The missing puzzle piece for racial discrimination? On labor market power and whether it drives inequality

Freddy Bachmann
Cornell University

Carlo Lombardo
Cornell University

Paper proposal – Econ 7510
December 4th, 2024

Racial pay gaps & discrimination: Can monopsony close the gap?

- Lower pay for Black workers is a pervasive and persistent phenomenon
  - Brazil (2002-14): 20% lower compared to white workers (Gerard et al., 2021)
  - U.S. (2015): 25% (Derenoncourt and Montialoux, 2021)

Racial pay gaps & discrimination: Can monopsony close the gap?

- Lower pay for Black workers is a pervasive and persistent phenomenon
  - Brazil (2002-14): 20% lower compared to white workers (Gerard et al., 2021)
  - U.S. (2015): 25% (Derenoncourt and Montialoux, 2021)

→ Economics of discrimination (Becker, 1957; Arrow, 1971; Phelps, 1972)
  - Canonical theories (taste-based, statistical discrimination) struggle to explain persistent discrimination in a competitive market

Racial pay gaps & discrimination: Can monopsony close the gap?

- Lower pay for Black workers is a pervasive and persistent phenomenon
  - Brazil (2002-14): 20% lower compared to white workers (Gerard et al., 2021)
  - U.S. (2015): 25% (Derenoncourt and Montialoux, 2021)

→ Economics of discrimination (Becker, 1957; Arrow, 1971; Phelps, 1972)
  - Canonical theories (taste-based, statistical discrimination) struggle to explain persistent discrimination in a competitive market

- Empirical work suggests monopsony could play a decisive role (Derenoncourt and Montialoux, 2021; Gerard et al., 2021) → *monopsonistic* discrimination.
  - Idea: Minorities may have less wage-elastic labor supply ⇒ stronger markdowns
  - Maybe even more so in developing countries: low safety, sparse job networks

Bringing IO to the study of labor market power

- New market power literature in labor economics since the 90s/00s (Manning, 2003)
- "Monopsony" (Robinson, 1933) refers to market power on the **demand** side (a monopsonist can set wages **below** the competitive level)
- The monopsonist's optimal wage

$$w = \frac{\epsilon_{L,w}}{1 + \epsilon_{L,w}} \times MRP_L$$

Bringing IO to the study of labor market power

- New market power literature in labor economics since the 90s/00s (Manning, 2003)
- "Monopsony" (Robinson, 1933) refers to market power on the **demand** side (a monopsonist can set wages **below** the competitive level)
- The monopsonist's optimal wage

$$w = \frac{\epsilon_{L,w}}{1 + \epsilon_{L,w}} \times MRP_L$$

- Estimates for elasticities & markdowns (for an average worker):
  - Colombia (1994–2009): $\epsilon_{L,w} = 2.5 \Rightarrow w$ marked down by 28.6% (Amodio and De Roux, 2024)
  - Oregon (2000-2017): $\epsilon_{L,w} = 4.2 \Rightarrow w$ marked down by 19.2% (Bassier et al., 2021)
  - U.S. overall (1976-2014): w marked down by 35% $\Rightarrow \epsilon_{L,w} = 1.9$ (Yeh et al., 2022)

Bringing IO to the study of labor market power

- New market power literature in labor economics since the 90s/00s (Manning, 2003)
- "Monopsony" (Robinson, 1933) refers to market power on the **demand** side (a monopsonist can set wages **below** the competitive level)
- The monopsonist's optimal wage

$$w = \frac{\epsilon_{L,w}}{1 + \epsilon_{L,w}} \times MRP_L$$

- Estimates for elasticities & markdowns (for an average worker):
  - Colombia (1994–2009): $\epsilon_{L,w} = 2.5 \Rightarrow w$ marked down by 28.6% (Amodio and De Roux, 2024)
  - Oregon (2000-2017): $\epsilon_{L,w} = 4.2 \Rightarrow w$ marked down by 19.2% (Bassier et al., 2021)
  - U.S. overall (1976-2014): w marked down by 35% $\Rightarrow \epsilon_{L,w} = 1.9$ (Yeh et al., 2022)
- To better understand labor market power, we can leverage IO's tools

Research questions

Empirical: Can monopsony help explain racial pay gaps?

- Estimate race-specific elasticities of firm-level labor supply & analyze their sources
- To what extent do firms *use* their market power over each group?
- How much of the pay gap can monopsonistic discrimination explain, compared to other explanatory variables, and other forms of discrimination (e.g. taste-based)?

Research questions

Empirical: Can monopsony help explain racial pay gaps?

- Estimate race-specific elasticities of firm-level labor supply & analyze their sources
- To what extent do firms *use* their market power over each group?
- How much of the pay gap can monopsonistic discrimination explain, compared to other explanatory variables, and other forms of discrimination (e.g. taste-based)?

What is the monopsony literature missing from the IO toolbox?

