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College Attainment, Income Inequality, and Economic Security A Simulation Exercise

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POLICY BRIEF

College Attainment, Income Inequality, and Economic Security

A Simulation Exercise

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BRIEF HIGHLIGHTS

- *We simulate how earnings inequality and poverty rates would change if educational attainment were to increase.*
- *The most intense simulation raises the share of prime-age adults with an associate degree from about 10 to 20 percent, and with a bachelor's degree from about 40 to 60 percent.*
- *Earnings increase by 5 to 15 percent, but the gains are concentrated among lower-income individuals.*
- *Consequently, the ratio of income between the top and bottom halves falls, especially for men.*
- *Moreover, the fraction of prime-age adults living in poverty falls from 11.3 to 8.9 percent.*

For additional details, see the working paper at https://research.upjohn.org/up_workingpapers/319.

Adults in the United States without a college degree have fared relatively poorly in terms of employment and earnings outcomes over the past four decades. The college wage premium—the ratio of earnings of those who have received a bachelor's degree to those who have not—increased between 1980 and 2000 and has held steady since, remaining at roughly 90 percent for both men and women. In addition, prime-age adults with no more than a high school degree have experienced a sizable decline in employment rates, both in absolute terms and compared to college-degree holders.

The divergent economic outcomes of those with and without a college degree have led many observers to stress the need for increased skill attainment, in particular increased college attainment, to boost individual economic security and address rising income inequality. This proposal is consistent with the arguments emphasized in the book *The Race between Education and Technology* (Goldin and Katz 2008). In highly simplified terms, Goldin and Katz argue that, during the 1980s and 1990s, the demand for college-educated workers rose faster than the supply of college-educated workers, leading to a rise in their relative wage.

We conduct a simulation exercise that gauges the likely impact of increased rates of college attainment on measures of income inequality and economic insecurity. The results reveal that increasing college attainment would shrink gaps between the 90th percentile and lower half of the earnings distribution, as well as between the median and bottom, in most cases. Increased college degree attainment would meaningfully raise economic security for individuals near the bottom of the earnings distribution and reduce poverty rates. However, increases in college attainment would not reduce gaps at the very top of the distribution—for instance, the 99/90 percentile ratio. The policy prescription of increased educational attainment should thus appeal to those whose primary concern is the economic security of lower-income individuals, but it will not satisfy the goals of reduced income shares at the top of the distribution.[1]

Simulation Approach

We measure employment, earnings, income, and poverty status using the same source the federal government uses for official income and poverty measures, the Annual Social and Economic Supplement of the Current Population Survey. To illustrate changes in earnings and inequality over a long horizon, we focus on the 1980 survey (covering earnings from 1979) and the 2019 survey (covering earnings from 2018). To minimize concerns about schooling and retirement decisions, we focus on simulating greater degree attainment for adult civilians of prime age, 25–54. We define full-time, full-year

[1]This paper builds on a 2015 policy memo that Hershbein and Kearney wrote with Larry Summers and posted on the Hamilton Project website (Hershbein, Kearney, and Summers 2015).

Among men age 25–54, the employment rate fell from 92 to 85 percent between 1979 and 2018, with larger losses for those without a college degree.

workers (FTFY) as those usually working at least 35 hours per week and at least 40 weeks of the year. For earnings, we include annual wages and salaries, as well as (positive) business income, adjusted for inflation to year 2018 dollars. Because poverty status is based on family rather than individual income, we measure income relative to poverty thresholds using total family income and official poverty thresholds for the individual's family size and type.

We examine four groups: all prime-age FTFY workers, prime-age FTFY men and women separately, and all prime-age men, regardless of work status. Among the last group, all men age 25–54, the employment rate fell from 92 to 85 percent between 1979 and 2018, with larger losses for those without a college degree. Partly as a result, earnings (adjusted for inflation) fell for the bottom half; even among FTFY men, earnings for the bottom half barely budged. At the top, earnings rose substantially for both groups. Among women, earnings increased for almost everyone, but the gains were much larger at the higher end of the distribution.

