Firms and Labor Market Inequality: Evidence and Some Theory

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Introduction

Inequality in imperfectly competitive labor markets

- Employers set wages (Robinson 33, Slichter 50, Krueger&Summers 88)
- Difficult to distinguish firm-wage premia from sorting (Gibbons&Katz 92)
- Impact of shocks to firm productivity on wages of stayers finding rent-sharing elasticities of 0.05-0.15
- AKM using switchers to identify additive worker and firm FE finding that 20% of variances in wages is due to firm FE

Linking rent-sharing elasticities to firm FE and worker sorting

- Review of literature on rent-sharing and studies using AKM
- Use data for Portugal to show that more productive firms have higher firm FE
- Model in which heterogeneous firms set wages when workers value firms differently
- Model has become known as "new classical monopsony"
- Show that this model explains rent-sharing elasticities, firm FE and sorting of workers across firms.

Productivity, Wages, and Rent Sharing

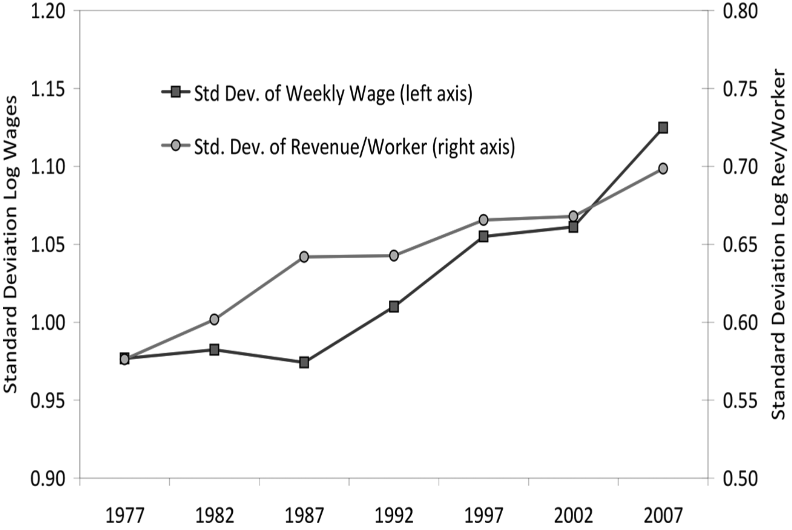


FIG. 1.—Trends in between-establishment dispersion in wages and productivity. Source: Barth et al. (2016). A color version of this figure is available online.

Impartial pass-through of productivity to wages

- Literature on rent sharing examines whether productivity differences feed into wage differences
- Rent-sharing elasticities of 0.05-0.15 show impartial pass-through suggesting firms have wage setting power
- Analog of literature in international economics and IO finding impartial pass-through of cost shocks to prices suggesting firms have price setting power
- Rent-sharing elasticities are sensitive to measurement issues

Measuring rents

- Assume that the wage at firm j is given by:

$$w_j = b + \gamma \frac{Q_j}{N_j} \tag{1}$$

  with Q_j / N_j quasi-rents per worker.

- Quasi-rents are given by:

$$Q_j = VA_j - bN_j - rK_j$$

  with VA_j value added (revenue net of material costs).

- Value added is given by:

$$VA_j = P_j T_j f(N_j, K_j)$$

  with T_j firm-specific TFP_j.

Rent-sharing elasticities with quasi-rents and profit per worker

- The elasticity of wages w.r.t. quasi-rents per worker is:

$$\xi_{Qj} \equiv \frac{dw_j}{d(Q_j/N_j)} \frac{Q_j/N_j}{w_j} = \frac{\gamma[Q_j/N_j]}{b + \gamma[Q_j/N_j]} \qquad (2)$$

which corresponds to the share of quasi-rents in wages.

- ξ_{Qj} is also elasticity of wages w.r.t. profit per worker because:

$$\begin{aligned}
\frac{\Pi_j}{N_j} &= \frac{1}{N_j}\left[VA_j - w_j N_j - rK_j\right] \\
&= \frac{1}{N_j}\left[VA_j - bN_j - rK_j - (w_j - b)N_j\right] \\
&= \frac{1}{N_j}\left[Q_j - \gamma \frac{Q_j}{N_j} N_j\right] \\
&= \frac{Q_j}{N_j}\left[1 - \gamma\right]
\end{aligned}$$

Rent-sharing elasticities with value added per worker

- The elasticity of wages w.r.t. value added per worker is:

$$\begin{aligned}
\xi_j &\equiv \frac{dw_j}{d(VA_j/N_j)}\frac{VA_j/N_j}{w_j} \\
&= \frac{dw_j}{d(Q_j/N_j)}\frac{VA_j/N_j}{w_j} \\
&= \frac{dw_j}{d(Q_j/N_j)}\frac{Q_j/N_j}{w_j}\frac{VA_j}{Q_j} \\
&= \xi_{Qj}\frac{VA_j}{Q_j}
\end{aligned}$$

- $\xi_j > \xi_{Qj}$ because $VA_j > Q_j$ (e.g. $VA_j/Q_j = 2$)
- A majority of studies estimates ξ_j

Summary of the rent-sharing literature

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

Summary of the rent-sharing literature

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.

