

# The Racial Wealth Gap: the Role of Entrepreneurship

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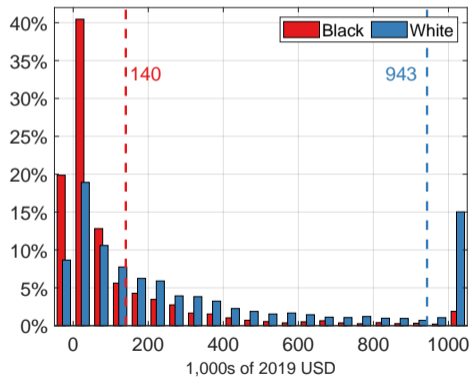
<sup>1</sup> Bank of England - The views expressed in this paper are those of the authors and do not represent those of the Bank of England or any of its committees.

<sup>2</sup> LSE - CFM & BGU Econ. This research was supported by THE ISRAEL SCIENCE FOUNDATION (grant No.51/22).

# Motivation - Racial Wealth Gap

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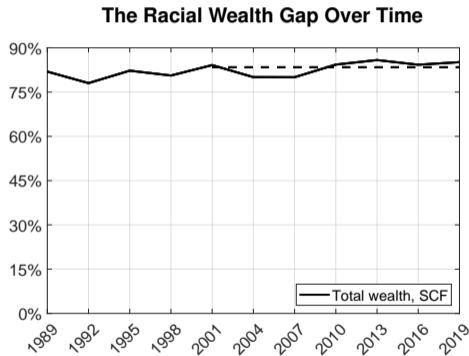
Wealth Distribution by Race



source: SCF 2019

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- 1 Wealth and race are correlated in the U.S.
- 2 The racial wealth gap is substantial, persistent and stable

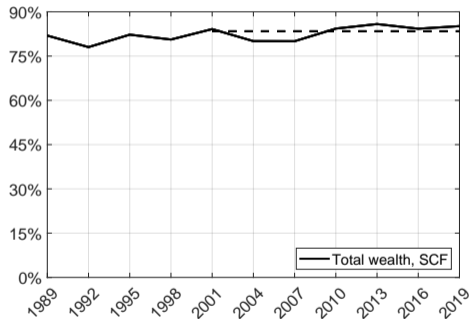


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The Racial Wealth Gap Over Time

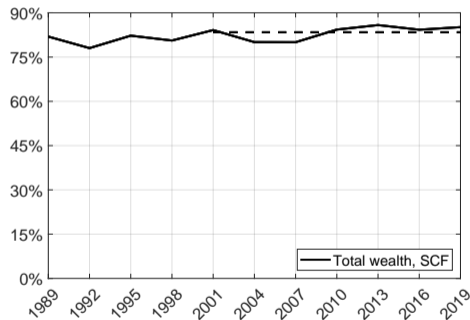


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  - ▶ **as entrepreneurs: capital cost distortion** Blanchflower et al. (2003); Blanchard et al. (2008); Cavalluzzo and Wolken (2005); García and Darity Jr (2021); Dougal et al. (2019); Hu et al. (2011); Atkins et al. (2022); Bates and Robb (2016); Fairlie et al. (2022); Bento et al. (2022)

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Untargeted racial wealth gap arising from three exogenous distortions



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Untargeted racial wealth gap arising from three exogenous distortions

- 1 Quantify the relative contribution of each distortion to the gap and the wealth distribution
- 2 Analyse how long it would take to close the racial wealth gap - explore the role of policies



## What we find

- **Q1: What are the determinants of the racial wealth gap?**
  - ① **Barriers to entrepreneurship are key**
  - ② Labour market conditions - second order importance for the gap
  
- **Q2: What is the potential role of policies in closing it?**

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Parity in wealth outcomes is only stable with parity in top incomes

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- ② It would take **200 years to close the gap** if all distortions were eliminated today

- ③ **Wealth transfers are insufficient without social change**

- ④ **Policies targeting barriers to Black entrepreneurship are a promising direction**

# Literature

Most closely related papers:

- Aliprantis, Carroll, and Young (2019)
- Ashman and Neumuller (2020)
- Boerma and Karabarbounis (2022)

## **This paper - unifying approach**

labour income gap + higher unemp. risk + barriers to entrepreneurship → wealth gap

