Earnings mobility in the United States, 1967–91

The young, the less educated, and blacks have more instability in their earnings than do those who are older, more educated, or white

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In recent years, the gap between high earners and low earners in the United States has widened. Information about this phenomenon is generally reported in relation to a particular point in time. The Census Bureau, for example, reports on the percentage of families whose income is below the poverty line during a particular year and releases annual data on the share of household income by quintile. While such statistics reveal important insights into how individuals are faring economically, they paint an incomplete picture.

To gain a fuller appreciation of the impact of poverty, one must understand not only trends in poverty rates, but also the extent to which a family that is in poverty in a given year will remain there in a particular specified period that follows. In a similar way, those concerned about equity will want to know not only whether the share of income going to the top fifth of the income distribution is growing or declining, but also whether there are patterns in the degree to which households move in and out of a given portion of the income distribution.

To move from the static view of the economy inherent in most economic data on the income distribution to a more dynamic perspective, it is necessary to have information on the *mobility* of individuals, families, and households over time—that is, the extent to which these economic units change positions in the income distribution over a given period. What proportion of families in poverty this year will escape poverty next year? Are those in the middle class now likely to be there 5 years from now? Do the rich in one year tend to be the rich in the next, or do individuals from other income classes move into the top tiers? A study of mobility can provide insights relevant to answering important questions such as these. In addition, the degree of earnings mobility is important not only for developing a more comprehensive view of the workings of the economy, but also in such areas as designing pension schemes or income-contingent student loan programs, where benefits or repayment responsibilities depend on a person's earnings over his or her working life and not during a particular year. Further, mobility patterns contribute to an understanding of labor markets, as certain patterns will be consistent with some labor market theories but not with others.[1]

This article addresses two important questions concerning earnings mobility in the United States. First, how do patterns of earnings mobility differ by sex, age, race, and education? While many recent studies examine trends in earnings across demographic groups,[2] much less attention has been devoted to the extent to which those of a given group are able to maintain or improve their relative economic status from one year to the next. And, second, how have mobility patterns changed over time? A vast literature has developed that seeks to document and explain the large increase in earnings inequality in the United States,[3] but little is known about whether—as the earnings distribution became more pulled apart—it got harder or easier for individuals to work their way up the economic ladder. Trends in mobility have implications both for the causes of the rise in earnings inequality and for the extent to which inequities in earnings in a given year even out over time.

A number of important findings emerge from this study. First, important differences appear

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across demographic groups in regard to their mobility within the overall earnings distribution: women are more likely to remain in the bottom quintile and less likely to remain in the top quintile of the overall earnings distribution than are men; and blacks are more likely than whites to slip out of the top quintile and to remain in the bottom quintile of the overall distribution. Second, differences also appear in relative mobility within various earnings distributions for groups defined by their demographic characteristics: the young, the less educated, and blacks have more instability in their earnings than those who are older, more highly educated, or white. Third, short-term mobility levels have not undergone major changes over the time span 1967–91.

Measuring mobility

Before mobility can be measured, a number of methodological issues must be addressed. First is the choice of the unit of analysis—that is, whether it is to be families or individuals.[4] Because this article examines the way in which the labor market distributes rewards and how the process changes over time, the focus is on individuals. For the same reason, earnings are emphasized rather than income, as the latter may include income from property, government programs, and other sources outside of the labor market. If the goal were to assess changes in the distribution of economic well-being, the family would probably be the appropriate choice, because one's welfare is determined not only by one's own income, but also by the income of other household members.[5] In addition, in that instance, it would be advisable to include as broad a measure of a family's economic resources as possible, not just its labor-market earnings.

The article focuses on two different concepts of earnings mobility. The first is concerned with the positions and movements of various demographic groups within the earnings distribution of the entire population. Measures of this type of mobility seek to provide answers to questions such as the following: What proportion of the blacks that are in the top quintile (top fifth) of the overall earnings distribution in a given year maintain that position over time? Or, what proportion of white males in the bottom quintile in a particular year will have moved to a higher quintile the following year? Such a concept of mobility highlights differences in various demographic groups' ability to change or maintain their relative positions within the overall earnings distribution.

The second type of mobility examines relative earnings movements within subdistributions defined by demographic characteristics. For example, it is well known that those with less education will have lower earnings, on average, than the more educated. But focusing, say, on high school dropouts, do the better off within this group tend to be the same year after year, or is there a substantial reshuffling of economic positions? And how does this "churning" in the earnings distribution for high school dropouts compare with that for other groups?

Issues in interpreting findings. A number of important issues must be kept in mind in interpreting the results to be presented. Suppose one of the findings is that individuals experienced substantial changes in their relative positions within the overall earnings distribution or within that of a subpopulation. This can be thought of as evidence of either a high degree of short-term earnings mobility or a high level of short-term earnings instability, depending on one's perspective. To most ears, "earnings mobility" sounds like something to be favored on equity grounds, as it connotes the opportunity to change one's relative economic position. The term "earnings instability," on the other hand, suggests a negative flip side to this, hinting at potential difficulties involved in attempting to maintain one's economic status. Thus, the normative aspects of the findings are a matter of interpretation, open to debate about whether the glass is "half empty" or "half full."

