Robinson Meets Roy:
Monopsony Power and Comparative Advantage

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July 2025

Context

- Vast and growing literature on monopsony
  - attributes monopsony power to largest employers (e.g., Berger et al., 2022)
  - stresses low-wage jobs and aggregate employment consequences (e.g., Hurst et al., 2022)

- **This paper attributes monopsony power to comparative advantage at an employer**

Contributions

1. **Methodological:** unite theories of comparative advantage (Roy, 1951) and non-competitive wage setting (Robinson, 1933) in a strategic general equilibrium.
   - Largest markdowns among workers who have a comparative advantage at their firm.

2. **Empirical:** estimate distribution of wage markdowns in Brazil within and across firms
   - Largest markdowns among high-wage workers at an employer
   - Firm size/market concentration does not seem to be the chief factor

Some Related Literature

- Follow tradition of Robinson (1932), Card (2016), Berger, et al. (2022), Volpe (2024)
  - Heterogenity in rents across employers, typically in outside wage or amentities
  - Search is alternative mechanism for rents (Manning, 2003, 2011, Dube, 2019, Jarosch et al., 2023)
- We allow for heterogeneity in productivity in tradition of Roy (1951)
  - Apply Roy model at employer level—no longer competitive
  - Monopsony power can also differ *within* firm
- Recent studies estimate firm labor-supply elasticities that imply sizable markdowns
  - e.g. Staiger, et al. (2010)—nurses, 10%; Dube, et al. (2019)—retailing, 20%; Lamadon, et al. (2022)—15%; Berger et al. (2022)—25%; Volpe (2024), for Norway, 14%
  - for Brazil's formal sector: Lobel (2024)—19%; Felix (2022)—50%
- Bigger earnings response for high-wage workers within firms to demand shocks from patents (Kline et al., 2019) or tax changes (Carbonnier, et al., 2022; Lobel, 2024)

Outline

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Economic Environment

- Key Elements
  - Roy model of comparative/absolute advantage across employers
  - Monopsonistic wage setting
- Notation
  - K firms: $k \in \{1, ..., K\}$
  - Unit mass of workers
  - Productivity of a worker at firm k is y_k
  - $\{y_k\}_{k=1}^{K} \sim \mathcal{F}(y_1, ..., y_K) \equiv C(u_1, ..., u_K)$ with marginals $u_k = F_k(y_k)$

Comparative Advantage

Definition (Comparative Advantage)

A worker with productivity bundle $\{y_k\}_{k=1}^K$ has a comparative advantage at firm k over firm j if

$$\frac{y_j}{y_k} \leq \frac{\mathbb{E}[y_j]}{\mathbb{E}[y_k]}$$

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$$\frac{y_j}{y_k} \leq \frac{\mathbb{E}[y_j]}{\mathbb{E}[y_k]} \iff 0 \leq \overbrace{\frac{\mathbb{E}[y_j]}{\mathbb{E}[y_k]} - \frac{y_j}{y_k}}^{\text{measures comp. adv.}}$$

$$\underbrace{\qquad\qquad}_{\in[0,1] \text{ if } \mathbb{E}[y_j]=\mathbb{E}[y_k]}$$

Firm's Problem

- Firms choose wage-productivity schedules:

$$w_k(y\,; \underbrace{\{w_j(y_j)\}_{j\neq k}}_{\textit{strategically!}})$$

- Workers choose the highest bidder given their productivity bundle: e.g., firm k if

$$w_k(y_k) = \max\{w_1(y_1), ..., w_K(y_K)\}$$

- Firm k's labor supply

$$n_k(w\,; y, \{w_j(y)\}_{j\neq k}) = \overbrace{P(w > \max\underbrace{\{w_j(y_j)\}_{j\neq k}}_{\text{cond. on } y}\,|y)}^{\text{hire prob.}} F_k'(y)$$

- Firm k's objective

$$\max_{0\leq w(y)\leq y} \Pi(y; w) = \int (y - w(y)) n_k(w; y, \{w_j(y)\}_{j\neq k}) dy$$

Oligopsony Equilibrium

Definition

An oligopsony equilibrium consists of wage policies $w_k(y) : \mathbb{R}_+ \times \mathbb{W}^{K-1} \to \mathbb{R}_+$ and labor supply functions $n_k(w\,; y)$ such that:

1. For each $y \in \mathbb{R}_+$ and $k \in \{1, ..., K\}$, $w_k(y)$ maximizes firm k's profits given its labor supply, $n_k(w; y)$, and competitors' offers $\{w_j(y)\}_{j \neq k}$).
2. Each worker chooses the firm with the highest wage offer given their productivity bundle $y_1, ..., y_k$.

