

Understanding Trends in Worker Pay over the Past 50 years

Scott Winship

Center on Opportunity and Social Mobility, American Enterprise Institute

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“Bernie Sanders is right about capitalism.” That’s the headline from a recent op-ed by CNN senior political analyst Kirsten Powers. “Late-stage capitalism” is “untethered to morality or decency,” and “it’s not working, except for the super-rich.”¹

Such declensionist views are not unique to Bernie Sanders and the political left. A policy handbook published by the national conservative outfit American Compass, titled “Rebuilding American Capitalism,” flatly states that the “breakdown in American capitalism over the past half-century is most apparent in its failure to deliver widespread prosperity for the American people.” The group claims that the wages of American workers have risen by only one percent in 50 years.²

These examples don’t simply reflect the pan-ideological rise of economic populism—the public discourse they exemplify has fueled it. The result is a concerning loss of faith in the ability of the American economy to serve our needs. Among young adults, only 24 percent have a positive impression of capitalism and a negative impression of socialism. In contrast, 28 percent think positively of socialism but not of capitalism. And 27 percent have a negative impression of both.³

Are these views justified? This report addresses a central question bearing on the performance of American capitalism in recent decades—how much has worker pay increased, and how should we think about the health of the economy in light of the evidence?

Has Worker Pay Risen Meaningfully?

Let’s begin with some basic facts. It is not anywhere near true that the wages of American workers have risen by only one percent over 60 years. The best data we have on hourly pay comes from the Bureau of Labor Statistics’ Current Population Survey. Using this source, we can look at trends between 1973 and 2022.⁴ Between these years, the hourly wage of the median paid employee—the one ranked right in the middle of worker pay—rose by 33 percent after accounting for the increase in the cost of living. That is 33 times more than American Compass claims.

This seemingly simple fact, however, is a bit ambiguous as an indicator of how workers have made out. Some adjustments to the basic analysis make the picture rosier, others darker, and some result in disparate pictures for different groups of workers. Start with the choice of wages as the indicator of worker remuneration. Employers are mostly indifferent as to the way they compensate workers for their labor, conditional on overall cost. If workers want to be paid partly in the form of health insurance or contributions to a retirement account, that’s all the same to employers. If employees are not interested in these forms of nonwage compensation, it is unclear why businesses would offer them instead of wages.

The exception to employees and employers working out the form that pay takes is mandatory employer contributions to public social insurance (its share of payroll taxes), but this expense is no less a cost of employing someone from the firm's perspective. We can think of pre-tax compensation as including an amount that is taxed away by the federal government; it does not matter if the form that taxation takes involves individual income taxes, the "employee's share" of payroll taxes or the "employer's share."⁵

If we look at the trend in hourly compensation, the median rose by 40 percent.

These figures lump together workers of all ages, so they are affected by changes in the age distribution of the workforce. This can be important because earnings tend to increase with work experience. Moreover, many younger workers are in school. Even more subtly, some adults who will go on to have the highest pay (doctors, for instance) will not show up in the data until a later age because they are in school fulltime and do not work. Once they enter the labor force, their initial pay may start nearer to that of other workers (who have accumulated experience while they were in school). But at older ages, their pay will be relatively higher as they enjoy the payoff to greater educational attainment. Finally, as workers get older and near the end of their career, they may switch into part-time work that offers lower wages than their line of work when they were younger.

If we exclude the youngest and oldest workers and focus on those ages 25 to 54, median hourly compensation rises 32 percent. Workers ages 18 to 29 only saw a 21 percent increase, while hourly compensation rose 34 percent among those ages 30 to 54. The lower rate for under-30 workers surely is affected by rising educational attainment in ways that are difficult to interpret.

Another way the workforce has changed is in its ethnic makeup. Some workers come from more disadvantaged backgrounds than others, and if they become a bigger share of the population, that could exert downward pressure on median pay. In particular, many immigrants have lower educational attainment than native-born workers and work in lower-paying jobs. However, median hourly compensation among 25- to 54-year-olds rose by 38 percent for non-Hispanic whites, 43 percent for non-Hispanic blacks, 36 percent for Hispanics, and 69 percent for other workers.

These different cuts at the data are interesting, but they pale in importance next to the most fundamental worker characteristic affecting trends in pay: the presence of a Y chromosome in a person's DNA. Among workers ages 25 to 54, median hourly compensation rose by 68 percent among women but by just 16 percent among men.

The disparity between the experiences of men and women are even more striking if we go beyond comparing medians. We can look at poorer and richer workers as well. The 10th percentile of hourly compensation is the compensation of the worker who is better off than only 10 percent of workers and worse off than 90 percent. The opposite is true of the 90th percentile of hourly compensation. Looking across the 10th, 25th, 50th, 75th, and 90th percentiles within five age groups ranging from 18-24 to 50-54 years old, the increase in hourly compensation was greater from 1973 to 2022 for women than for men in every one of the 25 comparisons. Among women ages 25 to 54, hourly compensation growth ranged from 59 percent for the 10th percentile to 122 percent for the 90th percentile. Among men, the figures were 21 percent and 48 percent. That is, the lowest-earning women had larger compensation growth than nearly all of the highest-earning men.⁶

We will return to the question of what happened to men’s pay and why. But to get there, it is worth first exploring a different question: was the increase in worker pay reasonable based on economic trends?

Has Worker Pay Kept Up with Productivity Growth? (Wrong Answers Only)

Obviously, it is a subjective assessment as to what constitutes a “reasonable” increase in worker pay. But one benchmark often used by economists and researchers is the increase in labor productivity. Just as hourly wage or compensation rates equal the amount workers are paid divided by the number of hours they work, labor productivity is just the value of what workers produce divided by the number of hours they work. In theory, in a competitive economy, workers’ pay should equal their marginal revenue product—their incremental contribution to the value of their firm’s output.⁷

If increasing the labor or capital used in production always leads to the same proportional increase in output, then the *average* worker’s pay should also equal average productivity and aggregate hourly pay should equal aggregate productivity. Therefore, under some basic assumptions about how the economy works, we would expect that when labor productivity increases by 10 percent in the economy, average pay should also increase by 10 percent.

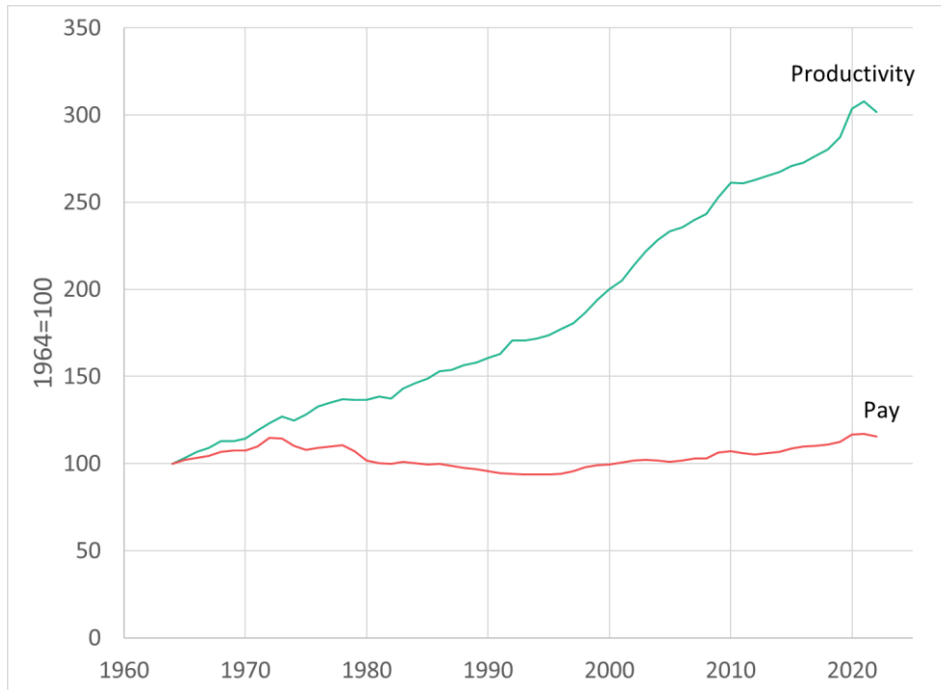
However, according to a number of researchers across the ideological spectrum, worker pay has failed badly to keep up with increases in labor productivity. For example, consider Figure 1, a modified version of a published chart from American Compass.⁸ According to these figures, labor productivity tripled between 1964 and 2022, but hourly pay grew by just 15 percent. (The group’s claim that pay grew by only 1 percent in fifty years comes from comparing 1972 and 2022.)

Or consider a similar chart from the progressive Economic Policy Institute, reproduced here as Figure 2.⁹ In this version of the chart, from 1948 to the early 1970s, pay and productivity grew at about the same rate. But productivity rose 65 percent between 1979 and 2022, while hourly compensation rose just 15 percent. A rendition of this chart appeared in the Biden Administration Council of Economic Advisers’ 2022 Economic Report of the President.¹⁰

Figure 3 presents one last version of the chart, this time an update of one produced by the Brookings Institution’s Hamilton Project.¹¹ In this version, pay and productivity track each other through 1971 before diverging. Between 1947 and 2022, labor productivity rose nearly five-fold, while hourly compensation increased just over three-fold.

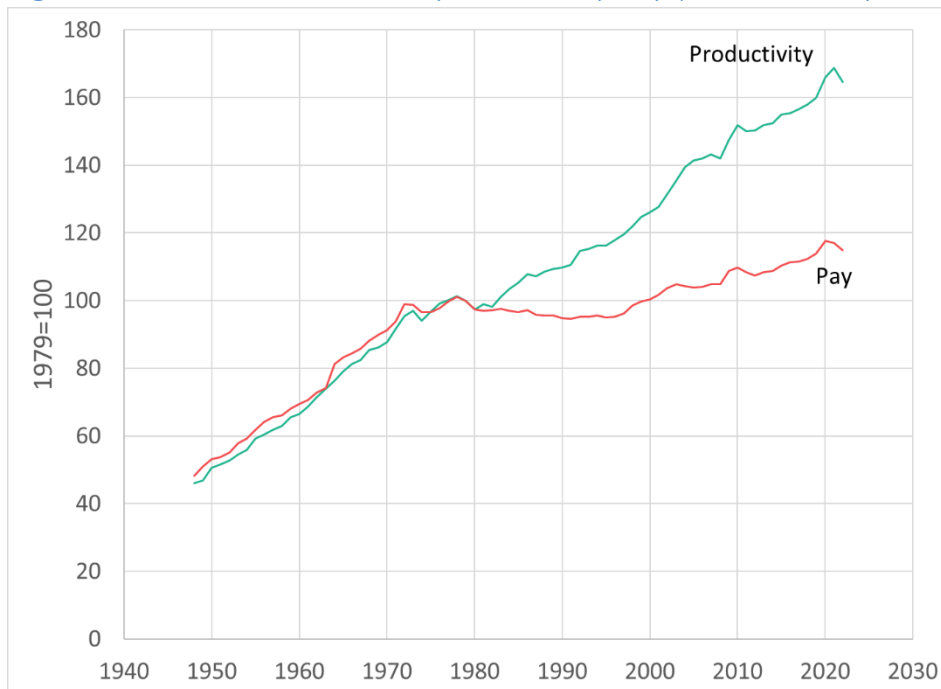
The impression given by these charts is one of an economy that has left workers behind for at least 50 years. Taken at face value, these statistics make a case for “rebuilding American capitalism,” as advocated by American Compass, and they reinforce the view of the Economic Policy Institute that, “Without policy interventions, economic growth will continue to sputter, and the growth we do see will largely fail to lift typical workers’ wages.”¹²

Figure 1. Growth in Productivity and Hourly Pay (Inconsistently Measured), 1964-2022



