

Labor Economics, Week 4
Wage inequality, labor demand,
Competitive model, and monopsony

Maximilian Kasy

Department of Economics, Oxford University

Takeaways for week 3 - Labor demand

1) Estimating labor demand



Roadmap

Estimating labor demand

Minimum wages

Monopsony

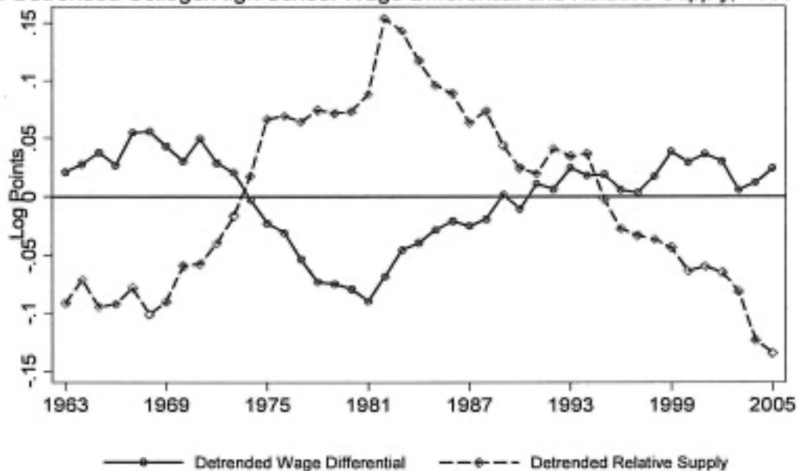
- ▶ Earned income is the largest source of household incomes (ca. 60%).
- ▶ ⇒ Wage inequality matters for income inequality.
- ▶ Many factors might affect the wage distribution:
 1. Labor **supply** of different “types” of workers
 - 1.1 Education
 - 1.2 Demographic change
 - 1.3 Migration
 2. Labor **demand**
 - 2.1 Technology
 - 2.2 Trade
 3. **Institutions** and policy
 - 3.1 Collective bargaining
 - 3.2 Social norms
 - 3.3 Minimum wages
 - 3.4 Tax system

What is the impact of labor supply on wages?

Large, controversial literatures on:

- ▶ What is the impact of immigration on native wage inequality?
- ▶ What is the impact of expanding / stagnating access to higher education on wage inequality?

A. Detrended College/High School Wage Differential and Relative Supply, 1963–2005



Setup

- ▶ Types of workers $j = 1, \dots, J$
by level of education, country of birth, ...
- ▶ Cross-section of labor markets $i = 1, \dots, n$
e.g., metropolitan areas
(some papers: time series $t = 1, \dots, T$, or panel i, t)
- ▶ Wages w_{ij}
- ▶ Labor supply N_{ij}

A typical regression

- ▶ Many papers estimate regressions such as:

$$\log \left(\frac{w_j}{w_{j'}} \right) = \text{controls} + \beta \cdot \log \left(\frac{N_j}{N_{j'}} \right) + \varepsilon_{j,j'},$$

- ▶ possibly instrumenting for labor supply.
- ▶ We will discuss economic models justifying this regression.
- ▶ But don't need to believe models for general interpretation!

Questions for you

Interpret this regression.

What is the meaning of β ?

Assumption 1

- ▶ Output Y_i in region i is described by an aggregate production function:

$$Y_i = f_i(N_{i1}, \dots, N_{iJ}).$$

- ▶ Marginal productivity theory of wages:

$$w_{ij} = \frac{\partial f_i(N_{i1}, \dots, N_{iJ})}{\partial N_{ij}}$$

- ▶ Justified by competitive, profit maximizing firms

Reasons marginal productivity theory might not hold

- ▶ If effort / the qualification of applicants depend on wages, employers will not set wage = marginal productivity.
- ▶ If employers face upward sloping labor supply (search frictions!) they depress wages below marginal productivity, acting as a “monopsony.”
- ▶ With search frictions, there is match specific surplus, leaving room for bargaining.
- ▶ Who knows what the marginal productivity is, esp. in large, complex firms?
- ▶ Social norms for remuneration.
- ▶ Collective bargaining.
- ▶ Labor markets do not clear.
- ▶ ...

Assumption 2

- ▶ Constant elasticity of substitution (CES) production function:

$$f_i(N_{i1}, \dots, N_{iJ}) = \left(\sum_{j=1}^J \gamma_j N_{ij}^\rho \right)^{1/\rho}$$

- ▶ Restricts the way different types of labor interact
- ▶ $\rho - 1$: “inverse elasticity of substitution”
(we will see why)
- ▶ γ : type-specific productivity

Questions for you

- ▶ Combine assumptions 1 and 2 to derive w_{ij} .
- ▶ Take the ratio of w_{ij} and $w_{ij'}$.
- ▶ Take logarithms on both sides of the equation.

