

Trends in US Wage inequality: Revising the Revisionists

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BACKGROUND

- ▶ **Motivation:** Wage differentials rose since 1980s.
Data: U.S. CPS Data 1963-2005. Full-time, full-year workers.
Regarding 1980s, **two views on why:** “Classic” and “Revisionists”

- ▶ **“Classics”:** (Autor, Katz, Goldin, Card pre-2001, Acemoglu)
 1. Mainly, **Shift in supply/demand for skills.**
Secular \uparrow demand for skill + \downarrow supply growth of college workers.
 2. But also \downarrow institutions protecting low-wage workers.

- ▶ **“Revisionists”:** (Card and DiNardo, 2002; Lemieux, 2006)
 1. **1980s:** \downarrow **Real minimum wage** \rightarrow A one-time episode.
 2. **1980+:** *Mechanical effect* of **changing labor force composition** (\uparrow education, experience).

- ▶ **Objective:** Reevaluate explanations, but over 1963-2005.

OUTLINE

- 1 Basic Trends
- 2 Reevaluating “Classics” and “Revisionists”
- 3 A possible improvement

BASIC TRENDS: OVERALL WAGE INEQUALITY

Figure 1: Change in Log Real Weekly Wage by percentile, 1963-2005.



- ▶ **↑Overall wage inequality:** *90pct rose by 55% more than 10pct.*

BASIC TRENDS: OVERALL, BETWEEN-GROUP AND WITHIN-GROUP

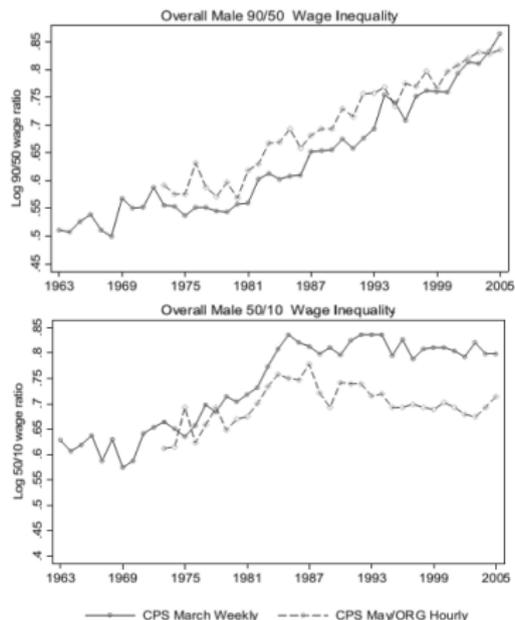
- ▶ **Between:** Compare two groups over time.
- ▶ **Within:** Residual variation within small groups.

Figure 2: Three measure of inequality, 1963-2005.



BASIC TRENDS: TOP VS BOTTOM INEQUALITY

Figure 3: 90/50 and 50/10 hourly and weekly wage inequality.



- ▶ **Pre-1980s:** Top and Bottom inequality increase.
- ▶ **Post-1980s:** Top inequality increases but bottom does not.

BASIC TRENDS:

- ▶ ↑ **Overall** wage inequality: 90th pct rise by 55% more than 10th.
But we see divergences when we look deeper.
- ▶ **Divergent paths** for different types of inequality:
 - ▶ Between-Group and Within-Group inequality rise since 1980s.
 - ▶ **1960s:** ↑College premium but overall inequality is “flat”.
 - ▶ **1970s:** ↑Overall and residual, but ↓college premium.
- ▶ **Bottom and Top Inequality move differently.**
 - ▶ **Pre-1980s:** Top and Bottom inequality increase.
 - ▶ **Post-1980s:** Top inequality increases but bottom does not.
→ Bottom might be secular, but top does not seem to be.
Inequality in 90/50 grew at about 1 log point per year, making 80% of total.

So, what can explain this? Now we look at **proximate causes**.

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“CLASSIC” CAUSES: CONCEPTUAL FRAMEWORK (KATZ AND MURPHY, 1992)

Assume **CES prod. func. with two factors**: college c and HS h .

$$Q_t = \left[\alpha_t (a_t N_{ct})^\rho + (1 - \alpha_t) (b_t N_{ht})^\rho \right]^{1/\rho}$$

where

- ▶ a_t, b_t represent labor augmenting technological change.
- ▶ $\alpha_t \approx$ indexing share of work allocated to skilled labor.
- ▶ $\sigma = \frac{1}{1-\rho}$ is agg elasticity of substitution.
Note: **Skill-Biased Technical Change** $\Leftrightarrow \uparrow a_t/b_t$ or $\uparrow \alpha_t$.

