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Present Values of Lifetime Earnings
of College Occupations

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PRESENT VALUES OF LIFETIME EARNINGS OF COLLEGE OCCUPATIONS

By Hugh Folk*

This paper presents an analysis of the economic returns to a number of occupations commonly entered by college graduates and uses the results to analyze several questions arising from the engineering and scientific labor market. The first section discusses several measures of the economic return to an occupation. The second section presents computations of present values of expected lifetime earnings for a number of occupations. The third section applies these findings to the analysis of the scientific and engineering labor market.

I. Economic Return to Occupations

What is the best measure of the economic returns to an occupation? Among the possibilities are:

(1) Starting salary

(2) Mean salary

(3) Mean salary adjusted for age distribution

(4) Expected lifetime earnings

(5) Present value of expected lifetime earnings based on a cross-section of earnings

(6) Present value of lifetime earnings for a cohort.

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It is obvious that the starting salary does not provide very much information about the economic return of an occupation over the lifetime of a worker. For example, the starting salaries or earnings of physicians are quite low relative to their peak earnings, while the starting salaries of school teachers, professors, and research scientists are high relative to their peak earnings.

Mean salary is also subject to objections. Rapidly growing occupations are disproportionately composed of young and inexperienced workers with relatively low earnings, while stable or slowly growing occupations have larger proportions of older workers. These problems could be met by standardizing all occupations on a given age distribution, but the data necessary for such standardization also permits the computation of expected lifetime earnings, a measure with some advantages over age-adjusted averages.

Expected lifetime earnings are computed by summing the expected earnings of a worker over his lifetime, taking account of his probability of survival (see Miller [4]). The formula for expected lifetime earnings is

$$L = \sum_{t=1}^{R} E_t p_t \qquad (1)$$

where

L is expected lifetime earnings

E_t is the average earnings in the occupation at time t (or age t).

R is time (or age) of retirement

p_t is the probability of surviving through time t (or age t).

The principle objection to expected lifetime earnings is that it fails to take account of differences in the time shapes of different earnings streams. In effect, all earnings are weighted equally, whether they occur early or late in working life. Thus in fig. 1, earnings stream 1 represents

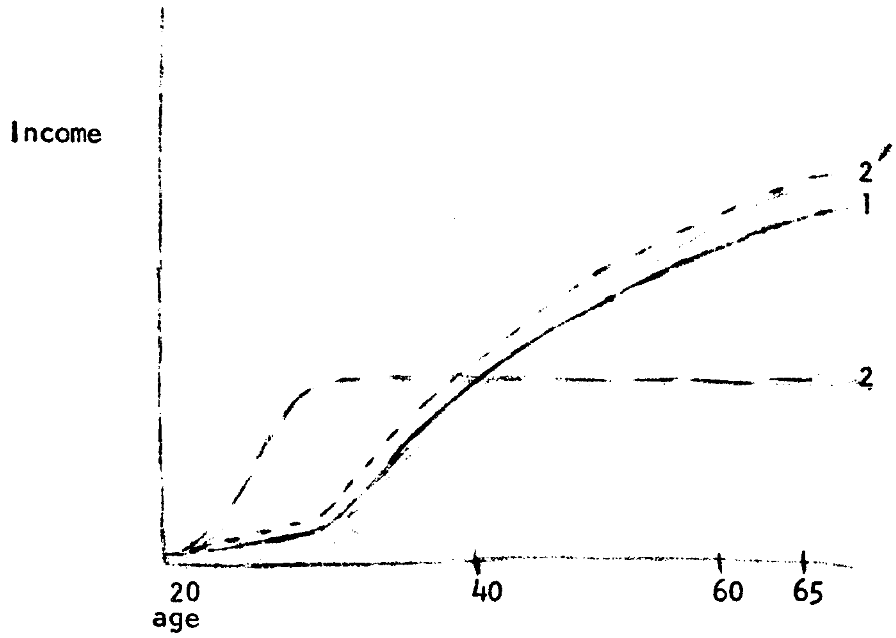

Figure 1

earnings in an occupation requiring long training before earnings begin to grow (such as surgery) and stream 2 represents earnings in an occupation in which earnings start earlier, increase rapidly, and then stabilize (such as dentistry). As long as $L = \Sigma E_t p_t$ is the same for both occupations we will conclude that the return is the same in both occupations. We should recognize, however, that the difference in earnings of 2 over 1, in the early years, could be put out at interest and redistributed over the working life so that 2 could attain an earnings stream 2' which was everywhere higher than 1.

