Does a younger male labor force mean greater earnings inequality?

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In a recent article in the *Monthly Labor Review*, Peter Henle and Paul Ryscavage showed that inequality of earnings among men grew between 1959 and 1977, although the rate of increase was lower after 1973.[1] Robert Plotnick likewise found an increase in the overall variance of men's earnings during the 1958–77 period.[2] Did this widening disparity reflect more than the effects of changes in the age composition of the labor force?

The answer to this question is important for public policy. If the greater inequality of earnings only reflects growth in the proportion of young males in the labor force as a result of the baby boom, then we might expect a reversal of the trend in the future. As this disproportionately large group of young men ages and is replaced by smaller cohorts, the distribution of earnings may become more equal. More disturbing would be the finding that inequality has grown among men with a given level of work experience. This would indicate that the greater overall inequality reflects more than simply the "younging" of the labor force.

Our analysis makes two contributions to the growing literature on earnings inequality. First, by focusing on inequality within education-experience groups, we demonstrate that two simple demographic explanations are not sufficient to explain the trend. Finis Welch and Richard Freeman have shown that the mean earnings of young workers fell relative to the mean earnings of older workers during the late 1960's and early 1970's.[3] This by itself would increase the between-age-group variance of earnings, and hence, increase the total variance. However, we show that, even after the influence of the between-group variance is eliminated, there remains a substantial trend towards greater inequality. The second demographic explanation is that the young make up a growing percentage of the labor force. Because the young typically have a high earnings variance,[4] the average of the within-age-group variances would tend to increase with the labor market entry of the baby boom. But by examining the variance of separate education-experience categories, we show that this factor is not sufficient to explain the trend in the overall variance. Our principal concern is with the experience

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composition of the labor force, but because Jacob Mincer has shown that earnings inequality varies with the level of education,[5] we control for this factor as well.

The second major contribution of this study is to show that the proportion of people with zero earnings also increased within education-experience categories. This development has largely been ignored in the literature. Henle and Ryscavage and Plotnick limited their samples to people with positive earnings. Likewise, our measure of inequality, the variance of the logarithm of earnings, does not allow us to include people with zero earnings. The exclusion of a growing group of individuals who fall at the lowest point in the distribution gives an incomplete picture.

Method of the study

To examine these issues, we start by reviewing our measures of inequality and zero earnings averaged across all education and experience groups. We then turn to an analysis of changes within education and experience categories.

Like Henle and Ryscavage, we used data from the work experience supplement to the March 1968–79 Current Population Survey.[6] The special household questionnaire included data on annual earnings and weeks worked. Our sample covered males 16 through 62, who were not then in school and who reported they had worked 50 to 52 weeks the previous year, or fewer weeks for reasons other than school or, in the case of older men, retirement. Those self-employed or working without pay were excluded. The observations were divided into four education categories: less than 12 years, 12 years, 13 to 15 years, and 16 years or more of schooling completed. Current age minus estimated labor force entry age was used to allocate individuals to single-year labor force experience groups.[7]

Within each of the 1,960 education-experience-year cells, we calculated the variance of log annual and log weekly earnings among earners, as well as the proportion of zero earners. (Weekly earnings are not collected directly from respondents to the March Current Population Survey. For this study, estimates of weekly earnings were obtained by dividing the respondent's reported annual earnings by reported weeks worked. The weeks worked may have been full time, part time, or some combination of the two.) These within-group measures are the basis for our analysis. Inequality of weekly earnings, which has the advantage of not being influenced by changes in the distribution of weeks worked, was not studied by Henle and Ryscavage or Plotnick.

