controller had highest percentage (only 1 WFH vacancy)

Back

Common Terms Unique to WFH Job Ads

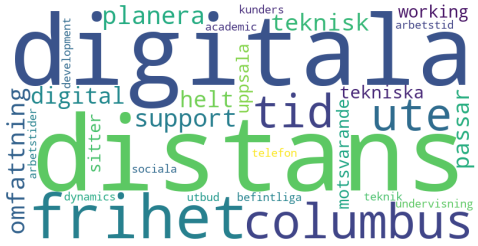
Figure 6: High-frequency, unique words in WFH vacancy text

▸ By Year ▸ Skills/Tech ▸ Back

WFH Word Cloud, by year

Figure: High-frequency, unique words in WFH vacancy text, by year

(a) 2018



(b) 2019

(c) 2020

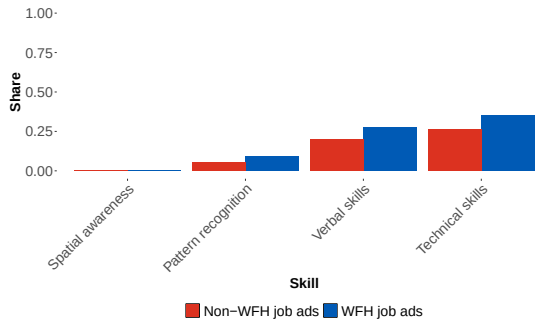
(d) 2021

(e) 2022

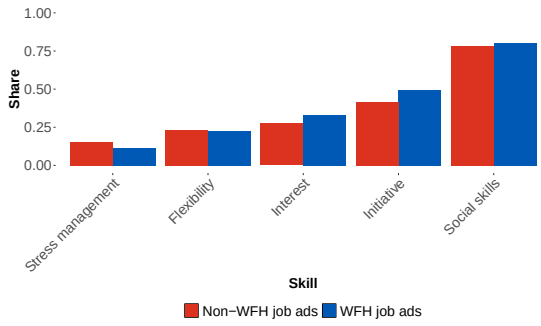
Back

Skills and Technology Comparisons

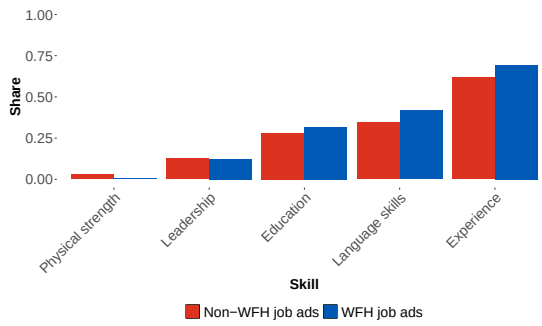
Figure: Share of WFH and in-person job ads mentioning skills / technologies



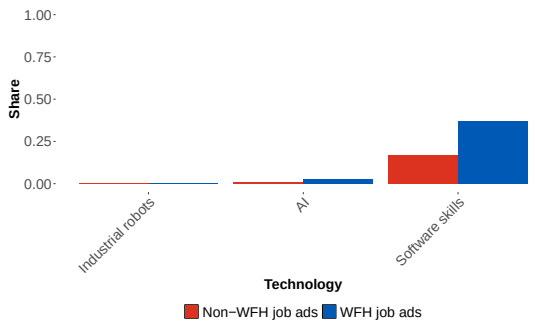
(a) Non-Cognitive Skills



(b) Cognitive Skills



(c) Other Skills



(d) Technology

▸ Back

Views per Vacancy

Figure: Views per vacancy by WFH offering (Monthly)