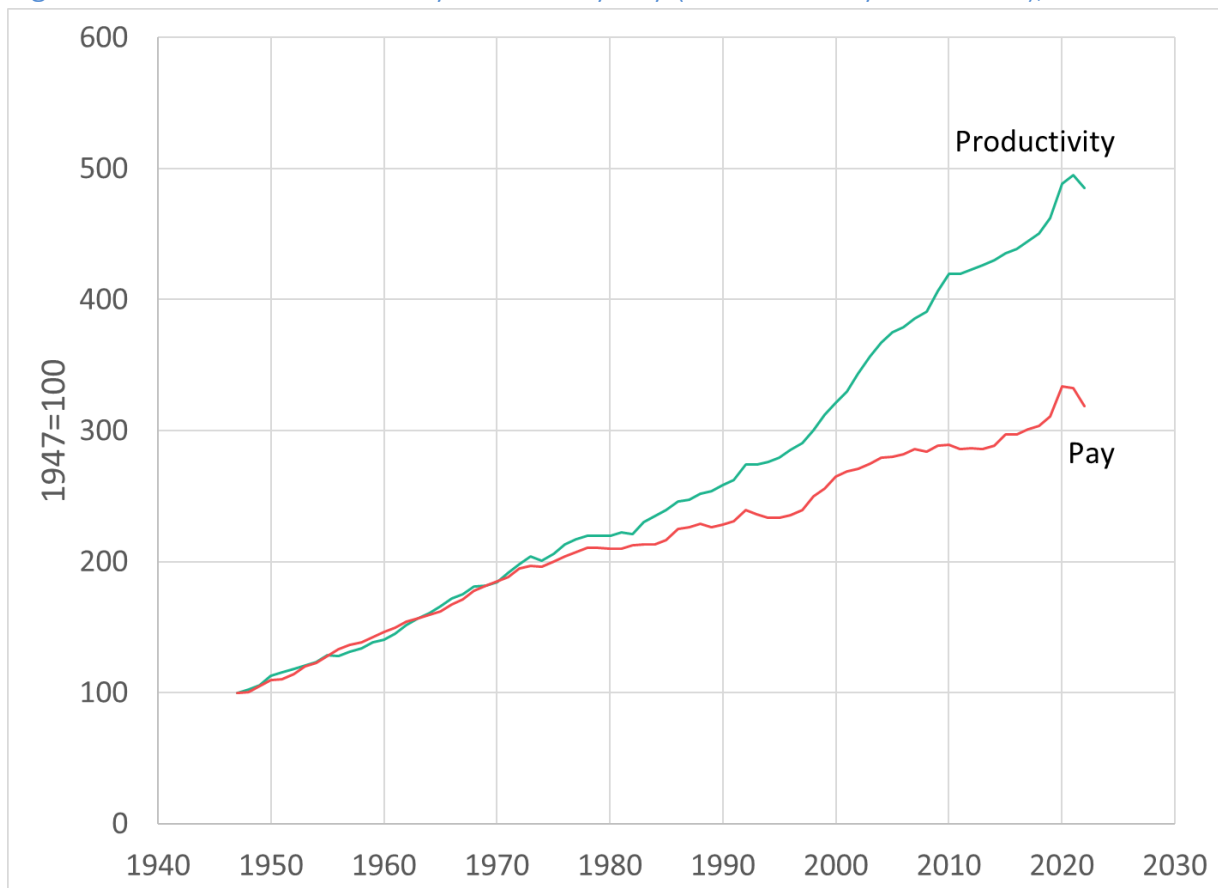
Source: Bureau of Labor Statistics—Major Sector Quarterly Labor Productivity and Costs database; Current Employment Statistics National Employment, Hours, and Earnings database; and Consumer Price Index All Urban Consumers database. See note 8 for details.

Figure 2. Growth in Productivity and Hourly Pay (Inconsistently Measured), 1948-2022



Source: Economic Policy Institute, “The Productivity-Pay Gap,” <https://www.epi.org/productivity-pay-gap/>. Data originally from Bureau of Economic Analysis, National Income and Product Accounts, Tables 1.7.6, 2.1, and 7.8; Bureau of Labor Statistics—Total US Economy: hours and employment spreadsheet; Consumer Price Index, Updated R-CPI-U-RS, All items, 1977-2023 spreadsheet; Current Employment Statistics National Employment, Hours, and Earnings database; and Consumer Price Index All Urban Consumers database. See note 9 for details.

Figure 3. Growth in Productivity and Hourly Pay (Inconsistently Measured), 1947-2022



Source: Bureau of Labor Statistics—Major Sector Quarterly Labor Productivity and Costs database and Consumer Price Index, Updated R-CPI-U-RS, All items, 1977-2023 spreadsheet. See note 11 for details.

Fortunately for American capitalism, these charts give the wrong impression. Through various methodological choices, they spoil the comparison between productivity and pay by comparing apples to oranges in one or more ways.¹³

Start with the American Compass chart. Its productivity measure is specific to the “nonfarm business sector,” which excludes workers from several parts of the economy. Among the workers omitted are employees of farms, government, private households, and nonprofit institutions serving households. (For the latter three sectors, output conventionally is estimated from data on pay, making a comparison between output and pay uninformative.)¹⁴ To compare growth in productivity and pay, we should look at a measure of pay that also excludes workers from those sectors.

However, American Compass instead shows the trend in pay for private production and nonsupervisory workers. This measure excludes about 20 percent of private sector employees (supervisors and non-production workers).¹⁵ Like the productivity measure, it excludes employees of farms, government, and private households, but unlike that measure, it includes employees of nonprofit institutions if they are not supervisors. The pay measure also excludes the self-employed, unlike the productivity measure. (Even if the pay measure included the self-employed, there would be another problem—dividing income

received by the self-employed into a part that is pay for the proprietor's labor and a part that involves profits earned by the proprietor as an owner is unavoidably arbitrary. The self-employed have accounted for a rising share of output, so this measurement problem is increasingly important over time.¹⁶⁾

Like American Compass's numbers, the Economic Policy Institute figures also involve the pay of private production and nonsupervisory workers. However, they reflect productivity for the entire economy, including supervisors, the self-employed, and employees of farms, government, and private households. Again, the workers being compared are different, and the inclusion of the self-employed in the productivity measure creates additional problems.

Furthermore, even if the Economic Policy Institute, for consistency, were looking at the pay of employees economy-wide, there would be another big issue. Economy-wide productivity is simply gross domestic product divided by hours worked. But gross domestic product includes something called "gross housing value added." For rental housing, that's the value of payments from tenants to landlords, while for owned homes, it involves an abstract payment of "imputed rent" from homeowners to themselves.¹⁷ In neither case are employees involved in producing all (or, in the case of homeownership, any) of this rental income, so there is no reason "pay" should correspond with gross housing value added in the way that it does with the output of firms.¹⁸

One reason that economy-wide productivity has increased faster than compensation is that gross housing value added has increased more than the parts of GDP that involve goods and services primarily produced by workers.¹⁹ But this divergence does not actually indicate a failure of workers to be paid in accordance with their value to employers. The housing sector of the economy should be left out of analyses comparing productivity and pay, which is one reason many researchers look at the nonfarm business sector.

The Hamilton Project improves on these other analyses by showing both productivity and pay for the nonfarm business sector. Not only does that compare the same workers, it avoids the problem presented by the housing sector. However, it fails to avoid the ambiguities involved in apportioning self-employment income.

Both the Hamilton Project and Economic Policy Institute figures appropriately include nonwage compensation in their pay estimates. The American Compass figures omit nonwage compensation.

American Compass and the Hamilton Project both err in how they handle "depreciation." Firms use some of the revenue from output to replace worn-out or obsolete equipment, machines, and structures. The cost of doing so comes at the expense of higher profits and worker pay, but failing to replace depreciating capital will lower workers' future pay. Therefore, trends in pay should be compared with trends in "net productivity," which subtracts depreciation from output before dividing by hours. This detail matters because depreciation has risen over time as a share of national income. The Economic Policy Institute correctly uses net productivity.

Finally, all three groups use different adjustments for inflation for their productivity and pay measures. As noted, firms would be expected to pay workers based on their marginal revenue product—not just how much they produce, but the value of what they produce. That value depends on the prices of the goods and services that constitute American firms' output.

Many analyses comparing trends in productivity and pay adjust compensation for inflation based on the changing prices of the goods and services that American consumers buy. The price of output produced, in contrast, also depends on demand from American businesses and government, as well as foreign purchasers. Those customers buy different things than American consumers and in different proportions. Moreover, American consumers buy goods and services from abroad, not just from American firms. Donald Schneider has succinctly formulated the basic issue: “we are interested in whether workers are paid for what they produce, not whether they are paid for what they consume.”²⁰

It is not strictly necessary for comparing productivity and pay trends to adjust for inflation—failing to do so will just show stronger “growth” for both because the rise in nominal productivity and pay will reflect inflation. But if one wants to adjust for inflation, one should adjust both productivity and pay in the same way—ideally by a measure of output inflation.

American Compass adjusts productivity for inflation using the “implicit price deflator” for the “gross value added” of the nonfarm business sector.²¹ It adjusts pay using the consumer price index (CPI). The CPI indicates more inflation than the measure used for productivity, both because of the difference between consumer-product inflation and output inflation and because the CPI overstates consumer-product inflation.²² Part of the reason, then, that pay lags productivity in the American Compass analysis is that inflation wrongly eats away too much of the increase in pay relative to the increase in productivity.

The Hamilton Project uses the same inflation adjustment for productivity as American Compass but a different version of the consumer price index (the “R-CPI-U-RS”). (This version also exaggerates inflation in consumer prices, though not as much as does the CPI.²³) The Economic Policy Institute comes closest to an apples-to-apples comparison: it uses the R-CPI-U-RS for both productivity and pay, except it modifies that index for adjusting compensation.²⁴

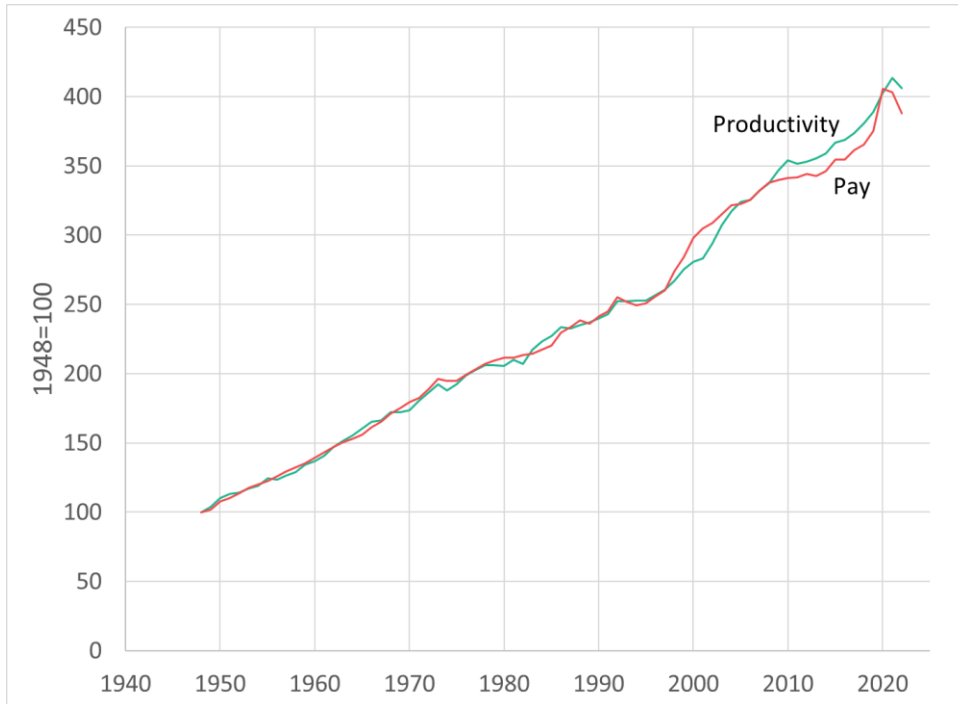
Yes, Worker Pay Has Kept Up with Productivity Growth

What do appropriate comparisons of productivity and pay trends reveal? Figure 4 shows trends from 1948 to 2022 for paid employees in the nonfarm business sector. I compare net productivity to real hourly compensation.²⁵ The two series have had similar trajectories, with productivity sometimes outpacing pay and pay sometimes outpacing productivity. By 2022, productivity had risen to 4.1 times its 1948 level, while hourly compensation had risen to 3.9 times the starting level. As recently as 2020, growth in the two series since 1948 was the same, and it was also true as of 2008.