→ **Theoretical:**

- More structure on the firm's behavior – test a set of models (similar to Nevo (2001))
- Is it tractable & useful to add a dynamic component? (DDC instead of DC)

→ **Methodological:**

- Compare the more common, indirect estimation approach to an IO-based approach

Contents

Related literature & our contributions

1. Monopsonistic discrimination (minorities have lower labor supply elasticities)
   - Gender
     - Via the "indirect" approach: e.g. Barth and Dale-Olsen (2009), Hirsch et al. (2010)
     - Using an IO-based approach: Sharma (2023)

Related literature & our contributions

1. Monopsonistic discrimination (minorities have lower labor supply elasticities)
   - Gender
     - Via the "indirect" approach: e.g. Barth and Dale-Olsen (2009), Hirsch et al. (2010)
     - Using an IO-based approach: Sharma (2023)

   → We are the first to estimate elasticities of firm-level labor supply *by race*.

Related literature & our contributions

1. Monopsonistic discrimination (minorities have lower labor supply elasticities)
   - Gender
     - Via the "indirect" approach: e.g. Barth and Dale-Olsen (2009), Hirsch et al. (2010)
     - Using an IO-based approach: Sharma (2023)

   → We are the first to estimate elasticities of firm-level labor supply *by race*.

2. *Effects* of elasticities. Do firms *use* their market power? Can it explain pay gaps?
   - Monopsony power likely not fully used (Bronfenbrenner, 1956)
   - Markdowns, based on production fct. estimation: Yeh et al. (2022); Amodio et al. (2024)
   - Group-specific markdowns (discrimination): No studies to date.
     - Indirect evidence, e.g. Ransom and Oaxaca (2010); Hirsch et al. (2010); Webber (2015)

Related literature & our contributions

1. Monopsonistic discrimination (minorities have lower labor supply elasticities)
   - Gender
     - Via the "indirect" approach: e.g. Barth and Dale-Olsen (2009), Hirsch et al. (2010)
     - Using an IO-based approach: Sharma (2023)

   → We are the first to estimate elasticities of firm-level labor supply *by race*.

2. *Effects* of elasticities. Do firms *use* their market power? Can it explain pay gaps?
   - Monopsony power likely not fully used (Bronfenbrenner, 1956)
   - Markdowns, based on production fct. estimation: Yeh et al. (2022); Amodio et al. (2024)
   - Group-specific markdowns (discrimination): No studies to date.
     - Indirect evidence, e.g. Ransom and Oaxaca (2010); Hirsch et al. (2010); Webber (2015)

   → We are the first to estimate actual wage markdowns *by race*. Plus, we want to use them to pick among a few alternative models of firm behavior.

Related literature & our contributions

3. Monopsony in general (firm-level elasticities, all workers)
   - Seminal work: Manning (2003). Reviews: Manning (2021); Sokolova and Sorensen (2021).
   - Most work uses a indirect approach based on Manning (2003)'s shortcut
   - Macro / GE approaches: e.g. Berger et al. (2022a,b, 2024)
   - IO approaches: e.g. Azar et al. (2022); Kroft et al. (2020)

Related literature & our contributions

3. Monopsony in general (firm-level elasticities, all workers)
   - Seminal work: Manning (2003). Reviews: Manning (2021); Sokolova and Sorensen (2021).
   - Most work uses a indirect approach based on Manning (2003)'s shortcut
   - Macro / GE approaches: e.g. Berger et al. (2022a,b, 2024)
   - IO approaches: e.g. Azar et al. (2022); Kroft et al. (2020)

$\rightarrow$ We explore bringing *dynamic* IO models to the study of labor market power.

Related literature & our contributions

3. Monopsony in general (firm-level elasticities, all workers)
   - Seminal work: Manning (2003). Reviews: Manning (2021); Sokolova and Sorensen (2021).
   - Most work uses a indirect approach based on Manning (2003)'s shortcut
   - Macro / GE approaches: e.g. Berger et al. (2022a,b, 2024)
   - IO approaches: e.g. Azar et al. (2022); Kroft et al. (2020)

   → We explore bringing *dynamic* IO models to the study of labor market power.

4. Racial discrimination on labor markets, generally
   - Review: Lang and Lehmann (2012).
   - Recent notable papers Derenoncourt and Montialoux (2021); Derenoncourt (2022); Derenoncourt et al. (2024); Gerard et al. (2021)

Related literature & our contributions

3. Monopsony in general (firm-level elasticities, all workers)
   - Seminal work: Manning (2003). Reviews: Manning (2021); Sokolova and Sorensen (2021).
   - Most work uses a indirect approach based on Manning (2003)'s shortcut
   - Macro / GE approaches: e.g. Berger et al. (2022a,b, 2024)
   - IO approaches: e.g. Azar et al. (2022); Kroft et al. (2020)

   → We explore bringing *dynamic* IO models to the study of labor market power.

