Studies in the Distribution of Income

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CURRENT POPULATION REPORTS

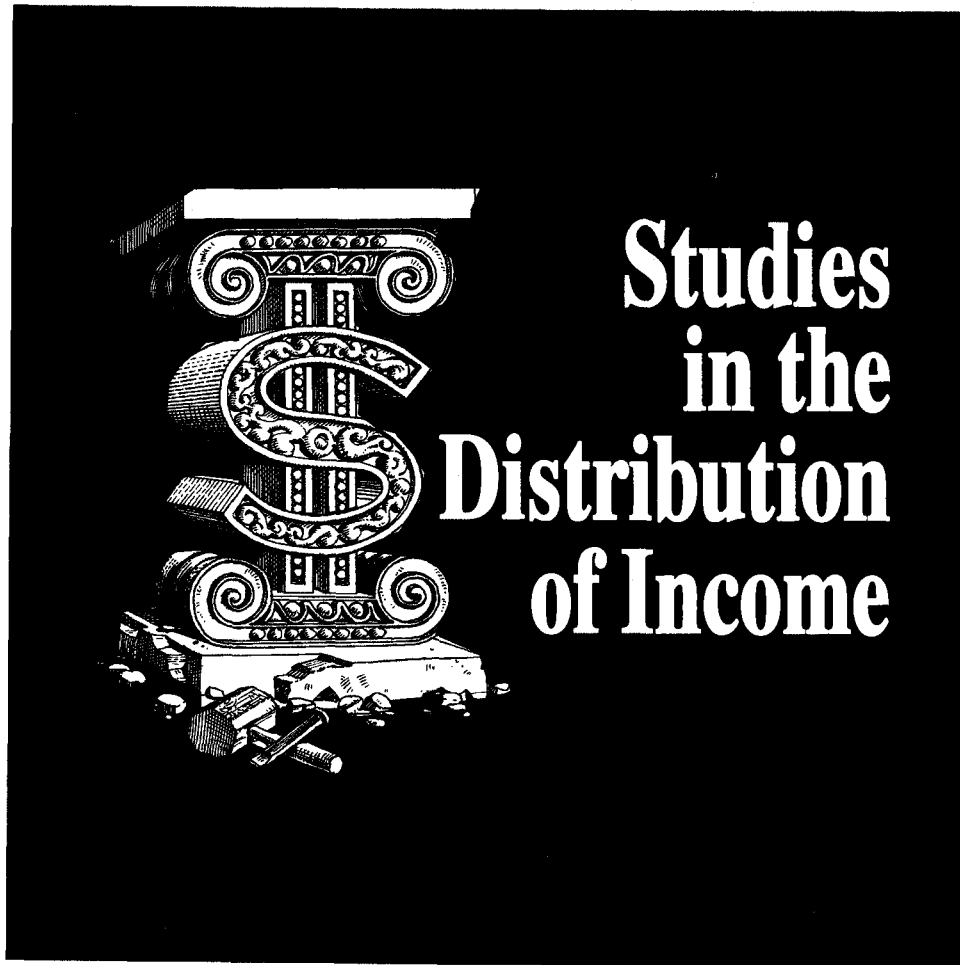**Consumer Income**

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of Income**

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INTRODUCTION

The following collection of papers contains analyses relating to the distribution of income. They were motivated by two long-run economic developments: the slowdown in the growth of family and household incomes in recent years and the growing inequality in the distribution of these incomes.

From the end of World War II until the early 1970's real incomes (incomes adjusted for changes in consumer prices) of most Americans rose rapidly. Moreover, the increases were spread fairly evenly across the income distribution, and income inequality changed very little. Between the early 1970's and 1990's, however, real income growth faltered, and the income gains that did occur were among those families and households at the upper end of the income distribution.[1] The result was a more dispersed and unequal distribution of income.

These developments, of course, were the cause of concern among many groups in the Nation. In the media, for example, news accounts of a declining and struggling middle class began to appear in the 1980's and they became more numerous when the economic slowdown of the early 1990's began. Politicians debated the economic problems confronting the Nation, while researchers tried to uncover the causes of slow income growth and growing income inequality.

Indeed, a significant amount of research has been conducted in this area over the years. The papers in this collection represent only a very small part of the total effort to understand the causes and implications of these economic developments.

The first study, "The Impact of Demographic, Social, and Economic Change on the Distribution of Income," by Paul Ryscavage, Gordon Green, and Edward Welniak, attempts to identify changes in the Nation's demography, society, and economy that may have been associated with income trends and rising income inequality. The second study, "Factors Affecting the Black-White Income Differential: A Decomposition," by Gordon Green, Paul Ryscavage, and Edward Welniak, examines the differential impact of the above mentioned changes on incomes and the income distribution of Black and White

households. The third study, "International Comparisons of Earnings Inequality for Men in the 1980's," by Gordon Green, John Coder, and Paul Ryscavage, analyzes the rise in wage dispersion in the United States in the context of the experience of four other countries. And the fourth study, "Trends In Income and Wealth of the Elderly in the 1980's," by Paul Ryscavage focuses on the economic situation of the elderly in relation to the rest of the population during the 1980's. All authors are economists or statisticians of the Bureau of the Census.

Before turning to these studies, however, a brief overview of trends in income and income inequality during the last 20 years is presented which provides a useful framework for their reading.

LONG-RUN TRENDS IN MONEY INCOMES

Figure 1 shows the long-run trend in the real median money income (in 1990 dollars) of families between 1947 and 1990 and households between 1967 and 1990.[2] With respect to the trend for families, the two distinct periods of income growth alluded to earlier can be seen in the figure. Between 1947 and 1973, the median rose from $16,370 to $33,370, or by 2.7 percent a year; between 1973 and 1990, however, the median fluctuated with the swings in the business cycle and, at $35,353 in 1990, was only about $2,000 higher than it was 17 years earlier. [3] Clearly, the income growth of families over these two periods was distinctly different.

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[1]Attention to this divergence in income growth was manifested in the early to mid-1980's in the debate over the declining middle class. For example, see Bob Kuttner, "The Declining Middle," *Atlantic*, July 1983, pp. 60-72.

[2]One of the major sources of data for studies of the income distribution is the Current Population Survey (CPS) conducted by the Bureau of the Census. Each March, income data relating to the previous calendar year are collected from a scientifically designed random sample of 60,000 households from around the country. The data relate to "money" incomes and data on noncash income, such as food stamps, health benefits, rent-free housing, and payments in-kind are excluded. For a description of the March CPS, see the appendices of U.S. Bureau of the Census, Current Population Reports, Consumer Income, Series P-60, No. 174, *Money Income of Households, Families, and Persons in the United States: 1990*.

[3]The Consumer Price Index for All Urban Consumers (CPI-U) of the Bureau of Labor Statistics (BLS) has typically been used to adjust nominal incomes for price inflation. Prior to 1983, however, the CPI-U's measurement of shelter costs included changes in the asset value of homes, thereby overstating inflation and understating changes in real incomes, especially in the late 1970's. To provide researchers with a consistent price deflator, the BLS created an experimental price deflator called the CPI-U-X1 which used a rental equivalence approach in the measurement of shelter costs. As a result, this deflator has been used to adjust nominal incomes for inflation in the 1967 to 1990 period; it was extrapolated backward to 1947 by the Census Bureau. The CPI-U-X1 is used throughout the remainder of this overview of income trends.

Figure 1.
Real Median Family Income, Real Median Household Income, and Gini Indexes for Families and Households: 1947 to 1990

Income   Gini index (0.0 to 1.0)

Legend:
- Gini index, Families
- Gini index, Households

Median Family Income

Median Household Income

Years
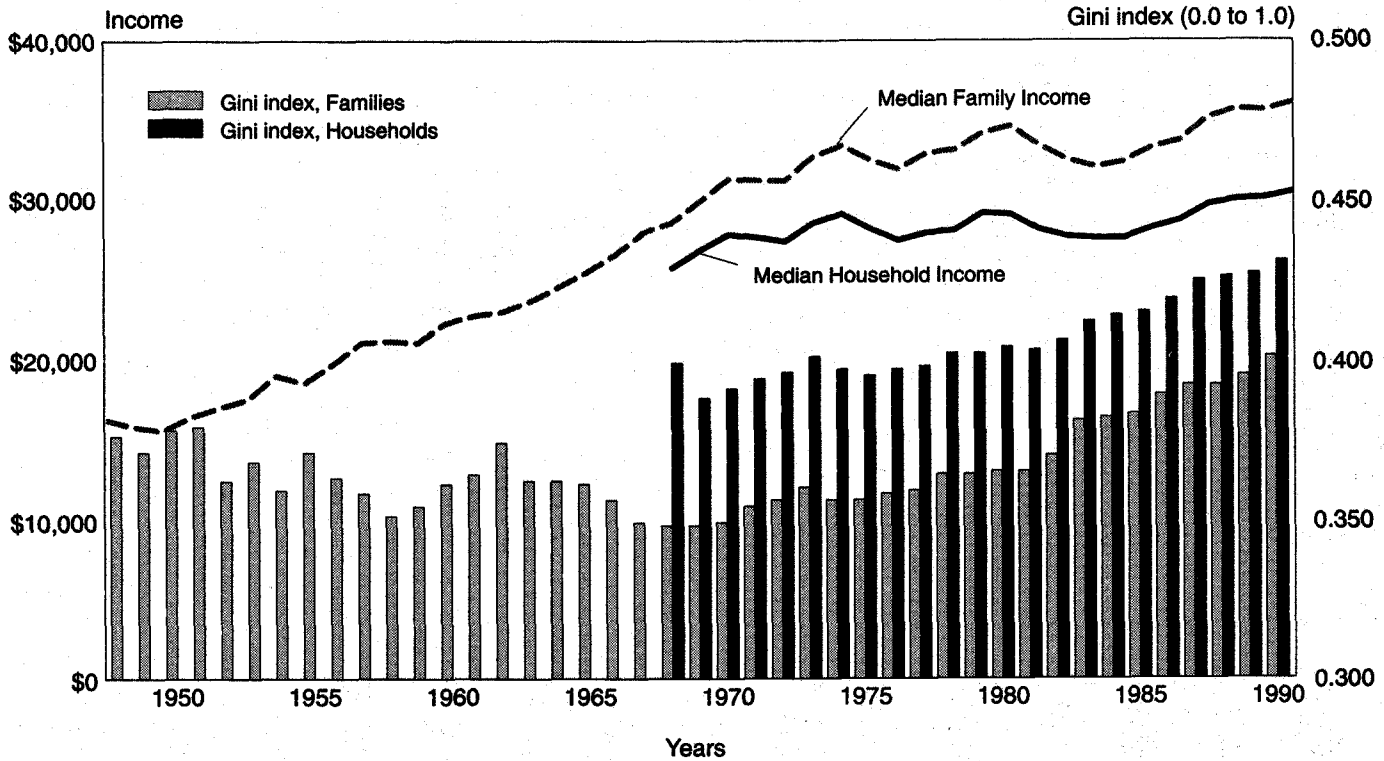
Figure 2.
Real Mean Income of Each Fifth of Households: 1973 to 1990

Income

- Highest fifth
- Fourth fifth
- Third fifth
- Second fifth
- Lowest fifth

Year
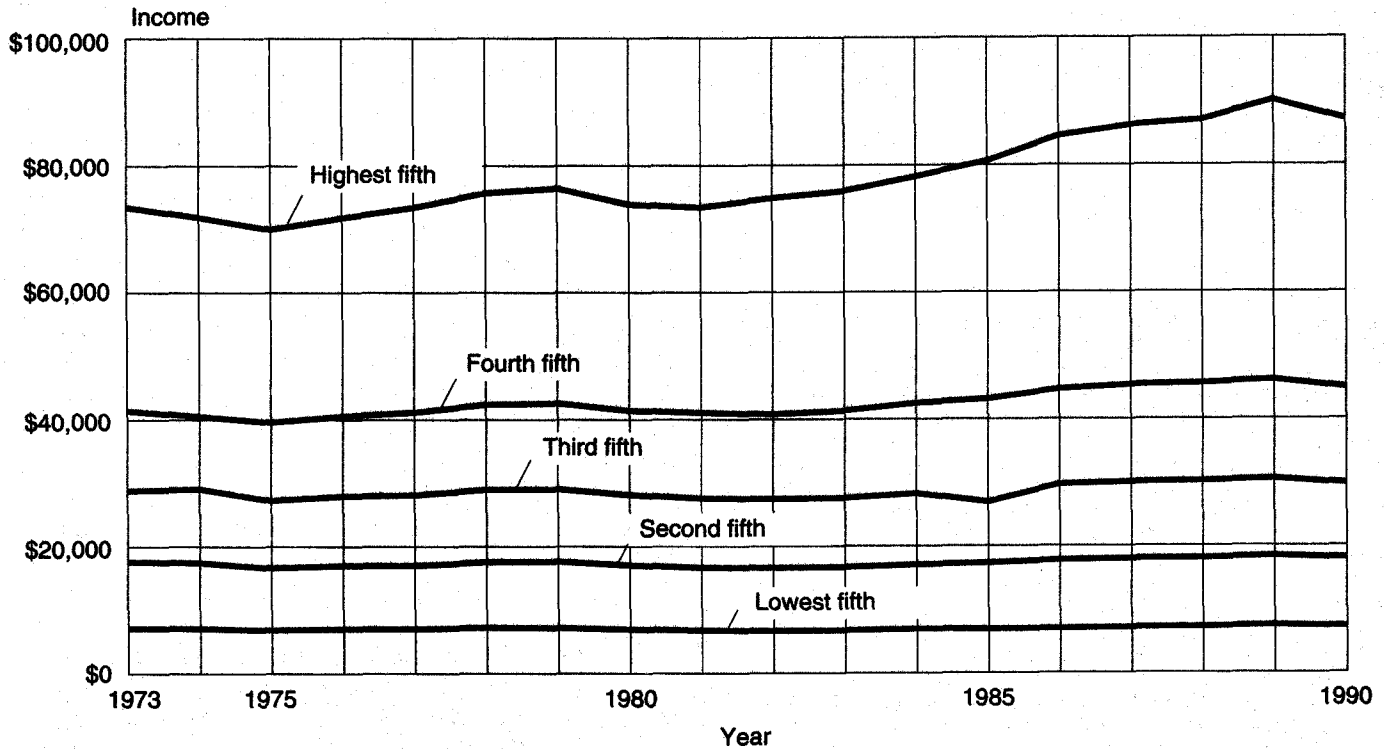
Real median household incomes also appear in figure 1. This statistical series begins in 1967, the first time household income data were available.[4] Median household income is considerably lower than the median for family households, for example, in 1990 the median for households was $29,943 and for families $35,353. This, of course, reflects the large proportion of individuals living alone or unrelated individuals living together that are counted as households. These individuals, on average, have lower incomes than family households, especially married-couple households.

Real median household income between 1973 and 1990 did not grow much and paralleled the trend in incomes of families. Indeed, the median for households increased by only $835 and stood at $29,943 in 1990. Between 1967 and 1973, on the other hand, it increased by almost $3,400—from $25,719 to $29,108. Consequently, the poor income performance observed for family households in the 1973-90 period was also evident among all households.

INCOME INEQUALITY

Several methods can be used to measure the amount of inequality in the income distribution. The Census Bureau uses two of the more common ones, the shares of aggregate income received by equal proportions of households and the Gini index of income concentration.[5] In the shares approach, incomes of households are ranked from lowest to highest and then divided into equal proportions. Typically, the income distribution is divided into fifths or quintiles, but other quantiles could be used such as quartiles (quarters), deciles (tenths), or even ventiles (twentieths).

Table 1 contains the shares of income received by each fifth of households in each year between 1967 and 1990. As is shown there, the share received by the highest fifth of households is nearly 12 times as large as that received by the lowest fifth of households.[6] Moreover, while the share received by the bottom fifth

changed little between 1973 and 1990 (not a statistically significant change), the share received by the highest fifth rose from 43.6 to 46.6 percent. The middle three-fifths, often used to represent the "middle class," experienced a decline in its share from 52.2 to 49.5 percent. Consequently, it was the highest fifth of households that were experiencing the greatest income growth.

This link between differential rates of income growth and rising inequality can be seen more clearly when mean incomes in each quintile are examined over the 1970's and 1980's. As is shown in figure 2, the real mean income of the highest fifth of households increased from $73,438 to $87,137 between 1973 and 1990, or by 19 percent. Real mean incomes grew much slower among the other fifths of households.

The second method for measuring income inequality used by the Census Bureau—the Gini index of income concentration—is related to the shares of income approach. The shares of income received by each fifth of households, or any quantile of households, can be displayed graphically in the form of a Lorenz curve, as is shown in figure 3. The vertical axis of the chart represents the cumulative percentage of aggregate income, while the horizontal axis represents the cumulative percentage of households ranked by income from lowest to highest. The Lorenz curve represents the relationship between the two. In other words, if all households received the same money incomes—perfect equality—the Lorenz curve would be represented by a diagonal emanating from the origin of the chart; if only one household received all the income—perfect inequality—the Lorenz curve would be represented by the horizontal axis and the right hand side of the chart.

Lorenz curves typically fall between the extremes of perfect equality and perfect inequality, as shown in figure 3. (The Lorenz curve depicted is based on the household income distribution existing in 1990 using deciles, or tenths of households.) The Gini index represents the area (A) between the diagonal, or line of perfect equality, and the Lorenz curve, as a percentage of the total area lying beneath the diagonal (A + B). In other words, the Gini index can vary between 0 and 1: therefore, when income inequality rises, the Lorenz curve bows further downward and the area (A) between it and the diagonal increases in size. The result is that the Gini index rises.

