

Occupation, Occupational Change and Movement Within the Income Distribution

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Social scientists have studied occupational mobility from many perspectives. Sociologists view an occupation as a basic link between an individual and the rest of society. Through that link comes an image of an individual's prestige, power, intelligence, status and income. This logic has led to the use of occupational mobility as a proxy for the broad concept of social mobility, and excellent studies exist of inter- and intra-generational social mobility (Sorokin (1959), Blau and Duncan (1967), Metcalf and Nickell (1983)). Economists have studied occupational mobility with reference to whether labor markets operate within segments (Cairnes (1874), Kerr (1954), Leigh (1976B) and (1976C), Doeringer and Piore (1971)). These studies mention, but do not focus on, the relationship between occupational mobility and change in income. Flanagan (1973), and especially Leigh (1976A), examine the relationship in more detail in their studies of segmentation and occupational upgrading. The upgrading concept is taken from Rosen (1972) and states that occupational mobility allows an individual to take advantage of training opportunities on each of several jobs. When training possibilities in one occupation are exhausted, a worker may seek an additional occupation to continue the human capital accumulation process. Workers proceed through a pathway of jobs during their careers, each adding progressively smaller amounts to human capital. In this way, occupational mobility contributes to future increments in wages. Leigh (1976A) uses a recursive system of equations to incorporate occupation change into his model predicting the wage rate for middle-aged men. Among his results is that the empirical effect of occupation change, as measured by the difference in median earnings between the two categories, appears to be consistent with Rosen's upgrading hypothesis. Along the same lines, Shaw (1984) defines occupational investment as "the accumulation of skills an individual acquires to perform work within an occupation," and finds evidence among younger men that occupational investment is an important determinant of income.

Economists have done a substantial amount of work on the related topic of job/employer change. Recent studies of employer change look at both turnover and wage. Many involve the test of a job search model or a job-matching theory of turnover, and a resulting wage increase due to the higher productivity of a better job match (Antel (1985), Blau and Kahn (1981), Borjas and Rosen (1980), Topel (1986)). The job search and matching models indicate not only that turnover affects the wage, but also that the wage and other current job conditions influence turnover. The basic idea of the job-matching model is that in a labor market with incomplete information and with costs to changing employment, workers may not be allocated to a worker-employment pairing that maximizes productivity. As workers and firms learn about each other on the job, the quality of the match can be evaluated relative to perceived alternatives. Beneficial pairings provide incentives for investments in job-specific human capital; unsatisfactory matches will end in turnover if separation costs are not too high. Anticipated gains from potential matchings, therefore, influence the probability of job change, and any turnover may alter earnings.

The purpose of this paper is to investigate the importance of occupation and change in occupation to

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changes in real labor income for a selected sample of white males with continuous work histories. In doing so we incorporate ideas from these formerly-separate areas of previous research. However, unlike existing studies we have data on annual wage income over a twelve year time span for our selected sample; we can isolate wage change in years of occupational mobility in addition to examining annual changes in wages for the same individuals during the years when they continued in the same occupation. Unlike the research on job-search and matching, we focus on occupational investment and change rather than on job turnover, but we do adjust for the interdependence of occupational and earnings mobility indicated in those theories.

This study is divided into four sections. First we report changes in real labor earnings and the associated occupational turnover patterns of members of the sample. Next we show the movement of individuals within an income distribution. By relating this movement to occupational change, we can isolate paths of financially successful mobility. In the following section we use combined time-series/cross-section regression techniques to distinguish between income changes due to personal characteristics from those attributable to occupation or to changes in occupation. The paper concludes with a brief summary. Anticipating our results, we find evidence of considerable earnings mobility in the United States. We conclude that occupation and movement among occupations exert a strong influence on this mobility and on relative standing within an income distribution even after controlling for characteristics of individual workers.