Replication using Portuguese data

- Wage data from Quadros de Pessoal (QP), a census of private sector employees between 2005-2009.
- Firm-specific financial information from SABI database by Bureau van Dijk with information on value added and sales per worker between 2004-2010.
- Merge QP and SABI using information on detailed location, industry, firm creation date, shareholder equity, and annual sales that are available in both data sets.
- Regress wages onto value added or sales per worker controlling for human capital variables, industry and location.

Rent-sharing elasticities for Portuguese male workers

Table 2
Cross-Sectional and Within-Job Models of Rent Sharing for Portuguese Male Workers

	Basic Specification (1)	Basic + Major Industry/City (2)	Basic + Detailed Industry/City (3)
A. Cross-sectional models (worker-year observations, 2005–9):			
OLS: rent measure = mean log value added per worker, 2005–9	.270	.241	.207
	(.017)	(.015)	(.011)
OLS: rent measure = mean log sales per worker, 2005–9	.153	.171	.159
	(.009)	(.007)	(.004)
IV: rent measure = mean log value added per worker, 2005–9; instrument = mean log sales per worker, 2004–10	.327	.324	.292
	(.014)	(.011)	(.008)
First-stage coefficient	.475	.541	.562
	(t = 26.19)	(t = 40.72)	(t = 64.38)

Rent-sharing elasticities for Portuguese male workers

B. Within-job models (change in wages from 2005 to 2009 for stayers):			
OLS: rent measure = change in log value added per worker from 2005 to 2009	.041	.039	.034
	(.006)	(.005)	(.003)
OLS: rent measure = change in log sales per worker from 2005 to 2009	.015	.014	.013
	(.005)	(.004)	(.003)
IV: rent measure = change in log value added per worker from 2005 to 2009; instrument = change in log sales per worker, 2004–10	.061	.059	.056
	(.018)	(.017)	(.016)
First-stage coefficient	.221	.217	.209
	(t = 11.82)	(t = 13.98)	(t = 18.63)

Firm Switching

AKM model

- Log daily real wage y_{it} of individual i in year t is given by:

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

- Estimates of firm effects typically explain 15%–25% of the variance of wages
- Sorting of workers and firms with high FE also explains part of the variance in wages
- Problem is that the person and firm effects are overstated and sorting is understated in small samples and limited mobility

Variance decompositions

- Variance of wages can be decomposed as:

$$\begin{aligned} Var(\ln(w_{it})) = & Var(\alpha_i) + Var(\psi_{J(i,t)}) + Var(x'_{it}\beta) \\ & + 2Cov(\alpha_i, \psi_{J(i,t)}) + 2Cov(\psi_{J(i,t)}, x'_{it}\beta) \\ & + 2Cov(\alpha_i, x'_{it}\beta) + Var(\epsilon_{it}) \end{aligned} \tag{3}$$

- An alternative decomposition is:

$$\begin{aligned} Var(\ln(w_{it})) = & Cov(\ln(w_{it}, \alpha_i) + Cov(\ln(w_{it}, \psi_{J(i,t)}) \\ & + Cov(\ln(w_{it}, x'_{it}\beta) + Cov(\ln(w_{it}, \epsilon_{it}) \end{aligned} \tag{4}$$

which is an ensemble assessment of each component, e.g.:

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

Identifying age and time effects

- A technical issue that arises in AKM models is the linear inclusion of age a_{it} in X_{it}.
- It is standard to include year effects t in X_{it}.
- This raises an identification problem because $a_{it} = t - b_i$ with b_i birth year which loads onto α_i
- Use actual experience instead of age if available and if gaps are exogenous conditional on α_i.
- Impose restrictions on age or time effects.