Alternatively, we can look at the nonfinancial corporate sector, a subset of the nonfarm business sector that excludes the self-employed (who I also excluded in Figure 4) and the financial sector.²⁶ According to this series (Figure 5), growth in pay has exceeded productivity growth for much of the period since the late 1960s. As of 2022, real hourly compensation was 4.6 times its 1948 level, compared with 4.7 for net productivity.

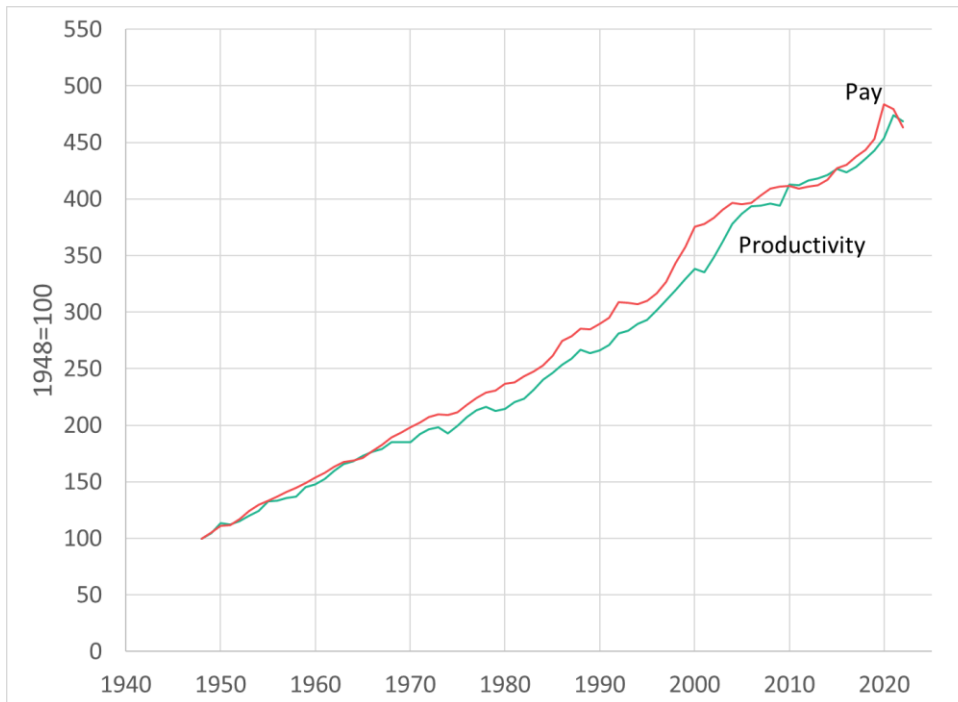
Even more strikingly, we can go back to 1929 if we compare net value added to total compensation. Net productivity and hourly compensation divide these quantities by the same estimate of hours, and estimates of the numerators of these hourly rates go further back in time. Figure 6 shows the trends for the nonfarm business sector.²⁷ Both net output, less proprietors’ income, and total compensation of paid employees rose by a factor of 23 from 1929 to 2022.

Figure 4. Growth in Net Productivity and Real Hourly Compensation, Paid Employees in the Nonfarm Business Sector, 1948-2022



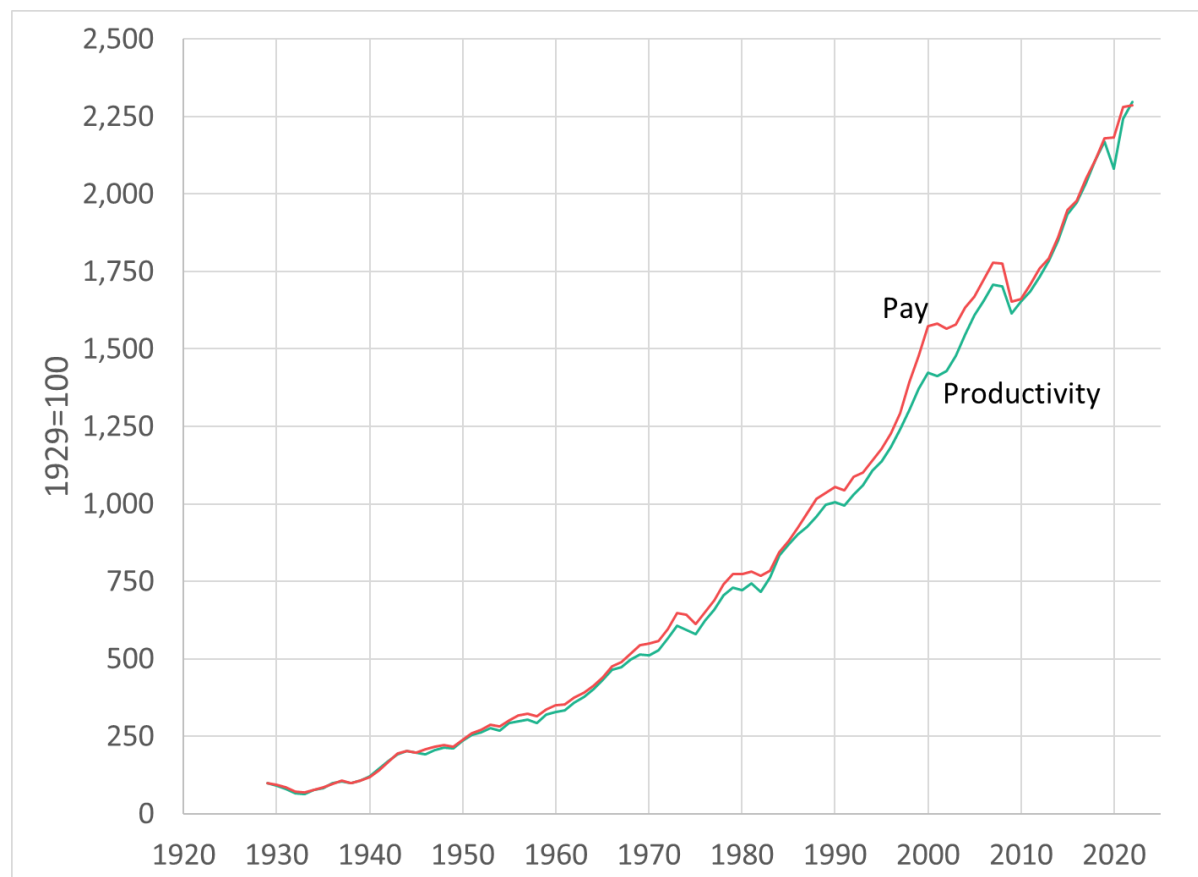
Source: Bureau of Economic Analysis, National Income and Product Accounts. Bureau of Labor Statistics, Hours Worked and Employment Measures. See note 25 for details.

Figure 5. Growth in Net Productivity and Real Hourly Compensation, Nonfinancial Corporate Sector, 1948-2022



Source: Bureau of Economic Analysis, National Income and Product Accounts. Bureau of Labor Statistics, Labor Productivity and Costs Measures. See note 26 for details.

Figure 6. Growth in Net Output and Total Compensation, Nonfarm Business Sector, 1929-2022



Source: Bureau of Economic Analysis, National Income and Product Accounts. Bureau of Labor Statistics, Hours Worked and Employment Measures. See note 27 for details.

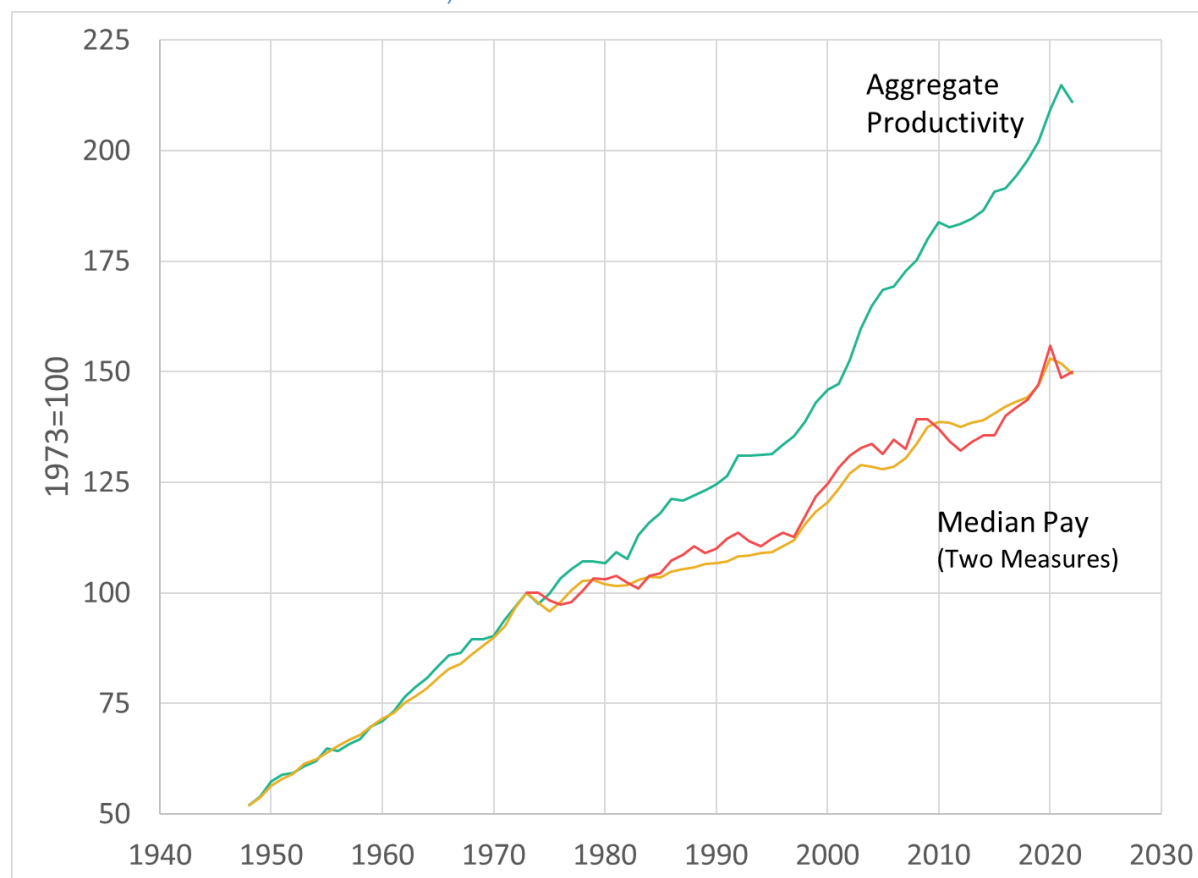
Other available estimates provide similar conclusions. Comparing real net value added in the nonfinancial corporate sector to real total compensation in the sector, the former rose by a factor of 29 from 1929 to 2023, while the latter grew by a factor of 28.5.²⁸ The growth rates were essentially the same as of 2019. In the corporate sector (including the financial sector), we can compare nominal net value added to nominal total compensation.²⁹ The former was 268 times its 1929 level in 2023, while the latter was 263 times higher. As of 2020, total compensation had risen slightly faster than net value added. Finally, we can return to comparing productivity and hourly compensation if we look at the entire nonfarm business sector, including proprietors, counting all their income as compensation.³⁰ From 1929 to 2022, productivity rose by a factor of 7.6 and real hourly compensation by 7.4. In 2020, those figures were 7.6 and 7.7.

Productivity and the Pay of the Median Worker

Overall growth in worker compensation, then, has kept pace with overall productivity growth. However, the compensation of the *median* worker has lagged overall productivity significantly. Figure 7 presents yet another pay-versus-productivity chart. The productivity measure is the same as in Figure 4, except it is now scaled so that the 1973 net productivity rate (instead of the 1948 rate) equals 100.