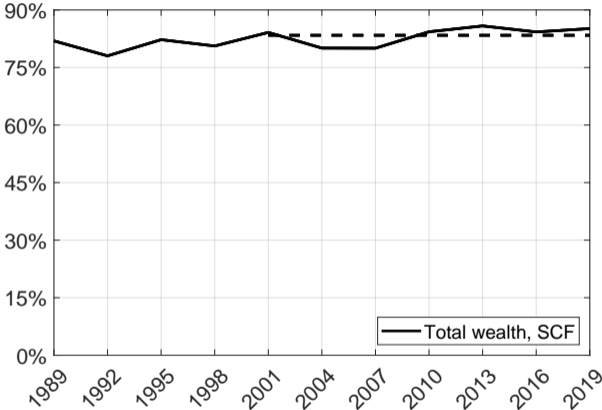
**Quantitative conclusion - barriers to entrepreneurship are key**

# Roadmap

- 1 Stylized facts - differences in wealth and entrepreneurship
- 2 Model
- 3 Calibration
- 4 Comparative statics - what is the contribution of each distortion to the gap?
- 5 Transition - how long to close the racial wealth gap?

# Stylized Facts

# Stylized Facts - The Racial Wealth Gap is stable

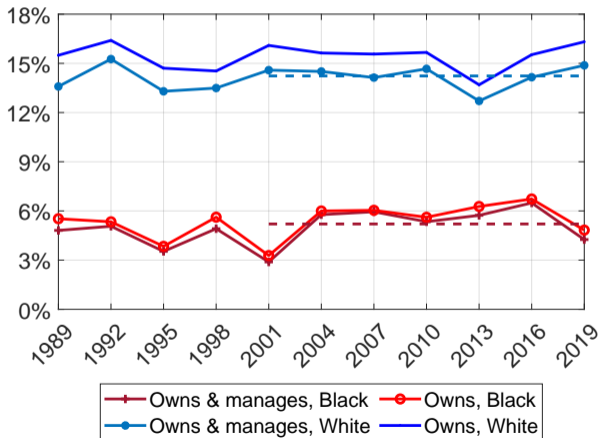


$$\text{gap} = \frac{\text{Average assets White HH} - \text{Average assets Black HH}}{\text{Average assets White HH}}$$

# Stylized Facts - Entrepreneurship Wealth and Race

- 1 Black households are nearly three times less likely to be entrepreneurs

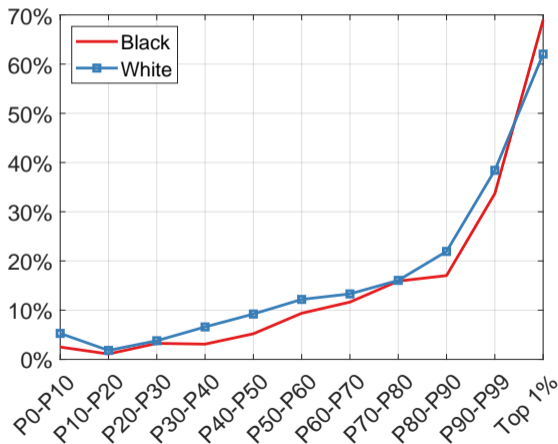
Entrepreneurship Rates by Race



# Stylized Facts - Entrepreneurship Wealth and Race

- 1 Black households are nearly three times less likely to be entrepreneurs
- 2 Entrepreneurs are over-represented at the top of the wealth distribution

Entrepreneurship Along the Wealth Distribution





# Model

## Model - Environment

Incomplete market economy with a discrete entrepreneurship choice in GE:

- Infinity lived households (dynasties) - **workers** or **entrepreneurs** that consume and save
- **Workers** face **idiosyncratic income risk** - empirically estimated income process
- **Workers** can choose to become **entrepreneurs**
- **Entrepreneurs** have **income from profits**, productivity grows stochastically
- Entrepreneurs face a **credit constraint**; have a **constant exit rate** back to **worker**

# Model - Racial Disparities

We model Black and White households as **ex-ante identical** but:

- 1 Black workers face a **proportional wage distortion**  $w (1 - \omega^B)$
- 2 Black workers experience **different transition rates** from employment to non-employment and vice versa, which are empirically estimated
- 3 Black entrepreneurs face **higher cost of capital**  $r (1 + \tau_K^B)$  - reduced-form barrier to entrepreneurship