Answer: The wage equation

- ▶ Combining assumptions 1 and 2:

$$w_{ij} = \frac{\partial f_i(N_{i1}, \dots, N_{iJ})}{\partial N_{ij}} = \left(\sum_{j'=1}^J \gamma_j N_{ij'}^\rho \right)^{1/\rho-1} \cdot \gamma_j \cdot N_j^{\rho-1}$$

- ▶ Taking ratios:

$$\frac{w_{ij}}{w_{ij'}} = \frac{\gamma_j}{\gamma_{j'}} \cdot \left(\frac{N_{ij}}{N_{ij'}} \right)^{\rho-1}$$

- ▶ Taking logs:

$$\log \left(\frac{w_j}{w_{j'}} \right) = \log \left(\frac{\gamma_j}{\gamma_{j'}} \right) + \beta_0 \cdot \log \left(\frac{N_j}{N_{j'}} \right),$$

where $\beta_0 = \rho - 1$.

Aside: Capital, labor, and the long run evolution of capitalism

- ▶ Aggregate production functions show up in many debates
- ▶ More general form with capital goods K , technology A :

$$Y = f(N_1, \dots, N_J, K_1, \dots, K_M, A)$$

- ▶ Wages and rates of return:

$$w_j = \frac{\partial f}{\partial N_j}$$

$$r_m = \frac{\partial f}{\partial K_m}$$

- ▶ Wealth (market value of capital), given interest rate r :

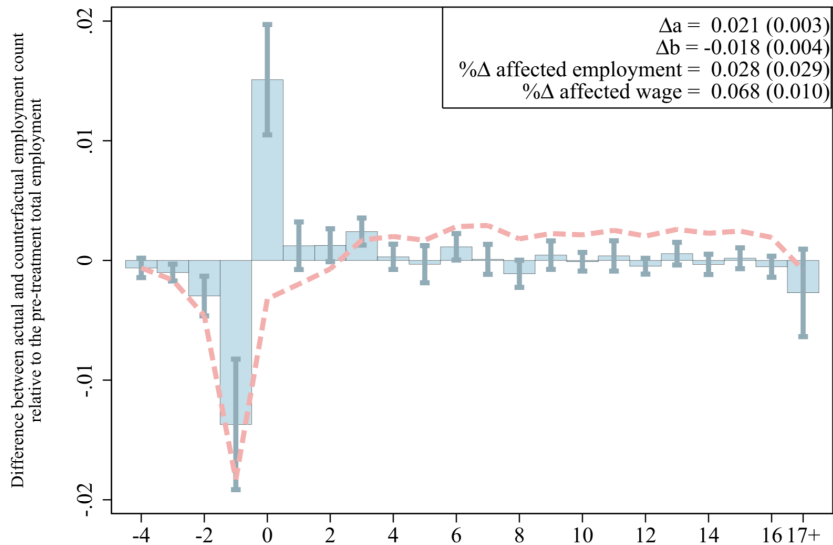
$$\sum_m \frac{r_m}{r} \cdot K_m$$

Long standing debates

- ▶ Does technical change lead to increased inequality?
- ▶ What's the distributional impact of international trade / globalization?
- ▶ Does the production function *determine* wages and profits, or leave room for power / collective action?
- ▶ What is the relationship between capital and wealth (capital times market prices)?
- ▶ Does an increase in K lead to a fall in profit rates?
cf. Marxist discussions about capitalist crises, imperialism.
Answer depends on elasticities of substitution, technical change.

References

- ▶ Impact of migration:
Card, D. (2009). Immigration and inequality. The American Economic Review, 99(2):1–21.
- ▶ Domestic migration of African Americans:
Boustan, L. P. (2009). Competition in the promised land: Black migration and racial wage convergence in the north, 1940–1970. The Journal of Economic History, 69(03):755–782.
- ▶ Technical change:
Autor, D. H., Katz, L. F., and Kearney, M. S. (2008). Trends in US wage inequality: Revising the revisionists. The Review of Economics and Statistics, 90(2):300–323.



References

- ▶ Cengiz, D., Dube, A., Lindner, A., and Zipperer, B. (2019). *The Effect of Minimum Wages on Low-Wage Jobs*. *The Quarterly Journal of Economics*, 134(3):1405–1454
- ▶ Council of Economic Advisers (2016). *Labor market monopsony: Trends, consequences, and policy responses*. Council of Economic Advisers Issue Brief, October 2016
- ▶ Boal, W. M., Ransom, M. R., et al. (1997). *Monopsony in the labor market*. *Journal of economic literature*, 35(1):86–112