Back

Job Attractiveness - Results

Table: Effect of WFH on getting at least one application

	Baseline	Occupation and Time F.E.s	Main Specification	Firm F.E.s
WFH offering	0.036***	0.024***	0.011***	0.005**
	(0.008)	(0.004)	(0.002)	(0.002)
Occupation and Time F.E.s	N	Y	N	N
Vacancy Controls	N	N	Y	Y
Firm Controls	N	N	Y	N
Local labor Market F.E.	N	N	Y	Y
Commuting zone × month-year F.E.	N	N	Y	Y
Occupation × month-year F.E.	N	N	Y	Y
Firm F.E.	N	N	N	Y
N	1,738,379	1,738,379	1,187,663	1,615,134

Note: Standard Errors are clustered at the local labor market level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Offering WFH increase the probability of getting at least one application by 1.1% (88.1% of sample get at least one application)

Back

Job Attractiveness - Results

Table: WFH on applications - post-COVID period (2021-2022)

	All job ads			
	(1) Baseline relationship	(2) Within occupations	(3) Main analysis	(4) Firm fixed effects
WFH offering	−0.329***	0.100***	0.043**	0.027***
	(0.044)	(0.024)	(0.018)	(0.010)
Occupation and Time F.E.s	N	Y	N	N
Vacancy Controls	N	N	Y	Y
Firm Controls	N	N	Y	N
Local Labor Market F.E.	N	N	Y	Y
Commuting Zone × month-year F.E.	N	N	Y	Y
Occupation × month-year F.E.	N	N	Y	Y
Firm F.E.	N	N	N	Y
Sample mean	26.3	26.3	26.3	26.3
N	1,306,978	1,306,978	854,513	1,220,373

??. Standard Errors are clustered at the local labor market level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Offering WFH gives a boost of 4.3% more applications (compared to a sample mean of 26.3 applications - about 1.1 more applications)

Back

Job Attractiveness - Results

Table: Effect of WFH on applications (high WFH occupations)

	Baseline	Occupation and Time F.E.s	Main Specification	Firm F.E.s
WFH offering	−0.066**	0.060***	0.030**	0.016*
	(0.032)	(0.015)	(0.012)	(0.008)
Occupation and Time F.E.s	N	Y	N	N
Vacancy Controls	N	N	Y	Y
Firm Controls	N	N	Y	N
Local labor Market F.E.	N	N	Y	Y
Commuting zone × month-year F.E.	N	N	Y	Y
Occupation × month-year F.E.	N	N	Y	Y
Firm F.E.	N	N	N	Y
Sample mean	13.60	13.60	13.60	13.60
N	424,882	424,882	312,795	409,920

Note: Standard Errors are clustered at the local labor market level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Offering WFH gives a boost of 3.0% more applications (compared to a sample mean of 13.6 applications - about 0.4 more applications)

Back

Job Attractiveness - Results

Table: Effect of WFH on attention (high WFH occupations)

	Baseline	Occupation and Time F.E.s	Main Specification	Firm F.E.s
WFH offering	−0.194***	0.133***	0.065***	0.038***
	(0.072)	(0.029)	(0.014)	(0.008)
Occupation and Time F.E.s	N	Y	N	N
Vacancy Controls	N	N	Y	Y
Firm Controls	N	N	Y	N
Local labor Market F.E.	N	N	Y	Y
Commuting zone × month-year F.E.	N	N	Y	Y
Occupation × month-year F.E.	N	N	Y	Y
Firm F.E.	N	N	N	Y
Sample mean	164.23	164.23	164.23	164.23
N	637,336	637,336	501,832	618,606

Note: Standard Errors are clustered at the local labor market level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Offering WFH gives a 6.5% boost in views on average (compared to sample mean of 164.2 views - about 11 more views)

Back

Job Attractiveness - Fully Remote

Table: Effect of fully remote WFH on attention

	Baseline	Occupation and Time F.E.s	Main Specification	Firm F.E.s
WFH offering	−0.011	0.695***	0.445***	0.417***
	(0.063)	(0.143)	(0.103)	(0.078)
Occupation and Time F.E.s	N	Y	N	N
Vacancy Controls	N	N	Y	Y
Firm Controls	N	N	Y	N
Local labor Market F.E.	N	N	Y	Y
Commuting zone × month-year F.E.	N	N	Y	Y
Occupation × month-year F.E.	N	N	Y	Y
Firm F.E.	N	N	N	Y
Sample mean	219.5	219.5	219.5	219.5
N	2,314,163	2,314,163	1,751,107	2,174,301

