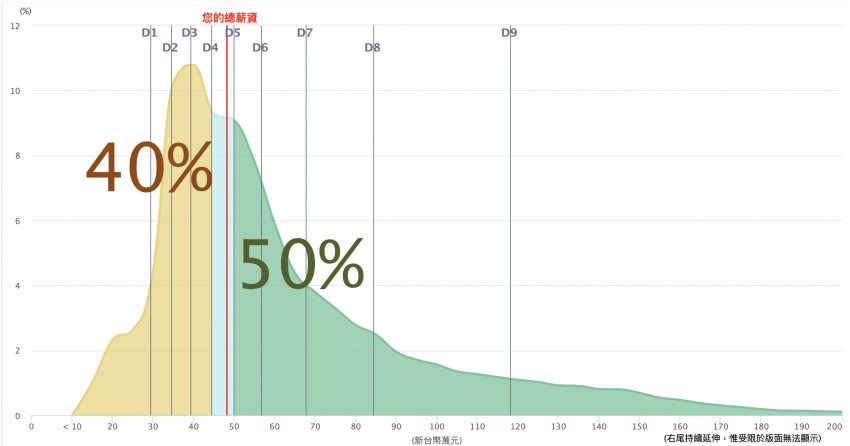
Sorting

Motivation: Wage Dispersion



D1：第1十分位數 29.6 萬元 **D2**：第2十分位數 34.7 萬元 **D3**：第3十分位數 39.4 萬元 **D4**：第4十分位數 44.6 萬元 **D5**：第5十分位數(中位數) 50.1 萬元
D6：第6十分位數 56.9 萬元 **D7**：第7十分位數 67.9 萬元 **D8**：第8十分位數 84.5 萬元 **D9**：第9十分位數 118.3 萬元

How much does where you work determine what you earn?

- High wage dispersion makes people think about this problem
- Competitive market
  - Price $\times$ Marginal Product of Labor
  - Wage varies by one's education, skill, etc.

How much does where you work determine what you earn?

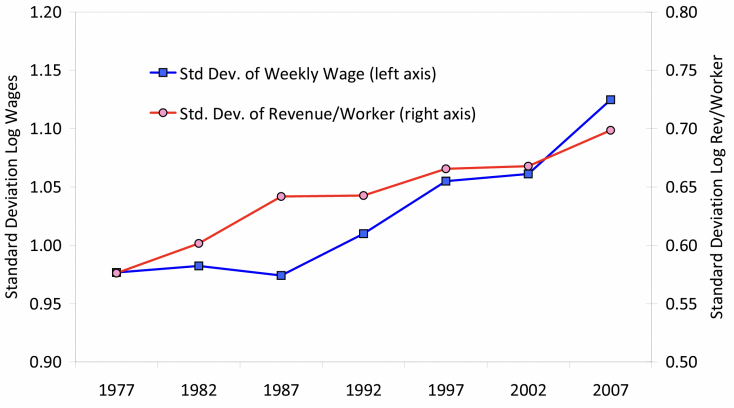
- But that doesn't seem the whole story
  - Substantial dispersion in productivity of firms
  - Could that affect wage inequality?
  - What is the role of firm?
    - One view: Different firm hires different workers
    - Or, firm's market power just pays people differently
    - Something else we cannot observe?
  - How to distinguish them?
    - Rent Sharing Literature: Effect of shock on wage to workers?
    - Moving Literature: What happen when people move?

Linked Employer-Empployee Datasets

- Many countries have this
- France, UK, USA, Denmark, ...
- Taiwan also has this

Productivity Dispersion

Figure 1: Trends in Between-Establishment Dispersion in Wages and Productivity



Source: Barth et al (2015)

Rent Sharing

- Will wage increases/decreases if firm encountered shocks?
- The profit that can potentially be shared is called "rent"
- Usually measured by value-added per worker
- Like the pass through in
- Smaller rent sharing means less monopsony power

Quantifying It

- Usual hurdles on quantifying such things
- Elasticity about 0.05 to 0.15.
- Evidence of more profitable firms pay more
- But not enough to explain the whole picture

Table 1
Summary of Estimated Rent-Sharing Elasticities from the Recent Literature (Preferred Specification, Adjusted to Total Factor Productivity Basis)

