



What Flattened the Earnings Profile of Recent College Graduates?

Yu-Chien Kong, *Technical Research Associate*

B. Ravikumar, *Vice President and Economist*

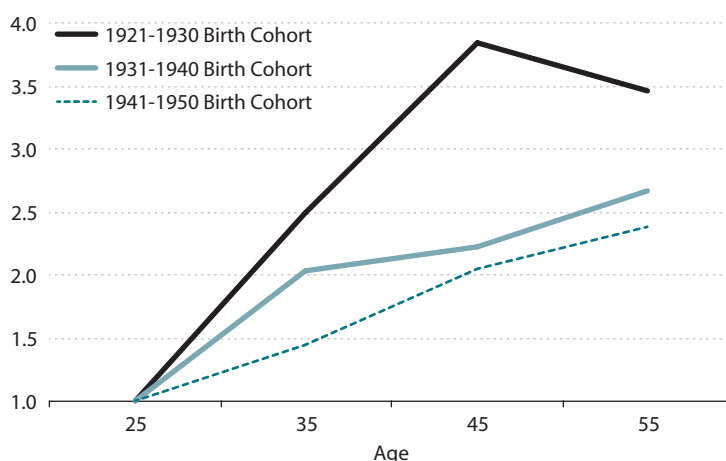
The U.S. labor market has changed dramatically over the past 100 years. Consider, for example, the effects of increased female labor force participation, the college premium, unionization, and immigration. In this essay, we explore the counterintuitive fact that the average life cycle earnings profile for college graduates of more-recent birth cohorts is flatter than that for older birth cohorts. That is, over their working lifetimes, college graduates who entered the workforce many decades ago experienced a much greater increase in wages than college graduates who entered the workforce in recent decades. We also explore a theoretical link between a measure of ability and the life cycle earnings profile and suggest an explanation for the flatter life cycle earnings profile for recent birth cohorts.

The first chart shows the earnings profile of college graduates for three birth cohorts: those born during the 1920s, 1930s, and 1940s. When college graduates born between 1921 and 1930 entered the labor force (at approximately 20 to 29 years of age), their average annual real earnings rose by a factor of 3.5 over the next 30 years. When college graduates born between 1931 and 1940 and between 1941 and 1950 entered the workforce, their earnings during the subsequent 30 years increased by factors of only 2.7 and 2.4, respectively.¹

The theoretical model of Ben-Porath (1967) is a useful starting point to understand the path of a worker's life cycle earnings. The theory postulates that (i) a worker's earnings at every point in the working life depend positively on the worker's human capital and (ii) a worker will accumulate human capital rapidly during the early stage of the life cycle and more slowly toward the end of the life cycle. This pattern of human capital accumulation implies that earnings will increase more

Over their working lifetimes, college graduates who entered the workforce many decades ago experienced a greater increase in wages than more-recent college graduates.

Real Earnings over the Life Cycle for Workers with at Least a Bachelor's Degree



NOTE: Real earnings are measured in 2000 dollars. Synthetic cohorts are built from Census data for white male workers who have attained a four-year college degree or higher. Each life cycle profile is described by the mean earnings of four age groups: 20-29, 30-39, 40-49, and 50-59 years. Earnings at each age for each cohort are normalized by earnings at age 20-29 for that cohort.

SOURCE: Census data 1940-2000 and Ruggles, Steven; Alexander, J. Trent; Genadek, Katie; Goeken, Ronald; Schroeder, Matthew B. and Sobek, Matthew. Integrated Public Use Microdata Series [IPUMS]: Version 5.0 [Machine-readable database]. Minneapolis: University of Minnesota, 2010; <https://usa.ipums.org/usa/>.

