Volume Title: Higher Education and Earnings: College as an Investment and Screening Device

Volume Author/Editor: Paul J. Taubman, Terence Wales

Volume Publisher: NBER

Volume ISBN: 0-07-010121-3

Volume URL: http://www.nber.org/books/taub74-1

Publication Date: 1974

Chapter Title: Appendix L: The Effects of Ediucation on Incomes of the Successful: Evidence from the Lewellen Data

Chapter Author: Paul J. Taubman, Terence Wales

Chapter URL: http://www.nber.org/chapters/c3667

Chapter pages in book: (p. 255 - 273)

Appendix L: The Effects of Education on Incomes of the Successful: Evidence from the Lewellen Data

W. G. Lewellen (1968) has recently estimated and analyzed the after-tax incomes—including in "income" the value of the various deferred-compensation schemes such as pension plans and stock options—for the first up to the fifth highest-ranking executives of 50 of the 70 largest manufacturing firms in the United States in the period 1940–1963.[1] Professor Lewellen has generously made available his data for our use.

Despite its obvious special nature, this sample is of interest for several reasons. First, contrary to the situation with other cross-section studies in general and high-income samples in particular, this sample has an accurate earned-income measure. Second, it is useful to see whether education differences are important for successful people, especially since it may be possible to compare the results with the Terman sample of geniuses.

We have attempted to obtain relevant demographic characteristics from various sources for each of the executives.[2] We have determined the education attainment, undergraduate and graduate school attended (if any), and age for about 350 of the 500 individuals in the Lewellen sample. Consequently, we can estimate the relationship between after-tax income, education, and years on the job. Unfortunately, except for academic

[1]The Securities and Exchange Commission requires the basic information on annual company reports.

[2]These are *Who's Who in America* (1950); *Who's Who in Commerce and Industry* (1940 and 1950); *World's Who's Who in Commerce and Industry* (1963); and *Poor's Register of Directors and Executives* (1940, 1950, and 1963). *Who's Who in Commerce and Industry* provided the most comprehensive data. This was the first source consulted. *Poor's Register* listed more names than did *Who's Who in Commerce and Industry*, but it was not nearly as comprehensive. *Poor's* listed college education only if a degree had been obtained, and in that case also listed the date the degree was received.

honors, no direct measure of ability is available. However, in view of the nature of the sample (very successful individuals in a narrowly defined occupation), we would expect the appropriately defined ability of almost everyone to be very high. Moreover, we would suspect that a measure of drive or ambition would be a more relevant variable than mental ability as measured by IQ. In addition, we do have information on the undergraduate college attended by each individual, and evidence exists that college quality is correlated with the mental ability of those attending.[3] The major disadvantage of the sample is that, since it is not typical, no conclusions of a general nature can be drawn from our findings.

CHARACTERISTICS OF THE SAMPLE

Before considering our regression results, it is useful to consider the characteristics of the sample from 1940 to 1963. Perhaps the most interesting question is the distribution of educational attainment over time. In Table L-1 we present the percentage of people (for whom we have the data) in each of four educational classes. In this table we have combined the data for the five positions.

In 1940, approximately 23 percent of the top executives had not attended college, an additional 12 percent had not graduated from college, 44 percent had an undergraduate degree only, and 21 percent had received more than one degree. Throughout the sample period, there was a steady trend toward more and more education of the people in the top job positions; thus, in 1950 the corresponding figures were 14 percent, 10 percent, 51 percent, and 25 percent. By 1963, only 7 percent had not attended college (and nearly all these people had been in the sample since 1939), and 8 percent had attended college but had not received a degree. On the other hand, 55 percent of the people had received one degree and an additional 30 percent had more than one degree.

It is of some interest to compare these developments with educational achievement in general and with the educational composition of the managerial-executive class in particular. For population cohorts born from 1890 through 1905, less than 15 percent of employed males had attended college (Taubman &

[3] See, for example, Solmon (1969), who correlated the quality measure we used with mean SAT scores. See also Wolfle (1954).

TABLE L-1
Percentage distribution of top executives by education, 1940–1963

	*High school**	*Some college*	*Undergraduate degree†*	*At least one graduate degree*
1940	23	12	44	21
1941	21	12	44	23
1942	20	12	44	24
1943	20	10	45	25
1944	20	10	47	23
1945	20	09	48	23
1946	18	10	49	23
1947	16	09	52	24
1948	15	09	52	24
1949	14	11	51	23
1950	14	10	51	25
1951	12	10	53	25
1952	12	10	51	27
1953	12	10	52	26
1954	13	11	50	27
1955	12	11	50	27
1956	13	10	51	26
1957	12	10	53	25
1958	09	09	59	23
1959	08	08	57	27
1960	07	08	58	27
1961	07	07	58	28
1962	07	06	57	29
1963	07	08	55	30

*One individual who did not graduate from high school is included in this group.
†A few people with some postgraduate work but no degree are included in this group.

