

What Income Inequality Measures Can (and Cannot) Tell Us

By Leonardo Martinez and Stephen Slivinski

In recent decades, income inequality has increased. But this doesn't mean that those with lower incomes are relatively worse off.

The recent rise in income inequality has been a prominent topic in the media and in policy debates. Most people have heard that income inequality has increased. However, details of the evolution of income inequality trends are less well known.

In their spring 2008 article, "On the Evolution of Income Inequality in the United States," published in the Federal Reserve Bank of Richmond's *Economic Quarterly*, Kevin Bryan and Leonardo Martinez show that, since the 1960s, income inequality displays different patterns for the top and the bottom halves of the income distribution.¹ In the bottom half of the distribution, income inequality rose significantly only in the 1980s. On the other hand, income inequality in the top half of the distribution has risen continuously in recent decades.²

A good way to measure inequality is to look at the ratios between different income percentiles. For instance, you can look at the ratio between incomes at the top of the distribution (the 90th percentile) and at the bottom (the 10th percentile) – or, to abbreviate it, the 90-10 ratio. But this distribution can be divided in other ways. You can also look at the ratio between the 90th percentile and the 50th percentile – abbreviated as the 90-50 ratio – to see income differences in the top half of the distribution. By the same logic, the ratio between the 50th percentile and the 10th percentile – abbreviated as the 50-10 ratio – allows us to see income differences in the bottom half of the distribution. This can be a useful tool in discerning movements in income inequality.

Bryan and Martinez analyze data from the U.S. Census Bureau's annual Current Population Survey March Supplement. Their results show that the vast majority of the increase in the inequality in the 90-10 ratio – that is, the difference between the top and the bottom of the income distribution – is due to an increase in the top half of the distribution (the 90-50 ratio). You can see that in Figure 1.³ Since 1961, the movement in the 90-50 ratio accounted for 75 percent of the overall increase in income inequality. And it accounts for nearly all of the increase in the 90-10 ratio since 1990.

Another way to look at this is to compare the inflation-adjusted (real) income in 2002 with that of an earlier year – in the Richmond Fed analysis, that base year is 1978 – for different percentiles of the

FIGURE 1:

LOGGED INCOME RATIOS

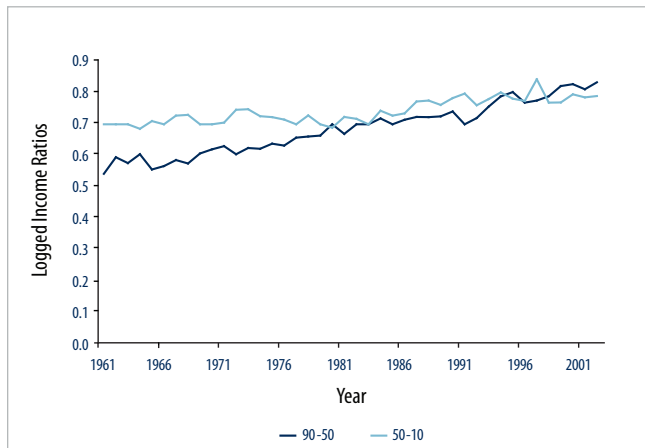
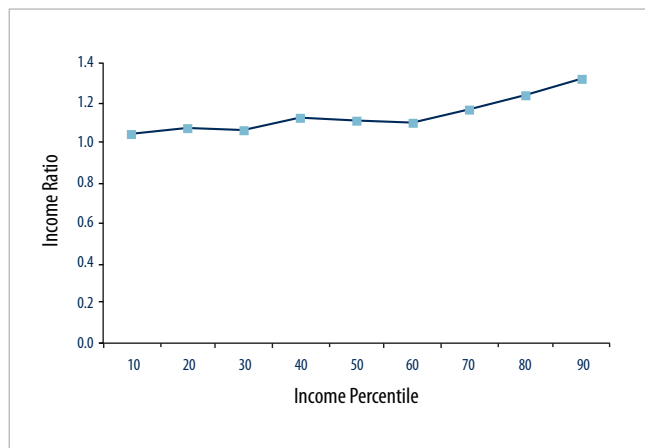


FIGURE 2:

INCOME RATIOS BY PERCENTILE FOR ALL WORKERS (2002-1978)



income distribution. In Figure 2, you can see that differences in income growth rates across percentiles are larger for the higher percentiles.