- Parallels first-price sealed-bid auction (e.g., Milgrom and Weber, 1982, Reny and Zamir, 2004)

Oligopsony Equilibrium: Wage Policies

- Optimal wage policy is a system of K nonlinear ODE's:

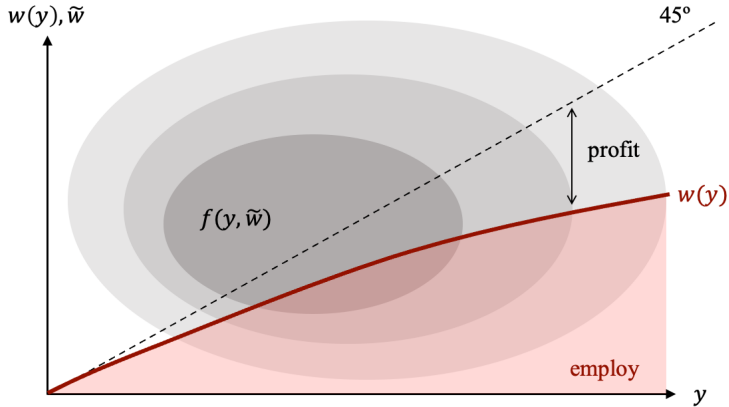
$$(y - w)\frac{\partial n_k(w; y, \{w_j(y_j)\}_{j\neq k})}{\partial w} = n_k(w; y, \{w_j(y_j)\}_{j\neq k}) \qquad \text{for all } k \in \{1, ..., K\}$$

- Mark-down at y depends on firm's labor supply elasticity among workers with $y_k = y$:

$$1 - \frac{w}{y} = \frac{1}{1 + \eta_k(w; y, \{w_j(y_j)\}_{j\neq k})},$$

Firm's Employment for a Wage Policy

Set $\tilde{w} = \max_j\{w_{j\neq k}(y_j)\}$



Symmetric Equilibrium: 3 Key Results

- Suppose $\mathcal{F}(y_1, ..., y_K)$ is symmetric with common marginals: $F_k(y) = F(y), \quad \forall k \in \{1, ..., K\}$

1. **Wage offer is a weighted average of lesser alternatives**:

$$w(y) = \mathbb{E}_{\tilde{\mathbf{F}}}[x | x \leq y],$$

where

$$\tilde{F}(x|y) \simeq \exp\left(- \int_x^y \underbrace{\frac{P[\max_{j \neq k} Y_j \simeq z \mid Y_k = z]}{P[\max_{j \neq k} Y_j \leq z \mid Y_k = z]}}_{\substack{\text{Marginal Employment} \\ \text{Total Employment}} \text{ at } Y_k = z} dz \right)$$

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2. **Equilibrium markdown is a (weighted) average of comparative advantage**

$$1 - \frac{w(y)}{y} = \mathbb{E}_{\tilde{F}}\left[1 - \frac{x}{y} \,\middle|\, x < y\right]$$

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3. $w(y)$ **is (strictly) increasing in productivity** $\Rightarrow$ **Employment allocation is efficient**

$$w(y_j) \geq w(y_k) \iff y_j \geq y_k$$

Example Wage Offers

- **Independent Copula**

$$\tilde{F}(x|y) = \left(\frac{F(x)}{F(y)}\right)^{K-1}$$

  - $K = 2 \Rightarrow w(y) = \mathbb{E}[x|x < y]$: *average productivity of employees at competing firm*
  - $K > 2 \Rightarrow w(y) = \mathbb{E}[x_{K-1}^{max}|x_{K-1}^{max} < y]$: *average 2^{nd} best productivity elsewhere*
  - $K \to \infty \quad \Rightarrow w(y) \to y$: Competition erases markdowns in the limit at a given y.

- **Joint Log-normal** (for $K = 2$)

$$\tilde{F}(x|y) = \left(\frac{F(x\,;\,\mu, \tilde{\sigma}(\rho))}{F(y\,;\,\mu, \tilde{\sigma}(\rho))}\right)^{\frac{1}{1-\rho}} \quad \text{where} \quad \tilde{\sigma}(\rho) = \sqrt{\frac{1+\rho}{1-\rho}}\,\sigma$$

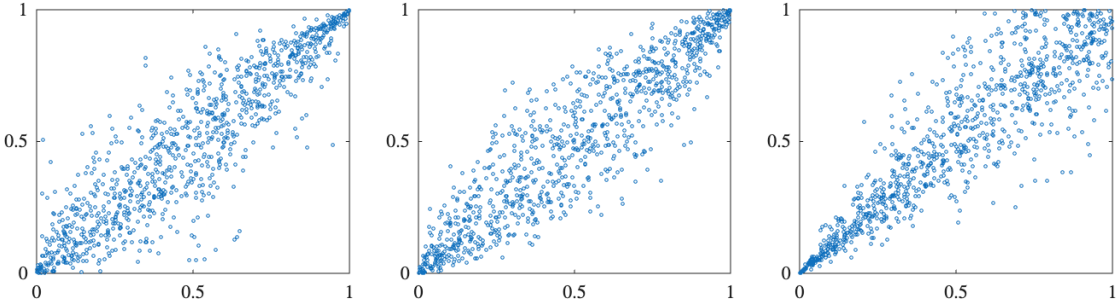
  - $\frac{1}{1-\rho}$ acts like K above while $\sqrt{\frac{1+\rho}{1-\rho}}$ steepens wage schedule
  - $\rho \to 1 \quad \Rightarrow w(y) \to y$ Correlation erases markdowns in the limit

Symmetric Equilibrium: Worker Productivity and Markdown

$$1 - \frac{w}{y} = \frac{1}{1 + \eta_k(w; y, \{w_j(y_j)\}_{j \neq k})},$$

- Markdown distribution within a firm depends on how $\eta_k(w; y, \{w_j(y_j)\}_{j \neq k})$ varies with y in eq'm.
- Illustrate with three copulas:
  1. Gumbel
  2. Gaussian
  3. Clayton

