The New Geography of Labor Markets

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Hoover Institution and SIEPR

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Source Material for this Talk

- "The Global Persistence of Work from Home" with Cevat Giray Aksoy, Jose Maria Barrero, Nick Bloom, Mathias Dolls and Pablo Zarate, 2 June 2025.
- "Measuring Work from Home," with Jose Maria Barrero, Nick Bloom, and Shelby Buckman, 15 February 2025.
- "The New Geography of Labor Markets" with Mert Akan, Jose Maria Barrero, Nick Bloom, Tom Bowen, Shelby Buckman and Hyoseul Kim, 8 March 2025.
- "The Big Shift in Working Arrangements: Eight Ways Unusual," *Macroeconomic Review*, 23, no. 1, April 2024
- "Remote Work, Employee Mix, and Performance," with Aksoy, Bloom, Marino and Özgüzel, 17 May 2025. VoxEU (If time permits)

Overview

1. Much more paid WFH now than before COVID.

A. US: ~7% of full workdays in 2019, ~28% since 2023.
B. Scale of shift to WFH varies greatly across countries.
C. The shift is concentrated among the college educated, highly paid employees, and in Finance, Information, and Professional & Business Services.

2. Many more workers now live far from their employers.

A. 2019: 4% of workers reside >50 miles from employer worksite.
B. By 2024: More than 9% of workers do so.
C. By 2024: More than 12% among those hired after March 2020.

3. WFH facilitates worker relocation to states with lower tax rates and areas with lower housing costs.

A. Rates of net migration away from high-tax states rise with earnings, more so after the pandemic.

B. Outmigration pressures are most acute for cities with high housing costs and situated in high-tax states, especially cities that also have high employment shares in industries with remote-suitable jobs.

C. Very rough estimate: The rise of WFH since 2020 – and the new-found flexibility it offers with respect to residential location – lowered aggregate state-level income tax revenues by $40 to $50 billion per year by 2023, which is 7 to 8% of aggregate state-level income tax collections in 2022.

4. Relocation can bring large drops in top tax rates and housing costs, especially for the affluent.

A. Consider workers with annual earnings > $250K who stay with the same employer from one year to the next. Persons in this group who moved between states in 2020 (i.e., December 2019 to December 2020) lowered their (top) state-level income tax rates by **an average of 5.2 ppts**.

B. Persons with annual earnings > $150K who stayed with the same employer but moved to a new zip code in 2020 experienced **a 16% reduction in local housing costs, on average**.

C. High earners who moved in 2021, 2022 and 2023 also enjoyed large savings in taxes and housing costs

D. WFH can yield large private welfare gains beyond its effects on productivity, commuting, personal autonomy, flexibility in time use over the day, and a relaxation of joint-location constraints in two-earner households.

5. Separation and hiring behavior differs between far and near employees.

A. Among shrinking firms, separation rates are higher for employees who live more than 50 miles away *and* more responsive to the firm's contraction rate.

B. Among growing firms, hiring rates for distant employees are greater *and* more sensitive to the firm's expansion rate.

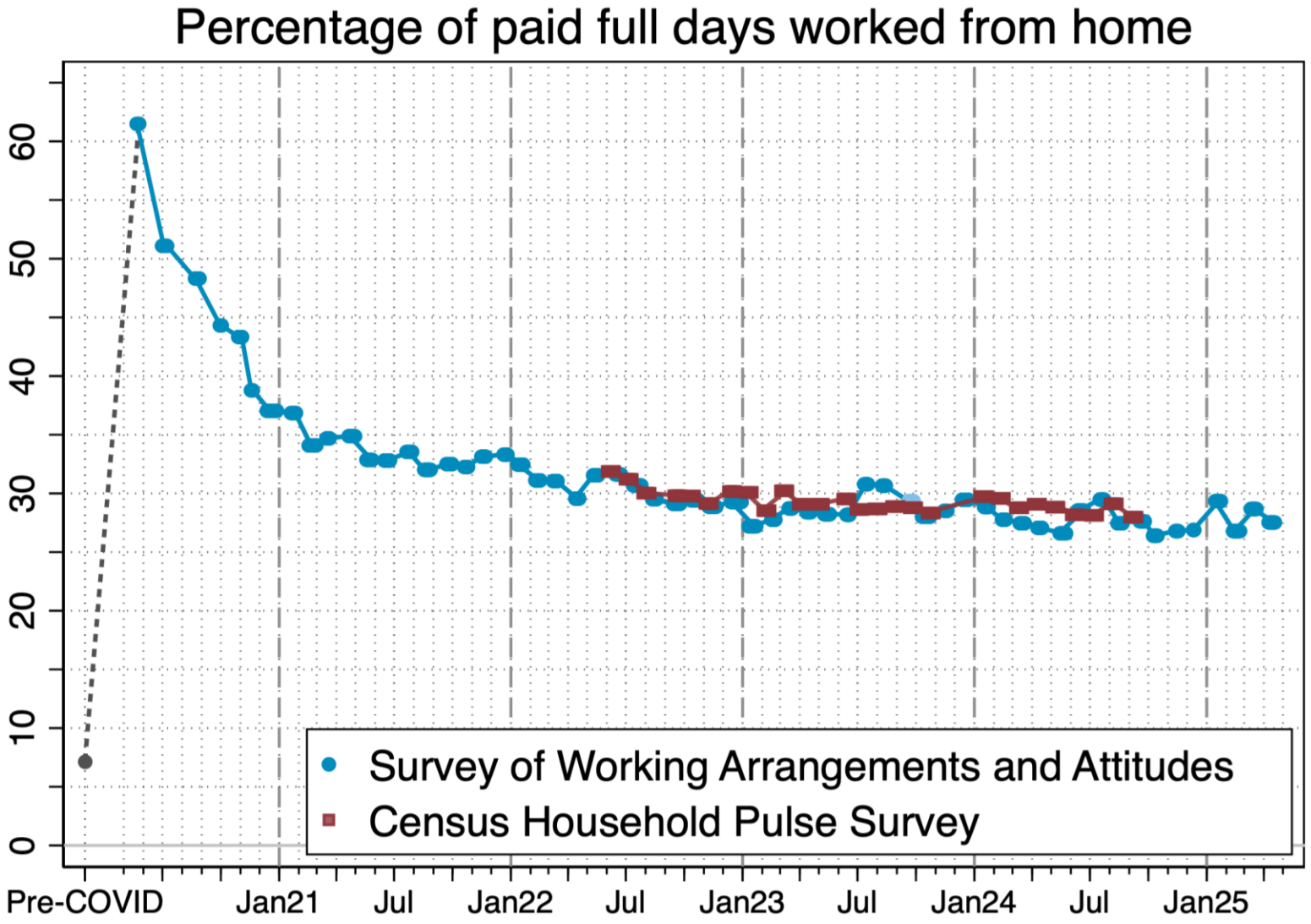
C. In short, firms treat distant employees as a more flexible labor input on both recruitment and separation margins.

6. 1 and 5 ⇒ Firm-level labor market footprints have become more spatially diffused.

A. The spatial diffusion of firm-level footprints is an ongoing process as workforces turn over and new employees live, on average, farther away.

B. Future labor market downturns and restructurings will be more spatially dispersed, moderating the negative effects of job loss on individuals and families (conditional on the aggregate scale of job losses).

U.S. WFH Rate as of April 2025: 27% of Paid Workdays



Source: "SWAA May 2025 Updates" at www.WFHresearch.com.

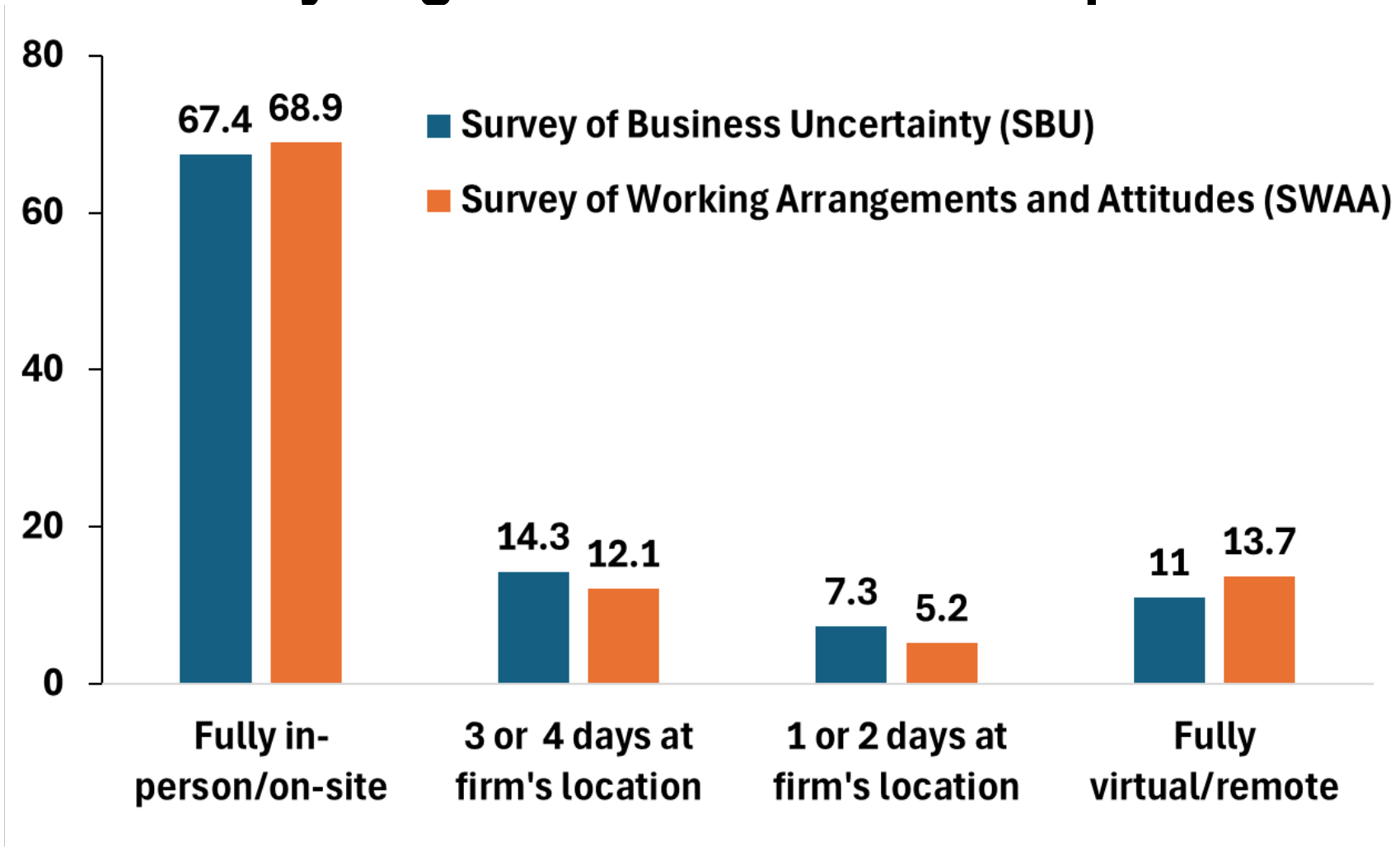
Source: Responses to the questions:

- **Currently (this week)** *what is your work status? (SWAA)*
- *For each day* **last week**, *did you* **work a full day (6 or more hours)**, *and if so* **where?** (SWAA)
- *In the last 7 days, have you…teleworked or worked from home? (HHP)*

Notes: For each wave, we compute the percent of paid full days worked from home in the SWAA and Household Pulse Survey (HHP) and plot it on the vertical axis. The horizontal-axis location shows when the survey was in the field. The pre-COVID figure is from the 2017-2018 American Time Use Survey. SWAA: Before November 2020, we asked the first question above. Since November 2021, we have asked the second question. From November 2020 to October 2021, we back-cast responses to the current question using a regression model based on current-question responses and another question (not shown). We re-weight the sample of US residents aged 20 to 64 earning $10,000 or more in a prior year to match CPS shares by age-sex-education-earnings cells. HHP: We focus on individuals aged 20 to 64 with household incomes above $25,000 per year. We assign 30% of days WFH if the respondent did so for "for 1-2 days;" 70% if they did so "for 3-4 days;" 100% if "5 or more days;" and 0 for "No."

