

# Discussion of 'Measuring the Productivity of Working from Home' by Braun, Cyronek and Rupert

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**Aim:** understand the increase in hours worked from home in the US from 2003 to 2019, with a focus on productivity changes in working from home vs working at workplace.

## Model

Production	Workers
$Y_t = A_t K_t^\alpha \left( \sum_j \left( \sum_i \theta_i l_{ijt} \right)^\omega \right)^{\frac{1-\alpha}{\omega}}$ $l_{ijt} = h_{ijt}^w + \gamma_{ijt} h_{ijt}^h$	$\max_{\{c_{ijt}, h_{ijt}^h, h_{ijt}^w\}} \log(c_{ijt}) - \eta_i \left[ (\chi_{it} h_{ijt}^h)^\rho + (h_{ijt}^w)^\rho \right]^{\frac{1}{\rho}}$ <p>s.t. <math>c_{ijt} = w_{ijt} (h_{ijt}^w + \gamma_{ijt} h_{ijt}^h)</math>.</p>

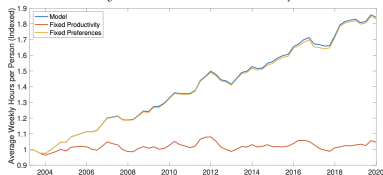
## Data:

- ATUS Leave and Job Flexibility Module (January 2017-December 2018)
  - ▷ Estimate substitution parameter  $\rho$ .
- 2003-2019 releases of the American Time Use Survey (ATUS)
  - ▷ Given  $\rho$ , estimate a set of relative productivities,  $\gamma_{ijt}$ , and worker preferences which consist of the relative disutility of work,  $\eta_i$ , the relative disutility of working from home,  $\chi_{it}$ .

## Main findings:

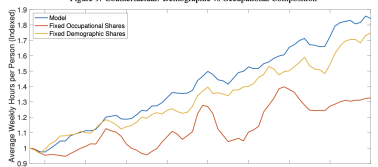
- Changes in preferences and the demographic composition of the workforce played little role in the rise of working from home.
- Increases in the relative productivity of working from home and employment shifts toward occupations with higher relative productivity can account for most of the observed increase in hours worked at home.

Figure 8: Counterfactual: Preferences vs Productivity



Note: The figure plots the average weekly hours worked at home per worker predicted by the model (blue), when productivity is held fixed (orange), i.e.  $\delta_j^i = 0$  for each  $j$ , and when preferences are held fixed (yellow), i.e.  $\delta_i^j = 0$  for each  $i$ . Each series is indexed to 1 at its 2003 value

Figure 9: Counterfactual: Demographic vs Occupational Composition



Note: The figure plots the average weekly hours worked at home per worker predicted by the model (blue), when occupational employment shares are held fixed at their 2003 values (orange), and when demographic employment shares are held fixed at their 2003 values (yellow).

I like the paper, it is an important and understudied issue.

- New approach to infer relative productivity.
- Provides the time trends in relevant variables to understand WfH.

#### Outline of the discussion

- Telework and COVID-19
- Model and estimation
- What does 'productivity' mean in your framework?
- Miscelanea

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- COVID-19 brought a huge uptake in telework, and it has remained high as compared to pre-pandemic telework (Barrero, Bloom, Davis, 2020; Aksoy et al, 2022.)
- Within your framework, would changes after COVID-19 be in productivity or preferences towards telework?
- Why don't you add post-pandemic years to the analysis (2021-2022)?

- The substitution parameter of WfH and working at the office,  $\rho$ , comes from ATUS Leave and Job Flexibility Module 2017-18, using variation in whether or not a worker gets paid for the work they do from home.
  - ▷ Is it reasonable to assume it is constant during all the period studied?
  - ▷ What does *work paid at home* really measure?
  - ▷ Robustness: Does  $\rho$  vary across occupations?
  
- Explain better the **estimation strategy** in the main text... a table with all parameters and where they come from would help.
  - ▷ What is the value of  $\omega$ ?
  - ▷ Is the time varying  $\theta$  from the Gamma distribution of  $\gamma$  the same as the parameter  $\theta_i$  on the aggregator of labor on page 11?



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Relative productivity of working from home is low, even for the occupations with highest relative productivity.

- What is the explanation of divergence with other papers?

Telework increased mainly due to increases in relative productivity of working from home... but what is productivity in your framework? Where is this coming from?

- Worker side: more access to WfH (+), forced to WfH (-), better training in technology to WfH (+), WfH getting paid(+), etc.

Firms are passive players in the model... but they may be very relevant in transitioning to telework (Brotherhood and Jerbashian, 2023).

- Investment in new technologies(+), investment in training(+), changes in restriction policies regarding teleworking(+), etc.

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Furthermore, it depends on general equilibrium forces:

- Innovation through interactions (Akcigit et al 2018), less contagion of infectious diseases (Fu, Kaplan, Moll, Vilante, 2020), etc..

Paper is silent about the mechanisms, the trade-offs and the general equilibrium effects: **What is happening? Why? What are the policy implications?**

- Does this trend matter in the aggregate? Back of the envelope calculation to quantify the impact of the increase in relative productivity.
- Why do you use different data bins for estimating  $\chi_{it}$  and  $\eta_i$ ?
- It would be informative to see evolution of the distribution of  $\gamma_{ijt}$ .
- What explains the cycles in the counterfactual with fixed occupational shares (orange line in Figure 9)?
- Graphs of groups (Figure 4 and 5) were very difficult to understand, select sub-groups!

Thank you!