There are two measures of median hourly compensation in Figure 7. The first is not technically a median, but in effect it is, and it is the only such measure that goes back to 1948. It is a modified version of the series on which American Compass and the Economic Policy Institute based their analyses, looking at the average hourly compensation of private production workers.³¹ To show that it is effectively a measure of median pay, Figure 7 also displays the trend since 1973 for the median hourly compensation of noninstitutionalized civilian workers in the private nonfarm sector.³² It is evident that since 1973, the two compensation trends are very similar. Of primary importance for our purposes, the two series end up at the same place in 2022.

Figure 7. Growth in Net Productivity and Median Hourly Compensation, Paid Employees in the Nonfarm Business Sector, 1948-2022



Source: Bureau of Economic Analysis, National Income and Product Accounts. Bureau of Labor Statistics, Current Employment Statistics National Employment, Hours, and Earnings database. Author's analysis of Current Population Survey microdata. See notes 31 and 32 for details.

Figure 7 shows that while productivity rose 111 percent from 1948 to 2022, median hourly compensation rose only by 50 percent. A striking feature of the chart is that median pay actually tracked productivity very closely from 1948 to 1973, diverging suddenly in the mid-1970s. What accounts for this fork in the trends? Three factors seem of primary importance.

Median Productivity Growth Has Lagged Overall Productivity Growth, and Median Pay Has Tracked Median Productivity

First, it is likely that productivity inequality grew, so that the productivity of the median worker grew less rapidly than the productivity of workers generally. Slower productivity growth for the median worker would be consistent with median compensation failing to keep pace with aggregate productivity. For instance, if the productivity of the median worker only rose by 50 percent, then the compensation trend in Figure 7 would be in accord with what economic theory would predict.

An accumulating mountain of evidence suggests that the productivity of the median worker has risen by less than overall productivity. We lack individual-level measures of productivity, but much of the evidence we have points to growing productivity inequality across individual workers. First, productivity inequality has increased across industries. For instance, industries with workers who have higher educational attainment have higher productivity. Industries with a higher level of education in 1989 saw stronger productivity growth through 2017.³³

Productivity inequality has also increased across firms. Moreover, both wage inequality and productivity inequality have risen primarily across firms within the same industry, as opposed to within firms or across industries.³⁴ Research finds that firms with workers that are more productive pay them higher wages—with everyone from the lowest paid employees to the highest paid benefiting. Moreover, increases in a firm's productivity lead to increases in its employees' pay.³⁵

Growth in productivity inequality across firms resembles growth in their wage inequality. One study of the US analyzing firms from 1977 to 2007 found that both productivity inequality and wage inequality between firms rose, with productivity inequality rising more. These increases occurred within each of eight industries as well.³⁶

A study of the United Kingdom looked at changes from 1984-1989 to 1996-2001 in firms' wages and productivity. Across thousands of firms, the 90th percentile of wages—meaning the per-worker real wages paid by some of the highest-paying firms—rose by 70 percent.³⁷ The 90th percentile of productivity—the level in some of the highest-productivity firms—rose by 49 percent. The 50th percentile of firm wages rose by 45 percent, or over a third (36 percent) slower than for the 90th percentile. Similarly, the 50th percentile of firm productivity rose by 34 percent—32 percent slower than the 90th percentile. The 10th percentile of wages and productivity rose by 27 percent and 15 percent, or 39 percent and 31 percent more slowly than the corresponding 90th percentile.

Another study of the United Kingdom using a different dataset looked at firm-level productivity trends from 1996 to 2016.³⁸ Ranking workers by the productivity of their employer, the researchers found that productivity for the median worker had not increased over the period. Productivity for the 90th percentile worker rose by nearly 50 percent, while productivity for the 10th percentile worker fell by nearly 20 percent. Similarly, firm-level wages fanned out over the period, with increases of 35 percent at

the 90th percentile and about 10 percent at the median and a decline of about 10 percent at the 10th percentile.

Not only has productivity inequality grown across industries and firms, it is likely has increased within firms too. A recent paper finds that firms with higher productivity have a larger wage gap between their highest and lowest paid workers. Even more strikingly, increases in firm productivity raise the pay of all of the firm's employees, but not equally. The highest earning workers in a firm with productivity growth receive a bigger earnings boost than do the lowest earning workers.³⁹ These findings suggest that more productive firms are more productive disproportionately *because of* the highest earners—that their productivity is greater than that of lower-paid workers. It would be odd if the most productive firms and those with the greatest productivity increases are overpaying their top earners while the least productive firms with the weakest productivity growth are underpaying them.

If rising productivity within a firm disproportionately reflects rising productivity at the top and leads to larger increases in pay higher up than for the typical employee, that would have clear implications for the national economy. Rising productivity in the economy may be driven by greater inequality in productivity and in productivity growth and, hence, lead to relatively sluggish growth in median pay. The authors of this study roughly estimate that national productivity growth from 1980 to 2013 caused 40 percent of the increase in within-firm pay inequality between the highest and lowest paid workers.

The Shift to a Service Economy Pulled Down Men's Productivity

There is another way in which productivity growth became less equal, which relates to the shift to a lower-productivity service economy and the way that shift differentially affected men and women. The slowdown in pay has mainly afflicted one-half of the population, and the rest of our story is about why that happened.

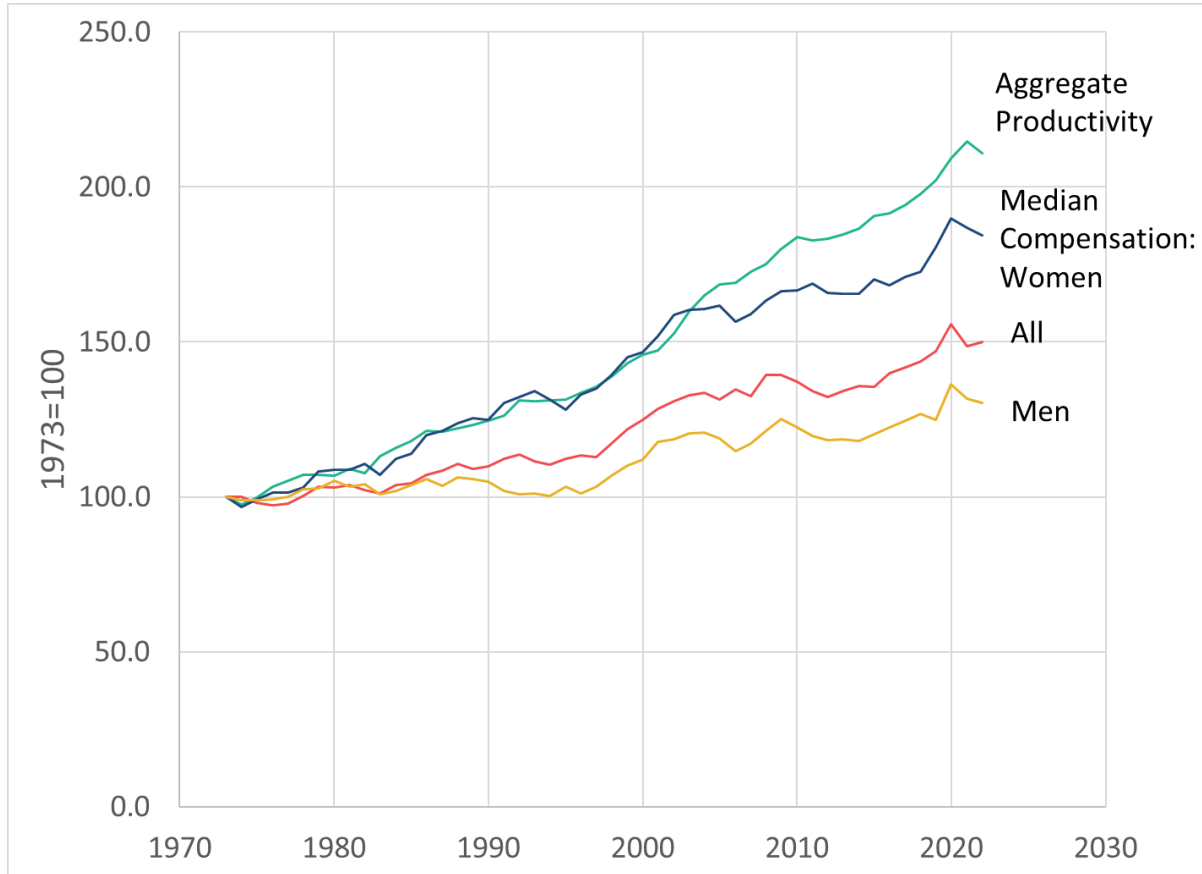
Figure 8 carries over the productivity and median hourly compensation trends from Figure 7, this time starting the series in 1973 instead of 1948. It also includes separate median trends for men and women. Women have seen much stronger compensation growth than men—an increase of 84 percent versus 30 percent. Indeed, the median woman's hourly compensation actually kept pace with aggregate productivity for the 30 years between 1973 and 2003. In contrast, men's pay was essentially flat through 1996. Pay for women and men have grown more similarly since then, with women's pay rising 39 percent and men's 29 percent.

Part of why men have done worse comes down to their earlier overrepresentation in high-productivity sectors of the economy such as manufacturing that employed a smaller share of the workforce over time. This initial overrepresentation set men up for diminished productivity growth as the economy changed.

Overall productivity growth decelerated beginning in the late 1960s—a trend common to most of the richest nations in the world at that time.⁴⁰ This slowdown is not well understood, but a key factor was the shift from an economy in which goods production dominated to a service economy.⁴¹ As people become richer, they purchase more services (health care being the textbook example). Productivity is generally lower in the service sector, since there are fewer opportunities to improve efficiency using machines, computers, and equipment. Think of haircutting or performing in a play. Moreover, over the long run, productivity grows at a slower rate in the service sector for the same reason. To a large extent,

the slowdown in productivity—which in turn has caused wage growth to slow—reflects the nation’s affluence.

Figure 8. Growth in Net Productivity and in Median Hourly Compensation by Sex, Paid Employees in the Nonfarm Business Sector, 1973-2022



Source: Bureau of Economic Analysis, National Income and Product Accounts. Bureau of Labor Statistics, Current Employment Statistics National Employment, Hours, and Earnings database. Author’s analysis of Current Population Survey microdata. See notes 31 and 32 for details.

Women were overrepresented in the service sector prior to 1973, so the economy-wide shift to services negatively affected their productivity growth less than it did for men. To the contrary, as female workers became better educated and more experienced, and as barriers to competing in formerly male-dominated sectors fell, they increasingly found themselves in higher-productivity, higher-paying occupations and industries.

In contrast, male workers found fewer jobs in goods production over time. Not only were these jobs becoming a smaller part of the labor market, but men increasingly had to compete with women for them. Over time, men increasingly ended up in lower-productivity, lower-paying service jobs. The result was decelerating growth in men’s pay beyond what would have occurred had economy-wide productivity growth slowed in a world without occupational segregation.

Unanchored Mid-Century Pay

If this were the only dynamic affecting men, their wage growth might have slowed, but probably not as much as shown in Figure 8. Nor would median pay for the combined group of men and women have lagged productivity so badly; after all, a redistribution of men and women between higher-productivity, higher-paying jobs and lower-productivity, lower-paying jobs would only alter the relative pay trajectories of men and women, not the overall growth in median pay. However, another historical transition compounded the problems of men, reducing both their wage gains and *overall* growth in pay.

An implicit assumption lies behind the view that growth in pay from some starting point should be the same as productivity growth—that pay at that starting point was where it should have been, given initial productivity levels. Consider an example in a different economic context. When incomes increase, we might expect that homeownership should also rise. However, imagine that homeownership is artificially common initially, perhaps because of degraded credit standards. At this starting point, more people own their homes than income levels would predict based on historical patterns. In that case, after five years of income gains, the homeownership rate may actually be lower than before, even if it ends up exactly where income levels would predict. Some observers might look at the decline in home owning and attribute it to an economic breakdown in the relationship between income and homeownership rates. However, the real problem in this case is that home owning initially was out of line with the historical income-homeownership relationship.