CHANGES IN REAL LABOR EARNINGS

Combined time-series/cross-section observations were derived from the Panel Study of Income Dynamics (PSID) from the University of Michigan's Survey Research Center.¹ Our sample is made up of individuals with strong attachments to the labor force; we selected those white male heads-of-household who received labor income in each year from 1968 to 1980. Thus, by 1980, the youngest of the 872 workers in this sample had 12 years of continuous work experience.²

We find considerable year-to-year earnings mobility in this sample of working white males, both in upward and downward directions, not only for those who changed job or occupation but among all workers. Table 1 reveals that only twelve out of the 872 workers increased his real labor earnings in as many as ten of the years from 1968 to 1980. The median number of increases is only six out of the twelve years covered.³ Another indication of the volatility of real earnings is that the average yearly increase for the twelve years was only \$18.09, but the standard deviation was a phenomenal \$3189.⁴ Ruhm (1987) finds evidence of this striking variance in income even looking at two and four-year averages of weekly wages. Increases and decreases of these magnitudes for many workers render the standard concave, monotonically increasing age-earnings profile inadequate for the study of an individual's earnings over time. As Lillard and Willis (1978) point out, the smooth concave profile, derived from cross-section data, depicts the "representative man."⁵ It reflects a stability in the pattern of earnings increases that apparently does not exist when looking at specific workers.

Table 1 results reveal the number of years of earnings increases from 1968-1980 for those in our sample of working white males. To connect these, and downward, earnings changes to occupational mobility we calculate the total change in real labor income for each individual between the two years 1968 and 1980, and display the results in Table 2 according to 1-digit occupations in those two years.⁶ The average earnings change and the number of workers, shown in parentheses, are reported for each of the sixty-four 1968 occupation-1980 occupation combinations. The diagonal entries represent those who reported being employed in the same occupation in both years; the off-diagonal terms are for those holding 1980 occupations different from their 1968 categories.⁷ The bottom row of Table 2 shows the averages of those off-diagonal entries, classified according to the 1980 occupations. One of several interesting results appearing here is that the greatest average increase associated with movement into any of the categories was \$3395, for those who had become managers between 1968 and 1980. These large gains demonstrate the economic incentives for the recent growth of MBA programs' enrollments. On the other hand, the risk of economic loss for those who run their own businesses is indicated by the \$4961 average fall in real earnings for those who switched occupations to become self-employed. The far right-hand column reports

TABLE 1
Workers Classified According to Number of Years of Increases in Real Labor Earnings, 1968-80
(n = 872)

Number of Years	Number of Workers	Number of Years	Number of Workers
12	0	6	251
11	0	5	166
10	12	4	97
9	30	3	27
8	96	2	7
7	186	1	0

TABLE 2
Changes in Real Labor Earnings, 1968-1980 for Working Male Heads-of-Household, n = 872
(number of observations in parentheses)

1980 1968	1 Prof.	2 Manag.	3 Self-emp.	4 Cler. and Sales	5 Craft	6 Oper.	7 Serv. and Labor	8 Farm	Mean of Row	Mean of Column
1 Prof.	-96 (118)	2166 (39)	-5555 (3)	-2976 (8)	-1586 (6)	— —	-2682 (2)	-2405 (5)	32 (181)	271 (63)
2 Manag.	2812 (13)	667 (80)	-6732 (3)	-908 (15)	1750 (8)	-2168 (3)	-2120 (2)	-4158 (4)	334 (128)	-222 (48)
3 Self-emp.	86 (1)	4618 (8)	-1802 (13)	-4870 (3)	-2624 (10)	-1563 (3)	-1780 (2)	-212 (1)	-871 (41)	-439 (28)
4 Cler. and Sales	2623 (11)	5103 (16)	-8965 (2)	-173 (50)	1270 (11)	-856 (6)	515 (3)	-255 (1)	940 (100)	2054 (50)
5 Craft	-477 (7)	3830 (16)	-6520 (5)	-1407 (9)	234 (134)	-711 (20)	-2094 (7)	-279 (3)	72 (201)	-254 (67)
6 Oper.	2079 (1)	3173 (10)	1817 (1)	-223 (3)	896 (33)	-219 (69)	-344 (17)	-5290 (1)	284 (135)	809 (66)
7 Serv. and Labor	5223 (5)	5293 (4)	5118 (1)	— —	3623 (8)	157 (9)	-1543 (16)	2888 (3)	1452 (46)	3049 (30)
8 Farm	-5639 (2)	1904 (1)	1080 (1)	-4911 (1)	2853 (4)	150 (5)	-665 (1)	-1422 (25)	-931 (40)	-114 (15)
Mean of Column	430 (158)	2141 (174)	-3545 (29)	-887 (89)	437 (214)	-378 (115)	-1150 (50)	-1445 (43)	217 (872)	
Mean of Changers	1977 (40)	3395 (94)	-4961 (16)	-1802 (39)	777 (80)	-617 (46)	-964 (34)	-1477 (18)		