It is also important to keep in mind the distinction between earnings *mobility* and earnings *growth*. The measures presented in this article of earnings mobility over a given period are concerned solely with the degree to which individuals shift *relative positions* within the earnings distribution, not with *absolute growth* in real earnings levels over time.[6] Thus, by definition, mobility implies that one person's upward movement within the earnings distribution is accompanied by another person's downward shift.

Data

The analysis to be presented uses March-March matched files from the Annual Demographic Files of the Current Population Survey (CPS)[7] from 1968 to 1992. The CPS is designed so that potentially half of the individuals surveyed in a given March will also be present in the sample in the following March.[8] By linking surveys, one can follow an individual for 2 years and see how his or her position in the earnings distribution changes over that period. While earnings mobility is best studied over as long a time span as possible, there are several important advantages to using the sequence of 2-year panels made available by linking CPS data. First, the CPS is a nationally representative data set, so one can follow all age groups over time.[9] Second, the samples obtainable from the matched CPS's are generally larger than those from the longitudinal data sets, allowing more precise estimates of mobility for various subpopulations than is possible using smaller panel data sets. Third, 2-year panels can be constructed to cover a lengthy period—nearly 25 years.

Construction of samples. From the 25 March CPS's from 1968 to 1992, it was possible to construct 20 matched

samples.[10] Each of these was divided into the following four main subsamples, using annual wage and salary income as the measure of economic status in a given year: men with positive wage and salary income in both years; men working full time, year round (at least 50 weeks' work, usually working at least 35 hours per week) in both years; women with positive earnings in both years; and women working full time, year round in both years.[11] For all samples, the following criteria had to be met for both years: age between 25 and 59 years; not self-employed; and not in the top percentile of the earnings distribution of the appropriate subsample. The trimming of the top 1 percent of earners is done both because some of the measures of mobility used in this article are sensitive to outliers and because it is desirable to eliminate from the sample those for whom data on earnings have been censored or "top coded." For the latter individuals, it is known that their earnings are above a certain threshold, but it is not known by how much.[12] To be included in the group of those with positive wage and salary income in a given 2-year sample (either men or women; referred to later as the positive samples), annual earnings merely had to be nonzero in both years. To be included in the group of those working full time, year round in both years of the sample (again, either men or women; referred to later as the full-time, year-round samples), which implicitly controls for differences across individuals in hours worked, annual earnings had to exceed 1,750 (50 weeks times 35 hours) times one-half the applicable minimum nonfarm hourly wage rate in both years.

Results are presented for both samples because they represent different aspects of mobility. For the full-time, year-round samples, the movement within the distributions is due mainly to relative changes in the rate of pay, while in the positive samples, changes in hours worked also play a role. In part because not all changes in hours worked are voluntary, it is important to assess mobility for both samples.

In addition to these four subsamples, the following samples, divided along three demographic dimensions, were used: age—intervals of 25–29, 30–39, 40–49, and 50–59 years; years of schooling completed—fewer than 12 years, 12 years, 13–15 years, and 16 or more years; and race—white and black.[13]

Mobility patterns, 1967–91

Mobility within the overall earnings distribution. To measure both kinds of mobility defined earlier, appropriate yardsticks are required.[14] For the first type of mobility—movement in the overall earnings distribution—consider a device known as a *transition matrix*. If the overall earnings distribution is divided into quintiles in year $t-1$ and year t, a 5×5 matrix can be calculated wherein each cell (i, j) shows the proportion of those in quintile i in year $t-1$ that are in quintile j in year t. Table 1 presents a hypothetical example of such a matrix. The matrix shows that, of those who are in the second quintile in year 1, 0.3, or 30 percent, will fall to the bottom quintile in year 2. The percentages in each row must sum to 1, because all of the individuals who were in a given quintile in year 1 must be in some quintile in year 2. By similar reasoning, the columns must sum to 1 as well. While every cell is of potential interest, for purposes of discussing movements within the overall distribution, consider cells (1, 1) and (5, 5)—that is, the percentage of those who start off in the bottom quintile of the overall earnings distribution and remain there, and the same measure for the top quintile.

How do demographic groups differ in terms of their positions and movements within the overall earnings distribution? To answer this question, let us examine the patterns of the two sexes and then, separately by sex, of the 10 demographic groups defined by age, years of schooling, and race. The first two columns of table 2 report the percentage of each demographic group that was in the first (bottom) and in the fifth (top) quintile of the overall earnings distribution during 1990, and the second two columns show the percentage of these that remained in those quintiles during 1991. The percentages are given for the positive and the full-time, year-round samples. While the results shown are for 1990–91 only, the basic patterns hold for any pair of years during the 1967–91 period.

Although differences in mean earnings between men and women have been declining,[15] striking differences remain at the extremes of the distribution, with women being much more likely than men to be in the bottom quintile and much less likely to be in the top quintile. In fact, about the same percentage of women were in the bottom quintile (30 percent) as men were in the top quintile (31 percent) of the earnings distribution for the positive sample during 1990. As regards each of the sexes, blacks were much more likely to be in the lowest quintile, and much less likely to be in the highest quintile, than whites were. White men were the least likely to be at the bottom and the most likely to be at the top, whereas the tendency for black women was just the opposite.