Note: Standard Errors are clustered at the local labor market level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Offering fully remote WFH gives a boost of 44.5% more attention (compared to a sample mean of 219.5 applications - about 98 more views)

Back

Job Attractiveness - WFH in Title

Table: WFH and applications (log total applications) - WFH in title

	All job ads			
	(1) Baseline relationship	(2) Within occupations	(3) Main analysis	(4) Firm fixed effects
WFH offering	0.254***	0.741***	0.482***	0.452***
	(0.087)	(0.107)	(0.108)	(0.110)
Occupation and Time F.E.s	N	Y	N	N
Vacancy Controls	N	N	Y	Y
Firm Controls	N	N	Y	N
Local Labor Market F.E.	N	N	Y	Y
Commuting Zone × month-year F.E.	N	N	Y	Y
Occupation × month-year F.E.	N	N	Y	Y
Firm F.E.	N	N	N	Y
Sample mean	28.8	28.8	28.8	28.8
N	1,531,314	1,531,314	1,060,687	1,428,685

Note: Standard Errors are clustered at the local labor market level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Stating WFH in job ad title gives a boost of 48.2% more applications (compared to a sample mean of 28.8 applications - about 14 more applications)

Back

Distribution of Distances

Figure: Maximum distances

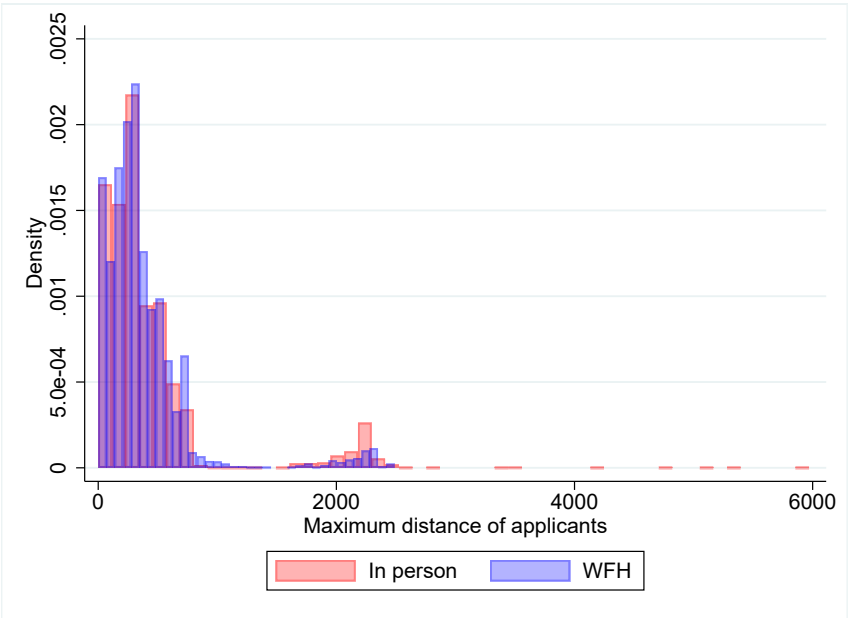
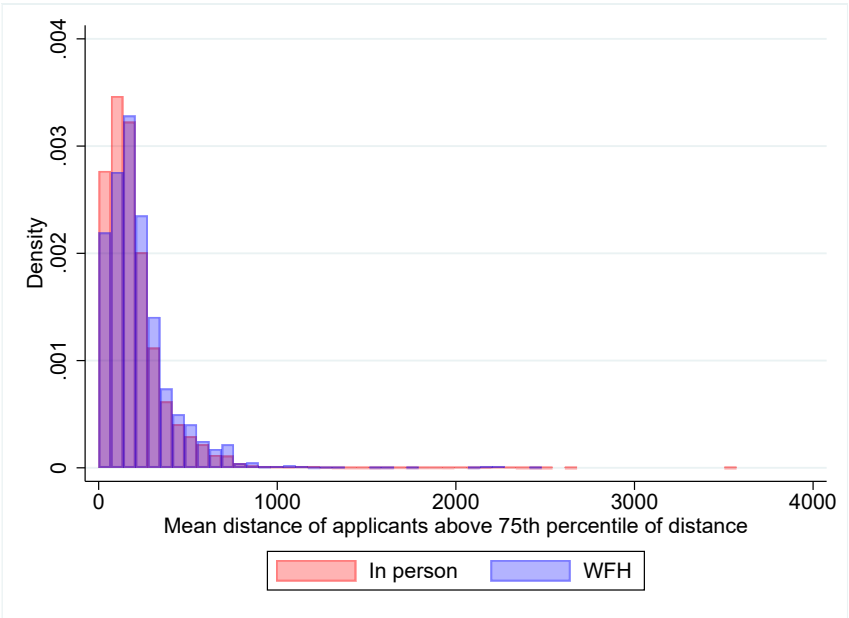