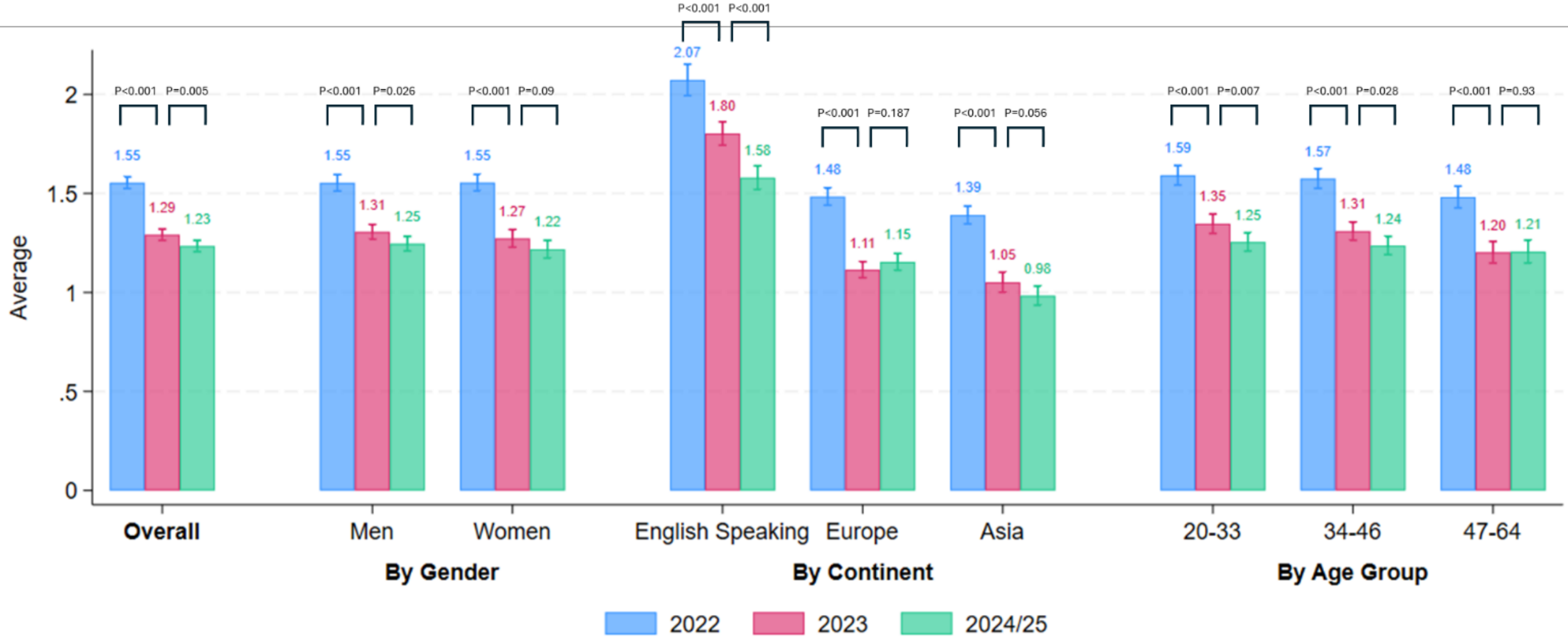
N = 235,624 (SWAA) N = 923,587 (HHP)

WFH rates reported by managers in the Atlanta Fed's Survey of Business Uncertainty align with those in a comparable SWAA sample



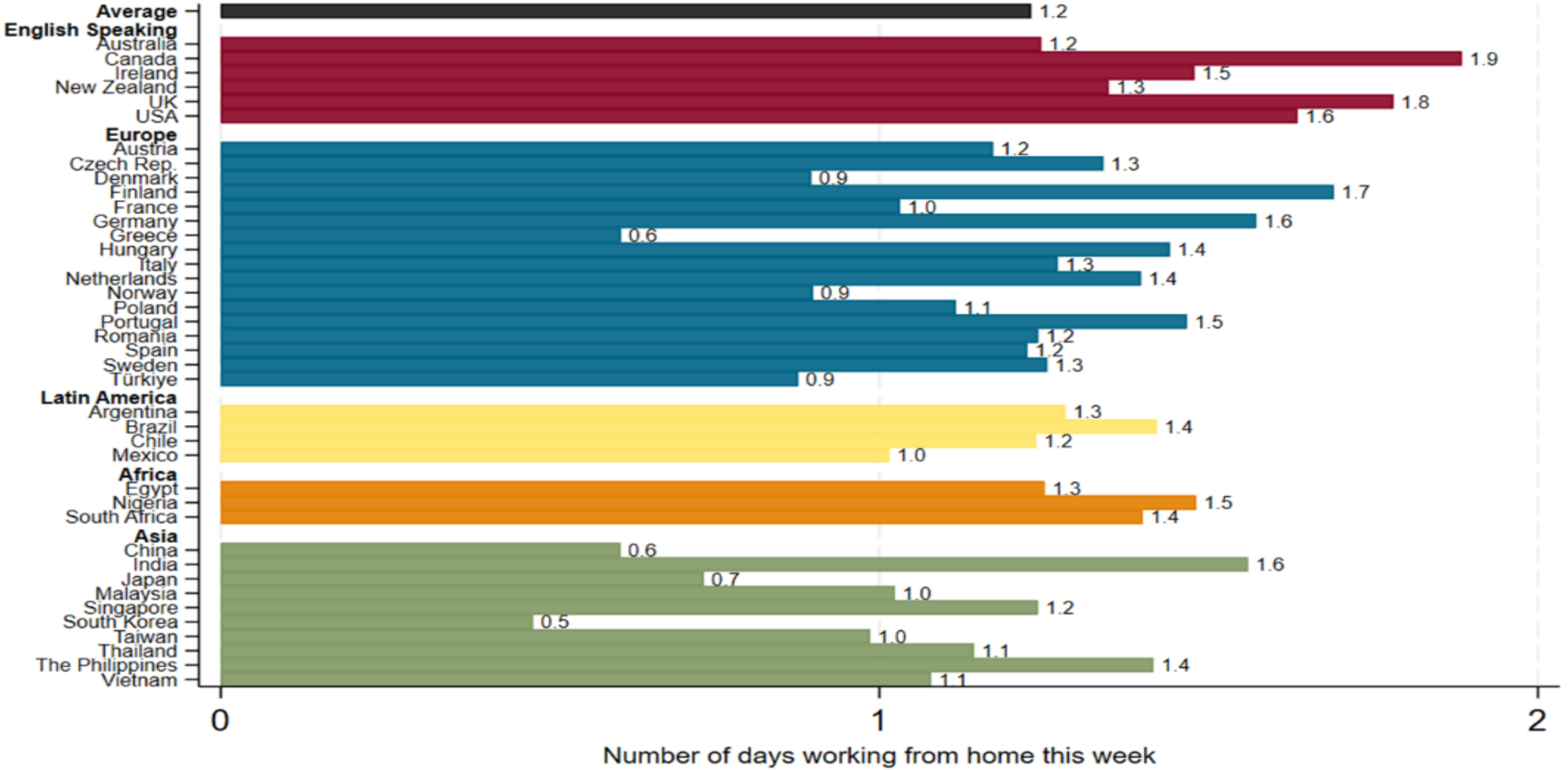
Notes: SWAA includes all employed individuals 20-64 earning at least $10,000. Placer AI includes employed individuals of all ages and earnings in office buildings in major US cities. We construct the Placer AI series as 100 - (employee office visits normalized to January 2020) where 0 is equal to pre-pandemic in person work and 100 is equal to full remote work.

WFH Rates Have Stabilzed Globally Since 2023, College-Educated Workers in 23 Countries



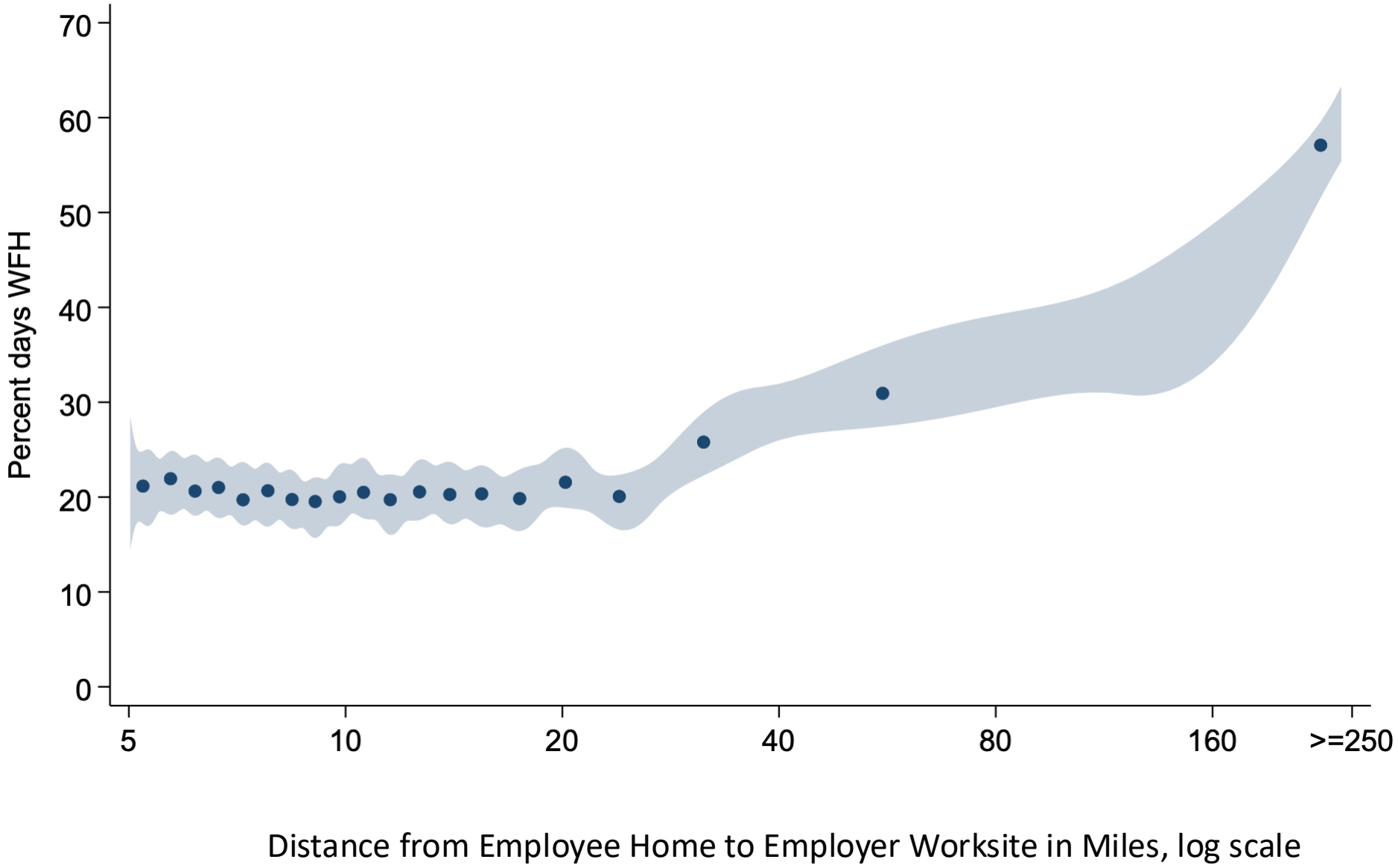
Notes: Responses to: "For each day last week, did you work 6 or more hours, and if so where?" Surveys of college-educated workers (N=42,938) across 23 countries (Australia, Austria, Brazil, Canada, China, France, Germany, Greece, Hungary, India, Italy, Japan, Malaysia, Netherlands, Poland, Singapore, South Korea, Spain, Sweden, Taiwan, Türkiye, UK, USA) in 2022, 2023 and 2024/25. Brazil is excluded in the split by continent. Source: Global Survey of Working Arrangements.

WFH Rates Vary Greatly Across Countries: Highest in the Anglosphere, Lowest in Asia



Note: Responses to the question "For each day **last week**, did you **work 6 or more hours**, and if so **where**?" N=16,422 college-educated workers in 40 countries surveyed from November 2024 to February 2025.