Table 1 and figure 1 show the Gini indexes for the household income distribution between the years of 1967 and 1990. Income inequality, as measured by the Gini index, stood at .399 in 1967 and .402 by 1977, a change that was not statistically significant. Thereafter, however, the index began to rise. By 1983, the index was .414, and by 1990 it was .428. Figure 1 also shows the trend in the Gini index for the family income distribution. Between 1947 and 1973, the period when family

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[4]A household is defined as a person or group of persons occupying a housing unit. A family is defined as a group of two or more persons related by birth, marriage, or adoption, and residing together.

[5]In addition to those used by the Census Bureau, measures such as the coefficient of variation, variance of the natural logarithm of incomes, the interquartile range, Theil index, and Atkinson measures of inequality have been used in the literature as well. A recent Census Bureau study also used a "relative income" concept to measure inequality. See John McNeil, U.S. Bureau of the Census, Current Population Reports, Series P-60, No. 177, *Trends in Relative Income: 1964 to 1989,* U.S. Government Printing Office, Washington, D.C., 1991.

[6]As Edgar K. Browning has pointed out, the shares received by each quintile would be different if different definitions of income are used. See Edgar K. Browning, "Inequality and Poverty," *Southern Economic Journal,* Vol. 55, No. 4, April 1989, pp. 819-830. As an illustration of his point, see U.S. Bureau of the Census, Current Population Reports, Series P-60, No. 176-RD, *Measuring the Effect of Benefits and Taxes on Income and Poverty: 1990,* U.S. Government Printing Office, Washington, D.C., 1991.

Table 1. Share of Aggregate Income Received by Each Fifth of Households: 1967 to 1990

Year	Number (thous.)	Percent distribution of aggregate income					Median (1990)	Gini ratio
		Lowest	Second	Third	Fourth	Fifth		
1990	94,312	3.9	9.6	15.9	24.0	46.6	$29,943	.428
1989	93,347	3.8	9.5	15.8	24.0	46.8	30,468	.431
1988	92,830	3.8	9.6	16.0	24.3	46.3	30,079	.427
1987	91,124	3.8	9.6	16.1	24.3	46.2	29,984	.426
1986	89,479	3.8	9.7	16.2	24.3	46.1	29,690	.425
1985	88,458	3.9	9.8	16.2	24.4	45.6	28,688	.419
1984	86,789	4.0	9.9	16.3	24.6	45.2	28,197	.415
1983	85,290	4.0	9.9	16.4	24.6	45.1	27,581	.414
1982	83,918	4.0	10.0	16.5	24.5	45.0	27,577	.412
1981	83,527	4.1	10.1	16.7	24.8	44.4	27,669	.406
1980	82,368	4.2	10.2	16.8	24.8	44.1	28,125	.403
1979	80,776	4.1	10.2	16.8	24.7	44.2	29,074	.404
1978	77,330	4.2	10.2	16.9	24.7	44.1	29,168	.402
1977	76,030	4.2	10.2	16.9	24.7	44.0	28,067	.402
1976	74,142	4.3	10.3	17.0	24.7	43.7	27,913	.398
1975	72,867	4.3	10.4	17.0	24.7	43.6	27,442	.397
1974	71,163	4.3	10.6	17.0	24.6	43.5	28,197	.395
1973	69,859	4.2	10.5	17.1	24.6	43.6	29,108	.397
1972	68,251	4.1	10.5	17.1	24.5	43.9	28,545	.401
1971	66,676	4.1	10.6	17.3	24.5	43.5	27,377	.396
1970	64,778	4.1	10.8	17.4	24.5	43.3	27,640	.394
1969	63,401	4.1	10.9	17.5	24.5	43.0	27,828	.391
1968	62,214	4.2	11.1	17.5	24.4	42.8	26,844	.388
1967	60,813	4.0	10.8	17.3	24.2	43.8	25,719	.399

NOTE: Median household income has been deflated by the CPI-U-X1. See footnote 3.

Figure 3.
Lorenz Curve for U.S. Household Income: 1990
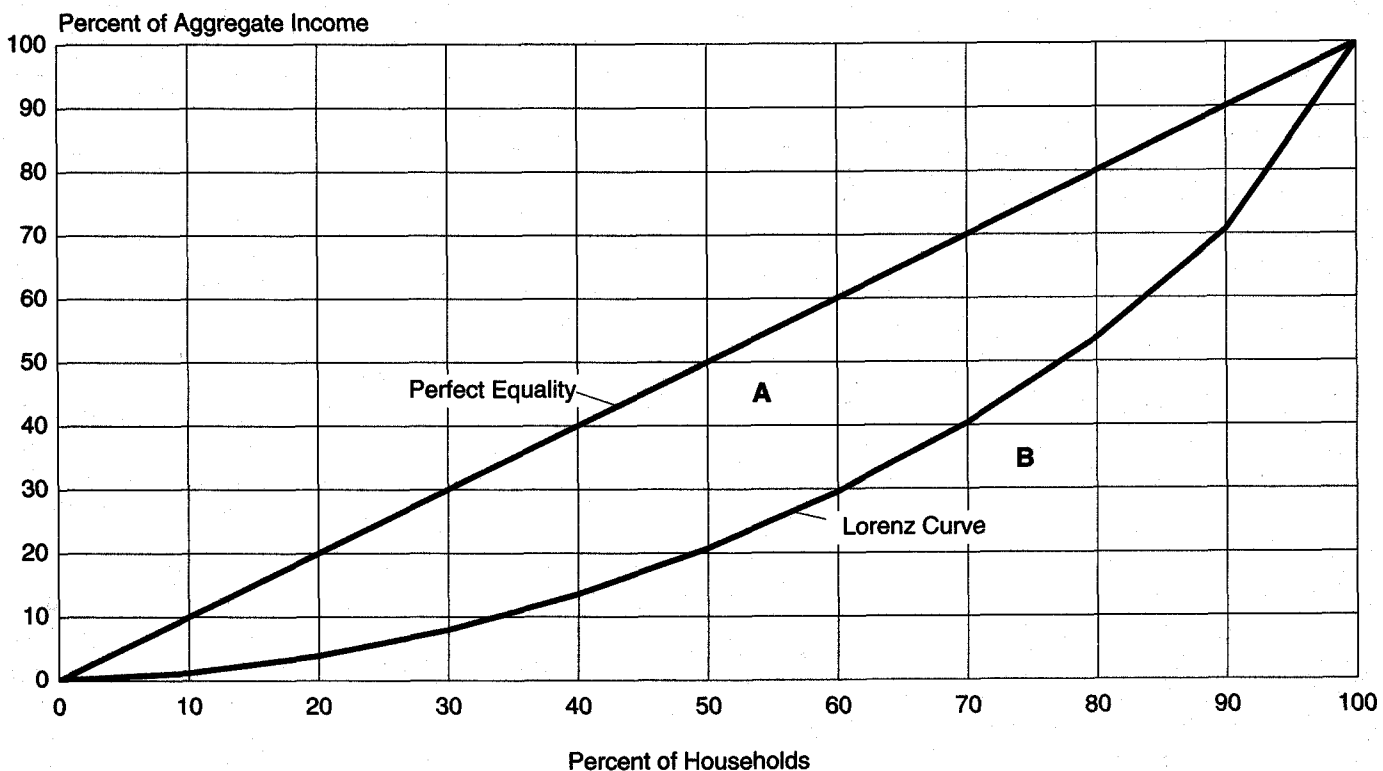
income was rising, inequality, as measured by the Gini index, was fairly stable or declining. In the 1973 to 1990 period, however, when family income grew very little, inequality began to rise.

INCOME INEQUALITY AMONG GROUPS

Growing income inequality in recent years has not been isolated among just one or a few groups. Rather, evidence of greater income differences has been observed among many groups in society to varying degrees. Special income tabulations that were developed for two of the income studies contained in this report, provide some evidence as to how income inequality changed among various groups between 1969, 1979, and 1989.

Figure 4 shows the Gini indexes for four groups of households classified on the basis of the age of the householder. As shown, increases in inequality were particularly sharp among those households in which the householder was under 45 years of age. While the number of households with a householder under 25 were not very numerous (5 million in 1989), the Gini index for this group rose from .316 to .396 between 1969 and 1989, or 25 percent. For those householders age 25 to 44, the Gini index increased from .302 to .374, or 24 percent. (Implied comparisons are not significant.) Inequality also increased among households in which the householder was age 45 to 64, but only by about 11 percent and most of this occurred in the 1980's. And for elderly households, those in which the householder was 65 or over, inequality actually fell between 1969 and 1989.

When inequality is examined by race, increases between 1969 and 1989 are also observed among White and Black households. Figure 5 indicates that the Gini index for White households was up by 10 percent and for Blacks 11 percent (statistical comparisons implied here are not statistically significant). For households of other races the change in the Gini index was not statistically significant.

Growing income inequality was also observed among married-couple households and single-parent households, especially during the 1980's. As shown in figure 6, the Gini index among the former rose from .331 to .368 between 1969 and 1989, or 11 percent, and for single parent families from .410 to .448, or 9 percent. The trend in inequality for nonfamily households reflected that of elderly households.

Gini indexes increased more among those households in which the householder had less than a college education than it did for householders with more education, as is shown in figure 7. The Gini index rose from .381 to .418 over the 20-year period, or by 10 percent, for those with less than a college education.

Among those with some college experience, the Gini index was up by only 6 percent (from .346 to .368) and

for those householders with a college education or more, the Gini index rose by only 5 percent, or from .351 to .370. Both of these changes were not statistically significant.

As has been shown, inequality of incomes has increased across many different groups in society, but the amount, or degree, of increase has also varied. One of the sharper contrasts was found among married-couple households in which the householder was age 25 to 44, and had either a college education or a high school education or less. Figure 8 shows that income inequality in the 1969-89 period, as measured by the Gini index, rose dramatically for those households in which the householder had a high school education or less—from .244 to .298, or 22 percent. In contrast, for those with college educations or more, the Gini index increased by only 6 percent, or from .281 to .297, a change that was not statistically significant. (The comparisons implied here were also not statistically significant.)

The composition of both groups were greatly affected by the maturing of the large baby boom cohort born between the years of 1946 and 1964. Indeed, in 1969 the "baby boomers" were only age 5 to 23 years of age but by 1989 they were age 25 to 43. As was pointed out, for those households in which the householders had high school educations or less, income inequality rose substantially, while for those with college educations the increase in inequality was less dramatic. Incomes also rose much faster for the college educated than for those with high school educations or less. For the college educated, median household incomes increased from $43,255 to $56,654 between 1969 and 1989, or 31 percent; for those with high school educations or less, household incomes rose from $30,560 to $33,026, or by about 8 percent. In other words, both the trend in income and income inequality were quite different and the major distinguishing characteristic between both groups was education.

POSSIBLE CAUSES OF GROWING INCOME INEQUALITY

Growing income inequality has been the subject of much research in recent years. Much of this research has focused on the changes taking place in the Nation's labor market and its wage distribution. This is a reasonable connection since the single largest component of household income is earnings derived from the labor market. According to this research, real earnings growth did indeed slowdown in the 1970's and 1980's relative to earlier decades, and greater dispersion in market earnings occurred.[7] One study showed that for men, the

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[7]The literature in the area of earnings and wage inequality is voluminous. For a sampling of the earlier work in this area see Peter Henle and Paul Ryscavage, "The Distribution of Earned Income Among Men and Women, 1958-1977," *Monthly Labor Review,* April

Figure 4.
Gini Indexes, by Age of Householder: 1969, 1979, and 1989

Gini Index (0.0 to 1.0)
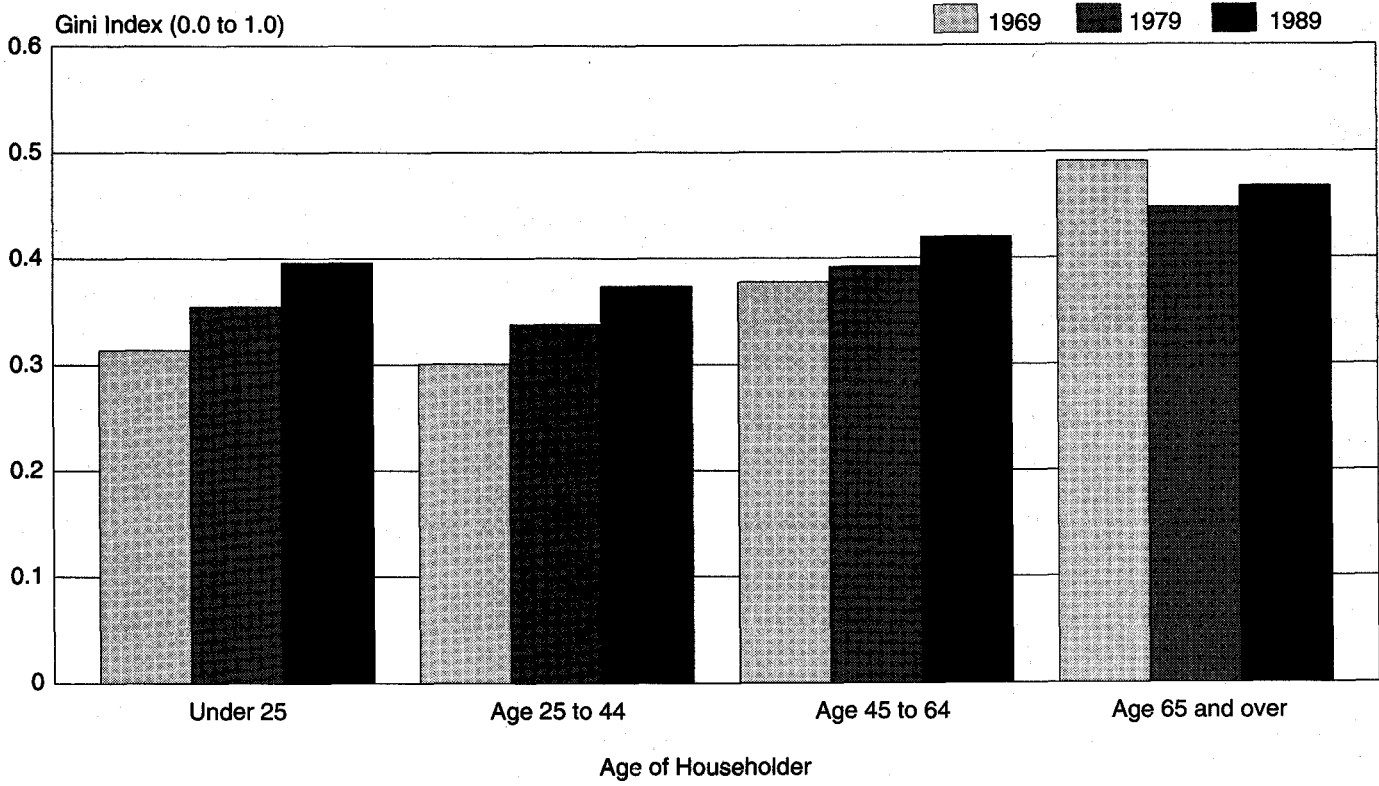
Age of Householder

Figure 5.
Gini Indexes, by Race of Householder: 1969, 1979, and 1989

Gini Index (0.0 to 1.0)

Race of Householder
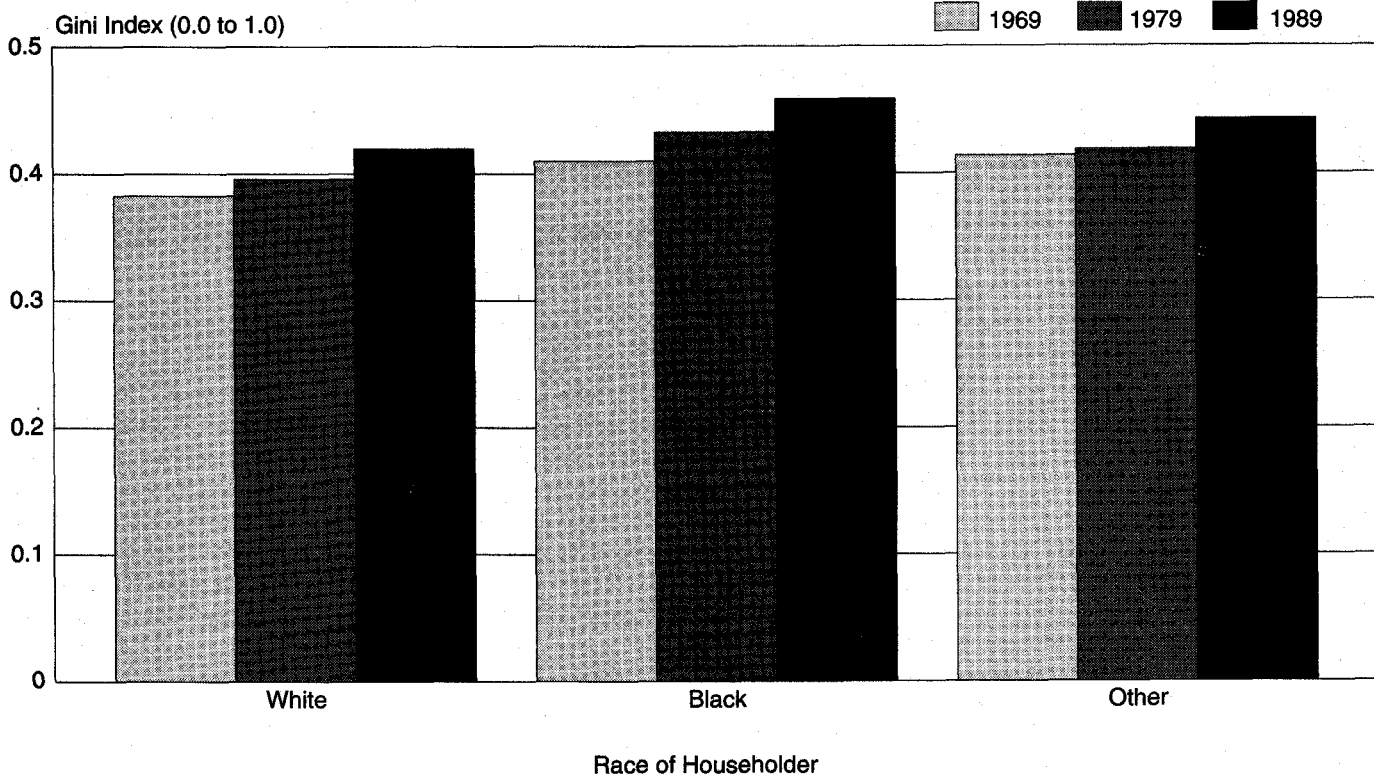
Figure 6.
Gini Indexes, by Type of Household: 1969, 1979, and 1989

