

Productivity Dispersion, Between-Firm Competition and the Labor Share

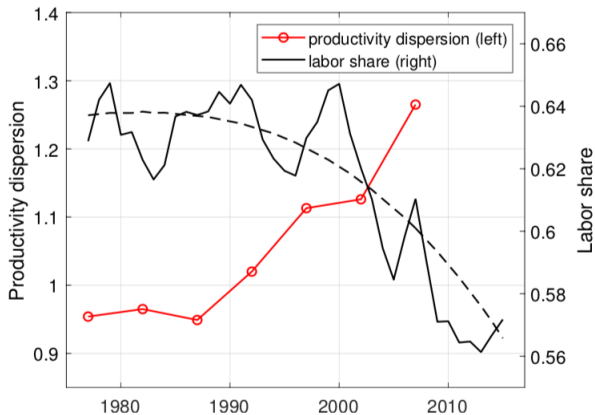
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Explaining the fall in the labor share

Could a rise in productivity dispersion explain the fall in the labor share?



Background

Kehrig and Vincent (2017) and Autor et al (2017):

- ▶ Aggregate labor share is:

$$LS = \sum_i (Y_i/Y) \times LS_i$$

- ▶ Fall in aggregate labor share due to **reallocation**
- ▶ Not driven by uniform fall in labor shares.

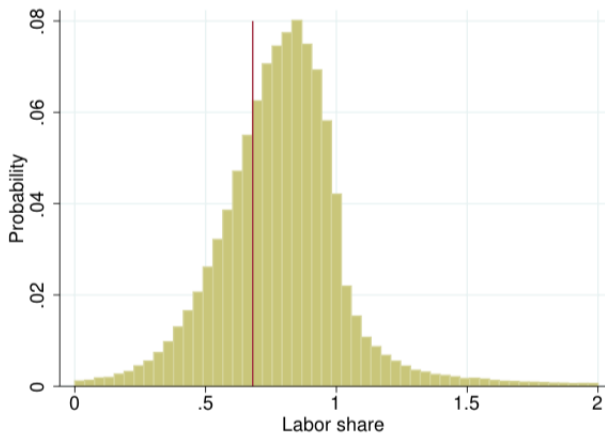
National Accounts Longitudinal Microdata File:

- ▶ Covers the universe of private sector employers in Canada over 2000–2015
- ▶ Labor share is:

$$LS_{i,t} = \frac{\text{worker compensation}_{i,t}}{\text{worker compensation}_{i,t} + \text{gross profits}_{i,t}}$$

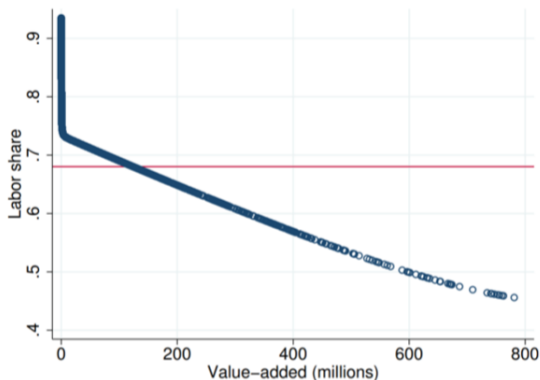
Three facts about the labor share

1. There are large and persistent differences in labor shares across firms.
2. In any given year, a large fraction (17%) of firms have a labor share above one.



Three facts about the labor share

- There is a strong negative relationship between firm labor share and firm output.



Model

Two key ingredients:

- ▶ search frictions in the labor market
- ▶ firm life-cycle

Environment:

- ▶ Continuous time
- ▶ Firms and workers are risk neutral and discount the future at rate $r > 0$.
- ▶ Firms compete by posting wage w and rent capital in a perfectly competitive market at cost $R = r + \delta$.
- ▶ Firms pay all of their workers the same wage
- ▶ Produce homogeneous good using

$$y = zK^\alpha N^{1-\alpha}$$

Model

Entry:

- ▶ At exogenous rate $\mu \geq 0$, an unemployed worker meets an entrepreneur.
- ▶ Entrepreneur draws productivity level $z \sim \Gamma_0$, decides whether or not to enter.
- ▶ Free entry, enter iff $z \geq z_\ell$.