AKM estimates with different restrictions on age effects

Table 3
Summary of Estimated Abowd, Kramarz, and Margolis (1999) Models for Portuguese Men, Alternative Normalizations of Age Function

	Cubic Age Function Flat				
	Age 40 (Baseline) (1)	Age 50 (2)	Age 30 (3)	Age 0 (4)	Gaussian Basis Function (5)
SD of person effects (across person-year observations)	.42	.41	.46	.93	.44
SD of firm effects (across person-year observations)	.25	.25	.25	.25	.25
SD of Xb (across person-year observations)	.07	.10	.12	.74	.08
Correlation of person/firm effects	.17	.16	.17	.14	.17
Correlation of person effects and covariate index	.19	.19	−.32	−.89	−.06
Correlation of firm effects and covariate index	.11	.14	−.03	−.08	.04

AKM estimates with different restrictions on age effects

Inequality decomposition (percentage of variance of log wage explained):					
Person effects + covariate index	63	63	63	63	63
Person effects	58	54	70	282	62
Covariate index	2	3	4	180	2
Covariate of person effects and covariate index	3	5	−11	−399	−1
Firm effects	20	20	20	20	20
Covariance of firm effects with person effect + covariate index	12	12	12	12	12
Covariance of firm effects with person effects	11	10	13	21	12
Covariance of firm effects with covariate index	1	2	−1	−9	0
Residual	5	5	5	5	5

Limited mobility bias and exogenous mobility

- Under the AKM assumptions, FE estimates are unbiased:

$$\forall j : \mathbb{E}\left[\hat{\psi}_j\right] = \psi_j \text{ and } \forall i : \mathbb{E}\left[\hat{\alpha}_i\right] = \alpha_i$$

- But noise leads to upward bias in variance of FE estimated effects and limited mobility to downward bias in covariance

- Exogenous mobility:

$$P(J(i,t) = j | \alpha_i, \psi, \epsilon_{i,1}, ..., \epsilon_{i,T}) = P(J(i,t) = j | \alpha_i, \psi)$$

which is an identifying assumption.

Wage changes for job switchers: men

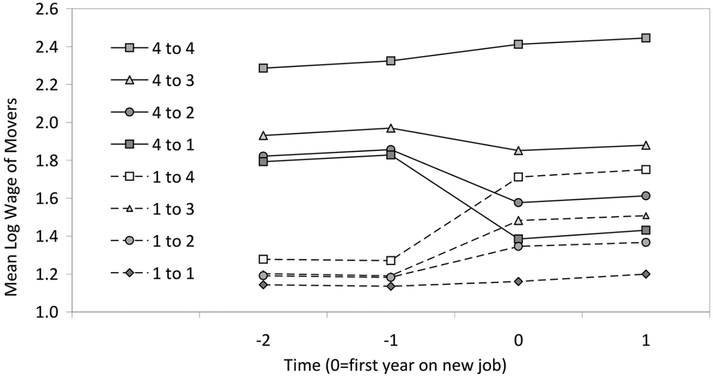


FIG. 3.—Mean log wages of Portuguese male job changers classified by quartile of coworker wages at origin and destination. The figure shows mean wages of male workers at mixed-gender firms who changed jobs in 2004–7 and held the preceding job for 2 years or more and the new job for 2 years or more. Jobs are classified into quartiles based on mean log wage of coworkers of both genders. Source: Card et al. (2016, fig. I). A color version of this figure is available online.