What would increasing educational attainment do to these trends? We simulate three hypothetical scenarios. Simulation 1 raises the share of the group (for each group above) with at least a bachelor's degree (BA share) to 50 percent. Simulation 2 raises the share of the sample with an associate degree (AA share) to 15 percent *and* the BA share to 50 percent. Simulation 3 raises the AA share to 20 percent and the BA share to 60 percent. Both new AA holders and new BA holders are drawn from the existing high school graduate population. For each scenario, we assign the "new" AA and BA holders simulated earnings in two ways. The *distribution method* assigns a random draw from the distribution of existing AA or BA holders (including those with higher than a BA), within cells defined by age group, race, and sex. For example, under this approach, suppose a black male 29-year-old with a high school diploma were simulated to have bachelor's degree; he would be assigned the earnings from a random draw of an existing black male 25-to-34-year-old who already has a bachelor's degree. The *causal parameter method*, on the other hand, assigns a percentage boost to an individual's existing income, where the specific percentage boost comes from studies that estimate the return to someone just earning an associate or bachelor's degree: 29 percent for an AA and 68 percent for a BA. (The working paper provides the underlying studies, as well as full methodological details of the simulation.) The distribution method allows an individual currently out of the workforce to be assigned positive earnings via the simulation and also accounts for the possibility that different people have different returns to college. The causal parameter, on the other hand, may come closer to capturing the average return for individuals likely to be affected by a policy to boost educational attainment.

Because an increase in the share of the population with a college degree tends to lower the college wage premium, all else equal—this law of supply and demand is the foundation for the Goldin and Katz approach mentioned above—we adjust earnings for this relative wage. Specifically, we estimate that a 1 percent increase in the relative supply of BA to non-BA labor narrows the wage premium by 0.26 percent; analogously, a 1 percent increase in the relative supply of AA to high school graduate labor decreases that relative wage premium by 0.17 percent. Depending on the simulation, these adjustments narrow the BA wage premium by between 4 and 11 percent and the AA wage premium by between 1 and 11 percent.

Impacts on Inequality and Poverty

In 2018, 45 percent of FTFY prime-age workers held at least a BA and 7 percent held an AA; among all prime-age adults, these numbers were 40 and 11 percent, respectively. Simulation 1 raises the BA share to 50 percent, a modest increase among FTFY workers, but a substantial one among all prime-age individuals, requiring that 11.1 million more adults hold a bachelor's degree. Simulation 3 is even more demanding, roughly doubling this number for BAs and adding about 10 million AAs. All three simulations raise earnings in each of the four samples for roughly the lower three-quarters of the earnings

In 2018, 45 percent of full-time, year-round workers held at least a bachelor's degree and 7 percent held an associate degree; the most intense simulation increases these shares to 60 and 20 percent.

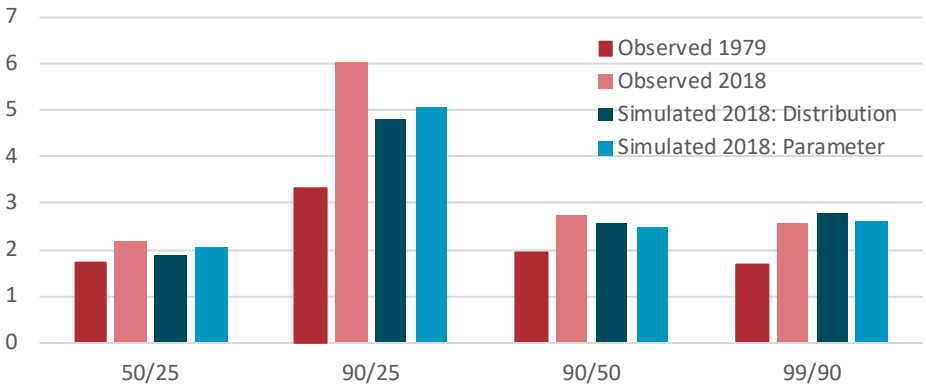
distribution, with the strongest gains in the middle. The highest percentiles, however, show much smaller gains (or even losses among FTFY men) due to the relative wage effects that lower the college wage premium.

To understand how distributional outcomes are affected, we compare observed and simulated percentile earnings ratios for prime-age FTFY men, prime-age FTFY women, and prime-age men. (For parsimony, we focus here on the third and most intense simulation.) Each group saw sizable increases in these ratios between 1979 and 2018, particularly between the 90th and lower percentiles, implying that the top were pulling away from those below them. However, the ratios from the simulations—under either method—show that increases in college attainment for FTFY men and women would lead to meaningful reductions in earnings inequality. For example, among FTFY men, the 90/10 ratio increased from 3.86 to 5.58, implying that in 2018 men at the 90th percentile earned 5.58 times as much as men at the 10th percentile, up from 3.86 times as much in 1979. Simulation 3 would bring that ratio down to 5.16 (distribution method) or 5.02 (causal parameter method), reducing the increase in inequality by about one-third. Among FTFY women, the 90/10 ratio increased from 3.6 to 5.0; simulation 3 would bring that ratio down to between 4.25 and 4.41, reducing the increase in inequality by almost half. We also find sizable reductions for the 90/25 and 50/25 ratios, although changes in the 99/90 ratio are slight, as most people in this range already have college degrees.