This stylized example has a real-world analogue in the long-term median wage growth trend. Figure 9 presents yet another productivity-versus-pay trend comparison, going back to 1929. This time, the productivity line represents the nonfarm business sector, but including the self-employed. The hourly compensation line represents the same group.⁴² Once again, productivity and compensation track each other well at the aggregate level, with net productivity rising 656 percent and hourly compensation rising 637 percent.

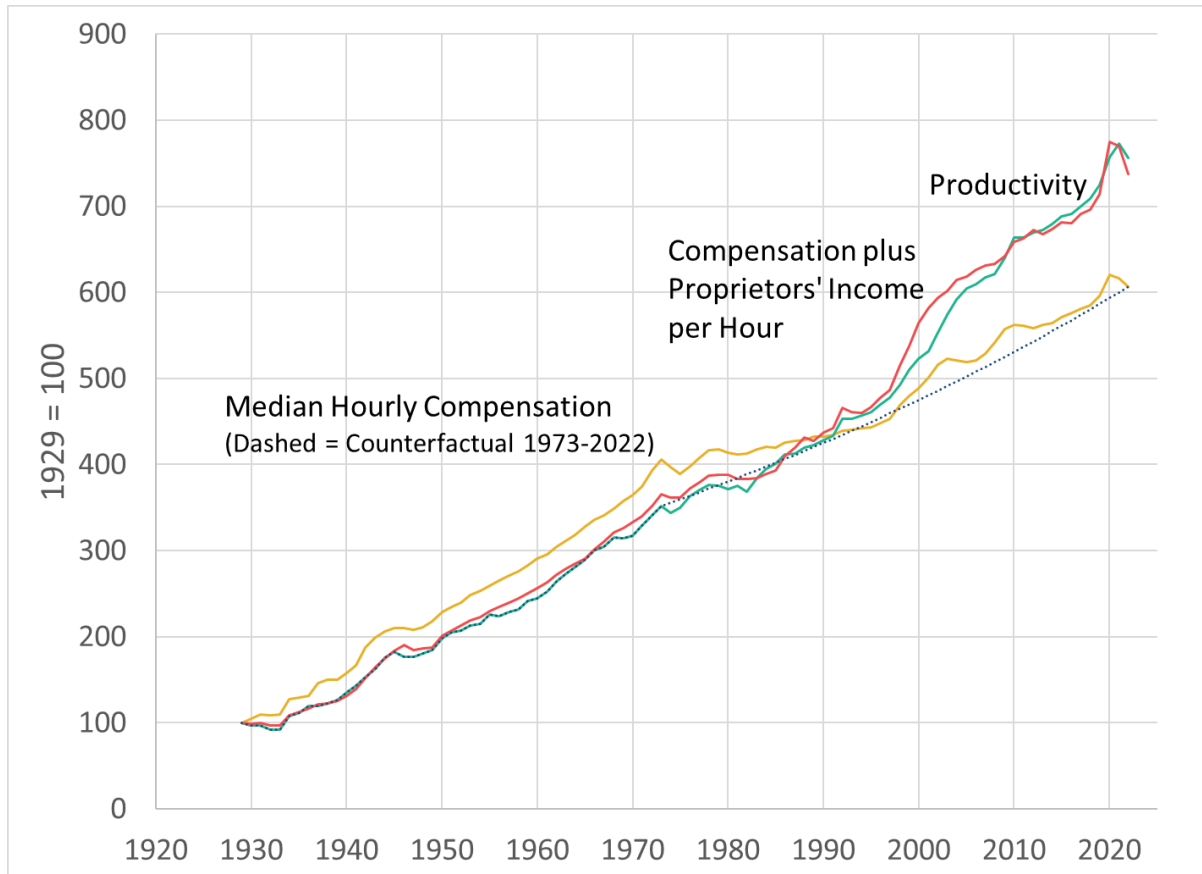
But look at the median hourly compensation trend. This is the same measure as the one in Figure 7 that started in 1948, but now extended back to 1929. Figure 7 suggested that median pay was right on track from 1948 to 1973, increasing at the same rate as aggregate productivity. Figure 9, however reveals that in 1948, median pay was too high relative to productivity; it had grown 38 percent more than productivity since 1929. By 1973, it was still too high by 21 percent. Looking at trends since 1948 or 1973 is like choosing a year with a housing bubble as a starting point from which to look at homeownership trends.

Median compensation rose especially rapidly in 1933, 1937-38, and 1942-43. New Deal policies played an important role in producing this excess of pay growth over productivity growth. The National Industrial Recovery Act of 1933 pressured employers to collude and develop industrial codes that raised wage rates and that reduced hours without cutting wages. This led to sharp wage increases among those fortunate enough to be employed but did so at the expense of creating jobs for the quarter of the labor force that was unemployed. The Wagner Act, passed in 1935, made it much easier for workers to unionize. The result was a wave of strikes and the wage increases of 1937-38.⁴³

Finally, while the 1942-43 increases reflected labor shortages during the war, they also came in the context of a command-and-control economy instituted by the federal government to prosecute World

War II. Price controls artificially boosted real wages. It's true that wage controls dampened nominal growth in pay, but nonwage compensation and overtime pay were outside of the controls.

Figure 9. Growth in Net Productivity and Aggregate and Median Hourly Compensation, Nonfarm Business Sector, 1929-2022



Source: Bureau of Economic Analysis, National Income and Product Accounts. Bureau of Labor Statistics, Current Employment Statistics National Employment, Hours, and Earnings database and "Total US Economy: hours and employment" spreadsheet. John W. Kendrick (1973). Lawrence H. Officer (2009). See note 42 for details.

Median hourly compensation grew at a rate similar to aggregate productivity through 1960 (remaining at an elevated level). It then slowly began to lag productivity growth. It would not be until 1992, however, that median hourly compensation would return to the level that cumulative growth in productivity would have predicted.

If median pay was excessively high in 1973 relative to productivity levels, then it should not necessarily have grown as quickly as productivity over the next 49 years. Instead, we might expect that it would have grown more slowly until productivity growth could "catch up"—that pay growth might have been sluggish for some time so as to rationalize pay levels that had become unanchored to productivity growth.⁴⁴

To see how this overly strong growth in median pay might have affected post-1973 growth, consider the dashed line in Figure 9. This line lies on top of the productivity trend from 1929 to 1973 and then connects the 1973 productivity level to the 2022 median hourly compensation level. It models a counterfactual scenario in which median hourly compensation had increased at the same rate as productivity through 1973 then had reached the same 2022 level as it actually did. The only way that median hourly compensation could have reached the same 2022 level while starting from the lower 1973 level would have been through stronger counterfactual growth after 1973. The thought experiment essentially assumes that median hourly compensation growth would have always gotten to its end point, even if pay had not grown faster than productivity before 1973.

According to this simplified counterfactual exercise, rather than rising by 50 percent from 1973 to 2022, median hourly compensation would have risen 72 percent. (In other words, back in Figure 8, the median trend line that ends at 150 would instead rise to 172—a bit below the trend line shown for women, which ends at 184.) Instead of rising only 52 percent as much as productivity over these 49 years, median hourly compensation would have risen 71 percent as much. Put another way, the gap between post-1973 productivity growth and median hourly compensation growth would have been smaller by about 40 percent.

Evidence from a completely different source of compensation data reinforces the story told in Figure 9. Figure 10 compares growth in net value added per employee in the nonfarm business sector to growth in the mean and median annual compensation of employees in that sector. The compensation data is available from 1937 to 2004.⁴⁵ The measure of productivity (which is real net output per worker rather than per hour) rose 312 percent over this period. Median compensation rose 309 percent, while mean compensation increased 370 percent.

The two pay series in Figure 10 may be less comparable to the productivity series than the pay and productivity series are in the previous charts. The point to take home is not that median compensation rose at the same rate as productivity or that mean compensation grew much faster than productivity. Rather, median compensation outpaced not only productivity (pulling away in the mid-1940s, not to converge again until the mid-1980s) but mean compensation (pulling away in the mid-1940s and converging in the mid-1970s).

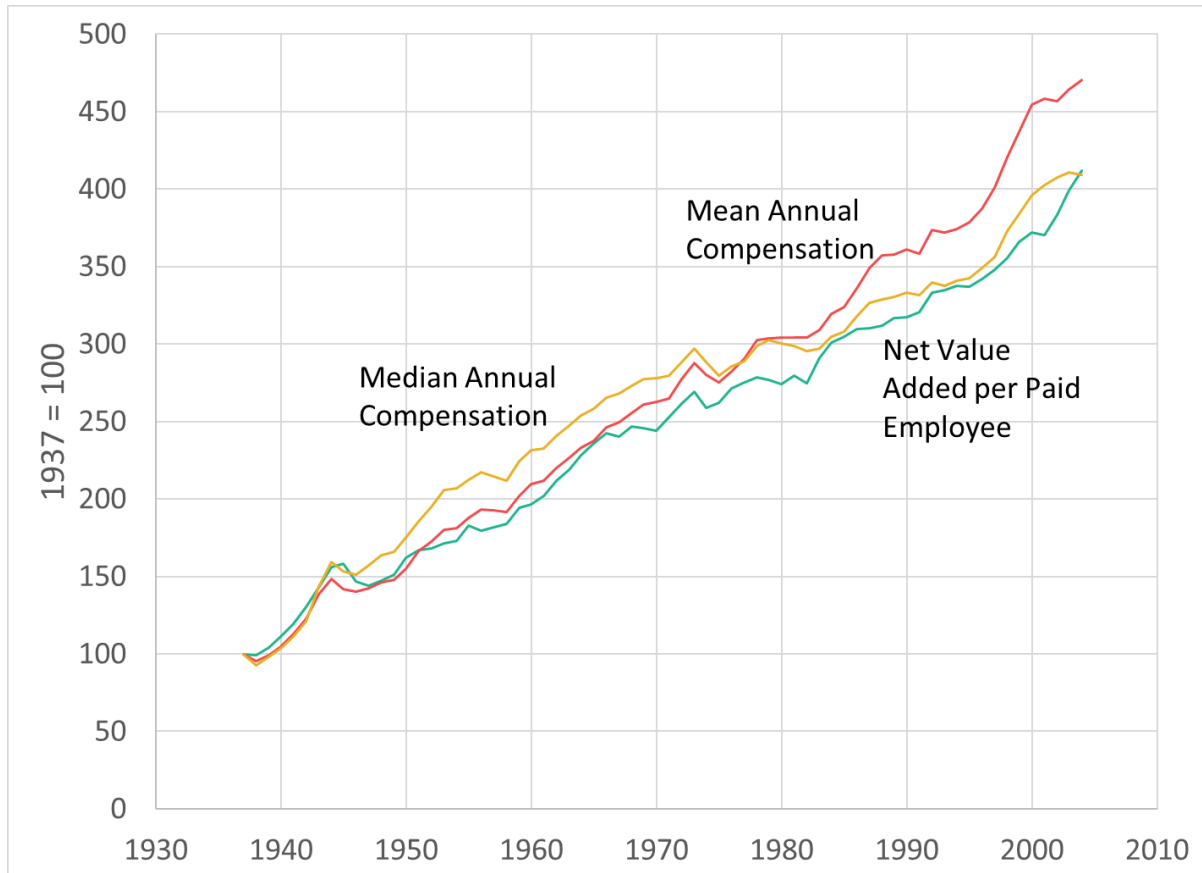
What does all this evidence have to do with men's exceptionally slow post-1973 pay growth? The timing of some of these trends provides an initial suggestion. Median pay returned to the level predicted by productivity growth in 1992. The economy was still recovering from the recession of 1990-91 in that year. But by 1997, the median pay of men had begun its first sustained increase since 1973.

One reason why growth in median pay outpaced productivity growth earlier in the twentieth century may be that many men enjoyed rents—wages above what a competitive labor market would have produced.

