Interindustry Labor Mobility Among Men, 1957-60

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This article and the study on which it is based illustrate one of the potential uses of data from the social security earnings records. The study is one in a series of analyses, now under way or planned, that delineate various aspects of the earnings and employment structure of the United States economy and the relation of lifetime earnings patterns to economic security. This study focuses on both empirical and theoretical aspects of the movement of workers between industries.

A VERY SIGNIFICANT facet of many of the current economic problems facing the United States is the ability, or lack of ability, of American labor markets to shift workers between varying types of jobs. If such shifts are carried out quickly and effectively, unemployment is reduced, economic growth is encouraged, and inflationary pressure is eased. On the other hand, the presence of significant barriers to the movement of workers between jobs has the effect of worsening these problems by making it more difficult for temporarily unemployed workers to find new jobs. When this happens the economy's output of goods and services is reduced, with negative effects on economic growth, and it becomes more expensive in terms of price inflation to reduce unemployment to a satisfactory level. The extent and character of job shifts affect also the patterns of lifetime earnings and the pressures toward early retirement.

Since the way in which job shifts take place in the economy has such widespread significance, much has been said and written about labor mobility in the United States.[1] For the most part, previous discussions of labor mobility have relied upon either relatively small samples of the population or cross-sectional data—that is, information describing the composition of the labor force at a particular point or points in time. Although these data have been useful, they do suffer from the shortcomings of either limited scope or an inability to describe precisely gross movements of workers over a period of time.

These difficulties have been at least partially overcome in the data presented here by making use of the 1-percent Continuous Work-History Sample from the earnings records of the Social Security Administration. From that sample, data have been tabulated that describe the industry of the major job of workers in 1957 cross-classified by their industry of major job in 1960.[2] An example of the type of available data is shown in table 1, which describes patterns of job movement for all men in the sample who were employed in both 1957 and 1960. The time span 1957–60 was selected because it represents a full business cycle (measured from peak to peak) for the national economy.

The data shown in table 1 represent only a small part of the total available information. In addition to describing worker movement the basic sample from which the data were derived provide estimates of mean earnings for each cell of table 1. This information has also been tabulated for different racial groups, by sex, and by 5-year age groups. Consequently, a wide variety of data relating to labor mobility patterns is available. Only the labor mobility patterns of male workers will be treated in this discussion, however.

THE MAXIMIZING HYPOTHESIS

In almost every discussion of labor mobility the question arises of how workers' mobility is affected by different wage levels. If workers are assumed to be maximizers in an economic sense, it is expected that they will respond to different

* Wharton School of Finance, University of Pennsylvania. This article is abstracted from a larger study, *Interindustry Labor Mobility in the United States, 1957–60*, by Lowell Gallaway with the assistance of Sebastia Svolos. The study was begun by Mr. Gallaway as a staff member of the Office of Research and Statistics. It is to be published late in 1966 by the Office of Research and Statistics in its Research Report series. The larger study is cited throughout this article by the short title, *Interindustry Labor Mobility*.

[1] A full bibliography is contained in appendix C of *Interindustry Labor Mobility*.

[2] A full description of the data may be found in appendix B of *Interindustry Labor Mobility*.

TABLE 1.—Industry of major job, 1957 and 1960, of male workers employed in both 1957 and 1960

Industry of major job in 1957	Total	Industry of major job in 1960									
		A	B	C	D	E	F	G	H	I	J
Total	312,773	8,512	6,635	28,421	121,517	23,204	63,528	12,552	32,434	14,379	1,591
A. Agriculture	8,923	5,524	66	546	1,017	180	871	68	386	224	41
B. Mining	7,397	95	5,022	452	798	156	434	50	216	135	39
C. Contract construction	27,603	452	311	19,280	2,462	595	1,975	528	1,180	570	250
D. Manufacturing	123,713	899	451	3,070	102,854	1,670	8,241	983	3,655	1,432	458
E. Transportation, communications, and public utilities	22,507	168	143	568	1,154	17,906	1,282	163	694	295	134
F. Wholesale and retail trade	65,950	778	322	2,470	8,392	1,594	45,598	1,116	4,003	1,301	376
G. Finance, insurance, and real estate	11,215	47	28	361	492	105	680	8,778	502	173	49
H. Services	30,019	304	119	874	2,630	670	3,107	594	20,778	809	134
I. Government	12,373	153	48	322	660	206	671	172	736	9,369	36
J. Unknown	3,073	92	125	478	1,058	122	669	100	284	71	74

wage levels by showing a greater tendency to move toward the high wage jobs.[3]

Whether they do react in this fashion can be determined, in part, from data such as that shown in table 1. Actually, there are three aspects of the matter of maximizing behavior. First, there is the behavior of those workers who may be thought of as "stayers"—those who do *not* change jobs. This is as much a part of the mobility process as the actual activity of job changing. Second, when the behavior of "movers" is considered, the focus may be on net flows of labor between different types of jobs. Third, the pattern of gross flows of workers out of a particular type of job may be considered.

Behavior of Stayers

The least complex of these aspects of mobility is the behavior of stayers. In table 2 data are presented that indicate the proportion of male workers whose major job was in a particular industry in 1957 who had the same industry of major job in both 1957 and 1960. In short, this table shows the percentage of stayers in each industry. When these percentages are compared with the 1960 level of mean earnings by industry for male workers and the 1960 industry unemployment rate, there are indications that workers behave in a maximizing fashion. Specifically, a least-squares regression equation indicates that the higher the level of wages the greater the tendency to stay in an industry, and the higher the unemployment rate in an industry the less likely workers are to stay in it.[4] The regression equation accounts for 70 percent of the variance to be explained.

Net Flows of Labor

In turning to the pattern of net movement of workers between industries, table 3 shows the net flow of labor into various industries in percentage terms. Using the wage and unemployment data from the stayer analysis it is again possible to test the maximizing premise by a regression equation. The results in this instance are quite different from those obtained in the case of stayers. Far from indicating the presence of maximizing behavior on the part of workers

[3] Maximizing behavior as used in this sense denotes a desire on the part of workers to attain the highest possible money income *given their subjective preferences for income and leisure* and the income opportunities available to them. Consequently, it does not mean that workers seek out higher levels of money income to the exclusion of all other considerations. The statement of the maximizing hypothesis set forth at this point—that it is expected that workers will respond to different wage levels by showing a greater tendency to move towards high wage jobs—is something of an oversimplification. For a full statement of the logic underlying this proposition see chapters 2 and 3 of *Interindustry Labor Mobility*.