4. Racial discrimination on labor markets, generally
   - Review: Lang and Lehmann (2012).
   - Recent notable papers Derenoncourt and Montialoux (2021); Derenoncourt (2022); Derenoncourt et al. (2024); Gerard et al. (2021)

   → We are the first to directly test & quantify monopsony's role.

Related literature & our contributions

3. Monopsony in general (firm-level elasticities, all workers)
   - Seminal work: Manning (2003). Reviews: Manning (2021); Sokolova and Sorensen (2021).
   - Most work uses a indirect approach based on Manning (2003)'s shortcut
   - Macro / GE approaches: e.g. Berger et al. (2022a,b, 2024)
   - IO approaches: e.g. Azar et al. (2022); Kroft et al. (2020)

   → We explore bringing *dynamic* IO models to the study of labor market power.

4. Racial discrimination on labor markets, generally
   - Review: Lang and Lehmann (2012).
   - Recent notable papers Derenoncourt and Montialoux (2021); Derenoncourt (2022); Derenoncourt et al. (2024); Gerard et al. (2021)

   → We are the first to directly test & quantify monopsony's role.

5. Job search models used for monopsony and discrimination
   - Monopsony generally: Burdett and Mortensen (1998); Manning (2003)
   - Discrimination: Black (1995) – race, Black (1995) – gender

Contents

General procedure

General procedure

Estimating elasticities and analyzing their sources:

General procedure

Estimating elasticities and analyzing their sources:

1. Labor supply model (DC or DDC), where job differentiation generates monopsony

General procedure

Estimating elasticities and analyzing their sources:

1. Labor supply model (DC or DDC), where job differentiation generates monopsony
2. Estimate reduced-form elasticities from data, using a quasi-experimental approach

General procedure

Estimating elasticities and analyzing their sources:

1. Labor supply model (DC or DDC), where job differentiation generates monopsony
2. Estimate reduced-form elasticities from data, using a quasi-experimental approach
3. Use moment conditions implied by (1) to decompose elasticities into their sources

General procedure

Estimating elasticities and analyzing their sources:

1. Labor supply model (DC or DDC), where job differentiation generates monopsony
2. Estimate reduced-form elasticities from data, using a quasi-experimental approach
3. Use moment conditions implied by (1) to decompose elasticities into their sources

Effects of elasticities (actual markdowns, pay gaps):

General procedure

Estimating elasticities and analyzing their sources:

1. Labor supply model (DC or DDC), where job differentiation generates monopsony
2. Estimate reduced-form elasticities from data, using a quasi-experimental approach
3. Use moment conditions implied by (1) to decompose elasticities into their sources

Effects of elasticities (actual markdowns, pay gaps):

4. Regress pay gaps on elasticity differences and other explanatory variables

General procedure

Estimating elasticities and analyzing their sources:

1. Labor supply model (DC or DDC), where job differentiation generates monopsony
2. Estimate reduced-form elasticities from data, using a quasi-experimental approach
3. Use moment conditions implied by (1) to decompose elasticities into their sources

Effects of elasticities (actual markdowns, pay gaps):

4. Regress pay gaps on elasticity differences and other explanatory variables
5. For a set of models of firm behavior, find optimal markdowns, plug in elasticities from (2) to get predicted markdowns
6. Estimate actual markdowns via production function estimation
7. Compare predicted and actual markdowns, identify best model of firm behavior

Contents

Theoretical part – Intuition/general plan

1. Explain firm-level elasticities of labor supply for different racial groups

Potentially dynamic discrete-choice model $\rightarrow$ Sources of race-specific elasticities:

- Firm & industry differentiation
- Search frictions

Theoretical part – Intuition/general plan

1. Explain firm-level elasticities of labor supply for different racial groups

Potentially dynamic discrete-choice model → Sources of race-specific elasticities:

- Firm & industry differentiation
- Search frictions

2. Predict optimal markdowns of the firms, given the elasticities

In the spirit of Nevo (2001): a few alternative models of firm behavior, with different combinations of modifications to the standard assumption

Starting point: A Discrete Choice model (Sharma, 2023)

- Nested logit $\rightarrow$ Nests: region r, industry j, and firm k

Starting point: A Discrete Choice model (Sharma, 2023)

- Nested logit $\rightarrow$ Nests: region r, industry j, and firm k
- Within a region, utility of a worker i of race g working at firm j in industry k:

$$u_{igjk} = ln(w_{gj}) + ln(a_{gk}) + ln(a_{gj}) + \varepsilon_{igjk}$$

Starting point: A Discrete Choice model (Sharma, 2023)

- Nested logit $\rightarrow$ Nests: region r, industry j, and firm k
- Within a region, utility of a worker i of race g working at firm j in industry k:

$$u_{igjk} = ln(w_{gj}) + ln(a_{gk}) + ln(a_{gj}) + \varepsilon_{igjk}$$

- Firms are **vertically differentiated** by *amenities* (a_{gk}, a_{gj}) and *wages* (w_{gj})

Starting point: A Discrete Choice model (Sharma, 2023)