Wage changes for job switchers: women

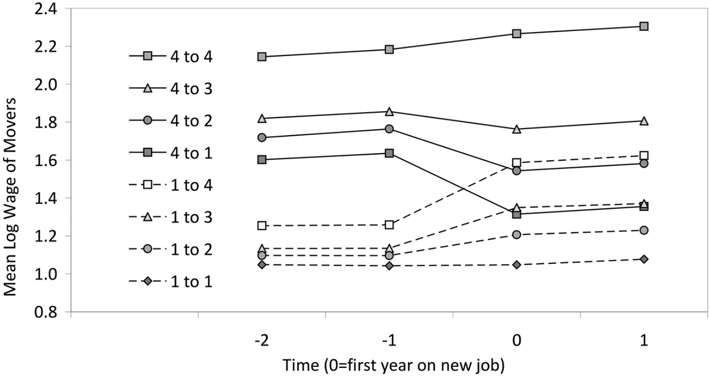
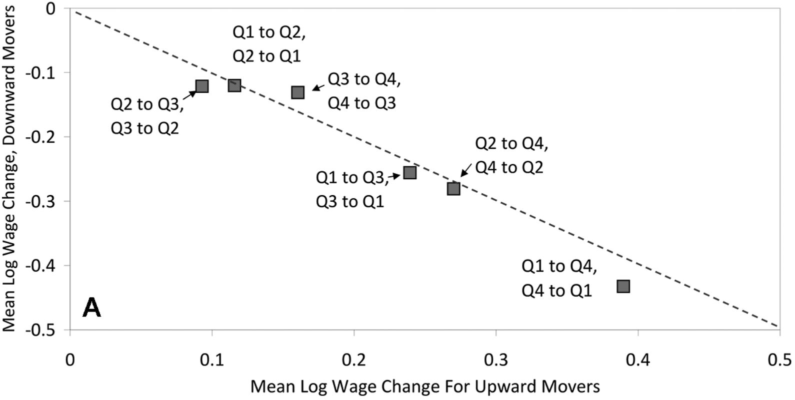
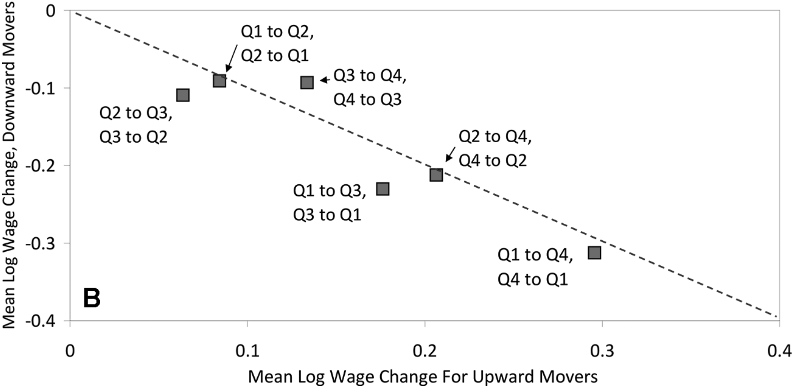


FIG. 4.—Mean wages of Portuguese female job changers classified by quartile of coworker wages at origin and destination. The figure shows mean wages of female workers at mixed-gender firms who changed jobs in 2004–7 and held the preceding job for 2 years or more and the new job for 2 years or more. Jobs are classified into quartiles based on mean log wage of coworkers of both genders. Source: Card et al. (2016, fig. II). A color version of this figure is available online.

Testing symmetry between switches: men



Testing symmetry between switches: women



Testing additive separability: men

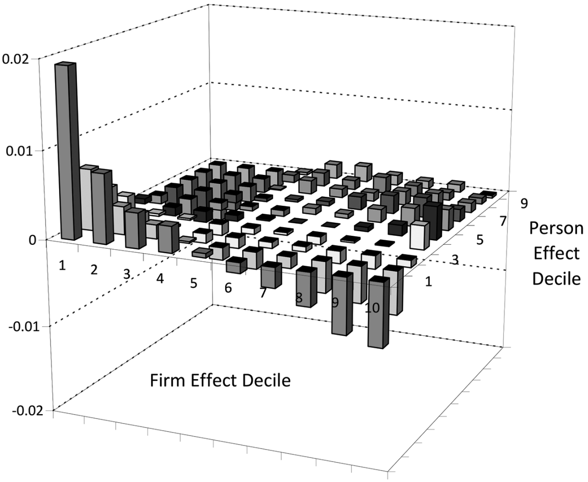


FIG. 6.—Mean residuals by person/firm deciles for Portuguese male workers. The figure shows mean residuals from an estimated Abowd, Kramarz, and Margolis (1999) model with cells defined by decile of estimated firm effects interacted with decile of estimated person effect. Source: Card et al. (2016, fig. B5). A color version of this figure is available online.

Testing additive separability: women

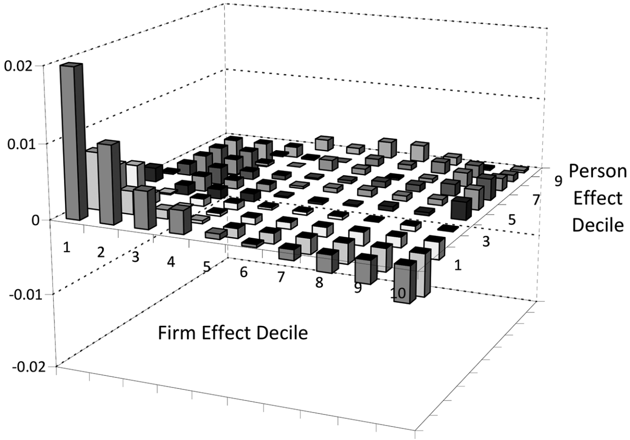


FIG. 7.—Mean residuals by person/firm deciles for Portuguese female workers. The figure shows mean residuals from an estimated Abowd, Kramarz, and Margolis (1999) model with cells defined by decile of estimated firm effects interacted with decile of estimated person effect. Source: Card et al. (2016, fig. B6). A color version of this figure is available online.