## Model - Labour Income Process

We model income =  $(1 - \omega^i)wz_L$ , where

$$z_{L,t} \left( \underbrace{l_t}_{\text{E/NE}}, \underbrace{z_{P,t}}_{\text{permanent comp.}}, \underbrace{z_{T,t}}_{\text{transitory comp.}} \right) = l_t \times e^{z_{P,t} + z_{T,t}}.$$

The permanent and transitory components follow a jump-drift process given by:

$$dz_{P,t} = -\mu_P z_{P,t} dt + dJ_{P,t},$$

$$dz_{T,t} = -\mu_T z_{T,t} dt + dJ_{T,t},$$

where  $dJ_{P,t}$  has an arrival rate of  $\lambda_P$ , mean equal to zero and variance equal to  $\sigma_P^2$ .

Households of race  $i$  switch from employment status  $l$  to  $l'$  according to  $\lambda_{ll'}^i$ .

# Model - Production and Profits

The entrepreneurs maximizes profits by hiring labour  $h$  and capital  $k$ :

$$\pi(a, z_F, i) = \begin{cases} \max_{k,h} z_F k^\alpha h^\beta - wh - r(1 + \tau_K^i)k, & \alpha + \beta < 1 \\ \text{s.t. } k \leq a\lambda_{CC} \end{cases} \quad (1)$$

Business productivity  $z_F$  follows a geometric Brownian motion generating a stable Pareto distribution with a tail parameter  $\zeta$ .

Notations:

|                |                       |
|----------------|-----------------------|
| $w$            | wage per $z_L$        |
| $a$            | asset holdings        |
| $r$            | rental rate           |
| $\tau_K^i$     | capital distortion    |
| $\lambda_{CC}$ | collateral constraint |
| $\lambda_D$    | exit rate             |
| $\zeta$        | tail param. $z_F$     |

◀ workers

◀ entrepreneurs

◀ market clearing

# Calibration

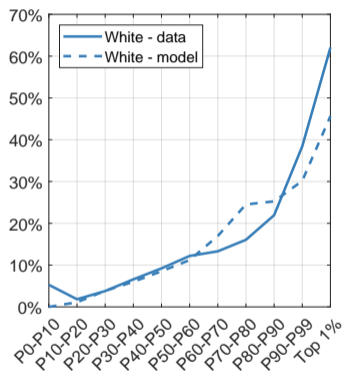
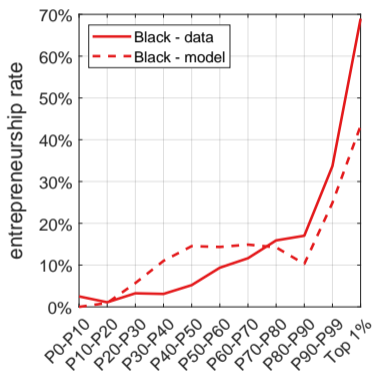
# Calibration

| Internally calibrated parameters |       |   |       | Externally calibrated parameters  |       |             |     |
|----------------------------------|-------|---|-------|-----------------------------------|-------|-------------|-----|
| Parameter                        | Value | Target  | Model |                                   |       |             |     |
| $\rho$                           | 8.5%  | net return of 4%                                | 4%    | CRRA utility                      | 1.5   | $\alpha$    | 0.3 |
| $\zeta$                          | 7     | top 10% wealth share of 72.3%                   | 73.8% | $\delta$                          | 0.048 | $\beta$     | 0.5 |
| $\lambda_{CC}$                   | 4.2   | annual capital/output ratio 3                   | 3     | $\frac{\sigma_F}{1-\alpha-\beta}$ | 0.12  | $\lambda_D$ | 0.1 |
| $\eta$                           | 0.045 | population entrepreneurship rate of 12.7%       | 12.9% |                                   |       |             |     |
| $\tau_K$                         | 0.72  | entrepreneurship gap of 9%                      | 9%    |                                   |       |             |     |
| $\underline{a}$                  | -0.48 | % of households with negative net wealth of 11% | 11.7% |                                   |       |             |     |
| $\tau$                           | 14%   | Model income floor 34% of median income         | 34%   |                                   |       |             |     |