[4] The regression results are:

$$S = 84.16 + .004W - .797U \text{ and } R^2 = .70$$
$$(.001) \quad (.418)$$

where S represents the percentage of stayers in an industry, W denotes 1960 mean estimated industry wages, and U indicates the 1960 industry unemployment rate. The numbers in parentheses beneath the regression coefficients indicate the standard errors of those coefficients and show that the coefficient of the wage variable is significantly different from zero at the 5-percent level and the unemployment coefficient is significant at the 10-percent level.

It should be kept in mind that the unemployment variable's significance may reflect in part involuntary displacement of workers. To the extent that this is the case the observed behavior of stayers reflects more than just rational calculation by workers.

TABLE 2.—Percent of male stayers, 1960 mean wages, and 1960 unemployment rate, by race and industry

Industry	Percent with same industry of major job in 1957 and 1960		1960 wages		1960 unemployment rate [1] (percent)
	All males	Negro males	All males	Negro males	
Agriculture	61.9	66.1	$1,922	$1,250	8.0
Mining	67.9	63.3	5,097	3,589	9.5
Contract construction	69.9	66.2	4,414	2,351	12.2
Manufacturing:					
Durable goods	81.2	76.8	5,637	3,747	6.3
Nondurable goods	76.6	71.6	5,387	3,445	6.0
Transportation, communications, and public utilities	79.6	69.1	5,533	3,310	4.3
Wholesale and retail trade	69.1	63.9	4,651	2,419	5.9
Finance, insurance, and real estate	78.3	63.8	5,783	2,664	2.4
Services	69.2	68.7	4,279	2,312	4.1
Government	75.7	66.0	3,477	2,685	2.6

[1] Data from U.S. Department of Labor, *A Report on Manpower Requirements, Resources, Utilization and Training*, 1964, table A-11.

the evidence in this case could reasonably be interpreted as indicating an absence of such behavior.[5]

Several reasons might be advanced for these results: (1) It is possible that workers do not behave in a maximizing fashion or (2) the logic underlying the expectation that maximizing behavior will produce a positive relationship between earnings and net flows of labor may not be complete. In view of the findings for stayers, the nonmaximizing explanation is not particularly attractive, for it seems anachronistic to explain one phase of workers' labor-market behavior in maximizing terms and then deny its existence in another area. Some alternative explanation for the observed results is necessary, however, before the nonmaximizing idea can be ignored.

A very real possibility in this respect is to introduce aspects of the mobility process that are essentially ignored when only maximizing behavior is considered. In particular, there is the situation of the worker who is dismissed from an existing job, either because of poor work performance or elimination of the job he holds by a reorganization of the productive process. In a very real sense such a worker is involuntarily mobile in contrast to the worker who after considering a number of alternatives decides either to change jobs voluntarily or to remain in his present work activity.

Distinguishing between the voluntarily and involuntarily mobile makes sense since the involuntarily displaced worker is faced with quite a different set of alternatives than the worker who elects to change his job. The major difference is that the displaced worker does not have the alternative of staying in his present job. He is consequently faced with choosing among various jobs that may or may not have wage levels higher than those in the job from which he was displaced. In addition, he will probably be subject to substantial pressures to locate another job as quickly as possible, will not have full market information, and is probably not particularly competitive in the labor market. After all, dismissal because of poor work performance, skills rendered obsolete by changes in either technology or demand, or physical shortcomings are not exactly substantial credentials to present to a prospective employer.

If workers who are involuntarily mobile are under greater pressure to locate a job, have less market information, and are less competitive than other workers, it would seem likely that they would move to those industries in which job opportunities are relatively more abundant. At least, such an assumption seems reasonable, for the greater number of job opportunities in an industry the greater the probability that a worker will be aware of such opportunities and, very possibly, the greater the probability that workers with marginal labor-force credentials will be able to qualify for employment.

This conclusion is perfectly consistent with the basic assumption of maximizing behavior by workers. Movement costs facing a displaced worker properly include the costs of acquiring information about other jobs—that is, "search" costs. Such costs may consist of both direct money

TABLE 3.—Net flow of labor for male workers, by industry[1] 1957–60

Industry	Percent
Agriculture	−4.61
Mining	−10.30
Contract construction	+2.96
Manufacturing:	
Durable goods	−1.60
Nondurable goods	−2.08
Transportation, communications, and public utilities	+3.10
Wholesale and retail trade	−3.67
Finance, insurance, and real estate	+11.19
Services	+8.04
Government	+16.21

[5] The regression results are:

$$M = 17.17 - .001W - 1.764U \text{ and } R^2 = .44$$
$$(.002) \quad (.764)$$

where M indicates the net flow of labor into an industry and the other symbols retain their previous meaning.

outlays to facilitate search or the opportunity costs implicit in allocating time to the search process. If the displaced worker finds himself temporarily facing a zero wage alternative it is not surprising that he may choose to forgo a more costly search for a higher paying job in favor of a less costly search for a lower paying one.

If this is the case and if there is a substantial amount of involuntary labor mobility in the economy, it is possible that the presence of involuntary displacement of workers could produce the relationship between net flows of labor and wage levels that has been found. This would be the result if the relationship between the availability of jobs and wage levels were a negative one. Under these circumstances, a substantial amount of involuntarily mobility would operate to disguise the expected positive relationship between earnings and net labor flows.

Although the presence of substantial amounts of involuntary mobility may explain the net flows of labor, some empirical evidence is necessary before the explanation can be accepted. Since it is not possible to distinguish directly between the two types of mobility, some indirect method of identifying the presence of involuntary mobility must be employed.