- Nested logit → Nests: region r, industry j, and firm k
- Within a region, utility of a worker i of race g working at firm j in industry k:

$$u_{igjk} = ln(w_{gj}) + ln(a_{gk}) + ln(a_{gj}) + \varepsilon_{igjk}$$

- Firms are **vertically differentiated** by *amenities* (a_{gk}, a_{gj}) and *wages* (w_{gj})
- ε_{igjk} has a nested Type-I GEV distribution

→ The distribution's scale parameters (which are allowed to be race-specific) capture **horizontal differentiation** of jobs, which creates monopsony power

- λ_g: Cross-region mobility
- θ_g: Cross-industry mobility
- η_g: Within industry, cross-employer mobility

▸ Further derivation

Bringing dynamics to the study of monopsony

What could dynamics add?

Bringing dynamics to the study of monopsony

What could dynamics add?

- Workers: Moving from a DC to a DDC model
  - When deciding to accept a new job, or quit a current job:
    Consider cost/benefits of searching while unemployed, relative to on-the-job search
  - Like in the durable goods case, workers are not in the market for a job all the time

Bringing dynamics to the study of monopsony

What could dynamics add?

- Workers: Moving from a DC to a DDC model
  - When deciding to accept a new job, or quit a current job:
    Consider cost/benefits of searching while unemployed, relative to on-the-job search
  - Like in the durable goods case, workers are not in the market for a job all the time

- Firms: Dynamic instead of static problem of labor demand
  - By hiring a worker: save expected costs of refilling that position next period – i.e. workers that are more likely to stick around may provide an additional, future benefit
  - Somewhat outside of our setting: Do dynamics enable collusion to keep wages low?

Alternative models of firm behavior

Firms are in a Cournot-type monopsonistic competition (a firm chooses quantity of a homogenous good, labor). $\rightarrow$ Wage in optimum:

$$w = \frac{\epsilon}{1+\epsilon} \times MRP_L$$

Alternative models of firm behavior

Firms are in a Cournot-type monopsonistic competition (a firm chooses quantity of a homogenous good, labor). $\rightarrow$ Wage in optimum:

$$w = \frac{\epsilon}{1+\epsilon} \times MRP_L$$

$\rightarrow$ Potential modifications:

- Firms see workers as differentiated "goods" ($\rightarrow$ taste-based discrimination)
- Wage-bargaining (e.g. bargaining power $\gamma \in [0, 1]$ for firms, $(1 - \gamma)$ for workers)
- Potentially a dynamic firm problem

Alternative models of firm behavior

Firms are in a Cournot-type monopsonistic competition (a firm chooses quantity of a homogenous good, labor). $\rightarrow$ Wage in optimum:

$$w = \frac{\epsilon}{1+\epsilon} \times MRP_L$$

$\rightarrow$ Potential modifications:

- Firms see workers as differentiated "goods" ($\rightarrow$ taste-based discrimination)
- Wage-bargaining (e.g. bargaining power $\gamma \in [0, 1]$ for firms, $(1 - \gamma)$ for workers)
- Potentially a dynamic firm problem

$\rightarrow$ Find optimal markdowns from each model, and compare to observed markdowns

Contents

Types of empirical approaches in the monopsony literature

1. Turnover-based, "indirect" approach, using steady state approximations:

Types of empirical approaches in the monopsony literature

1. Turnover-based, "indirect" approach, using steady state approximations:

$$\dot{L}(w) = R(w) - s(w)L(w) \quad \xrightarrow{\dot{L}(w) = 0} \quad L(w) = \frac{R(w)}{s(w)}$$

Types of empirical approaches in the monopsony literature

1. Turnover-based, "indirect" approach, using steady state approximations:

$$\dot{L}(w) = R(w) - s(w)L(w) \quad \xrightarrow{\dot{L}(w) = 0} \quad L(w) = \frac{R(w)}{s(w)}$$

- Then the elasticity of employment at the firm $\epsilon_{L,w}$ is:

$$\epsilon_{L,w} = \epsilon_{R,w} - \epsilon_{s,w}$$

Types of empirical approaches in the monopsony literature

1. Turnover-based, "indirect" approach, using steady state approximations:

$$\dot{L}(w) = R(w) - s(w)L(w) \quad \xrightarrow{\dot{L}(w) = 0} \quad L(w) = \frac{R(w)}{s(w)}$$

- Then the elasticity of employment at the firm $\epsilon_{L,w}$ is:

$$\epsilon_{L,w} = \epsilon_{R,w} - \epsilon_{s,w}$$

- In steady state, "quits and recruits are two sides of the same coin" (Manning, 2003)

$$\Rightarrow \quad \epsilon_{L,w} = 2\epsilon_{R,w} = -2\epsilon_{s,w}$$

Types of empirical approaches in the monopsony literature

1. Turnover-based, "indirect" approach, using steady state approximations:

$$\dot{L}(w) = R(w) - s(w)L(w) \quad \xrightarrow{\dot{L}(w) = 0} \quad L(w) = \frac{R(w)}{s(w)}$$

- Then the elasticity of employment at the firm $\epsilon_{L,w}$ is:

$$\epsilon_{L,w} = \epsilon_{R,w} - \epsilon_{s,w}$$

- In steady state, "quits and recruits are two sides of the same coin" (Manning, 2003)

$$\Rightarrow \quad \epsilon_{L,w} = 2\epsilon_{R,w} = -2\epsilon_{s,w}$$

$\rightarrow$ More straightforward to estimate.

