Does Income Inequality Reduce Middle-Class Income Growth? The United States in Comparative Perspective

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INTRODUCTION

When the economy grows, household incomes should rise. But if a large share of the economic growth goes to households at the top of the income ladder, those in the middle are likely to see their incomes increase less than they otherwise would, or perhaps even fall. Higher income inequality will yield slower middle-class income growth.¹

On the other hand, this isn't automatically true. A large income share for the top 1% could instead come at the expense of the near-rich and the upper-middle class, rather than at the expense of the middle class. Also, if the top 1% get a large share of the income gains, that could increase the pace of economic growth, which might result in rapidly growing incomes for middle-class households even as they fall farther behind those at the top.

In China and some other developing economies, incomes have increased sharply for the large majority of the population despite rapidly growing inequality. All the boats have been rising — the yachts and cruise liners, yes, but also the tugboats and rowboats.² In this context, inequality is likely to be easier to tolerate. On the other hand, where rising inequality causes economic growth to be accompanied by flat or falling incomes for middle-class families, those who work hard and play by the rules can become frustrated by their inability to get ahead, and by worry that their children won't be as well off as they are because they less opportunity than children from richer families.

In the United States, developments in the past half-century are consistent with the "inequality is harmful" hypothesis. Between the mid-1940s and the late 1970s, the top 1% of US households got about 8% of the income growth, and during that period middle-class incomes increased rapidly. Since 1979, the top 1% have taken a larger share of total income, about 13% on average, and in this period the incomes of middle-class households rose much more slowly.³ We see a similar story if we look across the US states. Jeffrey Thompson and Elias Leight have found that in states where the top 1%'s income share is larger, income growth for middle-class households has tended to be slower.⁴

Our research question is a simple one: Does this pattern hold if we compare across rich nations? Has middle-class income growth been slower in countries with greater income inequality? And how, if at all, has the Great Recession (GR) and its aftermath begun to change these patterns?
METHOD AND DATA

We focus on the world’s affluent nations. The ideal analytical approach would be a differences-in-differences design. We would see whether changes in income inequality from period 1 to period 2 correlate with changes in middle-class income growth. Since cross-nationally comparable data on middle-class household incomes begin around 1980, we might compare inequality and middle-class income growth in the 1980s with inequality and middle-class income growth in the 2000s. However, periods of one or even two decades are too short to accurately gauge the impact of income inequality. So we need an alternative analytical approach.

Our approach here is to see whether countries' average levels of top share income inequality over the period 1979-2010 correlate with middle-class income growth over this period. We have suitable data for sixteen countries: Australia, Canada, Denmark, Finland, France, Germany, Ireland, Italy, Japan, the Netherlands, New Zealand, Norway, Spain, Sweden, the United Kingdom, and the United States. The chief drawback is that we can’t control for country "fixed effects" — country-specific factors that are difficult to measure quantitatively or for which we lack data, that are correlated with income inequality, and that might affect middle-class income growth.

Our income inequality measure is the share of income that goes to the top 1% of households. The data are for pretax income, measured for tax units and excluding capital gains, as these are the most comparable data across nations. They are compiled by the World Top Incomes Database (WTID). Figure 1 shows the average top 1% share in each country over the period 1979-2010. The top 1%’s share was lowest in the Nordic countries (Sweden, Denmark, Finland, Norway) along with the Netherlands and Australia. It was highest in the Anglo countries (US, UK, Canada, Ireland) along with Germany. In Sweden and Denmark the top 1% accumulated about 5% of the income on average, while in the United States their share was about 13%.
Figure 1. Income inequality, 1979-2010

Top 1%’s share of pretax income, excluding capital gains. The large dot is the country’s average during the time period and the small dots are its lowest and highest values. Data source: World Top Incomes Database, topincomes.g-mond.parisschoolofeconomics.eu