◀ income process

# Racial Disparities in Entrepreneurship & Wealth - Model vs Data

## Entrepreneurship Rate Conditional on Wealth Quantile by Race



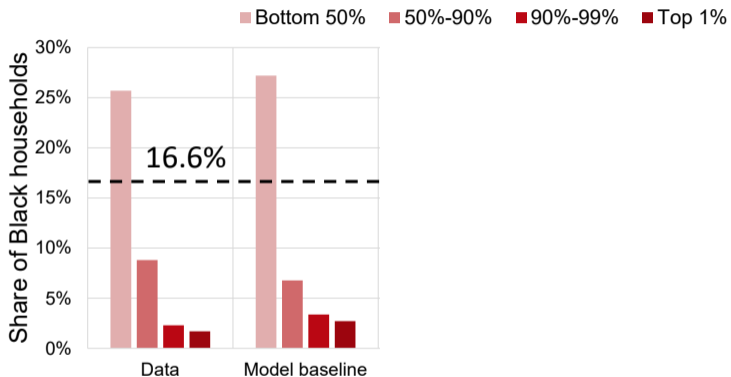
- Untargeted racial wealth gap = 81.4% (data = 83.4%)



# Results

# Results - The Contribution of The Distortions to the Racial Wealth Gap

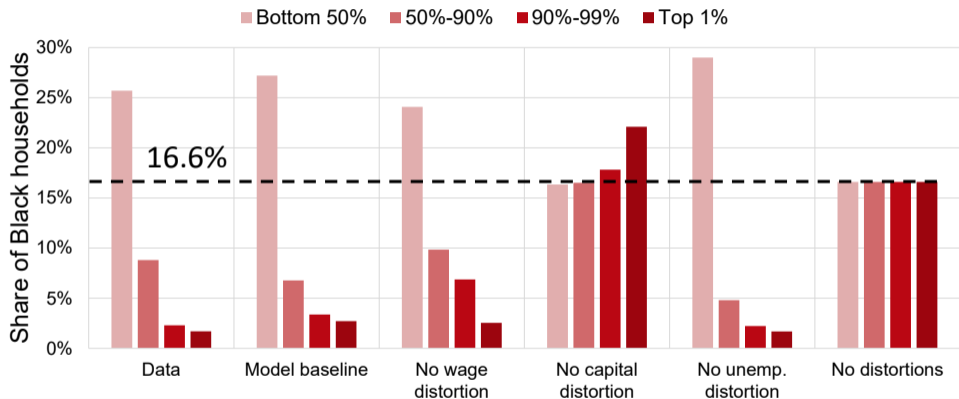
## Share of Black Households Conditional on Wealth Quantile



|                          |       |       |
|--------------------------|-------|-------|
| Racial Wealth Gap        | 83.4% | 81.4% |
| Racial Entrep. Gap (W-B) | 9.0%  | 9.0%  |