To correct for different time shapes of earnings streams it is necessary to discount the earnings stream back to some time such as the present by computing a "present value."

$$P = \sum_{t=1}^{R} \frac{E_t P_t}{(1+r)^t} \qquad (2)$$

Here P is the present value of expected lifetime earnings, E_t, P_t, and R' are as defined for equation (1), and $(1+r)^t$ is the discount factor. As time ranges from the present to R (retirement), the income is summed. The average earnings (E_t's) are obtained from cross-section data (such as the census for a single year) both for lifetime earnings and for present values. Thus the present value is based on the assumption that the average earnings of a worker (or cohort) entering the occupation will recapitulate the earnings that previous entrants have made at various ages over the worker's lifetime. Of course, the actual earnings experience of past cohorts thoroughly contradicts this assumption. The most striking examples of this is the commonly observed decline in the cross-section data from the 45-54 year age group to the 55-64 year age group, which leads Miller to argue:

> The average male worker enters the labor market either on a full-time or a part time basis when he is in his teens. For several years he goes through an apprenticeship or training phase during which he is paid relatively little. During this period he learns general rather than specific skills and he tends to change jobs and interests frequently. By the time he is in his midtwenties he has usually selected the general field in which he plans to work, and he spends the next period of his working life acquiring skill and experience. When he is in his forties or early fifties he has usually attained the peak of his earning power, and from that time until he is ready to retire from the labor market his annual earnings shrink until they are not any higher than those he received as a young man. In retirement, his earnings are frequently replaced by receipts from other sources such as pensions or public assistance; but his total income is, on the average, still far below what he received in his prime. (/_3_/, p.64)

With respect to averages this pattern simply is not true, even when we adjust for price changes. Thus Becker ([1], p. 141) shows that the college graduate cohort aged 35 to 44 years old in 1939 received a price adjusted average income of 8,386 in 1939, 11,543 in 1949, and 10,966 in 1958, instead of the amounts "forecast" by the cross-section in 1939 of 9,430 in 1949, and 8,338 in 1959.

To compute a present value of lifetime earnings taking account of the expected increase in earnings levels of all experience groups is a complex task. Not only must a set of age-specific mortality assumptions be made (which also exhibit cross-section bias), but also a set of average earnings levels for all numbers of years of experience must be made from the present year until the year when the cohort can be expected to retire or leave the labor force.

On what basis shall these projections be made? For example, the rate of growth of the average earnings of a mechanical engineer with ten years experience is for from constant, even when it is adjusted for changes in the general level of prices or the purchasing power of money, i.e., the age experience structure of earnings (or salaries) of an occupation changes unpredictably over time.

No doubt it is the difficulty of making defensible projections of future earnings that forces most economists to estimate present values on the basis of current cross-sectional age-earnings (or experience-earnings) averages. But it must be recognized that this is a mere expedient and is almost certain to bias the present value downward. Thus many of the calculations of present values are almost certainly too low (such as Becker [1] and Weisbrod [6]) and therefore tend to understate the rate of return to investment in college education rather seriously.

For example in the United States, average real earnings have been increasing at about 2 percent per year for several decades. If we assume this rate of increase, then the cohort present value would be

$$P' = \Sigma \frac{E_t P_t (1.02)^t}{(1 + r)^t}$$

where the 1.02 factor represents the annual rate of growth of earnings, and the E_t represents the cross-section earnings for the starting date. In general we can write

$$P' = \Sigma \frac{E_t P_t (1 + \alpha)^t}{(1 + r)^t}$$

or approximately

$$P' \simeq \Sigma \frac{E_t P_t}{(1 + r - \alpha)^t}$$

since $\frac{(1 + r)^t}{(1 + \alpha)^t} \simeq (1 + r - \alpha)^t$ when r and are small. In our example this means that for a 1.02 growth factor, the cohort present value at a given interest rate, say 8 percent, is closely approximated by the cross-section present value estimated at two percentage points less, or 6 percent.