Figure 1: Work from home intensity rises with distance to employer

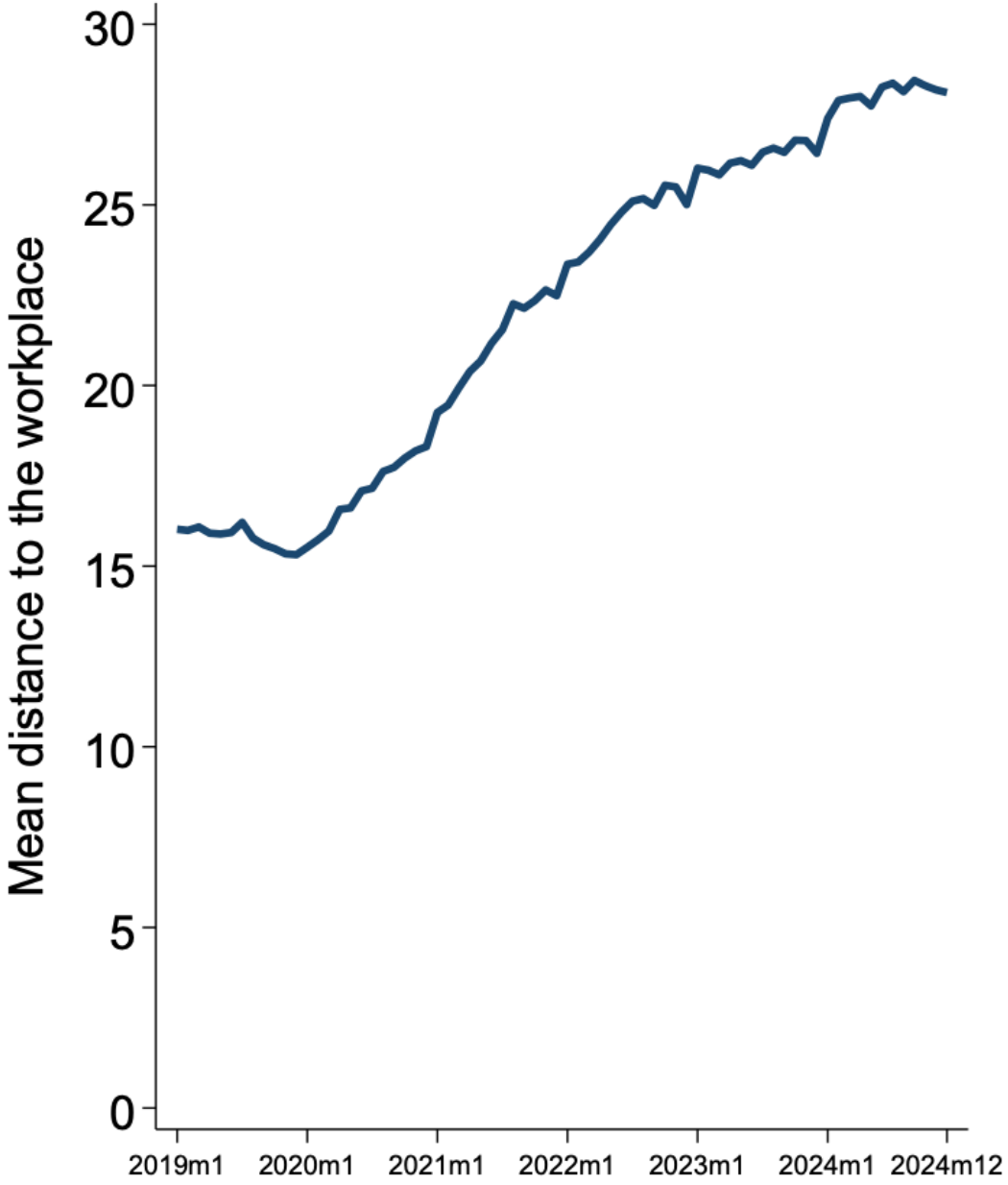


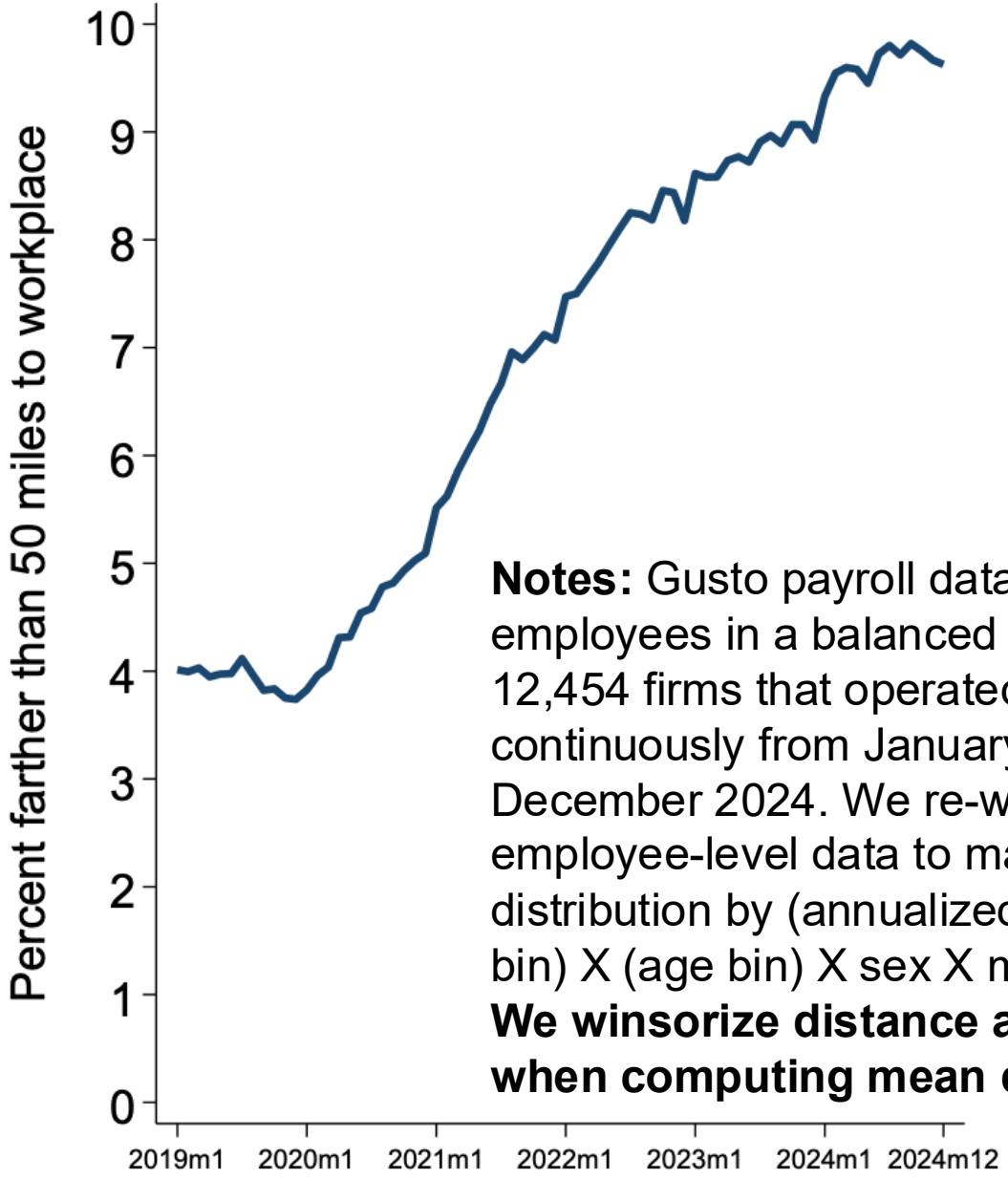
Notes: This chart plots the fitted relationship from a regression of Percent Days WFH on home-worksite distance with controls for education bins, earnings bins, age bins, and sex. We fit the regression to data on 44,110 respondents in the Survey of Working Arrangements and Attitudes (SWAA) from January 2022 to May 2024. We measure Percent Days WFH as the WFH percent of full paid workdays in the week. Our sample contains persons 20-64 years of age with prior-year earnings of $10,000 or more. We compute the haversine distance between the employee's home zip code centroid and the employer's worksite zip code centroid to obtain our distance measure. We drop employees who live within five miles of the employer's worksite because our measure is too coarse to accurately distinguish among short distances. Shaded regions denote 95 percent confidence bands.

Gusto Data

- Gusto provides payroll processing, tax, and other services to mostly small and mid-sized employers.
- We use anonymized, matched employer-employee data, following both over time. We weight individual-level data by the cross product of age bin, sex, annualized earnings bins and major industry group to match Current Population Survey
- **Balanced panel of firms** (and their employees) that operated continuously from January 2019 to December 2023.
- **All continuing employees**: Those who remained with the same employer from one December to the next.
- **Full dataset**: All observations except those pertaining to a firm's first and last month in the Gusto universe.

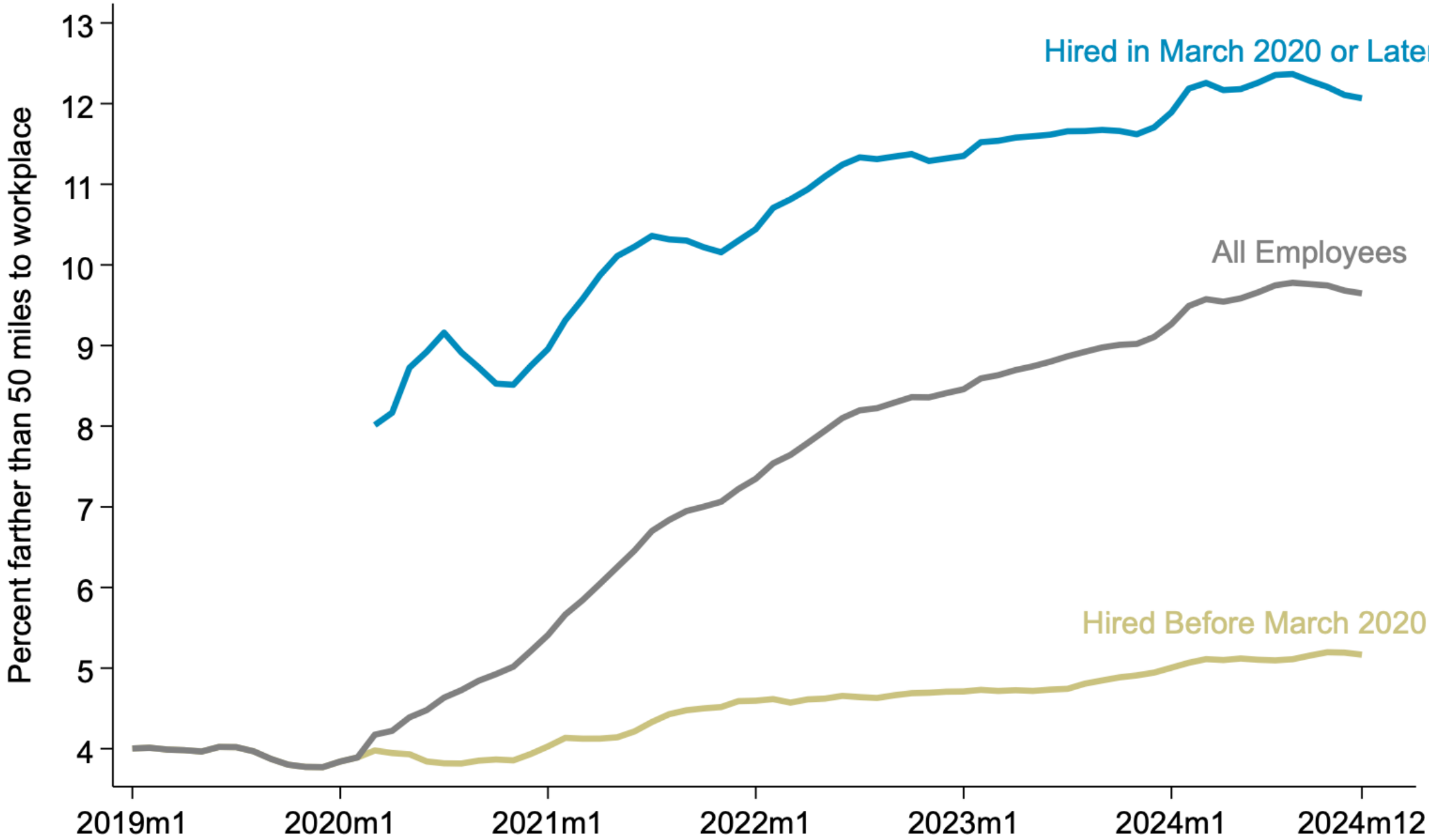
Figure 2: Americans now live farther from their employers than in 2019





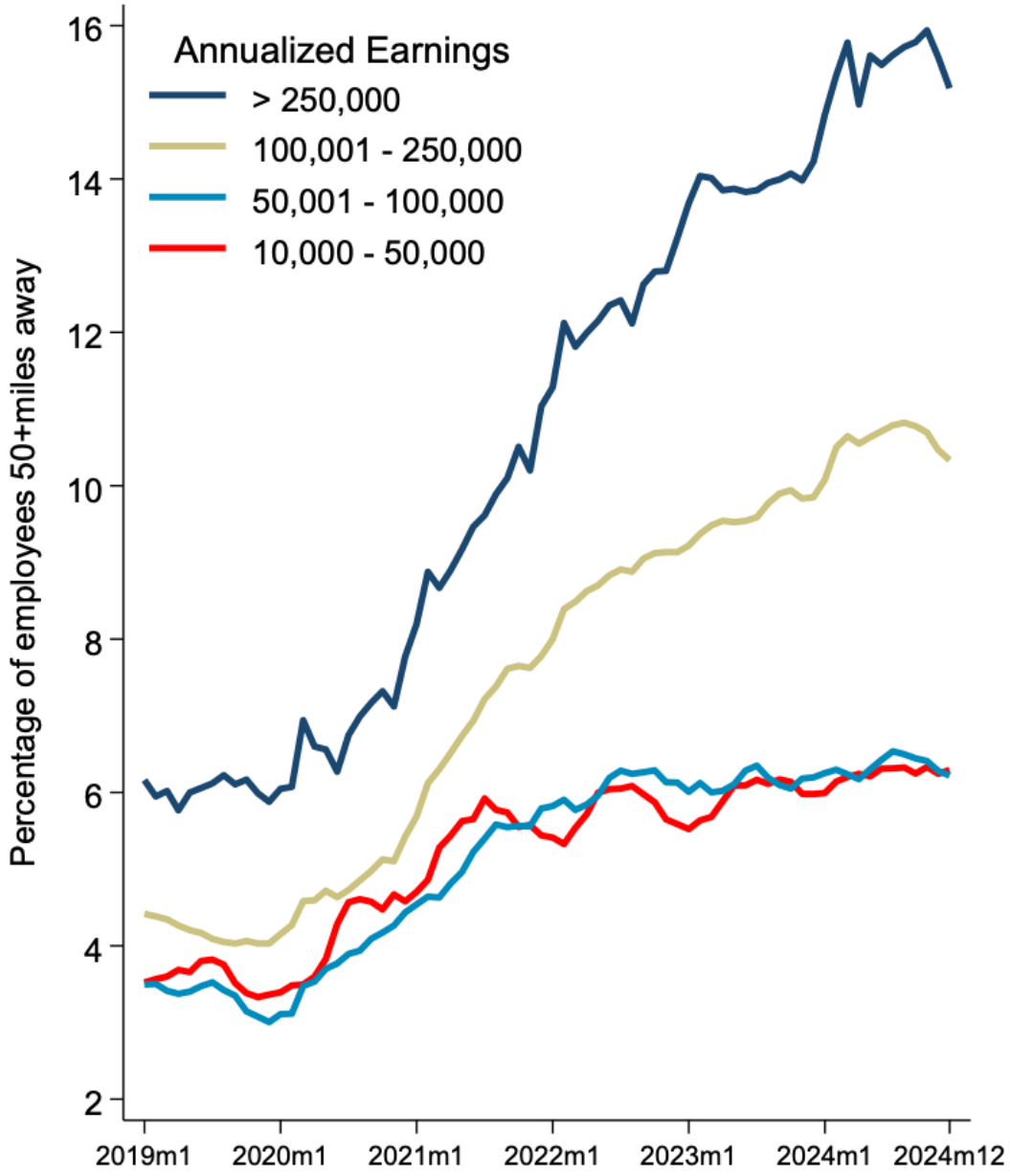
Notes: Gusto payroll data for 371,849 employees in a balanced panel of 12,454 firms that operated continuously from January 2019 to December 2024. We re-weight the employee-level data to match the CPS distribution by (annualized earnings bin) X (age bin) X sex X major industry. **We winsorize distance at 250 miles when computing mean distance**.