During an era when gender roles were more rigid and patriarchal, men and women alike broadly agreed that the ideal family consisted of a breadwinning husband and a stay-at-home wife taking care of children. This ideal was shared by early twentieth century progressives, most male and female New Dealers, social conservatives, and labor union members and supporters. It was reflected in the idea of a “family wage”—a wage (for men) large enough to support a family by itself.⁴⁶

Securing a family wage for its members was a top priority of organized labor, from the nineteenth century into the second half of the twentieth century. Those members tended to be male, and female members were often restricted to lower-paying jobs or required to resign upon getting married.⁴⁷ Between 1933 and 1945, when median hourly compensation was pulling most rapidly away from productivity, union membership rose from 7 percent to 27 percent. The rate was still 25 percent in 1960.⁴⁸

Figure 10. Growth in Net Value Added per Employee and Mean and Median Annual Compensation, Nonfarm Business Sector, 1937-2004



Source: Bureau of Economic Analysis, National Income and Product Accounts. Bureau of Labor Statistics, Current Employment Statistics National Employment, Hours, and Earnings database and “Total US Economy: hours and employment” spreadsheet. John W. Kendrick (1973). Wojciech Kopczuk, Emmanuel Saez, and Jae Song (2007). See note 45 for details.

But “breadwinner rents” were not simply confined to unionized workplaces. For example, Henry Ford’s famous “Five Dollar Day” raise was available to married men (to support them as breadwinners, and only if their wife did not work) and single men (to help them become breadwinners), but not to most women.⁴⁹ Occupational segregation was widespread.

Direct evidence that the unanchored hourly compensation growth from 1929 to 1960 was concentrated among men is limited by data availability. However, over the second half of this period, median annual individual income growth outpaced mean income growth only among men. From 1947 to 1960, the median for employed men, after adjusting for inflation, increased by 51 percent while the mean rose by just 43 percent. Women's individual income rose more slowly, and the mean grew slightly *faster* than the median (34 percent and 30 percent, respectively).⁵⁰

Where did these rents come from? A potential source is suggested by trends in income concentration. The share of income received by the top one percent fell sharply during World War II and continued to decline during the 1950s and 1960s.⁵¹ The breadwinner ideal was broadly shared, including among the nation's elite; it may very well have been a force working to keep mid-century inequality low.

If breadwinner rents were responsible for unmooring median hourly compensation from productivity, their erosion as married women's employment and earnings increased also fits as a possible explanation for the return of median pay to the levels predicted by productivity growth. Especially during the 1970s and 1980s, the number of sole-breadwinning husbands fell.⁵² With wives increasingly joining their husbands in the workforce, the rationale for paying a sole breadwinning male enough to support a family by himself disappeared.

Breadwinner rents dissipated. As men changed jobs or entered the workforce, they were less likely to be offered wages that built in the old-fashioned premium. The previous generation of men who had benefitted from the patriarchal regime gradually retired. As a group, men's pay stagnated or declined as productivity rose. Gradually, more and more men came to have wages in line with their marginal value to their employer, and those employers could justify giving them a raise as productivity increased. (Meanwhile, income concentration rose again starting in the early 1980s, possibly entailing the recapture of breadwinner rents by top earners.⁵³)

Conclusion

If the claims of the most alarmist observers and analysts about the pay received by American workers were true, we would have reason to worry about the state of our economy. This review of pay and productivity trends has established that at least two of the most striking claims bandied about by declensionists are untrue.

First, the fundamental relationship between economy-wide productivity and worker pay remains remarkably strong. Over 75 or 100 years, aggregate worker pay has closely tracked increases in productivity. Pay differences across industries, across firms within industries, and within firms all seem to correspond with productivity differences. If we could accelerate productivity growth, the benefits to workers would be substantial—perhaps more valuable than any plausible alternatives.

Incidentally, the fact that pay and productivity have increased together indicates that “labor's share of income” has been steady over 75 or 100 years. Workers receive the same piece of the economic pie as in the past.

Second, middle-class and lower-earning workers have seen gains in pay over the past 50 years. Those gains have been sizable for women, but modest for men. However, the stagnation for men is more reflective of a transition out of an industrial patriarchal past that all rich countries have made than a breakdown of capitalism.

Men have borne the brunt of the shift from an economy based on goods production to one based on services, since they dominated the former. They were disproportionately hurt by the decline of organized labor and the withering of the breadwinner ideal. But the shift to services also benefited men as consumers in a rich nation who could better afford the more expensive fruits of a lower-productivity sector. And the dissipation of breadwinner rents likely brought pay *more* in line with productivity, though that required men's pay to stagnate.

Men used to live in a world where their pay got a boost from patriarchal norms, where they worked in higher-productivity, higher-paying jobs, and where they faced little competition from female labor. The transition from that world was painful for many men. But the good news is that it is behind us. Men's pay has risen by 19 percent since 1996, not as much as the 36 percent gain that women have seen, but a real response to rising productivity of the kind that did not appear in the data for a long time after 1973. Most fundamentally, American men are not *worse* off than in the past, as too many declensionists seem to believe.

Rather than take seriously claims that the American economy is broken, the evidence here suggests that policymakers should look for ways to raise economy-wide productivity, to raise the productivity of working- and middle-class earners specifically, and to attend to the difficulties that American men seem to have succeeding in a service economy, reflected more in their declining labor force participation rates than their wages.⁵⁴

End Notes

¹ Kirsten Powers, “Bernie Sanders is Right about Capitalism,” CNN.com, February 24, 2023,

<https://www.cnn.com/2023/02/24/opinions/bernie-sanders-capitalism-freedom-powers/index.html>.

² American Compass, “Rebuilding American Capitalism: A Handbook for Conservative Policymakers,” 2023, p. 9.

³ Results are for adults ages 18 to 29. Pew Research Center, “Modest Declines in Positive Views of ‘Socialism’ and ‘Capitalism’ in the U.S.,” September 19, 2022, <https://www.pewresearch.org/politics/2022/09/19/modest-declines-in-positive-views-of-socialism-and-capitalism-in-u-s/#:~:text=Six%2Din%2Dten%20today%20say,Pew%20Research%20Center%20conducted%20Aug..>

⁴ All the analyses in this section exclude self-employed workers who do not receive any wages or salaries as paid employees and exclude self-employment income. Author’s calculations from the Current Population Survey microdata. For 1973 to 1978, I use the data from the May Supplement, provided by the Unicon Corporation, a company that no longer exists. For 1979 to 1993, I use the data from the Outgoing Rotation Groups file provided by the Unicon Corporation. For 1994 to 2022, I use the Basic Monthly Survey data from IPUMS, Minnesota Population Center at the University of Minnesota. (See Sarah Flood, Miriam King, Renae Rodgers, Steven Ruggles, J. Robert Warren, Daniel Backman, Annie Chen, Grace Cooper, Stephanie Richards, Megan Schouweiler, and Michael Westberry. IPUMS CPS: Version 11.0 [dataset]. Minneapolis, MN: IPUMS, 2023.) Hourly earnings are the reported amount for workers paid by the hour or, for other workers or if otherwise unavailable, usual weekly earnings divided by usual weekly hours. I restrict the sample to workers in the private nonfarm sector (consistently excluding the self-employed across all years). Unlike the analyses that follow, in which I need consistency with various productivity measures, I adjust the estimates in this section for inflation using the implicit price deflator for personal consumption expenditures, from NIPA Table 1.1.9, “Implicit Price Deflators for Gross Domestic Product,” April 25, 2024.

⁵ Indeed, with ideal data, we would add back to compensation the part of the corporate income tax that, de facto, comes out of employees’ pay. However, it does not appear that this would alter the trends reported here. Congressional Budget Office estimates for the middle fifth of adults in households with children, for instance, suggest that the employee’s share of corporate income tax was about 1 percent of wage and salary income in 1979 and in 2019. See Congressional Budget Office, “The Distribution of Household Income in 2020,” November 14, 2023, Table Builder spreadsheet, <https://www.cbo.gov/publication/59509#data>.

⁶ The data used understate wages at the very top of the earnings distribution. The age groups for the analyses are 18-24, 25-29, 30-39, 40-49, and 50-54.

⁷ Martin Feldstein, “Did wages reflect growth in productivity?,” *Journal of Policy Modeling*, 30(4), 2008, 591-594. Complicating this theoretical prediction is the “Baumol effect.” In a perfectly competitive economy, where any worker could take any job available regardless of skill requirements or geographic location, an increase in productivity in one sector that leads to higher wages would draw workers from other sectors, creating shortages. Employers in the lower-productivity, lower-wage sector would have to then offer higher wages to maintain their workforce, and those wages would exceed productivity in the sector. Workers in lower-productivity sectors would make more than their productivity levels would dictate. However, to the extent workers cannot simply switch between sectors and occupations, either due to lack of qualification, barriers to geographic mobility, occupational licensing, or other factors, this equalization of wages will not occur.

⁸ American Compass, “A Guide to Labor Supply,” May 4, 2023, <https://americancompass.org/a-guide-to-labor-supply/>. The productivity measure is for the nonfarm business sector, from the Bureau of Labor Statistics, Major Sector Productivity and Costs Database, <https://www.bls.gov/productivity/data.htm>. The pay measure is the average hourly earnings of production and nonsupervisory workers in the private economy, from the Bureau of Labor Statistics, Current Employment Statistics National Employment, Hours, and Earnings Database, <https://www.bls.gov/ces/data/>. For consistency with the American Compass analyses, I adjust average hourly earnings for inflation using the Consumer Price Index, from the Bureau of Labor Statistics, Consumer Price Index All Urban Consumers database, <https://www.bls.gov/cpi/data.htm>.

⁹ Economic Policy Institute, “The Productivity—Pay Gap,” October 2022, <https://www.epi.org/productivity-pay-gap/>. I use the numbers provided with the chart featured at this URL. The data originally is from the Bureau of Economic Analysis, National Income and Product Accounts, Tables 1.7.6 (net national product), and 2.1 and 7.8

(nonwage compensation); Bureau of Labor Statistics—Total US Economy: hours and employment spreadsheet (hours); Consumer Price Index, Updated R-CPI-U-RS, All items, 1977-2023 spreadsheet (prices); Current Employment Statistics National Employment, Hours, and Earnings database (earnings); and Consumer Price Index All Urban Consumers database (prices).

¹⁰ Figure 5-1, <https://www.whitehouse.gov/wp-content/uploads/2022/04/ERP-2022.pdf>.

¹¹ Jay Shambaugh, Ryan Nunn, Patrick Liu, and Greg Nantz, “Thirteen Facts about Wage Growth,” Brookings Institution, Hamilton Project, September 2017, https://www.hamiltonproject.org/assets/files/thirteen_facts_wage_growth.pdf. Estimates are for the nonfarm business sector, from the Bureau of Labor Statistics, Major Sector Quarterly Labor Productivity and Costs database, <https://www.bls.gov/productivity/data.htm> (productivity and compensation) and Consumer Price Index, Updated R-CPI-U-RS, All items, 1977-2023 spreadsheet, <https://www.bls.gov/cpi/research-series/r-cpi-u-rs-home.htm> (prices).

¹² American Compass, “Rebuilding American Capitalism: A Handbook for Conservative Policymakers”; Economic Policy Institute, “The Productivity—Pay Gap.”

¹³ The most thorough review of the methodological issues involved in comparing trends in pay and productivity is found in James Sherk, “Workers’ Compensation: Growing Along with Productivity,” Heritage Foundation, May 2016, <https://www.heritage.org/jobs-and-labor/report/workers-compensation-growing-along-productivity>. In particular, Sherk provides many of the specific measurement details that I use in my corrective analyses below.

¹⁴ Bureau of Labor Statistics, Handbook of Methods, “Chapter 10. Productivity Measures: Business Sector and Major Subsectors,” <https://www.bls.gov/opub/hom/pdf/msp-19970714.pdf>.

¹⁵ Bureau of Labor Statistics, Handbook of Methods, “Chapter 2. Employment, Hours, and Earnings from the Establishment Survey,” <https://www.bls.gov/opub/hom/pdf/ces-20110307.pdf>.

¹⁶ Sherk, “Workers’ Compensation.”