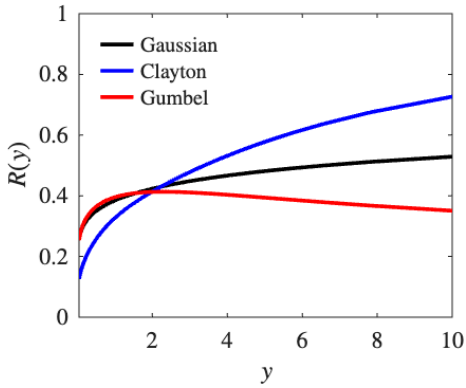
Dependence Structures with Copulas



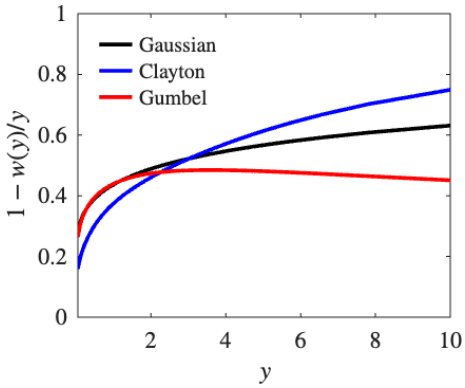
(a) Gumbel Copula (b) Gaussian Copula (c) Clayton Copula

Joint distribution of (u_1, u_2), with each copula calibrated to a Kendall's τ =0.75

Markdowns mirror comparative advantage



(a) Comparative advantage



(b) Markdown

Let $G(y) = \int_0^y \tilde{F}(x|y)dx$. $1 - \frac{w(y)}{y}$ increasing in $y \iff \frac{G'(y)y}{G(y)} > 1$

Asymmetric Oligopsony

Assumptions/Restrictions

- $K = 2$
- $y \in [0, y^{\max}]$
- C is Archimedean with generator function $\psi : [0,1] \to \infty$: (note $\psi' < 0$ and $\psi'' > 0$.)

$$\psi(C(u,v)) = \psi(u) + \psi(v)$$

Stochastic dominance concepts:

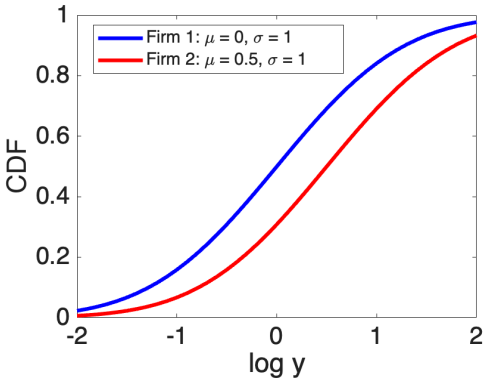
- $F_2 \succ_{FOSD} F_1 \iff F_2(y) < F_1(y)$ for all $y \in (0, y^{\max})$
- $F_2 \succ_{APD} F_1 \iff$ for all $x < y \in [0, y^{max}]$,

$$\psi(F_2(x)) - \psi(F_1(x)) > \psi(F_2(y)) - \psi(F_1(y)).$$

- $APD \implies FOSD$
- $Y_1 \perp\!\!\!\perp Y_2 \implies APD \equiv MRHR \quad (F_2(x)/F_1(x) \nearrow \text{ in } x)$

Asymmetric Duopsony: Two cases

CASE A: Firm 2 is more productive



CASE B: Firm 2 is more skill-elastic

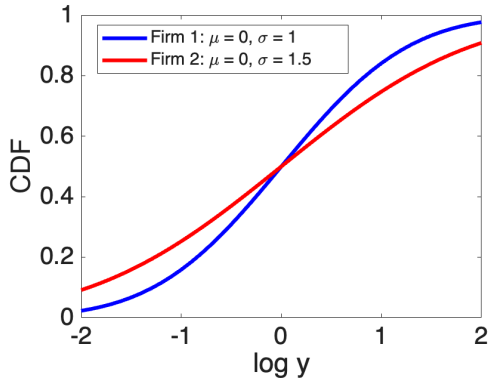
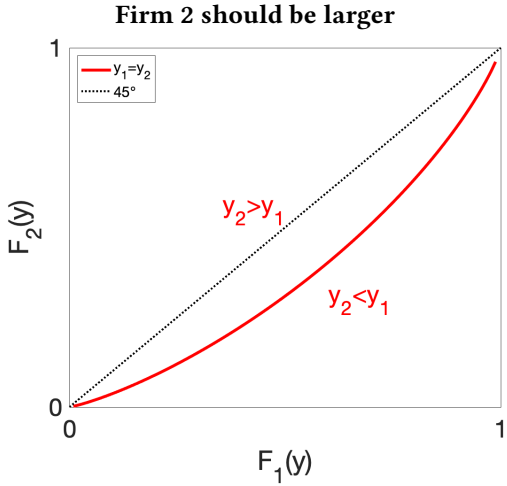
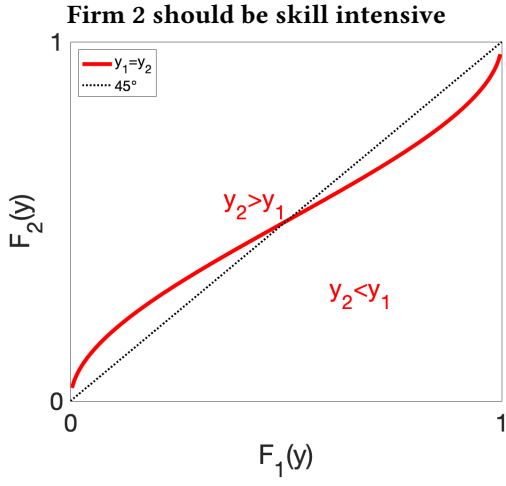