Gini Index (0.0 to 1.0)
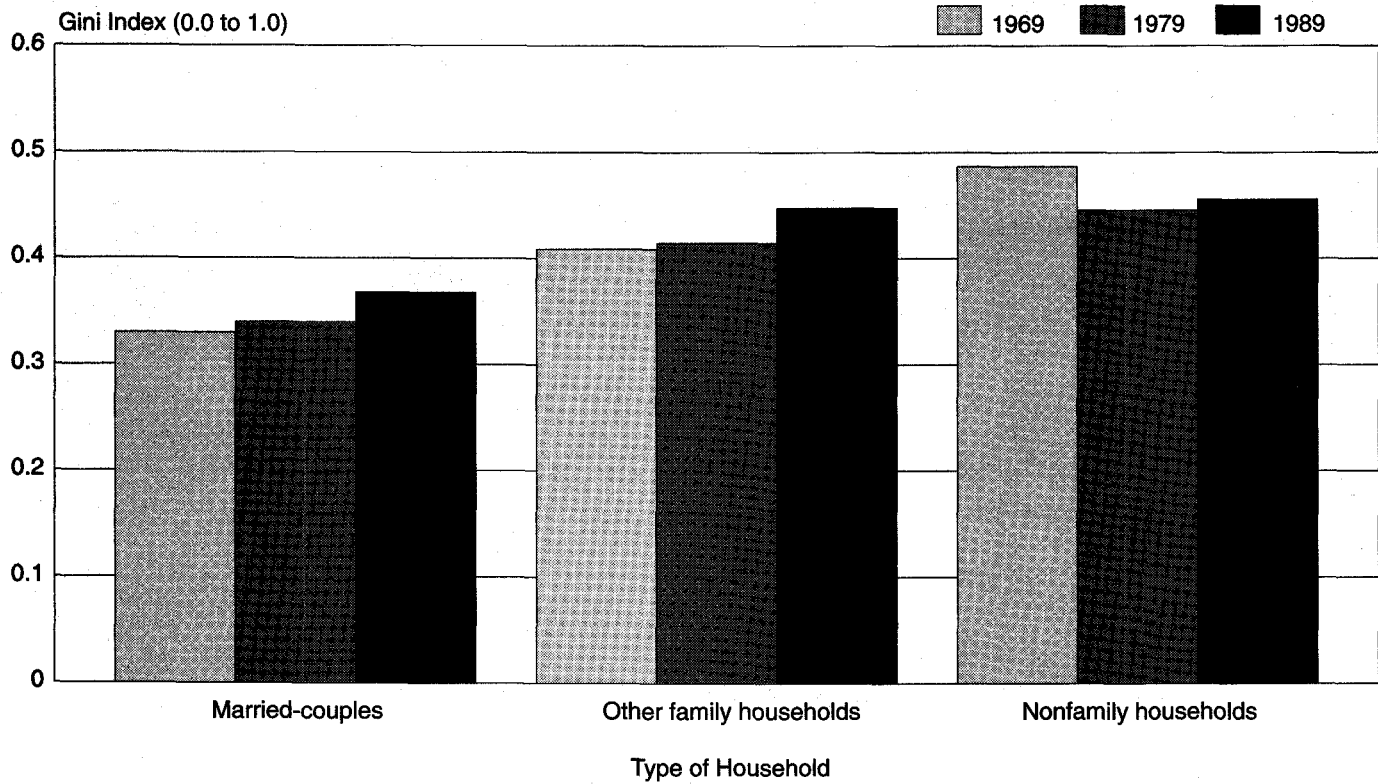
Type of Household

Figure 7.
Gini Indexes, by Education of Householder: 1969, 1979, and 1989

Gini Index (0.0 to 1.0)

Education of Householder
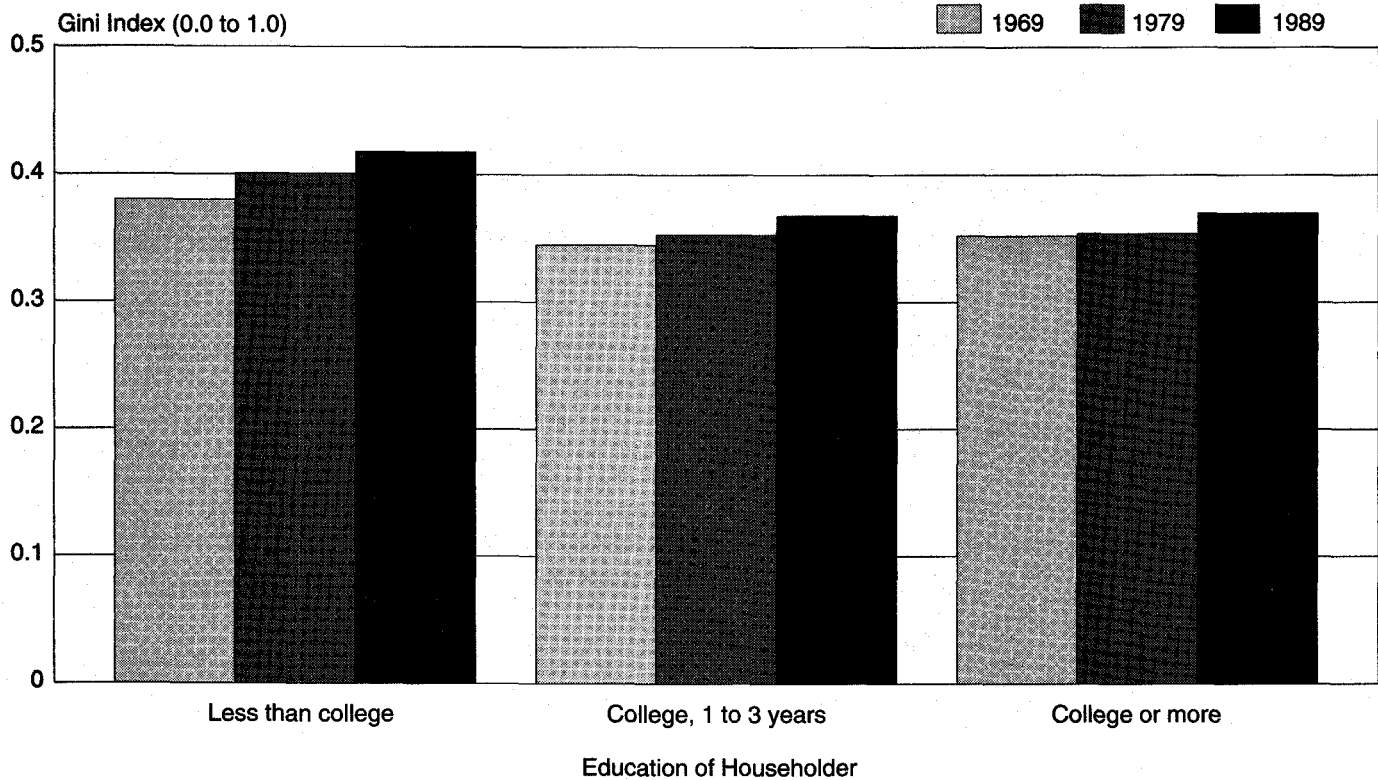
Education represents highest year of school completed.

Figure 8.
Gini Indexes for Married-Couple Households, by Education of Householder: Age 25 to 54

Gini Index (0.0 to 1.0)

▦ 1969 ▨ 1979 ■ 1989

Education of Householder
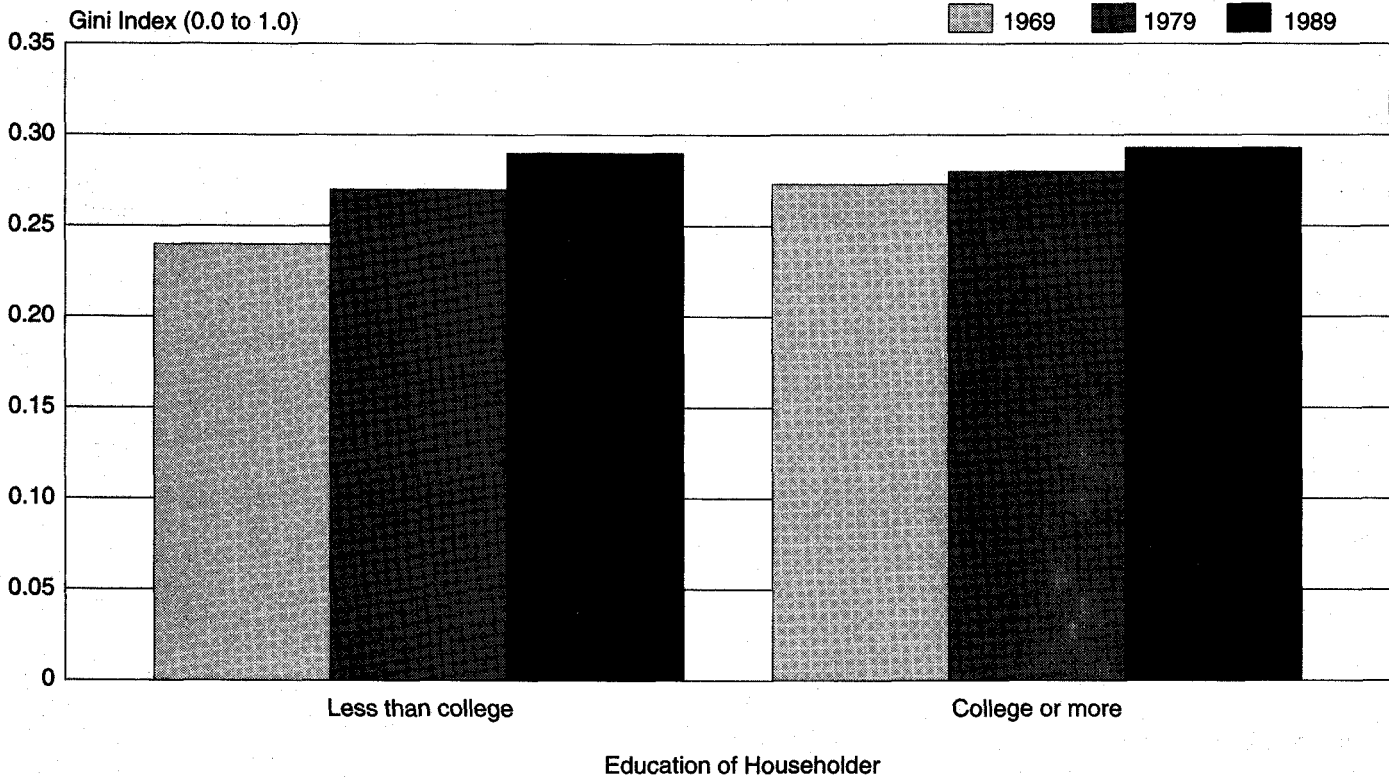
Education represents highest year of school completed.

Gini index rose from .351 to .405 between 1967 and 1987 indicating a 15 percent increase in the inequality of earnings derived from the labor market.[8]

One of the demand-side factors that researchers have thought to be causing greater wage dispersion has been the shift in economic activities away from goods-production to service-production.[9] Industries involved in the production of services typically have been paid lower wages and exhibited a larger amount of variation in their wage structure relative to those industries engaged in the production of goods. It would stand to reason as more and more workers entered the service-producing

industries wage growth would have become slower and the structure of wages more dispersed.

Other researchers have pointed out, however, that greater wage inequality has also been observed over time in the goods-producing industries as well. For example, in manufacturing the Gini index for men who worked full time, year round increased from .247 to .286 between 1978 and 1987.[10] Consequently, additional explanations have emerged.

One of the more popular explanations has focused on the growing gap in the economic returns to well-educated and poorly-educated workers.[11] According to this explanation, during the 1980's employers became more willing to pay wage premiums for highly skilled workers as the supply of these workers began to grow more slowly in that decade. Wages for the less-skilled, on the other hand, changed very little or even declined. A decline in labor demand for these workers, particularly in manufacturing industries, resulted in fewer job opportunities for them at relatively high wages.

1980, pp. 3-10; Martin Dooley and Peter Gottschalk, "Earnings Inequality Among Males in the U.S.: Trends and the Effect of Labor Force Growth," *Journal of Political Economy*, Vol. 92, No. 1, 1984, pp. 59-89; and Barry Bluestone and Bennett Harrison, *The Great American Job Machine: The Proliferation of Low Wage Employment in the U.S. Economy*, Report to the Joint Economic Committee of the U.S. Congress, December 1986.

[8]See Gary Burtless, "Earnings Inequality Over the Business and Demographic Cycle," in Gary Burtless, ed., *A Future of Lousy Jobs?*, Washington, The Brookings Institution, 1990.

[9]See Barry Bluestone and Bennett Harrison in footnote 7. Goods producing industries have traditionally been defined as agriculture, mining, construction, and manufacturing. The service-producing industries have been defined as transportation, communication, and public utilities, wholesale and retail trade, finance, insurance and real estate, business and repair services, personal services, entertainment and recreation services, professional and related services, and public administration.

[10]See Paul Ryscavage and Peter Henle, "Earnings Inequality Accelerates in the 1980's," *Monthly Labor Review,* December 1990, pp. 3-16.

[11]See Chinhui Juhn, Kevin M. Murphy, and Brooks Pierce, "Wage Inequality and the Rise in the Returns to Skill, *The Journal of Political Economy*, (forthcoming).

Immigration patterns and the country's trade deficit of the 1980's may have been related to the growing gap in wages between educational classes of workers.[12] Recent immigrants have been poorly educated and have added to the pool of native born workers with low education levels thereby depressing wages. The trade deficit may have also added to the problem since the Nation's imports embodied a greater proportion of unskilled labor than our exports. In other words, the imports consisted of goods that could have been made by low-skilled workers in this country but instead were made abroad.

Declining unionization, according to some researchers, may have also exacerbated the income inequality picture in recent years.[13] With union influence on wage setting practices diminishing, especially in certain high-paying goods-producing industries, the economic prospects for many less-skilled workers darkened in the 1980's. Such workers have typically received the greatest economic benefits from union membership.

Outside the economic realm, certain social and demographic developments have been associated with rising income inequality. These perhaps represent the linkage between both greater income inequality and greater earnings inequality. While the trend in income inequality is related to the trend in earnings inequality, it is also linked to the number of earners in a household, the amounts of income derived from outside the labor market, and other factors associated with household formation.

Changes in the age structure of the population and changes in household composition have been two noneconomic factors mentioned as affecting growing income inequality. The maturing of the baby boom generation in the 1970's and 1980's, as was discussed earlier, coincided with the growth in inequality, so it has been a logical suspect. Indeed, there was evidence of a growing gap in the incomes between younger and older workers in the 1970's and early 1980's, as the baby boom cohort matured.[14] However, and has been pointed out by a number of researchers, by the mid-1980's the baby boom generation was well into their middle years and income inequality continued to rise. Furthermore, because the baby boom generation spanned so many years, there were offsetting effects associated with its aging, and by the 1990's its overall impact had been neutralized.[15]

The evidence with respect to changes in household composition are more clear cut. Between 1969 and 1989 the proportion of all households that were married-couple households plunged from 70 percent to 56 percent. Taking the place of this traditional type of living arrangement were single-parent family households and nonfamily households, groups in which inequality of incomes is greater than among married couples. Increases in divorce and separations, births out of wedlock, and alternative life-style choices were obviously related to the dramatic change in living arrangements that took place.

The consequences of these changes, when combined with the changes that took place in the labor market during the 1970's and 1980's (i.e., lackluster wage growth), had implications for growing income inequality. On the one hand, a larger and larger proportion of working wives moved into the work force, in many cases to prop up the stagnating earnings of husbands. On the other, a smaller proportion of households had available to them additional persons to enter the labor force. Incomes in single-parent families and nonfamily households are much lower, on average, than those of married couples in which the wife worked. Obviously, the reasons for the recent increases in income inequality in this country are not fully understood. Not only is more research needed in understanding the greater inequality in the distribution of earnings derived from the labor market, but also in understanding the linkages between it and rising income inequality among households. We hope the following studies shed some light on growing earnings and income inequality in the United States.