The findings

Table 1 shows the total variance of log earnings and the weighted average of the within-group variances for

each year.[8] The average was constructed by weighing the variance of each of the education-experience cells by the proportion of people in that cell in that year. Column 1 shows that the total variance of log annual earnings grew substantially over the period. The rate of increase, however, seems to have been more rapid prior to 1973, confirming Henle and Ryscavage's earlier conclusions based on gini indexes.[9] Column 2 shows that the increase in the total variance occurs even when we eliminate the effect of changes in between-group variance. The average of the within-group variances of log annual earnings increased from .373 in 1967 to .454 in 1978. Examination of the data again indicates that the growth rate was considerably higher during 1967-72 than in the 1973-78 period.

To estimate growth rates, we fit linear time trends to the data in table 1. A spline covering the 1973-78 period was used to test for change in growth rates.[10] The estimated trend over the full period, the trend over 1967-72, and the change in the trend after 1972 are shown in the bottom three rows.[11]

The time trends fitted to the variance of the log annual earnings indicate a 2.8-percent growth rate in the total variance and a 2.5-percent growth rate in the within-group variance over the full period. This was a result of a very rapid rise between 1967 and 1972 and a leveling after 1972. Columns 3 and 4 of table 1 show that the increasing inequality of annual earnings is not only a reflection of changes in employment patterns. The total variance of weekly earnings also shows a 1.3-percent growth rate and the within-group variance shows a 0.9-percent growth rate; both are statistically signifi-

cant. Again, the growth rates are substantially higher during 1967-72 than in the later period, when the growth rates are quite small. These data indicate that annual and weekly earnings among workers with positive earnings have become less equal, although the rate of increase in the inequality dropped after 1972.

Column 5 shows the percent of males with zero earnings. This series shows a dramatic increase during the survey period. In 1967, 3.3 percent of all men in our sample had zero earnings. By 1978, the proportion had grown to 6.4 percent. The growth rates over the full period and the period 1967-72 are both large and significant. For the percent with zero earnings, the trends in the two subperiods are not significantly different.

The rise in the proportion of men with zero earnings is large enough to warrant careful attention. While it is beyond the scope of this study to explain why this rapid increase has occurred, it is consistent with other survey data which show that the proportion of men out of the labor force in any given month has been growing.[12] More surprisingly, our data indicate that many of these men did not have any earnings during the year.

Table 2 shows the estimated growth rate in the proportion of men with zero earnings and the estimated growth rate in the within-group variance of log annual and weekly earnings for 16 education-experience categories.[13] Columns 1 to 3 indicate that the within-group variance of log annual earnings increased in all cases. All growth rates except two are significantly greater than zero (the exceptions being the two highest experience groups for college graduates). The growth rates are both statistically significant and of substantial magnitude. The within-group variance of the log of annual earnings grew in the 2- to 4-percent range for most categories. This indicates that the average increase in the within-group variance of log annual earnings shown in table 1 reflects more than population shifts among cells as a result of the baby boom.

For the group with the lowest experience there is strong confirmation of a slowdown in the trend toward inequality, even within experience categories. Column 3 shows statistically significant declines for all educational levels. For other experience groups, the picture is not so clear. Column 3 shows a decline in the growth rates for all but three of the categories with more than 10 years of experience. However, almost none of these differences in the growth rates is statistically significant. This partially reflects the substantial year-to-year fluctuations in the data that make it difficult to draw conclusions about subperiods. Nevertheless, we can say that a decline in the trend toward greater inequality within education-experience categories is not strongly confirmed by the data for men with more than 10 years of experience.

Columns 4 to 6 show the growth rates in within-group variances of log weekly earnings. As found in ta-

ble 1, the growth rates are considerably lower than those for the log of annual earnings. In addition, we find that (with one exception) the trend toward greater inequality of weekly earnings is statistically significant only for men with less than a college degree and less than 21 years of experience. For these people, growing inequality of annual earnings also reflects growing inequality of weekly earnings. For the other groups, all but one trend coefficient in column 4 is positive but only one of these is statistically significant.[14] Few of the education-experience groups show statistically significant changes in growth rates between the two subperiods.