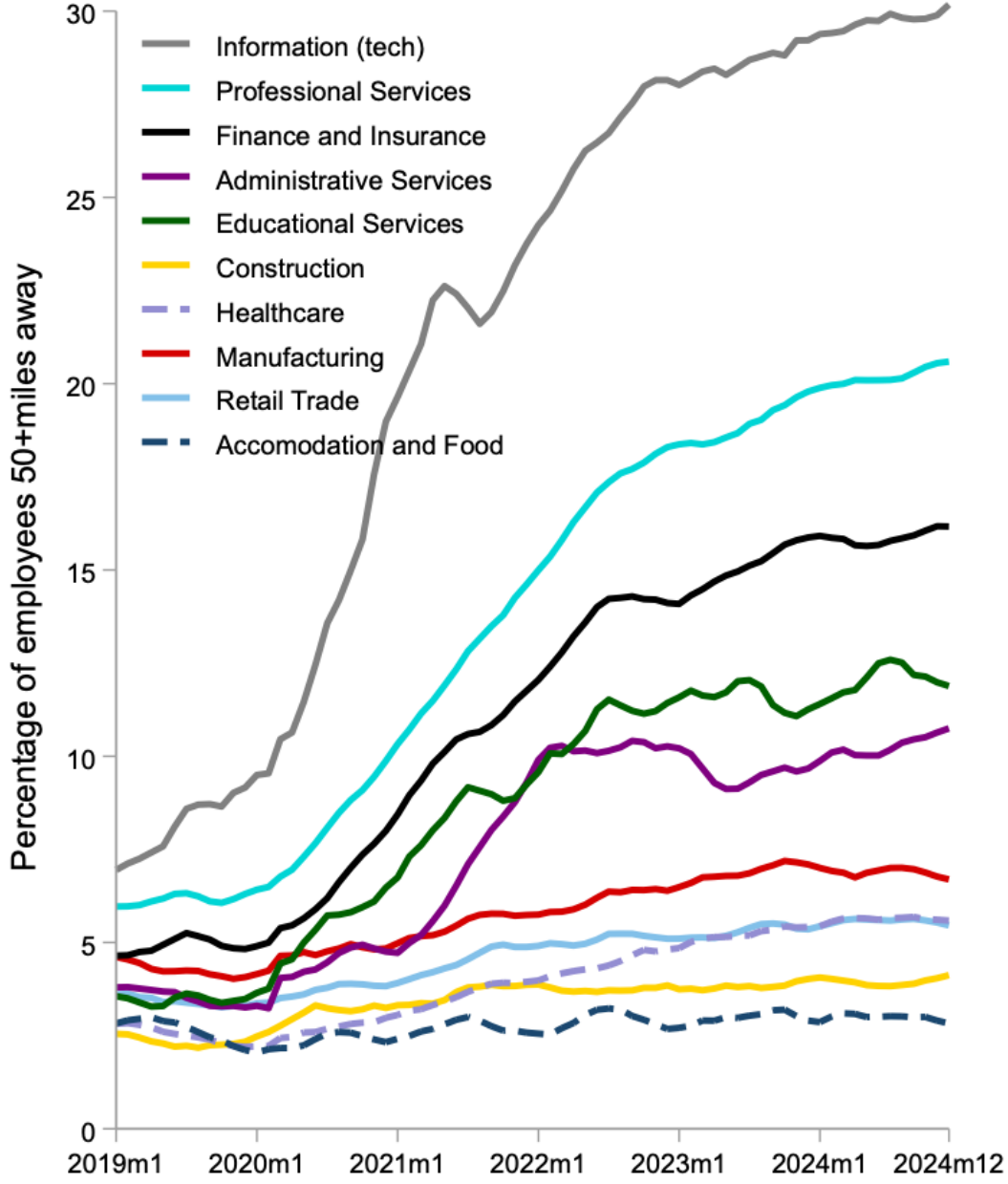
Figure 3: New hires since March 2020 account for the rise in distant employees



Notes: Gusto payroll data for 371,849 employees in a balanced panel of 12,454 firms. We re-weight the employee-level data to match the CPS distribution by (annualized earnings bin) X (age bin) X sex X major industry. We winsorize distance at 250 miles when computing mean distance.

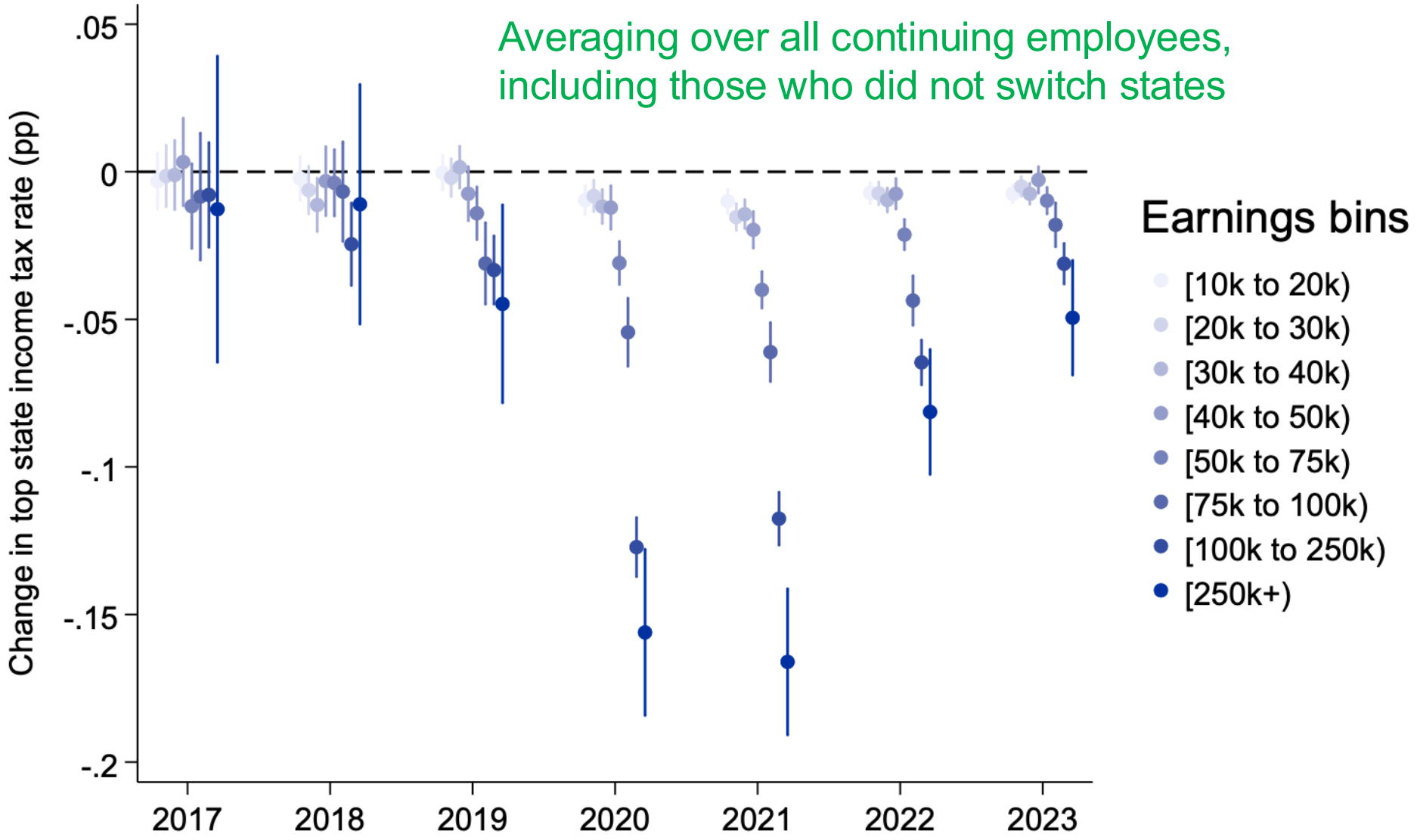
Figure 5: High earners in Information, Professional Services, and Finance saw the greatest increases in distance to the workplace





Notes: Gusto payroll data for 371,849 employees in a balanced panel of 12,454 firms. We re-weight the employee-level data to match the CPS distribution by (annualized earnings bin) X (age bin) X sex X major industry. We winsorize distance at 250 miles when computing mean distance.

Figure 6: Continuing employees moved to states with lower tax rates after the pandemic struck, with stronger migration responses for higher earners



Notes: This chart reports the mean net change in the top state-level labor income tax rate among 1 million employees who remained with the same employer from December of Year Y-1 to December of Y, where Y is reported on the horizontal scale. For example, an employee moving from California to Texas in 2019 would have a net change value of -12.3 percentage points. If an employee does not switch states, we set his or her net tax rate change to zero. Depending on the year, 52 to 64% of employees in the Gusto data set remain with their employer from December of Y-1 to December of Y. The vertical lines depict 95% confidence intervals. See Figure A.7 for a chart that reports corresponding changes in top tax rates conditional on moving between states.

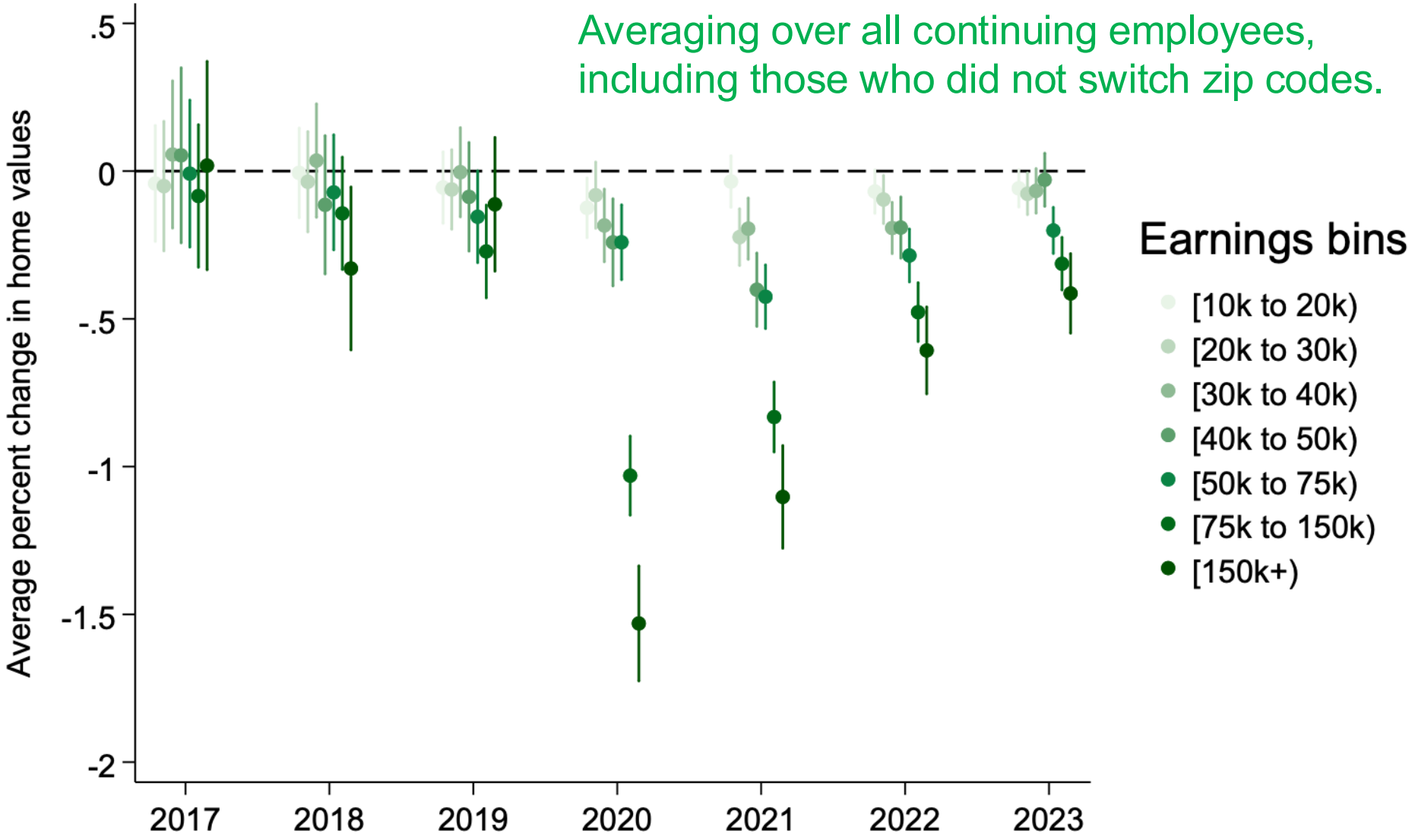
Assessing the Tax Revenue Consequences, 1

- For persons with annualized earnings of at least $250,000, the foregoing figure shows net tax rate reductions due to relocation between states of 16 bps in 2020 and roughly another 32 bps over the next three years. **That yields a cumulative tax rate reduction of 48 bps from 2020 to 2023 for this group**.
- Persons earning $250,000 or more account for about 40% of the $13 trillion in US labor income as of 2022.
- **These observations suggest that net migration to states with lower taxes reduced state-level income tax collections by about $25 billion per year, as of 2023, for this earnings group alone.**
- These calculations are crude in multiple respects, including: (a) not everyone in the $250K group pays a state's top marginal tax rate and (b) marginal and average state tax rates differ.

Assessing the Tax Revenue Consequences, 2

- Judging from Figure 6, net outmigration from high-tax states is not fully played out by 2023.
- Perhaps more important, relocation between states is probably more common among persons who switch employers as compared to those who stay with the same employer from one year to the next. For this reason, Figure 6 probably understates the intensity of net migration from high-tax to low-tax states after the pandemic.
- Summing up, our evidence suggests that the rise of WFH since 2020 – and the new-found flexibility it offers with respect to residential location – lowered state-level income tax revenues by roughly $40 to $50 billion per year.
- This amounts to 7 to 8% of state-level income tax collections in 2022.

Figure 7: Continuing employees moved to areas with cheaper housing after the pandemic struck, with stronger migration responses for higher earners

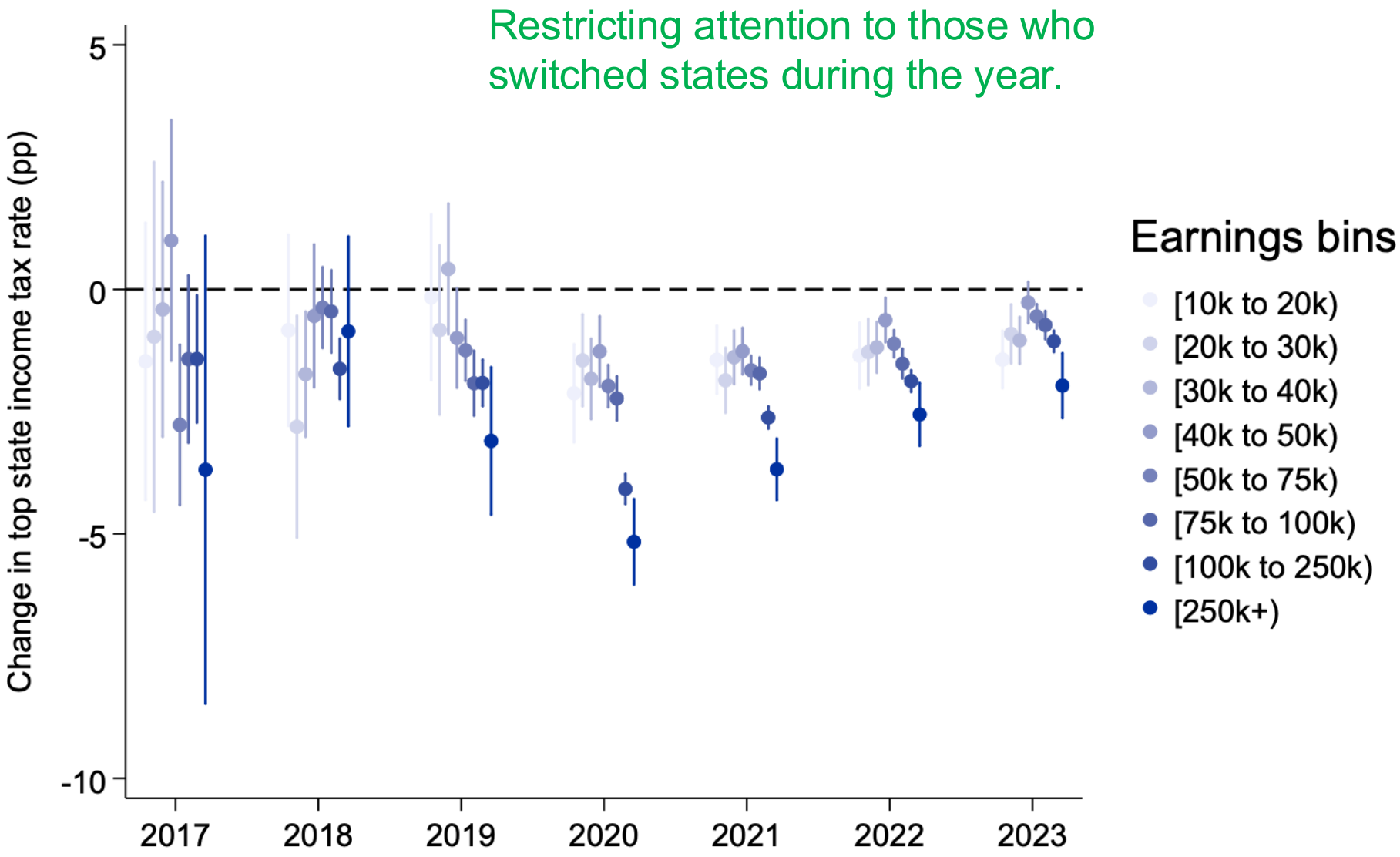


Notes: This chart reports the mean net change in zip-code level home values among 1 million employees who stayed with the same employer from December of Year Y-1 to December of Y, where Y is reported on the horizontal scale. We set zip-code level home values to the average monthly Zillow Home Value Index for each zip code from January 2017 to December 2023. The vertical lines depict 95% confidence intervals.
See Figure A8 for a chart that reports the corresponding percent change in local home prices conditional on moving between zip codes.