The method selected consists of isolating subgroups of the sample that might be expected to have different "mixes" of voluntary and involuntary mobility. For example, if subgroup A has more voluntary mobility in relation to involuntary mobility than subgroup B, the correlation coefficient measuring the relationship between net flows of labor and wages should be greater in A than in B. But what subgroups should be used? One possibility is groups with different age characteristics: sufficient detail is available in the data to make this operationally feasible and on several counts it is meaningful to make age distinctions when the question of the relative importance of voluntary and involuntary mobility within subgroups is dealt with.

First, there is the consideration that as workers grow older the objective and subjective costs of movement are likely to increase. On the objective side there is the very real consideration that workers may not be able to transfer fully the rights accumulated in retirement programs associated with their job; on the subjective side the psychic cost implicit in uprooting one's self from a particular job may greatly increase as one ages. The impact of such increases in the cost of movement is to inhibit the voluntary mobility of workers as they grow older, which implies a decline in the relative importance of voluntary mobility with increasing age.

Second, as workers age their income levels tend to rise up to approximately age 50. As this happens, barriers to the voluntary flow of labor between industries begin to develop. In particular, an older worker who contemplates movement to another industry is likely to run afoul of the seniority system in American industry. That system has the effect of differentiating between workers: a worker with 5 or 10 years of seniority who is employed in industry A is simply not the same as one working in industry B who might decide that the wage levels in A were so attractive that he wished to change jobs. To do this he would be required to start at the bottom of the seniority hierarchy in his new employment—that is, if any job openings were available. The loss of seniority implicit in such a job change imposes an additional cost of movement on a worker, a cost roughly proportionate to the amount of seniority he presently possesses and his earnings level in his present employment. Since both of these are positively related to age, the additional cost will rise with advancing age and voluntary mobility will be discouraged.

The expected decline in the amount of voluntary mobility with increasing age implies a greater relative amount of involuntary mobility among older age groups. Consequently, a test can be conducted by computing simple correlation coefficients between earnings and net flows of labor for the age subgroups of the sample. For the youngest subgroup this coefficient is .67 (table 4).

TABLE 4.—Correlation coefficients between net flow of labor and 1960 mean wages for male workers, by race and age

Age in 1960	Correlation coefficient	
	All males	Negro males
Under 20	+.67	
20–24	+.40	+.45
25–29	−.15	−.57
30–34	−.16	−.50
35–39	−.25	−.21
40–44	−.37	−.31
45–49	−.40	−.54
50–54	−.49	−.62
55–59	−.19	−.13
60–64	−.44	−.43
65 and over	−.40	−.43

Then, as age increases, the correlation decreases very regularly through the age group 50–54, at which point it reaches a minimum value of −.49. This is roughly the point of peak 1957 average earnings by age group. The pattern is quite consistent with the distinction between voluntary and involuntary mobility and indicates that voluntary mobility tends to be concentrated among the relatively young members of the labor force.

Gross Flows of Labor

The pattern of net flows of labor is more easily interpreted than the gross flows out of an industry towards other industries. Two basic factors account for the difficulties in dealing with gross labor flows: (1) The various industries are of different sizes and (2) the cost of movement and barriers to mobility between industries are quite different.[6] The first of these problems can be resolved by standardizing the gross flows of labor to eliminate the impact of differing industry size. The problem of differing movement costs and mobility barriers is much more difficult to resolve. To cope with this aspect of gross labor flows it is necessary to assume that the 1960 interindustry wage structure shown in the sample data is an equilibrium one. On the basis of such an assumption, it is possible to compare the standardized gross flows of labor with deviations from the interindustry wage structure.

If workers are maximizers, it would be expected that the greater the deviation (in a negative direction) from the overall wage structure the smaller will be the standardized gross flow of labor into the industry. For example, if workers moving from industry A to B receive wages that are $1,000 less than those of all workers employed in B while those moving from A to C receive $1,500 less in wages than all workers in C, the standardized flow of labor into B should be greater than into C.

In table 5 of the results of comparing gross flows of labor with deviations from the 1960 interindustry wage structures are shown for 10 broad industry categories. A brief examination of the data reveals widely varying relationships between the mobility and earnings variables. However, 8 of the 10 simple correlation coefficients between these variables are positive with some significantly different from zero at the 5-percent level, and only two (those for the service and wholesale and retail trade industries) are negative. A single measure of the degree of relationship between the mobility and earnings variables across all industries that aggregates the correlation coefficients for the 10 industries results in a value of .26, significantly different from zero at the 5-percent level. Although this finding is consistent with maximizing behavior on the part of workers, it certainly must be treated cautiously, for it explains less than 10 percent of the variation between the two variables.

TABLE 5.—Analysis of gross flows of labor between industries, for male workers, 1957–60

Industry	Regression coefficient	Standard error	Correlation coefficient
Agriculture	.00023	.00015	+.52
Mining	.00015	.00019	+.28
Contract construction	.00013	.00019	+.25
Manufacturing:			
Durable goods	.00007	.00010	+.28
Nondurable goods	.00007	.00011	+.24
Transportation, communications, and public utilities	.00019	.00015	+.44
Wholesale and retail trade	−.00004	.00012	−.14
Finance, insurance, and real estate	.00033	.00020	+.47
Services	−.00017	.00014	−.41
Government	.00028	.00011	+.70

Negro Mobility Patterns

It is interesting to contrast the data for all men with that for Negro men. When the behavior of male Negro stayers is analyzed it becomes clear that much weaker relationships exist between the proportion of workers who stay in an industry and industry earnings and unemployment levels.[7] At least a partial explanation for this phenomenon can be obtained by comparing the percentage of stayers by industry among Negroes with similar percentages for all workers (table 2).

In general, these data show signs of a systematic tendency on the part of the process of interindus-

[6] Differential costs of movement do not cause nearly as serious problems in analyzing net flows of labor since it is reasonable to assume that the costs of moving from A to B are approximately the same as the costs of moving from B to A.

[7] The stayer regression for Negro men is:

$$S = 60.97 + .003W - .054U \text{ and } R^2 = .21$$
$$(.002) \quad (.046)$$

where the symbols retain their previous meaning.