Mobility patterns within the overall distribution also differ by sex and race. In general, the lower a group's average earnings, the lower is the likelihood that individuals from

Table 1. Hypothetical transition matrix

Quintile in year $t-1$	Quintile in year t				
	1	2	3	4	5
1	0.4	0.2	0.2	0.1	0.1
2	.3	.3	.2	.1	.1
3	.2	.2	.3	.2	.1
4	.1	.1	.2	.4	.2
5	.0	.2	.1	.2	.5

Table 2. Sex and race differences in mobility within the overall earnings distribution in 1990–91, using matched CPS data

Sex and race	Percent in quintile—		Percent that stay in quintile—	
Positive sample	1	5	1	5
Full sample	20	20	66	74
Sex:				
Men	10	31	51	77
Women	30	8	72	63
Race:				
White men	8	33	48	78
Black men	23	17	57	59
White women	29	9	72	65
Black women	31	6	73	44
Full-time, year-round sample				
Full sample	20	20	68	74
Sex:				
Men	12	30	58	76
Women	30	8	73	64
Race:				
White men	10	31	56	77
Black men	26	17	65	54
White women	29	9	73	66
Black women	38	5	73	42

that group will stay in the highest quintile, and the greater is the likelihood that they will stay in the bottom quintile. For example, women are more likely to stay at the bottom than men: some 72 percent of women who were in the bottom quintile of the earnings distribution of the positive sample in 1990 stayed there in 1991, compared with only 51 percent of men. By contrast, 77 percent of men at the top in 1990 remained there in 1991, compared with only 63 percent of women. Low-earning women appear to be stuck at the bottom, even when the labor supply is controlled for by restricting the sample to those who work full time, year round in both years, which suggests that persistently low hours of work are not the sole source of these women's lack of upward mobility. It may be that women in the bottom quintiles are more likely to work in occupations that consistently pay low wages and have limited promotion potential.

A caveat must be mentioned before continuing with the findings: even within quintiles, groups will have different earnings distributions. For example, among those in the bottom quintile, men are closer than women, on average, to the boundary between the first and second quintiles. Thus, even if men and women have the same increase in earnings from one year to the next, men will be more likely than women to move out of the bottom quintile, boosting the meas-ure of mobility presented for men. Experimentation with other measures, however, suggests that the results would be qualitatively similar even if these intraquintile differences were taken into account when measuring mobility.

The ability to maintain one's position at the top of the overall earnings distribution appears to be more elusive for blacks than for whites—even for black men relative to white women. About 65 percent of white women who were in the top quintile in 1990 were there in 1991, compared with 59 percent of black men and 44 percent of black women. Similar racial differences in the ability to maintain the top economic status were also found by Bradley R. Schiller, Greg Duncan and Saul Hoffman, and Linda Datcher-Loury.[16] Datcher-Loury found that high-earning black men and high-earning white men differ in their distribution across occupations, which may contribute to their differences in earnings mobility. High-earning white men were more likely to work in managerial or professional occupations, in which earnings are more stable, whereas high-earning black men were more likely to be employed in sales and clerical jobs, in which earnings tend to fluctuate more. Significant differences across races in movements out of the bottom quintile exist only for men, with 52 percent of white men leaving the bottom quintile, compared with 43 percent of black men. These general patterns hold for both earnings samples.

Table 3 reports differences in mobility within the overall earnings distributions across age and education groups. Not surprisingly, younger, less educated workers are more likely than older, more educated workers to be in the bottom quintile, and less likely to be in the top quintile, of both earnings distributions. The percentage of each age group that remains in the bottom quintile decreases with age, except for the oldest group, whose percentage is higher than that of the youngest group. Similarly, the percentage of each age group that remains in the top quintile increases with age, also except for the oldest group, whose percentage is lower than that of the youngest group. These patterns are consistent with the human capital view of the pattern of earnings over the life cycle, which suggests that as a worker ages, earnings rise rapidly at first, then flatten out, and ultimately begin to fall.[17]

The percentage of each education group that stays in the bottom quintile decreases consistently with years of schooling, and the percentage that stays in the top quintile increases consistently with years of schooling, indicating that it is easier for more educated workers to move out of the bottom and to remain at the top than it is for workers with less education. These mobility patterns are similar for men and women within both earnings distributions. The education mobility patterns are not surprising if one believes that education represents a permanent improvement in an individual's human capital and thus earnings capacity. In that case, the highly educated workers would be more likely to

Table 3. Age and education differences in mobility within the overall earnings distribution in 1990–91, using matched CPS data

Sex, age, and education	Positive sample				Full-time, year-round sample			
	Percent in quintile—		Percent that stay in quintile—		Percent in quintile—		Percent that stay in quintile—	
	1	5	1	5	1	5	1	5
Men								
Age, years:								
25–29	18	14	53	74	22	12	58	71
30–39	10	28	49	79	13	27	61	77
40–49	6	41	46	79	8	38	50	79
50–59	9	40	57	71	9	38	64	69
Education, years:								
Fewer than 12	23	10	64	50	31	8	65	61
12	11	20	47	67	14	19	59	62
13–15	7	34	50	75	8	30	51	75
16 or more	5	56	37	86	5	52	49	83
Women								
Age, years:								
25–29	32	6	73	55	34	5	74	46
30–39	30	8	73	63	31	7	72	66
40–49	28	10	69	66	24	11	74	66
50–59	31	8	74	64	36	7	75	63
Education, years:								
Fewer than 12	55	2	81	10	67	1	85	33
12	36	3	71	54	40	4	75	55
13–15	25	7	71	59	25	6	66	58
16 or more	15	20	63	69	10	19	57	68

have the necessary skills to reach the top quintile and remain there. If a less educated worker, on the other hand, reaches the top quintile, then it is more likely to be due to a favorable transitory shock that will dissipate with time.