the averages of occupation-changers, classified by their original occupational group. The \$2054 and \$3049 increases for rows 4 and 7 show the large gains experienced by those leaving sales and clerical, and service and labor occupations, respectively. Note that, in general, greater increases (or smaller decreases) in real earnings are reported for those who changed occupation than for those who did not: the average increase between 1968 and 1980 for all workers in the sample was \$217; occupation-stayers experienced an average reduction of \$67; occupation-changers experienced an average increase of \$608.

In the next section we examine more fully the association between occupational mobility and earnings change by looking at occupation changes and movements of individuals within an overall income distribution. We construct an income distribution of the individuals in the sample and track year-to-year changes in each worker's position in that distribution. Thus, we relate changes in a worker's relative standing to occupational mobility.⁸ Calculating an income distribution broaches a broad topic of major interest as economists have given much attention to the stability of the distribution of income in the United States (see especially Sahota (1978)). This stability could be the result of two possible scenarios. One depicts a permanently poor and a permanently wealthy segment of society, i.e., that the relative earnings of individuals within the distribution remain constant over time. The alternative is that considerable individual earnings mobility exists, concealed by aggregation during cross-sectional measurements of the overall distribution. Our results will show that the second scenario is the more appropriate for our sample and that occupational mobility plays a significant role in this process.

CHANGE IN OCCUPATION AND THE DISTRIBUTION OF REAL LABOR INCOME

To examine the changes in relative position in the earnings distribution associated with changes in occupation, we divide the distribution of real labor income of our sample of experienced workers in each year into twenty groups, with five percent of the individuals in each category. The relative position of each worker in this earnings distribution can now be pinpointed for each year from 1970 to 1980. Movements of individuals among the 20 groups are summarized in Table 3. Results are reported separately for individuals who stayed in the same one-digit occupation in the year shown as in the previous year and for those who changed occupations between the two years. "Increase" in Table 3 indicates that an individual moved up in the income distribution at least two categories (or one, if into the top category) from the previous year. "Decrease" means that this relative position fell two or more categories (or one, if into the bottom category).

Table 3 results suggest the presence of a large amount of movement within the earnings distribution, even among stable, experienced workers and that upward mobility is often associated with occupation change.⁹ Indeed, instead of a stable distribution with little internal movement, a more appropriate description is one by Sorokin (1959) describing social mobility in the United States, "... remind one of a pot of boiling water in which the water particles move up and down, to and fro, with great rapidity."¹⁰ A closer examination of the table reveals that the percent of occupation-changers who increased their relative labor earnings by at least two 5% categories exceeded the percent of occupation-stayers similarly increasing their relative position in all of the 11 years measured; in 9 of these years the percentages are significantly greater. In none of the years does a significantly larger proportion of occupation-changers than occupation-stayers experience a decrease in relative earnings. Thus it appears that occupational mobility is related to improvements in the relative income of white male workers.

To investigate the role of occupational change among those who moved up in the relative income distribution we turn to Table 4. Table 4 allows us to examine occupation changes for the "Changers" who increased their relative standing in Table 3. The original and destination occupations for each of these successful moves was recorded, and the accumulated yearly changes for all of Table 3's "Changers" from 1970 to 1980 are reported. The original occupation is listed vertically along the left in Table 4 and the destination occupation horizontally along the top. The number switching from an original to a destination occupation and the percent that number represents of the total changes out of the originating category are contained in each cell. Cells representing the major destinations of those successful movers from each of

TABLE 3
Increases and Decreases within the Earnings Distribution for Occupation-Stayers and Occupation-Changers
(n = 872 in each year)

	Increases ^a		Decreases ^a	
	Stayers	Changers	Stayers	Changers
1970	.19	.28**	.18	.21
1971	.17	.25**	.16	.23
1972	.17	.26**	.20	.23
1973	.18	.22	.19	.25
1974	.22	.26	.18	.15
1975	.18	.30**	.20	.15
1976	.19	.25**	.18	.18
1977	.16	.28**	.18	.16
1978	.16	.30**	.17	.21
1979	.18	.27**	.17	.23
1980	.18	.29	.16	.15
	p = .18	.27	.18	.20

**The percentage of changers with increases is greater than the percentage of stayers with increases using $\alpha = .05$.