We measure middle-class income growth as absolute change in median post transfer-post tax household income from 1979 to 2010. The incomes are adjusted for household size, adjusted for inflation, and converted to a common currency (US dollars) using purchasing power parities. In some cases we can also compare post-tax and -benefit disposable incomes to market (pre-tax and pre-transfer) incomes. We try to stick with the working age population, but in some cases include the elderly as well. These data are from the Luxembourg Income Study (LIS), the best source for cross-nationally comparable income data. For three countries — Australia, France, and Sweden — we supplement the LIS data with data from the OECD in order to extend the series to 2010. For two countries — Japan and New Zealand — the entire series is from the OECD. (The findings are similar with these two nations excluded.) The data are available in roughly five-year increments around 1980, 1985, 1990, and so on. We calculate change in median income by regressing income on year and then multiplying the coefficient, which is a measure of average yearly change, by 31, which is the number of years in the period 1979-2010.

Figure 2 shows the trends in median household income for each of our sixteen countries. Middle-class incomes grew rapidly in some countries, such as Ireland, Norway, and Australia (in the 2000s). In others they increased at a
respectable pace. In a few, including Canada, Germany, Italy, Japan, and the United States, they barely rose at all.

Strictly speaking, the top 1 percent income data from the WTID are not entirely consistent with the LIS data. The LIS income data for households mainly excludes the top 1% due to sampling and non-sampling errors (like top-codes). The WTID data are based on tax unit and omit redistribution. Burkhauser and colleagues suggest this makes a large difference in the calculation of overall inequality because the bottom of the distribution may not pay income taxes but benefit the most from redistribution. However, we focus not on the bottom but on the top and middle classes where both household units and tax units are more similar and where earnings are the main sources of income in the middle classes while earnings and capital incomes dominate the trends in top shares. Just as some studies compare economic growth to inequality, we compare top end income inequality in one series (WTID) to median income from another series (LIS) to see if there is an association.

We should also recognize that the composition of both the middle and especially the top 1% are not static from year to year. Turnover at the top is liable to be greater than in the middle. The only evidence we have on this is from tax unit data in the United States, which suggest that of the top 1% in 2005, 25% of these were in the top 1% each year from 2005 to 2010, while about 40% of those in the top 1% in 2005 were in the top 1% at least one other year by 2010. At the same time, of those in the top 1% in any year, about 80% stayed in the top 5% during all the years. Based on these IRS observations it seems that 2.5% to 3% of taxpayers appeared in the top centile in at least one year from 2005 to 2010, and so while the top 1% has a sizeable degree of turnover, the large majority of those who exit remain in the top 5%. Hence while there is turnover, it remains skewed upwards suggesting that perhaps accumulated wealth is a better proxy for well-being in top-end families.

Our post transfer-post tax income measure includes the impact of government transfers and the tax system. A more direct income measure for assessing the impact of income inequality would be pre transfer-pretax income among working-age households. Unfortunately, such data are available for fewer countries. Figure 2 includes these pre transfer-pretax data where they are available. In every case the over-time pattern is very similar to that for post transfer-post tax income, which suggests that our reliance on the latter isn't likely to significantly affect the findings.
Figure 2. Median household income, 1979-2010

Household income adjusted for household size. The data shown are for a household with three persons. Incomes are adjusted for inflation and converted to US dollars using purchasing power parities. Data source: Luxembourg Income Study, lisdatacenter.org; OECD, stats.oecd.org.
Figure 2. continued
Figure 2. continued
Figure 2. continued
Figure 2. continued
FINDINGS

Our best estimate of the impact of income inequality on median (middle class) income is from a regression of change in median household income on economic growth (change in GDP per capita) and income inequality (top 1%’s income share). According to this regression, most of the variation in changes in median income across our sixteen countries from 1979 to 2010 owed to these two factors. (The regression’s R-squared is .78.) That’s not too surprising. Economic growth is normally the source of income gains for middle-class households, and the degree of top end income inequality determines how much of the economic growth actually reaches those in the middle.

