U.S. Earnings Dynamics: Inequality, Volatility, and Mobility

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Background

- There are several existing sources of statistics on income inequality (two are highlighted below)
  - Census Bureau’s Annual Report on Poverty and Income
  - IRS Statistics of Income reports and studies
- Most statistics are household based, use all income, and do not focus on labor earnings
- Information on the income distribution is available at the national level, while measures of the center of the distribution are available at the local level.
- We would like to release local area (county/MSA) estimates of individual real labor earnings inequality.
Background (continued)

- National earnings dynamics trends (past 20 years)
  - Increasing earnings inequality
    - Increase in the point in time distribution of annual earnings
  - Reduced worker earnings mobility
    - Reduced large changes in annual earnings across time (except during recessions)
  - Reduced worker earnings volatility
    - Reduced dispersion in the changes in annual earnings across time
LEHD Data is “Found”

- Although a reliable national jobs frame, LEHD data is not designed to be a reliable worker frame.
- A job should appear in LEHD data if the firm is covered by the state Unemployment Insurance system, except:
  - Not all firms are covered (about 90% of NIPA W&S data)
  - State entry occurs sporadically over 15 years
  - Earnings are filed using inconsistent/incorrect person identifiers
- For the purpose of measuring individual earnings inequality, jobs must be assigned to a worker.
- We create a reliable national worker frame by using only jobs associated with an “eligible worker”
What are Eligible Workers?

- We use the SSA Numident (list of officially issued SSN’s) to create a consistent frame of persons eligible to work every year.
- Combine the annual list of eligible workers with the same year LEHD jobs data to determine active status:
  - Include earnings from all jobs during the year if fewer than 12 jobs are reported, zero otherwise.
- Workers (“immigrant candidates”) on the LEHD jobs data that do not match to the SSA Numident or matches with more than 12 jobs per year are removed.
1990-1994: 19% of QCEW Employment (11 states)


1998-2003: 86% of QCEW Employment (38 states)

2004-2013: 100% of QCEW Employment (50 states+DC+OPM)
Comparison of Earnings Inequality Trends

- Statistics for the Eligible Workers and the All Workers Samples
  - Ratio of the 99th and the 1st percentiles
  - Ratio of the 95th and the 5th percentiles
  - Ratio of the 90th and the 10th percentiles
  - Ratio of the 80th and the 20th percentiles
  - Variance of Log Annual Earnings
Selected Inequality Measures: Eligible Workers Relative to 2000

- r_99_01
- r_95_05
- r_90_10
- r_80_20
- Var Ln Earn
Is Earnings Volatility Declining?

- Volatility is the variance or standard deviation of the percentage change in real annual earnings between the previous and the current year.
  - \( v_{it} = sd \left( \frac{e_{it} - e_{it-1}}{\frac{e_{it} + e_{it-1}}{2}} \right) \) or
  - \( v_{it} = sd(\ln(e_{it}) - \ln(e_{it-1})) \)

- Volatility measures how clustered the changes in annual earnings are around the mean.
- The trend in volatility is declining (except during recessions), but there is substantial across worker heterogeneity.
Stable vs not(Stable) Workers

- Stable Workers – Active all 4 qtrs in both years and dominant job (highest earning) the same in both years
- Not(Stable) Workers – Active at least 1 qtr each year (but not all 8) with possible dominant job change
Variance of Change in Log Earnings by Stable and not(Stable)

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Share of Total Variance in Log Earnings by Stable and not(Stable)

- Not(4 Qtrs Work and Dom Job Same Both Years)
- 4 Qtrs Work and Dom Job Same Both Years
Summary

- Stable worker population increases almost every year from a low of 64% in 1997 to a high of 72% in 2015, muting the impact of rising not(Stable) earnings variance.
- Stable workers typically have positive earnings growth (2.7%) and very low earnings volatility (0.05).
- Not(Stable) workers typically have negative earnings growth (-1.4%) and very high earnings volatility (0.77).
Earnings Bins

- A single volatility measure overstates the impact for the typical worker in the middle or top of the earnings distribution
  - Workers in the middle or top of the distribution are more likely to be “stable” than those at the bottom.
- Instead of removing workers at the tails of the earnings distribution, we divide the annual earnings distribution into three constant real earnings bins plus one inactive worker bin
  - Bin 0 (inactive) – No reported earnings
  - Bin 1 (~bottom 20%) – Real Earnings <= 12k
  - Bin 2 (~middle 60%) – Real Earnings (12k-72k]
  - Bin 3 (~top 20%) – Real Earnings > 72k
Females by Earnings Bin

- **Bottom <=12k**
- **Middle 12k-72k**
- **Top >72k**

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Summary

- The male earnings distribution is more unequal than the female earnings distribution.
- The proportion of workers at the top is increasing, while the proportion in the middle and the bottom is decreasing.
- Average earnings within the bottom and middle bins are constant, but average earnings is increasing at the top.
- Average earnings is increasing due to both an increasing share of workers at the top and an increase in average earnings at the top.
- The typical worker in the bottom and the middle has only a small amount of growth in average earnings.
Earnings Mobility

Movement of workers across and within earnings bins from the previous to the current year
Summary

- Decreasing earnings mobility. More workers are staying in the same earnings bin between $t - 1$ and $t$. More stayers implies less mobility.
- Decreasing earnings volatility for stayers (especially workers at the top) combined with more stayers is primarily responsible for the decrease in volatility.
- Stayers are doing well in the middle and above, but lower mobility makes it harder to recover from a negative shock.
- Workers at the bottom have consistently negative changes in earnings on average and high volatility.
Future Plans

- Regularly release national and local estimates of earnings inequality, mobility, and volatility.
- Produce statistics for workers at the bottom, middle, and top of the earnings distribution.
- Account for local worker entry and exit
  - Both age and geographic mobility
- Geography: place of work vs place of residence
Conclusion

- A framework is in place for producing new local statistics on earnings dynamics

- Challenges
  - Disclosure avoidance for small cells
  - Graphical interface development
  - Computing resources (although releasing the product annually will reduce the processing burden)

- Feedback welcome!