^aThe number indicates the percent that increases (decreases) at least two categories in the income distribution, or one category if into the top (bottom) group.

the left side occupations (the cells occurring with a frequency greater than fifteen percent) are highlighted by asterisks. The fifteen percent is an arbitrary figure, but the resulting pattern is robust with respect to a wide range of chosen percentages. The location of these highlighted cells suggests two separate channels for earnings growth from occupational mobility exist, one for white-collar workers and one for blue-collar workers. The white-collar successful changers benefitted from moves to other white-collar occupations, and the successful blue-collar switchers shifted to other blue-collar positions. Workers from all occupations experienced upward economic mobility but the paths occurred largely through two distinct segments of the labor market. The only major exception is the movement between the white-collar and blue-collar occupations that occurs through the craft category.

This apparent pattern of segmentation for the successful changers points to a role of occupational investment in the earnings mobility process as suggested by Rosen (1962) and Shaw (1984). Two caveats exist, however. First, examination of the means of successful movers versus the rest of the sample reveals that some of the income mobility may merely be due to cost-of-living differences in moving from the South to the Non-South or due to additional hours or weeks worked. Second, personal characteristics of the individual might also have been responsible for the large income changes. In the following section we control for many personal characteristics of the workers, regional mobility for cost-of-living differences, and hours and weeks worked while continuing to investigate the role of occupational investment and change on increments to earnings.

POOLED TIME-SERIES/CROSS-SECTION ESTIMATES OF CHANGES IN EARNINGS

Calculating the effect of occupational turnover on earnings is complicated by their interdependent relationship. Not only have we found that earnings increases often follow occupation changes, but also it is reasonable to assume that anticipated increases in earnings influence the decision to switch occupations. Indeed, Boskin (1974) demonstrates the positive influences of earnings on occupational choice. We used an instrumental variables approach to address this problem of simultaneity, estimating the probability of

TABLE 4
Occupational Mobility of Changers who Increased Relative Earnings by More than One Ventile
(Accumulated over the year from 1970 to 1980)

Frequency Row Pct	Destination Occupations								TOTAL
	1 Prof.	2 Manag.	3 Self-emp.	4 Cler. and Sales	5 Craft	6 Oper.	7 Serv. and Labor	8 Farm	
Original Occupations									
1 Prof.	0	23	2	10	9	1	0	1	46
	0.00	**50.00**	4.35	**21.74**	**19.57**	2.17	0.00	2.17	10.87
2 Manag.	15	0	13	19	11	5	2	1	66
	22.73	0.00	**19.70**	**28.79**	**16.67**	7.58	3.03	1.52	15.60
3 Self-emp.	3	9	0	6	11	4	4	1	38
	7.89	**23.68**	0.00	**15.79**	**28.95**	10.53	10.53	2.63	8.98
4 Cler. and Sales	12	24	2	0	8	5	1	2	54
	22.22	**44.44**	3.70	0.00	14.81	9.26	1.85	3.70	12.77
5 Craft	9	11	7	11	0	46	13	1	98
	9.18	**11.22**	7.14	11.22	0.00	**46.94**	13.27	1.02	23.17
6 Oper.	5	6	2	7	41	0	14	0	75
	6.67	8.00	2.67	9.33	**54.67**	0.00	**18.67**	0.00	17.73
7 Serv. and Labor	4	2	3	1	7	15	0	3	35
	11.43	5.71	8.57	2.86	**20.00**	**42.86**	0.00	8.57	8.57
8 Farm	0	0	1	4	2	2	2	0	11
	0.00	0.00	9.09	**36.36**	**18.18**	**18.18**	**18.18**	0.00	2.60
TOTAL	48	75	30	58	89	78	36	9	423
	11.35	17.73	7.09	13.71	21.04	18.44	8.51	2.13	100.00

occupation change for each individual in each year as a function of personal characteristics. This probability was then treated as an independent variable in an equation estimating change in real labor income.¹¹