Reconciling Rent-Sharing Estimates with Results from Studies of Firm Switching

Reconciling rent-sharing and AKM estimates

- Obtain a rent-sharing elasticity γ_w from:

$$\ln(w_{it}) = \beta_w + \gamma_w \ln(VA/N)_j + \epsilon_{w,it}$$

- Obtain γ_{α_i}, γ_{ψ_j} and $\gamma_{X'_{it}\beta}$ by regressing:

$$y = \beta_y + \gamma_y \ln(VA/N)_j + \epsilon_{y,it}$$

  with $y = \alpha_i, \psi_j$ and $\ln(X'_{it}\beta)$ respectively.

- We then have:

$$\gamma_w = \gamma_{\alpha_i} + \gamma_{\psi_j} + \gamma_{X'_{it}\beta}$$

  with γ_{ψ_j} a clean measure of the true rent-sharing elasticity and γ_{α_i} and $\gamma_{X'_{it}\beta}$ capturing sorting effects.

Reconciling rent-sharing and AKM estimates

Table 4
Relationship between Components of Wages and Mean Log Value Added per Worker

	Basic Specification (1)	Basic + Major Industry/City (2)	Basic + Detailed Industry/City (3)
A. Combined sample (n = 2,252,436 person-year observations at 41,120 firms):			
Log hourly wage	.250	.222	.187
	(.018)	(.016)	(.012)
Estimated person effect	.107	.093	.074
	(.010)	(.009)	(.006)
Estimated firm effect	.137	.123	.107
	(.011)	(.009)	(.008)
Estimated covariate index	.001	.001	.001
	(.000)	(.000)	(.000)

Reconciling rent-sharing and AKM estimates

B. Less educated workers (n = 1,674,676 person-year observations at 36,179 firms):			
Log hourly wage	.239	.211	.181
	(.017)	(.016)	(.011)
Estimated person effect	.089	.072	.069
	(.009)	(.009)	(.005)
Estimated firm effect	.144	.133	.107
	(.015)	(.013)	(.008)
Estimated covariate index	.000	.000	.000
	(.000)	(.000)	(.000)
C. More educated workers (n = 577,760 person-year observations at 17,615 firms):			
Log hourly wage	.275	.247	.196
	(.024)	(.020)	(.017)
Estimated person effect	.137	.130	.094
	(.016)	(.013)	(.009)
Estimated firm effect	.131	.113	.099
	(.012)	(.009)	(.010)
Estimated covariate index	−.001	−.001	−.001
	(.000)	(.000)	(.000)

No differential rent-sharing

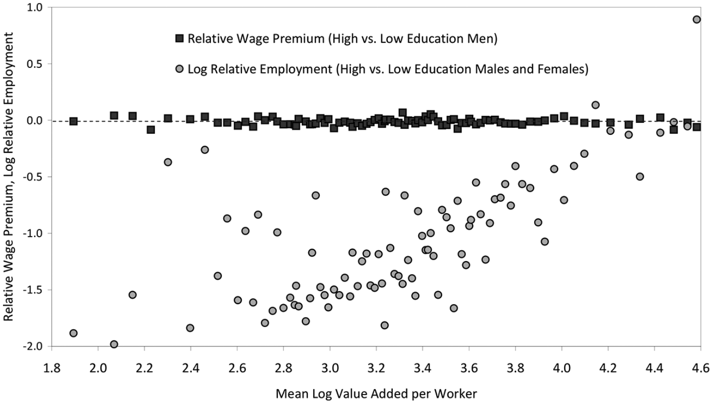


FIG. 8.—Relative wage premium and relative employment of high- versus low-education workers. Firms are divided into 100 cells on the basis of mean log value added per worker in 2005–9, with equal numbers of person-year observations per cell. A color version of this figure is available online.

Imperfectly Competitive Labor Markets and Inequality

Worker utility

- For worker i in skill group $S \in \{L, H\}$ utility of working at firm j is given by:

$$u_{iSj} = \beta_S \ln(w_j - b_s) + a_{Sj} + \epsilon_{iSj}$$

  with b_s reference wage, a_{Sj} firm-specific amenities valued by all workers, ϵ_{iSj} idiosyncratic preference for working at firm j.

- $\{\epsilon_{iSj}\}$ are independent draws from a type I Extreme Value distribution (to model worker's choice for j as in BLP).

- Firms post wages knowing the distribution of $\{\epsilon_{iSj}\}$ but not individual specific values and workers choose a j.