Figure: Mean of $\geq$ 75th percentile



Back

Geographic Dispersion - Results

Table: WFH and geographic dispersion - different minimum distance thresholds

	Minimum distance threshold			
	(1) 40 km	(2) 60 km	(3) 100 km	(4) Full data
WFH offering	0.266***	0.225***	0.201***	0.163***
	(0.015)	(0.013)	(0.012)	(0.010)
Vacancy Controls	Y	Y	Y	Y
Firm Controls	Y	Y	Y	Y
Local Labor Market F.E.	Y	Y	Y	Y
Commuting Zone × month-year F.E.	Y	Y	Y	Y
Occupation × month-year F.E.	Y	Y	Y	Y
Sample mean	55.0	63.9	74.2	88.9
N	961,288	973,521	985,609	996,813

Note: Standard Errors are clustered at the local labor market level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Back

Geographic Dispersion - Results

Table: Effect of WFH on maximum applicant distance (logs)

	All job ads			
	(1) Baseline relationship	(2) Within occupations	(3) Main analysis	(4) Firm fixed effects
WFH offering	−0.073*	0.332***	0.309***	0.352***
	(0.042)	(0.025)	(0.021)	(0.020)
Occupation and Time F.E.s	N	Y	N	N
Vacancy Controls	N	N	Y	Y
Firm Controls	N	N	Y	N
Local Labor Market F.E.	N	N	Y	Y
Commuting Zone × month-year F.E.	N	N	Y	Y
Occupation × month-year F.E.	N	N	Y	Y
Firm F.E.	N	N	N	Y
Sample mean (km)	145.3	145.3	145.3	145.3
N	1,326,144	1,326,144	927,677	1,241,048

Note: Restrict to minimum distance < 20km. Standard Errors are clustered at the local labor market level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Offering WFH increases the distance away of the furthest applicant by 30.9% (compared to a sample mean of 145.3km - about 44.9km further)

Back

Geographic Dispersion - Results

Table: Effect of WFH on mean applicant distance $\geq$ 75th percentile (logs)

	All job ads			
	(1) Baseline relationship	(2) Within occupations	(3) Main analysis	(4) Firm fixed effects
WFH offering	0.118***	0.346***	0.340***	0.380***
	(0.034)	(0.022)	(0.020)	(0.020)
Occupation and Time F.E.s	N	Y	N	N
Vacancy Controls	N	N	Y	Y
Firm Controls	N	N	Y	N
Local Labor Market F.E.	N	N	Y	Y
Commuting Zone × month-year F.E.	N	N	Y	Y
Occupation × month-year F.E.	N	N	Y	Y
Firm F.E.	N	N	N	Y
Sample mean (km)	79.8	79.8	79.8	79.8
N	1,326,144	1,326,144	927,677	1,241,048