Wales, 1972).[4] It is obvious, therefore, that top management had received much more education than the population as a whole.

It is also of interest to compare the education of top executives with the education of all executives in the same age group. The data that are more relevant (in ways described below) for

[4] The average age of the executives in our sample is about 50 in 1940 and 58 in 1960.

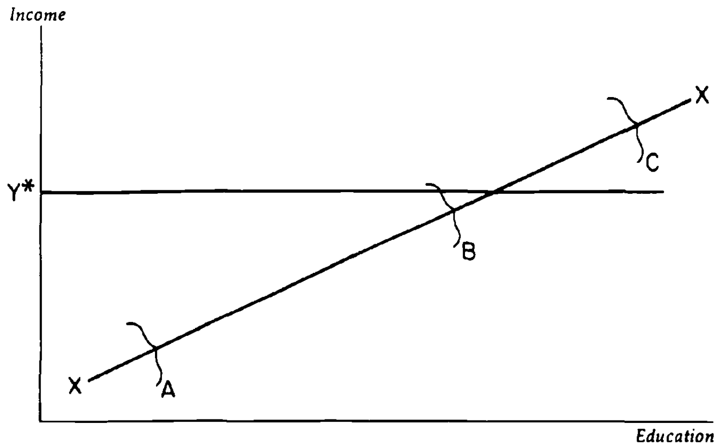
this comparison are not available. Some crude approximations obtained from the 1940, 1950, and 1960 censuses are given in Table L-2 for the category of nonfarm proprietors, managers, and officials 45 through 64 years of age. The distribution across the three education classes has shown little change over time. Educational upgrading has occurred, however: Those with *less* than a high school diploma in this occupation fell from about 60 percent of the total in 1940 to about 45 percent in 1960. For making comparisons with the Lewellen data, the data in Table L-2 are crude in several respects. The Lewellen sample involves executives of the largest manufacturing concerns. The census data include all types of companies of all sizes. In the 1960 census it is possible to obtain the educational distribution of salaried nonfarm managers and officials. This category should eliminate many of the owners of retail stores and small concerns. Although, as shown in the last row in Table L-2, there are fewer people in the high school and some-college groups, the distribution is still very different from that given in Table L-1. This difference could arise because reaching the top of the corporate ladder depends on ability, which is correlated with education. As shown in our earlier work (Taubman & Wales, 1972), even for the age cohorts being studied here, the more mentally able students would have, on the average, received more education. This may explain the high concentration of education in the Lewellen sample.

The above data certainly do not deny, and may even confirm, the proposition that more highly educated people have a better chance of reaching the highest-paying positions in American business. This sample can be used to answer several other interesting questions. First, we can determine the extent to which education affects the income of the successful by using the standard linear regression model, in which income is the dependent variable and education one of the independent vari-

TABLE L-2 ***Percentage distribution of nonfarm proprietors, managers, and officials, aged 45 to 64, with at least a high school education, 1940, 1950, and 1960***

Description	*High school graduates*	*Some college*	*One or more college degrees*
1940 census	51	26	22
1950 census	50	27	24
1960 census	47	29	24
1960 census, salaried	43	28	29

Figure L-1
Truncation of sample by income level



ables. Second, we can attempt to determine the extent to which education affects earnings for the population (of executives) as a whole. But to use our sample for this purpose, we must determine if application of the usual regression model to our data yields the same result as it would when applied to random samples of executives.

In the discussion to follow, the "estimated education coefficient" is the one obtained using regression analysis on our sample, while the "true coefficient" is the relationship between education and earnings in the population. It can be shown that the estimated education coefficient will in fact be biased downward if its true value is positive, will be unbiased if it is zero, and will be biased upward if it is negative. The case of a positive education coefficient may be understood by considering Figure L-1.

Suppose the true relationship is given by the line *XX*, and that the representative distributions of income about its mean at each education level are given by *A*, *B*, and *C*. Suppose also that (after translating success into income levels) only levels of income above Y^* are used in the sample. Then, for education levels corresponding to C, the entire distribution of earnings is represented in the sample, while for education levels corresponding to *B*, only the highest income values in the distribution are included. The effect of this is clearly to underestimate the effect of education on income. Earnings and education values corresponding to *A* are irrelevant as they are not contained in the sample at all.