A competitive equilibrium **implies**:

$$\begin{aligned} \ln(w_{ct}/w_{ht}) &= \ln[\alpha_t/(1 - \alpha_t)] + \rho \ln(a_t/b_t) - (1/\sigma) \ln(N_{ct}/N_{ht}) \\ &= (1/\sigma) [D_t - \ln(N_{ct}/N_{ht})] \end{aligned}$$

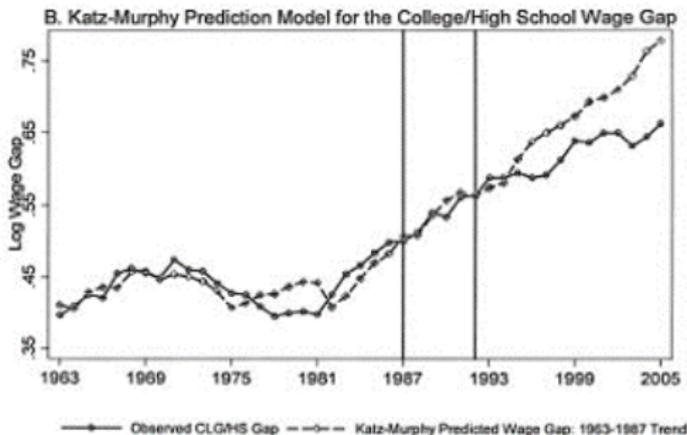
where D_t **indexes the relative demand shifts favoring college**.

\Rightarrow **Replace** this unobservable by **time trend and measure of cycles**.

“CLASSIC” CAUSES: TWO-FACTOR MODEL

$$\ln(w_{ct}/w_{ht}) = \gamma_0 + \gamma_1 t + \gamma_2 \ln(N_{ct}/N_{ht}) + \gamma_3 (\text{RealMinWage}_t) + \gamma_4 \text{Unemp}_t + \epsilon_t$$

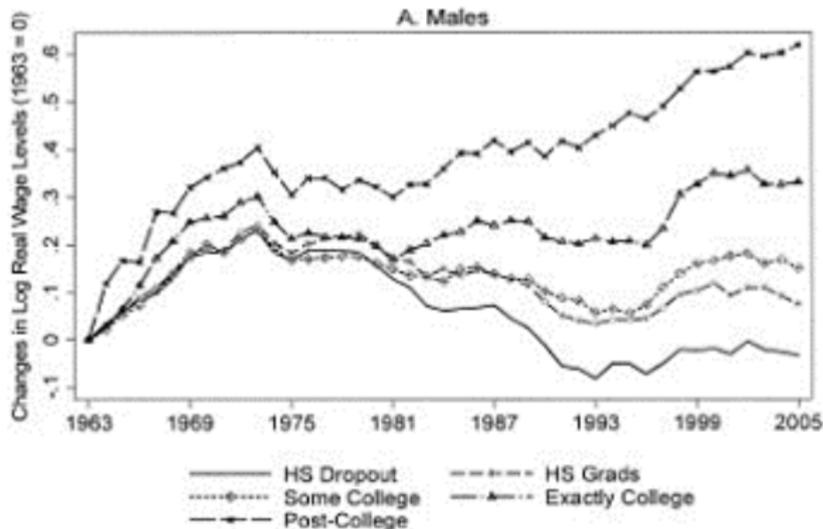
Figure 4: Pre-1987 prediction vs Observed.



- ▶ Good until 1992. **Slowdown demand growth for college?**
- ▶ **Min wage** or Unemployment don't add explanatory power.

“CLASSIC” CAUSES: CLOSER LOOK ⇒ POLARIZATION

Figure 5: Wage trends by Education.



- ▶ Post-college/HS gap rose rapidly and monotonically from 1980.
- ▶ College/HS gap rose much slower.
- ▶ HS/Dropouts first increased, then flattened.

⇒ **TWO factor model cannot explain polarization.**

“REVISIONISTS” CAUSES: MINIMUM WAGE

- ▶ There is a striking time series relationship between **real minimum wage and hourly wage inequality** (Card and DiNardo, 2002).

Figure 6: Real Minimum Wage and Hourly Wage Differentials.



- ▶ But this relation is **present also in 90/50 inequality**, which seems directly unrelated to minimum wage...

⇒ suggests **spurious relation**.

“REVISIONISTS” CAUSES: COMPOSITION VS PRICES

Composition Effect Argument (Lemieux, 2006):

- ▶ **Educational** attainment and **experience** have increased substantially since 1970s.
Example: college workers from 20% in 1973 to 33% in 2005.
- 1 **Earnings trajectories fan out** as workers gain experience.
- 2 **Hourly wage dispersion of college graduates** is higher than for less educated workers.