Worker sorting across firms

- Given posted wages, workers have logit choice probabilities:

$$p_{Sj} = \frac{\exp(\beta_S(\ln(w_{Sj} - b_S) + a_{Sj}))}{\sum_{k=1}^{J} \exp(\beta_S(\ln(w_{Sk} - b_S) + a_{Sk}))}$$

- Assume that J is very large such that:

$$p_{Sj} \approx \lambda_S \exp(\beta_S(\ln(w_{Sj} - b_S) + a_{Sj}))$$

- This gives firm-level supply functions:

$$\ln(L_j(w_{Lj})) = \ln(\mathcal{L}\lambda_L) + \beta_L \ln(w_{Lj} - b_L) + a_{Lj} \quad (5)$$
$$\ln(H_j(w_{Lj})) = \ln(\mathcal{H}\lambda_H) + \beta_H \ln(w_{Hj} - b_H) + a_{Hj} \quad (6)$$

Elasticities of firm-level labor supply

- The elasticities of firm-level labor supply are given by:

$$e_{Lj} \equiv \frac{\partial \ln(L_j(w_{Lj}))}{\partial \ln(w_{Lj})} = \beta_L \frac{w_{Lj}}{w_{Lj} - b_L}$$
$$e_{Hj} \equiv \frac{\partial \ln(H_j(w_{Hj}))}{\partial \ln(w_{Hj})} = \beta_H \frac{w_{Hj}}{w_{Hj} - b_H}$$

- Finite β_S implies workers' idiosyncratic preferences for amenities matter giving firms monopsony power.
- As $\beta_L, \beta_H \to \infty$ firm-level labor supply becomes perfectly elastic and we approach competitive labor market.

Firm optimization

- Firm have production functions:

$$Y_j = T_j f(L_j, H_j)$$

- The firm's optimal wage choices solve for the first-order conditions:

$$w_{Lj} \frac{1 + e_{Lj}}{e_{Lj}} = T_j f_L \mu_j \tag{8}$$

$$w_{Hj} \frac{1 + e_{Hj}}{e_{Hj}} = T_j f_H \mu_j \tag{9}$$

with e_{Sj} the elasticity of labor supply, f_S marginal labor productivity, and μ_j the firm's marginal cost.

Wage markdowns from marginal product

- Using expressions for firm-level labor supply elasticities gives:

$$w_{Lj} = \frac{1}{1+\beta_L} b_L + \frac{\beta_L}{1+\beta_L} T_j f_L \mu_j \tag{10}$$

$$w_{Hj} = \frac{1}{1+\beta_H} b_H + \frac{\beta_H}{1+\beta_H} T_j f_H \mu_j \tag{11}$$

- Wage is a weighted average of b_S and marginal product.
- If $b_S < T_j f_S \mu_j$, wage is marked down from marginal product.
- As $\beta_S \to \infty$ wage converges to marginal product and labor market is perfectly competitive.

Example for a single skill group

- Firm-level labor supply is given by:

$$w_j(S_j) = S_j^{\frac{1}{\beta}}$$

- Output is given by:

$$Y_j(S_j) = T_j S_j^{\frac{\epsilon-1}{\epsilon}}$$

- Product market is perfectly competitive with $P_j = 1$.

- Firms maximize profits:

$$\max_{S_j} \Pi = P_j Y_j(S_j) - w_j(S_j) S_j = T_j S_j^{\frac{\epsilon-1}{\epsilon}} - S_j^{\frac{1+\beta}{\beta}}$$

Example for a single skill group

- First-order condition is given by:

$$\underbrace{T_j \frac{\epsilon - 1}{\epsilon} S_j^{-\frac{1}{\epsilon}}}_{MRP} = \underbrace{\frac{1+\beta}{\beta} S_j^{\frac{1}{\beta}}}_{MFC} > S_j^{\frac{1}{\beta}} = w_j(S_j)$$

- Wage is marked down from MRP:

$$w_j = \frac{\beta}{1+\beta} MRP$$

- Equilibrium employment is given by:

$$S_j = \left[T_j \frac{\epsilon - 1}{\epsilon} \frac{\beta}{1+\beta} \right]^{\frac{\beta\epsilon}{\beta+\epsilon}}$$

- Equilibrium wage is given by:

$$w_j = \left[T_j \frac{\epsilon - 1}{\epsilon} \frac{\beta}{1+\beta} \right]^{\frac{\epsilon}{\epsilon+\beta}}$$