In his study, Lewellen derived estimates of earnings on an after-tax basis, on a before-tax basis, and on an equivalent before-tax basis under the assumption that the after-tax earnings had all been wages and salaries. Although we could have used any of the measures as our dependent variable, we have used only the after-tax income. Our choice was based on several considerations. First, after-tax income is the appropriate concept for calculating the private return. Since the sample covered such a small and select group of people, it is not possible to generalize to all college graduates; hence, a social-return concept is not worth pursuing.

In addition, we would expect that for top executives the after-tax return is a reasonable measure of differences in productivity for the following reasons.[5] Suppose we ignore the fact that top management has a large say in the setting of its earnings and the composition of its pay package and assume that each firm tries to minimize costs by reducing its before-tax payments to executives while at the same time increasing executives' after-tax earnings by altering their compensation package. If firms do not pay managers their marginal product, other firms could afford to hire them away (unless the executives' skills were company-specific) and, consequently, firms will have to set the after-tax pay package equal to the marginal product of each person. Since firms should tailor the components of the package to the wishes of their managers, after-tax earnings for a given tax structure will probably differ from before-tax earnings by a factor that is reasonably constant for all individuals in a given year. Years in which tax laws differ, however, cannot be combined if there is a lag in the adjustment to the tax provisions.

A few other details concerning the income data should be noted. First, the marginal-productivity theory is expressed in terms of real wages. Within any year we can treat prices as the same for the members of the cross section, but in comparing results for different years or in combining data from different years, we must deflate the income measure. The deflator we have used in regressions with different years combined is the Consumer Price Index (CPI) with 1957–1959 equal to 100. We recognize that the CPI is not really appropriate for upper-income individuals, but no alternative is readily available. Since Lewellen used a CPI with 1940 as the base year, our real-income figures are about twice as large as his.

[5] We shall show that the after-tax earnings are equal to the marginal productivity times $(1 - t)$, where t is the average marginal tax rate.

The second point is that, while individuals must be employed when in our sample, their incomes are still subject to cyclical swings because of profit sharing, wage bonuses, and stock options valued on the basis of stock prices.[6] Within any cross section, it is reasonable to assume that the cyclical developments would affect people with different education equally. Over time, this need not be true, since the educational composition of our sample changes. Thus, when comparing cross sections, we included zero-one dummy variables for the various years.

RESULTS The data can be analyzed using regressions at many different levels of aggregation. First, for each year an equation can be estimated for each position. Second, for a given year the effects of the education variables on earnings can be assumed to be the same at all positions, although the level of income also depends on the position. In this case, we can have one equation for each year with dummy variables for the positions. Finally, the data can be combined for sets of years (after deflating the income variable), while including dummies for positions and/or years. Such pooling of the data assumes that the effects on earnings of the independent variables are constant over time as well as over positions.

Consider the question of whether the data should be combined by position. Assuming that individuals receive their marginal products, there is no reason to believe a priori that additional education will have different effects that depend on the individual's position in the firm.[7] On the other hand, it is clear

[6] See Chapter 4 in Lewellen (1968) for a discussion of this method of valuing stock options.

[7] We have some empirical evidence on the effect of education on income for different positions. We ran some preliminary regressions (using years of schooling as the education variable) designed to determine if, in fact, these differences exist. Cross-section regressions for 1940, 1950, and 1963 computed separately for the five positions do not suggest different effects of education on income. For 1940, the education coefficients for the third, fourth, and fifth positions are marginally significant and have almost identical values. The coefficients for the first two positions differ considerably, but have such high standard errors that little significance can be attached to the point estimates. For 1950, the education coefficients for the second and fourth positions are significant, and almost identical, while the others are insignificant. Although these results do not prove that the effects of education are the same at all positions, they at least provide no evidence of significant differences. Consequently, in the analysis to follow we pool the data for different positions, thus forcing the coefficients of the independent variables to be the same across positions.

that income differences that reflect the hierarchical nature of the firms' administrative setup will exist between individuals in different positions within firms, even though they have the same age and education. If the attainment of the higher positions is due to such factors as ability and drive, which are excluded from our model but which are correlated with education, then we should include dummy intercept variables for the positions in order to avoid attributing to education some of the income differences due to ability and other factors. It is conceivable, however, that education better equips a person to obtain the more senior positions. In this situation, the inclusion of dummy intercept variables for positions would eliminate part of the return to education.[8] It is likely that the return to education is bracketed by the estimates obtained through including, and then excluding, the dummies. Since it is not clear which interpretation is more accurate, we present our main results for both cases—that is, inclusion and exclusion of the intercept position dummies.

