The Effect of Working from Home on the Agglomeration Economies of Cities: Evidence from Advertised Wages

Sitian Liu and Yichen Su

Queen's University

Federal Reserve Bank of Dallas[1]

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WFH and Agglomeration Effect of Cities

▶ Productivity and wages are higher in larger cities and dense areas than in smaller cities and rural areas—**agglomeration economies**.

  ▶ Knowledge spillovers (interaction);
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▶ The effect of working from home (WFH) on the agglomeration economies of cities and the aggregate productivity implications.

  ▶ **Pros:** Reduce commuting, better workers' well-being, higher productivity for some jobs, and better labor allocation (?)
 ▶ **Cons:** Reduce workplace interactions—core building block of agglomeration economies.

► Before WFH:
  ► Work locations and residential locations are **bundled**.
  ► Key mechanisms:
    ► Large cities benefit from productivity spillovers from workers' physical concentration.
    ► High-productivity large cities constrained by limited housing supply (high rent).

Before and After WFH Adoption

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▶ After WFH became widespread:
  ▶ Work locations and residential locations are **decoupled**.
  ▶ Key mechanisms:
    ▶ Large cities lose productivity due to reduction of onsite workers ($\downarrow$ aggregate productivity)
    ▶ High-productivity large cities gain access to a larger labor pool beyond their local housing supply constraint ($\uparrow$ aggregate productivity).

Labor Market in Large Cities: High WFH Adoption During COVID-19
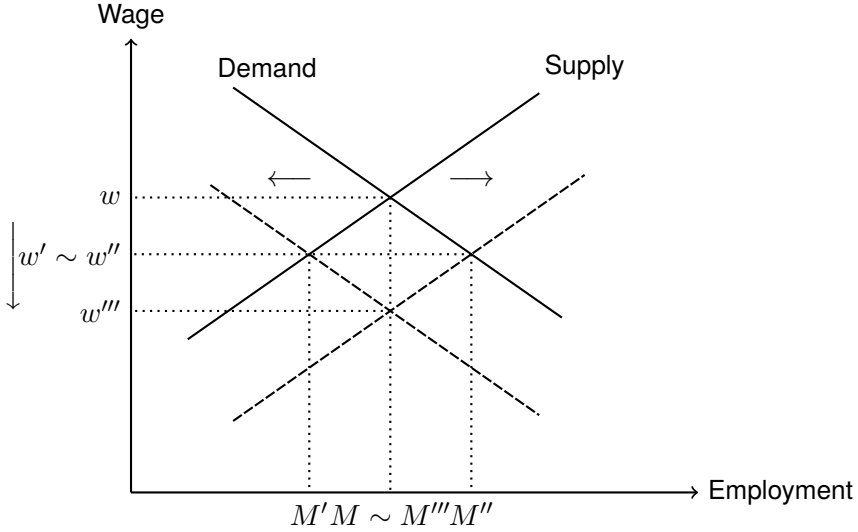
# Labor Market in Large Cities: Low WFH Adoption During COVID-19
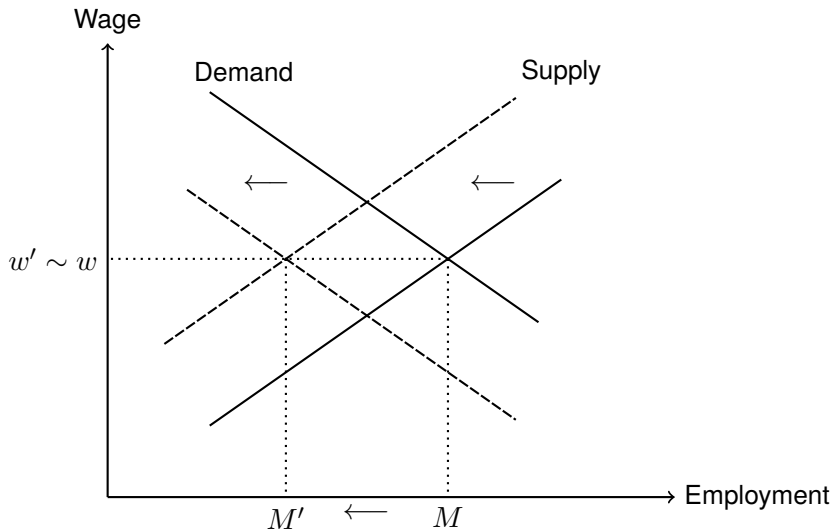
Data

▶ Burning Glass Technologies (now called Lightcast).