Equilibrium and wage pass-through of productivity shocks

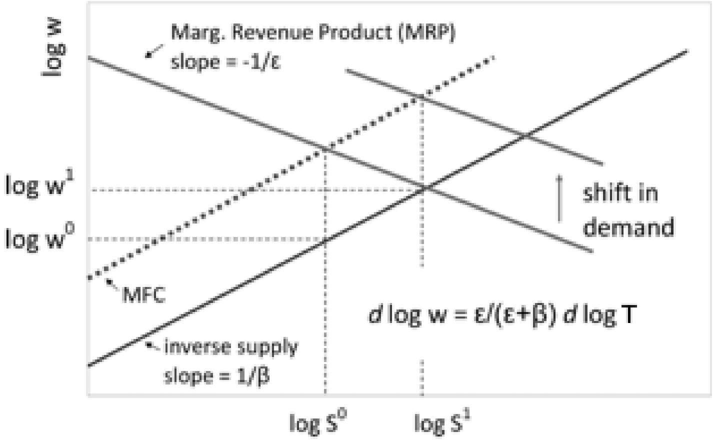


FIG. 9.—Effect of total factor productivity shock (single skill group). MFC = marginal factor cost. A color version of this figure is available online.

Baseline case: linear production function and fixed output price

- Return to setup with 2 skill types $S = L, H$.
- Linear production function with distribution parameter θ:

$$Y_j = T_j N_j = T_j((1-\theta)L_j + \theta H_j)$$

- Fixed output price P_j^0.
- The wage equations are given by:

$$w_{Lj} = \frac{1}{1+\beta_L} b_L + \frac{\beta_L}{1+\beta_L} T_j Pj^0 (1-\theta)$$
$$w_{Hj} = \frac{1}{1+\beta_H} b_H + \frac{\beta_H}{1+\beta_H} T_j Pj^0 \theta$$

Re-writing the wage equations to capture rent sharing

- An alternative way to write the wage equations is:

$$w_{Lj} = \frac{b_L}{1+\beta_L}\left[1 + \frac{\beta_L}{b_L} T_j Pj^0 (1-\theta)\right]$$
$$w_{Hj} = \frac{b_H}{1+\beta_H}\left[1 + \frac{\beta_H}{b_H} T_j Pj^0 \theta\right]$$

- Assume that $b_L = (1-\theta)b$ and $b_H = \theta b$
- Taking logs gives:

$$\ln(w_{Lj}) = \ln\left(\frac{(1-\theta)b}{1+\beta_L}\right) + \ln(1+\beta_L R_j) \tag{12}$$
$$\ln(w_{Hj}) = \ln\left(\frac{\theta b}{1+\beta_H}\right) + \ln(1+\beta_H R_j) \tag{13}$$

with $R_j \equiv P_j^0 T_j / b$ the gap between MRP and b.

Rent-sharing elasticities

- Value added per standardized unit of labor is:

$$\nu_j = P_j^0 Y_j / N_j = P_j^0 T_j = R_j b$$

- Rent-sharing elasticities are then given by:

$$\xi_{Sj} \equiv \frac{\partial \ln(w_{Sj})}{\partial \ln(\nu_j)} = \frac{\beta_S R_j}{1 + \beta_S R_j}$$

  which is the same as equation (2).

- This elasticity is around 0.1 such that $\beta_S R_j$ is around 0.1.

Elasticities of firm-level labor supply and relative wages

- The firm-level labor supply elasticity for group S is given by:

$$e_{Sj} = \frac{\beta_S w_{Sj}}{w_{Sj} - b_S} = \frac{1 + \beta_S R_j}{R_j - 1}$$

- If $\beta_S R_j = 0.1$ and $e_{Sj} = 4$, we have $R_j = 1.3$ and $\beta_S = 0.08$
- $\ln(1 + \beta_S R_j) \approx \beta_S R_j$ implies that:

$$\ln\left(\frac{w_{Lj}}{w_{Hj}}\right) = \ln\left(\frac{\theta}{1-\theta}\right) + \ln\left(\frac{1+\beta_L}{1+\beta_H}\right) + (\beta_H - \beta_L) R_j \tag{14}$$

such that $\beta_L = \beta_H$ implies that relative wages do not depend on firm-specific productivity shocks.