There are further problems that require attention. These include: (1) the problem of attrition from the occupation; and (2) options from the occupation. Turnover, or attrition, needs attention because there is much movement into and out of most occupations. There are relatively few lifetime occupations, such as physician or lawyer. The occupation of civil engineer is sometimes a prelude to a managerial job that is not titled "engineer" although engineering training may be required. Similarly, the occupation of manager is not typically a lifetime career, but is entered by persons from occupations in sales, engineering, or accounting. In measuring lifetime incomes we measure the expected income of a person that enters the occupation young and retires at the given time having enjoyed the average income over his lifetime.

It is known that some students enter engineering training because they wish to work in management and believe that engineering is a good entry port. Few persons with engineering training will be forced to earn less than the salary engineers receive since engineering jobs are currently plentiful. It seems reasonable to believe, then, that the lifetime earnings of persons that enter engineering and then leave it may be somewhat higher than the earnings of lifetime engineers.

If we were to attempt to measure the return to a certain kind of training, such as engineering, we might come closer to measuring occupational returns as they are usually thought of. This is the problem of options which Weisbrod has examined [5]. Engineering training is obviously valuable not only because it prepares a person for engineering, but also because it is good preparation for a managerial career. Similarly, engineering work and experience is valuable for advancement not only in engineering careers but in managerial careers. Lifetime earnings data from occupational incomes cannot include the value of these options from an occupation.

These limitations to our analysis are likely to have three main effects: (1) the estimates will probably be smaller than the actual outcomes since there is no correction for "cross-section bias;" (2) the estimated lifetime incomes of occupations characterized by late entry (such as managers) will tend to overestimate the lifetime incomes of persons entering these occupations from other entry occupations; (3) the lifetime earnings of persons entering occupations that provide options for entering more highly paid occupations will be underestimated by the estimated lifetime earnings of the entry occupation.

There remains the problem of choosing a rate of discount. A high rate, such as 10 percent, makes earnings to be received at the end of working life of relatively little importance, while a low rate of discount, such as 2 percent, makes them more important. Thus physicians whose earnings peak relatively late in working life have higher present values than dentists at a 2 percent rate of discount, but lower present values at a 6 percent or 10 percent rate of discount. The choice of a rate of discount will, therefore, have some effect on the rankings of occupations by present values, but there is relatively little effect because most career income patterns have similar shapes.

For the purpose of the present analysis, we shall adopt the 6 percent rate of discount. I do not suggest that this is a "best" rate. The rate relevant to the individual is his own rate of time discount, or his opportunity rate of interest, and these naturally differ between individuals.

II. Present Values of Lifetime Earnings

At a 6 percent rate of discount the male worker with four years of college has a present value of expected lifetime earnings of $129,000. (Table 1) Natural scientists as a group and chemists both earn less than this amount, but geologists and geophysicists, physicists, and all specialties of technical engineers earn more than the average. The differential of engineers over the average is not large, however, and this suggests that the substantial premiums earned by starting engineers have not been maintained over the whole working life, at least in the recent past. It is possible that currently entering engineers may be able to maintain the premium.

The strikingly low present values of teachers, college professors, and clergymen, and the relatively high present values of physicians, dentists, and lawyers provide the extremes to the selected occupations. There are no surprises except for the reduction in the differential between physicians earnings and other professional occupations that is observed in average earnings data. The late entry of physicians is responsible for this difference.

The close correlation between lifetime earnings and the amount of education is usually interpreted causally, but with the cautionary remark that ability varies also. The association of I.Q. with educational level suggests that some of the differential associated with education may be attributable to differences in ability. A study by Wolfle and Smith [7] throws some light on this possibility. They found that among persons of college level ability, incomes varied with education in each I.Q. class while there were only small income differences associated with I.Q. within each education class. Thus, on the average, education appeared necessary to permit I.Q. differences to have much effect on income.

