

# ECB FORUM ON CENTRAL BANKING

1–3 July 2024

## Morgane Richard



**THE SPATIAL AND  
DISTRIBUTIVE  
IMPLICATIONS OF  
WORKING-FROM-HOME**



EUROPEAN CENTRAL BANK  

---

EUROSYSTEM

# The Spatial and Distributive Implications of Working-from-Home

Morgane Richard



**The Idea : Work-from-home (WFH) → persistent change** in the way we organize labour

It raises new issues:

- Workers might need more space to be productive at home
- They commute to the office less often
- Not all occupations are equal in front of remote work

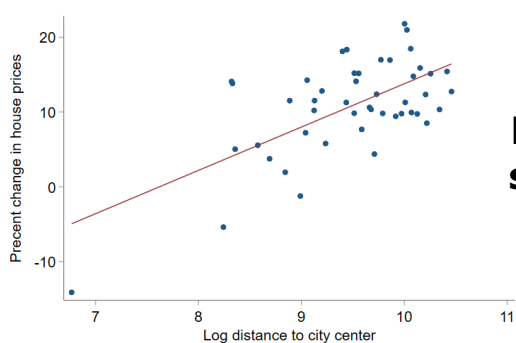
## This paper

- How did WFH reshape households' **housing demand**?
- Should workers who **cannot WFH** care?
- How will WFH impact **inequality** in the **short and long run**?

## Data

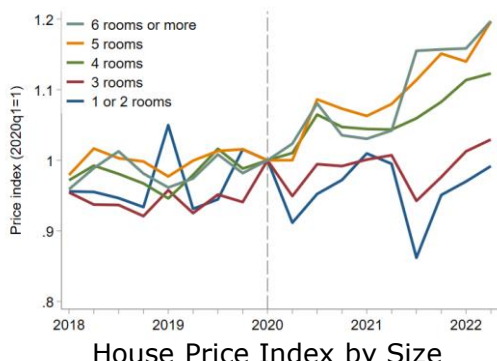
New evidence on the impact of WFH in London

- House prices and rents
- Property-level data
- Detailed property characteristics



Relative appreciation of suburban properties

House Price Growth on Distance to the City Center



Relative appreciation of larger properties

## Hedonic pricing schedule

$$\ln(p_{ijt}) = \delta_{after}^{size} \mathbb{1}_{after} \ln(size_i) + \delta_{after}^{dist} \mathbb{1}_{after} \ln(dist_i) + \delta^{size} \ln(size_i) + \delta^{dist} \ln(dist_i) + \beta X_i + \alpha_t + \eta_j + e_{ijt}$$

**Results:** WFH reshaped London's house prices

- **5% rise in the space premium**
- **6% decline in the commuting penalty**

## Model

- General Equilibrium Heterogeneous-Agent Model
- **Spatial: City is made of 2 locations**
- Households' utility:

$$U_{ikjt} = \frac{[c_{ikjt} \tilde{n}_{ikjt}^{(1-\gamma)}]^{(1-\sigma)} - 1}{1-\sigma} + \underbrace{\eta n_{ikjt}^H}_{\text{preference for WFH}} + \underbrace{\bar{e}_j + \sigma \epsilon_{it}(j)}_{\text{location}}$$

- Some workers can **WFH** → allocate their hours:
  - The **office**: more productive but pay commuting cost
  - **Home**: no commuting cost but use housing space

- Efficient units of labor from the office:

$$\tilde{n}_{ikjt}^O = A_t^O (\nu_{it} n_{ikjt}^O)^\theta$$

Efficient units of labor from home:

$$\tilde{n}_{ikjt}^H = A_{kt}^H (\underline{h})^{(1-\theta)} (\nu_{it} n_{ikjt}^H)^\theta$$

Overall efficient units of labor:

$$\tilde{n}_{ikjt} = \left[ (\tilde{n}_{ikjt}^O)^{\frac{\rho-1}{\rho}} + (\tilde{n}_{ikjt}^H)^{\frac{\rho-1}{\rho}} \right]^{\frac{\rho}{\rho-1}}$$