[12]See Frank Levy and Richard J. Murnane, "Earnings Levels and Earnings Inequality: A Review of Recent Trends and Proposed Explanations," *Journal of Economic Literature* (forthcoming).

[13]See McKinley Blackburn, David E. Bloom, and Richard B. Freeman, "The Declining Economic Position of Less Skilled American Men," in *A Future of Lousy Jobs?*, Gary Burtless, ed., Washington, The Brookings Institution, 1990.

[14]See Frank Levy, *Dollars and Dreams: The Changing American Income Distribution,* New York, Russell Sage Foundation, 1987.

[15]See Paul Ryscavage, Gordon Green, and Edward Welniak, "The Impact of Demographic, Social, and Economic Change on the Distribution of Income," in this report.

THE IMPACT OF DEMOGRAPHIC, SOCIAL, AND ECONOMIC CHANGE ON THE DISTRIBUTION OF INCOME

by Paul Ryscavage, Gordon Green, and Edward Welniak

I. INTRODUCTION

One of the more striking economic developments over the past 20 years has been the growth in income inequality among American households. During this period the percentage of households with incomes below the Federal government's poverty thresholds has also been persistently high. Both developments took place during a time when household incomes, on average, grew very slowly. Between 1969 and 1989, real median household income grew by a meager 2 percent, or from $28,344 to $28,906.[1]

These developments, of course, were in sharp contrast to the trends during the 1950's and 1960's. Incomes rose strongly in the immediate post-World War II era and the increases were spread more evenly throughout the income distribution. Income inequality changed very little, and poverty was dramatically reduced. It is for this reason, therefore, that the income trends over the last two decades have attracted so much attention from so many quarters of society.

At issue, of course, is whether the U.S. economy in recent years has been so transformed by world competition and other developments that it can no longer assure the ever increasing standard of living American households have become accustomed to. This theme has been popularized by a number of writers and economists during the 1980's. For example, Barry Bluestone and Bennett Harrison (1982) argued that "deindustrialization" was impeding the growth of the middle class. Robert Kuttner (1983) and Lester Thurow (1984) speculated about whether the Nation was becoming one of "haves and have nots." And Frank Levy (1987) warned that the increasingly unequal distribution of incomes was creating "an inequality of prospects" for the attainment of the American middle class life style.

One of the common threads running through all of their arguments was the belief that the source of the greater income polarization was the labor market. Economic forces, whether they be low productivity and wage growth, the soaring trade and fiscal deficits, the decline in union membership, and so forth, were all taking their toll on the traditional jobs of the middle class. On the other hand, demographic changes, such as the maturing of the baby boom generation, and social changes, such as changes in living arrangements, were usually given lower importance in the explanation for the growth in income inequality among households.

We believe that the developments occurring in the income distribution, whether they involve income levels, income inequality, or poverty, are the outcomes of a complex assortment of demographic, social, and economic factors. Furthermore, attempting to weight their relative importance suggests some preconception of the complex interrelationships going on among these factors. As is well known, this country's demography, society, and economy underwent profound changes during the 1970's and 1980's. In this paper, therefore, we examine trends in various demographic, social, and economic factors and investigate how they may have both separately and collectively affected our income and poverty measures between 1969 and 1989.

We begin in Section II by discussing some of the more important demographic, social, and economic trends during the last twenty years and their possible effects on income levels, inequality, and poverty. In Section III we present a standardization methodology—a tool of analysis more common among demographers—which allows us to quantify the impact of these factors on income measures. Section IV presents the results of this standardization technique when 1989 incomes of households are standardized for demographic, social, and economic changes taking place over the 1969-89 period and then standardized for demographic, social, and economic changes taking place over the 1979-89 period. The last section of the paper, Section V, outlines the implications of our results for further research into growing income inequality.

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[1]This increase in nominal incomes between 1969 and 1989 was adjusted for inflation by the Consumer Price Index for All Urban Consumers (CPI-U). If it had been adjusted with the experimental Consumer Price Index for All Urban Consumers (CPI-U-X1), the median would have increased by 9.5 percent. All other changes in incomes cited in this paper have been adjusted by the CPI-U-X1.

II. DEMOGRAPHIC, SOCIAL, AND ECONOMIC TRENDS

Trends in seven specific demographic, social, and economic factors and their possible effects on income and poverty measures are discussed in this section. Some of these factors are exogenous, that is, household behavior cannot affect them. Others are endogenous, that is, household members could have some control over them. Other factors might have been included, but given the nature of the methodology and our reading of the literature, the trends in these seven factors reflect the more fundamental changes that have taken place in the country during the 1970's and 1980's.

A. Demographic

Demographic trends in this paper refer specifically to changes in age structure and race of the population and these are considered to be exogenous in the analysis. The age structure might be thought of as endogenous, however, to the extent that people have some control over their fertility levels which in turn affects the age structure. Both age structure and racial composition do not change much in the short run, but over a longer period of time, such as 20 years, their potential effects on income and poverty can be large. Both income and the incidence of poverty, of course, vary substantially by age and race.

Perhaps the most important influence on the age structure during the 1970's and 1980's was the entrance of the baby boom generation into adulthood. Between 1946 and 1964, approximately 75 million babies were born and by 1969 the leading edge of this age cohort had finished their schooling and was entering the labor market (or had already entered). This process would continue throughout the 1970's and not be completed until almost the end of the 1980's. In other words, it was over the last two decades that this unusually large cohort of persons entered the labor force, started households, and, in general, moved on towards middle age.

Many studies have examined the effects of the baby boom generation on relative incomes over the years (e.g., Freeman, 1979). There is a consensus that the baby boom cohort did have lower relative incomes than other cohorts as they entered. Indeed, economic theory would suggest that an exogenous shift in labor supply, such as the maturing of the baby boom, would depress wages. This would also tend to depress income levels and most likely increase poverty rates and income inequality. But such effects, theoretically, should be short-lived as the cohort adjusts through increases in their training and the accumulation of work experience. Consequently, the baby boom's impact on income, poverty, and inequality should have been muted as the cohort aged.

Figure 1 reflects the impact of the baby boom generation on the age structure of households. The proportion of all households with a householder under 45—our dividing line between younger and older households—increased fairly rapidly during the 1970's and then began to slow down in the 1980's.[2] This trend, of course, is not only affected by basic fertility patterns, but also by rates of household formation and dissolution. Nevertheless, it is clear that the most dramatic shift in the age structure of households occurred in the 1970's.

A second demographic variable examined is race. Because of differential fertility patterns, the Black population has been growing faster than the White population.[3] Households with Black householders increased from 9.5 to 11.2 percent of all households, and the increase was relatively constant across the 1969-89 period. Given the generally lower income levels and higher poverty rates for Black households, their trends would have had a negative impact on broad income and poverty measures over time.

B. Social

Two frequently discussed social trends examined are changes in living arrangements (or type of household) and educational attainment. Both are considered to be endogenous since individuals have some control over their choice of marital status and education. Income and poverty status, of course, vary greatly by household type and educational attainment.

The greater incidence of marital disruptions and births out of wedlock, along with the increasing age at first marriage in recent years, has had a profound effect on the living arrangements of society. The Nation's divorce rate climbed steadily from the late 1960's and into the 1970's, only to level off in the 1980's. Births out of wedlock more than doubled as a proportion of all births between 1970 and 1987 (from 10.7 percent in 1970 to 24.5 percent by 1987). And the median age at first marriage for men went from age 22.5 in 1970 to age 25.1 by 1986. The resulting impact on the proportion of all households composed of married couples over these years can be seen in figure 2: In 1969, 70.1 percent of all households were made up of married couples, by 1979 the proportion had dropped to 60.8 percent, and by 1989, it was down to 56.0 percent. Both single parent families and nonfamily households became considerably more common. These compositional changes took place more rapidly in the 1970's rather than the 1980's.

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[2]The householder is the person in whose name the home is owned or rented.

[3]Although the Hispanic population has increased in size as well and their income situation is similar to Blacks, they were not explicitly accounted for in the standardization because data on this group only begin in 1972. While Hispanics may be of any race, most are White.

Figure 1.
**Households With a Householder Age 45 or Younger As a Percentage
of All Households: 1969 to 1989**
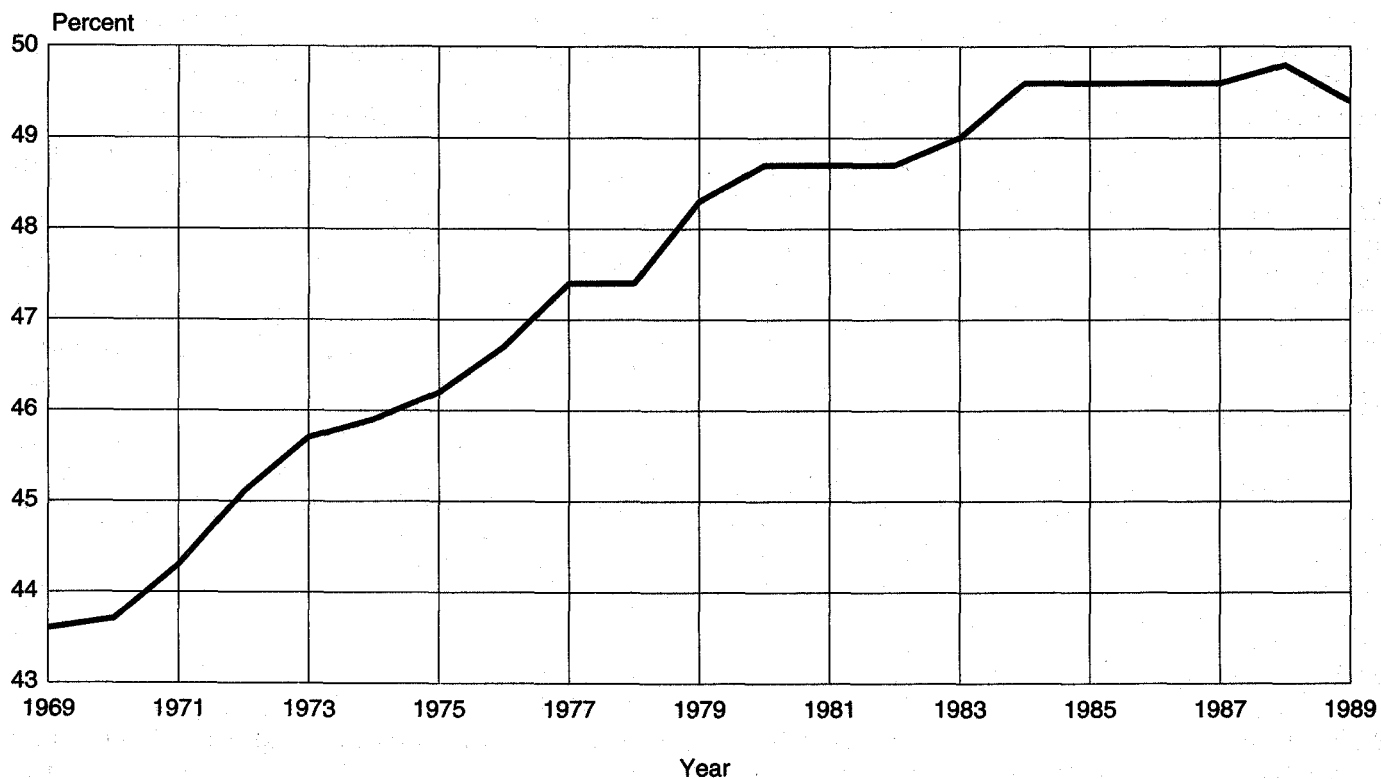
Figure 2.
**Married-Couple Households As a Percentage of All Households:
1969 to 1989**
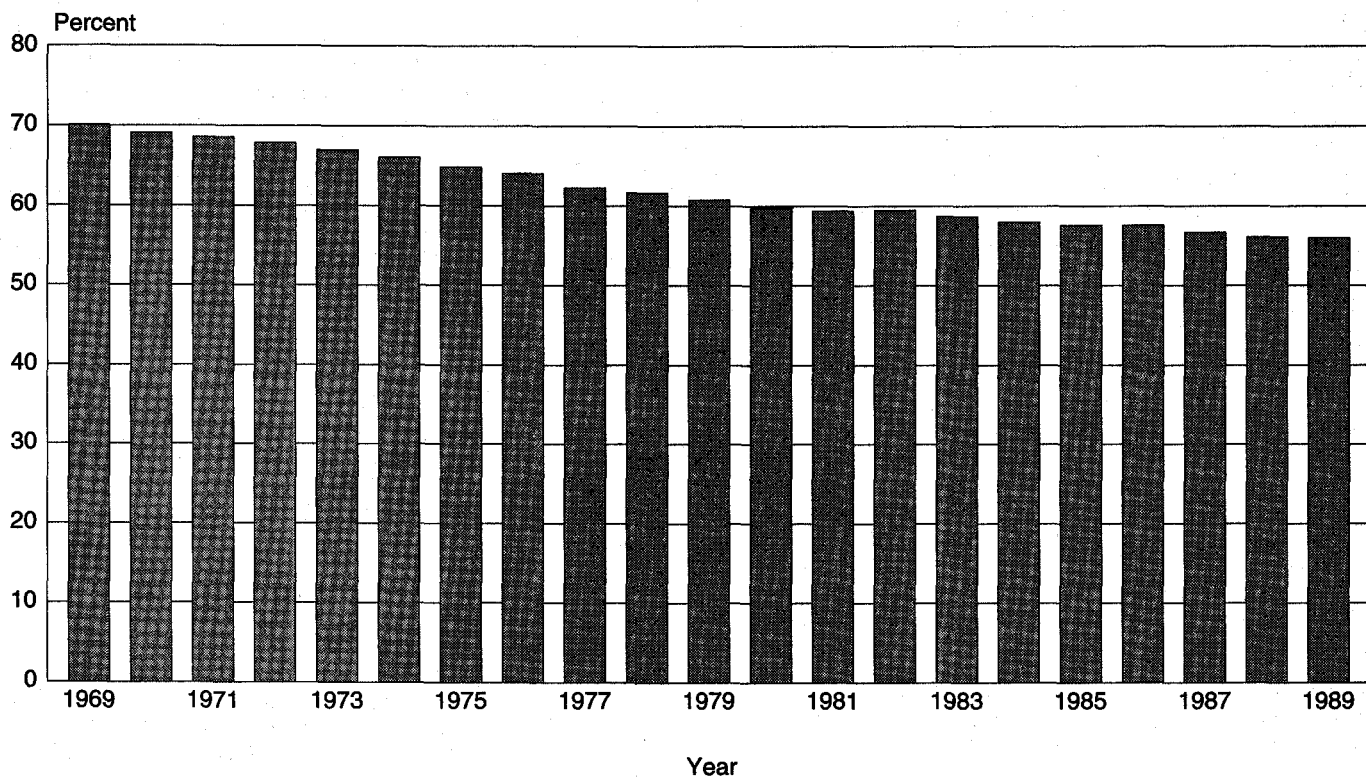
Married-couple households have much higher incomes than other types of households and the impact on income levels and the incidence of poverty is obvious. The declining proportion of married couple households would tend, ceteris paribus, to lower overall income levels and raise the poverty rate.

Educational attainment continued to increase throughout the 1969-89 period as is shown in figure 3. Persons age 25 and over with four or more years of college rose from 10.7 percent in 1969 to 16.4 percent in 1979 and 21.1 percent by 1989. The gain in education, therefore, occurred throughout the 20-year period. This trend is related to the maturing of the baby boom generation.

Increases in the proportion of persons with college educations have raised income levels over time and are consistent with human capital theory. However, and as has been widely reported, returns to education dropped during the 1970's and then increased in the following decade (e.g., Juhn, Murphy, and Pierce, 1989). For example, in 1968 the ratio of mean incomes of male college graduates to males with less than high school educations (age 25 to 34) was 1.38; by 1978 it had dropped to 1.22, but by 1987 it was up to 1.50.

C. Economic

Three economic trends often discussed in the income inequality literature are the work experience of householders, the work experience of wives in married-couple families, and the industry in which workers are employed. Occupation is also discussed, but it is difficult to analyze because of changes in the occupational classification system between 1970 and 1990. Some of the shifts in occupation are certainly related to shifts in industry. Each of these three variables is endogenous to the extent that a choice is made on the part of the individual as to whether or not to work and where to work. On the other hand, economic conditions, geographical considerations, and other barriers to employment may seriously constrain the decision to work and where.

In theoretical terms, the decision to work is based on a person's choice between labor or leisure, and his or her maximization of utility. When an individual's reservation wage—or the lowest wage a worker would accept to give up one hour of leisure—falls below an offer wage, the individual will supply labor. But, of course, many other considerations enter into this process. The presence of other household members, their earning power and need for support, the availability of nonlabor income, working conditions, and so on, all are factored into the labor-leisure choice.

As shown in figure 4, the proportion of householders with some work experience during the reference year has declined slightly over the 1975 to 1989 period. This probably reflects the increase in the proportion of elderly households as well as the increase in the proportion of households headed by women with small children. Householders who work full time (35 hours or more a week) year round (50 to 52 weeks a year) have represented slightly more than half of all householders. The decline in this proportion, especially in the early 1980's, reflects the recessions which took place at that time. Obviously, fluctuations in economic conditions have an impact on income trends and poverty. Burtless (1990), however, has shown that the changing levels of unemployment in the last two decades accounted for only a small part of the increase in earnings inequality in recent years.