As noted earlier, it is possible to study each year separately or to combine all individuals for those years in which the tax structure was constant. We have made both calculations. Consider first the results for the period 1954–1963, which is the longest interval available.

$$\frac{Y_{it}}{P_t} = -\underset{(2.6)}{66.7} - \underset{(3.4)}{40.1}PBK + \underset{(7.7)}{2.97}(Age - E) + \underset{(.7)}{9.13}Coll + \underset{(5.6)}{62.5}CGrad + \underset{(4.7)}{57.7}PGrad \qquad \bar{R}^2 = .06 \quad \text{(L-1)}$$

$$\frac{Y_{it}}{P_t} = \underset{(2.5)}{62.7} - \underset{(2.3)}{25.3}PBK + \underset{(5.1)}{1.89}(Age - E) + \underset{(.01)}{.21}Coll + \underset{(5.2)}{53.6}CGrad + \underset{(4.4)}{51.2}PGrad - \underset{(8.8)}{69.8}D2 - \underset{(9.8)}{84.5}D3 - \underset{(11.4)}{105.4}D4 - \underset{(11.9)}{116.2}D5 \qquad \bar{R}^2 = .19 \quad \text{(L-2)}$$

where Y_{it} = after-tax earnings of the *i*th individual in the *t*th

[8] Of course, if there is no correlation between educational attainment and positions, then the coefficient on the education variable will be the same.

year, measured in thousands of dollars

P = the Consumer Price Index, 1957–1959; equals 1.00

PBK = a dummy variable for honors in college; the categories included are Phi Beta Kappa, Sigma Chi, and graduated with academic honors[9]

Age = age of individual

E = years of schooling after high school[10]

$Coll$ = a dummy variable that equals 1 if the person attended but did not graduate from college

$CGrad$ = a dummy variable that equals 1 if a person graduated from college but did not receive a graduate degree

$PGrad$ = a dummy variable that equals 1 if the person received one or more graduate degrees (including any law degree)

DJ, $J = 2$–5 = a dummy for the position of the individual in his firm

In Eq. (L-1) we have included all individuals from the top to the fifth executive for whom we have the necessary educational information. In this equation there are several striking results, the most surprising of which is that the 20 or so people who achieved academic honors in college earn a statistically significant $40,000 less than their colleagues with the same education. As long as positional dummies are excluded in all our equations, the coefficient on *PBK* is always minus $40,000 to minus $45,000. As typified in Eq. (L-2), when position dummies are included, the *PBK* coefficient is still minus $25,000. Two tentative explanations for the negative effect of *PBK* are the following: (1) while those who earned the *PBK* have intellectual and other talents necessary to succeed in academic programs, the non-*PBK* people who graduated from college and who reached the top in the business have greater amounts of other nonacademically oriented talents than those with *PBK*, and these nonacademic talents are more valuable in performing managerial functions; (2) The non-*PBK* people took programs that bet-

[9]The individual is credited with *PBK* whether or not he has an advanced degree.

[10]Part-time college attendance was counted as two years, a college degree as four years, a master's degree or some postgraduate education as five years, and a Ph.D. or law degree as seven years.

ter prepared them for the business world, but these programs either did not give an honors award or gave one that was not considered worth listing in *Who's Who* or elsewhere. For those who are still suspicious of this result, it should be noted that when Eqs. (L-1) and (L-2) are rerun without *PBK*, the other coefficients are only very slightly changed.

For the period 1954–1963 the average age in the sample is close to 60, and the average income of a high school graduate in this sample is $112,000 (in 1957–1959 dollars). Eq. (L-1) indicates that each additional year of employment after completion of schooling adds $3,000 to income. Those who attended college but who did not graduate earned a mere (and statistically insignificant) $9,000, or 8 percent, more than high school graduates. Although just going to college did not add much to income, graduation (without *PBK*) adds $62,500, or 50 percent, to a person's income.[11] A graduate with a *PBK* earns only $20,000 more than a high school graduate.

That college graduates do so well is not so surprising, but it may seem unusual to find that those with graduate degrees earn less than those with just an undergraduate degree. Thus, while the average college graduate had an income of $175,000, the average advanced-degree holder had an income of only $170,000. Moreover, since college graduates have been working four years longer, they receive an additional $12,000 more than an advanced-degree holder of equal age. This pattern also occurs in the 1960 census data. For example, for nonfarm salaried managers, college graduates in the age group of 45 to 64 earn approximately 50 percent, and advanced-degree holders 46 percent, more than high school graduates. To find the same percentage in returns is surprising, because our sample includes only the successful managers, whereas the census data include some who have switched from a professional to a managerial position and have had less time to reach the top positions in their field.

