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# Degrees of Poverty: Family Income Background and the College Earnings Premium

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## Degrees of Poverty

### Family Income Background and the College Earnings Premium

**H**ow can we help equalize economic opportunity? An oft-proposed policy solution is to expand access to higher education. A college education, it is hoped, will help the children of the poor and working class gain a larger share of the economic pie.

But how much does college really pay off for lower-income Americans? Perhaps surprisingly, there has been little research on how family income background influences the career earnings boost from a college education. In new research, we reach a startling finding: the percentage boost to career earnings from a college education is much lower for individuals who grew up in lower-income families, compared to their peers who grew up in higher-income families. It is not surprising that a low-income background handicaps future career earnings. But one would have hoped that going to college would help close the gap. It does not, at least overall, and for some major groups.

#### Career Earnings by Education and Family Income Background

In our ongoing research (Bartik and Hershbein 2016), we use the Panel Study of Income Dynamics, a unique survey that has tracked the same individuals and their descendants since 1968, to estimate career earnings profiles by education and family income background. We match individuals growing up in the

1950s through the 1980s to their parents' incomes at those times to identify who was raised in a low-income family, which we define as having an income below 185 percent of the federal poverty line, a threshold that determines eligibility for the federal school lunch program. We determine the highest level of education earned by age 25, and we compare the earnings of bachelor's graduates and high school graduates from the ages of 25–62.

Our key finding is that the proportional increase in career earnings from obtaining a bachelor's degree, relative to a high

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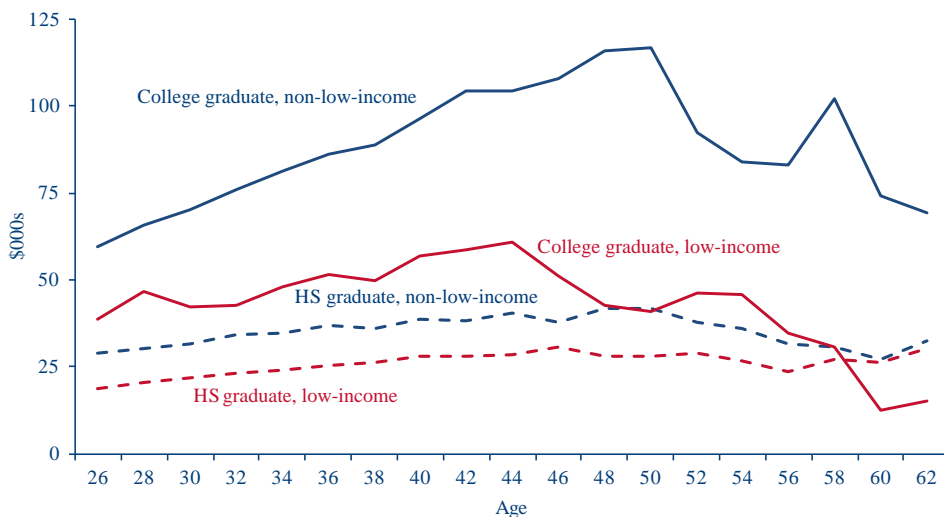
**The percentage boost to career earnings from a college education is much lower for individuals who grew up in lower-income families.**

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school diploma, is much smaller for individuals from lower-income families compared to those from higher-income families. The career earnings premium from a bachelor's degree is 71 percent for individuals who grew up in families below 185 percent of the poverty line, but for individuals from families above that income threshold, the career earnings premium for a bachelor's degree is almost twice as large, at 136 percent.<sup>1</sup>

Figure 1 shows how career earnings paths vary by income background group. For high school graduates, the earnings slopes are quite similar across

**Figure 1 Estimated Career Earnings Profiles by Education and Family Income Background (annual earnings, thousands of 2014 \$)**



NOTE: Mean earnings by age are in year 2014 dollars, adjusted with the PCE deflator from the Bureau of Economic Analysis, and are calculated including zeros but dropping imputations. SOURCE: Bartik and Hershbein (2016), using data from the Panel Study of Income Dynamics.

income backgrounds, with roughly \$700 increases every two years of age, although those with higher-income backgrounds earn about \$10,000 more at each age up to about age 50. In contrast, for college graduates, both slopes and levels diverge considerably across different income background groups. From the mid-twenties through the mid-forties, low-income-background

graduate from a low-income family earns as much at career peak as the average college graduate from a higher-income family at career beginning.

Our findings are also summarized in Table 1. For individuals from low-income families who obtain only a high school diploma, career earnings are \$475,000, while for those who receive at least a bachelor’s degree, earnings

are \$810,000—a 70.6 percent increase. For individuals from higher-income families, high school graduates earn \$661,000 over the career (about 39 percent more than high school grads from poorer families). However, average career earnings for bachelor’s graduates from the more well-to-do families reach \$1.56 million. Not only is this amount nearly twice what low-income bachelor’s graduates earn, it is 136 percent more than what higher-income-background high school graduates earn. If low-income-background college graduates received the same proportional boost to career earnings as their peers from more fortunate backgrounds, their present discounted career earnings would be \$1.12 million, or \$312,000 (38.5 percent) more than what they are observed to earn. If low-income-background college graduates received the same dollar return to college graduation as their peers from higher-income backgrounds, their present discounted career earnings would be \$1.38 million, or \$566,000 (69.9 percent) more than their observed earnings.