TABLE 6.—Percent of male stayers and 1957 mean earnings, by race and age

Age in 1960	Percent with same industry of major job in 1957 and 1960		1957 earnings	
	All males	Negro males	All males	Negro males
Under 20	41.4	44.3	$337	$265
20–24	46.4	44.6	1,557	1,067
25–29	62.5	57.2	3,187	2,108
30–34	73.1	65.8	4,243	2,601
35–39	76.9	69.4	4,804	2,825
40–44	79.8	72.5	5,006	2,889
45–49	81.7	74.6	5,007	2,914
50–54	83.2	78.2	4,963	2,871
55–59	84.5	80.4	4,894	2,852
60–64	85.9	83.3	4,721	2,870
65 and over	84.9	84.4	3,897	2,355

try labor mobility towards shifting Negro males into industries with low earnings levels. This conclusion is suggested by the fact that the proportion of Negro stayers tends to be relatively high (compared with that for all workers) in the low-income industries and relatively low in the high-income industries. Of course, such shifting of Negro workers toward industries at the lower earnings level has a depressing effect on their income levels and accounts in part for the observed difference between earnings of Negro workers and other workers.

When net labor flows among Negro men are examined the phenomenon of a shift toward the low-earnings industries can again be observed but only in two age groups. Table 4 shows simple correlation coefficients between net labor flows and earnings, by age group, for all male workers and Negro male workers.[8]

Little difference in these coefficients by race appears except for those aged 25–29 and 30–34. In both these groups the coefficient for Negro men is substantially more negative than that for all men, indicating that in these age groups Negro men have a markedly greater tendency to move toward industries at the low earnings level. Even though this phenomenon occurs in only two age groups its impact should not be underestimated. Because mobility is more prevalent among younger workers, these two age categories account for almost one-third of the mobile Negro men in the sample (3,012 among a total of 9,533 workers).

[8] No data are presented for the age group under 20 because the sample does not provide enough observations in this group to permit calculating a correlation coefficient with a reasonable degree of assurance that the results would be reliable.

Some idea of the overall impact of this shift on the earnings levels of Negro men can be inferred from the fact that their earnings increased by only 12.7 percent in 1957–60 and earnings of all men rose 16.1 percent. Consequently, mean earnings of Negro men, as a proportion of earnings of all men, declined from 59.3 percent in 1957 to 57.5 percent in 1960.[9]

AGE DIMENSIONS OF INTERINDUSTRY MOBILITY

The discussion of net flows of labor between industries indicated the presence of substantial differences in the amount of mobility found in various age groups. In general, it was argued that with increasing age the amount of voluntary mobility would decrease and the proportion of stayers in each age group would thus be increased. The data in table 6 show that this situation actually does happen. In the youngest age group, only 41 percent of the workers are stayers; in the older age groups the percentage is about 85. Two factors may account for this: (1) additional costs of movement that are strictly the product of increasing age and (2) the higher income levels of older workers. Analysis makes it quite clear that the smaller amount of mobility found among older workers is not simply the product of age but is also related to the higher earnings levels found among older workers.

Individual Industry Patterns

Although these aggregative results are interesting, to a certain extent the detail of the data have been blurred and some of the richness lost. Part of this detail can be recovered by focusing on the mobility patterns of individual industries and utilizing the data for various age groups. In effect, the result will be a duplicating of some of the previous analysis of the relationship between mobility and age at the level of the individual industry.

[9] This finding is consistent with the findings of Allan Batchelder in his "Decline in the Relative Income of Negro Men," *Quarterly Journal of Economics*, November 1964, pp. 525–548.

TABLE 7.—Percent of male stayers, by age and industry

Industry	Age in 1960									
	Under 20	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65 and over
Agriculture	35.5	34.7	51.6	61.7	63.2	69.0	72.3	76.4	76.2	78.1	81.1
Mining	29.4	42.6	49.9	61.2	68.8	72.8	75.6	72.3	77.1	80.0	75.4
Contract construction	38.4	43.6	59.2	69.4	72.7	75.1	75.1	76.2	76.7	77.3	79.4
Manufacturing:											
Durable goods	52.9	58.4	68.8	78.2	81.5	85.2	86.5	88.8	89.0	90.5	85.3
Nondurable goods	34.3	47.3	62.7	74.2	78.0	81.3	83.7	85.1	86.3	87.1	84.6
Transportation, communications, and public utilities	23.6	43.7	67.6	78.0	81.2	82.7	85.1	86.9	88.1	88.5	80.2
Wholesale and retail trade	49.8	46.2	59.2	68.5	72.7	74.7	77.5	77.8	79.3	80.8	83.1
Finance, insurance, and real estate	22.5	41.9	61.6	75.6	77.1	80.0	82.9	86.6	86.5	87.2	89.2
Services	26.4	37.4	56.0	67.7	71.4	72.3	76.1	79.7	82.1	84.5	85.9
Government	28.2	33.2	52.7	68.8	76.8	80.4	83.0	86.9	88.3	90.4	89.9

Table 7 presents data by age group that describe the percentage of workers who can be classed as stayers in each industry. With this detailed data it is possible to analyze the impact of age on the proportion of stayers for individual industries (table 8) and formulate conclusions that confirm the aggregative analysis.

Some variation in results does appear, however. Take the case of agriculture. Among agricultural workers, age is apparently much more significant in determining whether a worker stays in the industry than it is for most other industries. Consequently, even though the mean earnings levels of agricultural workers are by far the lowest for any industrial classification, the overall percentage of workers who stay in the industry is not greatly different from this percentage for some industries with much higher earnings levels. As a case in point, 67.9 percent of workers in mining stay in that industry and 61.9 percent stay in agriculture, despite the fact that there is a difference of more than $3,000 in the mean earnings levels of the two industries in both 1957 and 1960. Admittedly, the small difference in the percentage of stayers is partly explained by the difference in unemployment levels in the two industries, but it can also be attributed in part to the strong impact of the age variable with respect to the agricultural sector.

One of the most interesting aspects of the data presented in table 8 is the amount of variability in the various statistical measures. The great amount of variation in these coefficients indicates that workers in different industries are differentially sensitive to the variables that influence their mobility decisions. Such sensitivity no doubt can be traced to certain conditions peculiar to the particular industry.