Levels of mobility within various subdistributions. With regard to the second type of mobility examined in this article—movement within the earnings distribution of a particular demographic group—transition matrices are also calculated, except that in this case an individual is assigned to a quintile for a pair of years in terms of his or her position in the earnings distribution for a given demographic group, not for the entire population. In addition to the proportions that remain in the top and bottom quintiles, two further measures are calculated. The first reflects the percentage of people that stay in the same quintile for both years or, in other words, stay on the diagonal of the transition matrix. To calculate this measure, it is necessary to add up the percentages in the diagonal and then divide by 5 (because each of the percentages is calculated with a base that represents one-fifth of the population).

If there is perfect immobility—that is, if every individual stays in the same quintile—then the measure will equal 1.0, because all the diagonal elements will be 1.0 (and all the other elements 0.0). If, on the other hand, there is perfect mobility—that is, if an individual's position in the beginning year has no impact on his or her position in the ending year—then the measure will equal 0.2, because all the diagonal elements—and, in fact, all elements—will equal 0.2. Making the relevant calculations for the transition matrix in table 1 results in a value of 0.38 ([0.4 + 0.3 + 0.3 + 0.4 + 0.5]/5) for this measure of mobility.

An additional measure calculates the percentage of individuals who either stay in the same quintile or move into an adjacent one—in other words, those who stay on or near the diagonal of the transition matrix. Under perfect immobility, this measure will also be 1.0, as everyone stays on the diagonal. With perfect mobility, it will be 0.52 because there are 13 elements on or adjacent to the diagonal, each of which would equal 0.2 ([13 × 0.2]/5 = 0.52). As applied to table 1, the measure equals 0.68.[18]

The final measure for assessing the extent of mobility within a given distribution is the *correlation coefficient*, which gives a guide to the extent to which individuals maintain their positions within the earnings distribution. The

measure ranges from –1.0 to 1.0, with 1.0 indicating perfect immobility, 0.0 perfect mobility, and negative values (not observed in the calculations carried out) some reversal of positions.

In this section, mobility patterns are examined for 1967–91, and both the levels and trends in various relative immobility indexes are documented. As noted earlier, what is of interest is mobility within the earnings distributions defined by the four main subsamples and mobility within various distributions for particular demographic groups. Table 4 reports average immobility measures for the 1967–91 period for the four main subsamples. As expected, the measures are slightly higher for the full-time, year-round samples than for the positive earnings samples, because, for the former, fluctuations in hours of work are largely eliminated.

How do mobility indexes differ across sex, age, education, and racial groups? Table 5 gives the 1990–91 immobility indexes for both the positive earnings and full-time, year-round samples. The 1990–91 immobility measures for the positive earnings sample are slightly higher for women than for men, with differences in mobility being more pronounced at the extremes of the earnings distributions. The table shows that 62 percent of men remain in the bottom quintile of their earnings distribution, compared with 70 percent of women. Similarly, the proportion of men who stay at the top of their distribution is 5 percentage points lower than the corresponding proportion of women. However, among full-time, year-round workers, the differences in mobility between the sexes are smaller.

Table 5 also suggests that short-term immobility is typically lower among young workers, both male and female. This finding is in accord with that of Donald Parsons, who compares the National Longitudinal Survey cohorts of young men and older men.[19] Given the wider range of ages covered in the CPS, the current study is able to examine more closely the relationship between short-term mobility and age. Table 5 indicates that short-term earnings immobility initially increases with age and then levels off. In other words, those in their twenties have higher mobility rates than other workers, but there is little difference across other age groups, except within the positive earnings sample, where workers in their fifties have significantly higher mobility rates than do workers in their forties. This difference in regard to older workers does not exist in the full-time, year-round sample, which implicitly controls for variations in hours, and thus may be the result of a change in the degree of labor force attachment as workers approach retirement age. The difference in mobility rates for the young is greater for the positive earnings sample than for the full-time, year-round sample, indicating that the high mobility rates for the young are also partly the result of greater fluctuations in hours. In addition, greater job mobility among the young probably is an important contributor.[20] The findings presented in this article differ from the strictly positive relationship found between 1-year earnings correlation coefficients and age in the United Kingdom, but are broadly consistent with recent findings in regard to Sweden.[21]

Table 5 also shows a positive relationship between education and earnings stability or immobility. Within the men's positive earnings sample, the 1990–91 correlation coefficient was 12 percent higher for college graduates than for high school dropouts. Short-term earnings mobility or instability levels were highest for those who did not complete high school, particularly high school dropouts in the positive earnings sample. In both the positive earnings and full-time, year-round samples, college graduates had significantly lower earnings instability than those in the other education groups. Parsons also found a positive relationship between schooling and 1-year earnings correlation coefficients for the National Longitudinal Survey cohort of older men, but not for that of young men, among whom he found mobility levels to be highest for college graduates.[22] This suggests that the relationship between education and mobility might differ across age groups.