Figure A5: Employers in areas with high housing prices have a much greater share of distant employees, 2023 data

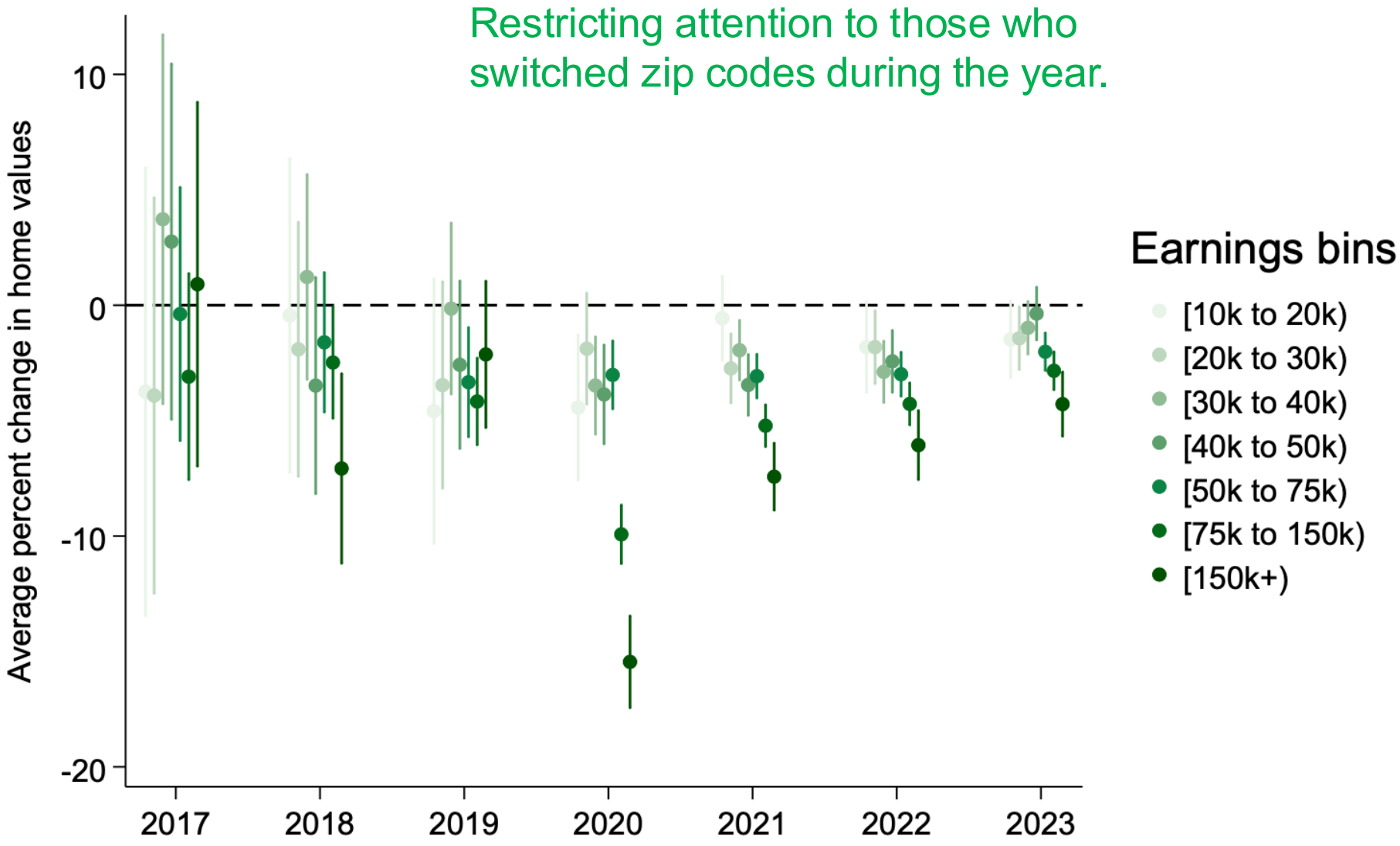
Notes: Gusto payroll data in 2023. Employee-level data are reweighted to match the CPS distribution by (annualized earnings bin) X (age bin) X sex X major industry.

Figure A7: Mean changes in top tax rates, continuing employees who move between states



Notes: We construct this chart using the same approach as in Figure 6 in the main text, except that we now restrict attention to continuing employees who switched their state of residence from Year Y-1 to year Y.

Figure A8: Mean percent changes in local home prices, continuing employees who moved between zip codes

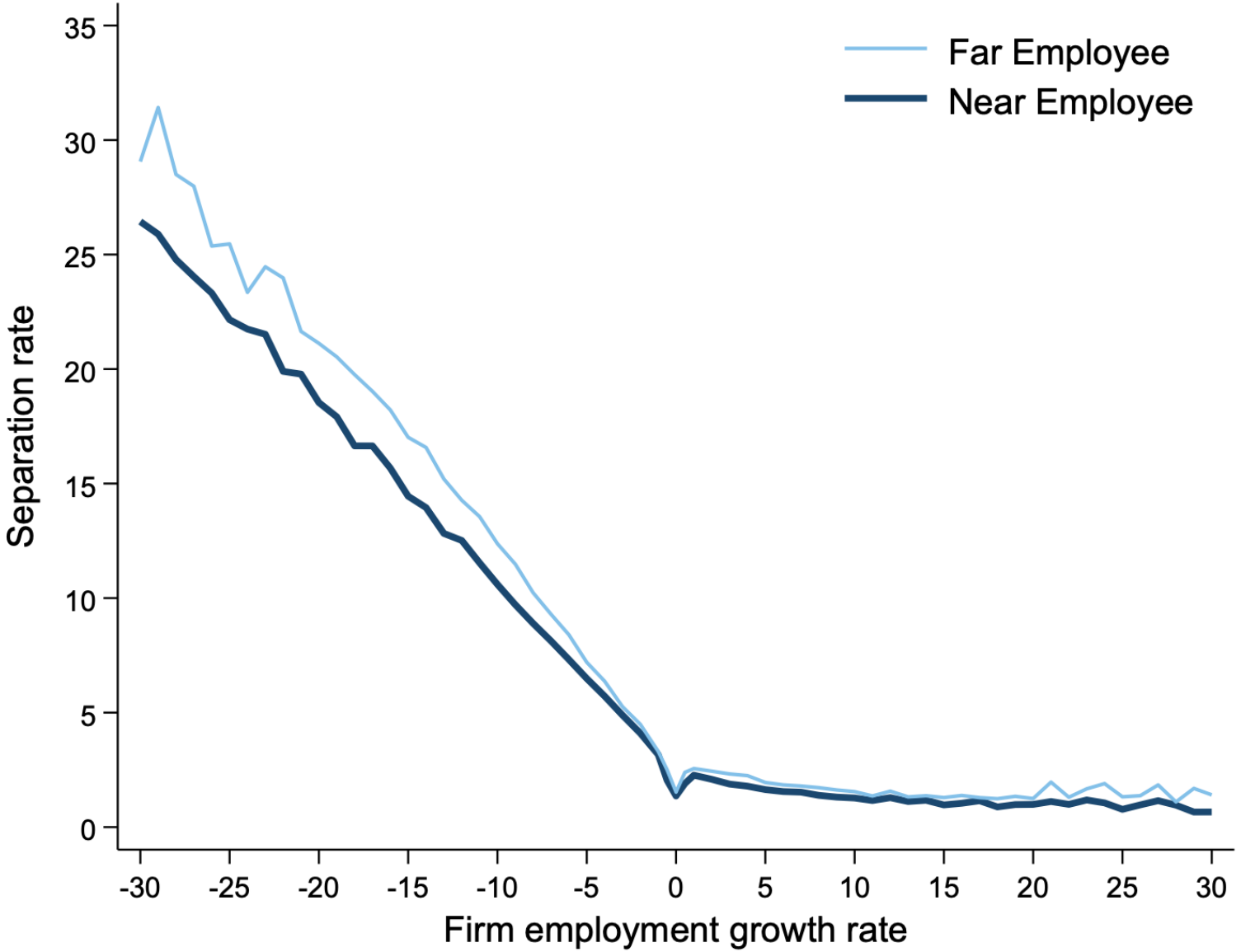


Notes: We construct this chart using the same approach as in Figure 7 in the main text, except that we now restrict attention to continuing employees who moved between between zip codes from Year Y-1 to ear Y.

Figure 8: Separation and hiring rates are greater, and more responsive to employer growth, for distant employees

Notes: Gusto payroll data of a sample of about 3.8 million employees and 140 thousand companies from 2017 to 2023. We obtain these plots from nonparametric least-squares regressions of separation and hiring rates on monthly employer-level growth rate bins. There are four separate regressions: two for the hiring rates of far and near employees, and two for the hiring rates of far and near employees.

Figure A9: Separation rates remain more responsive to firm-level growth for far employees when controlling for individual-level job tenure, age, and sex



Notes: We obtain these plots from nonparametric least-squares regressions of individual-level monthly separation values on monthly employer-level growth rate bins and controls for job tenure, age, and sex of the employee. For each person employed in month $t-1$, we set the separation value to 1 if he or she longer works for the same firm in month t, and 0 otherwise. We pool the data over months from 2017 to 2023 and distinguish far and near employees. We fit separate regressions for far and near employees. In each case, we regress the individual-level separations value on an exhaustive set of interval dummies for firm-level growth rates at t (using the same set of interval dummies as in Figure 8), an exhaustive set of dummies for the individual's current tenure with the firm (one month, two months, three months,…), an exhaustive set of dummies for the individual's age, and the individual's sex. As in Figure 8, we read the plotted relationships directly from the coefficients on the interval dummies for firm-level growth rates. The near-employee sample contains 46.9 million individual-level observations, and the far-employee sample contains 5.8 million observations.

A Case Study

- Tempo, a major call-center company in Turkey, has about 3,500 employees.
- The company services a broad clientele that includes banks, mobile phone operators, food chains, and embassy visa sections.
- Before COVID-19, Tempo operated offices in seven provinces, including its headquarters in Istanbul.
- In response to the national lockdown imposed in Turkey on March 11, 2020, Tempo executed a rapid transition to remote work.
- Within two weeks, the company shifted its entire workforce of 3,500 call center agents to remote operations.
- To facilitate this transition, Tempo provided laptops and internet support to its employees.
- Tempo stuck with remote work after the lockdown ended.