Types of empirical approaches in the monopsony literature

1. Turnover-based, "indirect" approach, using steady state approximations:

$$\dot{L}(w) = R(w) - s(w)L(w) \quad \xrightarrow{\dot{L}(w) = 0} \quad L(w) = \frac{R(w)}{s(w)}$$

- Then the elasticity of employment at the firm $\epsilon_{L,w}$ is:

$$\epsilon_{L,w} = \epsilon_{R,w} - \epsilon_{s,w}$$

- In steady state, "quits and recruits are two sides of the same coin" (Manning, 2003)

$$\Rightarrow \quad \epsilon_{L,w} = 2\epsilon_{R,w} = -2\epsilon_{s,w}$$

→ More straightforward to estimate.

2. Direct approach, regressing firm's employment on wages

→ More demanding, requires firm-level demand shifters

Data

- We will link two rich sources of data
  1. Employer-employee linked data (RAIS)
     - Universe of formal employment in Brazil
  2. Customs records (SECEX customs data)
     - Establishment-level exports
- We are alternatively considering using U.S. data: the Longitudinal Employer-Household Dynamics (employer-employee) and CPS (household survey)

Basic empirical strategy

Use firm-level labor demand shock to estimate firm-specific labor supply elasticities

$$Y_{jt} = \beta_t \text{Demand shock}_j + FE + \upsilon_{jt}$$

- Y_{jt} is wages or employment in firm j in period t

Basic empirical strategy

Use firm-level labor demand shock to estimate firm-specific labor supply elasticities

$$Y_{jt} = \beta_t \text{Demand shock}_j + FE + \upsilon_{jt}$$

- Y_{jt} is wages or employment in firm j in period t

$\rightarrow$ Dynamic DiD strategy to identify the exogenous effect of the demand shifter on wages and employment

- Goal: Compare treated Black (white) workers with their control counterparts

Identification: what are the demand shocks?

Export-driven, firm-specific shock to wages

Identification: what are the demand shocks?

Export-driven, firm-specific shock to wages

- **Continuous** version (Amodio and De Roux, 2024)

$$E_{jt} = \sum_{d} \underbrace{S_{jdt-1}}_{= \frac{X_{jdt-1}}{\sum_d X_{jdt-1}}} \times \underbrace{R_{dt}}_{= R^{\text{n}}_{dt} \frac{CPI_{dt}}{CPI^{\text{br}}_{t}}}$$

R_{dt} : Real exchange rate between Brazilian Real and the foreign currency of d (shock)

S_{jdt-1} : Previous year share of firm j's exports to country d (measure of exposure to shock)

Identification: what are the demand shocks?

Export-driven, firm-specific shock to wages

- **Continuous** version (Amodio and De Roux, 2024)

$$E_{jt} = \sum_d \underbrace{S_{jdt-1}}_{=\frac{X_{jdt-1}}{\sum_d X_{jdt-1}}} \times \underbrace{R_{dt}}_{=R^{\text{n}}_{dt}\frac{CPI_{dt}}{CPI^{\text{br}}_t}}$$

R_{dt} : Real exchange rate between Brazilian Real and the foreign currency of d (shock)

S_{jdt-1} : Previous year share of firm j's exports to country d (measure of exposure to shock)

- **Discrete** version
  - Define D_j: treatment indicator equal to 1 if a worker's baseline employer exports more than 50% of its total export value to a d with a depreciated real exchange rate

Identification: what are the demand shocks?

Export-driven, firm-specific shock to wages

- **Continuous** version (Amodio and De Roux, 2024)

$$E_{jt} = \sum_{d} \underbrace{S_{jdt-1}}_{= \frac{X_{jdt-1}}{\sum_d X_{jdt-1}}} \times \underbrace{R_{dt}}_{= R^{n}_{dt} \frac{CPI_{dt}}{CPI^{br}_{t}}}$$

R_{dt} : Real exchange rate between Brazilian Real and the foreign currency of d (shock)

S_{jdt-1} : Previous year share of firm j's exports to country d (measure of exposure to shock)

- **Discrete** version
  - Define D_j: treatment indicator equal to 1 if a worker's baseline employer exports more than 50% of its total export value to a d with a depreciated real exchange rate
- Potential issue: exclusion restriction, wage spillovers (Berger et al., 2022a; Sharma, 2023)
  - Compare our estimates in textile and clothing with Sharma (2023)

Identification: what are the demand shocks?