Perhaps the most striking difference in short-term mobility levels recorded in table 5 occurs between blacks and whites. Over the 1990–91 period, the correlation coefficient for black men was 16 percent lower than for their white counterparts. These racial differences—particularly with regard to men—persist across both earnings samples, indi-

Table 4. Average immobility measures, by earnings sample, 1967–91

Sample	Correlation coefficient	Percent that stay on diagonal	Percent that stay on or near diagonal	Percent that stay in first quintile	Percent that stay in fifth quintile
Men:					
Positive sample	0.76	57	88	65	71
Full-time, year-round sample	.77	59	89	69	72
Women:					
Positive sample	.77	58	89	64	72
Full-time, year- round sample	.78	59	89	67	74

Table 5. Immobility measures by demographic group in 1990–91, using matched CPS positive earnings sample

Sex, age, education, and race	Correlation coefficient	Percent that stay on diagonal	Percent that stay on or near diagonal	Percent that stay in first quintile	Percent that stay in fifth quintile
Men					
Full sample	0.77	59	88	62	70
Age, years:					
25–29	.73	53	85	62	70
30–39	.77	59	89	64	74
40–49	.75	59	88	64	70
50–59	.74	57	87	65	72
Education, years:					
Fewer than 12	.66	53	83	58	69
12	.70	54	85	60	67
13–15	.72	57	87	69	69
16 or more	.74	61	88	68	72
Race:					
White	.77	59	88	65	74
Black	.65	51	83	55	70
Women					
Full sample	.78	60	89	70	75
Age, years:					
25–29	.76	59	89	70	72
30–39	.79	61	88	71	74
40–49	.80	59	89	68	76
50–59	.76	59	88	66	72
Education, years:					
Fewer than 12	.66	53	85	61	62
12	.74	57	87	68	71
13–15	.75	58	86	72	69
16 or more	.75	58	88	67	68
Race:					
White	.75	61	89	68	73
Black	.75	52	86	66	67

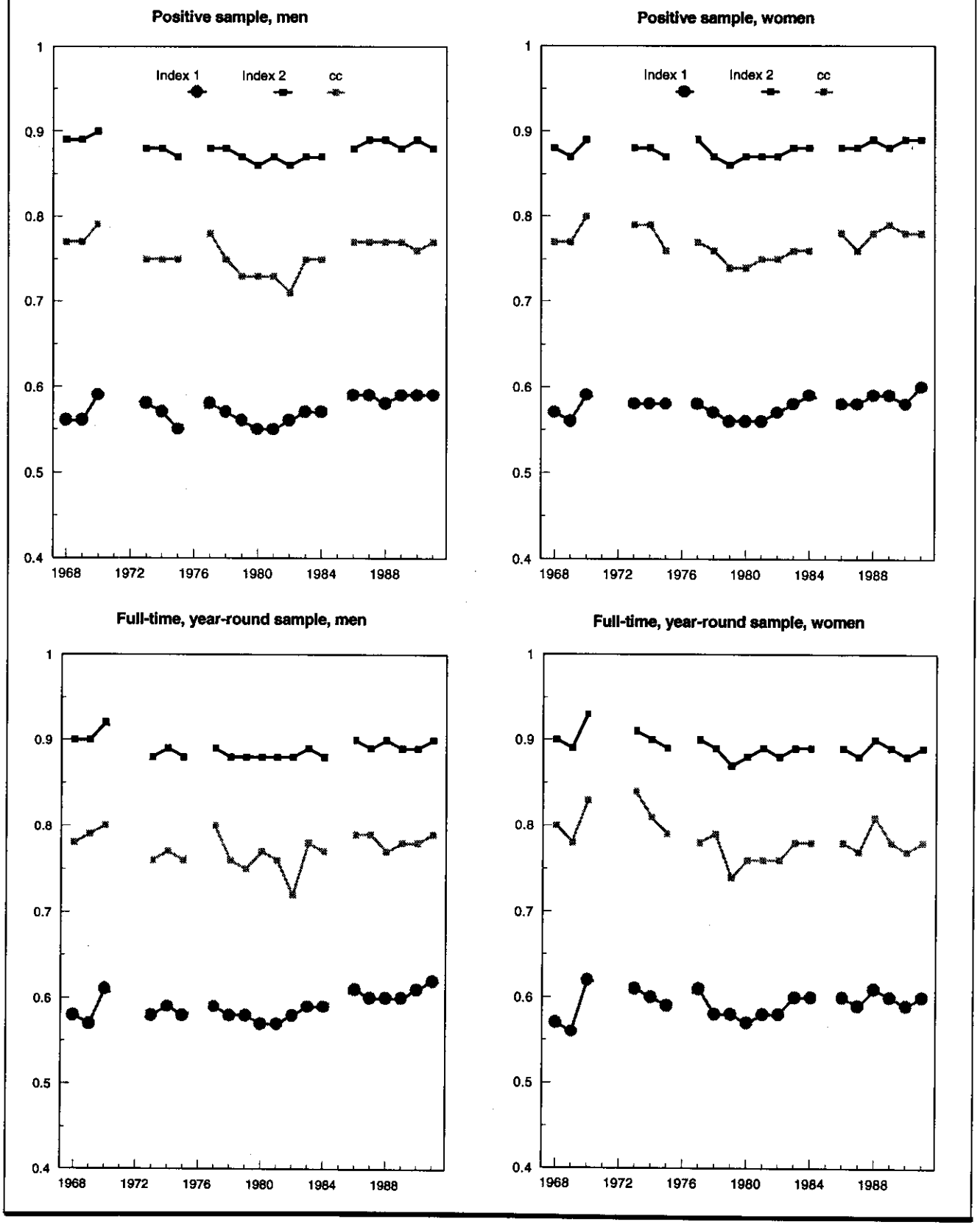
cating that the differences are largely due to blacks' greater instability in pay rates, rather than greater fluctuations in hours worked. Evidence of a higher degree of earnings mobility or instability among blacks was also found by Duncan, who used hourly earnings of males from the Panel Study of Income Dynamics.[23] The differences across races in short-term earnings mobility appear larger for men than for women. This is consistent with the fact that the earnings differential between blacks and whites is much smaller for women than for men.[24]