The Working Environment Before (A) and After (B) the Shift

A: Working from the office

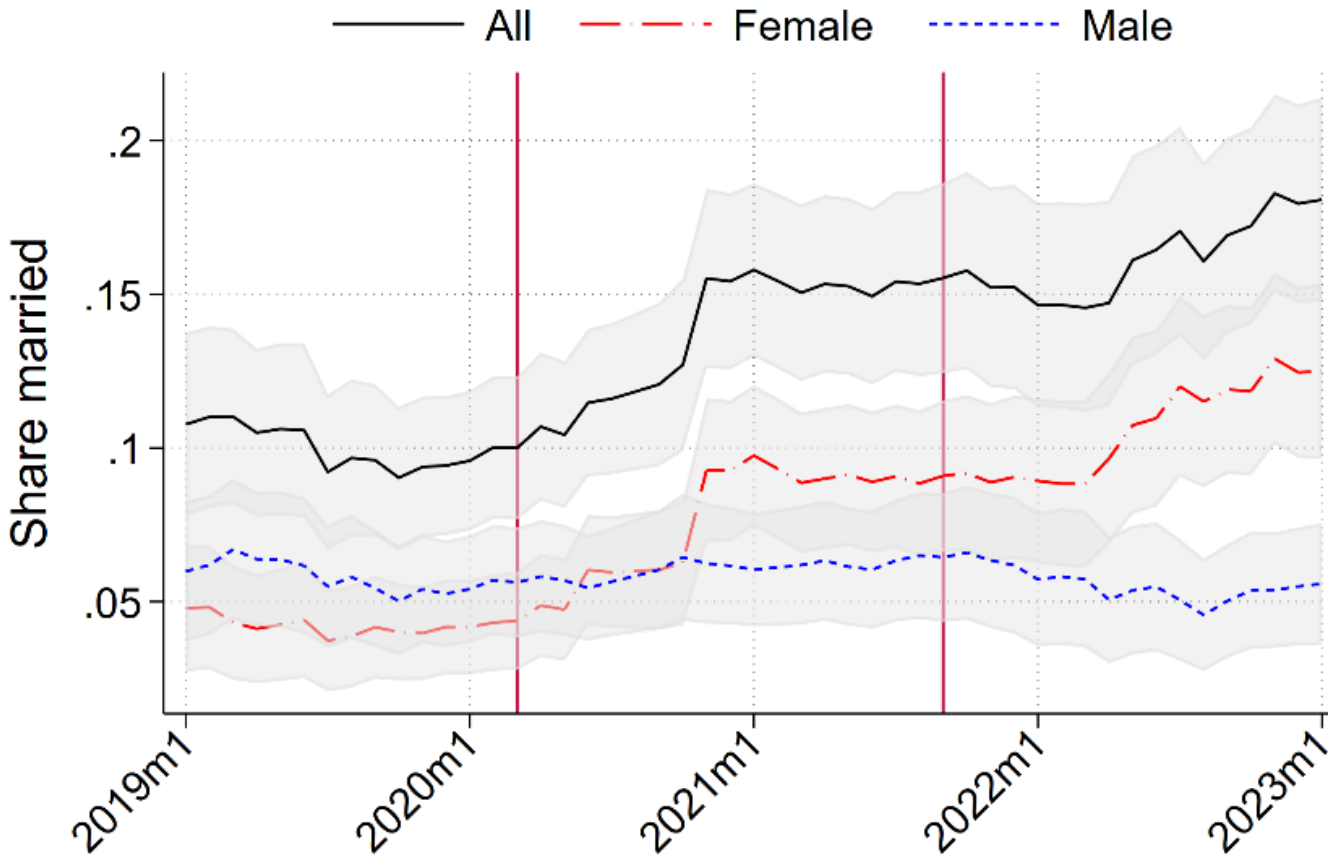
B: Working from home

Main Findings

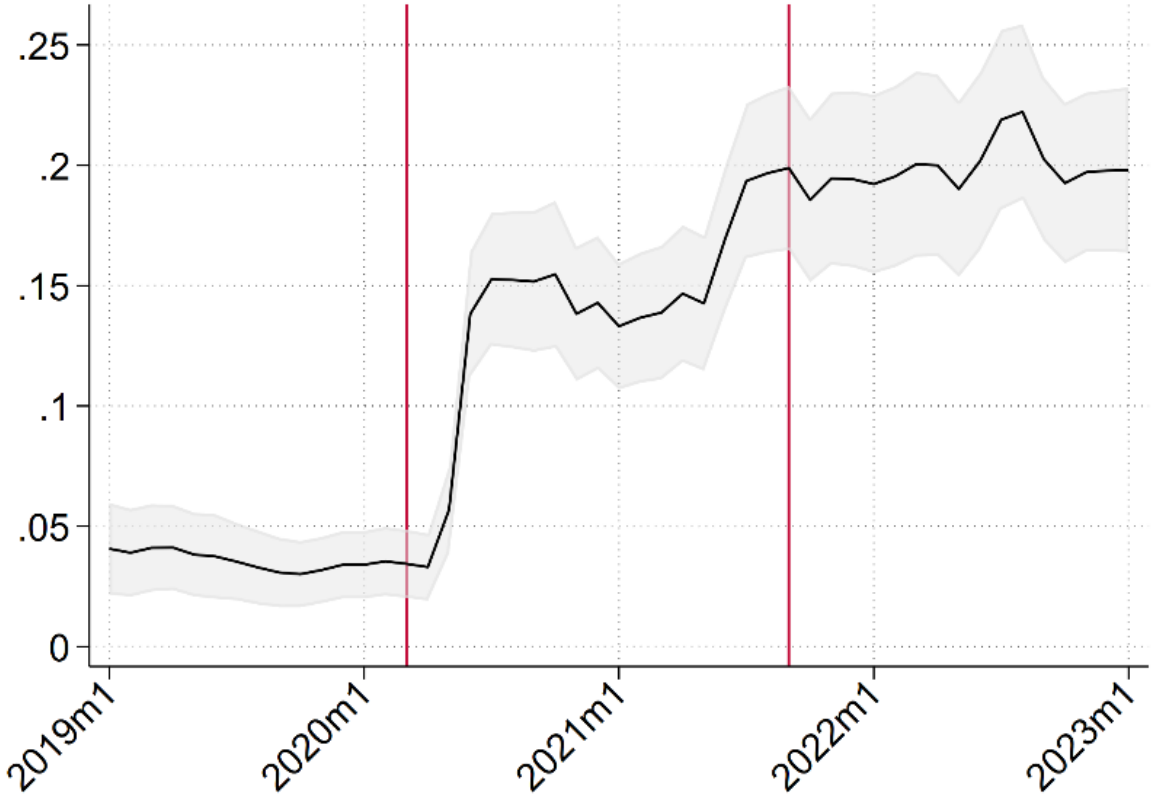
1. The shift to remote work led to sharp rises in the company's workforce shares of women, older and more-educated workers, **and persons who reside outside metropolitan areas**.
2. Average workforce productivity rose by 5.8 percent from 2019 (onsite work) to 2022-2023 (remote work).
   - The productivity gains mainly reflect shorter call durations, with no loss of service quality.
3. Productivity effects are similar for men and women.

Company Workforce Mix, January 2019 to January 2023

Share Who Are Married

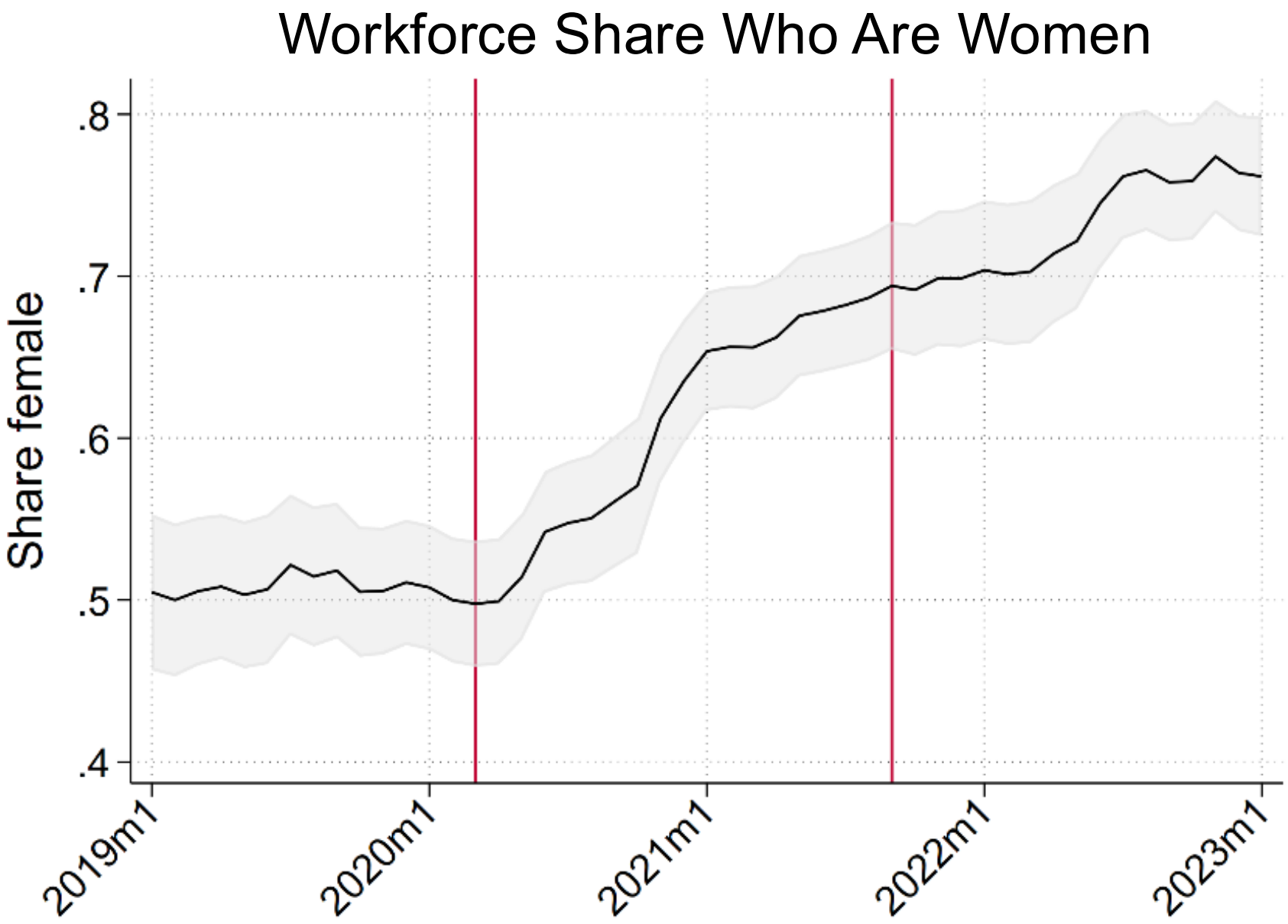


Share in Less Populous Provinces



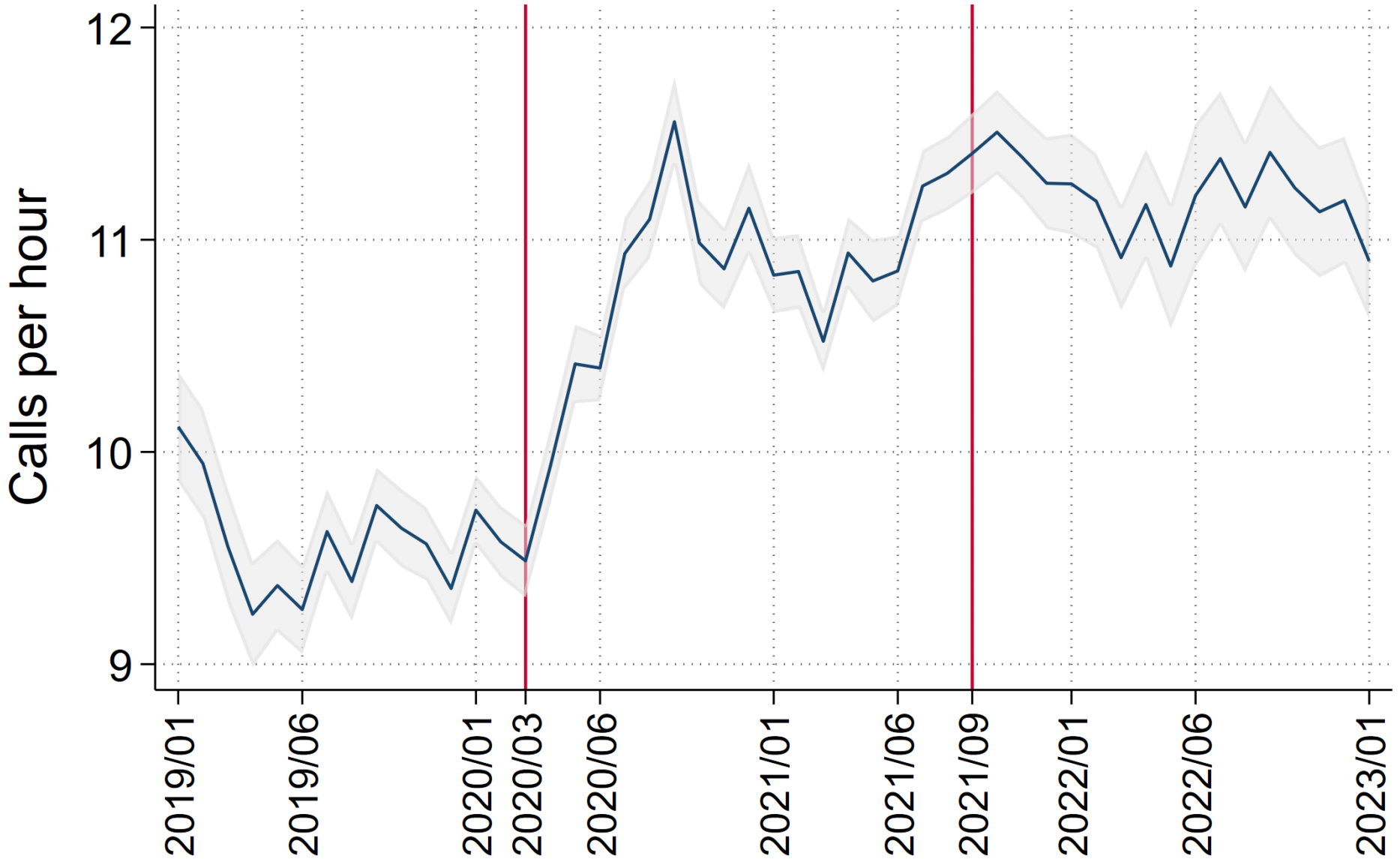
"Less Populous Provinces" have fewer than 750,000 persons each. 33 of 60 covered provinces meet this criterion.

Company Workforce Mix, January 2019 to January 2023



Notes: The first vertical line shows when Turkey introduced lockdown restrictions. The second line shows when Turkey ended the restrictions. Shaded areas show 95 percent confidence intervals around monthly means.

Workforce productivity rose after the shift to remote work



Notes: This figure shows regression coefficients on monthly dummies, controlling for the mix of calls, repeat calls, and agent fixed effects. Shaded areas show 95 percent CIs based on errors clustered at the agent level.

