Inequality in Annual Earnings, Volatility, and Inequality in Lifetime Earnings in the United States, 1986-2018

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Inequality in annual earnings in the United States has risen in recent decades, and many studies have sought to determine to what extent this rise reflects greater volatility in earnings, which can be smoothed over time, or an increase in the inequality of persistent lifetime earnings driven by structural factors. These studies have mostly focused on estimating earnings volatility from short, overlapping panels, and tracking it over time. They generally find that increased volatility was an important factor driving the increase in annual inequality (Moffitt, 2020). However, they cannot determine whether inequality in lifetime earnings also increased in this period or fully account for the impact of changes in the joint distribution of age and schooling on inequality in annual earnings.

A number of studies have directly estimated inequality in lifetime earnings within cohorts, which they measure from long panels of individual earnings histories drawn from longitudinal administrative datasets. These include Bjorklund's (1993) and Aaberge and Mogstad's (2015) work on Scandinavian data, neither of which followed variation in lifetime inequality over time; and Guvenen et al.'s (2017) analysis of inequality in lifetime earnings in the United States within single-year birth-cohorts born between 1932 and 1958 These studies offer valuable historical perspectives on lifetime inequality, but their extensive data requirements imply that they can only be applied to cohorts near or past the end of their working lives and for whom there are sufficiently long data series. This effectively precludes their application to more recent cohorts, and to tracking lifetime earnings inequality among active participants in the labor force by calendar years—a measure that can be compared to standard calendar-year measures of inequality in annual earnings.

We offer a less direct approach, which estimates anticipated average lifetime earnings from shorter earnings histories, and can be applied to more recent cohorts, thus enabling a comparison of annual and lifetime earnings inequality among (the same) active labor force participants in a calendar year. Using PSID data, we measure annual earnings as wages and salaries, trimming the top and bottom one percent of positive earnings in each year. Following the approach applied in Justman and Stiassnie (2021), we first regress earnings on a cubic function of age and its interaction with education, race, and cohort-group, and on individual random effects, to obtain predicted annual earnings over the life cycle for male heads of households born between 1927 and 1987, from which we estimate their anticipated average lifetime earnings. We show that these estimates accord closely with average lifetime earnings for cohorts for whom fuller earnings histories are available.

This preliminary stage then allows us to decompose the variance of log annual earnings in each year, annually from 1986 to 1996 and biannually to 2018, among males aged 31-59 with positive untrimmed earnings in each year, into six components: the variance of log anticipated average lifetime earnings, the variance of the log difference between actual and predicted annual earnings (our measure of volatility), the variance of the log difference between predicted annual earnings and average lifetime earnings (our measure of dispersion in life-cycle variation in earnings), and the covariances between each three pairs of these variables. We focus on the variance of log earnings as a measure of inequality because it allows this decomposition; we show that other widely used measures behave similarly.

We find that annual inequality fluctuated without trend from 1986 to the turn of the millennium, increases moderately during the dot-com recession, and then more sharply after 2008, following the Great Recession. Inequality in anticipated average lifetime earnings hardly varied at all throughout the period studied. Consequently, the variance of log lifetime earnings accounted for 45% of the variance of log annual earnings, on average, before 2008, but only 35% after 2008. The variance of life-cycle variation in earnings, measured as the variance of the log difference between predicted annual and lifetime earnings, was much smaller, and varied without trend in a very narrow range.

This points to the role of volatility, measured as the variance of the log difference between actual and predicted earnings, in driving changes in annual inequality, and indeed we find a correlation of 0.98 between the two series. This supports the findings of previous studies that estimated volatility from short overlapping panels regarding the importance of increased volatility in driving the recent rise in annual earnings inequality. Our findings go beyond previous research in demonstrating the stability of inequality in lifetime earnings over the last three decades, and in quantifying the changing relation between annual inequality, lifetime inequality and volatility, over time. We also show that a recent increase in the regressive incidence of transitory shocks amplified the effect of volatility on inequality.

To allow a comparison of our estimates of lifetime earnings inequality to estimates from other data sources, we also estimate lifetime inequality within forty-one rolling ten-year cohort groups born between 1938 and 1987. We find that it first rises substantially and then falls back to its original level.

References

Aaberge, R and M Mogstad, 2015. Inequality in current and lifetime income. Social Choice and Welfare 44:217–230.

Bjorklund, A, 1993. A comparison between actual distributions of annual and lifetime income: Sweden 1951-89. Review of Income and Wealth 39:377–386.

Guvenen, F, G Kaplan, J Song, and J Weidner, 2017. Lifetime incomes in the United States over six decades, NBER WP23371.

Justman, M and H Stiassnie, 2021. Intergenerational income mobility in lifetime incomes. Review of Income Inequality. 67(4):928-949.

Moffitt, R, 2020. Reconciling trends in US male earnings volatility: Results from a four data set project. NBER WP23371.