Figure: Marginal productivity distributions

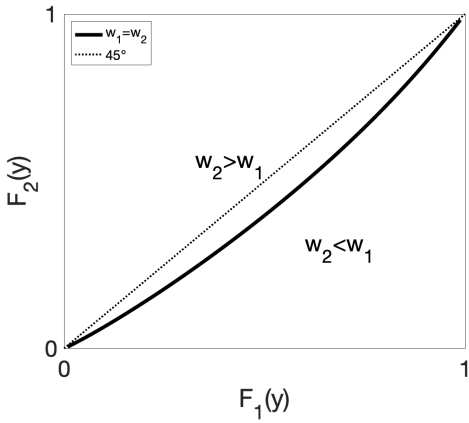
Efficient allocation mirrors comparative advantage



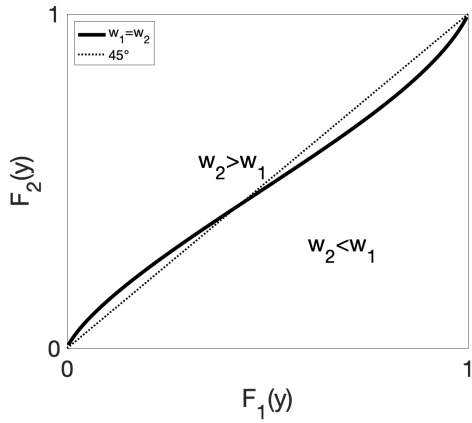


Equilibrium allocation follows comparative advantage

Firm 2 is larger



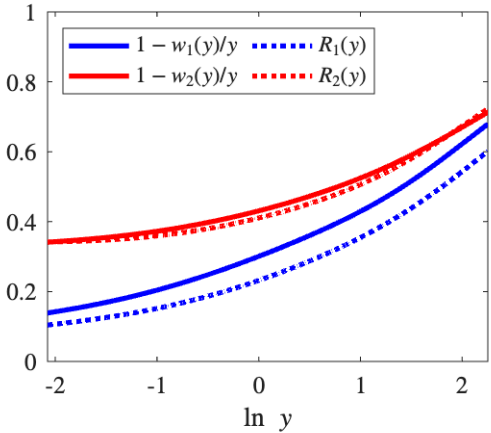
Firm 2 is skill-intensive



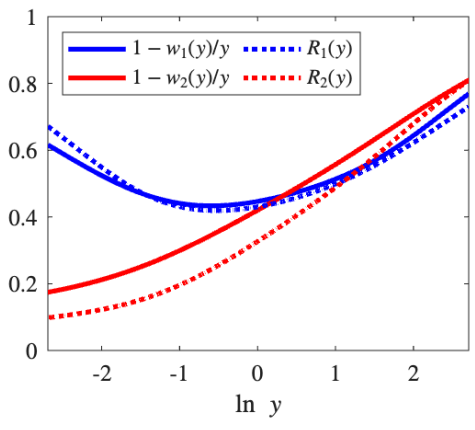
Requires global/local FOSD

Markdowns follow comparative advantage

Firm 2 marks down more



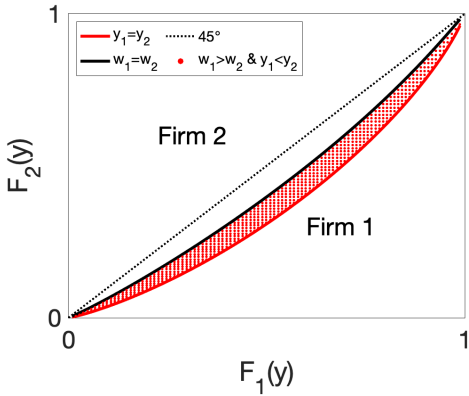
Firm 1 marks down low wages
Firm 2 marks down high wages



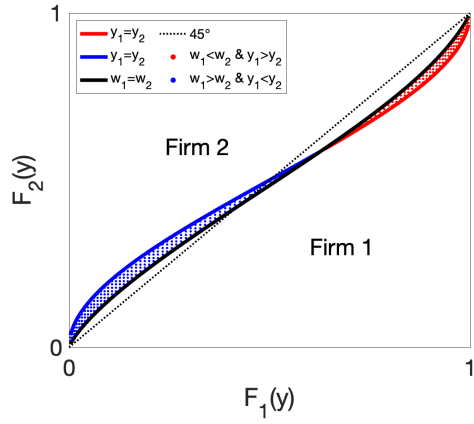
Requires global/local FOSD and APD

Asymmetric equilibria are inefficient!