Note: Restrict to minimum distance < 20km. Standard Errors are clustered at the local labor market level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Offering WFH increases the average distance away of the applicants in the 75th percentile of distance by 34.0% (compared to a sample mean of 79.8km - about 27.1km further)

Back

Geographic Dispersion - Fully Remote

Table: Effect of fully remote WFH on average applicant distance (log)

	Baseline	Occupation and Time F.E.s	Main Specification	Firm F.E.s
WFH offering	0.203***	0.326***	0.176***	0.318***
	(0.047)	(0.036)	(0.044)	(0.043)
Occupation and Time F.E.s	N	Y	N	N
Vacancy Controls	N	N	Y	Y
Firm Controls	N	N	Y	N
Local labor Market F.E.	N	N	Y	Y
Commuting zone × month-year F.E.	N	N	Y	Y
Occupation × month-year F.E.	N	N	Y	Y
Firm F.E.	N	N	N	Y
Sample mean	88.1	88.1	88.1	88.1
N	1,381,947	1,381,947	966,522	1,294,173

Note: Standard Errors are clustered at the local labor market level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- Offering fully remote WFH attracts applicants from 17.6% further away (compared to a sample mean of 88.1km - about 15.5km further)

Back

Demographic Composition - Results

Table: Compositional changes of unemployed applicants (in shares)

	(1) Female	(2) High Education ($\geq$ bachelor's)	(3) Young (< 45)	(4) Immigrant	(5) Rural
WFH offering	0.018***	0.009*	0.012**	−0.005	0.001
	(0.005)	(0.005)	(0.006)	(0.005)	(0.003)
Vacancy Controls	Y	Y	Y	Y	Y
Firm Controls	Y	Y	Y	Y	Y
Local Labor Market F.E.	Y	Y	Y	Y	Y
Commuting Zone × month-year F.E.	Y	Y	Y	Y	Y
Occupation × month-year F.E.	Y	Y	Y	Y	Y
Sample mean	0.461	0.263	0.601	0.489	0.098
N	397,719	398,588	398,588	398,588	398,588

Note: Standard Errors are clustered at the local labor market level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- ↑ in female and younger applicants (and to a lesser extent highly educated applicants)

▸ Back ▸ Views ▸ Unemployed Sample

Unemployed Sample

Table: Summary Statistics for Unemployed Sample

	Unemployed applicants	Unemployed viewers	Full population
Share of women	0.479	0.491	0.500
Share of immigrants	0.486	0.471	0.252
Share of rural individuals	0.095	0.099	0.150
Share of highly educated ($\geq$ bachelors)	0.218	0.228	0.301
Share of young workers ($<$ 45)	0.625	0.617	0.479
Average age	39.77	40.24	47.01
N	1,405,143	2,537,722	7,779,436

Back

Demographic Composition - Results

Table: Compositional changes of unemployed attention (in shares)

	(1) Female	(2) High Education ($\geq$ bachelor's)	(3) Young ($<$ 45)	(4) Immigrant	(5) Rural
WFH offering	0.014***	0.006***	0.006***	−0.008***	0.007***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)
Vacancy Controls	Y	Y	Y	Y	Y
Firm Controls	Y	Y	Y	Y	Y
Local Labor Market F.E.	Y	Y	Y	Y	Y
Commuting Zone × month-year F.E.	Y	Y	Y	Y	Y
Occupation × month-year F.E.	Y	Y	Y	Y	Y
Sample mean	0.518	0.342	0.545	0.414	0.110
N	1,692,005	1,692,061	1,692,061	1,692,061	1,692,061

Note: Standard Errors are clustered at the local labor market level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