Study	Country/Industry	Estimated Elasticity	Standard Error
Group 1—Industry-level profit measure:			
Christofides and Oswald 1992	Canadian manufacturing	.140	.035
Blanchflower, Oswald, and Sanfey 1996	US manufacturing	.060	.024
Estevao and Tevlin 2003	US manufacturing	.290	.100
Group 2—Firm-level profit measure, mean firm wage:			
Abowd and Lemieux 1993	Canadian manufacturing	.220	.081
Van Reenen 1996	UK manufacturing	.290	.089
Hildreth and Oswald 1997	United Kingdom	.040	.010
Hildreth 1998	UK manufacturing	.030	.010
Barth et al. 2016	United States	.160	.002
Group 3—Firm-level profit measure, individual-specific wage:			
Margolis and Salvanes 2001	French manufacturing	.062	.041
Margolis and Salvanes 2001	Norwegian manufacturing	.024	.006
Arai 2003	Sweden	.020	.004
Guiso et al. 2005	Italy	.069	.025
Fakhfakh and FitzRoy 2004	French manufacturing	.120	.045
Du Caju et al. 2011	Belgium	.080	.010
Martins 2009	Portuguese manufacturing	.039	.021
Gürtzgen 2009	Germany	.048	.002
Cardoso and Portela 2009	Portugal	.092	.045
Arai and Heyman 2009	Sweden	.068	.002
Card et al. 2014	Italy (Veneto region)	.073	.031
Carlsson et al. 2014	Swedish manufacturing	.149	.057
Card et al. 2016	Portugal, between firm	.156	.006
Card et al. 2016	Portugal, within job	.049	.007
Bagger et al. 2014	Danish manufacturing	.090	.020

NOTE.—For a more complete description of each study, see table A1.

Movers

- Another way to answer our question is whether movers get higher or lower wage
- Evidence of different firms pay differently
  - Even for the same individual

Framework

$$\log w_{it} = \alpha_i + \psi_{J(i,t)} + X_{it}'\beta + \epsilon_{it}$$

- X_{it}: experiences
- w_{it}: wage
- $J(i,t)$: employer of worker i in year t
- α_i: individual effect
- ψ: firm effect

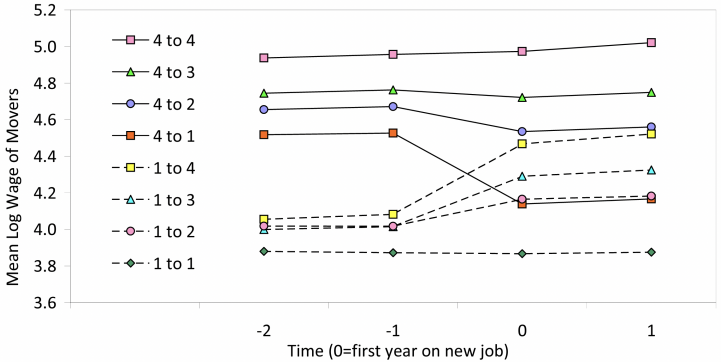
Variance Decomposition

$$\begin{aligned} Var(\log w_{it}) = & Var(\alpha_i) + Var(\psi_{J(i,t)}) + Var(X'_{it}\beta) + Var(\epsilon_{it}) + \\ & 2Cov(\alpha_i, \psi_{J(i,t)}) + 2Cov(\alpha_i, X'_{it}\beta) + 2Cov(\psi_{J(i,t)}, X'_{it}\beta) \end{aligned}$$

- Recently found $\frac{Var(\psi_{J(i,t)})}{Var(\log w_{it})} \in [0.15, 0.25]$
- Issues:
  - Additive Separability
  - Exog. Mobility
  - Incidental Parameters

Some Support for Additivity

Figure 2: Mean Wages of West German Male Job Changers, Classified by Quartile of Co-worker Wages at Origin and Destination (2002-09)

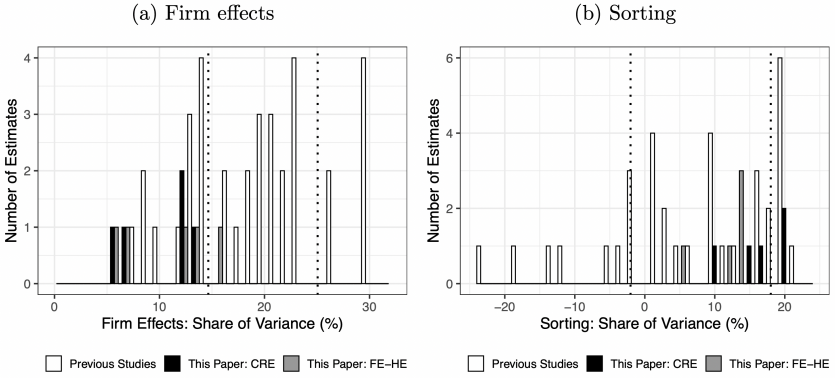


Notes: figure shows mean wages of male workers observed in 2002-2009 who change jobs in 2004-2007 and held the preceding job for 2 or more years, and the new job for 2 or more years. Jobs are classified into quartiles based on mean wage of co-workers.

Econometric Issue

- Incidental Parameter Problems
- Too many parameters to estimate $I + J$, too few sample points
- Need "connected" component to identify
- Think about a typical fixed effect model
- It was such a serious problem that sorting was estimated to be negative

Figure 1: Comparison to Existing Studies



Notes: FE estimates from previous studies in white bars. Correlated random-effects (CRE) bias-corrected estimates from this paper based on the grouping of Bonhomme et al. (2019) in black. Heteroskedastic fixed-effects (FE-HE) bias-corrected estimates from this paper using the method of Kline et al. (2020) in greu. The vertical dotted lines indicate the interquartile range of estimates in previous studies.