The $\bar{R}^2$ in Eq. (L-1) is very low—.06—partly because we have included people from the top five positions in each firm without taking account of the wage structure within the firms. Eq. (L-2) enters dummy variables for the various positions.

[11]Of course, since the person has been on the job four years less than a person the same age who did not go to college, he would earn only $50,000 ($62,000 − $12,000) more than a high school graduate of the same age.

Before considering these results, we remind the reader that according to our previous discussion, if education aids in advancing to the top, the coefficient in this equation will understate the returns to education.

In Eq. (L-2), we see quite clearly the wage structure by position. The average company head with a college degree earns \$225,000, and the corresponding person in the second position earns about \$155,000. Those with a college degree in the third, fourth, and fifth positions earn \$140,000, \$120,000, and \$110,000, respectively. Once we have held positions constant, the effects of education are somewhat smaller. Within each of the positions, college dropouts earn a minuscule \$200 more, and college graduates and advanced-degree holders earn about \$50,000 more, than high school graduates. Thus, holding positions constant in Eq. (L-2) reduces the coefficients on the various educational categories in Eq. (L-1) by \$7,000 to \$10,000. The *PBK* coefficient changes from minus \$40,000 to minus \$25,000. This indicates that those with *PBK* not only do not get as high up on the management ladder but also earn less on a given rung. As noted earlier, Eqs. (L-1) and (L-2), which yield similar education effects, should bracket the true coefficient. With the introduction of the position dummies, the $\bar{R}^2$ increases to .19.

We have reestimated both equations including yearly dummies. Compared with 1963, executives earned \$40,000 more in 1955–1957, and \$20,000 more in 1959–1962. Since these dummies had only minor effects on the education and time-on-the-job coefficients, we do not present the equations.

We also computed regressions in which we added a variable defined as $Q \times CGrad$ where Q is a measure of college quality and *CGrad* is the same dummy variable as before. The measure of Q we used was the Gourman rating for 1955, the earliest one available.[12] While the quality ratings of schools change slowly, 1955 ratings may be too far removed from the dates at which people attended college, since even in 1963 most people in the sample had attended college more than 30 years earlier. Still, it is of some interest to use such a variable, since the best schools and worst schools do not change greatly over such time periods.

Since by construction *CGrad* must be uncorrelated with all the

[12]See Gourman (1956). The Gourman rating is available for subsequent years but not earlier. The rating scheme, which we understand is not infallible, takes account of quality of students, faculty, and facilities.

variables except *PBK* and (*Age* − *E*) and since *Q* happens to be uncorrelated with these two variables, the coefficients on the other variables are unchanged when we introduce the new variable. The coefficient on *CGrad*, which indicates the income earned if *Q* were zero, is about $20,000. Each one-point increase in *Q* adds about $70 to income when position dummies are not included and $50 when they are included.[13] Since *Q* in our sample ranges from under 300 to 770, college quality differences could account for a range of about $35,000 in income, which is less than the difference between high school and college graduates. It should be noted that evidence in Wolfle (1954) and in Solmon (1969) indicates that average school quality and average IQ are correlated, but that within schools there is a wide range in individual abilities. Thus, the quality variable reflects both individual mental-ability differences and quality-of-schooling differences.[14]

The coefficients of (*Age* −*E*) from Eqs. (L-1) and (L-2) indicate that an additional year on the job adds about $3,000 to income if positions are not held constant and $2,000 if they are. That is, those who are successful and move to higher positions can expect to receive, on the average, a salary increase per year $1,000 higher than those who are not promoted.

We turn next to the equations obtained when each year is treated as a separate cross section. In these regressions, we have not deflated the income data; hence, in making year-to-year comparisons, it is necessary to deflate all the coefficients. In the following discussion, we shall ignore the results for the World War II years 1942 to 1945. Table L-3 contains the results when the position dummies are excluded, while Table L-4 presents the equations that include the position dummies.

Although the education coefficients in Table L-4 are generally lower than those in Table L-3 and although the positions dummies always have the correct signs and are statistically significant, the same qualitative pattern emerges in both tables. Therefore we will only discuss Table L-3. An intriguing pattern

[13]Both estimates are significant at the 5 percent level.