Export-driven, firm-specific shock to wages

- **Continuous** version (Amodio and De Roux, 2024)

$$E_{jt} = \sum_d \underbrace{S_{jdt-1}}_{= \frac{X_{jdt-1}}{\sum_d X_{jdt-1}}} \times \underbrace{R_{dt}}_{= R^{\text{n}}_{dt} \frac{CPI_{dt}}{CPI^{\text{br}}_t}}$$

R_{dt} : Real exchange rate between Brazilian Real and the foreign currency of d (shock)

S_{jdt-1} : Previous year share of firm j's exports to country d (measure of exposure to shock)

- **Discrete** version
  - Define D_j: treatment indicator equal to 1 if a worker's baseline employer exports more than 50% of its total export value to a d with a depreciated real exchange rate
- Potential issue: exclusion restriction, wage spillovers (Berger et al., 2022a; Sharma, 2023)
  - Compare our estimates in textile and clothing with Sharma (2023)
- Moreover: Informal employment

Estimating the elasticities – discrete treatment example

- Sharma (2023) uses a trade shock to specific parts of the Brazilian textile industry
- Treatment indicator $D_j = 1$ means the firm was affected by the shock

Estimating the elasticities – discrete treatment example

- Sharma (2023) uses a trade shock to specific parts of the Brazilian textile industry
- Treatment indicator $D_j = 1$ means the firm was affected by the shock

- For each race g, estimate these models and compute the labor supply elasticity:

$$\Delta \ln(n)_{jg} = \alpha_1 D_j + \alpha_2 D_j s_{jg} + \alpha_3 s_{ig} + FE + \nu_{jg}$$
$$\Delta \ln(w)_{jg} = \beta_1 D_j + \beta_2 D_j s_{jg} + \beta_3 s_{jg} + FE + \eta_{jg}$$

Estimating the elasticities – discrete treatment example

- Sharma (2023) uses a trade shock to specific parts of the Brazilian textile industry
- Treatment indicator $D_j = 1$ means the firm was affected by the shock

- For each race g, estimate these models and compute the labor supply elasticity:

$$\Delta \ln(n)_{jg} = \alpha_1 D_j + \alpha_2 D_j s_{jg} + \alpha_3 s_{ig} + FE + \nu_{jg}$$
$$\Delta \ln(w)_{jg} = \beta_1 D_j + \beta_2 D_j s_{jg} + \beta_3 s_{jg} + FE + \eta_{jg}$$

$$\Rightarrow \widehat{\epsilon}_{gj} = \frac{\Delta \widehat{\ln(n)}_{jg}(s_{jg}, s_{kg})}{\Delta \widehat{\ln(w)}_{jg}(s_{jg}, s_{kg})} = \frac{\widehat{\alpha}_1 + \widehat{\alpha}_2 s_{jg}}{\widehat{\beta}_1 + \widehat{\beta}_2 s_{jg}}$$

Additional empirical exercises

Additional empirical exercises

- Estimate elasticities at multiple points in time $\rightarrow$ would make us the first to study how potential monopsonistic discrimination evolved **over time**!
  - Need to divide our sample, e.g. by decade, and estimate separately
  - Could allow us to speak to historical patterns of discrimination (Derenoncourt and Montialoux, 2021; Derenoncourt et al., 2024).

Additional empirical exercises

- Estimate elasticities at multiple points in time → would make us the first to study how potential monopsonistic discrimination evolved **over time**!
  - Need to divide our sample, e.g. by decade, and estimate separately
  - Could allow us to speak to historical patterns of discrimination (Derenoncourt and Montialoux, 2021; Derenoncourt et al., 2024).

- Re-estimate elasticities with the turnover-based, indirect approach and compare → methodological contribution

Additional empirical exercises

- Estimate elasticities at multiple points in time → would make us the first to study how potential monopsonistic discrimination evolved **over time**!
  - Need to divide our sample, e.g. by decade, and estimate separately
  - Could allow us to speak to historical patterns of discrimination (Derenoncourt and Montialoux, 2021; Derenoncourt et al., 2024).

- Re-estimate elasticities with the turnover-based, indirect approach and compare → methodological contribution

- Wage regression including elasticities as covariates → decomposition of pay gaps into shares attributable to monopsony vs. other sources (see also Gerard et al. (2021))

Theoretical vs. observed markdowns

- Production function estimation to find actual markdowns by race
  - Well-developed literature is available for this (overview: De Loecker and Syverson (2021)), so this approach is more common than using proxies for MRP_L (Syverson, 2024)
  - Notable papers estimating markdowns: Yeh et al. (2022); Amodio et al. (2024)

Theoretical vs. observed markdowns

- Production function estimation to find actual markdowns by race
  - Well-developed literature is available for this (overview: De Loecker and Syverson (2021)), so this approach is more common than using proxies for MRP_L (Syverson, 2024)
  - Notable papers estimating markdowns: Yeh et al. (2022); Amodio et al. (2024)

- Similar to Nevo (2001), compare to markdowns predicted by our models of firm behavior, trying to single out one that works best

$\rightarrow$ Could help to decompose discrimination into the different mechanisms (monopsony, taste-based, etc.)