▸ Back

Correlation between WFH and Labor Market Tightness

Figure: Average by CZ x Occupation

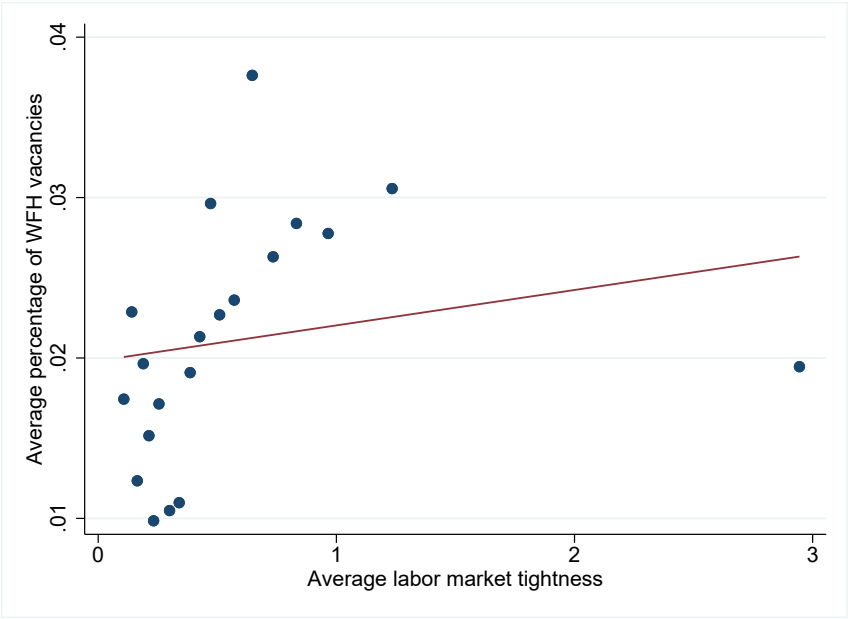
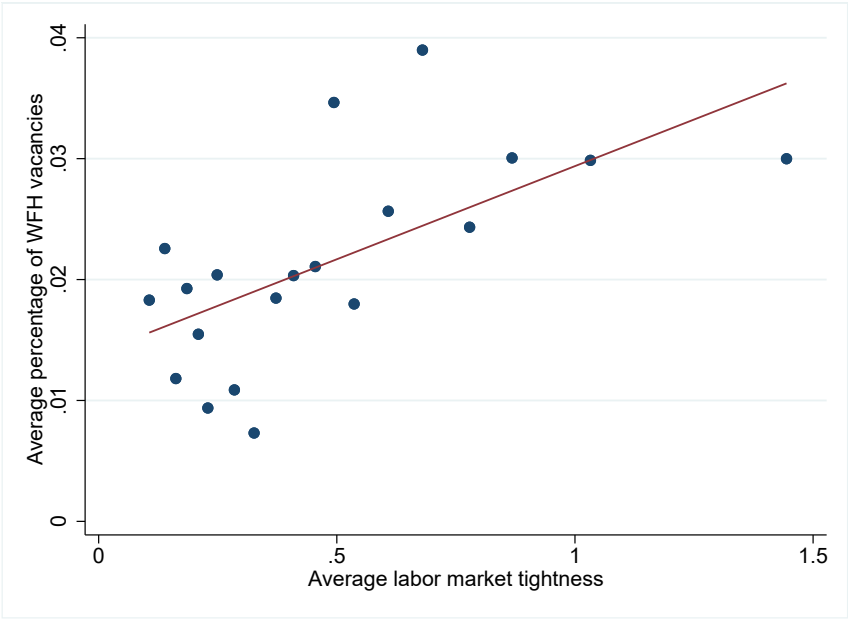


Figure: Average by CZ x Occupation (LM tightness < 2)



▸ Full Data

Labor Market Tightness - Specification

- **Local-labor-market level analysis**:

$$WFH\_ads_{z,o,t} = \beta_0 + \beta_1 * LLM\_Tightness_{z,o,t-1} + \theta_o + \theta_z + \theta_t + \epsilon_{z,o,t}$$

  - *WFH_ads* is the share of job ads signaling WFH
  - *LLM_Tightness* is the tightness (# of job ads/# of job seekers) in the previous quarter
  - Include occupation (θ_o), commuting zone (θ_z), and time (θ_t) F.E.s