Trends

This section examines the trends in three measures of earnings immobility over the 1967–91 period: the percentage of individuals that stay on the diagonal in the transition matrix, the proportion that stay at or near the diagonal, and the correlation coefficient. The trends in earnings mobility are particularly interesting in light of the increase in cross-sectional earnings inequality observed during the 1980's, because these trends affect patterns in long-run inequality. To give a simple example, suppose an economy has just two people. In 1994, person A earns $100,000 and person B earns nothing. Clearly, a good deal of inequality is present in this economy, and from an equity standpoint, it may be a matter of concern. But suppose now that in 1995, the fortunes of A and B are reversed, so that A earns nothing and B earns $100,000. Then, when earnings are summed up over the 2-year span, both individuals have earned $100,000, so no inequality is present. Thus, in this example, mobility is such that, even though there is a great deal of inequality in 1 year, over a longer span the distribution of earnings is exactly equal.

Certainly, in the U.S. economy, the degree of mobility is not high enough so that an individual's position in the earnings distribution in any year is not relevant to his or her position as earnings are summed up over a lifetime. Even so, there is enough mobility that the degree of inequality over longer spans is less than that over 1 year. For example, Lee A. Lillard estimated that inequality in a single year was 50 percent greater than over a lifetime.[25]

Chart 1. One-year correlation coefficients and immobility indexes, 1968–70, 1973–75, 1977–84, and 1986–91



The preceding example of a two-person economy demonstrates how, with annual inequality staying constant, movement in the earnings distribution can still work to reduce inequality when earnings are summed over a longer period. Just as mobility may help allay concerns about a degree of inequality in one particular year, it can also help alleviate worries about a rise in annual inequality. If annual inequality rises, as it did in the 1980's in the United States, then this will automatically translate into higher inequality over a longer period if there is no change in the extent to which individuals exchange positions in the earnings distribution. If the degree of mobility increases, however, it will reduce the extent to which increases in annual inequality are translated into increases in long-run inequality. On the other hand, a reduction in mobility would reinforce the inequality-increasing effects of rises in annual inequality.[26]

What is the pattern for recent trends in earnings mobility? Chart 1 graphs the trends in 1-year correlation coefficients and two transition matrix measures for the men's and women's positive earnings and full-time, year-round samples for the period 1967–91. As mentioned earlier, four pairs of years are missing from the time series. The missing pairs make it difficult to distinguish much of a trend over the early portion of the series. After this, however, short-term immobility indexes appear to follow a stable trend. For the men's positive earnings sample, immobility, as measured by the correlation coefficient, declined from 0.78 in 1977 to 0.71 in 1982 and increased moderately thereafter. This U-shaped pattern applies as well to the men's full-time, year-round sample. For the women's positive earnings and full-time, year-round samples, 1-year correlation coefficients began to decline sometime in the early 1970's and rose gradually after 1978. Note, however, that the fluctuations in the correlation coefficient graphed in chart 1 take place over a fairly limited range. On the whole, then, the findings suggest that mobility patterns have not been that different in the 1980's from what they were in the 1970's.

What are the implications of these findings for the extent to which increased annual inequality is being translated into increases in long-run inequality? Clearly, additional research is needed here, but the results presented in this article do not suggest that mobility patterns have changed in such a way as to offset the recent rise in earnings inequality.

More speculatively, these same results can also be used to shed additional light on the causes of the recent rise in earnings inequality. While a detailed review of the literature on inequality is beyond the scope of the article, one view holds that a key factor behind the rise in earnings inequality is that the demand for skilled workers has increased, leading to a widening of the earnings gap between those who are skilled and those who are not.[27] Given that such a shift in favor of the skilled would be likely to persist over time, this has an important implication for patterns of mobility: if the distance in earnings across skill levels has widened, it becomes more difficult for individuals to pass each other on the earnings ladder, implying that mobility will decline over time.