An error components model was used for the pooled time-series/cross-section estimate of change in earnings for each year for the entire sample, thus increasing our effective sample size to 10,464. The error components procedure assumes that the error term can be divided into three independent components. One component varies over the cross-sectional units, i.e. the workers, but remains constant for each individual over time. A second component varies over time, but is assumed to be the same for each cross-sectional unit, or worker. The third component is the remaining variation both among individuals in the sample and over time. Thus, the model allows the error terms to differ among workers at each given point in time, and allows the terms to differ for each worker at different points in time. Given certain general assumptions, the coefficients are unbiased and consistent estimates of the true parameters. The Fuller-Battese option of the SAS procedure TSCSREG, a GLS estimation procedure, was used for the actual estimation.¹²

We estimate yearly changes in real labor income from 1968 to 1980 as a function of variables that influence income mobility.¹³ The probability of turnover, the relative benefits of the current employment-

worker pairing, the direct effects of personal characteristics including the human capital accumulated in the firm, any changes in hours or weeks worked, and cost-of-living changes all are hypothesized to influence the dependent variable. Holding these factors constant, we calculate the effect of occupation and occupation change in income changes.

Results of the estimation are reported in Table 5. The coefficient on the probability of occupation change variable, PROB, is positive and significant, demonstrating the interdependence of income change and turnover. The higher the probability of an individual's occupational turnover, the greater the change in real labor income. Real labor income in the previous year, PREVINC, has a significant negative effect on change in earnings. PREVINC is included to represent the state of the pairing of worker and occupation. If PREVINC is relatively low due to an unsatisfactory pairing arrangement, then, *ceteris paribus*, an increase in income due to a change in the pairing may be forthcoming. The significance of PREVINC may also reflect a regression toward the mean earnings. With a large number of variables that determine income held constant, time-series observations may show reduced random deviations as earnings levels tend toward their means, *ceteris paribus*.

Including PREVINC also modifies the way the other coefficients must be interpreted. The dependent variable is current real labor income (CURRINC) minus PREVINC implying:

$$(1) \text{CURRINC} - \text{PREVINC} = \sum X\beta.$$

Adding PREVINC as an independent variable yields

$$(2) \text{CURRINC} - \text{PREVINC} = \sum X\gamma + \theta \text{PREVINC},$$

or

$$(3) \text{CURRINC} - (1 - \theta)\text{PREVINC} = \sum X\gamma.$$

If $\theta \neq 0$, then $\gamma \neq \beta$ and the γ vector of coefficients reflects an equation predicting change in real labor income, adjusted for the level of previous real labor income.¹⁴ Thus it is the γ vector of coefficients that appears in Table 5.

The next set of independent variables listed in Table 5 represent the direct effects of personal characteristics of the individual workers. These include three dummy variables representing increasing amounts of time on the current job, (EXP2, EXP3, EXP4); the years of labor market experience since age 18 (LEXP18) and its squared term; and a series of dummy variables indicating the highest level of education attained (NOHS, MTHS, CGRAD, MTCGRAD). All these measures show human capital to be positively and significantly related to change in real labor income. The results support the standard conclusion that, on average, earnings profiles are steeper for these workers with higher levels of human capital. Other significant coefficients reveal that married men experience greater income gains than do the unmarried, and that disabled workers acquire lower increments than do those who are not disabled. Clearly, personal characteristics influence earnings gains.

Of the two coefficients representing the influence of geographic mobility and included as a proxy for cost-of-living differences between regions of the country, only one is significant. Movement from the Non-South to the South, NONSTOS, is negatively correlated with earnings changes, *ceteris paribus*. The coefficient on movement from the South to the Non-South (STONONS) is positive but not significant. Changes in both hours and weeks worked are positively correlated with movements in earnings, as expected.