[14]We attempted to include a variable to account for nepotism based on a dummy variable with a value of 1 when the individual had the same surname as an older person who had been an officer of the company during the period 1940–1963 and in a few instances when a person was known to be related to the major stockholder.

emerges. For the period 1940–1941, the coefficient for some college is positive, significant, and somewhat greater than the coefficients for one degree or several degrees. Although in 1940 some of the people in the sample may have been the founders of the company, the same result emerges in Table L-3, in which positions are held constant. After World War II, the variable for some college is never significant. Between 1945 and 1958, *CGrad* and/or *PGrad* are generally significant, whereas after that, no education variable is significant. From 1956 to 1963, *CGrad* does not differ significantly from *PGrad*. *PBK* is positive until the late forties and insignificantly negative thereafter. The time-on-the-job variable is positive except in 1962 and significant until 1960 (1958 in Table L-4).

The consensus that emerges from these equations is that *PGrad* is never very different from *CGrad*, and that except in the early years, the income of those with some college does not add to the income of the top executives. These results are in conformity with the continuous cross-section results given above. The *PBK* results are in rough conformity, since the variable is negative in each of the years from 1954 to 1963.

CONCLUSION We have studied the after-tax incomes of top corporate executives for the period 1940–1963. In the early part of this period, those who attended college but did not graduate received the most income. During the post-World War II era the following pattern emerges: When each year from 1950 to 1958 is analyzed separately, those with one or more degrees generally earn significantly more income than high school graduates. After 1958 there is no significant relationship between education and income. When the years 1954 to 1963 are combined, college-degree holders earn significantly more income than either high school graduates or college dropouts. In no case is there a significant difference between the incomes of those with one college degree and those with more than one college degree. In the postwar period, college dropouts earn approximately the same income as high school graduates. The above results hold whether or not the executive's position in the firm is held constant using dummy variables.

It is interesting to compare these results with others in the literature. For example, in a recent study, Shane J. Hunt (1963) finds a zero or negative rate of return for graduate education.

TABLE L-3 ***Annual income-education regressions, 1940–1963***

	PBK	Time on the job	Coll	CGrad	PGrad	Constant	$\bar{R}^2$
1940	19.0	2.1	30.2	19.8	25.6	−61.9	.10
	(0.9)	(4.2)	(2.1)	(1.8)	(1.9)	(2.1)	
1941	9.8	2.3	47.4	18.1	24.4	−78.1	.12
	(0.5)	(4.2)	(3.0)	(1.5)	(1.7)	(2.4)	
1942	6.2	0.8	9.4	17.0	18.1	−13.0	.09
	(1.7)	(3.7)	(1.4)	(3.3)	(3.0)	(0.9)	
1943	10.8	.7	8.4	11.9	11.9	−3.9	.10
	(1.7)	(3.6)	(1.6)	(3.1)	(2.7)	(0.4)	
1944	0.4	1.5	4.1	13.9	28.5	−49.6	.18
	(0.0)	(5.8)	(0.5)	(2.5)	(4.3)	(3.1)	
1945	5.8	1.2	−1.2	4.3	11.0	−23.7	.09
	(0.6)	(4.3)	(0.1)	(0.8)	(1.6)	(1.4)	
1946	20.8	1.1	−4.1	4.7	9.1	14.7	.16
	(2.7)	(4.8)	(.6)	(.9)	(1.4)	(1.0)	
1947	−.5	1.5	−5.9	9.7	13.5	−34.0	.10
	(0)	(4.8)	(.5)	(1.2)	(1.5)	(1.8)	
1948	−2.5	2.0	−10.8	6.5	17.5	−41.2	.21
	(.2)	(6.7)	(1.0)	(.9)	(2.0)	(2.2)	
1949	−14.3	1.6	3.1	13.8	28.3	−27.9	.16
	(1.3)	(5.6)	(0.3)	(1.9)	(3.4)	(1.6)	
1950	−13.2	1.8	2.5	15.2	24.2	−29.2	.12
	(1.1)	(5.0)	(0.0)	(1.7)	(2.4)	(1.3)	
1951	−20.3	1.5	11.6	29.6	35.0	−24.0	.08
	(1.4)	(3.7)	(0.8)	(2.8)	(2.9)	(0.9)	

NOTE: Figures in parentheses are *t* statistics.

This result is substantiated by rough calculations using 1960 census data on the managerial occupation. Our findings suggest the same conclusion even for people working in a narrowly defined occupation who have proved to be successful. In addition, we find that those with one degree earn approximately 50 percent more income than high school graduates—an estimate once again roughly in accord with census calculations.