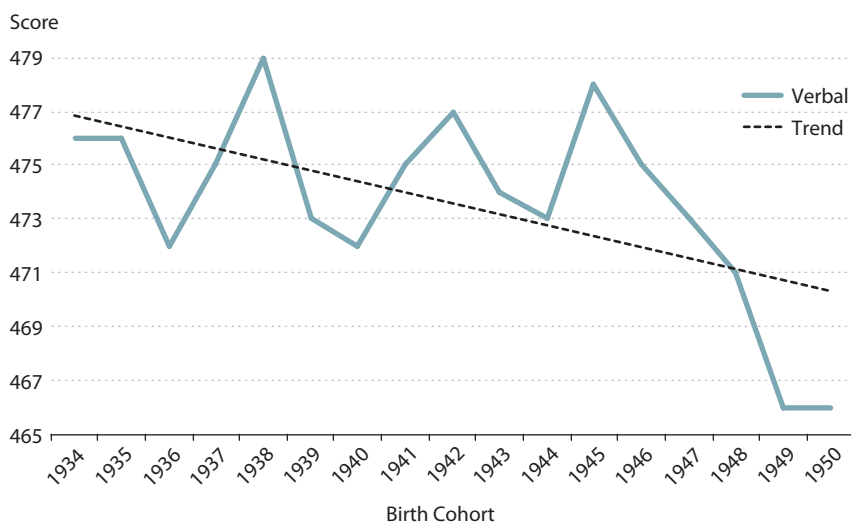
rapidly when the worker is young and less rapidly as the worker ages. Further, the model implies that a worker with higher innate ability accumulates human capital at a higher rate relative to a worker with lower ability. Hence, workers with higher abilities will experience faster earnings growth and have steeper life cycle earnings profiles relative to workers with lower abilities.

How does this theory help explain the earnings profiles? Consider, for example, the possibility that the ability of the *average* college graduate during the 1920s was higher than the ability of the average college graduate during the 1930s.² Then, the pool of college graduates from the later cohort that entered the labor force might have had lower *average* ability relative to the pool from the earlier cohort and, hence, a flatter earnings profile.

To test the theory, we need a measurement of the innate abilities of college graduates from each birth cohort. Such measurements are difficult to obtain. However, we can examine many manifestations of abilities, although they are not perfect. The average SAT score is one example of an imperfect measure that provides some evidence on the differences in ability across birth cohorts.³

The second chart shows the average verbal SAT scores of college-bound seniors for each birth cohort from 1934 to 1950. The trend suggests that students from later cohorts had lower average SAT scores than those from earlier cohorts.⁴ Thus, to the extent that the decline in the average SAT score suggests lower average ability of college graduates from the later cohorts, the life cycle earnings model implies that the life cycle earnings profile would be flatter. ■

Average Verbal SAT Scores of College-Bound Seniors



SOURCE: National Center for Education Statistics.

Notes

¹ At entry into the labor force, the college graduates from the later cohort earned more than those from the earlier cohort. In the first chart, the earnings of both cohorts have been normalized to show the earnings growth over the life cycle. See Kambourov and Manovskii (2009) and Kong (2013) for details.

² One possible reason is that college was sufficiently expensive that only the most able persons, on average, could attend. College graduation data suggest that only 35 percent of high school graduates born between 1921 and 1930 graduated from college, while the corresponding figure for high school graduates born between 1941 and 1950 is 50 percent.

³ The SAT was introduced as an aptitude test (Scholastic Aptitude Test) and was then changed to an achievement test in 1990.

⁴ A declining trend also holds for the mathematics component of the SAT. The earnings data in the first chart include individuals with birth years starting in 1921, but the SAT scores are available only for individuals with birth years starting in 1934.

References

Ben-Porath, Yoram. "The Production of Human Capital and the Life Cycle of Earnings." *Journal of Political Economy*, August 1967, 75(4), pp. 325-65.

Kambourov, Gueorgui and Manovskii, Iouri. "Accounting for the Changing Life Cycle Profile of Earnings." Unpublished manuscript, University of Toronto, October 2009.

Kong, Yu-Chien. "College Attainment and the Changing Life Cycle Profile of Earnings." Unpublished manuscript, University of Iowa, April 2013.