Concluding Remarks

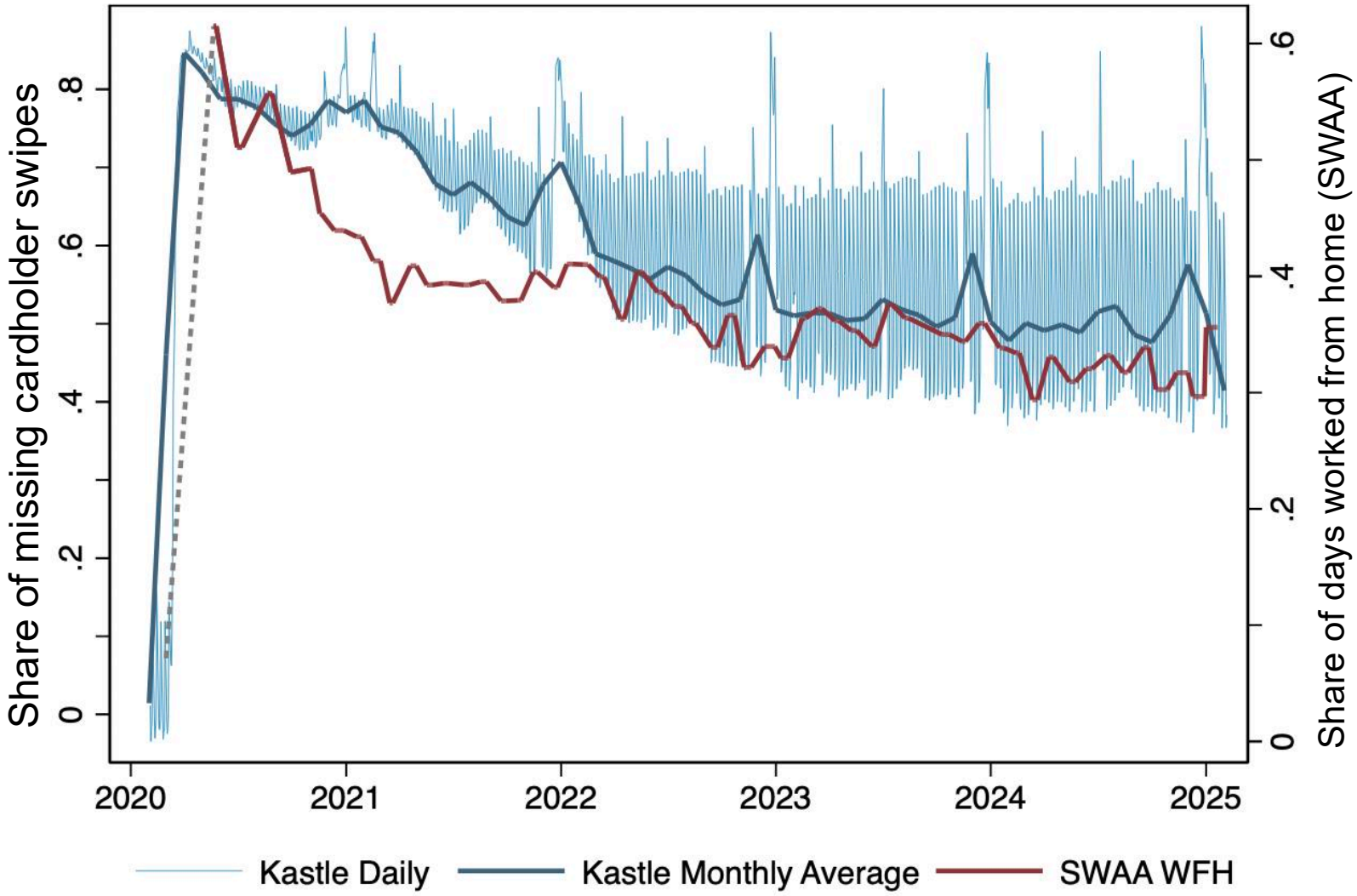
WFH relaxes locational constraints for workers, families, and employers. In doing so,

1. It expands employment options for anyone who can work in jobs that are suitable for hybrid or fully remote work.
2. It expands residential location options for individuals and families, and it relaxes joint location constraints for working couples.
3. It allows employers to recruit broadly, including from areas with lower wages or deeper talent pools, without relocating the business.
4. It diffuses the labor market footprint of individual employers.

These developments have important implications for cities, housing markets, tax revenues, labor supply, wage determination, business dynamics, and the effects of labor market downturns.

Extra Slides

Data on "Missing" Office Workers in Top 10 U.S. MSAs Also Point to Stabilization of WFH Rates Since 2023



Notes: SWAA and Kastle data are both restricted to the top 10 MSAs include Washington DC, NYC, Chicago, Houston, Philadelphia, SF, LA, Dallas, San Jose, Austin. SWAA includes all employed individuals 20-64 earning at least $10,000. Kastle includes employed individuals of all ages and earnings, primarily office workers. We construct the Kastle data as 1 - (percent of cardholder swipes into the office normalized to February 3 – February 13 2020) where 0 is equal to pre-pandemic in person work and 1 is equal to full remote work.

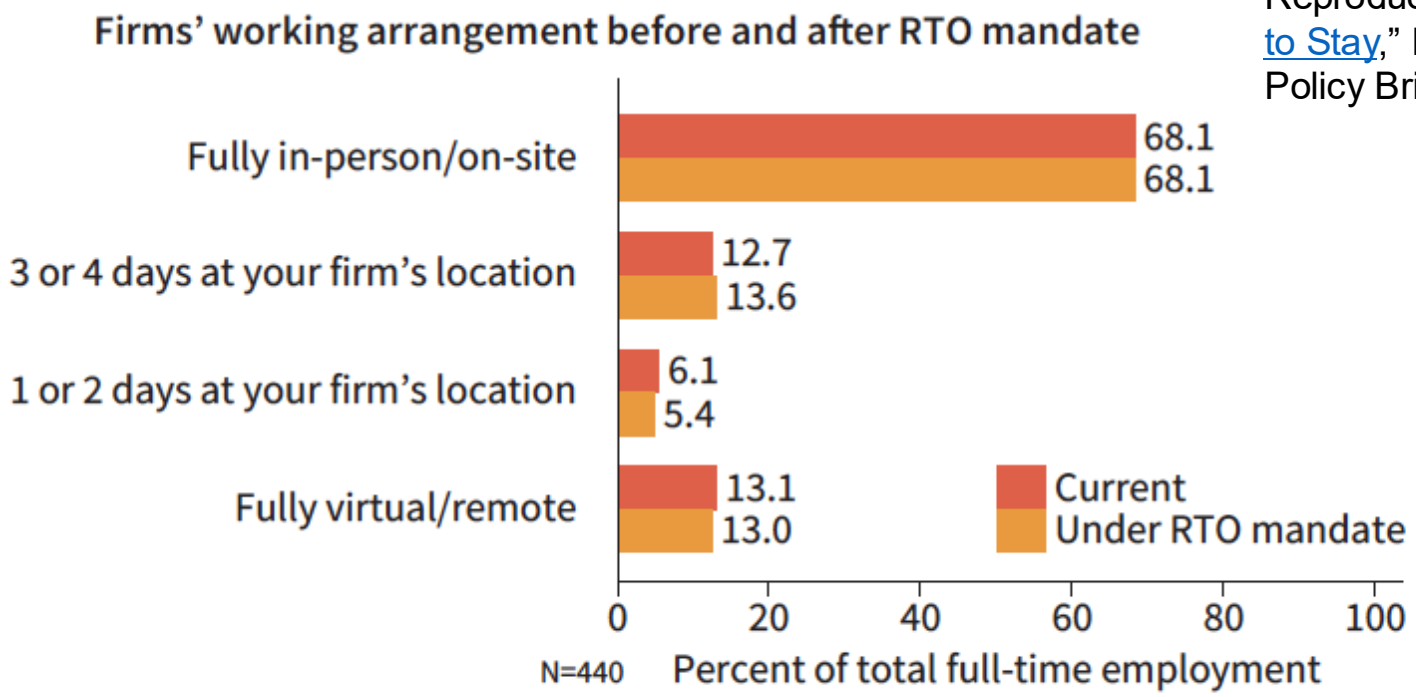
Regarding RTO mandates, we asked the executives to look ahead:

> **"During the next 12 months, is your firm planning a return-to-office mandate for those employees who currently work in hybrid or fully remote arrangements?"**

Just 12 percent of the executives that currently have hybrid or remote workers report plans for an RTO mandate in the year ahead. And many of these mandates don't involve a full return to onsite work. Instead, more than a quarter of the planned RTOs will require onsite work only 1 to 4 days a week.

FIGURE 1: Return-to-office mandates barely move the needle on WFH

Question: What do you expect would be the share of your firm's full-time employees in each category under the return-to-office mandate? Answers should sum to 100 Your firm's current shares are in parentheses.



Reproduced from "U.S. Executives Predict Work from Home Is Here to Stay," Barrero, Bloom, Davis, Foster, Meyer and Mihaylov. SIEPR Policy Brief, March 2025.

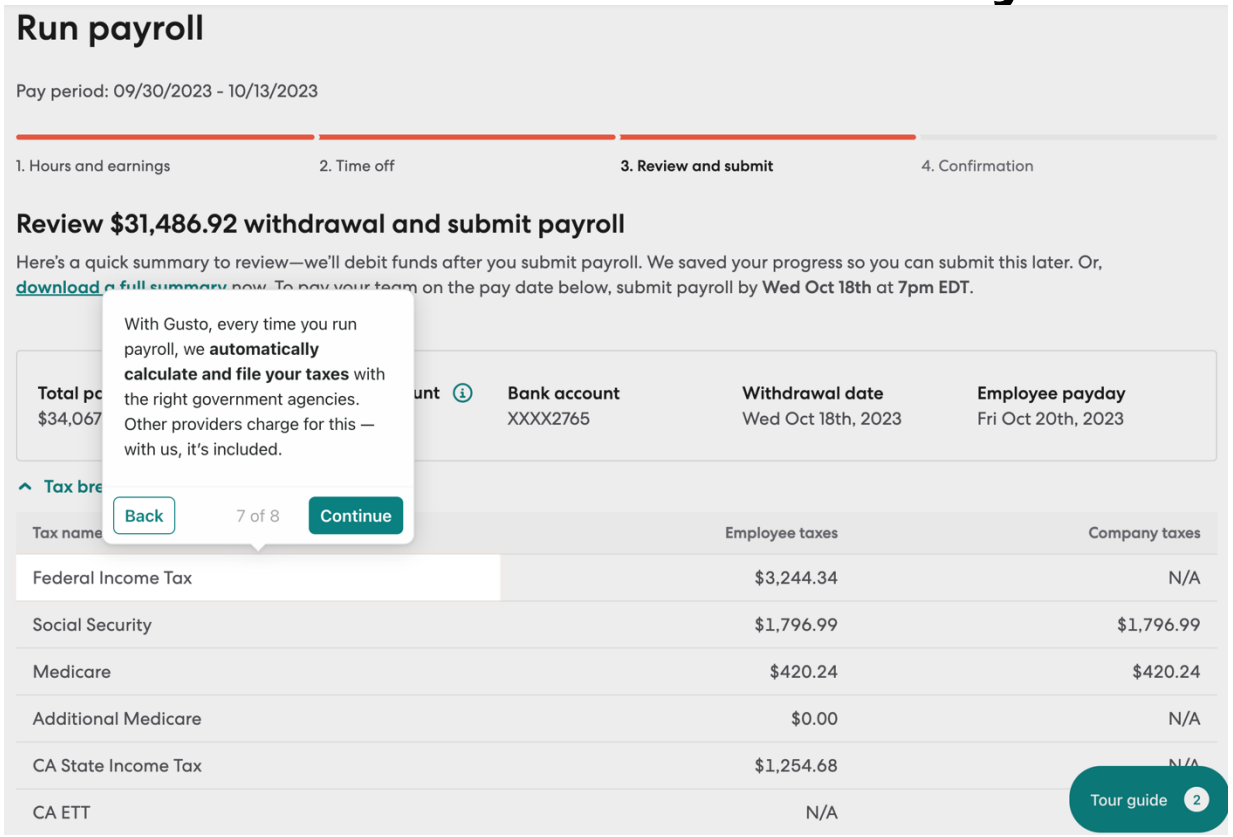
- Paid working days at home as a percent of all working days currently: 21.2%
- Paide working days at home as a percent of all working days after under the return-to-office mandate: 20.8%

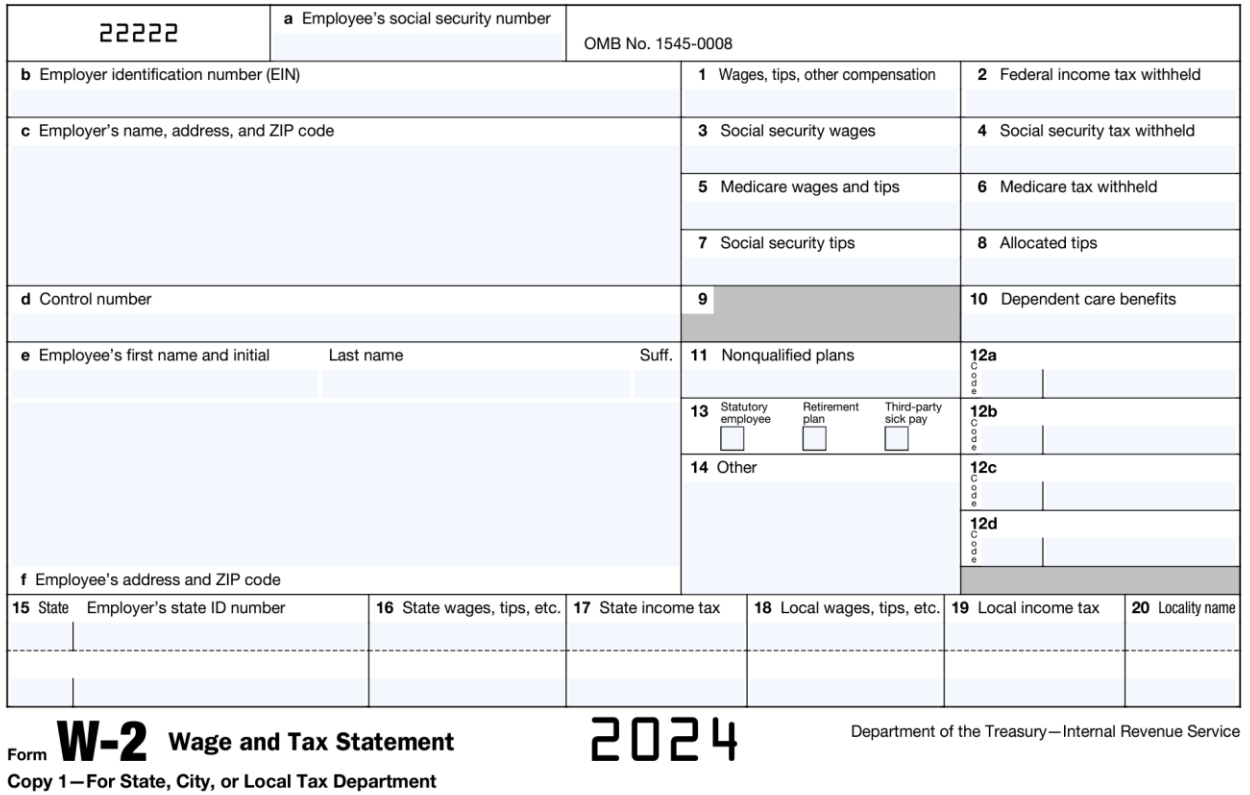
Paid working days at home as a percent of all working days is calculated by converting the number of days at home to a fraction of the 5-day workweek (0.3 for 1-2 days, 0.7 for 3-4 days, and 1 for 5 days)

Note: Results are weighted by firm employment. These questions were fielded in the February 2025 SBU survey wave.