The entrance of women into the labor force, especially married women, has been one of the more dramatic labor force developments in the second half of this century. As is shown in figure 5, the proportion of married couples with a wife in the paid labor force increased from 39.3 percent in 1969 to 49.2 percent by 1979 and 57.7 percent by the close of the 1980's. The somewhat slower increase in the 1980's parallels the slightly slower growth in labor force participation of all women.

The impact of working wives on family incomes has been the topic of much research. One of the more recent contributions has concluded that while wives' earnings have become an increasingly important source of family income they have not caused greater income inequality among married couples (Cancian, Danziger, and Gottschalk, 1991). Indeed, wives earnings have been an "equalizing" force on the income distribution of married couples.

The more important question for our purposes, however, is the impact of working wives on the income distribution of all households. As was pointed out earlier, living arrangements have changed dramatically in recent years and between group differences in incomes have widened. For example, the ratio of married couples' median income to the median incomes of families with a female householder has risen from 2.07 to 2.22 between 1969 and 1989. Such differences would tend to increase income inequality. Consequently, the impact of working wives on the household income distribution is important.

The shift in the Nation's industrial structure from a goods-producer to a service-producer has been discussed extensively by Barry Bluestone (1990) and others as a primary factor in the growth of wage inequality, and by implication, greater income inequality. This restructuring, in terms of jobs, has been documented many times and is shown in figure 6. The proportion of all nonagricultural payroll jobs found in the service-producing industries rose from 65.4 percent in 1969 to 76.6 percent twenty years later. This gradual shifting has been alleged to depress income growth and produce greater income inequality because wages tend to be lower in service-producing industries and are more greatly dispersed.

Figure 3.
Percentage of Persons Age 25 and Over That Completed 4 Years of High School or More and Completed 4 Years of College or More: 1969 to 1989

High school
College
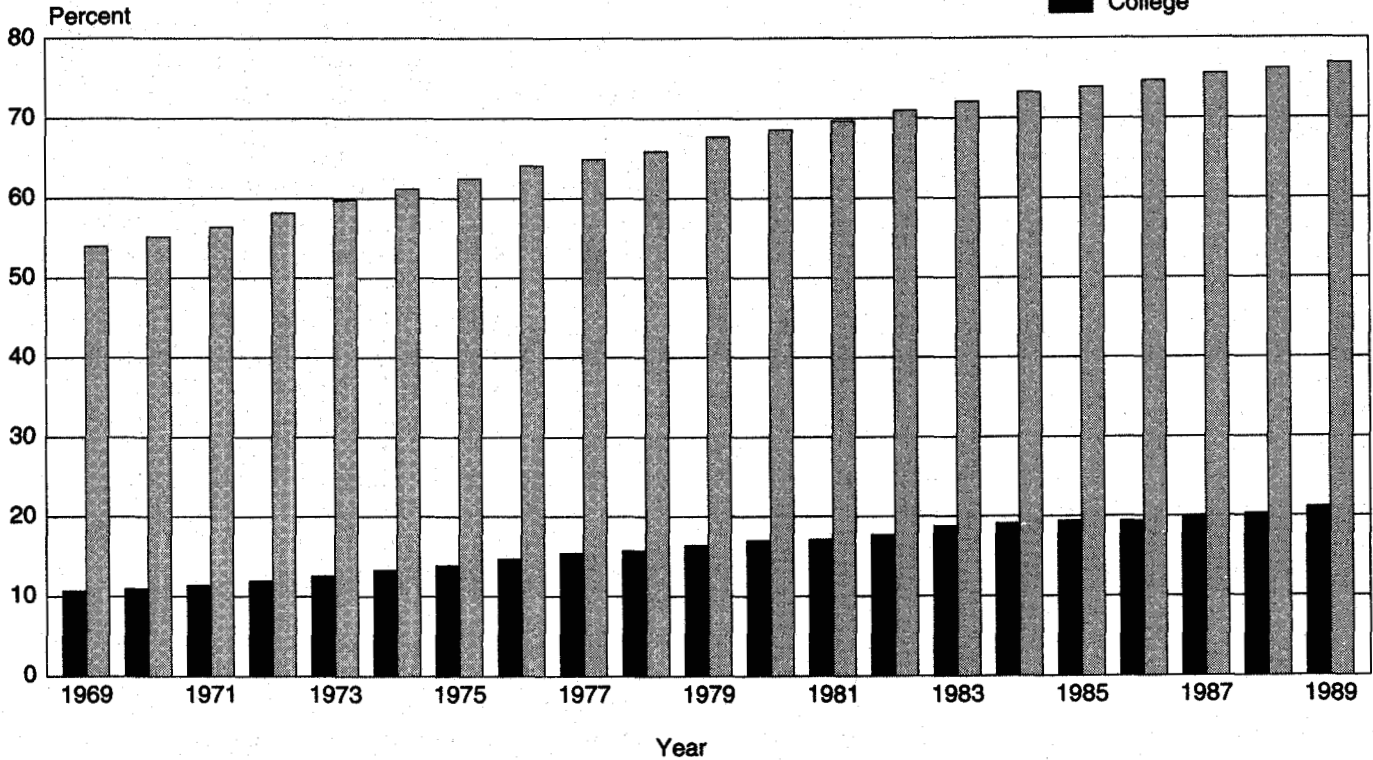
Figure 4.
Percentage of Households in Which the Householder Worked or Did Not Work During the Year: 1975 to 1989

Householders who worked
Householders not working
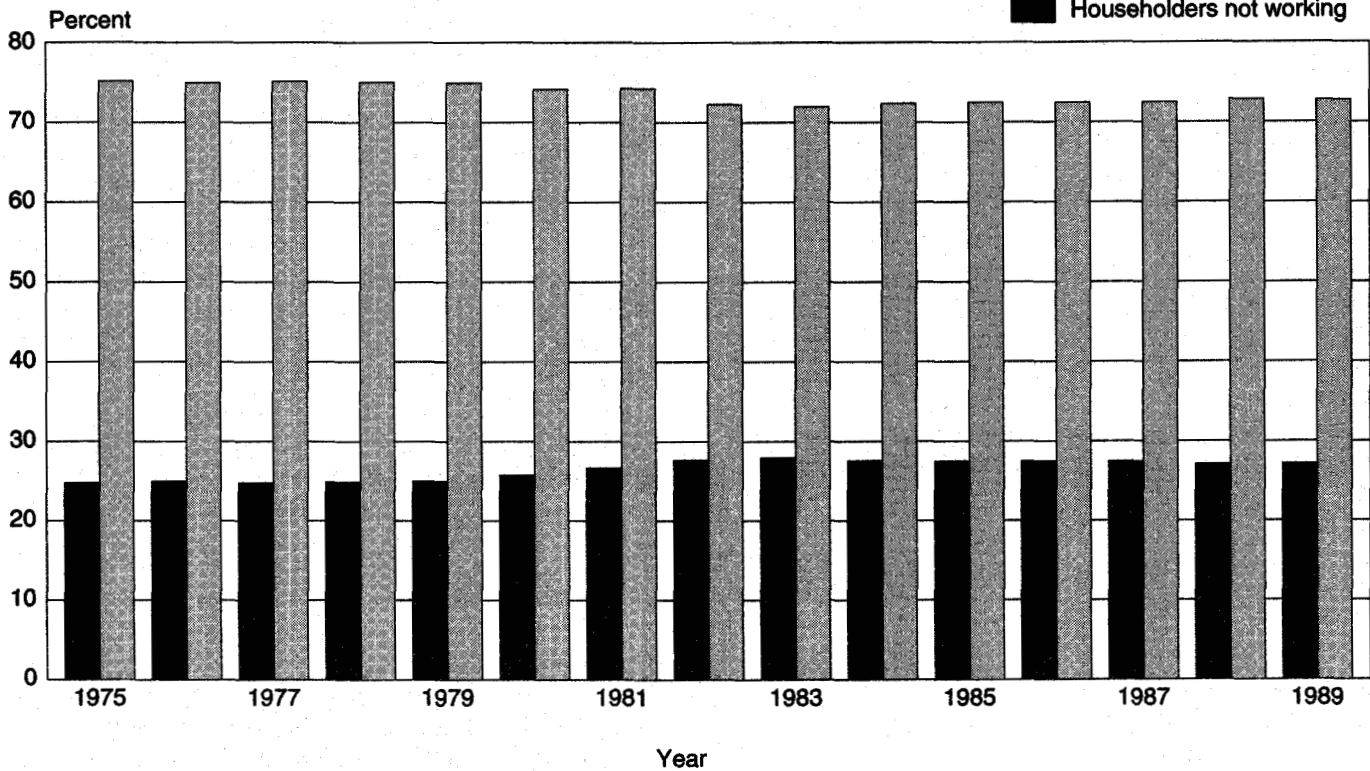
Figure 5.
Percentage of Married-Couple Households in Which Wife Was in Paid Labor Force: 1969 to 1989

Percent

Year
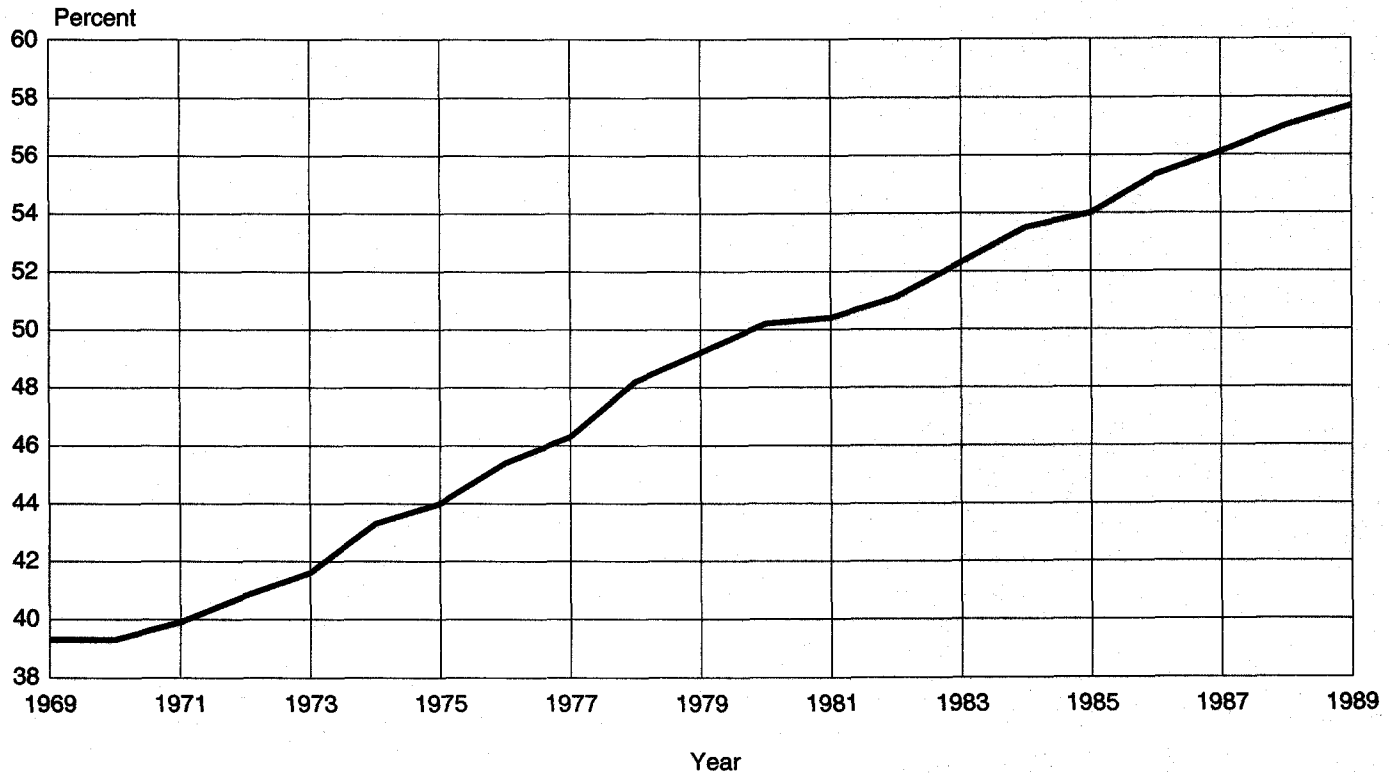
Figure 6.
Percentage of Nonagricultural Payroll Employment in Goods-Producing and Service-Producing Industries: 1969 to 1989

Service-producing
Goods-producing

Percent

Year
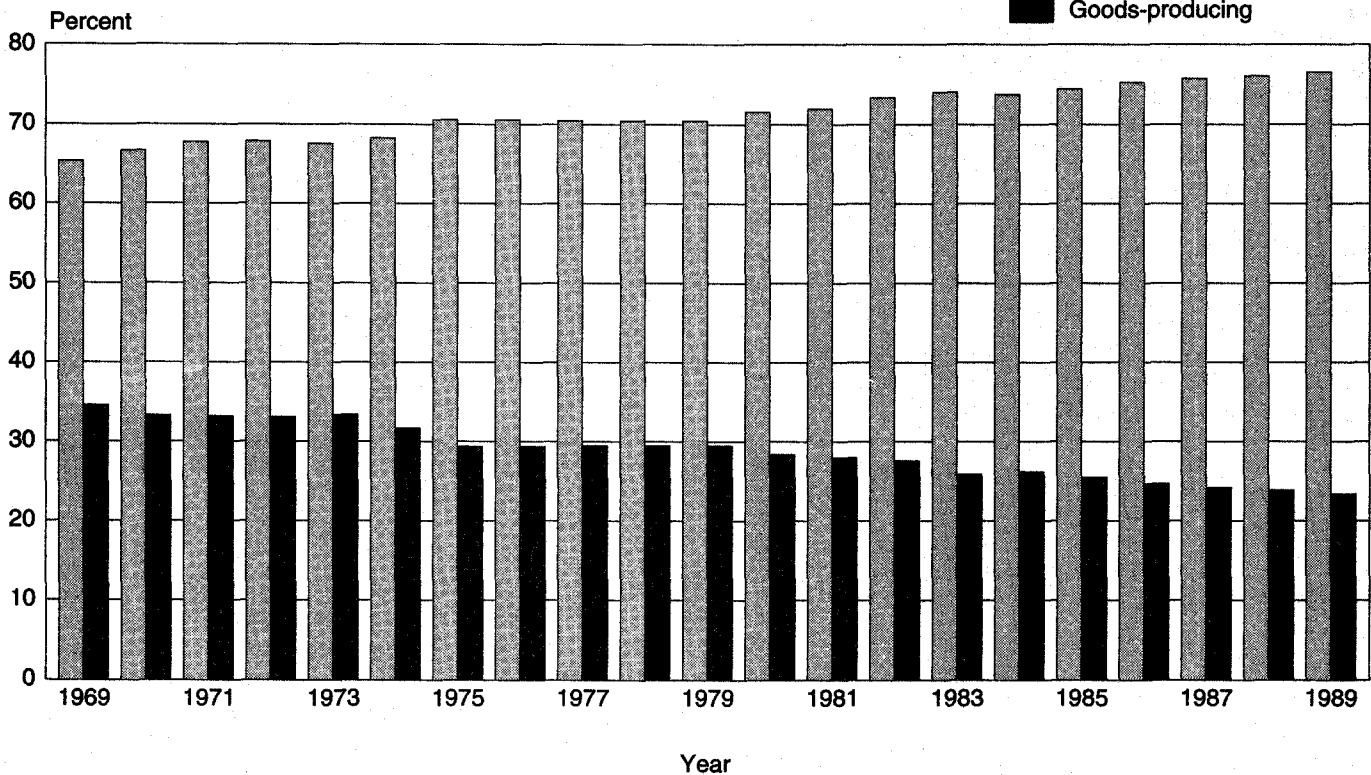
III. A STANDARDIZATION TECHNIQUE

While it is possible to speculate about the possible effects of these demographic, social, and economic trends on income, poverty, and income inequality during the past two decades, a more rigorous approach is required to measure their quantitative importance. A standardization methodology, therefore, has been employed to do just that.[4] Moreover, because some of these trends did not continue at constant rates over the 1970's and 1980's, the methodology has been applied, first, to the entire period from 1969 to 1989 and, second, to just the 1979 to 1989 period. The standardization technique used here, therefore, allows us to address the hypothetical question: What would happen to 1989's income, poverty, and income inequality measures if households had the same set of demographic, social, and economic characteristics that existed in 1969 and in 1979?

The methodology discussed below is presented in the context of the 1969 to 1989 period, but it is identical to that used in the 1979 to 1989 period. Mean household income in 1989 is defined as a weighted average

$$\overline{Y}_{89} = \sum_{i=1}^{n} p_{i89}\, \overline{y}_{i89}$$

where $\overline{Y}_{89}$ is the overall mean income in 1989, p_{i89} is the proportional weight of the ith group in 1989, and $\overline{y}_{i89}$ is its mean income in 1989. Alternatively, we could write the formula for standardized mean income as

$$\overline{Y}^{*}_{89} = \sum_{i=1}^{n} p_{i69}\, \overline{y}_{i89}$$

where p_{i69} is the ith group's proportion of all households in 1969. An equivalent way to write this equation is

$$\overline{Y}^{*}_{89} = \overline{Y}_{69} + \sum_{i=1}^{n} p_{i69}\, \Delta \overline{y}_i$$

where $\overline{Y}_{69}$ is the overall mean income in 1969 and $\Delta \overline{y}_i$ is the change in mean income for the ith group between 1969 and 1989. This is a useful formulation for a later discussion on changes in income between 1969 (or 1979) and 1989. Our standardized mean income, $\overline{Y}^{*}_{89}$, therefore, is similar to a fixed-weighted price index where base period weights, or quantities of goods, are used to weight the current prices of the goods.