We now turn to the set of variables designed to isolate the effect of occupational characteristics and change on earnings changes. The first seven, PROF through FARM, represent those who stayed in the one-digit occupation from the previous year to the current one. Approximately eighty-five percent of the sample remained in the same category from one year to the next, so the coefficients on these variables in part reflect relative gains due to occupational investment for those individuals compared to the base group, those who stayed in the service and labor category. The results are similar to those shown in Table 2 in that the largest increases in real labor earnings attributable to occupation accrue to those in the managerial category; and that those in craft occupations also tend to receive significant increments. We find positive signs on all the occupation variables except FARM which is insignificant, and four of the six positive coefficients are significant at a 5% level. Although other supply and demand factors may influence the size of these coefficients, part of the measured effect is likely to be a difference in returns to "occupation-

TABLE 5
 Estimation of Pooled Time-Series/Cross-Section Data With an Error Components Procedure
 (Dependent Variable = Change in Real Labor Income)

Variable ^a	Coefficient	Std. Error	Mean
Intercept	-26.32	396.37	
Prob	1674.01**	561.68	.1516
Previnc	-3771.36**	80.03	.9978 ^b
Mar	322.58**	153.00	.9418
Exp2	784.10**	146.42	.2041
Exp3	1046.86**	164.01	.2778
Exp4	1074.00**	179.26	.3823
Lexp18	1255.98**	185.37	2.4123 ^c
Sq Lexp18	-241.69**	35.06	6.8564
Disabil	-509.09**	119.77	.0908
NoHS	-434.09**	125.37	.2517
MTHS	385.20**	122.08	.1685
CGrad	1064.19**	154.76	.1471
MTCGrad	1442.67**	209.01	.0820
CHWeeks	67.12**	4.68	-.0394
CHHours	12.07**	3.57	-.1933
NonStoS	-769.08*	429.04	.0045
StoNonS	410.95	553.68	.0027
Unemp	52.63	143.60	.6054 ^d
Prof	1048.22**	237.36	.1956
Mana	1782.05**	231.04	.1633
Self Emp	388.87	266.85	.0579
Cler	747.44**	239.79	.1109
Craft	719.60**	215.34	.2342
Oper	319.59	222.99	.1432
Farm	-385.32	285.10	.0474
Prof to Mana ^d	1642.30**	369.40	.0092
Prof to Cler ^d	1581.92**	617.78	.0024
Prof to Crft ^d	1314.01**	595.86	.0026
Prof to Farm	-2767.33**	1199.80	.0006
Mana to Prof ^d	968.73**	406.89	.0068
Mana to Crft ^d	1212.34**	497.30	.0039
Mana to Labr	-1825.72*	1034.10	.0008
Self to Mana ^d	1251.96**	459.74	.0050
Self to Farm	-3953.54**	1312.50	.0005
Cler to Prof ^d	1095.95**	540.57	.0032
Cler to Mana ^d	1536.42**	386.64	.0077
Cler to Farm	7316.91**	1686.30	.0003
Crft to Prof ^d	2798.33**	698.59	.0018
Crft to Mana ^d	2171.09**	467.17	.0046
Crft to Oper ^d	640.03**	306.24	.0151
Oper to Crft ^d	716.89**	301.01	.0162
Farm to Mana	-5837.28**	2897.00	.0001
Farm to Cler	5088.99**	1044.40	.0008
Farm to Oper	-2328.58**	988.53	.0009

n = 10464
d.f. = 10383

**represents significance at $\alpha = .05$

*represents significance at $\alpha = .10$

^aThe omitted categories are: unmarried, less than one year experience on the current job, not disabled, high school graduate, non-movers, service or labor occupation stayers.

^bThis variable was scaled by dividing by 10,000; thus, the actual mean value would be \$9978.

^cThis variable was scaled by dividing by 10; thus, the true mean will be 10 times the value shown.

^dThis path has ten or more observations.

specific" human capital. Viewed in this way, workers do appear to build up occupational capital and reap rewards from it. Note that this holds true even after adjusting for the acquisition of firm-specific human capital (EXP2, EXP3, EXP4) and holding constant other personal characteristics.

In addition to these seven, fifty-five dummy variables were added to the time-series/cross-section regression to account for the workers who changed occupational groups between the previous and the current years.¹⁵ These correspond to the off-diagonal alternatives in Table 4 for which we have observations, only now the data includes every occupation change in the entire sample and many other effects are held constant. The coefficients reflect the effects of both the amount of human capital accumulated in the previous occupation and its transferability, *ceteris paribus*. The average gain to occupation change is, however, only partially captured by those occupation coefficients because of the additional estimated earnings benefits from the expected occurrence of turnover as measured by the PROB variable. The signs and significance of the occupation change coefficients show the degree to which human capital is transferred from one category to another. Nineteen of the fifty-five coefficients are statistically significant and reported in Table 5. To conserve space the other thirty-six coefficients are not listed. Fourteen of the nineteen show positive avenues of human capital transfer.