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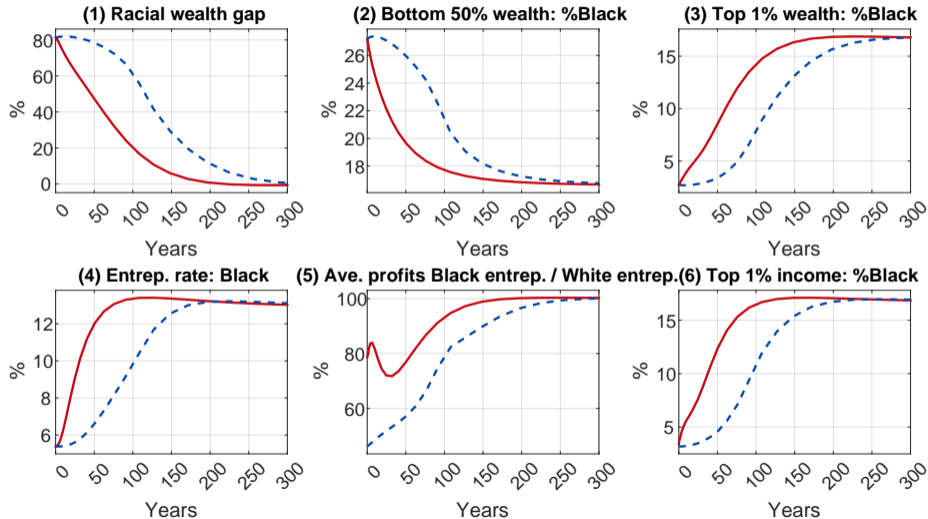
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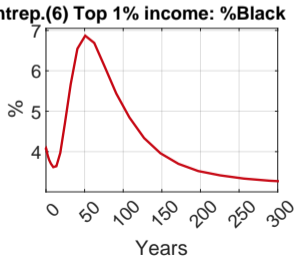
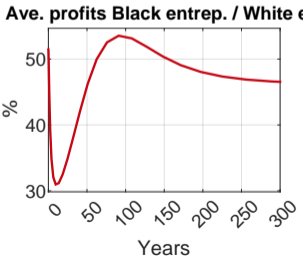
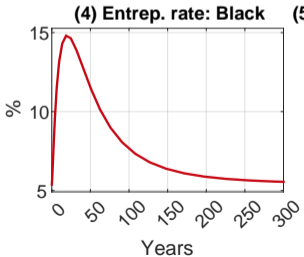
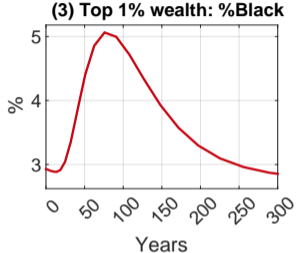
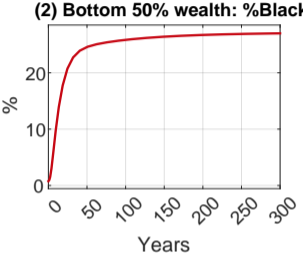
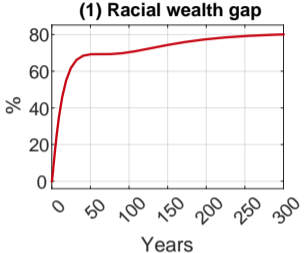
|                          |       |       |       |         |       |      |
|--------------------------|-------|-------|-------|---------|-------|------|
| Racial Wealth Gap        | 83.4% | 81.4% | 73.2% | - 25.2% | 89.1% | 0.0% |
| Racial Entrep. Gap (W-B) | 9.0%  | 9.0%  | 8.7%  | - 4.5%  | 11.2% | 0.0% |

# How Long to Close the Racial Wealth Gap?

— Distortions removed immediately - - - Distortions removed slowly

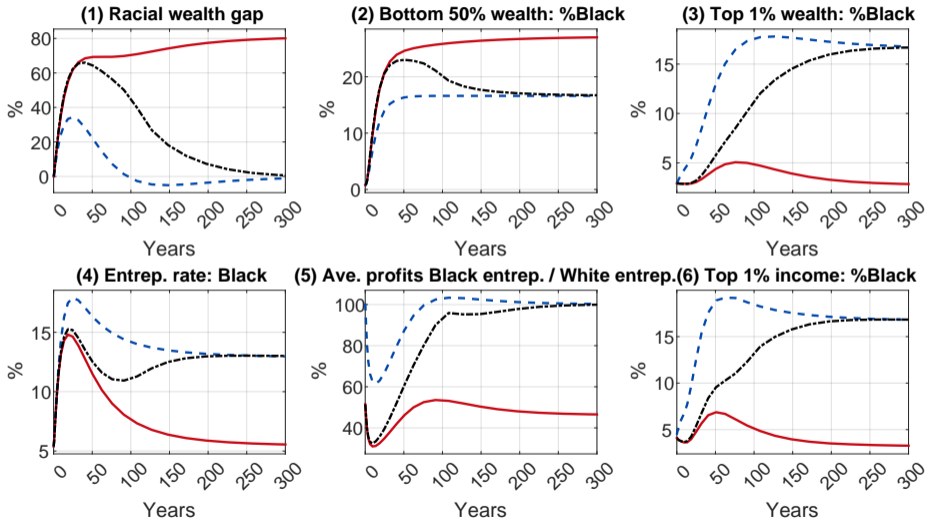


# Can Wealth Transfers Help?



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— No social change    - - - Distortions removed immediately    - - - - Distortions removed slowly



