Trends in US Wage inequality: Revising the Revisionists

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Background

- **Motivation:** Wage differentials rose since 1980s.
  Regarding 1980s, **two views on why:** “Classic” and “Revisionists”

  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.
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.*
Outline

1. Basic Trends

2. Reevaluating “Classics” and “Revisionists”

3. A possible improvement
“Classical” 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** ⇔ \( \uparrow a_t / b_t \) or \( \uparrow \alpha_t \).

A competitive equilibrium implies:

\[
\ln \left( \frac{w_{ct}}{w_{ht}} \right) = \ln \left[ \frac{\alpha_t}{(1 - \alpha_t)} \right] + \rho \ln \left( \frac{a_t}{b_t} \right) - \left( \frac{1}{\sigma} \right) \ln \left( \frac{N_{ct}}{N_{ht}} \right)
\]

\[
= \left( \frac{1}{\sigma} \right) \left[ D_t - \ln \left( \frac{N_{ct}}{N_{ht}} \right) \right]
\]

where \( D_t \) indexes the relative demand shifts favoring college.

⇒ Replace this unobservable by time trend and measure of cycles.
"Classic" Causes: Two-Factor Model

\[
\ln \left( \frac{w_{ct}}{w_{ht}} \right) = \gamma_0 + \gamma_1 t + \gamma_2 \ln \left( \frac{N_{ct}}{N_{ht}} \right) + \gamma_3 (\text{RealMinWage}_t) + \gamma_4 \text{Unemp}_t + \epsilon_t
\]

Figure 4: Pre-1987 prediction vs Observed.

- Good until 1992. **Slowdown demand growth for college?**
- **Min wage** or Unemployment don’t add explanatory power.
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.
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.
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.
1 Basic Trends
2 Reevaluating “Classics” and “Revisionists”
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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:** ↑ Abstract, ↓ Routine, ≈ Manual.

⇒ *non-monotone impact throughout earnings distribution.*

**Figure 6:** Task intensity by Skill.

![Task intensity by Skill](image)

Note: Routine tasks mainly on 20th to 60th percentile.
Computerization ⇒ \( \uparrow \) 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 \( \approx 3 \) 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.