  ▶ Jobs posted on online job boards.

  ▶ Subsample contains wage information.

  ▶ Date, geography (county), employers, NAICS, SOC.

  ▶ Detailed skill requirements.

▶ Quarterly Census of Employment and Wages (QCEW): Number of jobs by industry based on firms' locations.
  Industry Share Validation with QCEW

▶ Measuring WFH prevalence:

  ▶ American Community Survey (ACS)

  ▶ O*NET Imputation Within-Sample Validation

  ▶ American Time Use Survey (ATUS)

Empirical Evidence: ↓ Urban Wage Premium for High-WFH Jobs
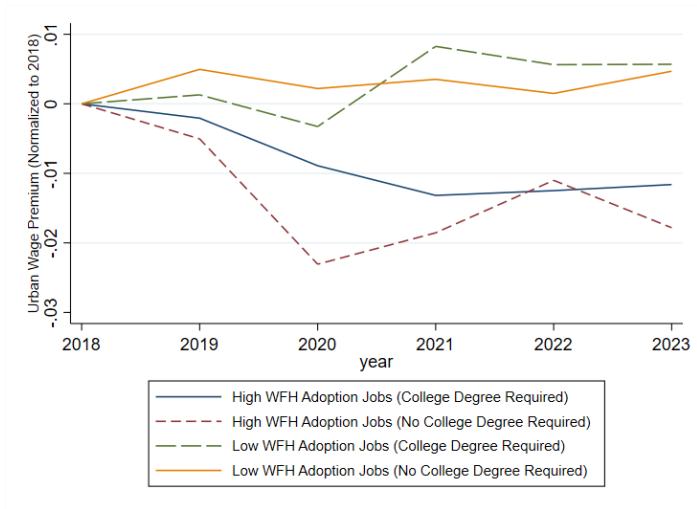
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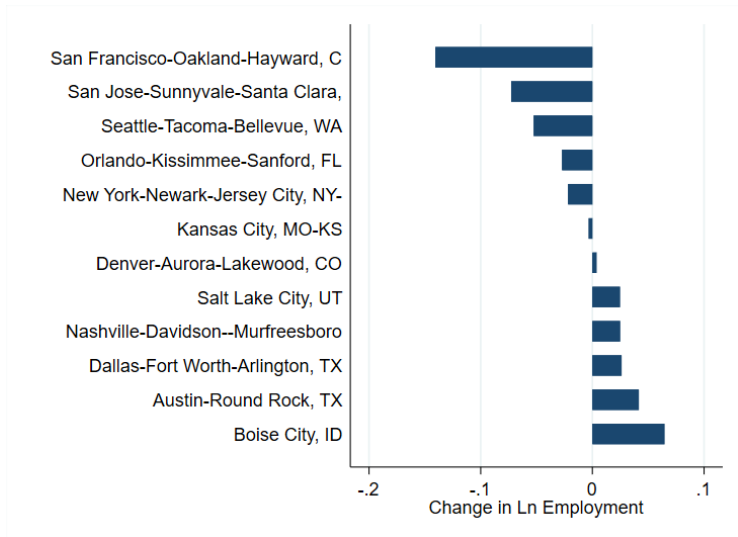► Mechanical result from higher adoption of WFH in large cities?