Apparently, one such case is the industrial classification of government where the percentage of workers who are stayers is relatively low among the youngest age group but is relatively high among the older age groups. In the group under age 20 only 28.2 percent of the workers stayed in government employment, but all stayers represented 41.2 percent of those under age 20. In

TABLE 8.—Analysis of behavior of male stayers, by industry

Industry	Partial correlations		Regression coefficients		Regression intercept	R^2
	Earnings	Age	Earnings	Age		
Agriculture	+.88	+.97	.0108	3.8177	23.3114	.98
Mining	+.95	+.91	.0062	2.1988	24.7252	.98
Contract construction	+.97	+.90	.0075	1.4842	31.7103	.99
Manufacturing:						
Durable goods	+.96	+.87	.0055	1.4099	45.9478	.98
Nondurable goods	+.99	+.96	.0082	1.3794	30.3409	.99
Transportation, communications, and public utilities	+.98	+.23	.0124	.2592	19.1510	.99
Wholesale and retail trade	+.86	+.89	.0039	2.1758	42.3472	.96
Finance, insurance, and real estate	+.91	+.74	.0075	2.2591	24.2753	.96
Services	+.94	+.91	.0067	3.4973	67.2145	.98
Government	+.97	+.95	.0127	3.1374	18.6812	.99

contrast, among those aged 65 and over, 89.9 percent stayed in government employment and 84.5 percent were stayers among all industries combined. Thus the percentage of stayers in the group age 65 and over is highest for workers who stayed in government employment, but among those under age 20, workers staying in government employment ranked only seventh. Yet mean earnings in the government sector ranked at or next to the bottom for both age groups.[10]

[10] The definition of government employment excludes Federal employment for the most part. The fact that it is essentially State and local government employment that is considered here accounts for the low wage levels observed.

The Impact of Age on Negro Mobility

When mobility patterns for Negro men are considered separately it becomes clear that the impact of age on the proportion of workers who stay in an industry is much stronger than it is for all workers. From table 6 it appears that the proportion of stayers increases with age much more regularly among Negroes than among all workers.[11] Among the workers under age 20, 44.3 percent of Negro men are stayers and 41.4 percent of all men are in this category. However, in the age group 30–34 only 65.8 percent of Negroes stay in the same industry, compared with 73.1 percent for all workers. Thus, between the age group under 20 and that aged 30–34 there is an increase in the percentage of stayers of about 21 percent among Negroes and 32 percent among all workers. In addition, between the group aged 30–34 and the group aged 65 and over, the increases in the proportion of stayers for Negroes and for all workers are 19 percent and 12 percent, respectively. As a result, among those aged 65 and over there is a negligible difference in the proportion of stayers for the two groups.

The pattern that is shown by these data is consistent with the earlier findings that indicate a difference in the extent to which Negroes were able to respond to varying earnings levels. Essentially, what seems to happen is that, as workers age, the earnings levels rise quite rapidly through about age 35 and the bulk of the workers respond by being less likely to change jobs. Negro workers follow this pattern, but their response to increased earnings levels is not as marked as that among all workers and, consequently, the increase in the percentage of stayers among Negroes in these younger age brackets is substantially smaller. As earnings levels become more stable beyond age 35 the rise in the proportion of stayers is much less among all workers than it is among Negro workers.

The apparent differential sensitivity of Negro men to variations in lifetime earnings undoubtedly reflects what was earlier referred to as a systematic shifting of Negroes toward low earnings level industries. It is not possible to be definite about which is cause and which is effect, but the observed mobility patterns suggest that Negro men are involuntarily displaced from jobs to a much greater extent in the crucial early years of their working life and thus do not have the opportunity to respond to increasing earnings levels in the same fashion as all workers. Such an argument receives support from the earlier finding that the correlations between net flows of labor and earnings for the Negro age groups 20–24 and 25–29 are substantially more negative than those for all workers of the same age, a fact which implies greater relative amounts of involuntary mobility among Negroes than among all workers in these age groups.

The "Reverse Flow" of Labor

In the earlier discussion reference was made to age-group differences in the patterns of net labor flows. The general conclusion drawn at that point was that these differences can be explained by distinguishing between voluntary and involuntary mobility. Specifically, voluntary mobility is found to be relatively great among the young, but involuntary mobility predominates after age 30. Since voluntary mobility is positively correlated with earnings and involuntary mobility negatively correlated, this an indication that younger workers tend to move toward types of employment with high wage levels, and older workers shift toward the low-wage industries.[12] For example, within the youngest age group (under age 20 in 1960) there is a substantial shift in the industry composition of employment between 1957 and 1960 (table 9). Agricultural employment (a low-wage industry) declined from 9.1 percent of the sample in 1957 to 5.4 percent in 1960. Meanwhile, employment in the two components of manufacturing taken together increased from 9.6 percent to 23.5

[11] This conclusion is derived from the following regression:

$$S = 36.66 + .006E + 3.030A \text{ and } R^2 = .98$$
$$(.001) \quad (.280)$$

where S denotes a proportion of stayers, E denotes the 1957 level of earnings by age group, and A is an age variable where age is measured in 5-year intervals by assigning the numbers 1 through 11 to the age classes in ascending order. The age variable in this regression has a coefficient almost half again as large as the coefficient obtained through the use of data for all workers (2.118).

[12] High-wage industry is defined as one with earnings above the level of mean earnings for all workers in the age group.

TABLE 9.—Percentage distribution of male workers by industry, by selected age groups, 1957 and 1960

Industry	Age in 1960			
	Under 20		55–59	
	1957	1960	1957	1960
Agriculture	9.1	5.4	3.1	3.2
Mining	.3	.9	2.8	2.5
Contract construction	4.1	8.4	8.7	8.4
Manufacturing:				
Durable goods	2.9	12.8	24.5	23.9
Nondurable goods	6.7	10.7	14.8	14.6
Transportation, communications, and public utilities	1.4	3.5	7.5	7.5
Wholesale and retail trade	51.1	38.5	18.2	18.1
Finance, insurance, and real estate	1.3	2.3	4.4	4.7
Services	19.7	12.4	10.1	11.2
Government	1.6	4.4	5.1	5.6
Unclassified	1.7	.7	1.0	.5

percent. Similar shifts occurred in favor of mining, transportation and public utilities, and finance—all high-wage industries—and against wholesale and retail trade and services which are low-wage industries. Exceptions to this pattern are the construction industry and government, which showed an increase in employment despite their low wage status.[13]

The data for the age group under 20 can be contrasted with similar data for the group aged 55–59 (also shown in table 9). In this case the shifts that occur show increases, although in some cases small ones, in such low-wage industries as agriculture and services and declines in many high-wage industries—mining, both types of manufacturing, transportation and public utilities, and wholesale and retail trade (which is a high-wage industry for this age group). The only exceptions to this pattern are finance, a high-wage industry that shows an increase in employment, and construction, a low-wage industry showing an employment decline. And, of course, government employment shows its usual increase.