¹⁷ Homeowners receive a flow of benefits (such as having a roof over their heads) for which they would have to pay a landlord if they were renting. By including these housing services as output and spending and including “imputed rent of homeowners” as income, the national accounts avoid showing that national output and income is falling as homeownership increases. For both landlords and homeowners, gross housing value added deducts any costs of owning the property, such as maintenance, taxes, insurance, and the like.

¹⁸ Rental income is income from an asset. For landlords, any compensation of employees is deducted from gross rental income, so the extent to which the pay of those workers should reflect their productivity depends on their contribution to producing the gross rental income. For homeowners, there are no workers to speak of. Employees of private households produce services that are different from those captured in gross housing value added. See Nicole Mayerhauser and Marshall Reinsdorf, “Housing Services in the National Economic Accounts,” September 2007, <https://www.bea.gov/sites/default/files/methodologies/RIPfactsheet.pdf>.

¹⁹ Loukas Karabarbounis and Brent Neiman, “Accounting for Factorless Income,” *NBER Macroeconomics Annual* 33, 2018, 167-228.

²⁰ Donald Schneider, “Pay, Productivity, and the Labor Share,” Medium blog post, July 11, 2023, <https://medium.com/@donaldschneider/56329/pay-productivity-and-the-labor-share-8a241ba539a0>. Sherk notes that changes in consumer prices and output prices have been similar when both are measured well. However, many analyses use consumer price indexes that are poorly measured relative to the corresponding output price index. See Sherk, “Workers’ Compensation.”

²¹ Gross value added for a sector or industry is output less the cost of goods and services consumed in producing that output.

²² For the problems with the CPI, see Scott Winship, “Poverty after Welfare Reform,” Manhattan Institute, Appendix 2, August 2016, <https://manhattan.institute/article/poverty-after-welfare-reform>.

²³ Ibid.

²⁴ Specifically, the Economic Policy Institute adjusts the part of compensation made up of health benefits by the consumer price index for medical care. This is unwarranted because the R-CPI-U-RS already encompasses health care inflation, so EPI is effectively double counting it by adjusting *non*-health-benefit compensation by an inflation measure that is heavily affected by health care prices.

²⁵ I obtain estimates of nominal net value added for the nonfarm business sector from the Bureau of Economic Analysis’s National Income and Product Accounts, NIPA Table 1.9.5, “Net Value Added by Sector,” September 29, 2023. I convert these to real 2017 dollars using the implicit price deflator for net value added in the nonfarm

business sector, from NIPA Table 1.9.4, “Price Indexes for Net Value Added by Sector,” September 29, 2023. From this, I subtract nonfarm proprietors’ income. I obtain nominal estimates of that income from NIPA Table 6.12, “Nonfarm Proprietors’ Income by Industry,” September 29, 2023, then I adjust for inflation using NIPA Table 1.9.4. That yields the real net value added of paid employees in the nonfarm business sector. To get net productivity, I divide by hours worked by paid employees in the nonfarm sector. Those come from the Bureau of Labor Statistics, “Total US Economy: hours and employment” spreadsheet, March 7, 2024, <https://www.bls.gov/productivity/tables/home.htm>. I sum the hours of private nonfarm employees (excluding nonprofit institutions) and the hours of employees of government enterprises. It is possible to compute these estimates from 1947 to 2022.

For hourly compensation, I begin with estimates of the total compensation of employees in the nonfarm business sector. I take compensation received by employees in domestic industries and subtract compensation in the farm, federal general government, state and local general government, household, and institutions sectors. All of these except the latter two are from the Bureau of Economic Analysis’s National Income and Product Accounts, NIPA Table 6.2, “Compensation of Employees by Industry,” September 29, 2023. Compensation of employees in the household and institutions sector is from NIPA Table 1.13, “National Income by Sector, Legal Form of Organization, and Type of Income,” September 29, 2023. I then divide by hours worked by paid employees in the nonfarm sector, described above. Finally, I adjust for inflation using the implicit price deflator for net value added in the nonfarm business sector, also described above. It is possible to compute these estimates from 1948 to 2022.

²⁶ I obtain real net value added for the sector from the Bureau of Economic Analysis’s National Income and Product Accounts, NIPA Table 1.14, “Gross Value Added of Domestic Corporate Business in Current Dollars and Gross Value Added of Nonfinancial Domestic Corporate Business in Current and Chained Dollars,” March 28, 2024. I divide these estimates by hours worked by employees in the sector, from the Bureau of Labor Statistics, “Major sectors: nonfarm business, business, nonfinancial corporate, and manufacturing” spreadsheet, March 7, 2024, <https://www.bls.gov/productivity/tables/home.htm>.

I obtain nominal hourly compensation for employees in the sector from the same Bureau of Labor Statistics spreadsheet. I convert compensation to real compensation using the implicit price deflator for net value added in the sector, which I compute from the current dollar and real estimates of net value added in NIPA Table 1.14. Hourly compensation is unavailable for the broader domestic corporate sector, which includes the financial sector. I have benefitted from conversations with Donald Schneider regarding these series.

²⁷ Nominal net value added for the nonfarm business sector, less proprietors’ income, and total compensation of paid employees in the sector are from the same sources as in note 25, with one exception. Before 1948, for nominal total compensation, I obtain estimates from the Bureau of Economic Analysis’s National Income and Product Accounts, NIPA Table 6.2, “Compensation of Employees by Industry,” September 29, 2023. (The estimates from that table end in 2000.)

²⁸ Real net value added and nominal total compensation are from the Bureau of Economic Analysis’s National Income and Product Accounts, NIPA Table 1.14, “Gross Value Added of Domestic Corporate Business in Current Dollars and Gross Value Added of Nonfinancial Domestic Corporate Business in Current and Chained Dollars,” March 28, 2024. I convert nominal total compensation to real compensation using the implicit price deflator for net value added in the sector, which I compute from the current dollar and real estimates of net value added in NIPA Table 1.14.

²⁹ Nominal net value added and nominal total compensation are from the Bureau of Economic Analysis’s National Income and Product Accounts, NIPA Table 1.14, “Gross Value Added of Domestic Corporate Business in Current Dollars and Gross Value Added of Nonfinancial Domestic Corporate Business in Current and Chained Dollars,” March 28, 2024.

³⁰ Nominal net value added for the nonfarm business sector is from the Bureau of Economic Analysis’s National Income and Product Accounts, NIPA Table 1.9.5, “Net Value Added by Sector,” September 29, 2023. I obtain nominal compensation of paid employees in the sector from 1948 to 2022 as in note 25 and from 1929 to 1948 as in note 27. I obtain nominal proprietors’ income in the sector as in note 25 and add it to compensation of paid employees. I divide both series by hours for the sector, from two sources. From 1947 to 2022, hours are from the Bureau of Labor Statistics, “Total US Economy: hours and employment” spreadsheet, March 7, 2024, <https://www.bls.gov/productivity/tables/home.htm>. For 1929 to 1946, estimates are from John W. Kendrick, *Postwar Productivity Trends in the United States, 1948-1969* (Cambridge, Massachusetts: National Bureau of Economic Research, 1973), Appendix Table A-21, <https://www.nber.org/books-and-chapters/postwar-productivity->

[trends-united-states-1948-1969](#). The Kendrick estimates are indexed so that 1958 equals 100. Both hours series include 1947, so I back-cast the BLS estimates using the percent change in the Kendrick estimates. Finally, I adjust both series for inflation using the implicit price deflator for net value added in the nonfarm business sector, from NIPA Table 1.9.4, “Price Indexes for Net Value Added by Sector,” September 29, 2023.

³¹ I start with the nominal average hourly earnings of private production workers from 1948 to 2002 (the most recent year available), from the Bureau of Labor Statistics, Current Employment Statistics National Employment, Hours, and Earnings Database, <https://www.bls.gov/ces/data/>. I forecast this series to 2022 using the change in the nominal average hourly earnings of private production and nonsupervisory workers (from the same source). (The two series, with and without supervisors, grow at essentially the same rate from 1989 to 2002.) Next, I adjust these earnings values to compensation. I use the compensation-to-wages ratio for the nonfarm business sector, computed by taking wage and salary income or compensation received by employees in domestic industries and subtracting wages or compensation in the farm, federal general government, state and local general government, household, and institutions sectors. All of these except the latter two are from NIPA Table 6.2. Compensation of employees in the household and institutions sector is from NIPA Table 1.13. (Technically, the private production worker earnings estimates include the nonfarm business sector plus institutions serving households.) Finally, I adjust all estimates for inflation using the implicit price deflator for net value added in the nonfarm business sector (NIPA Table 1.9.4).

While basing my estimates on an hourly compensation series that includes supervisors may seem less appropriate for purposes of examining the typical worker than using a series that excludes supervisors, the former more closely tracks trends in median hourly compensation that I discuss in the next note.

³² Author’s calculations from the Current Population Survey microdata (see note 4). I adjust these estimates for inflation using the implicit price deflator for net value added in the nonfarm business sector, from NIPA Table 1.9.4, “Price Indexes for Net Value Added by Sector,” September 29, 2023.

³³ Edward Lazear, Kathryn L. Shaw, Grant E. Hayes, and James M. Jedras, “Productivity and Wages: What Was the Productivity-Wage Link in the Digital Revolution of the Past, and What Might Occur in the AI Revolution?” NBER Working Paper No. 30734 (Cambridge, MA: National Bureau of Economic Research, 2022).

³⁴ Faggio, Salvanes, and Van Reenen, “The Evolution of Inequality in Productivity and Wages.” Ryan A. Decker, John Haltiwanger, Ron S. Jarmin, and Javier Miranda, “Changing Business Dynamism and Productivity: Shocks versus Responsiveness,” *American Economic Review*, 110(12), 2020, 3952-3990. For cross-national evidence, see Dan Andrews, Chiara Criscuolo, and Peter N. Gal, “Frontier Firms, Technology Diffusion and Public Policy: Micro Evidence from OECD Countries,” *The Future of Productivity: Main Background Papers*, OECD, 2015, Figure 1, <https://www.oecd.org/economy/growth/Frontier-Firms-Technology-Diffusion-and-Public-Policy-Micro-Evidence-from-OECD-Countries.pdf>; Dan Andrews, Chiara Criscuolo, and Peter N. Gal, “The Best Versus the Rest: The Global Productivity Slowdown, Divergence across Firms and the Role of Public Policy,” *OECD Productivity Working Papers*, No. 05, OECD, 2016, Figure 2, <https://www.oecd-ilibrary.org/docserver/63629cc9-en.pdf?expires=1714154324&id=id&accname=guest&checksum=3EAD10912A48DAF83EC97E69E44CD0FF>.

Evidence from US manufacturing finds that productivity inequality started rising as early as 1986. Faggio, Salvanes, and Van Reenen argue that by excluding the service sector, the economy-wide increase in productivity inequality is understated. See Timothy Dunne, Lucia Foster, John Haltiwanger, and Kenneth R. Troske, “Wage and Productivity Dispersion in United States Manufacturing: The Role of Computer Investment,” *Journal of Labor Economics* 22, no. 2, 2004: 397-430.

On wage inequality, see Jae Song, David J. Price, Fatih Guvenen, Nicholas Bloom, Till von Wachter, “Firming Up Inequality,” *Quarterly Journal of Economics* 134, No. 1, 2019: 1-50; Faggio, Salvanes, and Reenen, “The Evolution of Inequality in Productivity and Wages”; Erling Barth, Alex Bryson, James C. Davis, and Richard Freeman, “It’s Where You Work: Increases in the Dispersion of Earnings across Establishments and Individuals in the United States,” *Journal of Labor Economics* 34, no. S2, Part 2, 2016: S67-S97; John Van Reenen, “Increasing Differences between Firms: Market Power and the Macroeconomy,” CEP Discussion Papers dp1576, Centre for Economic Performance, London School of Economics, https://www.kansascityfed.org/Research/documents/6974/VanReenenPaper_JH2018.pdf; and OECD, “The Role of Firms in Wage Inequality: Policy Lessons from a Large-Scale Cross-Country Study,” 2021, Figure 3.2.