It is also possible that the increase in inequality in a given year has been caused by increased randomness in the economy. As Robert Moffitt and Peter Gottschalk maintain, the amount of turbulence in the economy may have increased because of growing international competition, a reduction in regulations, the waning influence of labor unions, and a variety of other factors.[28] This increased influence of transitory factors would imply that mobility would increase, as it is more likely that, with regard to the economic ladder, someone who has the good fortune of benefiting from the increased turbulence will surpass someone who has not. Because we do not see strong trends in mobility—either a rise or a fall— the results suggest that both the permanent factors associated with a rise in returns to skill and the transitory factors associated with growing turbulence in the economy may be important in the recent rise in earnings inequality.

THIS ARTICLE HAS UNCOVERED several interesting differences in short-term earnings mobility across demographic groups. First, men have higher short-term earnings mobility levels than women do. Second, workers in their twenties have high levels of earnings mobility or instability relative to their older counterparts. Aside from this, however, mobility levels do not show any clear pattern with age. Third, higher education levels generally mean higher 1-year correlations—in other words, more stability—in short-term earnings. Fourth, black men have more instability in their earnings than their white counterparts have, and this racial difference in mobility levels is present, but less pronounced, for women. Last, mobility measures followed a general U-shaped pattern during the 1967–91 period, although the magnitude of the shifts that occurred indicates that short-term mobility in the 1980's was not profoundly different from that in the 1970's. □

Footnotes

[1] For a more detailed discussion of the importance of data on mobility, see A. B. Atkinson, F. Bourguignon, and C. Morrisson, "Earnings Mobility," *European Economic Review*, vol. 32 (1988), pp. 619–32.

[2] See Lawrence F. Katz and Kevin M. Murphy, "Changes in Relative Wages, 1963–87: Supply and Demand Factors," *Quarterly Journal of Economics*, February 1992, pp. 35–78, for a recent study of changes in the pattern of pay by age (experience), education, and sex; and Francine D. Blau and Andrea H. Beller, "Black-White Earnings over the 1970s and 1980s: Gender Differences in Trends," *Review of Economics and Statistics*, May 1992, pp. 276–86, for an examination of earnings differentials by race.

[3] For a survey of this literature, see Frank Levy and Richard J. Murnane, "U.S. Earnings Levels and Earnings Inequality: A Review of Recent Trends and Proposed Explanations," *Journal of Economic Literature*, September 1992, pp. 1333–81.

[4] See Lynn Karoly, "The Trend in Inequality among Families, Individuals, and Workers in the United States: A Twenty-Five Year Perspective," in Sheldon Danziger and Peter Gottschalk, eds., *Uneven Tides: Rising Inequality in America* (New York, Russell Sage Foundation, 1993), for an illuminating discussion of similar issues in studies of earnings inequality.

[5] For two recent studies of mobility based on family income, see Thomas L. Hungerford, "U.S. Income Mobility in the Seventies and Eighties," *Review of Income and Wealth*, December 1993, pp. 403–17; and Isabel V. Sawhill and Mark Condon, "Is U.S. Income Inequality Really Growing?" *Policy Bites*, The Urban Institute, June 1992, pp. 1–4.

[6] Of course, the two may be connected, as the pace of economic growth may have implications for earnings mobility.

[7] The CPS is a monthly survey of approximately 60,000 households conducted by the Bureau of the Census for the Bureau of Labor Statistics. The March survey contains a special supplement that asks about income earned in the year prior to the interview.

[8] See the appendix for more information on matching CPS's over time, including a discussion of biases that may arise in using the matched CPS's for analysis.

[9] In lieu of the CPS, the Panel Study of Income Dynamics might have been used; however, while the "split-offs" from the original members enable this survey to maintain representation across all groups, the impact of attrition on the representativeness of the sample is an issue of concern.

[10] See the appendix for further information.

[11] As an alternative to selecting those who are full-time, year-round workers as a way to control for differences in hours worked, calculations were done with samples for which the measure of economic status was the hourly wage. These results, which were broadly similar to the findings in this article, were not reported for two reasons: the data necessary to calculate hourly wages from the March CPS—weeks worked in the previous year and usual hours worked per week—are available only beginning with the 1976 CPS; and there is likely to be substantial measurement error in calculating hourly wages by dividing annual wage and salary income by number of weeks worked multiplied by usual number of hours worked per week, making the results less reliable.

[12] While the 99th percentile was used as a cutoff, the bunching of incomes, in some cases at the top codes, caused those that were trimmed to constitute a somewhat larger portion of the distribution for some years. See Karoly, "Inequality among Families, Individuals, and Workers," for a discussion of alternative treatments of the top code and their impact on measures of inequality.

[13] Results are not reported separately for the racial group defined as "other," because of its small size and heterogeneity.

[14] See A. B. Atkinson, F. Bourguignon, and C. Morrisson, *Empirical Studies of Earnings Mobility* (Chur, Switzerland, Harwood Publishers, 1992), for a fuller discussion of ways to measure mobility.

[15] For a discussion of this trend and potential explanations of it, see June O'Neill and Solomon Polachek, "Why the Gender Gap in Wages Narrowed in the 1980s," *Journal of Labor Economics*, January 1993, pp. 205–28.

[16] See Bradley R. Schiller, "Relative Earnings Mobility in the U.S.," *American Economic Review*, December 1977, pp. 926–41; Greg Duncan and Saul Hoffman, "Dynamics of Wage Change," in Martha Hill, Daniel Hill, and James N. Morgan, eds., *Five Thousand American Families—Patterns of Economic Progress*, vol. IX (Ann Arbor, MI, Institute for Social Research, 1981); and Linda Datcher-Loury, "Racial Differences in the Stability of High Earnings among Young Men," *Journal of Labor Economics*, July 1986, pp. 301–17.