# Conclusion

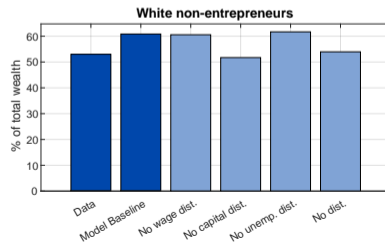
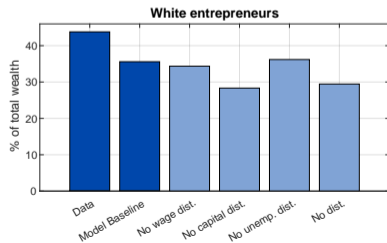
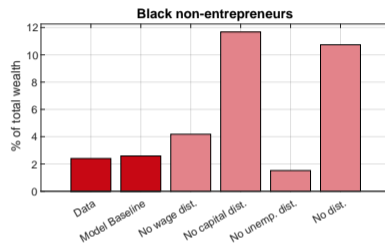
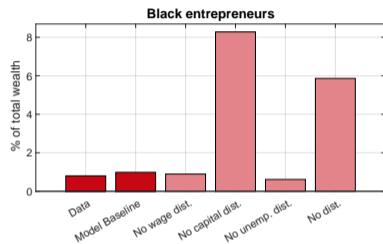
**Q1:** What are the determinants of the racial wealth gap?

**Q2:** What is the potential role of policies in closing it?

- 1 Differences in entrepreneurship account for most of the racial wealth gap
- 2 Closing the racial wealth gap will take a long time
- 3 Wealth transfers are insufficient without social change ...
- 4 ... but policies targeting barriers to Black entrepreneurship are a promising direction

# The Contribution of the Distortions to the Racial Wealth Inequality -

## Workers vs. Entrepreneurs [◀ main](#)





# Market Clearing Conditions

◀ back

The model has four clearing conditions

- 1 Asset market -  $r$

# Market Clearing Conditions [◀ back](#)

The model has four clearing conditions

## 1 Asset market - $r$

$$\underbrace{\sum_{i=\{B,W\}} \left( \int_{\underline{z}_L}^{\bar{z}_L} \int_{\underline{a}}^{\infty} \mathbf{a} \mu_L(a, z_L, i) da dz_L + \int_{\underline{z}_F}^{\bar{z}_F} \int_{\underline{a}}^{\infty} \mathbf{a} \mu_E(a, z_F, i) da dz_F \right)}_{\text{aggregate net asset positions}} =$$
$$\underbrace{\sum_{i=\{B,W\}} \int_{\underline{z}_F}^{\bar{z}_F} \int_{\underline{a}}^{\infty} \mathbf{k}(\mathbf{a}, \mathbf{z}_F, \mathbf{i}) \mu_E(a, z_F, i) da dz_F}_{\text{capital demand}}$$

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$$\underbrace{\sum_{i=\{B,W\}} \int_{\underline{z}_L}^{\bar{z}_L} \int_{\underline{a}}^{\infty} \mathbf{z}_L \mu_L(a, z_L, i) da dz_L}_{\text{Labour supply}} =$$
$$\underbrace{\sum_{i=\{B,W\}} \int_{\underline{z}_F}^{\bar{z}_F} \int_{\underline{a}}^{\infty} \mathbf{h}(\mathbf{a}, \mathbf{z}_F, \mathbf{i}) \mu_E(a, z_F, i) da dz_F}_{\text{Labour demand}}$$

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- 3 Government budget -  $T$

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$$\underbrace{\tau_{\pi}(\mathbf{1} + \hat{\gamma}_{\pi})\mathbf{\Pi}}_{\text{income from profit tax}} + \underbrace{\tau_{\mathbf{w}}\mathbf{W} \sum_{i=\{B,W\}} \int_{z_L}^{\bar{z}_L} \int_{\underline{a}}^{\infty} \mathbf{z}_L (\mathbf{1} - \omega^i) \mu_L(a, z_L, i) da dz_L}_{\text{income from labour income tax}} +$$

$$\underbrace{\tau_{\mathbf{a}}(\mathbf{r} - \delta) \sum_{i=\{B,W\}} \left( \int_{z_L}^{\bar{z}_L} \int_0^{\infty} \mathbf{a} \mu_L(a, z_L, i) da dz_L + \int_{z_F}^{\bar{z}_F} \int_0^{\infty} \mathbf{a} \mu_E(a, z_F, i) da dz_F \right)}_{\text{income from capital income tax}}$$

$$= \mathbf{T}(\mathbf{1} - \mathbf{m}_E)$$

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$$\hat{\gamma}_\pi = \frac{\overbrace{\mathbf{w}\omega^{\mathbf{B}} \int_{\underline{z}_L}^{\bar{z}_L} \int_{\underline{a}}^{\infty} \mathbf{z}_L \mu_L(a, z_L, B) da dz_L}^{\text{Value of wage distortion}}}{\underbrace{\Pi}_{\text{Aggregate profits}}}$$