Table 1

Present Values at Age 23 of Lifetime Earnings of Selected Occupations by Years of College, Discounted at Six Percent

	Four Years	Five Years Or More
Total experienced civilian	$129,455	$147,429
Professional and technical	119,154	150,527
Accountants and auditors	120,150	126,590
Clergymen	64,260	65,717
College professors	78,079	112,509
Dentists	230,083	228,275
Lawyers and judges	177,661	202,342
Natural scientists	119,119	131,973
Chemists	114,897	128,986
Geologists and geophysicists	151,093	151,848
Physicists	137,090	151,804
Physicians and surgeons	214,482	232,720
Social scientists	134,116	134,084
Economists	141,711	146,305
Teachers	77,355	94,819
Elementary school teachers	74,361	92,378
Secondary school teachers	78,419	96,582
Insurance agents and brokers	137,418	131,891
Real estate agents and brokers	175,434	162,071
Technical engineers	138,127	145,732
Aeronautical engineers	145,778	150,281
Civil engineers	132,871	134,316
Electrical engineers	139,131	151,225
Mechanical engineers	136,630	143,196
Sales engineers	149,824	151,015
Managers, officials, and proprietors	172,891	177,105
Buyers and department store heads	153,497	157,579
Inspectors, public administration	98,379	99,443
Officials and administrators nec	110,937	126,327
Other specified managers	117,105	120,626

Source: Appendix Table 2.

No doubt this applies somewhat less strongly within occupations. The obstacle to the earning ability of highly intelligent people is often one of the barriers to occupational entry. Once occupational barriers are overcome, ability becomes more important. Apparently this is true to a degree, since the income differential associated with college education within occupations are in most instances smaller than those of all occupations combined (see Table 2). This comparison omits occupations such as dentistry and medicine in which entry is effectively limited to graduates.

If for the moment we accept the difference between high school and college present values as the value of a college education in the occupation, it becomes clear that in absolute terms a college degree is very valuable to persons in business, such as managers and real estate agents, but of much less value to engineers and scientists. Clearly the major value of a college degree is in gaining entry into engineering and scientific occupations and not in earning a large differential over those persons that somehow manage to enter the occupation without a degree. For obvious reasons we cannot attribute the differences in earnings of college graduates and high-school graduates in the same occupation to college education alone. Differences in ability between the two levels are perhaps greater in the business occupations than in technical occupations. Objections mentioned above relating to late entry business occupations are also valid.

Table 2

Difference between College Graduate and High-School Graduate Present Values of Expected Lifetime Earnings at Six Percent, Selected Occupations

	High School	College	Dif-ference	Difference as % of High School
Total experienced civilian	$ 88,277	$129,455	$41,178	46.7
Professional, technical, and kindred	101,765	119,154	17,389	17.1
Accountants and auditors	98,651	120,150	21,499	21.8
Clergymen	59,084	64,260	5,176	8.8
Natural Scientists	95,724	119,119	23,395	24.4
Chemists	94,889	114,897	20,008	21.1
Teachers	82,671	77,355	- 5,316	-6.4
Insurance agents and brokers	104,082	137,418	33,336	32.0
Real estate agents and brokers	126,158	175,434	48,276	38.3
Technical engineers	115,030	138,127	23,097	20.1
Aeronautical engineers	125,631	145,778	20,147	16.0
Civil engineers	100,452	132,871	32,419	32.3
Electrical engineers	117,755	139,131	21,376	18.2
Mechanical engineers	122,833	136,630	13,797	11.2
Sales engineers	129,139	149,824	20,685	16.0
Managers, officials, and proprietors	117,411	172,891	55,480	47.3
Buyers and department store heads	112,992	153,497	40,505	35.8
Inspectors, public administration	87,630	98,379	10,749	12.3
Officials and administrators, nec	91,145	110,937	19,792	21.7
Other specified managers	101,630	117,105	15,475	15.2

Source: Appendix table 2.

III. Application to Scientific Manpower Problems

The present values derived in the foregoing section suggest that engineers did not receive earnings markedly above the average of all graduates and that scientists received somewhat less than the average. The lifetime incomes are not consistent with the commonly held view that engineers receive "large" compensation. It is not possible to make valid comparisons over time, but there is some evidence that the ratios of present values of expected lifetime earnings of engineers and chemists to present values for all college graduates have deteriorated rather sharply since 1929 and especially from 1949 to 1959, a period in which the shortage of engineers was thought to be severe and during which the opposite movement would have been expected.