Using data files from the March 1970 Current Population Survey (CPS) and March 1990 CPS (and March 1980 CPS for the 1979-89 standardization), sample members who were householders and wives have been categorized into a matrix of demographic, social, and economic characteristics of their households.[5] A matrix of over 5,000 cells was produced (as indicated in appendix A, sparse cells were collapsed). The proportion of persons in each cell for 1970 (and 1980) was divided by the proportion for 1990 thus producing a ratio for each cell in the matrix. In effect, these ratios, or "adjustment factors," reflect the compositional shifts in the characteristics that have taken place over time. The adjustment factors were then multiplied by the sample weight of each sample member falling into a particular cell in the 1990 March CPS. In other words, the 1990 March CPS was reweighted according to the adjustment factors. Consequently, a variety of income measures, such as the mean and median household income, shares of aggregate income by quintile, Gini indexes, and poverty rates could then be derived from the reweighted file.

The sets of demographic, social, and economic household characteristics used to create the matrices are indicated below:

Demographic	Social	Economic
Age	Education	Work Experience, Hhldr.
Under 25	12 years or less	Did not work
25 to 44	1 to 3 yrs., col.	Wkd., FTYR[1]
45 to 64	16 yrs. or more	Less than FTYR[1]
65 and over		
Race	Household Type	Work Experience, Wife
White	Married Couple	Not married couple
Black	Not married couple	Did not work
Other	Nonfamily household	Wkd. FTYR[1]
		Less than FTYR[1]
		Industry
		Did not work
		Goods-producing
		Serv.-producing (1)
		Serv.-producing (2)

[1]Full-time (35 hours or more week), year-round (50 to 52 weeks a year) employment.

Although most of these variables are self-explanatory, the categories of goods-producing and service-producing industries require explanation. The goods-producing industries are composed of agriculture, mining, construction, and manufacturing. Service-producing industries (1) are composed of transportation, communication, and public utilities, wholesale trade, finance, insurance

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[4]Regression analysis, of course, would also allow one to quantify the effects of these demographic, social, and economic factors on these broad income measures. The advantage with the particular standardization approach we use (as will be seen), however, is that an entirely new data file is created which can then be tabulated by any set of characteristics and distributional measures.

[5]Characteristics from the March CPS are as of the survey date, but income statistics refer to amounts received in the previous calendar year. A standardization technique of this kind was used by Green and Welniak (1982) to examine the effects of changing family composition on income differentials. Standardization techniques have also been popular for examining the effects of population changes on the Nation's unemployment rate. For an example of this work see Flaim (1990).

and real estate, public administration, and professional and related services. Service-producing industries (2) are composed of retail trade, personal services, business and repair services, and entertainment and recreation services. Annual earnings tend to be higher in the first service category than in the second, and this is the reason the two groups were treated separately.

The resulting fixed-weight mean income for 1989, by definition, reflects only "noncompositional" changes that have taken place between 1969 (or 1979) and 1989. That is, only incomes have been allowed to change. It is the amount of change in income that would have taken place if the world had stayed as it was in 1969 (and 1979). But, it is not a pure measure of the change that would have occurred because of noncompositional reasons.[6] If the composition of the population actually remained the same as in 1969 (and 1979), for example, this could have affected the supply of workers in different jobs, which could have affected wages if there were not corresponding shifts in demand to offset these trends. Under such circumstances, actual incomes would be different than the ones shown in the fixed weight measure. Such interactions are not accounted for in the standardization procedure used here. This can be shown to be the case when the change in mean household incomes between 1969 (or 1979) and 1989 is decomposed. Thus, in the case of the 1969-89 standardization

$$\overline{Y}_{89} - \overline{Y}_{69} = \sum_{i=1}^{n} p_{i69} \Delta \overline{y}_i + \overline{y}_{i69} \Delta p_i + \Delta \overline{y}_i \Delta p_i$$

where the $\overline{Y}$'s represent mean income in 1969 and 1989, the p_i's represent the proportion of the ith group, the y_i's, the mean income of the same group, and Δ represents the change in either p_i or $\overline{y}_i$ between 1969 and 1989. The change in incomes from 1969 to 1989 (or any years) consists of three components: The first term—the change in income if composition had remained unchanged and incomes for the groups had changed as they did—is the basic component of the fixed weight mean household income; the second is the change that would have taken place if only the composition had changed and incomes remained the same as they were in 1969; and the third is the interaction between changes in composition and changes in incomes. Only if the third term is zero or small can the first term be assumed to be a measure of the change that would have occurred because of noncompositional reasons.[7]

Other limitations involving standardization techniques exist. First, standardizations are inherently static analyses, as the above discussion implies. In a sense, the analysis moves from one equilibrium position to another, without any regard to the dynamics, or process going on between positions. The result is necessarily a partial equilibrium, not a general equilibrium, because the interactions have not been accounted for.

Another limitation concerns the selection of the base year in which the income measures are standardized to, or fixed.[8] Clearly, the choice is arbitrary and results could differ if different years had been selected.

One last limitation is that the selection of characteristics is also arbitrary, even within broad demographic, social, and economic categories. The number of characteristics selected is constrained by the size of the CPS. Although the CPS is a fairly large household survey (approximately 60,000 households), controlling for too many household characteristics would be impractical. It would be possible to control for many more characteristics if data from the decennial census were used instead.

The major advantage of using our standardization technique is that a reweighted data file for 1989 is created which reflects the demographic, social, and economic characteristics of households in both 1969 and 1979. Not only can mean incomes be derived, but other distributional measures as well. In addition, it is possible to isolate the effects of demographic, social, and economic factors, both individually and collectively, on income and poverty measures.

IV. THE RESULTS OF THE STANDARDIZATION

Table 1 shows the actual real median household income levels, shares of aggregate income received by quintiles of the household income distribution, the Gini index, and the poverty rate for households in 1969, 1979, and 1989 (see appendix B for a technical discussion of these measures). As was summarized at the outset, the trends in these data suggest that real income growth over this period was minimal, income inequality had increased, and the incidence of poverty showed very little improvement.

The data presented in Tables 2 to 5 reveal what the income measures would have been in 1989, if the various demographic, social, and economic characteristics of the Nation's households had not changed between 1969 and 1989. Tables 6 to 9 reveal what the situation would have been if these characteristics remained unchanged between 1979 and 1989.

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[6]See Antos, Mellow, and Triplett (1979) for an excellent discussion of this point in the context of a weighted unemployment rate.

[7]The size of the interaction term was estimated and found to be about 14 percent of the size of the first term of the equation, in other words, relatively small.

[8]Aside from the fact that the year 1969 provides a significant amount of time to allow for characteristics to change, another reason exists for selecting 1969. It represents a point in time when significant changes were about to occur in the country: the baby boom generation was on the threshold of adulthood, changes in social behavior were soon to intensify (i.e., divorce, births out of wedlock), and the economy was shortly to enter a period of stagflation.

A. The 1969 to 1989 Period

As is shown in table 2, the changes in the age distribution of householders had a negative effect on the real median household income in 1989. In other words, the median would have been $29,170, or $264 more than it actually was, if the age distribution had not shifted.

This relatively small effect of age on income may appear odd in light of the 75 million or so young persons who came to maturity over this time period. However, it may very well be the case that their movement into adulthood had offsetting effects on this income measure. That is, as the leading edge of the cohort moved into their middle-age years, rising incomes associated with greater work experience and maturity offset the downward pressure of the relatively low incomes of younger members of the cohort. Other writers have also showed that demographics explained little of the increase in income inequality during these years (e.g., Bradbury, 1986).

The more rapid growth in the number of Black households relative to White households also had a small negative effect on overall median household income. In its absence, the median would have reached $29,100 in 1989, or $194 more than the actual median in that year.

Changes in social characteristics of households, specifically, changes in types of households and educational attainment of householders, produced two dramatic effects. However, the effects were in opposite directions. Household compositional changes have frequently been cited as responsible for much of the slower increase in income and growing income inequality. Controlling solely for this factor confirms this point. Real median household income would have been $3,226 more than was officially reported for 1989 if household composition had not changed. By implication this means that the declining proportion of married couple households and rising proportions of single parent families and nonfamily households had a large negative impact on the Nation's median income level in 1989.

On the other hand, continued increases in educational attainment had a positive effect on real median household income over this 20 year period. As is shown in table 2, the standardized median would have only been $25,896 in 1989, $3,010 below the actual median, had not educational attainment continued to increase. The impact of human capital accumulation on the part of householders is clearly demonstrated by this result.

Standardizing for compositional shifts in the economic variables—the work experience of householders, the work experience of wives in married couple families, the industries employing the householders—resulted in substantial negative effects on the median income level between 1969 and 1989. In each instance, median household income would have been much higher—over $30,000— if the shifts had not occurred.

These economic effects appear reasonable for the work experience of householders and the industry of their employment based on the trends in these factors discussed earlier. Proportionally fewer householders over this period were in the paid labor force and the composition of the labor force was shifting towards the lower-paying service industries. For the wives in married couples, however, the result may appear more puzzling and, indeed, counter-intuitive. It would seem that more working wives should increase the median income level, or in other words, have a positive influence on income.

This apparent inconsistency becomes more plausible when one considers the increase in working wives in the context of the shifts that took place in the composition of households. Living arrangements changed dramatically in the 1970's and 1980's, as reflected by the decline in the proportion of married couple families as a percent of all households. Households with working wives in them actually changed very little as a proportion of all households in this period.

When the effect of working wives is examined only in the context of married couple families, the expected positive effect can be observed. If wives had not entered the labor force to the extent they had, the median income of married couples would have only been $35,645, instead of the actual median of $38,664.

Overall, the effect on real median household income of the trends in these seven demographic, social, and economic variables was to retard its growth somewhat. Had these compositional shifts not taken place between 1969 and 1989, the real median household income in 1989 would have been $29,146, or $240 more than the official level.

The effects of the changes on the income shares received by each quintile, the Gini index, and the poverty rate are presented in Tables 3 to 5. After standardizing only for changes in the age distribution, the shares of income received by each fifth of households are virtually the same as they actually were in 1989. The one small exception is the effect of age on the share of income going to the highest fifth. It would have become 47.0 percent compared to the actual level of 46.7 percent (table 3), and this accounts for the fact that income inequality, as measured by the Gini index, would have been even greater in 1989 than it actually-was (table 4). The changing age distribution, however, had no effect on the poverty rate (table 5).

The shifting racial composition of households had very little impact on the shares of income received by each fifth of households as well as the degree of inequality in the income distribution. It did, however, (and as might be expected) tend to push the overall

Table 1.Various Measures of the Household Income Distribution, 1969, 1979, and 1989

(Incomes in 1989 dollars)

Measure	1989	1979	1969
Total households (in thous.)...	93,347	80,776	63,401
Median household income	$28,906	$28,115	$28,344
Share of income received by (in percent):			
Lowest fifth	3.8	4.1	4.1
Second fifth...	9.6	10.2	10.9
Third fifth	15.9	16.8	17.5
Fourth fifth..	24.0	24.7	24.5
Highest fifth..	46.7	44.2	43.0
Gini index..	.429	.404	.391
Poverty rate (in percent)..	12.2	12.0	14.1

Table 2. Effect on 1989 Median Household Income of Standardizing for Demographic, Social, and Economic Changes Between 1969 and 1989

(1989 incomes standardized to 1970 composition, in 1989 dollars)

Standardizing variable	1989 median income		Absolute difference (actual-standardized)
	Actual	Standardized	
ALL VARIABLES	$28,906	$29,146	-$240
Age..	28,906	29,170	-264
Race..	28,906	29,100	-194
Type of household.	28,906	32,132	-3,226
Education...	28,906	25,896	3,010
Work experience of household head	28,906	30.469	-1,563
Work experience of wife.....................................	28,906	30,124	-1,218
Industry shifts	28,906	30,669	-1,763

Table 3. Effect on Shares of Income (in percent) Received by Each Fifth of Households in 1989 of Standardizing for Demographic, Social, and Economic Changes Between 1969 and 1989

(1989 incomes standardized to 1970 composition)

Standardizing variable	Total fifth	Lowest fifth	Second fifth	Third fifth	Fourth fifth	Highest fifth
Actual 1989 shares.........................	100.0	3.8	9.6	15.9	24.0	46.7
After standardizing:						
ALL VARIABLES..........................	100.0	4.3	10.2	16.3	23.8	45.3
Age.....................................	100.0	3.8	9.5	15.8	23.9	47.0
Race....................................	100.0	3.9	9.6	15.9	24.0	46.6
Type of household	100.0	4.2	10.2	16.3	23.9	45.4
Education	100.0	3.8	9.4	15.9	24.2	46.7
Work exper. of head......................	100.0	4.1	9.9	16.1	23.9	46.0
Work exper. of wife......................	100.0	4.2	9.9	15.9	23.6	46.3
Industry of head.........................	100.0	4.1	10.1	16.2	23.9	45.6

poverty rate higher in 1989 than it would have been (12.2 vs. 11.8 percent). Black households, of course, are disproportionately represented among all poor households.

The mixed effects of household compositional shifts and educational shifts are clearly seen in the data. With respect to the influence of changing living arrangements, Tables 3 and 4 show that income inequality would have been much lower had not these shifts taken place. The lowest fifth of households would have received

a bigger part of aggregate income and the highest fifth would have received much less. The Gini index would have only risen to .411 instead of the .429 that it actually did reach. In addition, table 5 indicates that the poverty rate would have risen much less over the 20 year period—it would have reached only 10.1 percent instead of 12.2 percent.

As was indicated above, the increase in education among householders, on the other hand, had a very strong positive effect on income growth. With respect to

income inequality, as reflected by the income shares and the Gini index, it appears that the trend had very little impact. The same level of inequality would prevail if the education distribution of householders were the same in 1989 as it was in 1969. In terms, of poverty, however, the education effect is very apparent as it was in terms of income levels. As shown in table 5, the poverty rate, standardized for educational changes, would have been 14.2 instead of the actual 12.2 percent.

All three economic variables tended to exacerbate the trend toward greater income inequality. In each instance—the work experience of the householder, the work experience of the wife, and the industrial attachment of the householder—the share of income received by the lowest quintile of households would have been higher and the share received by the highest quintile would have been lower had not these shifts taken place (table 3). Moreover, the Gini index, instead of .429 in 1989, would have been .419 if there had been no change in the work experience of householders, .420 if there had been no change in the work experience of working wives, and .415 if there had been no change in the industrial attachment of the householders (table 4). (It should be pointed out, however, that in the context of married couples only, the effect of the work experience of working wives did have an "equalizing effect" on the married couples' income distribution, as others have shown (Cancian, Danziger, and Gottschalk, 1991). The Gini index for married couple families would have risen to .384 instead of the .368 level that it actually reached.) Table 5 also shows that these three economic variables also had a fairly strong impact on the poverty rates, in that, in each case, the incidence of poverty would not have risen to the extent that it did in 1989.

When all of these demographic, social, and economic factors are combined, it can be shown that over this 20 year period they had a profound impact on the income distribution. As shown in table 3, the share of income received by the lowest fifth of households would have been 4.3 percent compared to the 3.8 percent that was actually received; the share received by the highest fifth would have only been 45.3 percent compared to the actual 46.7 percent. The Gini index would have increased only half as much as it did—from .391 to .410, instead of .429 (table 4). And the poverty rate would have fallen to 11.7 percent instead of 12.2 percent (table 5).

B. The 1979 to 1989 Period

As was mentioned earlier, some of the demographic, social, and economic trends between 1969 and 1989 did not occur at constant rates over this period. The rise in the proportion of householders age 45 or younger began to slow down or level off in the 1980's, the

decline in the proportion of households that were married couple households appeared to ease in the 1980's, and the increase in the proportion of working wives in married couple households was a little slower in the 1980's relative to the 1970's. Such slowdowns in the "rates of change" of these trends suggest that the standardization exercise be applied to the decade of the 1980's.

Table 6 shows that, indeed, the effects of the trends on income were different in the 1980's then over the entire 20 year period. Indeed, the effect of the changing age distribution in the 1980's now had a positive influence on real median household income. In other words, a significant proportion of the baby boom generation had now moved well into their middle years, years in which household incomes begin to rise. Median household income would have been nearly $300 less than it actually was had not the age distribution changed. On the other hand, the effect of race continued to exert a small negative effect on income in the 1980's as it had in the 1969-89 period.

The impact of changing living arrangements continued to have a negative influence on median household income in the 1980's, but not to the same extent it did over the 20-year period. Median income would have been nearly $1,200 higher if the shifts away from married couple households had come to a halt. Education continued to have a strong positive influence on the income trend—the median income level would have been almost $1,500 lower had not this trend continued in the 1980's. In fact, while changing household composition had the largest effect of all seven factors studied in the 1969-89 period, education had the largest single impact in the 1979-89 period.