The regression yields a coefficient of -1,765 for the top 1%’s income share. This number is in 2010 US dollars, for a household with three persons. It suggests that if the top 1%’s share in country A was one percentage point higher than in country B, median household income in country A is likely to have increased by about $1,765 less between 1979 and 2010 than in country B. If the top 1%’s income share in country A was eight percentage points higher than in country B — this was the actual range for our sixteen countries, with the top 1%’s share at 13% in the US and 5% in Sweden — the difference in median income growth between these two nations would be roughly $14,000. That’s a large number. To put it in context, median income (for a three-person household) in the United States rose from $45,000 in 1979 to $52,000 in 2010, for an increase of $7,000. Adding another $14,000 to that increase would have made a big difference in the lives of middle-class Americans.
Figure 3 shows the association between the top 1%’s income share and change in median household income, adjusting for economic growth. The correlation is fairly striking given the small number of countries.

**Figure 3.** Change in median household income by level of income inequality, 1979 to 2010

Median household income is adjusted for household size, adjusted for inflation, and converted to US dollars using purchasing power parities. Change in median income is adjusted for economic growth; it is the residuals from a regression of change in median income on change in GDP per capita. The range from “small” to “large” on the vertical axis is $23,800. Data sources: Luxembourg Income Study, lisdatacenter.org; OECD, stats.oecd.org. Income inequality is measured as the top 1%’s share of pretax income, excluding capital gains. Data source: World Top Incomes Database, topincomes.g-mond.parisschoolofeconomics.eu. The line is a linear regression line.

Our estimate of income inequality's impact is probably an upper-bound one, as there may be other factors correlated with income inequality that contributed to differences in income growth across these countries. Note, however, that forces that affect median income growth via their impact on the growth of the pie and/or the relative size of the piece that goes to the rich are already captured in these two variables. We needn’t, therefore, control for countries' degree of unionization, globalization, technological advancement, immigration, corporate governance structures, social policy generosity, and so on.

Human capital, or skills, could affect middle-class incomes independent of its impacts on economic growth and on income inequality. A useful country-level measure is average adult literacy and numeracy scores as judged by the OECD’s Survey of Adult Skills assessment. Adding this to the regression doesn't, however, reduce the estimated effect of income inequality; instead it strengthens it.⁹
This relationship may be driven by the relative number of high skill workers in each country. Figure 4 summarizes cross-national differences in wage returns to skills from 2011–2013. It suggests that the United States has the highest return to added skills as measured by the percentage increase in wages for a one standard deviation increase in skill.\textsuperscript{10} It also has one of the largest fractions of adult workers who have either fallen behind or not exceeded their parents' educational attainment, and a rising effect of inequality on college going and completion, with the children of the top quartile much more likely to both matriculate and graduate from post-secondary institutions.\textsuperscript{11} These facts and findings complement our story.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure4}
\caption{Wage returns to skills across nations}
\end{figure}

\textbf{Figure 4.} Wage returns to skills across nations

Source: E. A. Hanushek, G. Schwerdt, S. Wiederhold, L. Woessmann, Returns to Skills Around the World: Evidence from PIAAC (NBER Working Paper 19762, Cambridge, MA, 2013), Table 2, as shown in Autor (2014), Figure 2
Another important question: Is it appropriate to control for economic growth in estimating the impact of income inequality on middle-class income growth? Economic growth is an important determinant of changes in middle-class incomes; across our sixteen countries the correlation between change in GDP per capita and change in median household income for the 1979-2010 period is +.72. But what if income inequality affects middle-class income growth in part by altering the pace of economic growth? Various hypotheses assert that income inequality affects economic growth, with some saying it increases growth and others asserting that it reduces growth. It's almost certainly true that at very low levels of income inequality the effect of growth is positive, with an increase in inequality boosting economic growth. And at very high levels of inequality the impact surely is negative, with an increase in inequality reducing growth. But what is the impact at the levels of income inequality we observe in existing affluent countries? Most studies have concluded that if there is an effect in one direction or another, it is probably a small one. If so, then we should indeed control for economic growth in assessing the effect of income inequality on middle-class income growth, as we do here.