Comparing the patterns of worker movement in these two age groups suggests the existence of something that can be thought of as a "reverse flow" of workers back into low-wage industries with increasing age. The specific impact of the reverse flow can be seen more clearly by considering the data in table 10, which show the shifts in employment, expressed as percentage changes, within age groups for all industries between 1957 and 1960. It is apparent on looking at the data for the high-wage industries that there is a tendency toward large net flows of workers into these industries from the youngest age group, followed by declines in such flows as age increases up to about 35. Beyond age 35 there seems to be little change in the size of the net flows.

Similarly, among the low-wage industries (agriculture, services, and trade) there are large flows out of the industries, followed by declines in the outflow (sometimes resulting in net inflows) through age 35. After that age, the flows stabilize and there is little change.[14]

Actually, the "reverse flow" phenomenon is nothing more than a detailed restatement of the voluntary-involuntary mobility distinction developed earlier. What is happening in the situations described is that voluntary mobility becomes relatively less important as age increases. As this happens, the net flows of labor into high-wage industries decline and the net flows out of low-wage industries also decline. The result is an apparent flow reversal, the existence of which accounts for the difficulties initially met in analyzing net flows of labor in the aggregate. In fact, it presents a strong argument against the use of highly aggregated data in labor-mobility analysis. There is simply too much diversity within the working population to permit much that is meaningful to be developed from global data.

THE IMPACT OF THE BUSINESS CYCLE

One of the most interesting aspects of interindustry labor mobility is the impact of the variations in the general level of economic activity that accompany the business cycle. Analyzing the cycle's effect on mobility is made easier by the availability of data describing the industrial attachment of workers in the basic sample of data for the intermediate years 1958 and 1959. These data are particularly useful in that both the initial and terminal years previously discussed (1957 and

[13] Government is a peculiar industrial category from the standpoint of labor mobility patterns. In fact, when it is excluded, the correlation between earnings levels and net flows of labor in the age group under 20 is + .89 instead of the + .67 reported earlier.

[14] Some of these changes may represent nothing more than the impact of changes in the composition of the demand for labor in the aggregate—that is, a job opportunity phenomenon. A detailed analysis of this possibility may be found in chapter 5 of *Interindustry Labor Mobility*. The conclusion there is that job opportunity considerations do not explain the flow patterns observed.

TABLE 10.—Net flow of labor for male workers, by age and industry, 1957–60

[In percents]

Industry	Age in 1960										
	Under 20	20–24	25–29	30–34	35–39	40–44	45–49	50–54	55–59	60–64	65 and over
Agriculture	−40.62	−32.42	−2.22	−2.72	−1.13	+3.73	+6.92	+11.33	+2.53	+8.05	+3.78
Mining	+194.12	+1.39	−14.85	−18.09	−11.18	−9.00	−7.96	−10.66	−9.08	−10.54	−9.05
Contract construction	+102.74	+6.71	+.74	+6.59	+3.58	+4.70	+.91	−.87	−3.30	−2.87	−2.96
Manufacturing:											
Durable goods	+336.13	+19.62	−7.56	−4.45	−3.51	−2.64	−2.50	−2.34	−2.21	−1.92	−7.07
Nondurable goods	+61.19	+3.61	−4.80	−2.96	−2.35	−2.63	−3.31	−2.98	−1.30	−3.11	−5.75
Transportation, communications, and public utilities	+158.33	+25.41	+9.41	+1.68	0.00	+1.02	+3.20	+.01	−.87	−2.82	−4.23
Wholesale and retail trade	−24.68	−20.25	−.99	−.28	+1.38	−.55	−.01	−1.60	−.25	−1.53	+1.63
Finance, insurance, and real estate	+74.65	+54.01	+19.81	+9.72	+5.97	+7.64	+9.04	+8.09	+6.17	+9.94	+9.11
Services	−36.78	+9.30	+20.16	+9.32	+7.24	+6.05	+7.85	+9.91	+10.33	+8.54	+9.25
Government	+171.76	+23.30	+18.68	+16.72	+19.70	+16.45	+14.37	+15.51	+9.96	+9.59	+6.74

1960) are years preceding a peak unemployment year. Thus, information is available that covers roughly a full business cycle with the initial and terminal years those of relatively low levels of unemployment.

A summary of these data is provided in table 11, which shows cross-sections of employment by industry for the years 1957–60. In addition, to take into consideration withdrawal from employment in an intermediate year by a member of the sample an additional classification of "not employed" has been added. The data in table 11 show that more than 11,000 workers (3.6 percent) of the 312,000 men in the sample were counted in this category in 1958—most of them individuals who withdrew from the labor force as a result of the cyclical downturn in that year.[15] The data therefore represent evidence of the responsiveness of labor-force participation rates to the downswing of the business cycle.[16] Where the withdrawal does relate to the downswing, however, it is a temporary one for many workers. When the cycle swings upward in 1959, the number of workers in the category "not employed" declines by about 25 percent to 8,600. Of course, the manner in which the sample is defined insures that in 1960 no workers fall in this classification.