Firm 2 is not large enough



Firms are not specialized enough



▸ Roy style charts

Asymmetric Duopsony: Key Results

◦ **CASE A: Firm 2 is more productive** ◦ **CASE B: Firm 2 is more skill-elastic**

1. **Efficient allocation follows comparative advantage** (Roy, 1951)
   - **A** Productive firm should be larger
   - **B** Skill-elastic firm should be skill intensive
2. **Equilibrium allocation follows comparative advantage**
   - **A** Productive firm pays better and employs more of all skill levels
   - **B** Skill-elastic firm better rewards skill, employs more skilled workers
3. **But markdowns also follow comparative advantage**
   - **A** Productive firms at all wage levels
   - **B** Skill-elastic firm among high-wage workers, skill-inelastic firm among low-wage workers
4. **Asymmetric equilibria are inefficient!**
   - **A** Productive firms are not large enough
   - **B** Firms are not specialized enough

Mapping model predictions to worker/firm characteristics

1. **Within a firm**
   - Larger wage markdowns among high-wage workers
2. **Across firms**
   - Larger firms have larger wage markdowns
   - High-wage firms have steeper markdown-wage profiles

Outline

Estimation of Markdowns

- Estimate labor supply elasticity from wage and employment responses to employer-level demand shocks by wage quartile at employer (establishment × occupation).

$$\Delta \ln \text{wage}_{it} = \beta_q \Delta \ln \text{emp}_{jt} + \alpha_{mqt} + \varepsilon_{it} \tag{1}$$

$$\Delta \ln \text{emp}_{jqt} = \gamma_q \Delta \ln \text{emp}_{jt} + \kappa_{mqt} + \mu_{jqt} \tag{2}$$

- (1) estimated at worker-year level for **stayers**
- (2) estimated at employer-year level
- (1) & (2) instrument for $\Delta \ln \text{emp}_{jt}$ to isolate demand shocks from shifts in labor supply

$$\hat{\eta}_q = \frac{\hat{\gamma}_q^{IV}}{\hat{\beta}_q^{IV}} \quad \Rightarrow \quad \hat{m}_q = \frac{1}{1 + \hat{\eta}_q}$$

Data and Sample Selection

- **Brazil (RAIS)**: 2006 - 2018
  - Administrative panel on linked employee-employer pairs; covers universe of formal sector
- **Labor market = Metro area × Occupation** (79 x 3)

	Same metro area	Same occupation	Same 7-digit industry
Hiring rate	81%	76%	20%

- Measure **employment** as of end of year, **wages** for month of December (includes overtime pay, bonuses, commissions, tips) $\Rightarrow \Delta$ = change from December $t-1$ to December t
- **Exclude** military, government, directors/managers, below 95% of minimum wage.

Instruments for labor demand

IV-1 : Employer's life-cyle: Younger & smaller employers grow faster

- Instruments are age (1-3, 4-10, 11-20, and > 20 years) and size ($ln(emp_{t-2})$ and its square)

IV-2 : National industry growth: at 7-digit level

- holding market (metropolitan area by occupation) employment fixed
- robust to dropping industries with "in-hiring" or using only predictable cyclicality

IV-3 : Interaction of IV-1 and IV-2

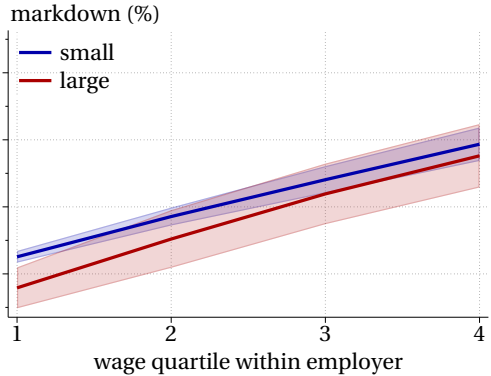
IV-3: employer's life-cycle × industry's employment growth

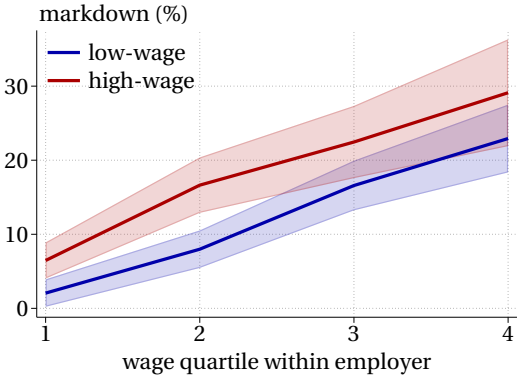
quartile (q)	wage response ($\widehat{\beta}_q$)	emp response ($\widehat{\gamma}_q$)	elasticity ($\widehat{\eta}_q$)	markdown (%)
all	0.15 (0.02)	1.00 (—)	6.9 (0.8)	12.7 (1.4)
1st	0.03 (0.01)	1.38 (0.10)	42.2 (18.5)	2.3 (1.0)
2nd	0.13 (0.02)	0.96 (0.05)	7.5 (1.1)	11.7 (1.5)
3rd	0.18 (0.02)	0.71 (0.02)	3.9 (0.6)	20.5 (1.9)
4th	0.23 (0.03)	0.59 (0.03)	2.6 (0.4)	28.1 (2.9)

Notes.– Standard errors are clustered at the employer-year level.

- Robust to dropping industries that hire > 10% from within ▸ results
- Robust to only instrumenting with business cycle × industry cyclicality ▸ results

Within firm variation is much larger!