Among the economic factors, both changes in the work experience of the householder and changes in the work experience of the wife were much less important influences on the overall trend in household income. However, of continuing importance was the shift in the industrial attachment of the householder. It continued to have a negative influence and the median household income level would have been $744 higher than it actually was had householders remained in the same industries they were employed in 1979.

On balance then, the positive influences of education and age were sufficient to offset the continued negative influences of changes in living arrangements and industrial attachment of householders. Overall, the changes in demography, society, and the economy in the 1980's, as reflected in the trends under examination, were operating in a favorable direction as far as the median household income level was concerned. Real median household income would have been $881 lower in 1989 had not these changes occurred.

Examination of the income shares and Gini indexes in Tables 7 and 8, respectively, shows what impact the demographic, social, and economic trends had on income

Table 4. Effect on 1989 Gini Index of Standardizing for Demographic, Social, and Economic Changes Between 1969 and 1989

(1989 incomes standardized to 1970 composition)

Standardizing variable	1989 Gini index		Absolute difference (actual - standardized)
	Actual	Standardized	
ALL VARIABLES	.429	.410	.019
Age	.429	.432	−.003
Race...	.429	.427	.002
Type of household...	.429	.411	.018
Education..	.429	.430	−.001
Work exper. of householder.................................	.429	.419	.010
Work exper. of wife	.429	.420	.009
Industry of householder	.429	.415	.014

Table 5. Effect on 1989 Poverty Rate (in percent) of Standardizing for Demographic, Social, and Economic Changes Between 1969 and 1989

(1989 incomes standardized to 1970 composition)

Standardizing variable	1989 poverty rate		Absolute difference (actual - standardized)
	Actual	Standardized	
ALL VARIABLES	12.2	11.7	0.5
Age	12.2	12.2	-
Race...	12.2	11.8	0.4
Type of household...	12.2	10.1	2.1
Education..	12.2	14.2	−2.0
Work exper. of householder.................................	12.2	11.1	1.1
Work exper. of wife	12.2	10.8	1.4
Industry of householder	12.2	10.9	1.3

Table 6. Effect on 1989 Median Household Income of Standardizing for Demographic, Social, and Economic Changes Between 1979 and 1989

(1989 incomes standardized to 1980 composition, in 1989 dollars)

Standardizing variable	1989 median income		Absolute difference (actual - standardized)
	Actual	Standardized	
ALL VARIABLES	$28,906	$28,025	$881
Age	28,906	28,618	288
Race...	28,906	28,990	−84
Type of household...	28,906	30,059	−1,153
Education..	28,906	27,422	1,484
Work exper. of householder.................................	28,906	28,859	47
Work exper. of wife	28,906	28,987	−81
Industry of householder	28,906	29,650	−744

inequality after standardizing. On first glance, income shares do not seem to have been very much affected. However, shares that would have prevailed had not changes in household composition and industrial attachment occurred do appear to be more equally distributed then is the case for other trends. Indeed, table 8 indicates that the Gini indexes would have only reached .424 in both cases, instead of the actual .429 in 1989.

Nevertheless, when all the trends are accounted for in the standardization, the degree of income inequality would not have been much different than actually resulted in 1989. The Gini index in 1989, after standardizing would have been .426 compared to .429. In other words, collectively, these factors appeared to have had little effect on the overall trend toward growing income inequality in the 1980's. As we have seen, in the 1969-89 period, however, they accounted for roughly half of the increase in the Gini index.

Table 9 presents the effect on the poverty rate after standardizing 1989 incomes for demographic, social, and economic changes that took place during the 1980's. As was shown earlier, these changes had a positive effect on the trend in real median household income in that decade, or in other words, had not the changes taken place, median income would have been lower than it actually was. It follows, therefore, that the poverty rate would have been higher had not these changes taken place. Indeed, the overall poverty rate would have reached 12.7 percent instead of the actual 12.2 percent. Both the favorable shifts in the age distribution and the educational distribution were sufficiently powerful enough to offset the unfavorable shifts in living arrangements and the industry employment of the householders.

V. IMPLICATIONS

One of the major findings of this research is quite evident: the changes taking place in the seven demographic, social, and economic factors examined had a much different impact on income trends over the entire 1969-89 period than they did over the 1979-89 period. In the first instance, they tended to retard income growth and increase the poverty rate, while generating more income inequality. In the second instance, they tended to promote income growth, reduce the poverty rate, and have a relatively benign effect on income inequality. The major implication of this finding is that it was in the 1970's that changes in the characteristics of households had their most "unfavorable" impact on income trends and the shape of the income distribution.

Other implications, however, flow from the findings. As was indicated, during the 1969-89 period changes in living arrangements and changes in economic characteristics of the households had the greatest negative influence on income trends. But even in the 1979-89 period, when the overall effect of all the factors was positive, changes in living arrangements and changes in the industrial attachment of the householder were exerting a downward pressure on income trends and exacerbating income inequality and poverty. Median household income would have been higher and the Gini index and poverty rate would have been lower if these specific changes had not occurred. In other words, these findings provide useful "signposts" as to what areas should be further investigated in explaining changes in broad income measures.

Another implication of the findings is that education has a strong positive influence on income trends and poverty rates. This was the case in both the 1969-89 period and 1979-89 period. In fact, increases in the educational attainment of householders (along with changes in the age distribution) were powerful enough in the 1980's to offset the negative influences of changes in household compositions and the industrial attachments of householders.[9]

Last, the effect of the changes in the age distribution, specifically, the maturing of the baby boom generation, was shown to exert both negative and positive effects on income trends. For the entire 1969-89 period, a relatively small negative effect was observed on the median income of households. In the 1979-89 period, on the other hand, the effect was in the positive direction reflecting the aging—and rising income levels —of this large cohort. By implication, this suggests that the baby boom generation had a significant negative impact on income trends in the 1970's.

The results of these standardization exercises also suggest that more research is needed to understand the causes of rising income inequality in the 1980's. The standardization for the 1969-89 period accounted for about half of the increase in the Gini index over these two decades, while the standardization for the 1979-89 period could account for much less. In the latter case, evidence was found that changes in household compositions and in the industrial attachment of householders may be contributing to the increase, but the evidence was indirect at best. Consequently, these two factors, their interrelationship, and other aspects associated with the choice of industrial employment and living arrangements require further investigation.

Standardization exercises, such as this one, are only first approximations as to the possible effects of particular demographic, social, and economic factors on broad income measures. This is inherent in the nature of

[9]The powerful effect of education was also observed when the original standardization exercise for the 1969-89 period was repeated, but after excluding the education variable. As was shown in table 2, after standardizing the incomes for the seven factors, median household income would have been $29,146 in 1989 compared to the actual $28,906 estimate, or $240 more. When the education variable is excluded, or in other words, letting its effect on income be felt, the standardized median would rise to $31,123, or $2,217 more.

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Table 7. Effect on Shares of Income (in percent) Received by Each Fifth of Households in 1989 of Standardizing for Demographic, Social, and Economic Changes Between 1979 and 1989

(1989 incomes standardized to 1980 composition)

Standardizing variable	Total fifth	Lowest fifth	Second fifth	Third fifth	Fourth fifth	Highest fifth
Actual 1989 shares..........................	100.0	3.8	9.6	15.9	24.0	46.7
After standradizing:						
ALL VARIABLES.........................	100.0	3.9	9.7	15.9	23.9	46.5
Age..	100.0	3.8	9.5	15.8	24.0	46.9
Race.......................................	100.0	3.9	9.6	15.9	24.0	46.7
Type of household	100.0	4.0	9.8	16.0	24.0	46.3
Education	100.0	3.8	9.5	15.9	24.1	46.7
Work exper. of householder	100.0	3.9	9.6	15.9	24.0	46.7
Work exper. of wife........................	100.0	4.0	9.7	15.9	23.8	46.7
Industry of householder.....................	100.0	3.9	9.8	16.0	24.0	46.3

Table 8. Effect on 1989 Gini Index of Standardizing for Demographic, Social, and Economic Changes Between 1979 and 1989

(1989 incomes standardized to 1980 composition)

Standardizing variable	1989 Gini index		Absolute difference (actual - standardized)
	Actual	Standardized	
ALL VARIABLES	.429	.426	.003
Age..	.429	.431	-.002
Race.......................................	.429	.428	.001
Type of household............................	.429	.424	.005
Education....................................	.429	.430	-.001
Work exper. of householder....................	.429	.429	-
Work exper. of wife	.429	.427	.002
Industry of householder	.429	.424	.005

Table 9. Effect on 1989 Poverty Rate (in percent) of Standardizing for Demographic, Social, and Economic Changes Between 1979 and 1989

(1989 incomes standardized to 1980 composition)

Standardizing variable	1989 poverty rate		Absolute difference (actual - standardized)
	Actual	Standardized	
ALL VARIABLES	12.2	12.7	-0.5
Age..	12.2	12.5	-0.3
Race.......................................	12.2	12.0	0.2
Type of household............................	12.2	11.4	0.8
Education....................................	12.2	13.0	-0.8
Work exper. of householder....................	12.2	12.2	-
Work exper. of wife	12.2	11.9	0.3
Industry of householder	12.2	11.7	0.5

the methodology. The methodology may not be sufficiently sensitive to the interaction of compositional and noncompositional shifts. For example, other changes taking place in the country, such as, changes in computer technology, international trade, and employment in trade-sensitive industries, are not easily accommodated in a standardization methodology. More rigorous procedures are required for refining these first approximations and uncovering the causes of growing income inequality. Such procedures permit a more detailed specification of economic behavior (which would include those captured in the interaction term of a standardization). Decomposing a Theil or Atkinson inequality index into various behavioral characteristics might be a useful next step in untangling effects.

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APPENDIX A. STANDARDIZATION METHODOLOGY

The standardization technique used in this paper involved adjusting sample weights on a current microdata set to reflect past demographic, social, and economic characteristics of households. Weighting adjustment factors are merely ratios derived by comparing past characteristics of households to current ones. The basis of adjustment for this paper is the March 1990, March 1980, and the March 1970 Current Population Surveys(CPS) microdata sets.

Weighting adjustment factors were derived from the set of demographic, social and economic variables shown in table A-1.

Table A-1. **Variables Used to Classify Households**[1]

Variable	Definition
Demographic:	
Age	Under 25 years
	25 to 44 years
	45 to 64 years
	65 years and over
Race	White
	Black
	Other
Social:	
Education	Less than college
	1 to 3 years college
	4 or more years college
Household type	Married-couple households
	Other family households
	Nonfamily households
Economic:	
Work experience (householder)	Did not work
	Year-round, full-time
	Other work experience
Work experience (wife)	Not a wife
	Did not work
	Year-round, full-time
	Other work experience
Industry	Did not work [2]
	Goods producing [2]
	Service sector1 [3]
	Service sector 2 [4]

[1]Age, race, education, and industry variables are characteristics of the householder. In married-couple households, the husband was always designated the householder.

[2]Goods producing industries include: agriculture, forestry, fisheries, mining, construction, and manufacturing.

[3]Service sector 1 industries include: transportation, communication, public utilities, wholesale trade, finance, insurance, real estate, professional and related services, and public administration.

[4]Service sector 2 industries include: retail trade, business and repair services, personal services, and entertainment and recreation services.

These variables, when cross-classified with each other, produce a 5,184 cell matrix into which all households from the March 1990 CPS, March 1980 CPS, and the March 1970 CPS were categorized and tallied. These weighted tallies were used to compute weighting adjustment factors that were applied to the March 1990 CPS microdata. The adjustment factors (in the context of the March 1970 and March 1990 CPS) can be expressed as

$$F_i = \frac{P_{i70}}{P_{i90}}$$

where

$$P_i = \frac{t_i}{T} \quad \text{and} \quad T = \sum_{i=1}^{5184} t_i$$

for each of the years. t is the number of households in cell i. T is the total number of households for all cells in the matrix. P is the proportion derived by dividing t by T. F is the adjustment factor derived by dividing P_{i70} by P_{i90}. The adjustment factors are then applied to weights on the March 1990 CPS.

It is important to realize that not all of the 5,184 cells of the matrix necessarily contain any data. In fact, only 1,156 cells contained one or more sample cases in either year. Table A-2 shows the number of cells containing data for each of the classification variables individually and in combination. (Usable cells in the standardization using the March 1980 CPS and March 1990 CPS were of about the same magnitude.)

Table A-2. **Total and Usable Cells for Classification Variables**

Variable	Total cells	Usable cells
Economic	48	36
Social	9	9
Demographic	12	12
Economic-Social	432	133
Economic-Demographic	576	372
Social-Demographic	108	107
Economic-Social-Demographic	5,184	1,156

Cells not containing any observations were either unlikely combinations or in some cases, impossible ones. For example, in the economic variables, householders or wives who did not work obviously could not be assigned to a particular industry. The variables were

classified in the manner selected in order to be able to assign all households to each group in a mutually exclusive and exhaustive way.

To reduce the impact of high sampling variability in some of the more sparse cells of the matrix, a count of the number of sample cases within each cell was kept and only cells with 5 or more sample cases in both years were used to compute a weighting adjustment factor. Cells with fewer than 5 sample cases in either year were given a factor derived by collapsing the detail used to define the cell. The process of collapsing continued until a factor could be derived based on 5 or more sample cases. Although none of the demographic and social variables needed to be collapsed, about 23 percent of the economic variables were collapsed (approximately the same proportion were collapsed in the 1979-89 standardization). Additional collapsing was done for combinations of these variables that did not have at least five sample cases in both years.

APPENDIX B. INCOME MEASURES

Household Income. Income summary measures presented in this paper are limited to money income before payments of Federal, State, local, or Social Security taxes and before any other types of deductions, such as union dues and Medicare premiums. Total money income is the sum of the amounts received by all member of the housing unit age 15 years and over. Income sources include: wages and salaries, self-employment income, Social Security, Supplemental Security income, public assistance, interest, dividends, rent, royalties, estates or trusts, Veterans' payments, unemployment and workers' compensations, private and government retirement and disability pensions, alimony, child support and any other source of money income which are regularly received. Capital gains (or losses) and lump-sum or one-time payments such as life insurance settlements are excluded.

Median income. The median income is the amount which divides the income distribution into two equal groups, one having income above the median, and the other having incomes below the median. All medians in this paper were derived from grouped data using linear interpolation. The income intervals used were $2,500 groupings beginning with under $2,500 and ending with an interval of $100,000 and over.

Gini ratio. The Gini ratio (or index of income concentration) is a statistical measure of income equality ranging from 0 to 1. A measure of 0 indicates prefect equality, i.e., all households having equal shares of income; a measure of 1 indicates perfect inequality, i.e., one household has all the income and the rest have none. Thus, higher levels of the Gini ratio indicate higher levels of income inequality. The Gini ratio is derived by calculating the ratio of the area between a Lorenz curve and a diagonal to the area below the diagonal. As shown in figure 1, the Gini ratio can be expressed as:

$$G = \frac{A}{A+B} = \frac{\text{area between Lorenz curve and diagonal}}{\text{area under diagonal}}$$

Lorenz Curve

Percent of Aggregate Income

Percent of Households

All Gini ratios presented in this paper were derived from grouped data. Basically, data in $2,500 intervals were interpolated to produce 100 percentile groupings. Mean incomes were then estimated for each percentile by either linear or Pareto interpolation. From these data, a Lorenz curve was developed and the area below the curve was estimated using trapezoidal approximation.

Income shares. Income shares are ratios of aggregate income for selected groups to the overall aggregate income of all groups and expressed as percentages. For this paper income shares are presented by income quintile. Quintiles are derived by ranking households by income and then dividing them into five groups with each group containing 20 percent of households. Aggregate income is then calculated for each of the five groups and expressed as a percentage of the total population aggregate income. All income shares presented in this paper were derived from grouped data.

Poverty definition. Official poverty estimates are based on money incomes of families and unrelated individuals.

Families and unrelated individuals are considered to be in poverty if their annual incomes fall below Federally established poverty thresholds. Weighted average poverty thresholds are displayed in table B-1.

Table B-1. **Weighted Average Poverty Thresholds in 1989**

Size of family unit	Threshold
One person (unrelated individual)	$6,311
Two persons..................................	8,076
Three persons	9,885
Four persons	12,675
Five persons.................................	14,990
Six persons..................................	16,921
Seven persons...............................	19,162
Eight persons	21,328
Nine persons or more.........................	25,480

Poverty estimates in this paper are not official. Currently, no official poverty definition for households exists. The poverty definition presented in this paper is an adaptation of the current official poverty definition applied to the household concept. The poverty status of a household was determined by the poverty status of the primary family or primary unrelated individual residing in the housing unit. Furthermore, the poverty status of the primary family or individual for the year 1969 and 1979 was determined by applying current criteria for poverty instead of the criteria in place at that earlier time. This involved the use of a condensed set of poverty thresholds currently in place and deflating them to a 1969 and 1979 standard of living level as measured by the Consumer Price Index for All Urban Consumers (CPI-U, 1982-84 = 100).

FACTORS AFFECTING BLACK-WHITE INCOME DIFFERENTIALS: A DECOMPOSITION

by Gordon Green, Paul Ryscavage, and Edward Welniak

I. INTRODUCTION

Real incomes of American households during the last two decades grew much slower than in the 25 or so years immediately following World War II. The consequences of this slowdown have been associated with a variety of economic developments in recent years. These range from concerns over the economic problems of the young and unskilled to more general ones about the prospects for the American standard of living. Another area of concern has been the economic status of Black Americans.