- **Housing**

- Choice to own or rent
- Financial friction of min. down-payment
- Non-convex selling costs

- Saving in a risk-free low return asset
- Collateralized borrowing

- Households are heterogeneous in income, liquid wealth, housing wealth, occupation (can WFH or not), and where they live

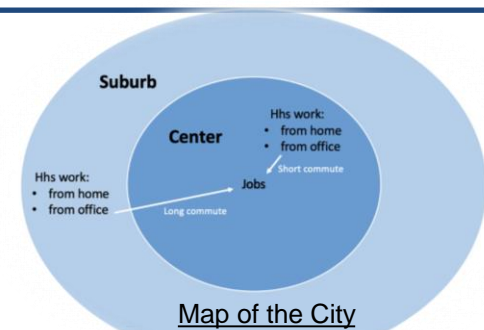
## Main Mechanism

House prices and rents are **determined in equilibrium** in each location

→ **Endogenous WFH decisions** from part of the workforce...

... **shift house prices and rents**, and...

... **trickle down** to the rest of the economy



## WFH Experiment : Impact of a permanent change in preference for WFH

Change in preference calibrated to match the patterns of WFH **during the transition period**

Explore the impact of WFH at two horizons:

- Short run
- Long run

## Results

1. House prices and rents ↑ **everywhere**

- Largest ↑ in the **suburb**
- ↑ **demand for space**
- ↓ **commuting penalty**

2. Speed of price ↑ depends on the **composition of new movers**

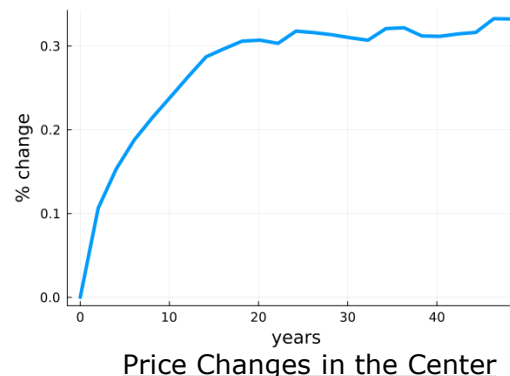
- Suburb: **wealthy movers** → buy right away
- Center: movers **need to build liquid wealth** before buying

3. **Suburb-wide gentrification**

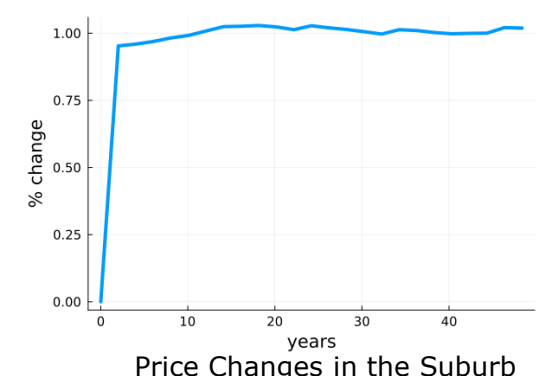
- Workers who cannot WFH are crowded out of ownership
- Non-telecommuters' home-ownership rate: -4 pts

4. Rise of a **Tele-premium**

- Inequality across occupations rises
- Workers who can't WFH → **welfare losses** ...
- ... that can be mitigated by **Office-to-Apartment conversions**



Price Changes in the Center



Price Changes in the Suburb

Tele-premium	Before WFH	After WFH
Consumption	1.45	1.55
Housing wealth	1.98	2.47
Liquid wealth	1.32	1.37

Tele-premium: ratio of averages for households who can WFH / households who cannot WFH

Non-telecommuters	Consumption Variation	Consumption Variation (Pol.)
All non-telecommuters	2.8%	0.3%
Renters	3.9%	0.4%
Owners	1.45%	0.2%

Welfare Losses (in % Consumption)

First column of welfare table computes welfare for the baseline/ Last column computes welfare for the office-to-apartment conversion policy experiment