95% conf. intervals shaded. Large = top 5% by market (44% of workers); high-wage 50% of workers ranking employers by med. wage

▸ market concentration ≃ size

Outline

Minimum Wage and Informal Sector

- Add legal minimum wage, $\underline{w}$, to a symmetric market
  - $y < \underline{w}$ are displaced; for $y > \underline{w}$:

$$w(y) = w^*(y) + \underbrace{[\underline{w} - w^*(\underline{w})]\,\zeta(y)}_{\text{wage bump}}$$

$w^*(y)$: wage offer w/o minimum wage $\zeta(y) \in (0,1]$ with $\zeta(\underline{w}) = 1$ and $\zeta'(y) < 0$.

- Add informal sector option: $w_0 \sim i.i.d.\ F_I(w_0)$.
  - $y < \min\{w_0, \underline{w}\}$ work in the informal sector at w_0; for $y > \underline{w}$:

$$w(y) = w^*(y) + \underbrace{[\underline{w} - w^*(\underline{w})]\,\zeta(y)}_{\text{wage bump}} + \overbrace{b(y)}^{\geq 0}$$

where $b(\underline{w}) = 0$.

  - If informal pay is lower than formal, then gains skew toward low-wage formal workers.

Calibration

Objectives

1. Show what estimates imply for cross-employer dependence
2. Effect of market power on wage dispersion
3. Effects of minimum wages and the informal sector on employment and wage markdowns

Calibration Moments with Minimum Wage and Informal Sector

Targeted Moments	Data Source	Data	Model
Within-formal-firm std of log wage	Authors' calculation	0.31	0.31
Formal sector average markdown (%)	Authors' estimation	16.1	16.1
Formal sector employment share (%)	Engbom et al. (2022)	66	66
Minimum-to-formal wage ratio	Authors' calculation	0.33	0.33
Informal-to-formal wage ratio	Meghir, Narita and Robin (2015)	0.69	0.69

Notes: The within-employer std of log wage and the formal-to-minimum wage ratio are calculated by the authors using the RAIS data.

- Formal sector markdowns with Clayton Copula (not targeted)

Quartile	1	2	3	4
Data	2.3	11.7	20.5	28.1
Model	6.9	11.4	16.6	27.4

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Quartile	1	2	3	4
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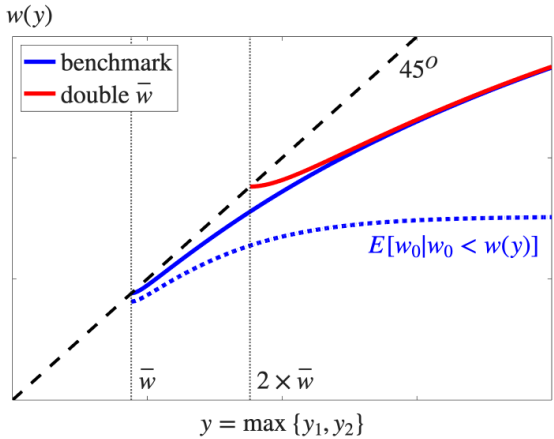
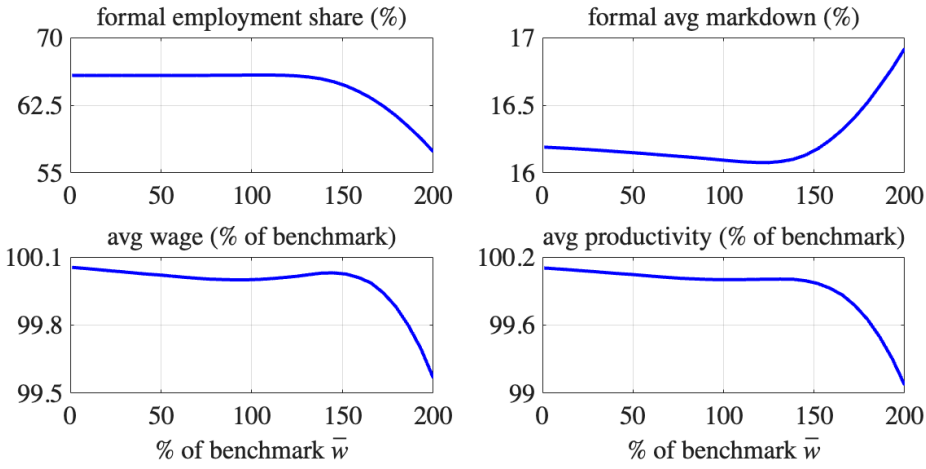
24% reduction in log-wage dispersion.

Double the minimum wage



$\underline{w} < y < 2\underline{w} \Rightarrow$ Displaced: wage and efficiency losses $\qquad 2\underline{w} < y \Rightarrow$ wage gains.