For prime-age men, we omit ratios including the 10th percentile (which corresponded to zero earnings in both 1979 and 2018) and focus on the other ratios, as shown in Figure 1. As the causal method increases earnings only for those with positive earnings, the simulated effects on income inequality are smaller at the lower end than those from the distribution method. The latter simulation implies the 50/25 ratio, which rose from 1.71 to 2.18 between 1979 and 2018, would fall to 1.89. The 90/25 ratio, which rose from 3.33 to 6.00, would fall to 4.83. The distribution method simulation also shows the employment rate would rise by 2.8 percentage points, suggesting gains below the 25th percentile not captured by the displayed ratios.

We also consider how the three simulation scenarios would affect measures of economic insecurity among prime-age adults, as captured by different ranges of income relative to official poverty thresholds (FPL). We consider the outcomes of deep poverty (below 50 percent FPL), poverty (below 100 percent FPL), near poverty (below 150 percent FPL), and low-income (below 200 percent FPL). Each of these measures of poverty increased between 1979 and 2018, with the share of prime-age adults living below the poverty line increasing from 8.2 to 11.3 percent. Under the distribution

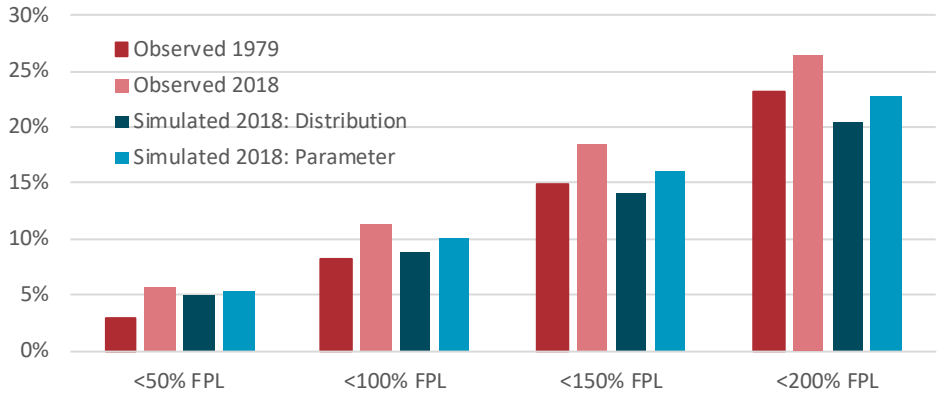
Figure 1 Percentile Earnings Ratios, Prime-Age Men



NOTE: Figure shows ratios of earnings for men, age 25–54, across different percentiles, as measured in 1979 and 2018 and as simulated according to the two methods described in the text. For example, in 2018, a man at the 90th percentile earned six times as much as a man at the 25th percentile, but the simulations reduce this ratio to 4.8 or 5.1.

Reductions in the near-poverty or low-income rate are larger, with the first falling from 18.5 to 14.2 percent, and the second from 26.5 to 20.4 percent. Both simulated rates are lower than their actual levels in 1979.

Figure 2 Family Income Relative to Poverty Line, Shares of Prime-Age Adults



NOTE: Figure shows shares of adults, age 25–54, whose family incomes fall below 50, 100, 150, and 200 percent of the federal poverty line, respectively, as measured in 1979 and 2018 and as simulated according to the two methods described in the text. For example, in 2018, 18.5 percent of adults age 25–54, lived in a family with income below 150 percent of the federal poverty line

method, the simulated poverty rate falls by 2.4 percentage points, to 8.9 percent. Reductions in the near-poverty or low-income rate are larger, with the first falling from 18.5 to 14.2 percent, and the second from 26.5 to 20.4 percent. Both simulated rates are lower than their actual levels in 1979. The rate in deep poverty also falls, but only modestly, from 5.6 to 5.0 percent, reflecting the concentration of deep poverty among those with less than a high school degree, a group not directly affected by the simulation. Under the causal parameter method, the reductions are roughly half as large, a consequence of this method boosting earnings only for those who already work and not for those who aren't employed.

Conclusion

We simulate the effects of increasing college attainment, both bachelor's and associate degrees, for men and women age 25–54, on earnings and earnings inequality. Our two different approaches yield similar conclusions: increasing the educational attainment of adults without a college degree will increase their average earnings, with gains concentrated in the lower half of the earnings distribution. These earnings shifts imply meaningful reductions in rates of poverty and near-poverty, with modest reductions in upper-lower tail inequality, but little impact at the very top of the distribution.

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