Firm productivity:

- ▶ Firms draw new productivity $z \sim \Gamma_0$ at rate χ .
- ▶ Firm chooses to exit whenever z falls below threshold z_ℓ .

Model

Firm growth:

- ▶ A firm with measure N of workers meets new workers at rate λN .
- ▶ Matching technology is CRTS.
- ▶ In each time interval Δ , an unemployed worker:
 - ▶ Stays unemployed
 - ▶ Receives job offer from incumbent w/ prob $\Delta\lambda(1 - u)$
 - ▶ Receives job offer from startup w/prob $\Delta\mu(1 - \Gamma_0(z_\ell))$.
- ▶ An employed worker:
 - ▶ Stays employed at same firm.
 - ▶ Gets a new job offer from an incumbent $\Delta\lambda(1 - u)$
 - ▶ Becomes unemployed at rate $\Delta\chi\Gamma_0(z_\ell)$.

Firm problem

Optimal worker policy:

- ▶ Employed workers accept any wage-increasing job offer.
- ▶ Unemployed workers accept any job offer above a reservation wage.

Firm growth:

- ▶ For a firm of size N with wage w ,

$$\dot{N} = \tilde{g}(w)N$$

- ▶ Employment growth function $\tilde{g}(w)$:

$$\tilde{g}(w) = \underbrace{\lambda u + \lambda(1-u)\tilde{P}(w)}_{\text{hiring rate}} - \underbrace{\lambda(1-u)(1-\tilde{P}(w))}_{\text{separation rate}} \quad \forall w \geq w_r$$

Firm problem

Passthrough:

$$w'(z) = \underbrace{v(z)}_{\text{value effect}} \times \underbrace{2\lambda(1-u)}_{\text{search frictions}} \times \underbrace{P'(z)}_{\text{local competition}}$$

- ▶ Firms grow by poaching workers from other firms.
- ▶ Local competition term: the density of employment at z .
- ▶ If high, firm grows a lot by raising its wage.
- ▶ High productivity firms face
 - ▶ low $P'(z)$
 - ▶ locally inelastic labor supply
 - ▶ little competition over workers

Firm problem

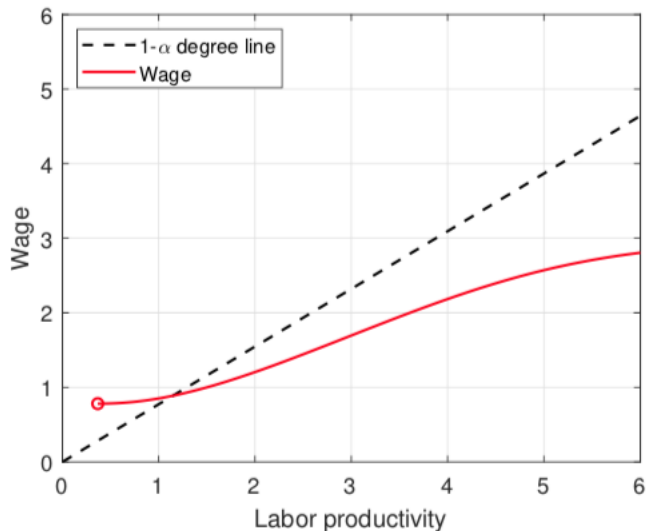
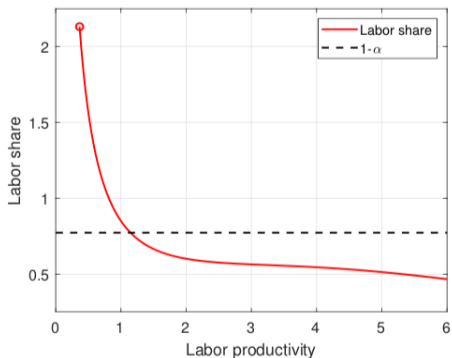


Figure 4: Equilibrium wage schedule in the calibrated model.