	PBK	*Time on the job*	*Coll*	*CGrad*	*PGrad*	*Constant*	$\bar{R}^2$
1952	−11.0	1.4	24.8	31.4	32.7	−17.6	.05
	(0.6)	(3.0)	(1.5)	(2.4)	(2.2)	(0.6)	
1953	− 4.0	2.0	31.9	37.1	38.9	−46.6	.06
	(0.2)	(3.6)	(1.5)	(2.3)	(2.1)	(1.3)	
1954	− 9.5	1.9	24.9	45.9	48.2	−42.3	.07
	(0.5)	(3.4)	(1.2)	(2.9)	(2.8)	(1.2)	
1955	−53.6	5.4	46.8	99.4	104.4	−226.4	.10
	(1.2)	(4.1)	(1.0)	(2.7)	(2.6)	(2.7)	
1956	−39.8	5.6	2.2	102.6	88.2	−217.3	.09
	(0.7)	(3.7)	(0.0)	(2.6)	(2.0)	(2.3)	
1957	−51.4	4.5	3.5	95.4	88.7	−161.0	.09
	(1.1)	(3.4)	(0.1)	(2.6)	(2.1)	(1.9)	
1958	−39.4	1.7	3.2	44.0	39.6	−6.0	.06
	(1.6)	(2.4)	(0.1)	(2.1)	(1.6)	(0.1)	
1959	−53.3	2.2	−18.1	33.1	27.8	3.2	.04
	(1.8)	(2.1)	(0.4)	(1.0)	(0.8)	(0.0)	
1960	−41.4	2.7	3.4	35.6	35.2	− 25.2	.03
	(1.3)	(2.4)	(0.1)	(1.0)	(0.9)	(0.3)	
1961	−55.5	2.6	−15.7	44.9	43.9	− 20.6	.02
	(1.4)	(1.8)	(0.3)	(1.0)	(0.9)	(0.2)	
1962	−58.6	−0.2	−0.5	43.7	20.2	145.7	−.009
	(1.4)	(0.1)	(0.0)	(0.9)	(0.4)	(1.3)	
1963	−28.3	0.4	−4.9	49.6	20.7	85.8	−.001
	(.08)	(0.3)	(0.1)	(1.2)	(0.5)	(0.9)	

TABLE L-4 ***Annual income-education regressions (with positions held constant), 1940–1963***

	PBK	*Time on the job*	*Coll*	*CGrad*	*PGrad*
1940	21.9	1.6	22.3	17.7	18.8
	(1.2)	(3.3)	(1.6)	(1.8)	(1.5)
1941	14.8	1.9	38.7	14.1	18.2
	(0.8)	(3.6)	(2.5)	(1.2)	(1.4)
1942	8.5	0.7	3.2	13.4	13.9
	(1.1)	(3.5)	(0.5)	(2.9)	(2.6)
1943	11.6	4.9	29.0	8.8	8.9
	(2.2)	(3.1)	(0.7)	(2.7)	(2.3)
1944	−3.7	1.2	−2.5	10.0	22.1
	(0.0)	(4.6)	(0.4)	(2.0)	(3.6)
1945	4.2	0.9	−10.4	1.5	5.6
	(0.5)	(3.6)	(1.4)	(0.3)	(0.9)
1946	23.8	.9	−6.6	4.8	1.6
	(3.7)	(4.4)	(1.1)	(1.1)	(.3)
1947	4.6	1.1	−13.3	7.1	6.1
	(.4)	(3.8)	(1.3)	(1.0)	(.7)
1948	4.6	1.1	13.3	7.1	6.1
	(.4)	(3.8)	(1.3)	(1.0)	(.7)
1949	−4.0	1.2	−3.9	7.1	23.5
	(0.4)	(4.7)	(0.4)	(1.1)	(3.3)
1950	−3.6	1.3	−8.7	9.1	20.6
	(0.4)	(4.3)	(0.9)	(1.2)	(2.3)
1951	−7.5	1.0	−5.2	21.5	25.4
	(0.5)	(2.6)	(0.4)	(2.2)	(2.3)

NOTE: Figures in parentheses are *t* statistics.