Implications of minimum wage



Conclusions

- Want to know where to expect monopsony—model says look to comparative advantage
- For the formal Brazilian labor market, markdowns ...
  - bigger for higher-wage workers within employer
  - somewhat bigger for higher-wage employers (but *not* for larger employers)

  ⇒ compress wage dispersion
- Minimum wage and informal sector ...
  - help reduce markdowns for low-wage workers, provided they don't lose their (formal) jobs
  - have little effect on high-wage workers who experience largest markdowns

  ⇒ have limited capacity to eliminate monopsony power

SUPPLEMENTARY SLIDES

Cross-Section Sample Restrictions

Restriction	% meeting each
$18 \leq$ age ≤ 64	98.2
Paid ≥ 0.95 times legal minimum	97.5
Not military, government, director/manager, science/art prof., or apprentice	71.0
In one of 74 metropolitan areas	71.7
Meeting all restrictions	49.1

Notes: Starts from sample of 553,266,008 worker-years employed at year's end with a December wage

Regression Sample Restrictions

Restrictions	% meeting each‡
Paid monthly	90.8
At establishment all of December	96.2
$40 \leq$ weekly hours ≤ 44	91.2
Employer ≥ 10 workers with stayers above & below median	61.7
Stayer with consecutive wages	52.6
Meeting all restrictions	28.9
Resulting sample size	
Worker-year	79,614,942
Employer-year	3,415,115

Notes: Starts from sample meeting previous table's restrictions

Wage Gains during Mass Hire Events

Table: Wage Gains (in %'s) for Mass Hires by Wage Quartile

	quartile (q)			
mass hires of	1^{st}	2^{nd}	3^{rd}	4^{th}
at least 50%	5.6	17.4	24.8	37.5
at least 80%	4.3	16.9	24.8	39.8

Notes: Samples restrict to job matches that satisfy (i) all sampling restrictions, except that "stayer with consecutive wages" in Panel B is replaced by "new hires," (ii) the worker's last job within the past year is observed and satisfies Panel A restrictions in Table **??**, (iii) the employer experiences a mass-hire in the year, and (iv) the last job's separation is initiated by the worker. The resulting sample size is 1,841,134 for at least 50% mass-hires and 313,284 for at least 80% mass-hires. We control for market-by-year fixed effects.

OLS Estimates:

Table: OLS Estimates: Wage and Employment Responses by Wage Quartile

quartile (q)	wage response ($\widehat{\beta}_q$)	emp response ($\widehat{\gamma}_q$)	elasticity ($\widehat{\eta}_q$)	markdown (%)
all	0.027 (0.001)	1.00 (–)	37.4 (1.3)	2.6 (0.1)
1st	0.013 (0.001)	1.22 (0.01)	93.2 (5.3)	1.1 (0.1)
2nd	0.023 (0.001)	0.92 (0.00)	40.5 (1.5)	2.4 (0.1)
3rd	0.030 (0.001)	0.81 (0.01)	27.3 (1.1)	3.5 (0.1)
4th	0.036 (0.001)	0.76 (0.01)	20.8 (0.8)	4.6 (0.2)

Notes: Wage responses reflect 79,614,942 worker-year observations; employment response reflect 3,415,115 employer-year observations, with observations weighted by employer's employment. Standard errors (in parentheses) for wage and employment responses are clustered at employer-by-year level. Those for labor supply elasticity and markdown are derived by Delta Method. Not every employer is represented in all four quartiles.

IV1: employer's life-cycle (quadratics in log size and log age)

q	wage response ($\widehat{\beta}_q$)	emp response ($\widehat{\gamma}_q$)	elasticity ($\widehat{\eta}^s_q$)	markdown (%)
all	0.19 (0.02)	1.00 (–)	5.4 (0.6)	15.7 (1.5)
1st	0.05 (0.02)	1.41 (0.03)	29.1 (13.6)	3.3 (1.5)
2nd	0.16 (0.02)	0.91 (0.02)	5.6 (0.6)	15.2 (1.5)
3rd	0.23 (0.02)	0.64 (0.03)	2.8 (0.3)	26.6 (2.2)
4th	0.31 (0.03)	0.52 (0.02)	1.7 (0.2)	36.8 (2.4)

IV-2: industry's employment growth

q	wage response ($\widehat{\beta}_q$)	emp response ($\widehat{\gamma}_q$)	elasticity ($\widehat{\eta}^s_q$)	markdown (%)
all	0.12 (0.02)	1.00 (−)	8.2 (1.6)	10.9 (1.9)
1st	0.04 (0.03)	1.46 (0.12)	41.0 (30.0)	2.4 (1.7)
2nd	0.10 (0.03)	0.96 (0.07)	9.8 (2.9)	9.2 (2.5)
3rd	0.14 (0.02)	0.77 (0.01)	5.4 (0.9)	15.5 (2.2)
4th	0.18 (0.03)	0.65 (0.06)	3.5 (0.7)	22.0 (3.4)

IV: industry's growth, excluding industries with > 10% internal hires

- this drops 5% (out of 1402) industries, accounting for 25% obs in reg sample

q	wage response ($\widehat{\beta}_q$)	emp response ($\widehat{\gamma}_q$)	elasticity ($\widehat{\eta}^s_q$)	markdown (%)
1st	0.07 (0.02)	1.26 (0.15)	16.9 (5.6)	5.6 (1.7)
2nd	0.10 (0.03)	1.00 (0.11)	10.2 (3.2)	8.9 (2.6)
3rd	0.13 (0.03)	0.82 (0.02)	6.2 (1.3)	13.8 (2.4)
4th	0.17 (0.03)	0.72 (0.03)	4.3 (0.9)	18.8 (3.0)

Standard errors in parentheses, clustered at the employer-by-year level.