⇒ **Mechanically** increase dispersion:

↑ share of experienced or educated ⇒ ↑ divergence.

“REVISIONISTS” CAUSES: COMPOSITION VS PRICES

Without taking into account general equilibrium effects, we can:

1. **Decompose density of wages** into: a “price” function and a “composition” function with density of attributes.

$$f(w|T = t) = \int g(w|x, T = t) h(x|T = t)$$

2. **Simulate** (by reweighing) **hypothetical case** where price changes but composition does not.

Find:

- ▶ **Composition-constant inequality** rise is at least 65% of **top inequality** unadjusted change. Usually much more.
- ▶ Both expansion and compression of **lower-tail inequality** are **largely explained by price changes**.
Composition effect goes opposite way actually.
- ▶ *Why can composition can explain well 90/10?*
It **over-generates** ineq in 50/10 and **under-generates** it in 90/50.

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TWISTING THE TWO-FACTOR MODEL: WHAT EXPLAINS POLARIZATION?

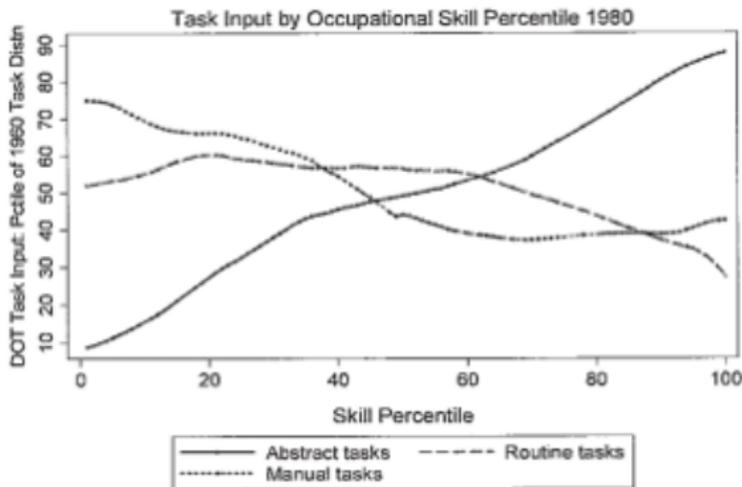
Canonical supply-demand model with two factors failed.

Focus on tasks instead of skill,

Computerization: \uparrow Abstract, \downarrow Routine, \approx Manual.

\Rightarrow *non-monotone impact throughout earnings distribution.*

Figure 6: Task intensity by Skill.



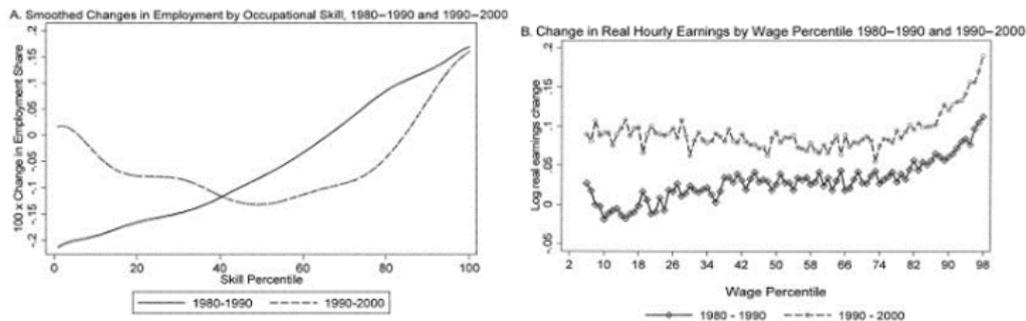
Note: Routine tasks mainly on 20th to 60th percentile.

(BASIC) TEST OF COMPUTERIZATION IDEA

Computerization \Rightarrow \uparrow **relative demand for both** high- and low-skill tasks.

*If demand driven, expect earnings levels and employment changes by skill level to **positively covary** in both decades.*

Figure 7: Change in occupation's share and real hourly earnings.



- ▶ Both Monotone (1980s) and U-shape (1990s) in two decades.
- ▶ Regression gives coefficient of ≈ 3 in two decades.
 \Rightarrow **Demand-side might explain** monotone rise and polarization.

CONCLUSION

- ▶ Overall, Between-Groups and Within-Groups **wage differentials increased** since 1960s.
- ▶ Changes in the **real minimum wage** or the **composition** of workers do NOT explain it.
- ▶ A simple **two-factor supply-demand model** cannot either because of the recent polarization in wages.
⇒ But **modifying** to cover **different types of tasks** can help.

*Then, a **shift in the task-demand** (1990+ computerization) might reconcile observables with supply-demand model.*