³⁵ Melanie Wallskog, Nicholas Bloom, Scott W. Ohlmacher, Cristina Tello-Trillo, “Within-Firm Pay Inequality and Productivity,” NBER Working Paper No. 32240 (Cambridge, MA: National Bureau of Economic Research, 2024).

³⁶ Barth, Bryson, Davis, and Freeman, “It’s Where You Work.”

³⁷ Faggio, Salvanes, and Van Reenen, “The Evolution of Inequality in Productivity and Wages.”

³⁸ Jan De Loecker, Tim Obermeier, and John Van Reenen, “Firms and inequality,” IFS Deaton Review of Inequalities, 2022, <https://ifs.org.uk/inequality/firms-and-inequality>.

³⁹ Melanie Wallskog, Nicholas Bloom, Scott W. Ohlmacher, Cristina Tello-Trillo, “Within-Firm Pay Inequality and Productivity,” NBER Working Paper No. 32240 (Cambridge, MA: National Bureau of Economic Research, 2024).

⁴⁰ Robert C. Feenstra, Robert Inklaar and Marcel P. Timmer (2015), “The Next Generation of the Penn World Table” *American Economic Review* 105(10), 3150-3182, available for download at www.ggdnet.net/pwt.

⁴¹ Dietrich Vollrath, *Fully Grown: Why A Stagnant Economy Is a Sign of Success* (Chicago: University of Chicago Press, 2020).

⁴² Ideally, as discussed in the text, I would exclude the self-employed from these trends, but the hours series available does not separate the self-employed in the nonfarm business sector from paid employees prior to 1947. I obtain real net value added for the nonfarm business sector from NIPA Table 1.9.6.

For the aggregate hourly compensation trend, I start with total compensation of employees, from NIPA Table 6.2 for 1929-1947. For 1948-2022, it is calculated from NIPA Table 6.2 and NIPA Table 1.13 as compensation received by employees in domestic industries less compensation in the farm, federal general government, state and local general government, household, and institutions sectors. To compensation of employees, I add proprietors’ income in the nonfarm business sector, from NIPA Table 6.12. I adjust the hourly pay series for inflation using the implicit price deflator for net value added in the nonfarm business sector, from NIPA Table 1.9.4.

I divide both net value added and compensation-plus-proprietors’-income by hours in the nonfarm business sector. Hours for the sector for 1947-2022 come from the Bureau of Labor Statistics, “Total US Economy: hours and employment” spreadsheet, March 7, 2024, <https://www.bls.gov/productivity/tables/home.htm>. For 1929 to 1946, estimates are from John W. Kendrick, *Postwar Productivity Trends in the United States, 1948-1969* (Cambridge, Massachusetts: National Bureau of Economic Research, 1973), Appendix Table A-21, <https://www.nber.org/books-and-chapters/postwar-productivity-trends-united-states-1948-1969>. Both hours series include 1947, so I back-cast the BLS estimates using the percent change in the Kendrick estimates.

For the median hourly compensation series, I start with the nominal average hourly earnings of private production workers from 1947 to 2002 (the most recent year available), from the Bureau of Labor Statistics, Current Employment Statistics National Employment, Hours, and Earnings Database, <https://www.bls.gov/ces/data/>. I forecast this series to 2022 using the change in the nominal average hourly earnings of private production and nonsupervisory workers (from the same source). (The two series, with and without supervisors, grow at essentially the same rate from 1989 to 2002.) I back-cast the series to 1939 using the change in the nominal average hourly earnings of production and nonsupervisory workers in durable-goods-producing industries (from the same source). The annual adjustment from 1939-46 proportionally reduces the growth rate to account for the fact that the durable goods production worker series grows faster than the private production worker series from 1947 to 1964. Next, I adjust all of these earnings values to compensation. For 1948-2022, I use the compensation-to-wages ratio for the nonfarm business sector, computed by taking wage and salary income or compensation received by employees in domestic industries and subtracting wages or compensation in the farm, federal general government, state and local general government, household, and institutions sectors. All of these except the latter two are from NIPA Table 6.2. Compensation of employees in the household and institutions sector is from NIPA Table 1.13. (Technically, the private production worker earnings estimates include the nonfarm business sector plus institutions serving households.) For 1939-1947, I use the compensation-to-wages ratio for the total workforce, from NIPA Table 2.1, reducing the ratios by 2 percent to account for the fact that ratios for production and nonsupervisory workers are slightly smaller than ratios for the total workforce after 1947.

I then back-cast this compensation series to 1929 using annual change in the estimates from Lawrence H. Officer, *Two Centuries of Compensation for U.S. Production Workers in Manufacturing* (New York: Palgrave Macmillan, 2009), available at <http://www.measuringworth.com/uswage/>.

Finally, I adjust all estimates for inflation using the implicit price deflator for net value added in the nonfarm business sector (NIPA Table 1.9.4).

While basing my estimates on an hourly compensation series that includes supervisors may seem less appropriate for purposes of examining the typical worker than using a series that excludes supervisors, the former more closely tracks trends in median hourly compensation of civilian noninstitutionalized workers.

⁴³ George Selgin, “The New Deal and Recovery, Part 8: The NRA,” Cato Institute, August 2020, <https://www.cato.org/blog/new-deal-recovery-part-8-nra>.

⁴⁴ Of course, all of this assumes that median pay was at the “right” level in 1929—well anchored to what productivity levels in 1929 would have predicted. This assumption is bolstered by a finding from Robert Gordon that in 1929, both aggregate productivity and hourly compensation were at the level that growth in each from 1870 to 1928 would have predicted. See Robert J. Gordon, *The Rise and Fall of American Growth: The US Standard of Living Since the Civil War* (Princeton, NJ: Princeton University Press), p. 542, Figure 16-3.

⁴⁵ Starting with the net value added per employee series, for 1947 to 2022, I obtain nominal net value added from NIPA Table 1.9.5. I subtract nominal nonfarm proprietors’ income (NIPA Table 6.12). Then I adjust for inflation using the implicit price deflator for net value added in the nonfarm business sector (NIPA Table 1.9.4). Also for 1947 to 2022, I subtract proprietors in the nonfarm business sector from jobs in the sector, obtaining both from the Bureau of Labor Statistics, “Total US Economy: hours and employment” spreadsheet, March 7, 2024, <https://www.bls.gov/productivity/tables/home.htm>. That gives me real net value added per employee in the nonfarm business sector for 1947-2022. To extend this back to 1937, I assume that the 1937 to 1947 trend is the same for employees in the sector as for all workers in the sector (including the self-employed). I estimate real net value added for all workers by taking the 2007 to 2022 estimates from NIPA Table 1.9.6. For 1929 to 2007, I use the nominal estimates from NIPA Table 1.9.5 and then adjust them for inflation using the implicit price deflator for net value added in the nonfarm business sector. I back-cast the 2007-to-2022 series using the change in the 1929-to-2007 series. I use only the 1937-1947 estimates. I obtain the number of persons engaged for 1929-1947 from John W. Kendrick, *Postwar Productivity Trends in the United States, 1948-1969* (Cambridge, Massachusetts: National Bureau of Economic Research, 1973), Appendix Table A-21, <https://www.nber.org/books-and-chapters/postwar-productivity-trends-united-states-1948-1969>. Persons engaged includes fulltime-equivalent employees plus proprietors and unpaid workers. I assume that persons engaged and workers in the nonfarm business sector grow proportionally over these years, as is the case from 1947 to 1966, when the series overlap. Dividing the proportional change in real net value added by the proportional change in persons engaged yields the proportional change in real net value added per worker. Finally, I back-cast the 1947-2022 series using the 1937-1947 series.

Annual compensation estimates are from Wojciech Kopczuk, Emmanuel Saez, and Jae Song, “Uncovering the American Dream: Inequality and Mobility in Social Security Earnings Data Since 1937,” NBER Working Paper No. 13345 (Cambridge, MA: National Bureau of Economic Research, 2007), Figure 0, available at <https://www.columbia.edu/~wk2110/uncovering/old/>. Estimates are for commerce and industry workers (similar to employees in the nonfarm business sector) ages 18-70. I adjust them for inflation using the implicit price deflator for net value added in the nonfarm business sector.

⁴⁶ Martha May, “The Historical Problem of the Family Wage: The Ford Motor Company and the Five Dollar Day,” *Feminist Studies* 8, no. 2 (1982): 399–424, <https://www.jstor.org/stable/3177569>; Ruth Milkman, *Women, Work, and Protest: A Century of U.S. Women’s Labor History* (London: Routledge and Kegan Paul, 1985); Alice Kessler-Harris, *Out to Work: The History of Wage-Earning Women in the United States* (Oxford: Oxford University Press, 1983); Julia Kirk Blackwelder, *Now Hiring: The Feminization of Work in the United States, 1900–1995* (College Station, TX: Texas A&M University Press, 1997); and Allan Carlson, *The Family in America: Searching for Social Harmony in the Industrial Age* (New Brunswick, NJ: Transaction, 2007).

⁴⁷ Nancy Gabin, “Women and the United Automobile Workers’ Union in the 1950s,” in Ruth Milkman, ed., *Women, Work, and Protest: A Century of U.S. Women’s Labor History* (London: Routledge, 1990). Marriage bars were a more general feature of the labor market beyond unionized workplaces. See Claudia Goldin, “Marriage Bars: Discrimination against Married Women Workers from the 1920s to the 1950s,” in Patrice Higonnet, David S. Landes, and Henry Rosovsky, eds., *Favorites of Fortune: Technology, Growth, and Economic Development since the Industrial Revolution* (Cambridge, MA: Harvard University Press, 1991).

⁴⁸ Gerald Mayer, “Union Membership Trends in the United States,” CRS Report for Congress, Congressional Research Service, August 2004, Table A1.

⁴⁹ Martha May, “The Historical Problem of the Family Wage.”

⁵⁰ Herman Phillip Miller, “Trends in the Income of Families and Persons in the United States, 1947 to 1960,” Bureau of the Census, Technical Paper No. 8, 1963, Table 14.

⁵¹ Thomas Piketty, Emmanuel Saez, and Gabriel Zucman, “Distributional National Accounts: Methods and Estimates for the United States,” *Quarterly Journal of Economics* 133, no. 2 (May 2018): 553–609, <https://gabriel-zucman.eu/files/PSZ2018QJE.pdf>. For the factor income estimates for equal-split individuals, see Thomas Piketty, Emmanuel Saez, and Gabriel Zucman, “Appendix II: Detailed Distributional Series,” October 17, 2022, Table TA10,

[https://gabriel-zucman.eu/files/PSZ2022AppendixTablesII\(Distrib\).xlsx](https://gabriel-zucman.eu/files/PSZ2022AppendixTablesII(Distrib).xlsx). Estimates for pretax national income from 1960 forward are available from Auten and Splinter, “Income Inequality in the United States: Using Tax Data to Measure Long-term Trends,” *Journal of Political Economy* (forthcoming), https://www.davidsplinter.com/AutenSplinter-Tax_Data_and_Inequality.pdf, data available at <https://davidsplinter.com/AutenSplinter-IncomeIneq.xlsx>.

⁵² Scott Winship, “Bringing Home the Bacon: Have Trends in Men’s Pay Weakened the Traditional Family?” American Enterprise Institute, December 2022, <https://www.aei.org/wp-content/uploads/2022/12/Bringing-Home-the-Bacon-Have-Trends-in-Mens-Pay-Weakened-the-Traditional-Family.pdf?x85095>.

⁵³ Piketty, Saez, and Zucman, “Appendix II”; Auten and Splinter, “Income Inequality in the United States.”

⁵⁴ Scott Winship, “What’s Behind Declining Male Labor Force Participation: Fewer Good Jobs, or Fewer Men Seeking Them?” Mercatus Center at George Mason University, 2017, [file:///C:/Users/scott.winship/Downloads/winship_malelaborparticipation_mr_v2%20\(5\).pdf](file:///C:/Users/scott.winship/Downloads/winship_malelaborparticipation_mr_v2%20(5).pdf).