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IV: industries exposure to business cycle due to cyclicality

quartile (q)	wage response ($\widehat{\beta}_q$)	emp response ($\widehat{\gamma}_q$)	elasticity ($\widehat{\eta}^s_q$)	markdown (%)
1^{st}	0.04 (0.05)	1.90 (0.27)	45.1 (53.2)	2.2 (2.5)
2^{nd}	0.17 (0.09)	0.70 (0.15)	4.1 (2.4)	19.6 (9.3)
3^{rd}	0.26 (0.09)	0.63 (0.07)	2.4 (0.9)	29.3 (7.8)
4^{th}	0.36 (0.12)	0.52 (0.14)	1.4 (0.6)	40.9 (10.4)

Standard errors in parentheses, clustered at the employer-by-year level.

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Robustness Check for Wage $\geq 1.2\times$ Minimum Wage

quartile (q)	wage response ($\widehat{\beta}_q$)	emp response ($\widehat{\gamma}_q$)	elasticity ($\widehat{\eta}^s_q$)	markdown (%)
1^{st}	0.04 (0.01)	1.49 (0.04)	36.9 (13.0)	2.6 (0.9)
2^{nd}	0.14 (0.02)	0.88 (0.02)	6.3 (0.7)	13.6 (1.3)
3^{rd}	0.19 (0.02)	0.68 (0.03)	3.6 (0.4)	21.5 (2.0)
4^{th}	0.23 (0.03)	0.58 (0.03)	2.5 (0.3)	28.3 (2.6)

Standard errors in parentheses, clustered at the employer-by-year level.

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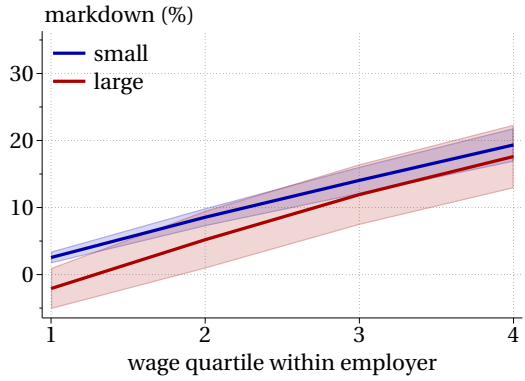
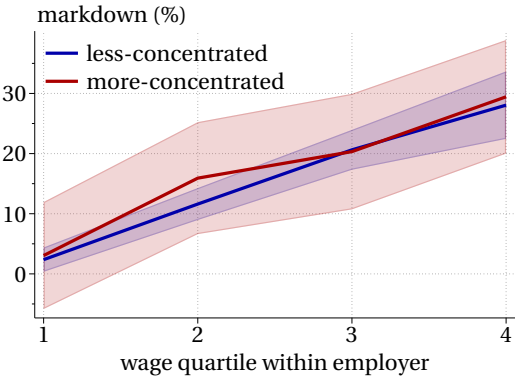
Markdowns by Employer Size vs. Market Concentration



(a) By employer size



(b) By market's concentration ratio

Notes:– shaded areas depict 95% confidence intervals.

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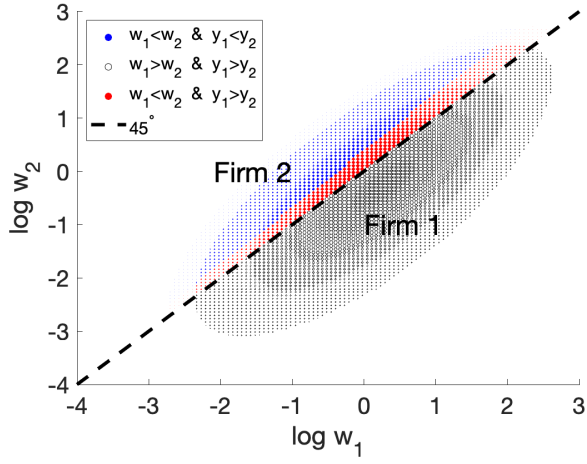
Asymmetric Duopsony Equilibrium: $\mu_1 > \mu_2$, $\sigma_1 = \sigma_2$



Assumptions: $y_1 \sim N(1,1)$, $y_2 \sim N(0,1)$ with $\rho = 0.75$. Productive firm is inefficiently small!

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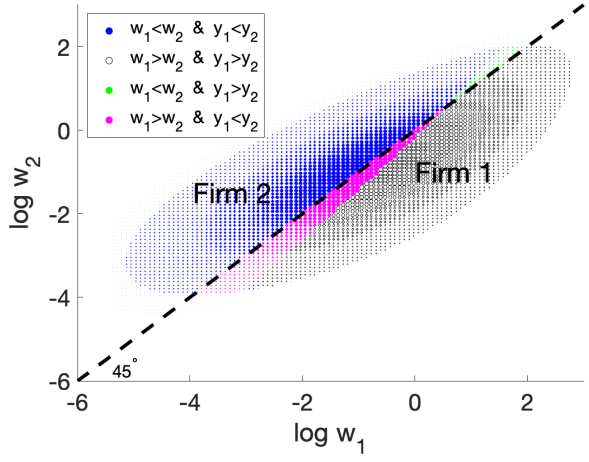
Asymmetric Duopsony Equilibrium: $\mu_1 = \mu_2, \sigma_1 >> \sigma_2$



Assumptions: $y_1 \sim N(0, 1.7)$, $y_2 \sim N(0, 1)$ with $\rho = 0.75$. Two-sided distortion to sorting efficiency!

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References

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