"Firming up inequality"
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Labor economics

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Introduction – Motivation

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- ▶ Massive, matched employer-employee database
- (1) Variance decomposition : within vs. between-firm
- (2) AKM methodology
  - – Some exploration of firm size distribution : within firm variance happen in mega-firms.

Great data set

► Massive database covering almost all workers in the U.S.

- All W-2 form from U.S. Social Security administration
- Start in 1981 (measurement issue) until 2013, 5 periods of 7 years
- Yearly annual earnings in 2013 $ (PSE deflator)
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- Sample restrictions :
    - Employed : with earnings at least the amount of working 13 weeks for 40 hours at minimum wage ($ 7.25)
    - Men (for computing reasons), between 20 and 60 years
    - Exclusion of public administration and educational services
    - Firm : EIN corporate unit for tax : less disaggregated than establishments
        - 30 millions estbl. in U.S. LBD vs. 6 millions of EIN

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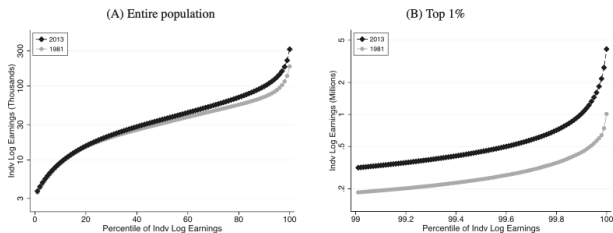- Average sample : 72.6 million workers and 477,000 firms a year

FIGURE I

Cumulative Distributions of Annual Earnings in the SSA Data

Variance decomposition

▶ Cross-sectional variance of log-earning : decomposed into Between vs. Within firms

$$y_t^{i,j} \equiv \overline{y}_t^j + \left[y_t^{i,j} - \overline{y}_t^j\right]$$

$$\mathbb{V}\mathrm{ar}(y_t^{i,j}) = \mathbb{V}\mathrm{ar}_j(\overline{y}_t^j) + \sum_j \omega_j \mathbb{V}\mathrm{ar}(y_t^{i,j} | j = j(i,t))$$

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▶ *Between firms* variance represents two third of the overall change, while *Within firm* accounts for one third
▶ Difference across the firm size distribution
▶ Two others fancier exercises :
  • Comparing worker earning vs. average firm earning (coworker) at different percentiles
  • Non-parametric density decomposition of earning : holding fixed between or within firm percentile

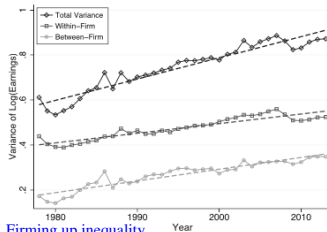# Variance decomposition : Between vs. Within firms

(A) Overall decomposition
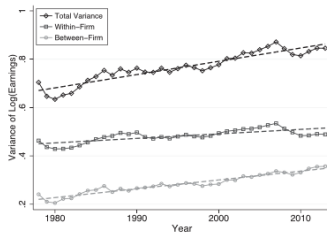
(B) Workers at firms with 20 to 10,000 employees
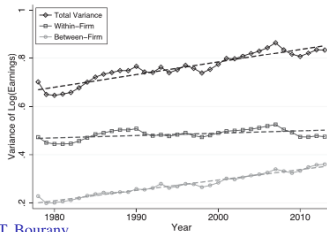
(C) Workers at mega firms (10,000+ employees)

AKM - methodology

▶ Abowd, Kramarz, Margolis 1999 (AKM) and Card, Heining, Kline 2013 (CHK)

$$y_t^{i,j} = \theta^{i,p} + X_t^i \beta^p + \psi^{j,p} + \epsilon_t^{i,j}$$

– Worker i, Firm j, Period p, Year t, Observables X_t (age)

▶ Variance decomposition : $\mathbf{var}(y_t^{i,j}) = \underbrace{\mathbf{var}(\theta^i - \overline{\theta}^j) + \mathbf{var}(\epsilon_t^{i,j})}_{\text{Within-firm component}}$

$$+ \underbrace{\mathbf{var}(\psi^j) + 2\mathbf{cov}(\overline{\theta}^j, \psi^j) + \mathbf{var}(\overline{\theta}^j)}_{\text{Between-firm component}}$$

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▶ Decomposition of levels :
  • Variance of worker effect $\approx 50\%$

▶ Decomposition of the *change* (Table IV) :
  • Firm pay premium – i.e. firm fixed effect variance $\mathbb{Var}(\psi^j)$ – stable
  • Worker fixed effect variance rise, mostly due to composition effect :
  (1) Sorting effect : $\mathbb{Cov}(\overline{\theta}^j, \psi^j)$ accounts for 35% of the rise
  (2) Segregation effect : $\mathbb{Var}(\overline{\theta}^j)$: accounts 31%

AKM - methodology

▶ Plenty of robustness checks :
  • Graphs with quartiles symmetric.
  • Include match fixed effect m_{ij}
  • Exclude the year of change of firms
  • Same issue of the limited mobility bias, but may not affect the change
  • Most details in appendix D and CHK
▶ Replication by firms size (Table V) :
  • Small firms : entirely between firm component (equally sorting/segregation)
  • Mega-firms : within firm mostly

Summary and theory

- ▶ Rising inequality/variance of earning :
  - • The between firms component explain a large share (2/3) of rise in variance of earning
  - • Split equally between sorting effect and segregation
  - • Occur mostly in medium-small firms, and within sector, regions and demographic groups.

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- ▶ Theories that could rationalize these :
    - Rise in return of skill (mechanical effect only explains a small share)
    - Skill-biased technical change
    - Rising Outsourcing (firm focus on "core competencies")
    - Complementarity between workers (tasks) or between worker and firms (technology)
    - Within firm inequality driven by mega firms :
      (1) Stagnating earning lower paid workers (big firm premium gap shrank) and (2) Rising earning of top 1% (rising returns of stocks)