Comparing the results of the occupation variables in Table 5 with the paths indicated in Table 4 reveals an interesting pattern of upward economic mobility through occupation change. Omitting changes with sample sizes less than ten in Table 5 eliminates all the negative coefficients and amounts to leaving out movements into and out of the farm category and the managerial-to-labor link. After the omissions, twelve significant paths remain: one blue-collar, craft to operative; three into craft; and eight white-collar. All twelve are highlighted in Table 4. We conclude that occupation effects are important aspects of the earnings change process, even holding constant a variety of variables. Ten of the twelve significant paths are actually two-way streets. For example, not only do individuals gain from moving from the professional to the managerial category, but also from the managerial to the professional classification. This dual-direction aspect of mobility indicates substantial transfer of human capital exists between some of the occupational categories, but not others. Apparently, a wide range of alternative jobs exist within each broad one-digit classification so that beneficial moves can be made in either direction when the human capital can be transferred across the categories. We do not have two- or three-digit occupation data over the entire time span, and even if we did, the computer facilities required would be prohibitive. However, further detail would be worthwhile in tracing potential occupation paths.

Only one of the twelve significant coefficients represents the effect of mobility into a blue-collar category other than craft. This stands in contrast to the variety of blue-collar occupation changes leading to upward income mobility visible in Table 4. Table 5 results suggest that individuals in blue-collar occupations (except for craft) generally have flatter age-earnings profiles than those in white-collar positions, have relatively small earnings gains from mobility within the blue-collar segment and seldom receive financial benefit from changing into white-collar categories.

SUMMARY

This study was designed to investigate the influence of occupation and occupational change on changes in real labor earnings: does choice of occupation or a specific change in occupation influence earnings changes, once personal characteristics and firm-specific human capital are taken into consideration? We follow the changes in both real income and relative real income over time for a selected sample of experienced working white males. Large fluctuations in earnings exist even within this sample of workers, and the income changes vary markedly by occupation. By examining movements from year to year within the overall distribution of real labor income, we calculate that the percent of occupation-changers who increased their relative labor earnings by two or more 5% categories in the income distribution exceeded the percent of occupation-stayers similarly increasing their position in all 11 years measured. We conclude that a strong association exists between occupational mobility and changes in real labor earnings, both in absolute terms and relative to an income distribution.

To distinguish the extent of the influence of personal characteristics from that of occupation in the

APPENDIX Independent Variables

- Exp2 = 1 if years of experience with current employer is 1-3.5 years*
 Exp3 = 1 if years of experience with current employer is 3.5-9.5 years*
 Exp4 = 1 if years of experience with current employer exceeds 9.5 years*
 Lexp18 = number of years of work experience since age 18
 SqLexp18 = square of Lexp18
 NoHS = 1 if less than a high school diploma
 MTHS = 1 if attended college, but did not receive a bachelors degree
 CGrad = 1 if received a college bachelors degree
 MTCGrad = 1 if received an advanced degree
 Mar = 1 if married in the current year
 Disabil = 1 if condition limits type or amount of work*
 Unemp = county unemployment rate
 ChWeeks = weeks worked minus weeks worked in the previous year
 ChHours = hours per week worked minus hours per week worked in the previous year
 NonStoS = 1 if moved from Non-South to South during the current year
 StoNonS = 1 if moved from South to Non-South during the current year
 Prob = predicted probability of occupation change during the current year
 Previnc = respondent's real labor income from the previous year
 Prof = 1 if professional occupation in both the previous and the current year
 Mana = 1 if managerial occupation in both the previous and the current year
 Self-Emp = 1 if self-employed in both the previous and the current year
 Cler = 1 if sales or clerical occupation in both the previous and the current year
 Craft = 1 if craft occupation in both the previous and the current year
 Oper = 1 if operative occupation in both the previous and the current year
 Farm = 1 if farmer or farm manager in both the previous and the current year
 Labor = 1 if service or labor occupation in both the previous and the current year
 Occ1 to Occ2 = Forty-five dummy variables representing a move from occupation category 1 to occupation category 2 during the current year