It is difficult to brush aside these results because they do not accord with common prejudices or because the concepts of present values used are open to serious objection. It is possible that the movements in starting salaries that are so obvious a sign of shortage have not been reflected in lifetime earnings. Indeed, it may be that the high demand for engineers has been largely for recently trained junior engineers with fresh technology and that older engineers are affected only to the extent that they are substitutes for this group. Considered as a career, engineering does not pay better than other business careers for college graduates. It must be noted, however, that we have not been able to evaluate engineering training and experience as gateways to management.

The data in the previous section also allows us to examine the economic position of engineers without college degrees. While graduate engineers do little better than the average graduate, non-graduate engineers do markedly better. While there are significant differences in present value associated with education for engineers, there is no question that non-graduate engineers do very well relative to non-graduates and to graduate engineers (Table 3). These results suggest that the claim of many non-graduates to deserve the title "engineers" should be taken somewhat more seriously than it has been hitherto by students of scientific manpower. Obviously, it would be desirable to know a great deal more about the qualifications of these non-graduate engineers and the channels by which they entered engineering.

The major conclusion that we can draw from the foregoing data is that engineers and scientists are not well paid relative to the professions, selected business occupations, and all college graduates. This conclusion contradicts the commonly held view that engineering is a well paid occupation. If comparisons were made for persons of equal academic ability, measured, perhaps, by I.Q., the conclusion would probably be even stronger. It is known that the average I.Q.'s of engineering and science students is higher than the average I.Q.'s in most other occupations (see Folk [2]).

Since lifetime incomes do not maintain the relatively high rankings of engineering starting salaries, the economic attractiveness of the occupation is overestimated by starting salaries. The failure of an increasing fraction of college students to major in engineering and science in response to what is seen as a short-run inducement can hardly be considered surprising. It would be expected that the number of entrants to an occupation would increase in response to an increase in economic rewards going to the occupation, but our findings suggest that engineering is not highly rewarding from a career point of view, regardless of what the trend may be.

Table 3

Engineers' Present Values as Percent of Total Experienced Civilians' Present Values, by Education, 1959

	High School		College		
	1-3 years	4 years	1-3 years	4 years	5 years or more
Technical engineers (total)	$109,815	$115,030	$120,691	$138,127	$145,732
Total experienced civilian	77,219	88,277	103,040	129,455	147,429
Engineers as percent of total	142.2	130.3	117.1	106.7	98.8

Source: Appendix Table 2.

Let us assume that the present value of engineering earnings is increasing relative to the present value of other occupations (although we have no evidence of this.) Is there any reason to expect this would lead to an increased supply of engineers or to an increasing proportion of college students entering the occupation? I think not. Two reasons come to mind. First, the working conditions of engineering may have deteriorated during the period; and, second, the relative position of engineering may be so low that even improvement is not sufficient to stop the decline in enrollment proportions.

I believe a strong case can be made to support the possible decline in working conditions in engineering. A large fraction of engineers now work for defense contractors that operate on a contract basis. Employment in such firms is sometimes temporary, however well paid it may be. During the development stage, engineers are employed in large numbers, and as the project develops and is either cancelled or put into production, the engineering staff is reduced in size. The short-term engineer gains no benefit from pensions and his specialized training is often useless when he enters the market. He may also be accustomed to high earnings but have little transferrable knowledge that can demand a premium over newly graduated engineers. Thus part of the higher starting salaries of recent years may reflect the temporary nature of many of the defense engineering jobs.

To support the second possibility, we need only assume that the process of occupational choice is subject to lags in response. Occupational returns are not widely known, and changes in earnings profiles take time to become established and accepted into the attitudes of counselors, students, and parents. The relatively low earnings of engineers during the temporary post-World War II engineer glut become established, and the relatively higher earnings of the post-sputnik era are still below a level of parity with other occupations. Entry into engineering training was perhaps relatively high in the earlier period even though earnings were, say, 20 percent below the long-run rate needed to procure continued recruitment at the 1948 rate. After this period, the earnings of engineers increased so that they were only 10 percent below the long-run constant recruitment rate, and in so doing, they showed an increase relative to other occupational earnings. The earnings ratio increase was offset by the learning of the potential recruits, and this accounts for the decline in the engineering enrollment percentage during a period when the earnings ratio was increasing.