Columns 7 and 8 show the growth rates in the percent of men with zero earnings. Column 7 shows significantly positive growth rates in the proportion of respondents with zero earnings, even in the higher education-experience cells. Not only are the growth rates in columns 7 and 8 statistically significant but they are quite large, almost all being above 7 percent per year. Columns 8 and 9 indicate that the growth rates in the percentage of zero earners did decline after 1972. However, the statistically significant declines are concentrated in the two groups with lower experience.

IN SUMMARY, we find that the increasing inequality of male earnings reflects more than the changes in the composition of the labor force which resulted from the labor market entry of the baby boom. Even within education-experience cells, the variance of log annual earnings has been increasing. For men with less than 20 years of experience, the variance of log weekly earnings has also been rising. Furthermore, there is an increasingly large proportion of men who earn no income over a full year. The rise in this proportion of zero earners is not confined to those with little education or experience. It seems to be occurring across the board.

What are the possible explanations for our observed inequality *within* education-experience cells? One might be that increased transfer programs have generated disequalizing labor supply responses. But while this hypothesis has yet to be tested rigorously, indirect evidence suggests that it is not a full explanation. Recall, for example, that high education-experience males, whose greater earnings capacity makes them less likely to be eligible for transfer payments, also experienced an increase in inequality. This suggests that expanded transfer programs were not the only factor at work. Another possible explanation involves the education and

Table 2. Trends[1] in average within-group earnings variances and in the percentage of men with zero earnings, by years of experience and education, 1967–78

[In percent]

Experience-education category	Average within-group variance						Percent of men with zero earnings		
	Log annual earnings			Log weekly earnings			Trend, 1967–78 (7)	Trend, 1967–72 (8)	Change in trend after 1972 (9)
	Trend, 1967–78 (1)	Trend, 1967–72 (2)	Change in trend after 1972 (3)	Trend, 1967–78 (4)	Trend, 1967–72 (5)	Change in trend after 1972 (6)			
1 to 10 years' experience: Education:									
Less than 12 years	[2].033	[2].061	[2] –.050	[2].018	.017	.002	[2].087	[2].166	[2] –.140
12 years	[2].044	[2].077	[3] –.060	[2].018	.024	–.010	[2].104	[2].206	[2] –.180
13 to 15 years	[2].054	[2].143	[2] –.158	[2].032	[2].066	[3] –.061	[2].114	[2].212	[2] –.174
16 years or more	[3].017	[2].070	[2] –.093	.002	[3].023	[3] –.037	[2].082	[2].180	[2] –.174
11 to 20 years' experience: Education:									
Less than 12 years	[2].040	[2].070	–.050	[3].018	[3].044	–.047	[2].130	[2].162	[3] –.058
12 years	[2].072	[2].076	–.007	[2].052	.010	[2].073	[2].113	[2].138	–.044
13 to 15 years	[2].041	[2].042	–.003	[2].027	.022	.009	[2].163	[2].240	[3] –.136
16 years or more	[2].025	[3].038	–.022	.007	.014	–.011	[2].111	.041	.124
21 to 30 years' experience: Education:									
Less than 12 years	[2].023	[3].038	–.027	–.004	.020	.017	[2].108	[2].115	–.013
12 years	[2].039	[2].080	[3] –.071	.012	[3].054	.073	[2].094	[2].102	–.014
13 to 15 years	[2].030	.021	.015	.016	.030	–.022	[2].104	[2].121	–.030
16 years or more	.012	–.011	.040	.001	–.027	.050	[2].031	.025	.010
31 or more years' experience: Education:									
Less than 12 years	[2].019	[2].036	[3] –.030	[3].007	.007	–.001	[2].088	[2].099	–.020
12 years	[2].019	[2].032	[3] –.024	.004	.006	–.002	[2].115	[2].109	.012
13 to 15 years	[3].028	[2].082	[3] –.096	.018	[3].063	–.080	[2].060	.015	.080
16 years or more	.015	–.010	.044	.016	.004	.023	.032	.073	–.074

[1] Trends are fitted to the log of the average variances and percentage of zero earnings within each experience-education category.