*Panel Study questions or response alternative changed during the years included in our dataset.

earnings growth process, we estimated changes in real earnings with pooled time-series/cross-section data by an error components procedure. We used an instrumental variables technique to address the interdependence between changes in earnings and turnover. Results revealed the importance of this interdependence, the state of the pairings, and a variety of personal factors including measures of human capital, marriage, disability and geographic mobility on yearly changes in real income. Occupation effects on earnings increments, especially in white-collar classifications, retained their significance even when adjusting for the other influences.

NOTES

1. The data utilized in this paper were made available by the Inter-University Consortium for Political and Social Research. Neither the original source nor the Consortium bear any responsibility for the analyses or interpretations presented here.
2. Workers who were unemployed for part of the year were thus included. We excluded the SEO subsample, and included a few workers who retired one or two years before the end of the sample period for which years we imputed earnings based on an earnings regression from all the workers for the entire time period. By approaching the building of the observations from a perspective where we had available data for past and future years, we were able to reconstruct data missing for one or more years, a process impossible for a researcher using only cross-section data.
3. To calculate real labor income, nominal labor earnings were deflated using the CPI for the appropriate year. The base year for the CPI was 1967. Non-monetary benefits are omitted from this study. A similar analysis of nominal earnings shows a higher median number of years of increase, eight of the 12 years.

4. Much of this volatility can be attributed to the fact that hours and weeks varied considerably for some workers across years.
5. See Lillard and Willis (1978), pp. 985-6.
6. More complete titles for the one-digit occupational groupings are as follows:
 - 1: Professional, technical and kindred workers.
 - 2: Managers, officials and proprietors, not self-employed.
 - 3: Managers, officials and proprietors, self-employed.
 - 4: Clerical and kindred workers; and sales workers.
 - 5: Craftsmen, foremen and kindred workers.
 - 6: Operatives and kindred workers.
 - 7: Laborers; service workers; farm laborers.
 - 8: Farmers and farm managers.
7. The diagonal column in Table 2 also includes those workers who switched out of their 1968 occupations and then back into the original occupations by 1980. Note that a bias toward zero earnings change for job switchers may exist if a portion of the measured occupation changes is due to response error. See Mellow and Sider (1983) for a discussion of response error.
8. The PSID reports income by year, not by occupation. By associating a move that occurs within the year extending from times t to $t + 1$ with a change in income from that period minus the previous one, the effect of occupational mobility on earnings may be underestimated. Using next year's income would omit the immediate effects of turnover and further confuse multiple occupation-change situations. In their studies of employer change, Borjas and Rosen (1980) and Blau and Kahn (1981) showed that most of the effects on their income variable were immediate, although some additional returns were received.
9. See Schiller (1977), Duncan and Hoffman (1981) and Hoffman (1977) for discussions of relative income mobility, relative wage mobility, and wage mobility, respectively, that do not classify workers into stayers and changers.
10. See Sorokin (1959), p. 381.
11. The probability that an individual changes occupation was estimated in a logit equation with time-series/cross-section observations of seventeen variables believed to influence turnover. Results are available from the authors upon request.
12. See Fuller and Battese (1974) for a more complete explanation of the error-components procedure. Potential drawbacks to the error components model are that the correlation of the error terms across time are constant and equal for each worker, and that the correlation between the error terms of two workers are equal in any given time period (see Judge, *et al.* (1985) or Kmenta (1971)). See SAS Institute (1986, pp. 625-645) for more information about the estimation procedure.
13. The Appendix contains a description of each of the independent variables.
14. See Augustyniak (1981) and Duncan (1979), pp. 121-2.
15. The costs and benefits of occupation change may differ according to whether the mobility is voluntary or involuntary. Unfortunately, too much missing data and interview questions not precisely aimed at the topic prevented us from comparing the effect of voluntary and involuntary mobility. Also, Rosen's (1981) caution applies to any study of this type: since some workers quit to avoid being fired and some will delay quitting in the hope of receiving benefits from being laid-off, the distinction between the voluntarily and the involuntarily unemployed is not clear-cut.

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