While both of these arguments are ad hoc, they seem reasonable in the light of lifetime income levels and known salary trends.

Appendix A. Method of Computation of Present Values

The formula used in computing the present values of expected lifetime earnings is $P = \Sigma \frac{E_t P_t}{(1+r)^t}$, where P is the present value, E_t is expected earnings at time t, P_t is the probability of surviving through time t, and $(1+r)^t$ is the discount factor.

The E_t are derived from mean earnings given in U.S. Census of Population: 1960, volume II, part 7B, "Occupation by Earnings and Education." Average earnings by education and occupation are given for four age groups, 25 to 34 years, 35 to 44 years, 45 to 54 years, and 55 to 64 years. Since we are estimating present values as of age 23 (the median age of graduation from college) we need average earnings for the 23rd and 24th years. In our calculations we assume that average earnings for age 23 and age 24 are the average earnings for the 25 to 34 year age group. Earnings data for the 18 to 24 age group are available, but these appear to be far too small for the full-time earnings of persons 23 and 24 years old. In estimating E_t, it was occasionally necessary to interpolate or estimate a value for one of the four age groups. This was done by applying a ratio of the earnings of two adjacent age groups in a closely similar occupation to one of the earnings figures adjacent to the empty cell.

Survival ratios are derived from life-table values in U.S. Department of Health, Education, and Welfare, Vital Statistics of the United States, 1959, section.5.

Appendix Table 1

Present Values at Age 23 of Lifetime Earnings of Selected Occupations by Years of Schooling Discounted at Two Percent

	High School		College		
	1-3 yrs.	4 years	1-3 yrs.	4 years	Five or More Yrs.
Total experienced civilian	$140,739	$162,231	$194,313	$250,031	$294,227
Professional and technical	172,827	187,988	197,896	226,834	302,083
Accountants and auditors	172,001	184,667	190,863	231,332	239,484
Clergymen	-	105,756	110,366	116,816	120,763
College professors	-	-	-	155,361	218,125
Dentists	-	-	-	413,130	418,912
Lawyers and judges	-	-	-	341,529	429,808
Natural scientists	-	179,208	198,603	221,996	250,922
Chemists	-	175,539	190,038	213,799	242,364
Geologists and geophysicists	-	-	-	296,515	297,053
Physicists	-	-	-	269,650	284,322
Physicians and surgeons	-	-	-	438,836	477,230
Social scientists	-	-	-	262,397	253,147
Economists	-	-	-	273,301	280,208
Teachers	-	151,138	139,868	142,832	176,368
Elementary school teachers	-	-	-	135,111	169,494
Secondary school teachers	-	-	-	145,219	180,115
Insurance agents and brokers	196,483	193,447	200,210	265,959	245,480
Real estate agents and brokers	193,950	226,801	253,316	315,945	296,071
Technical engineers	201,117	211,360	222,280	258,424	272,377
Aeronautical engineers	203,510	232,340	246,990	267,670	272,689
Civil engineers	178,621	185,991	201,523	246,616	252,565
Electrical engineers	209,856	214,143	224,070	259,366	276,046
Mechanical engineers	208,394	222,796	231,110	253,967	268,329
Sales engineers	266,683	235,815	256,341	284,743	289,172
Mgrs, officials, and proprietors	196,045	222,652	266,410	347,087	353,838
Buyers and dept. store heads	191,152	212,145	246,388	307,988	312,493
Inspectors, public admn.	158,164	158,900	166,555	181,545	180,238
Officials and administrators, nec.	151,078	168,562	186,153	209,682	239,392
Other specified managers	180,481	186,970	196,893	217,629	223,072

Appendix Table 2

Present Values at Age 23 of Lifetime Earnings of Selected Occupations by Years of Schooling Discounted at Six Percent