AKM worker and firm effects

- We had that:

$$\ln(w_{Lj}) \approx \ln\left(\frac{(1-\theta)b}{1+\beta_L}\right) + \beta_L R_j$$
$$\ln(w_{Hj}) \approx \ln\left(\frac{\theta b}{1+\beta_H}\right) + \beta_H R_j$$

- If $\beta_L = \beta_H = \beta$, wages can be written as an AKM model:

$$\ln(w_{Sj}) = \alpha_S + \beta R_j = \alpha_S + \psi_j \tag{15}$$

with α_S and ψ_j additive worker and firm effects with $\alpha_S \equiv \ln(b/(1+\beta)) + \mathbb{1}(S=L)\ln(1-\theta) + \mathbb{1}(S=H)\ln(\theta)$

AKM worker and firm effects

- If $\beta_H > \beta_L$, the log wage gap between H and L will be higher at more profitable firms.
- We get AKM model with skill group–specific firm effects:

$$\psi_j^H = \beta_H R_j > \psi_j^L = \beta_L R_j$$

- Estimate of β_H/β_L from projecting ψ_j^H onto ψ_j^L:

$$\psi_j^H = (\beta_H/\beta_L)\psi_j^L$$

- Card et al. (2016) estimate β about 10% larger for males than females in Portugal (because men value wages more and pass-through of productivity to wages is larger for men).

Between-firm sorting

- If $\beta_H = \beta_L$, the market-wide average wage for S is:

$$\mathbb{E}[\ln(w_{Si})] = \alpha_S + \sum_j \psi_j \pi_{Sj}$$

  with π_{Sj} the share of S-type workers employed at j.

- The market-wide wage differential between groups is given by:

$$\mathbb{E}[\ln(w_{Hi})] - \mathbb{E}[\ln(w_{Li})] = \alpha_H - \alpha_L + \sum_j \psi_j [\pi_{Hj} - \pi_{Lj}] \quad (16)$$

- Card et al. (2016) show that 15% of wage differential between men and women in Portugal is explained by men sorting more into firms that pay higher premium (to men and women).

Between-firm sorting by age and education

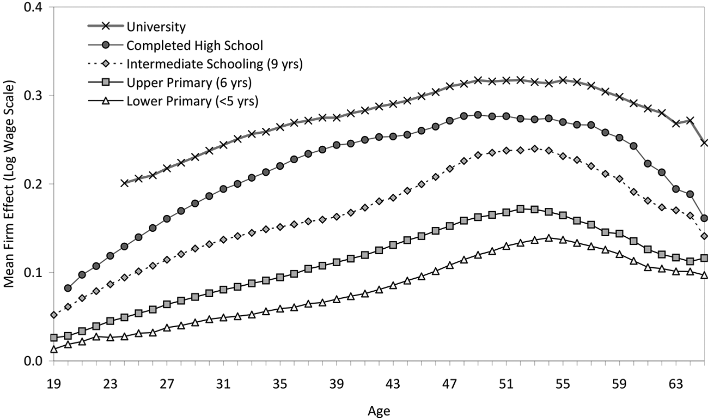


FIG. 10.—Mean firm effects by age and education group for Portuguese males. Firm effects are normalized using the method of Card et al. (2016).

Market-wide wage differences when $\beta_H \neq \beta_L$

- If $\beta_H \neq \beta_L$, the market-wide wage differential is given by:

$$\begin{aligned}
\mathbb{E}[\ln(w_{Hi})] - \mathbb{E}[\ln(w_{Li})] &= \alpha_H - \alpha_L \\
&\quad + \sum_j \psi_j^L [\pi_{Hj} - \pi_{Lj}] + \sum_j [\psi_j^H - \psi_j^L] \pi_{Hj} \\
&= \alpha_H - \alpha_L \\
&\quad + \sum_j \psi_j^H [\pi_{Hj} - \pi_{Lj}] + \sum_j [\psi_j^H - \psi_j^L] \pi_{Lj}
\end{aligned}$$

- Market-wide wage differential now also accounts for differential rent-sharing within firms.
- As in Oaxaca decomposition, there are alternative ways to evaluate the relative importance of between and within firm components.

Extensions

- Downward sloping firm-specific product demand:

$$P_j = P_j^0 Y_j^{-1/\epsilon}$$

with $R_j' = [(\epsilon - 1)/\epsilon]\nu_j/b$

- Imperfect substitution between skill groups:

$$Y_j = T_j N_j = T_j \left[((1-\theta)L_j^{\rho} + \theta H_j^{\rho})\right]^{1/\rho}$$

and basic intuition of benchmark model remains

- Other extensions would be (non-random) sorting of workers or strategic interactions between employers.

Conclusions

Conclusions

- CCHK framework in this paper is known as "new classical monopsony"
- It is consistent with evidence on rent-sharing elasticities and AKM models of additive worker and firm effects
- New classical monopsony differs from "modern monopsony" based on search frictions (Burdett&Mortensen 98)
- Interesting extensions would be to bridge gap between both approaches by incorporating dynamics in CCHK.
- Other interesting extension would be to incorporate strategic interaction between firms.