Is the estimate of income inequality's impact on middle-class income growth sensitive to the particular set of countries for which we have data? We noted earlier that the household income data for two of the countries, Japan and New Zealand, come from the OECD rather than LIS. But excluding them doesn't reduce the estimate effect. Dropping other individual countries one at a time also doesn't significantly alter the finding. The only noteworthy reduction in the magnitude of the estimated effect of income inequality occurs with the United States omitted; instead of -1,765, the regression coefficient for income inequality is -1,285. If the latter is the true cost of income inequality, a difference in the top 1%’s income share of five percentage points, which is the difference between Sweden and Denmark at the low end and the UK and Canada at the high end, would have reduced median household income by approximately $6,400 over the 1979-2010 period. That is still a large effect on a $40,000 income.

Finally, the year 1979 was a peak in the business cycle whereas 2010 was in the middle of a downturn. Normally we want to compare peak to peak or trough to trough. It’s therefore worth looking at the period 1984 to 2010 to see if results are different. The income inequality regression coefficient for the 1984-2010 periods is 1,365, which is smaller than the 1,765 estimate for the 1979-2010. Note that part of the reason it is smaller is simply that the time period is five years shorter. If this is the true effect of income inequality, a difference of eight percentage points in the top 1%’s income share, the difference between Sweden and Denmark at the low end and the US and the UK at the high end, reduced middle-class income growth by about $11,000, still quite a substantial effect.
THE GR

Our analysis includes the years 1979 to 2010. This has the advantage of covering a fairly lengthy period of time, which should help to capture the true impact of income inequality. It also allows us to incorporate at least some the impact of the Great Recession, which is the most consequential economic downturn of the past half century and therefore important to take into account. Between 2007 and 2010 real median incomes fell in many nations, though not all. Australia, Canada, and the Nordic countries continued to see their median incomes rise. France, Netherlands, and Germany had neither a large rise nor fall through 2010. The other Anglo nations, Japan, Italy, New Zealand, and Spain saw real median incomes fall. These changes translate fairly well into changes in life satisfaction as measured in the OECD Society at Glance publications.\(^\text{14}\)

What if we focus on the period prior to the Great Recession, 1979-2007? The estimated effect of income inequality on middle-class household income growth is smaller: the regression coefficient for income inequality shrinks from \(-1.765\) to \(-1.290\). This suggests that the Great Recession tended to hit middle-class incomes hardest in high-inequality countries. Some analysts have hypothesized recently that income inequality was a major cause of the Great Recession.\(^\text{15}\) Whether that is correct or not, income inequality does appear to have magnified the income loss middle-class households suffered in the recession.

In fact the most recent US pre-tax money income data for 2013 suggests that American middle class families have still not gained from the four years of recovery captured by these data. While the Census Bureau data is for pre-tax and transfer money income, tax rates have not much changed since the end of the GR, and because earnings are the primary source of income for median income working class families, these consistently measured data capture the trend (if not the level) in middle class incomes fairly well. Overall median household income was constant in 2012 and 2013, following two consecutive annual declines. It is still 8 percent below its level in 2007 before the recession and 8.6 percent below its peak in 2000. The trend in incomes for working age households (under age 65) was also reported, and their median income from 2000 to 2013 declined 11.2 percent, from nearly $65,800 to $58,450\(^\text{16}\). This new data suggest that median incomes have been fairly flat and that the pattern captured in Figure 2 above for the United States has not changed in the three years since 2010.

None of these data capture national or cross-national wealth developments for the middle class, especially since the end of the GR. Most middle-class households experienced absolute wealth declines due to reduction in home prices during the GR. In contrast, the top income group experienced a
rebound in their net wealth position, as stock prices in many nations, especially the United States, have rebounded sharply since 2009.  

OTHER FACTORS: HOURS WORKED

The relationship between top incomes and after tax and benefit middle-class income growth has many facets which we aren't able to fully explore at this point. It clearly makes a difference across nations if median incomes are attributable to longer or shorter hours of work, and at what wage level. Societies with rising wages may indeed voluntarily reduce work hours and therefore consume more family time. In others, maintaining or increasing middle class incomes might be obtained only through longer hours of work in the absence of wage increases, or even wage declines.

A complete set of work hours by income level and country is not available for all of our nations, even though the amount of effort expended to maintain or increase family incomes is clearly important. But what evidence we do have is suggestive.