Labor Market Tightness - Results

Table: Main analysis of labor market tightness on job WFH offering

	(1) Baseline relationship	(2) Main analysis
Share of WFH job ads	0.40***	0.009**
	(0.073)	(0.018)
Commuting Zone F.E.	N	Y
Occupation F.E.	N	Y
Time F.E.	N	Y
Sample mean	0.17	0.17
N	35,814	35,043

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

- An increase of about 0.003 more WFH job ads between 10th to 90th percentile of tightness - 1.9% of sample mean

Back

WFH and Labor Market Tightness - Full Data

Figure: Average by CZ x Occupation

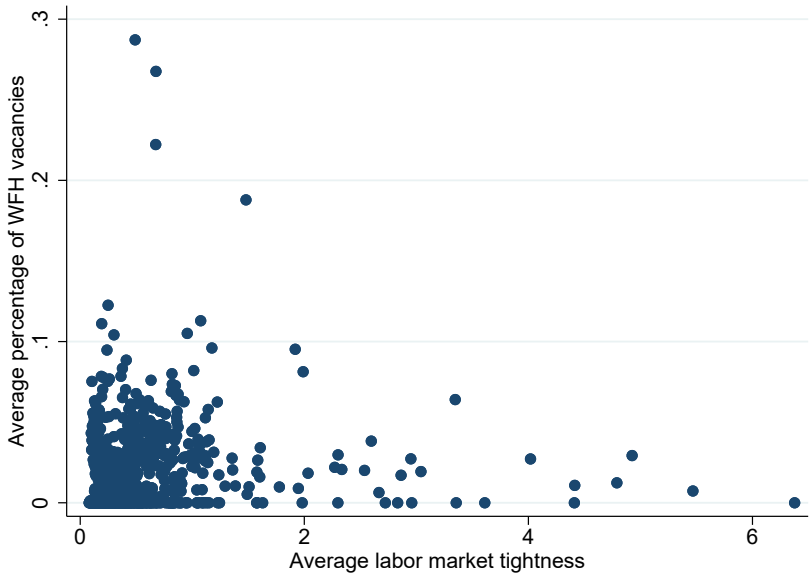
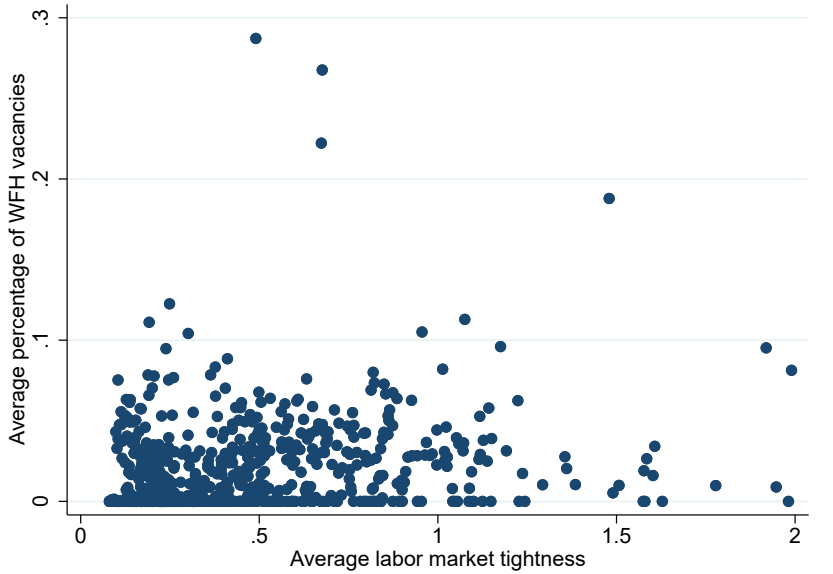


Figure: Average by CZ x Occupation (LM tightness < 2)



Back