TABLE 11.—Male workers employed in both 1957 and 1960, by industry, 1957–60

Industry	1957	1958	1959	1960
Agriculture	8,923	8,013	7,819	8,512
Mining	7,397	7,026	6,744	6,635
Contract construction	27,603	27,235	27,518	28,421
Manufacturing:				
Durable goods	78,458	74,349	76,447	77,204
Nondurable goods	45,255	44,049	44,291	44,313
Transportation, communications, and public utilities	22,507	22,156	22,469	23,204
Wholesale and retail trade	65,950	63,304	61,984	63,528
Finance, insurance, and real estate	11,215	11,528	11,872	12,552
Services	30,019	29,455	30,113	32,434
Government	12,373	12,812	13,277	14,379
Not employed		11,344	8,600	

With substantial changes in employment patterns occurring over the course of the business cycle, the question is how they relate to the phenomenon of interindustry labor mobility. To answer that question it is necessary to refer once more to age-group data. Consider the data for the youngest age group—those under 20 (table 12). To begin with, these data indicate that the shift from being employed in 1957 to the nonemployed category in 1958 is quite large (19.7 percent) for this group in comparison with the shift observed in the aggregate (3.6 percent)—probably because the youngest age group has a larger proportion of workers who may be thought of as marginal. The use of the term "marginal" in this context is meant to imply that these workers are marginal in the sense of being the most susceptible to displacement on the downswing of the business cycle, whether because of low seniority levels, lack of job experience, or the like.[17] As these

[15] A full discussion of why most of the shift to the "not employed" category represents labor-force withdrawal may be found in chapter 8 of *Interindustry Labor Mobility.*

[16] Some excellent work in identifying and measuring this phenomenon has recently been done by T. Dernberg and K. Strand, "Hidden Unemployment: A Quantitative Age-Sex Analysis, 1953–1962," *American Economic Review*, March 1966. See also their "Cyclical Variation in Civilian Labor Force Participation," *Review of Economics and Statistics*, November 1964, and A. Tella, "The Relation of Labor Force to Employment," *Industrial and Labor Relations Review*, April 1964.

[17] Such differential displacement among the young on the downswing of the business cycle would explain the magnitude of what has been called the "discouragement" effect observed among the young. The Dernberg-Strand analysis, *op. cit.*, indicates a much stronger "discouragement" effect in this age group.

TABLE 12.—Male workers employed in both 1957 and 1960, 1957–60, and 1960 mean wages, by selected age groups and industry

Industry	Employment				1960 wages
	1957	1958	1959	1960	
	Age under 20				
Agriculture	485	339	313	288	$986
Mining	17	17	35	50	2,136
Contract construction	219	239	384	444	1,533
Manufacturing:					
Durable goods	155	166	417	676	2,105
Nondurable goods	353	341	460	569	1,820
Transportation, communications, and public utilities	72	60	120	186	1,820
Wholesale and retail trade	2,711	2,206	2,130	2,042	1,389
Finance, insurance, and real estate	71	57	93	124	1,672
Services	1,044	738	615	660	1,077
Government	85	81	138	231	994
Not employed	-------	1,029	563	-------	-------
	Aged 50-54				
Agriculture	847	822	838	943	$1,979
Mining	835	799	756	746	5,255
Contract construction	2,883	2,782	2,781	2,858	4,643
Manufacturing:					
Durable goods	7,950	7,734	7,715	7,764	6,083
Nondurable goods	4,733	4,611	4,620	4,592	6,002
Transportation, communications, and public utilities	2,313	2,248	2,285	2,315	6,076
Wholesale and retail trade	5,942	5,838	5,751	5,847	5,333
Finance, insurance, and real estate	1,199	1,244	1,264	1,296	6,645
Services	2,845	2,842	2,931	3,127	4,848
Government	1,451	1,533	1,578	1,674	3,983
Not employed	-------	726	643	-------	-------

marginal workers are shifted out of the "employed" category by the impact of the cycle, sizable drops in employment levels should occur in the various industries in the intermediate years 1958 and 1959. Upon examination, however, the data reveal that this decrease occurs in only certain of the industries under investigation. Specifically, agriculture, wholesale and retail trade, and services show such declines in both intermediate years. Four industries—nondurable manufacturing, finance, transportation and public utilities, and government—show declines in 1958 followed by sharp increases in 1959. Three industries—mining, construction, and durable goods manufacturing—show either no change or increases in employment in both intermediate years.

Out of these data a definite pattern emerges and not a surprising one, considering the earlier findings with respect to the relationship between net flows of workers and earnings levels within this youngest age group. The pattern referred to is one that finds industries at relatively high earnings levels showing a consistent tendency toward increases in employment, despite the negative effect the cycle has on overall employment within the sample group. On the other hand, the low-earnings industries in general show precipitous declines in numbers of workers in both intermediate years. The only exception to this pattern is government and it is often a special case. These data suggest clearly that what has previously been called voluntary labor mobility is a powerful force within the age group under 20. The attractiveness of high earnings levels seems to induce sufficient job shifting of a voluntary type to offset the negative impact of the cycle on employment levels in general, even in an industry like durable goods manufacturing, notoriously susceptible to the downswing of the business cycle. Similarly, the pattern of job shifts from relatively low-earnings industries to industries at relatively high earnings levels operates to accentuate the decline in employment in low-earnings industries. Thus, a pattern of a positive relationship between earnings levels and changes in employment levels between 1957 and the intermediate years appears. Precise measures of the extent of this relationship can be obtained by correlating percentage changes in employment between 1957 and 1958 and between 1957 and 1959 with the industry earnings levels. The respective results are +.63 and+.80, the first of which is significant at the 5-percent level and the second at the 1-percent level.

The impact of the business cycle on the age group under 20 can be contrasted with that for the older age groups. In table 12, for example, data identical to that for the group under age 20 are shown for those aged 50–54 in 1960. Just a cursory glance at those data reveals some significant differences. Most obvious is the smallness of the shift toward the "nonemployed" category in the intermediate years (2.3 percent in 1958 and 2.1 percent in 1959). But beyond this it is apparent that the pattern observed in the age group under 20 with respect to the differences between high- and low-earnings industries has disappeared. Instead of industries at low earnings levels showing marked declines in employment and those at high earnings levels showing increases in employment, almost all industries exhibit declines between 1957 and both 1958 and 1959. The only exceptions to this are finance and government between 1957 and 1958 and finance, government, and services between 1957 and 1959.