For families with children under age 14, the United States had by far the largest number of two parent full time workers in the countries examined here. Nearly 60% of children under 14 living in coupled households have both parents working full time in the US compared to 55% in Finland, and far less in most other nations. For instance, German and Dutch couples with dual full time earners are below 20% of all 2 parent working households.

There is also evidence that the share of single parents working either full or part time as of 2007 was the highest by far in Japan and the United States, the two nations with the most hours of work among single parent families. Further, as shown in Table 1, although since 1979 work hours fell in almost all nations (save Sweden), the United States now has the largest number of average annual hours of work per employed person, larger than those in other wealthy countries. And it has by far the largest number of workers who work weekends and evenings.

Table 1. Average Annual Hours Worked/Employed Person

<table>
<thead>
<tr>
<th>Country</th>
<th>1979</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>1832</td>
<td>1728</td>
</tr>
<tr>
<td>Canada</td>
<td>1841</td>
<td>1710</td>
</tr>
<tr>
<td>Denmark</td>
<td>1636</td>
<td>1546</td>
</tr>
<tr>
<td>Finland</td>
<td>1869</td>
<td>1672</td>
</tr>
<tr>
<td>France</td>
<td>1804</td>
<td>1479</td>
</tr>
<tr>
<td>Japan</td>
<td>2126</td>
<td>1745</td>
</tr>
<tr>
<td>Country</td>
<td>1984</td>
<td>2010</td>
</tr>
<tr>
<td>---------</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>Netherlands</td>
<td>1556</td>
<td>1381</td>
</tr>
<tr>
<td>Sweden</td>
<td>1530</td>
<td>1621</td>
</tr>
<tr>
<td>U.K.</td>
<td>1813</td>
<td>1654</td>
</tr>
<tr>
<td>U.S.</td>
<td>1829</td>
<td>1790</td>
</tr>
</tbody>
</table>


While a complete analysis is not available at this time, it appears that some countries where median household income was flat or falling, such as the United States and Japan, also had more full time workers who worked longer hours. In other nations hours worked were fewer, especially among coupled families with children and single parents. In most cases such choices are determined by national norms, family patterns, and public policies, but also by efforts to maintain middle class incomes.

**CONCLUSION**

Logic suggests that if households at the top get a large share of a country's income, those in the middle class will experience slower income growth than they otherwise would. Developments in the world's affluent nations since the late 1970s are consistent with this worry. In the highest-inequality nation, the United States, the top 1%'s income share is about eight percentage points higher than in the lowest-inequality countries, Sweden and Denmark. The data suggest that this difference may have reduced income growth for middle-class households in the United States by $11,000 to $14,000 over the period from 1984-2010, and 1979 to 2010, respectively. American workers also work more hours than their counterparts in almost all other nations. But even leaving the United States out of the mix, there is a strong negative relationship between high income shares and median income growth in all of the nations examined here.
NOTES


4 Thompson and Leight, "Do Rising Top Income Shares Affect the Incomes or Earnings of Low and Middle-Income Families?".

5 Causal patterns are likely to be different in middle- and low-income countries.


The regression coefficient for the top 1%’s income share is -2,220 instead of -1,765.

Autor, David. “Skills, education, and the rise of earnings inequality among the “other 99 percent”, Science May 3 ;2014 Vol. 344 Issue 6186 : 843-851. See Figure 2, page 845


12 Sarah Voitchovsky, "Does the Profile of Income Inequality Matter for Economic Growth?" Working Paper 354, Luxembourg Income Study; Lane Kenworthy, Egalitarian Capitalism, Russell Sage Foundation, 2004; Dan Andrews, Christopher Jencks, and Andrew Leigh, "Do Rising Top Incomes Lift All Boats?" B.E. Journal of Economic Analysis and Policy, 2011; Jared Bernstein, "The Impact of Inequality on Growth,” Center for American Progress, 2013. Across our sixteen countries, the correlation between income inequality (top 1%’s income share) and economic growth over the period 1979-2010 is +.14.