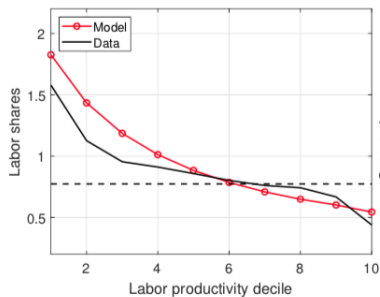
Firm problem



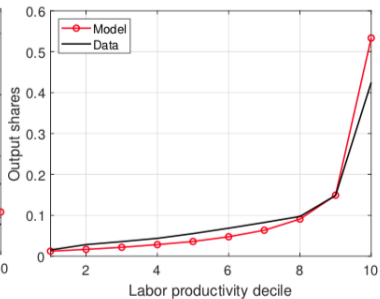
In his calibration, it is everywhere decreasing.

- ▶ Not always true.
- ▶ But there always exists a threshold \tilde{z} so that the labor share is decreasing for productivity above \tilde{z} .

The distribution of labor shares



(a) Labor shares.

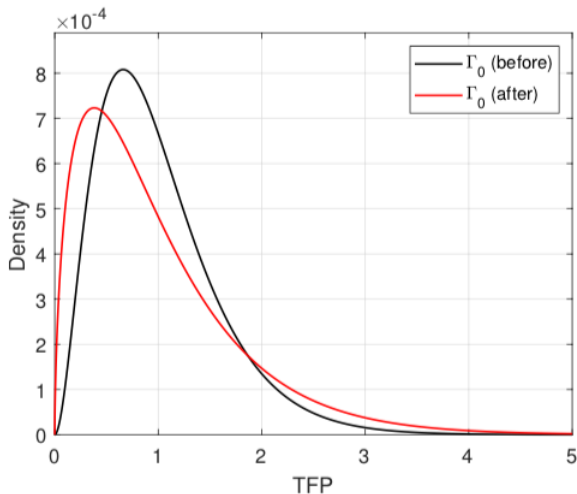


(b) Output shares.

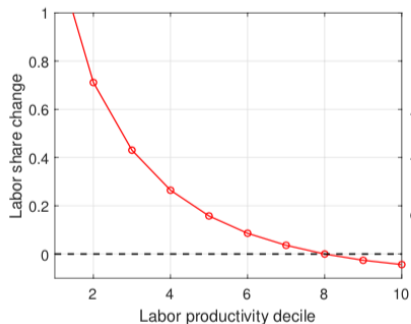
Productivity dispersion and the labor share

How much did cross-sectional log revenue per worker dispersion rise from 1977–2007?

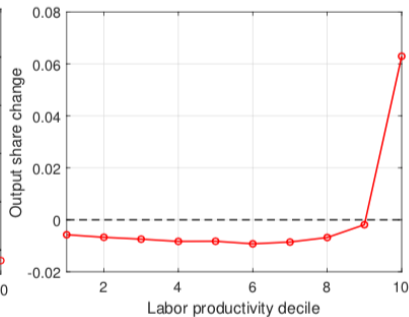
- ▶ Barth et al (2016) measure increase of 0.311
- ▶ Mean preserving spread in model of 0.3.



Productivity dispersion and the labor share



(a) Adjustment of labor shares.



(b) Reallocation of output shares.

For most of distribution, labor share rose!

Productivity dispersion and the labor share

Model predicts a fall in labor share of 2.26 pp (63 % of data).

- ▶ Decline in model driven by reallocation of output to firms with low labor share.
- ▶ Concentration of output increases.
- ▶ Employment concentration remains constant.

These facts are all consistent with Kehrig and Vincent (2017)

Conclusion

This paper studies a model of heterogeneous firms that

- ▶ grow by accumulating labor
- ▶ and post wages in a frictional market.

When you feed an increase in productivity dispersion into the model that concentrates productivity among most productive firms:

- ▶ Lowers competition faced by large firms.
- ▶ Reallocates output to low labor share firms.

This mechanism can account for $2/3$ of the fall in the labor share.