**Possible Reasons for the College Returns Gap**

What is causing this gap across income groups in the earnings returns to college? Some clues are provided by seeing how the gap changes when we focus on different subgroups.

**If low-income-background college graduates received the same proportional boost to career earnings as their more fortunate peers, their career earnings would be \$312,000 greater.**

college graduates on average increase their earnings by about \$2,300 every two years, while higher-income-background college graduates have average increases more than twice as large, at roughly \$5,200 every two years. Earnings peak in the mid-forties for the low-income background group but continue rising until age 50 for the higher-income-background group. The average college

**Table 1 Present Discounted Value of Career Earnings, by Education and Family Income Background**

	Earnings (2014 \$)	College – high school	College/ high school	Difference-in-differences	Difference in ratios
Low-income					
High school grad	474,500 (31,600)	335,100 (77,200)	1.706 (0.187)		
College grad	809,600 (70,500)			565,800*** (154,900)	0.657** (0.289)
Non-low-income					
High school grad	661,000 (25,700)	900,900 (134,300)	2.363 (0.220)		
College grad	1,561,900 (131,800)				

NOTE: Cumulative earnings (rounded to nearest \$100) from ages 25–62, taken from the PSID sample, are discounted at an annual rate of 3 percent from the perspective of an 18-year-old. Standard errors robust to heteroskedasticity and intrapersonal correlation and calculated via the delta method are in parentheses. \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01.

**Table 2 Career College Premium Earnings Ratios under Different Sample Restrictions**

	College/high school: Non-low-income	College/high school: Low-income	Difference in ratios
Baseline	2.363	1.706	0.657**
Include age 20+ earnings	2.176	1.602	0.574**
Drop zero earnings	2.230	1.466	0.764***
Drop graduate degrees	1.873	1.862	0.011
Drop 99th percentile	1.825	1.698	0.127
Median	1.938	2.231	-0.293
75th percentile	1.848	1.551	0.297*
90th percentile	2.026	1.472	0.554*
Men	2.699	1.404	1.295***
Women	1.999	1.987	0.012
Whites	2.311	1.120	1.191***
Blacks	2.788	2.731	0.057

NOTE: Asterisks indicate that the difference in ratios is statistically significant, with \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

SOURCE: Bartik and Hershbein (2016, Tables 6, 8, and 9).

Table 2 shows how the ratio of college to high school career earnings changes for different family income background groups as we impose restrictions. The second row uses earnings ages 20–62, not the 25–62 baseline. This reduces the gap only slightly. The third row counts only positive earnings, dropping individuals in a given year if they don't work. This restriction widens the gap, showing that the original gap is not due to employment differences.

The gap shrinks or even disappears with other restrictions. Calculating earnings only for individuals whose highest ever degree is a bachelor's, thus dropping graduate-degree holders, eliminates the ratio gap. Likewise, profiles that omit very high earners—those above the 99th percentile in any given year—show a vastly reduced ratio gap.<sup>2</sup> These two restrictions suggest that the college premium gap by family income background is driven by the highest earners. This hypothesis is supported if we focus not on mean earnings but at various percentiles of the earnings distribution. For the individual with median earnings the gap is negative, but the positive gap returns as we rise higher in the earnings distribution to the 75th percentile and the 90th percentile. Individuals from low-income backgrounds, even with a college education, are less likely to access the

highest parts of America's earnings distribution.

We also show ratios separately for men, women, whites, and blacks. The overall gap is driven by men and whites, with minimal gaps for women and blacks. The gaps for men and whites result both from higher college premiums for individuals from higher-income families and from low college premiums for those from low-income families. Blacks

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### **The college returns handicap for individuals from lower-income backgrounds is driven by lack of access to the highest earning opportunities.**

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experience high college premiums regardless of income background, with women's college premiums of moderate size regardless of income background. These patterns are also consistent with the highest earners driving the gap in the college premium, as men and whites have greater access to lucrative careers.

### **Conclusion**

Individuals from low-income family backgrounds gain in career earnings from college, but these college earnings gains may not be enough to equalize economic

opportunity. This handicap for individuals from lower-income backgrounds is driven largely by differential access to the upper tail of the earnings distribution. The relative lack of access to the highest earnings for low-income college graduates is of extra concern because the top of the earnings distribution has seen the fastest recent growth. Individuals from poorer backgrounds may be encountering a glass ceiling that even a bachelor's degree does not break.

### **Notes**

1. These and other earnings figures we report are based on present discounted value from the perspective of an 18-year-old, using a 3 percent real discount rate, which is commonly used by economists. That is, the underlying earnings represent the amount of money that an 18-year-old could invest at a 3-percent inflation-adjusted rate of return and end up with the same total career earnings.

2. Although the ratio gap is eliminated under these restrictions, the absolute dollar difference is not, with individuals from higher-income families experiencing a career college earnings boost \$200,000 greater than those from low-income families.

### **Reference**

Bartik, Timothy J., and Brad Hershbein. 2016. "Degrees of Poverty: Family Income Background and the College Earnings Premium." Upjohn Institute mimeo. Kalamazoo, MI: W.E. Upjohn Institute for Employment Research.

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