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- 2 Labour market -  $w$
- 3 Government budget -  $T$
- 4 Excess profits -  $\hat{\gamma}_\pi$
- 5 + Consistency condition (helpful in practice) -  $m_E$  is consistent with our guess

# Model - Worker's Problem ◀ Back

Workers of group  $i \in \{B, W\}$  choose consumption  $c$ , given their asset level  $a$ , efficiency units of labour  $z_L$  + **race-dependent distortions**

$$\rho V(a, z_L, i) = \max_c u(c) + \tag{2}$$

$$\frac{\partial V}{\partial a} \left[ \underbrace{wz_L(1 - \omega^i)(1 - \tau_w)}_{\text{labour income}} + \underbrace{(1 - \tau_a I_{a>0})(r - \delta)a - c}_{\text{capital income}} + \underbrace{T}_{\text{Transfer benefit}} \right] +$$

$$\eta \underbrace{\max \{F(a, z_F, i) - V(a, z_L, i), 0\}}_{\text{option to become entrep.}} + \underbrace{A_{z_L}(i)V(a, z_L, i)}_{\text{income process - permanent, transitory, E/NE}}$$

Notations:

|              |                            |
|--------------|----------------------------|
| $\rho$       | discount rate              |
| $u(c)$       | CRRA util.                 |
| $w$          | wage per $z_L$             |
| $\omega^i$   | wage distortion            |
| $\tau_w$     | income tax                 |
| $r - \delta$ | net return                 |
| $\tau_a$     | cap. income tax            |
| $z_L$        | labour prod.               |
| $A_{z_L}$    | generator of $z_L$ process |
| $V$          | worker val. func.          |
| $F$          | entrep. val. func.         |
| $z_F$        | entrant prod.              |
| $\eta$       | idea arrival rate          |

# Model - Entrepreneur's Problem ◀ Back

Entrepreneur of group  $i \in \{B, W\}$  choose consumption  $c$ , given their asset level  $a$ , and business productivity  $z_F$  + race-dependent distortions

$$\rho F(a, z_F, i) = \max_c u(c) + \tag{3}$$

$$\frac{\partial F}{\partial a} \left[ \underbrace{(1 - \tau_\pi)(1 + \hat{\gamma}_\pi) \pi(z_F, a, i)}_{\text{profit income}} + \underbrace{(1 - \tau_a I_{a>0})(r - \delta)a - c}_{\text{capital income}} \right] +$$

$$\lambda_D \underbrace{E_{z_L}[V(a, z_L, i) - F(a, z_F, i)]}_{\text{value of becoming a worker again}} + \underbrace{A_{z_F} F(a, z_F, i)}_{\text{stochastic process for productivity}}$$

Notations:

|                    |                            |
|--------------------|----------------------------|
| $\rho$             | discount rate              |
| $u(c)$             | CRRA util.                 |
| $w$                | wage per $z_L$             |
| $\hat{\gamma}_\pi$ | excess profits             |
| $\tau_\pi$         | prof. income tax           |
| $r - \delta$       | net return                 |
| $\tau_a$           | cap. income tax            |
| $z_L$              | labour prod.               |
| $\lambda_D$        | exit rate                  |
| $A_{z_F}$          | generator of $z_F$ process |
| $V$                | worker val. func.          |
| $F$                | entrep. val. func.         |

# Labour Income Process [back](#)

We model the following income process

$$z_{L,j,t}(\underbrace{l_{t,j}}_{\text{E/NE}}, \underbrace{z_{P,j,t}}_{\text{permanent comp.}}, \underbrace{z_{T,j,t}}_{\text{transitory comp.}}) = l_{t,j} \times e^{z_{P,j,t} + z_{T,j,t}} \quad (4)$$

Estimation: PSID 2001 - 2019, ages 25 - 65, males, labour income of households

- 1 **Wage distortion:**  $\omega^B = 31.3\%$
- 2 Estimate income process parameters
- 3 Optimize grid for best discretized analogue

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### Employment status transition rates