[17] See Jacob Mincer, *Schooling, Experience and Earnings* (New York, Columbia University Press, 1974), for an elaboration of this view.

[18] Note that no summary measures were used to assess mobility within the overall distribution, as such measures are potentially misleading. By definition, in assessing mobility within a demographic group, 20 percent of the population will be in each quintile. This is not the case when one examines the mobility of a demographic group within the overall earnings distribution, because a group is not likely to be evenly spread across the overall distribution. As a result, in calculating summary measures, differences across demographic groups in the degree of movement in and out of quintiles will get confounded with differences across these groups in their initial distribution over the quintiles.

[19] See Donald Parsons, "The Autocorrelation of Earnings, Human Wealth Inequality and Income Contingent Loans," *Quarterly Journal of Economics*, November 1978, pp. 551–69. The National Longitudinal Survey cohort of young men is a nationally representative group of 5,225 men aged 14 to 24 years in 1966 who were surveyed periodically beginning that year. The cohort of older men, with whom interviews also began in 1966, is a nationally representative group of men aged 45 to 59 years in 1966.

[20] See Jacob Mincer and Boyan Jovanovic, "Labor Mobility and Wages," in Sherwin Rosen, ed., *Studies in Labor Markets* (Chicago, University of Chicago Press, 1981), for a discussion of variation in job mobility by age.

[21] See Atkinson, Bourguignon, and Morrisson, *Empirical Studies of Earnings Mobility;* and Björn Gustaffson, "The Degree and Pattern of Income Immobility in Sweden," *Review of Income and Wealth*, March 1994, pp. 67–86.

[22] Parsons, "Earnings, Inequality and Loans."

[23] See Greg Duncan, "An Empirical Model of Wage Growth," in Greg Duncan and James Morgan, eds., *Five Thousand American Families—Patterns of Economic Progress*, vol. VII (Ann Arbor, MI, Institute for Social Research, 1979).

[24] See Blau and Beller, "Black-White Earnings."

[25] See Lee A. Lillard, "Inequality: Earnings Versus Human Wealth," *American Economic Review*, March 1977, pp. 42–53.

[26] For a more detailed discussion of the connections between mobility and inequality in the context of the recent rise in earnings dispersion in the United States, see Paul R. Krugman, *The American Prospect*, Fall 1992, pp. 19–31.

[27] For a detailed elaboration of this view, see Chinhui Juhn, Kevin M. Murphy, and Brooks Pierce, "Wage Inequality and the Rise in Returns to Skill," *Journal of Political Economy*, June 1993, pp. 410–42.

[28] Robert Moffitt and Peter Gottschalk, "Trends in the Covariance Structure of Earnings in the U.S.: 1969–87," mimeograph, Boston College, March 1993.

APPENDIX: Construction and evaluation of matched samples from the CPS

The data used in this article are from March-March matched files from the Annual Demographic Files of the Current Population Survey (CPS). At the time of the analysis, the CPS was available for the period 1968–92, containing earnings data for the year prior to the interview. While that implies the existence of 24 adjacent-year pairs of records (1968–69 through 1991–92), changes in household identifiers across adjacent years make it impossible to perform matches for 1971–72, 1972–73, 1976–77, and 1985–86. Thus, we were able to construct matched files for 20 pairs of years between 1968 and 1992.

Under the sample design of the CPS, half of any March sample can be matched with the March sample of an adjacent year. A household will be in the sample for 4 months, out for 8 months, and then back in for an additional 4. Thus, households that are in their first through fourth months in the sample in March of year t will be in their fifth through eighth months in the sample in year $t+1$. In practice, it is not possible to match fully half of the sample, given that individuals leave it for various reasons. The match rates used in this article result from a fairly conservative algorithm and tend to fall in the range of 60 percent to 70 percent of individuals who are eligible to be matched. This attrition rate raises the concern as to whether matched samples can be considered rep-

resentative. Franco Peracchi and Finis Welch recently subjected matched March samples to a rigorous testing and concluded that, while the matched and unmatched populations are different in important dimensions, "no major biases appear in the estimates of transitions between labor force states after controlling for sex, age and labor force status at the time of the first survey."[1] While the research focus of the current article is different from theirs, Peracchi and Welch's results provide some support for using matched CPS data in analyzing labor force dynamics. One caveat they mention is that attrition rates are highest among the very young. Similar conclusions were reached in an earlier analysis by Francis W. Horvath.[2] Accordingly, to minimize attrition problems in the present research, very young workers were omitted from the samples and analyses were performed separately by age group. One of the sensitivity tests that was carried out involved the calculation of inequality statistics for various samples from the matched data. The results indicated that both the levels and trends obtained are comparable to those calculated from the full March CPS.

Footnotes to the appendix

[1] See Franco Peracchi and Finis Welch, "How Representative Are Matched Cross-Sections: Evidence from the Current Population Survey," unpublished manuscript, October 1992.

[2] See Francis W. Horvath, "Tracking Individual Earnings Mobility with the Current Population Survey," *Monthly Labor Review*, May 1980, pp. 43–46.

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