Contents

Conclusion

- IO tools can advance our understanding of market power in labor markets
- Monopsony might be the missing puzzle piece in the study of racial inequality

Conclusion

- IO tools can advance our understanding of market power in labor markets
- Monopsony might be the missing puzzle piece in the study of racial inequality
- We provide the first direct assessment of monopsony's role in racial pay gaps. For the first time modeling and estimating elasticity differences AND the actually resulting markdowns.

Conclusion

- IO tools can advance our understanding of market power in labor markets
- Monopsony might be the missing puzzle piece in the study of racial inequality
- We provide the first direct assessment of monopsony's role in racial pay gaps. For the first time modeling and estimating elasticity differences AND the actually resulting markdowns.
- Additional options that we are considering for this paper include:
  - Adding dynamics
  - Methodological contribution: Comparing "direct" (IO-based) and "indirect" (turnover-based) estimation approaches
  - Both race and gender, to see how they are different
  - Using US data
  - Theoretically explaining *persistency* of discrimination

Thank you!

The missing puzzle piece for racial discrimination?
On labor market power and whether it drives inequality

Freddy Bachmann
Carlo Lombardo

Twitter & Bluesky: @FredBachmann

Email: Lb746@cornell.edu

Starting point: A Discrete Choice model (Sharma, 2023)

Back

- For a worker of race g, the **probability of choosing to work at firm** j (in industry k and in region r) is:

$$p_{gj} = \underbrace{\frac{(a_{gj} w_{gj})^{1+\eta_g}}{\sum_{j' \in k} \left(a_{gj'} w_{gj'}\right)^{1+\eta_g}}}_{\text{choice prob. for firm } j} \times \underbrace{\frac{a_{kg}^{1+\theta_g} \left(\sum_{j \in k} (a_{gj} w_{gj})^{1+\eta_g}\right)^{\frac{1+\theta_g}{1+\eta_g}}}{\sum_{k' \in R} a_{k'g}^{1+\theta_g} \left(\sum_{j \in k'} (a_{gj} w_{gj})^{1+\eta_g}\right)^{\frac{1+\theta_g}{1+\eta_g}}}}_{\text{choice prob. for industry } k} \times \underbrace{\frac{\bar{W}_{gr}^{1+\lambda_g}}{\sum_{R'} \bar{W}_{gr'}^{1+\lambda_g}}}_{\text{choice prob. region } r}$$

Starting point: A Discrete Choice model (Sharma, 2023)

Back

- For a worker of race g, the **probability of choosing to work at firm** j (in industry k and in region r) is:

$$p_{gj} = \underbrace{\frac{(a_{gj} w_{gj})^{1+\eta_g}}{\sum_{j' \in k} \left(a_{gj'} w_{gj'}\right)^{1+\eta_g}}}_{\text{choice prob. for firm } j} \times \underbrace{\frac{a_{kg}^{1+\theta_g} \left(\sum_{j \in k} (a_{gj} w_{gj})^{1+\eta_g}\right)^{\frac{1+\theta_g}{1+\eta_g}}}{\sum_{k' \in R} a_{k'g}^{1+\theta_g} \left(\sum_{j \in k'} (a_{gj} w_{gj})^{1+\eta_g}\right)^{\frac{1+\theta_g}{1+\eta_g}}}}_{\text{choice prob. for industry } k} \times \underbrace{\frac{\bar{W}_{gr}^{1+\lambda_g}}{\sum_{R'} \bar{W}_{gr'}^{1+\lambda_g}}}_{\text{choice prob. region } r}$$

$\rightarrow$ Aggregate over workers to get the **group-specific labor supply to a firm** j:

$$n_{gjkr} = \left(\frac{w_{gjkr}}{\bar{W}_{kgr}}\right)^{\eta_g} \left(\frac{\bar{W}_{kgr}}{\bar{W}_{gr}}\right)^{\theta_g} \left(\frac{\bar{W}_{gr}}{\bar{W}_{g}}\right)^{\lambda_g} a_{gjkr}^{1+\eta_g} a_{gk}^{1+\theta_g} N_g$$

where $\bar{W}_{kgr}, \bar{W}_{gr}, \bar{W}_g$ are amenity-adjusted wage indices.

Bibliography I

Amodio, F., Brancati, E., Brummund, P., de Roux, N., and Maio, M. D. (2024). Global labor market power. IZA Discussion Paper 16823, IZA Institute of Labor Economics. Accessed: 2024-12-01.

Amodio, F. and De Roux, N. (2024). Measuring labor market power in developing countries: evidence from colombian plants. *Journal of Labor Economics*, 42(4):949–977.