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|  |                  |       |
|--|------------------|-------|
| Employment $\rightarrow$ Non-employment, B | $\lambda_{10}^B$ | 17.1% |
| Employment $\rightarrow$ Non-employment, W | $\lambda_{10}^W$ | 6.2%  |
| Non-employment $\rightarrow$ Employment, B | $\lambda_{01}^B$ | 81.9% |
| Non-employment $\rightarrow$ Employment, W | $\lambda_{01}^W$ | 72.6% |

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# Labour Income Process Estimation [◀ back](#)

## Moments targeted:

|                          | Moments  |           |                       |                             | Moments  |           |                       |
|--------------------------|----------|-----------|-----------------------|-----------------------------|----------|-----------|-----------------------|
|                          | (1) Data | (2) Model | (3) Discretised Model |                             | (1) Data | (2) Model | (3) Discretised Model |
| fraction wage = 0, Black | 16.6%    | 16.5%     | 9.1%                  | kurtosis $\Delta 2y$        | 7.5      | 7.7       | 7.3                   |
| fraction wage = 0, White | 7.8%     | 7.7%      | 4.6%                  | kurtosis $\Delta 4y$        | 6.5      | 6.0       | 6.5                   |
| wage low, Black          | 8.8%     | 8.5%      | 9.3%                  | kurtosis $\Delta 6y$        | 6.1      | 6.6       | 6.8                   |
| wage low, White          | 5.1%     | 4.9%      | 4.9%                  | fraction $\Delta 2y < 5\%$  | 18.5%    | 20.6%     | 35.8%                 |
| std $\Delta 2y$          | 0.44     | 0.45      | 0.43                  | fraction $\Delta 2y < 10\%$ | 34.2%    | 32.3%     | 41.4%                 |
| std $\Delta 4y$          | 0.51     | 0.54      | 0.51                  | fraction $\Delta 2y < 20\%$ | 55.1%    | 45.2%     | 57.7%                 |
| std $\Delta 6y$          | 0.55     | 0.59      | 0.55                  |                             |          |           |                       |

## Estimation results:

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### Labour income

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|                                      |              |        |
|--------------------------------------|--------------|--------|
| Racial wage gap                      | $\omega^B$   | 31.3%  |
| Mean reversion, permanent            | $\mu_P$      | 0.002% |
| Mean reversion, transitory           | $\mu_T$      | 14.4%  |
| Volatility of jumps, permanent       | $\sigma_P^2$ | 0.99   |
| Volatility of jumps, transitory      | $\sigma_T^2$ | 0.49   |
| Rate of arrival of jumps, permanent  | $\lambda_P$  | 1.0%   |
| Rate of arrival of jumps, transitory | $\lambda_T$  | 30.3%  |

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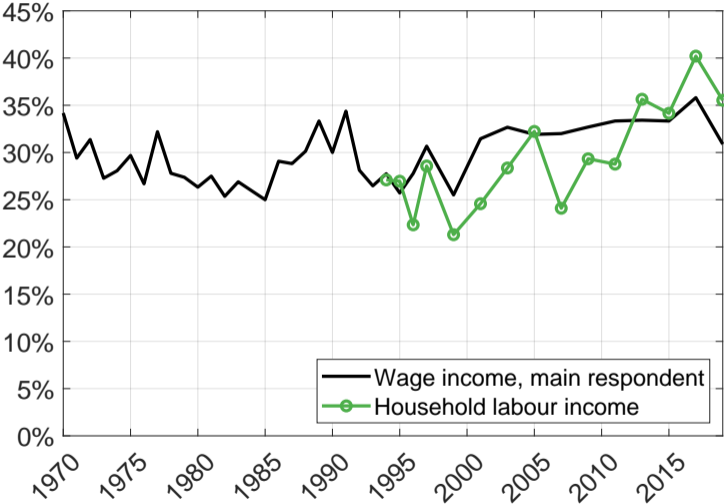
### Employment status transition rates

---

|                                |                  |       |
|--------------------------------|------------------|-------|
| Employment → Non-employment, B | $\lambda_{10}^B$ | 17.1% |
| Employment → Non-employment, W | $\lambda_{10}^W$ | 6.2%  |
| Non-employment → Employment, B | $\lambda_{01}^B$ | 81.9% |
| Non-employment → Employment, W | $\lambda_{01}^W$ | 72.6% |

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# Labour Income Gaps (PSID) [◀ back](#)



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