	High School		College		
	1-3 yrs.	4 years	1-3 yrs.	4 years	Five or More Yrs.
Total experienced civilian	$ 77,219	$ 88,277	$103,040	$129,455	$147,429
Professional and technical	93,728	101,765	105,458	119,154	150,427
Accountants and auditors	91,819	98,651	102,002	120,150	126,590
Clergymen	-	59,084	61,733	64,260	65,717
College professors	-	-	-	78,079	112,509
Dentists	-	-	-	230,083	228,275
Lawyers and judges	-	-	-	177,661	202,342
Natural scientists	-	95,724	106,239	119,119	131,973
Chemists	-	94,889	102,047	114,897	128,986
Geologists and geophysicists	-	-	-	151,093	151,848
Physicists	-	-	-	137,090	151,804
Physicians and surgeons	-	-	-	214,482	232,720
Social scientists	-	-	-	134,116	134,084
Economists	-	-	-	141,711	146,305
Teachers	-	82,671	139,868	77,355	94,816
Elementary school teachers	-	-	-	74,361	92,378
Secondary school teachers	-	-	-	78,419	96,582
Insurance agents and brokers	100,274	104,082	108,746	137,418	131,891
Real estate agents and brokers	107,680	126,158	140,994	175,434	162,071
Technical engineers	109,815	115,030	120,691	318,127	145,732
Aeronautical engineers	111,122	125,631	132,075	145,778	150,281
Civil engineers	97,734	100,452	110,141	132,871	134,316
Electrical engineers	113,520	117,755	121,508	139,131	151,225
Mechanical engineers	115,903	122,833	125,760	136,630	143,196
Sales engineers	133,032	129,139	145,612	149,824	151,015
Mgrs., officials, and proprietors	104,736	117,411	137,696	172,891	177,105
Buyers and dept. store heads	102,443	112,992	132,901	153,497	157,579
Inspectors, public administration	89,140	87,630	91,894	98,379	99,443
Officials and administrators, nec.	82,202	91,145	99,629	110,937	126,237
Other specified managers	98,854	101,630	106,334	117,105	120,626

Appendix Table 3

Present Values at Age 23 of Lifetime Earnings of Selected Occupations by Years of Schooling Discounted at Ten Percent

	High School		College		
	1-3 yrs.	4 years	1-3 yrs.	4 years	Five or More Yrs.
Total experienced civilian	$50,353	$57,194	$65,345	$ 80,636	$ 89,013
Professional and technical	60,552	65,654	67,128	75,013	90,227
Accountants and auditors	58,696	63,084	65,050	75,117	79,922
Clergymen	-	38,852	40,771	41,839	42,501
College professors and instructors	-	-	-	48,155	69,640
Dentists	-	-	-	149,487	145,951
Lawyers and judges	-	-	-	111,462	116,579
Natural scientists	-	61,173	67,979	76,344	83,349
Chemists	-	61,214	65,400	73,733	82,247
Geologists and geophysicists	-	-	-	93,379	93,241
Physicists	-	-	-	83,793	96,683
Physicians and surgeons	-	-	-	124,085	135,135
Social scientists	-	-	-	82,659	85,008
Economists	-	-	-	88,291	91,572
Teachers	-	53,724	48,782	49,894	60,876
Elementary school teachers	-	-	-	48,509	59,916
Secondary school teachers	-	-	-	50,493	61,915
Insurance agents and brokers	62,199	66,817	70,100	84,790	84,031
Real estate agents and brokers	70,698	82,559	92,022	114,167	104,527
Technical engineers	71,463	74,526	78,003	88,224	93,120
Aeronautical engineers	72,314	81,050	84,185	94,105	97,819
Civil engineers	63,828	64,599	71,413	85,433	85,425
Electrical engineers	73,612	76,930	78,604	89,118	98,129
Mechanical engineers	76,440	80,246	81,527	87,548	91,114
Sales engineers	94,757	83,743	83,849	94,943	95,322
Mgrs, officials, and proprietors	67,137	74,473	85,968	104,912	107,472
Buyers and dept. store heads	65,609	71,951	85,229	93,652	96,556
Inspectors, public administration	59,443	57,356	60,078	63,661	65,012
Officials and administrators nec	53,107	58,710	63,685	70,302	79,765
Other specified managers	64,434	65,716	68,293	75,014	77,761

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