Arrow, K. (1971). The Theory of Discrimination. Working Paper 403, Princeton University, Department of Economics, Industrial Relations Section.

Azar, J. A., Berry, S. T., and Marinescu, I. (2022). Estimating Labor Market Power. *NBER Working Papers*, null(30287-30410):1–58.

Barth, E. and Dale-Olsen, H. (2009). Monopsonistic discrimination, worker turnover, and the gender wage gap. *Labour Economics*, 16(5):589–597.

Bassier, I., Dube, A., and Naidu, S. (2021). Monopsony in movers: The elasticity of labor supply to firm wage policies. *Journal of Human Resources*.

Becker, G. S. (1957). *The economics of discrimination*. Economics research studies of the Economics Research Center of the University of Chicago. Univ. of Chicago Press, Chicago, Ill.

Berger, D., Herkenhoff, K., Kostøl, A. R., and Mongey, S. (2024). An anatomy of monopsony: Search frictions, amenities, and bargaining in concentrated markets. *NBER Macroeconomics Annual*, 38(1):1–47.

Bibliography II

Berger, D., Herkenhoff, K., and Mongey, S. (2022a). Labor market power. *American Economic Review*, 112(4):1147–1193.

Berger, D. W., Herkenhoff, K. F., and Mongey, S. (2022b). Minimum wages, efficiency and welfare. Technical Report w29662, National Bureau of Economic Research.

Black, D. A. (1995). Discrimination in an Equilibrium Search Model. *Journal of Labor Economics*, 13(2):309–334. Publisher: [University of Chicago Press, Society of Labor Economists, NORC at the University of Chicago].

Bronfenbrenner, M. (1956). Potential monopsony in labor markets. *ILR Review*, 9(4):577–588.

Burdett, K. and Mortensen, D. T. (1998). Wage differentials, employer size, and unemployment. *International Economic Review*, 39(2):257–273. Publisher: [Economics Department of the University of Pennsylvania, Wiley, Institute of Social and Economic Research, Osaka University].

De Loecker, J. and Syverson, C. (2021). An industrial organization perspective on productivity. In *Handbook of industrial organization*, volume 4, pages 141–223. Elsevier.

Derenoncourt, E. (2022). Can you move to opportunity? evidence from the great migration. *American Economic Review*, 112(2):369–408.

Bibliography III

Derenoncourt, E., Kim, C. H., Kuhn, M., and Schularick, M. (2024). Wealth of two nations: The u.s. racial wealth gap, 1860–2020. *The Quarterly Journal of Economics*, 139(2):693–750.

Derenoncourt, E. and Montialoux, C. (2021). Minimum wages and racial inequality. *The Quarterly Journal of Economics*, 136(1):169–228.

Gerard, F., Lagos, L., Severnini, E., and Card, D. (2021). Assortative matching or exclusionary hiring? the impact of employment and pay policies on racial wage differences in brazil. *American Economic Review*, 111(10):3418–3457.

Hirsch, B., Schank, T., and Schnabel, C. (2010). Differences in labor supply to monopsonistic firms and the gender pay gap: An empirical analysis using linked employer-employee data from germany. *Journal of Labor Economics*, 28(2):291–330.

Kroft, K., Luo, Y., Mogstad, M., and Setzler, B. (2020). Imperfect competition and rents in labor and product markets: The case of the construction industry. Working Paper 27325, National Bureau of Economic Research.

Lang, K. and Lehmann, J.-Y. K. (2012). Racial Discrimination in the Labor Market: Theory and Empirics. *Journal of Economic Literature*, 50(4):959–1006.

Manning, A. (2003). *Monopsony in motion: imperfect competition in labor markets*. Princeton University Press, Princeton, N.J.

Bibliography IV

Manning, A. (2021). Monopsony in labor markets: A review. *ILR Review*, 74(1):3–26.

Nevo, A. (2001). Measuring market power in the ready-to-eat cereal industry. *Econometrica*, 69(2):307–342.

Phelps, E. S. (1972). The Statistical Theory of Racism and Sexism. *The American Economic Review*, 62(4):659–661. Publisher: American Economic Association.

Ransom, M. and Oaxaca, R. (2010). New Market Power Models and Sex Differences in Pay. *Journal of Labor Economics*, 28(2):267–289.

Robinson, J. (1933). *The economics of imperfect competition*. Macmillan.

Sharma, G. (2023). Monopsony and gender. *Working paper*.

Sokolova, A. and Sorensen, T. (2021). Monopsony in labor markets: A meta-analysis. *ILR Review*, 74(1):27–55.

Syverson, C. (2024). Markups and markdowns. Working Paper 32871, National Bureau of Economic Research.

Webber, D. A. (2015). Firm market power and the earnings distribution. *Labour Economics*, 35:123–134.

Yeh, C., Macaluso, C., and Hershbein, B. (2022). Monopsony in the us labor market. *American Economic Review*, 112(7):2099–2138.