Gusto Dataset

- Gusto provides payroll processing, tax, and other services to mostly small and mid-sized employers.

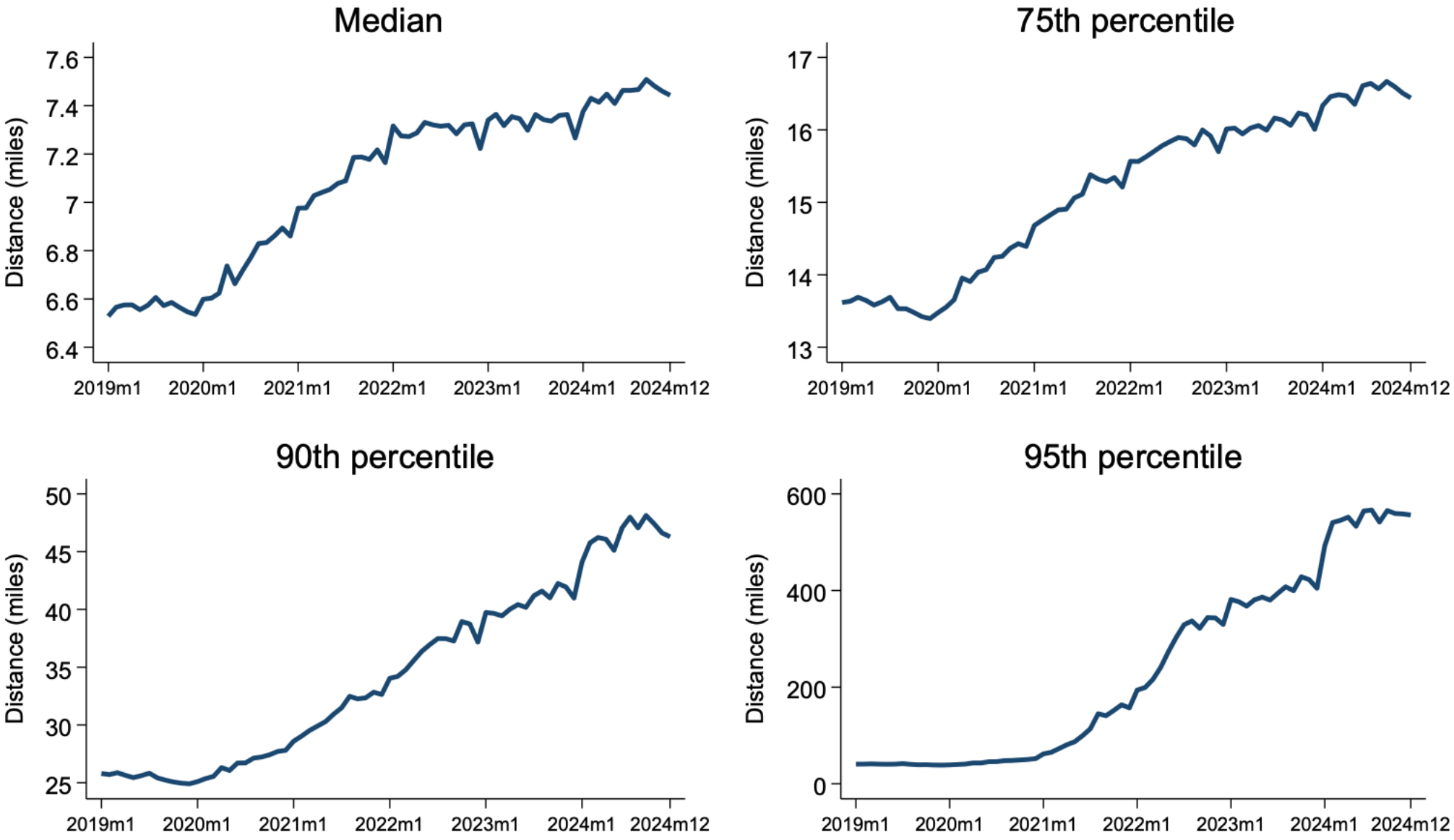




Data and cleaning steps

- Main analysis: monthly balanced panel of firms from January 2019 to December 2023 containing 15,742 firms and about 450,000 employees
- Distance measured as the haversine (crow flies) distance between geocoded employee home address employer location
- Some multi-location employers assign all employees to a single location for payroll purposes
    - If the measured distance from home to assigned employer location exceeds 50 miles for at least 25% of a firm's workforce on average before March 2020, we drop that firm and its employees from the balanced panel of firms
- Weight individual-level data by the cross product of age bin, sex, annualized earnings bins and major industry group to match Current Population Survey

Figure A2: Distance to employer rose across the entire distribution after the pandemic struck



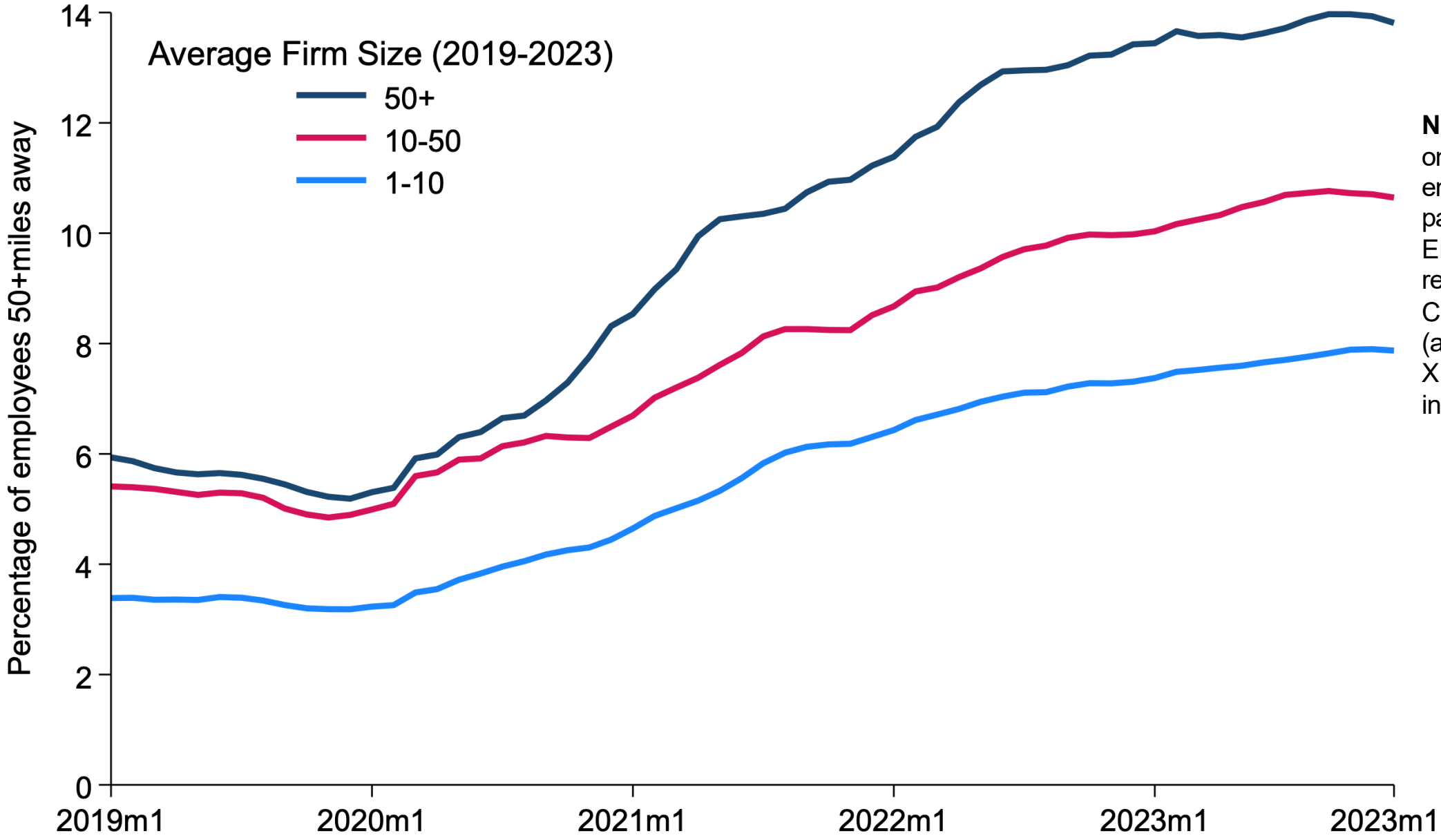
Notes: See notes to Figure 2.

Figure A4: Distance to employer rose in every major industry sector but much more so among new hires in Information, Finance & Insurance, and Professional Services

	All Employees		Hired Before March 2020	Hired After March 2020
	2019	2023	2023	2023
Accommodation and Food Services (72)	2.6	2.9	2.0	3.2
Retail Trade (44-45)	3.5	5.7	4.5	6.3
Health Care and Social Assistance (62)	2.5	5.1	2.7	6.7
Manufacturing (31-33)	4.3	7.2	4.1	8.9
Educational Services (61)	3.5	11.5	5.1	15.0
Administrative Services (56)	3.8	11.4	5.0	13.9
Professional Services (54)	6.3	19.3	8.9	26.0
Finance and Insurance (52)	4.9	16.2	8.2	22.6
Information (51)	8.7	29.2	13.2	37.8

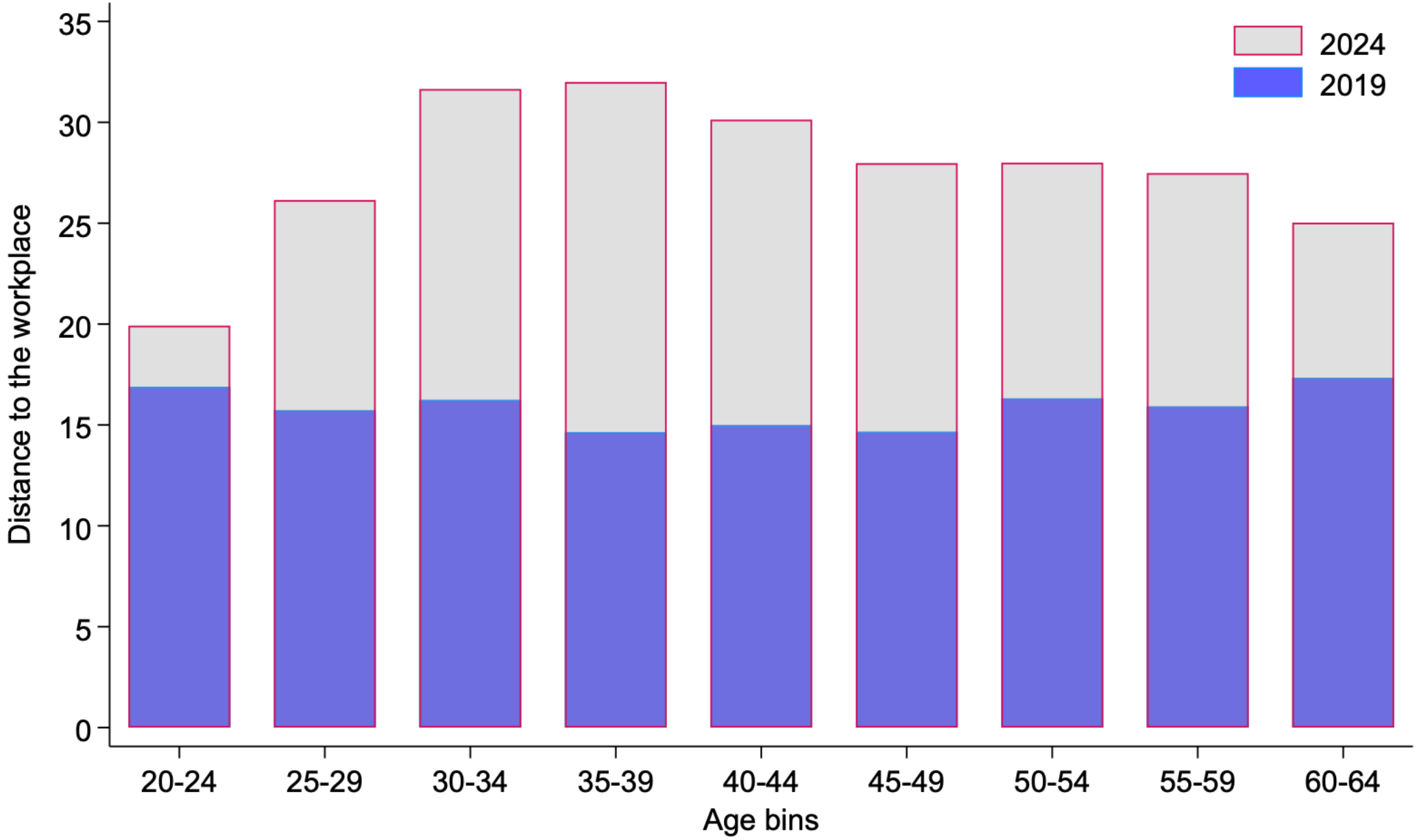
Notes: Gusto payroll data on a sample of 395,517 employees in a balanced panel of 14,613 firms. Employee-level data are reweighted to match the CPS distribution by (annualized earnings bin) X (age bin) X sex X major industry.

Figure A6: Distant employees became more common across the employer size distribution after the pandemic struck



Notes: Gusto payroll data on a sample of 395,517 employees in a balanced panel of 14,613 firms. Employee-level data are reweighted to match the CPS distribution by (annualized earnings bin) X (age bin) X sex X major industry.

Figure 4: Employees in their 30s and 40s have largest rise in distance to employer



Notes: Gusto payroll data for 371,849 employees in a balanced panel of 12,454 firms. We re-weight the employee-level data to match the CPS distribution by (annualized earnings bin) X (age bin) X sex X major industry. We winsorize distance at 250 miles when computing mean distance.