Robustness to Alternative Explanations

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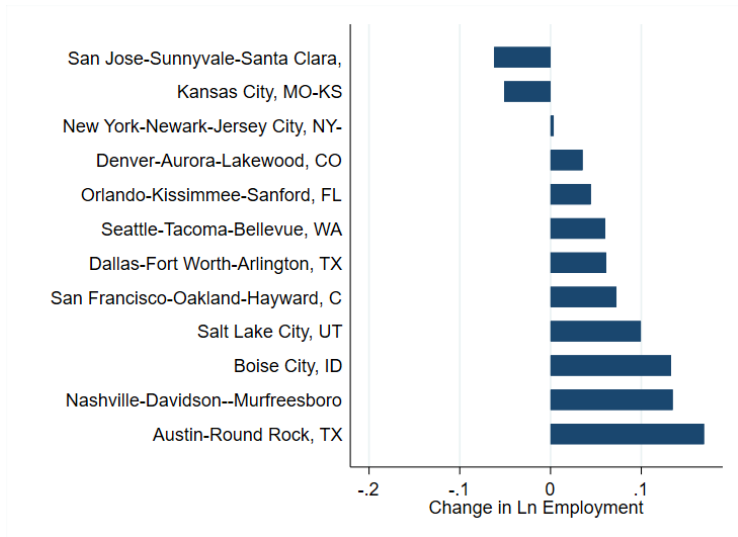▶ Mechanical result from higher adoption of WFH in large cities?

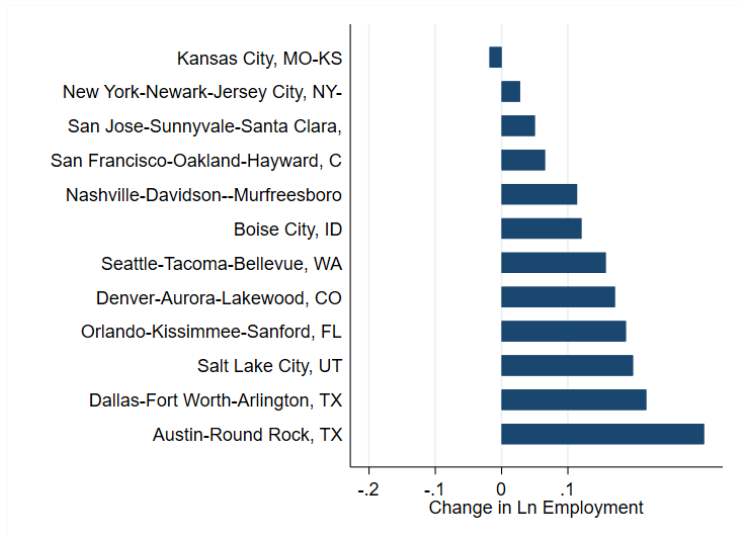▶ ↓ Commuting time in large cities → ↓ Compensating differentials?

Empirical Evidence: Employment Growth (2019-2022) (Food Services)

Empirical Evidence: Employment Growth (2019-2022) (Finance and Information)

Empirical Evidence: Employment Growth (2019-2022) (Prof and Business)

► Decline in wage premium in large cities (urban wage premium) among the high-WFH jobs:

   ► The returns to *some* skills likely declined in large cities relative to small cities

   ► Identifying *which* skills → reveals the driver of the ↓ UWP.

Additional Evidence: Decompose the ↓ UWP

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▶ Skills conducive to **interactive** activities (e.g., building relationship, marketing, and customer support) ↓ UWP
  → Less occurence of productive interactive activities in larger cities
  → Weakened agglomeration economies.

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▶ Skills complementing **remote technologies** (e.g., information technology) ↓ UWP
  → Influx of labor supply to large-city firms.

Top Drivers of the ↓ of UWP (2019 to 2022/2023)

Skill	π
2022–2023	
Communications	22.5%
Information Technology	22.2%
Customer and Client Support	21.4%
Building Relationship	16.1%
Administration	15.9%
Marketing and Public Relations	14.1%
Business Management	11.6%
Maintenance, Repair, and Installation	6.6%
Physical Abilities	4.6%
Human Resources	3.1%
Creativity	2.9%
Engineering	2.3%
Decision Making	2.2%
Personal Care and Services	2.1%
Education and Training	1.8%
Media and Writing	0.8%
Design	0.6%
Public Safety and National Security	0.5%
Agriculture	0.2%
Economics, Policy, and Social Studies	0.1%
Energy and Utilities	0.0%

Takeaways

▶ WFH weakened agglomeration economies of large cities

▶ WFH also expands labor pool to more productive cities

▶ The weakening of agglomeration effect outweights the effect of labor pool expansion over 2020-2022
    ▶ May be the reverse over the long run with hybrid models

▶ Caveats:
    ▶ Hybrid model
    ▶ Robust and spontaneous person-to-person interactions made feasible on virtual platforms.