The general decline in employment across all industries suggests the impact of the downswing

of the cycle, with workers being displaced from employment. This effect was also present in the age group under 20 but was dominated in the high-wage industries by voluntary flows of labor into them. In the older age groups, though, the voluntary flows are not present in the same degree and, consequently, it is possible to observe this displacing of workers in almost all industries. This is only a small part of the difference between younger and older age groups, however, for once workers have been displaced by the business cycle's downswing the adjustment pattern that follows produces results for the older age group that differ greatly from those for the group under age 20. Instead of flowing toward the high-earnings industries, the workers now seem to move markedly toward the industries at the low earnings levels. In general, in the high-earnings industries once the initial decline in employment has occurred between 1957 and 1958 there is little tendency toward a return to previous employment levels. Industries with 1960 mean earnings higher than mean earnings for all workers show a decline of 358 in employment between 1957 and 1958 and a rise of only 130 between 1958 and 1960 (with 52 of this rise in finance).

Although there is little rebound from the shock of the downswing of the business cycle in high-wage industries, the opposite is true of low-wage industries. In these areas the decline in employment between 1957 and 1958 is 90 and the increase between 1958 and 1960 is 553—a confirmation of the previous findings of a negative relationship between earnings levels and net flows of labor in the older age groups. Apparently, after the cycle's downswing displaces workers from jobs in all industries they respond by seeking employment wherever job opportunities exist and, as noted, job opportunity is negatively correlated with earnings levels. What is here described is merely involuntary mobility and the patterns suggest quite strongly that the business cycle is a powerful catalytic agent in generating this type of mobility. In effect, the downswing of the cycle introduces a random shock in the labor market that produces some displacement of workers. In response to this displacement, workers move toward areas where job opportunities exist—with the results previously described.

In addition to noting the general impact of the business cycle on labor mobility, it is interesting to ask whether the cycle has a different impact on labor mobility among Negroes. To begin with, it is apparent that the cycle has a much greater effect on employment patterns among Negro workers in 1958 and 1959 than it does among all workers. In 1958, for example, the percentage of Negroes in the "nonemployed" category is 5.6, in contrast to 3.6 for all workers. In 1959 these percentages are 4.2 and 2.7, respectively.

The earlier discussion indicated that most of those classified as nonemployed in the intermediate years represent individuals who have withdrawn from the labor force. Consequently, the higher percentages of nonemployed among Negroes probably indicate a greater "discouragement" effect among these workers—that is, withdrawal from the labor force because of worsening employment conditions. The greater incidence of such withdrawal among Negroes has a substantial effect on their relative income position. For the entire sample of Negro workers, mean estimated wages fell from $2,513 in 1957 to $2,385 in 1958, a decline of 5.1 percent. Among all workers the decline in mean estimated wages for all members of the sample was only $3 or 0.1 percent.

Not all this marked difference in the impact of the cycle on Negro relative income, however, is explained by their higher nonemployment rate. If comparisons are confined to the mean estimated wages of only the employed members of the sample, somewhat similar results are obtained. In 1958 such earnings were $2,526 for Negro men (an increase of $13 or 0.5 percent from 1957) and $4,395 for all workers (an increase of $155 or 3.7 percent from 1957). Thus, even the earnings of Negroes who remained employed in the intermediate year 1958 declined in relation to earnings of all workers.

The greater initial impact of the business cycle on Negro employment and relative income is magnified by differences in the pattern of adjusting to displacement among Negro workers. In particular, there is less rebound from the initial shock of displacement in high-wage industries among Negroes than among all workers. For all workers, the increase in jobs in high-wage industries between 1958 and 1960 amounts to 89 percent of the decline in jobs in those industries from 1957

to 1958. In contrast, for Negro workers this percentage is 54. Quite clearly, this difference indicates that not only are Negro workers more frequently displaced on the business cycle downswing but, once displaced from jobs at high earnings levels, they are less prone to return to employment in those industries on the upswing of the cycle. Such a pattern certainly contributes to declining Negro relative income.

CONCLUSIONS

The findings of this exploration of interindustry mobility patterns have revealed the existence of sizable amounts of both voluntary and involuntary mobility among the labor force in the United States. The indication that there is a meaningful amount of purposive mobility in the economy is reassuring. Its presence makes possible some of the marginal adjustments in the labor market envisaged in the conventional economic theory of the operation of the labor market.

Such a conclusion suggests that the process of interindustry labor mobility has the potential for making a significant contribution toward solving some of the problems discussed initially—reducing unemployment, increasing economic growth, and limiting inflation. At the same time the existence of such a large amount of involuntary mobility is somewhat disquieting. The greater the amount of such mobility the greater the pressure on the labor-market adjustment mechanism and the more difficult it becomes to achieve a given level of efficiency in the economy. Of particular concern in this respect is the substantial amount of labor-force withdrawal that occurs whenever displacement of workers takes place. To the extent that this labor-force withdrawal is the result of an inability of the labor-market mechanism to present workers with alternatives sufficiently attractive to keep them in the labor force, such withdrawal represents a loss of output for the economy.

The differences between mobility patterns among Negroes and all workers also provide some insight into the reasons for relatively low levels of earnings among Negro men. Apparently, Negroes are more prone to change jobs, are more likely to be shifted towards low-earnings industries, and are more adversely affected in employment and income by the impact of the business cycle. The cumulative effect of these phenomena is to contribute to the relative decline in the earnings level of Negro men noted earlier.

Notes and Brief Reports

OASDHI Contributions on Cash-Payment Basis*

Estimates of quarterly OASDHI contributions from 1951 through 1964, defined on a cash-payment basis, are presented in the tables that accompany this note—for employees, employers, and the self-employed and for all contributors and all individuals.

There are several possible ways of relating contributions to a specified time period. For some purposes, the relevant measure is that of tax liability accruing during the quarter or other period in question. Another measure would count the contributions actually received by the Government during the quarter. With a further time lag, these contributions become Treasury appropriations to the trust funds.

The latter series is published in table M–3 of the Current Operating Statistics section of the BULLETIN and is the one most frequently used in analyses of social security financial operations. However, since OASDHI contributions and personal income taxes are not segregated in tax collection reports received by the Treasury, monthly appropriations to the trust funds are of necessity estimated. Subsequent adjustments to the initial appropriations, made when more complete information on taxable earnings becomes available, are recorded in the month when the adjustment is made. A quarterly total of contributions derived from table M–3 data may therefore include contributions actually paid several months before the quarter.

The new series presented here picks up at a

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