Position 2	*Position 3*	*Position 4*	*Position 5*	*Constant*	$\bar{R}^2$
−43.8	−53.0	−54.4	−55.8	8.5	.26
(4.0)	(4.3)	(4.8)	(4.9)	(0.3)	
−27.0	−40.0	−43.6	−51.3	−24.7	.21
(2.2)	(3.1)	(3.3)	(4.1)	(−0.7)	
−13.8	−20.4	−25.7	−29.6	14.4	.27
(2.8)	(3.9)	(5.0)	(5.7)	(1.1)	
−13.6	−18.4	−22.9	−26.3	22.3	.36
(3.8)	(5.2)	(6.5)	(7.0)	(2.3)	
−16.5	−22.8	−27.4	−30.0	−8.6	.31
(3.0)	(4.1)	(4.7)	(5.0)	(0.5)	
−13.4	−24.4	−29.0	−29.2	11.0	.25
(2.5)	(4.2)	(5.2)	(4.5)	(0.6)	
−13.3	−26.1	−33.8	−35.8	20.4	.43
(2.9)	(5.5)	(7.0)	(7.3)	(1.6)	
−21.5	−34.2	−34.2	−39.3	12.4	.26
(3.0)	(4.3)	(4.3)	(5.4)	(.6)	
21.4	34.2	34.1	39.2	12.3	.42
(3.0)	(4.3)	(4.3)	(5.4)	(.6)	
−25.5	−27.8	−39.6	−51.9	26.1	.41
(4.4)	(4.5)	(6.5)	(7.7)	(1.6)	
−28.9	−34.0	−51.9	−60.0	32.0	.37
(3.9)	(4.3)	(7.1)	(7.3)	(1.6)	
−24.2	−39.1	−50.7	−47.8	40.2	.25
(2.8)	(4.3)	(7.1)	(7.3)	(1.6)	

TABLE L-4 (continued)

	PBK	*Time on the job*	*Coll*	*CGrad*	*PGrad*
1952	−5.1	1.0	8.0	25.5	30.3
	(0.3)	(2.3)	(0.4)	(2.0)	(2.2)
1953	2.0	1.3	12.7	28.9	31.8
	(0.1)	(2.3)	(0.6)	(1.8)	(1.8)
1954	−2.5	1.2	6.3	37.0	41.3
	(0.1)	(2.1)	(0.3)	(2.5)	(2.6)
1955	−43.0	3.5	20.3	80.8	81.4
	(1.0)	(2.7)	(0.4)	(2.3)	(2.1)
1956	−4.6	3.8	−15.2	89.7	78.2
	(0.1)	(2.5)	(0.3)	(2.4)	(1.9)
1957	−17.5	3.4	−6.8	83.7	88.0
	(0.4)	(2.7)	(0.2)	(2.4)	(2.2)
1958	−32.7	0.9	0.3	40.6	31.9
	(1.5)	(1.4)	(0.0)	(2.1)	(1.5)
1959	−45.1	1.2	−19.7	21.5	22.3
	(1.6)	(1.3)	(0.5)	(0.7)	(0.7)
1960	6.9	1.3	10.0	33.5	29.7
	(0.2)	(1.2)	(0.2)	(1.1)	(0.9)
1961	−43.1	1.9	−14.2	42.0	43.9
	(1.1)	(1.3)	(0.3)	(1.0)	(0.9)
1962	−38.3	−0.8	−13.3	46.5	23.0
	(1.0)	(0.5)	(0.2)	(1.0)	(0.4)
1963	−13.8	0.2	20.8	57.8	35.3
	(0.4)	(0.2)	(0.4)	(1.5)	(0.8)

Position 2	Position 3	Position 4	Position 5	Constant	$\bar{R}^2$
−29.7	−42.0	−50.4	−48.0	39.5	.16
(2.7)	(3.6)	(4.3)	(3.8)	(1.3)	
−34.4	−46.9	−54.9	−54.3	32.6	.15
(2.5)	(3.3)	(3.6)	(3.2)	(0.8)	
−30.9	−62.0	− 53.4	−66.1	45.9	.21
(2.4)	(4.7)	(3.7)	(4.4)	(1.2)	
−83.9	−107.7	−111.4	−129.1	−28.9	.19
(2.8)	(3.4)	(3.3)	(3.7)	(0.3)	
−109.9	−116.7	−141.0	−133.6	−21.1	.20
(3.4)	(3.5)	(3.8)	(3.3)	(0.2)	
−91.5	−99.3	−138.2	−131.7	−10.9	.21
(3.2)	(3.1)	(4.0)	(3.8)	(0.1)	
−53.2	−57.2	− 77.8	−103.5	90.7	.27
(3.7)	(3.6)	(4.9)	(5.5)	(2.0)	
−62.7	−61.3	−101.5	−122.5	124.5	.21
(3.0)	(2.6)	(4.3)	(5.1)	(1.9)	
−67.1	−100.0	−109.8	−122.3	118.5	.21
(3.1)	(4.0)	(4.6)	(4.7)	(1.7)	
−60.3	−68.1	−110.7	− 99.7	72.7	.09
(2.2)	(2.1)	(3.1)	(2.9)	(10.7)	
−92.3	−86.4	−123.8	−149.4	241.9	.11
(3.0)	(2.5)	(3.2)	(3.4)	(2.2)	
−62.0	−66.4	−97.3	−123.6	134.1	.10
(2.5)	(2.5)	(2.9)	(3.0)	(1.5)	