Focusing on the top 10 percent of income earners yields further refinement in the analysis. Between 1961 and 2003, the labor income share of the top 10 percent rose from 27 percent to 37 percent. Yet, the increase in the share earned by the top 1 percent accounts for 60 percent of the rise in the share earned by the top 10 percent. Similarly, between 1977 and 2003, the increase in the share of the top 0.1 percent of the income distribution accounts for more than 60 percent of the increase in the share of the top 1 percent. In other words, no matter how close you look, the same pattern emerges: The increase in income inequality is explained mainly by the rapid growth in the highest-income class.

When you break the data into gender categories, the inequality between the 90th percentile earners and the 10th percentile earners

of both genders is explained largely by a continuous increase in the 90-50 ratio (which accelerated in the 1970s) and an increase in the 50-10 ratio in the 1980s. An interesting wrinkle is that real income in the lower deciles of the male distribution decreased from 1978 to 2002 while females experienced a rise in real income during that period in all deciles. Further analysis finds that inequality between males and females has been shrinking over time.

There are things that these income inequality measures cannot tell us, however. To draw any conclusions about how inequality might affect the quality of life – what economists call “welfare” – requires the analysis of other variables.

Welfare depends on the consumption of goods and leisure. It could be that while income inequality has increased, for instance, consumption inequality has not.

Regular surveys on the consumption of goods have existed since the 1980s. A study by economists Dirk Krueger and Fabrizio Perri in 2006 estimated that between 1980 and 2003 consumption inequality grew, at most, half as fast as income inequality.⁴ That may be because, as the authors suggest, the development of credit markets allowed households to better smooth their consumption against income fluctuations.

A 2007 analysis by Mark Aguiar and Erik Hurst studied leisure inequality since 1965.⁵ They define leisure as time not spent at work or on household chores. They estimate that the average leisure hours per week for males with 16 years or more of schooling fell by 5.6 hours between 1985 and 2003 while they grew by 9.4 hours for those with less than a high school degree. Since those with more education have higher incomes on average, one can at least infer from these findings that those with lower incomes have seen the largest increase in leisure time. Note, however, that some of this increase in leisure time may be involuntary – the result of job losses in the lower-income percentiles, for instance.

Ideally, one should look at measures of consumption of goods and leisure to have a better picture of the evolution of welfare inequality. An increase in income inequality shouldn't automatically lead one to conclude that those at the bottom of the income distribution are relatively worse off ■

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ENDNOTES

¹ Bryan, Kevin A., and Leonardo Martinez. 2008. "On the Evolution of Income Inequality in the United States," Federal Reserve Bank of Richmond *Economic Quarterly* 94: 97-120.

² A large part of the Richmond Fed analysis uses pretax individual labor income.

³ Technically, the ratios in this analysis are compared in their logarithmic form. The log of a ratio of two values is equal to the difference of the logs of these values. That allows for an easy analysis of the approximate percentage change between these ratios. For instance, an increase in the log 90-10 ratio from 0.10 to 0.15 implies that the worker in the 90th percentile went from making approximately 10 percent more than the worker in the 10th percentile to making approximately 15 percent more.

⁴ Krueger, Dirk, and Fabrizio Perri. 2006. "Does Income Inequality Lead to Consumption Inequality? Evidence and Theory." *Review of Economic Studies* 73: 163-193.

⁵ Aguiar, Mark, and Erik Hurst. 2007. "Measuring Trends in Leisure: The Allocation of Time over Five Decades." *Quarterly Journal of Economics* 122: 969-1006.



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