[2] 1.64 < t.
[3] 1.28 < t < 1.64.

training investment decisions of persons born during the baby boom. Increasing inequality of human capital investment among members of recent cohorts may have led to increased earnings inequality, especially during the early years of the life cycle. In an earlier study, we provided both theoretical and empirical support for this hypothesis. Including a measure capturing baby boom effects reduces the trend toward inequality but does not eliminate it.[15] A more satisfactory explanation for the trend towards greater inequality, both within demographic groups and within occupations (as shown by Henle and Ryscavage), therefore, remains an important topic for further research. □

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[1] Peter Henle and Paul Ryscavage, "The distribution of earned income among men and women, 1958–77," *Monthly Labor Review*, April 1980, pp. 3–10.

[2] Robert D. Plotnick, "Trends in Male Earnings Inequality," *Southern Economic Journal*, January 1982, pp. 724–32.

[3] See Finis Welch, "Effects of Cohort Size on Earnings: The Baby Boom Babies' Financial Bust," *Journal of Political Economy*, October 1979, pp. S65–S97; and Richard Freeman, "The Effect of Demographic Factors on Age-Earnings Profiles," *Journal of Human Resources*, Summer 1979, pp. 289–318.

[4] See Jacob Mincer, *Schooling, Experience and Earnings* (New York, Columbia University Press, 1974).

[5] See Jacob Mincer, *Schooling*.

[6] The March work experience supplement is a retrospective survey which asks respondents to describe their own labor force experience and that of other household members for all of the previous calendar year.

[7] Finis Welch and William Gould used data from the 1940, 1950, 1960, and 1970 censuses and the Coleman-Rossi sample to estimate labor force entry age for men conditional on observed age, education, and birth cohort. These data were kindly provided to the authors by Finis Welch. Current age minus estimated labor force entry age was used to estimate labor force experience. See Finis Welch and William Gould, "An Experience Imputation or an Imputation Experience," unpublished paper (Los Angeles, University of California, October 1976).

[8] The between-group variance in each year is simply the difference between the total and the average within-group variance shown in table 1.

[9] See Henle and Ryscavage, "The distribution of earned income."

[10] The time trends in table 1 are estimated by fitting a time trend and a spline (which is a variable which takes on the values 1, 2 . . . n in the n years following 1972, allowing the fitted time trend to kink in 1973) to the 12 yearly observations for each series. The dependent variables are the logarithms of the averages shown in table 1.

An alternative procedure is to use observations on each category in each year, yielding 1,960 observations for each regression. Because these observations can be grouped exactly on the 12 yearly values of the independent variables, this procedure is identical to estimating equations using the time trend and spline as independent variables and the average of the logs, rather than the log of the averages, as dependent variables. The trends based on this alternative procedure give the same qualitative results.

[11] The 1973–78 trend can be obtained by adding the bottom rows.

[12] For example, see Donald Parsons, "The Decline in Male Labor Force Participation," *Journal of Political Economy*, February 1980, pp. 117–34.

[13] The trends in table 2 are calculated as follows: The 1960 single year-experience-education categories, which make up our basic data, are aggregated into 192 categories made up of 16 experience-education cells observed in each of 12 years. The single year-experience-education data are used to calculate weighted averages of the two variables shown in table 2 (percentages of zero earners and within-group variances) for each of the 16 categories for each year. Time trends are fitted to the log of these averages within each aggregated category. Again, the alternative procedure of fitting trends to the averages of the logs gives similar results.

[14] Entering the unemployment rate in the regression used to estimate the trend does not alter the basic conclusion. Time trends still tend to be insignificant for all but the groups with the least education and experience.

[15] Martin Dooley and Peter Gottschalk, *Earnings Inequality Among Males in the U.S.: Trends and the Effect of Labor Force Growth*, QSEP Research Report No. 19 (Hamilton, Ont., McMaster University, February 1982).