Blacks made great economic progress over the last fifty years, but the rate of progress slowed in the 1970's and 1980's. According to Smith and Welch (1986), the Black-White family income ratio rose from 41 percent in 1940 to 61 percent by 1970, but thereafter hardly changed at all. Indeed, the poverty rate for Blacks in 1989 was about three times as great as that for Whites, much as it was twenty years earlier. Evidence of this faltering progress was documented in the recent report of the National Academy of Sciences on the social and economic status of Blacks (Jaynes and Williams, Jr., 1990). And one economist has recently suggested that by some indicators, Blacks may have even lost ground in recent years (Aaron, 1990).

The slowdown in the rate of economic improvement of Blacks has been difficult to explain. But there is a belief it is related to the complex assortment of economic, social, and demographic changes that took place in the country over the last 20 years. Economic activity in this period was punctuated by periods of recession, inflation, and recovery, all at a time when profound changes were taking place in the Nation's industrial structure and labor market. Household living arrangements changed dramatically, partly in response to increases in divorce, separations, and births out of wedlock. And the baby boom generation, born between the years of 1946 and 1964, moved into adulthood, placing an added strain on the country's social structure.

Untangling these changes and then assessing their importance for the economic situation of Blacks is a formidable task. Analytical models have yet to be developed which capture the complexity of the interactions among these demographic, social, and economic changes. Researchers have had to rely on more indirect methods and apply them to aspects of the Black situation. The literature, consequently, contains numerous studies about the influence of the labor market or welfare system or family situation on the economic status of Blacks.

Despite the formidability of the task, we believe it is possible to provide some "evidence", in a very broad sense, as to what factors may be responsible for the slower economic improvement of Blacks in recent years. In this paper, we use a standardization procedure to identify those demographic, social, and economic factors that may have influenced the Black-White income ratio, and other income measures, over the 1969-89 period. Although such techniques are mechanical by nature, they are useful for approximating the effects of compositional changes on economic measures, as Sawhill (1988) points out. The evidence we present, therefore, may be helpful to researchers in the development of more appropriate models for understanding the dynamic process of economic change among Blacks.

In Section II of the paper, recent trends in the Black-White income ratio are presented as well as trends in demographic, social, and economic characteristics of Blacks and Whites that may have affected their income levels and poverty rates. The standardization methodology used in the analysis is presented in Section III. The results from two standardization exercises and their impact on the Black-White income differential and other measures are analyzed in Section IV: First, those obtained from standardizing 1989 incomes of Blacks and Whites for certain household characteristics as they existed in 1969; and second, standardizing 1989 Black household incomes by certain characteristics of White households as they existed in 1989. Section V of the paper contains a summary of the findings and the directions for further research we believe they suggest.

II. FACTORS AFFECTING INCOMES IN BLACK AND WHITE HOUSEHOLDS, 1969-89

Black-White income differentials, or ratios, have been used widely in the literature as measures of the economic gap separating the races (e.g., Gwartney, 1970).

A variety of these income ratios can be calculated from the income statistics of the March Current Population Surveys (CPS) over the post-World War II period.

Figure 1 shows the Black-White income ratio for all households and married couple households in the 1969-89 period. Clearly, the ratio for all households has changed very little over the last two decades, hovering around the .60 mark. This trend stands in sharp contrast to that based on income of Black and White "families" in the 1947-69 period, which is not shown; it increased from .51 to .63 reflecting the relatively faster growth in the incomes of Blacks and other races.[1]

The ratio for all households does not reveal the differences in income ratios that exist on the basis of household and family type. For example, the differential for married-couple families is much higher than it is for all families. And more importantly for our purposes, the trend in the Black-White income ratio for married-couples, as depicted in figure 1, has improved during the 1970's and 1980's. Real median family income among Black married couples increased by 33 percent (from $23,066 to $30,650), but for White married-couples the increase was about 22 percent (from $32,231 to $39,208).[2] This development, as well as others, has prompted researchers over the years to include noneconomic factors, along with economic factors, in their attempts to explain the slowdown in the economic progress of Blacks.

The following discussion, therefore, reviews some of the more important demographic and social—as well as economic trends—that may have affected Black and White incomes and the income ratio over the last 20 years or so. The first to be examined is a demographic factor, specifically the age structure of Blacks and Whites. It is well known that Blacks have higher fertility and mortality rates, and shorter life expectations. As a result, their population is younger on average than the White population (in 1988 the median age of Blacks was 27.5 compared to 33.3 for Whites). In addition, a "baby boom" among Blacks occurred in the years after World War II just as it did among Whites.

As a consequence of these demographic changes, both Black and White households during the 1969-89 period experienced an increase in the proportion of persons who were householders under age 45.[3] For Blacks, the proportion of householders under 45 in 1969 was 49 percent and by 1979 it had risen to 53 percent. For Whites, the comparable proportions went from 43 to

47 percent. But in the 1980's these proportions increased much less, the Black's reaching 55 percent and the White's, 48 percent. Another changing aspect of the age structure has been the slow but steady increase in the proportion of householders age 65 or over. Whites have a somewhat higher proportion of such households than Blacks, but both increased over the 1969-89 period. Since both younger and older households have relatively low incomes, the effect of these age structure changes on the broad income averages for both race groups was to depress them.

The two social trends examined here are the type of household, or living arrangements, of Blacks and Whites and the educational attainment of each group. Significant changes took place in the living arrangements of Blacks and Whites during the period under examination. As is popularly pointed out in the media, the traditional "Ozzie & Harriet" type family faded rapidly in importance during this period, and especially so for Blacks. As shown in figure 2, the proportion of all Black households that consisted of married couples dropped from 56.7 percent to to 35.7 percent between 1969 and 1989. This is why some economists have suggested that examining the economic status of Black married couples is not as meaningful in judging the overall economic progress of Blacks. For Whites, the proportion of all households that were married couples shrunk from 73 percent to 59 percent, not as sharp a drop as for Blacks.

Analyses of the changes in the structure of Black households, of course, are becoming more numerous. One of the more recent studies has found that declines in Black marriages have been far more important than changes in divorce or separation in explaining the decline in married couples (Ellwood and Crane, 1990). For Whites, in contrast, it appears that marriages and separations were critical factors.

The complement of this development, of course, has been the surge in other family households (primarily headed by women) and nonfamily households where incomes tend to be less than in married couples. Also shown in figure 2 are the increases in these types of households for Blacks and Whites. In 1969, the proportion of all households that were other family households rose from 25 to 35 percent, while for Whites the increase was only from 9 to 12 percent. Nonfamily households also increased in prevalence for both races. The implication for broad income measures, such as the median, is fairly evident.

Both races continued to show improvement in educational attainment. Indeed, although Blacks still lag behind Whites, the former had somewhat stronger gains over the 1970's and 1980's than the latter. Figure 3 shows the proportion of Blacks and Whites age 25 and over with 4 years of high school or more and 4 years of college or more. In terms of both measures, Blacks appeared to double their proportions of persons with the amounts of education indicated, compared to much

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[1]Reflecting changing social customs and improvements in income data collection over the years, the Census Bureau made changes in the race and household type classifications. It was only in the 1960's and 1970's that income data for Black households became available. In addition, data became available for Blacks separately (not grouped with other races).

[2]Nominal incomes have been adjusted for inflation by the Consumer Price Index for All Urban Consumers (CPI-U-X1).

[3]The householder is the person in whose name the home is owned or rented.

Figure 1.
Income Ratio for Black and White Householder: 1969 to 1989
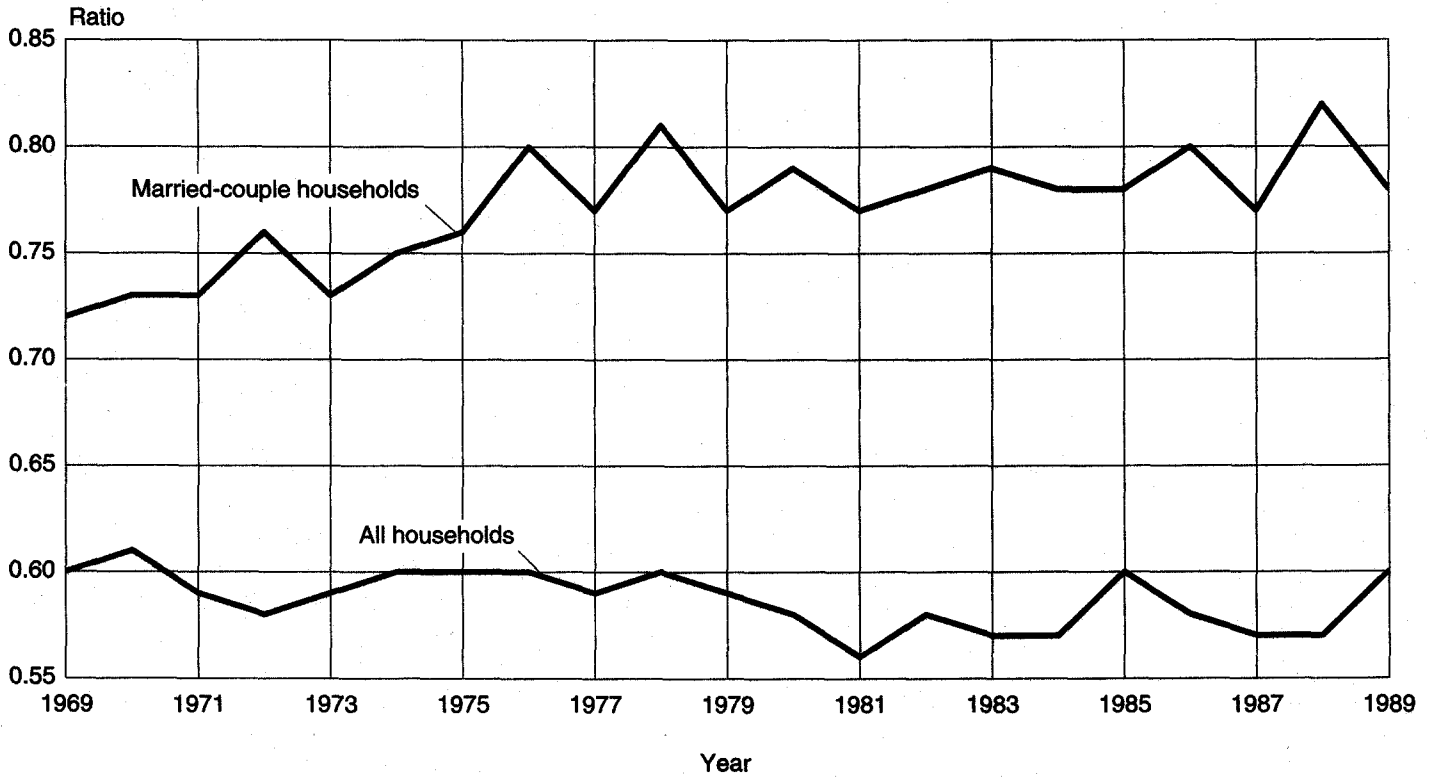
Figure 2.
Living Arrangements of Black and White Households: 1969 and 1989
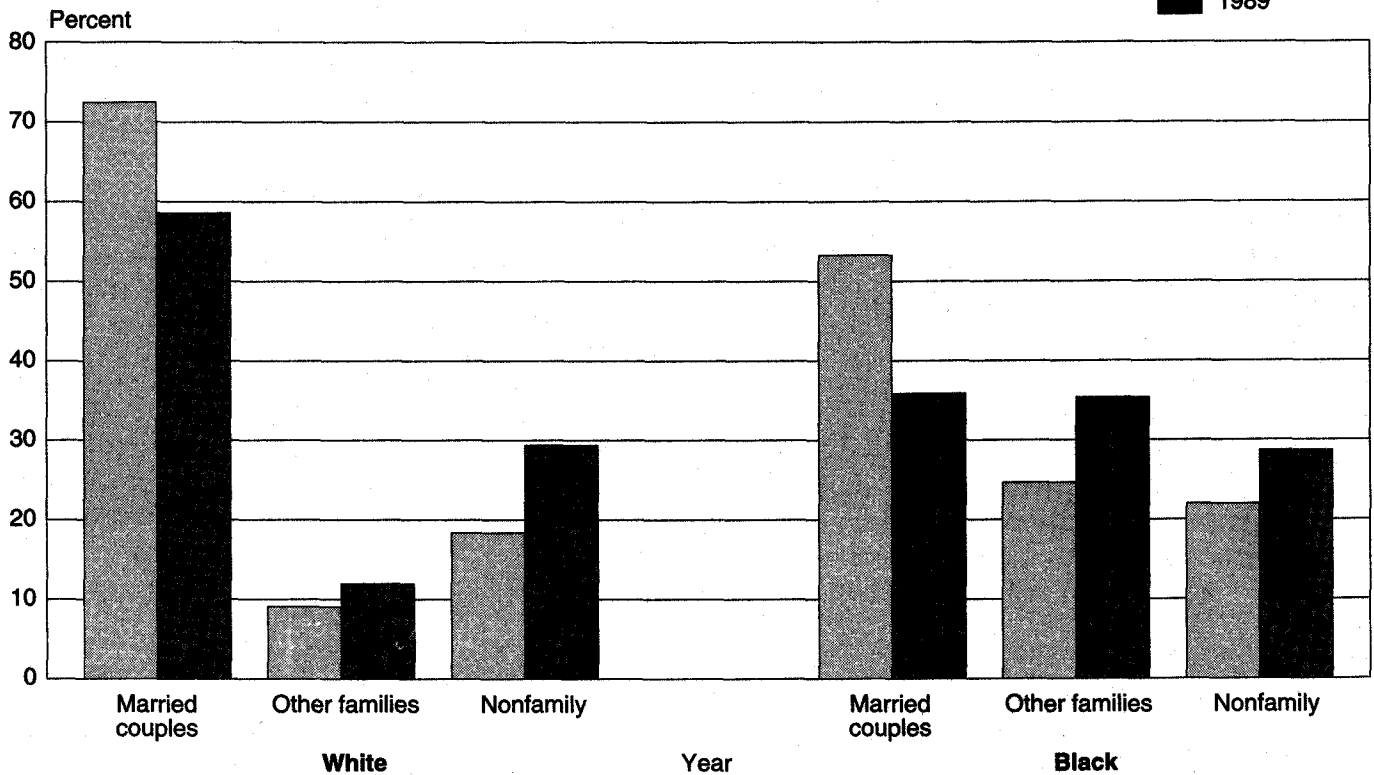
smaller gains for Whites. This differential in the acquisition of human capital, of course, should have helped narrow Black-White income differences, if everything else remained the same.

Three economic trends were investigated: the work experience of householders, the work experience of wives in married-couple families, and the movement of workers from goods-production to service-production jobs. Much has been written about the employment problems of Black workers over the past 20 years and, in particular, Black men. The work of Smith and Welch (1986), alluded to at the outset, suggests that the Black-White "wage" gap changed little over the last two decades and, indeed, may have widened for younger men. Jaynes (1990) believes that the recent shifts in the supply-demand relationship for low-skilled workers stemming from broader economic developments have had a significant effect on the real wages of Blacks vis-a-vis Whites since a greater proportion of the former have a high school education or less. And O'Neill (1990) has concluded that even though Blacks continue to advance in terms of educational attainment, the increasing premiums placed on high skill levels makes "...differences in school quality, family and socioeconomic background..." more important for economic outcomes than in the past.

While our analysis does not address the Black-White wage gap per se, it does focus on labor supply changes that occurred between 1969 and 1989 among Black and White householders and wives. Obviously, market wages as well as many other factors contribute to labor supply decisions which in turn affect household income, or outcomes. Figure 4 displays proportions of Black and White householders and unrelated individuals who worked. (In 1969 the Nation's unemployment rate was 3.4 percent and in 1989, 5.2 percent.) The first item of interest is that smaller proportions of Black and White householders were working in 1989 than in 1969, but the decline was substantially greater among Blacks. Second, among Black and White unrelated individuals the proportion with some work experience increased among Whites but decreased for Blacks. While 1969 and 1989 are separated by two decades when many demographic, social, and economic developments were taking place that ultimately determined these changes, this basic work experience profile is revealing.

For both racial groups, the proportion of working wives among all married-couple families (as of March of each year) has increased between 1969 and 1989 (from 38 to 57 percent among Whites and from 53 to 64 percent for Blacks). However, when the proportion is calculated relative to all households, as shown in figure 5, a different picture is presented. In 1969, 29 percent of all Black households contained a working wife, but 20 years later the proportion had dropped to 23 percent. In contrast, for Whites the comparable proportion rose slightly from 28 to 34 percent. Consequently, the greater changes taking place in the living arrangements of

Blacks have offset the positive effect of wives' earnings on their overall household income average.

The movement of jobs from goods-producing industries to service-producing industries in recent years has also been the focal point of much analysis because of its presumed importance for earnings inequality. While industrial distributions by race for as far back as 1969 were not tabulated (except in the decennial census), data for 1979 and 1989 were available. As shown in figure 6, shifts from goods-producing to service-producing industries occurred among both Black and White workers, and by similar amounts. However, it is also interesting to note that a greater proportion of Blacks are employed in the service-producing industries where wages are not only lower but more greatly dispersed.

III. THE STANDARDIZATION METHODOLOGY

The standardization methodology used in this paper allows us to obtain a first approximation of the effects of changes in particular demographic, social, and economic characteristics on the incomes of Black and White households—and the resulting income ratio. Techniques of this kind have been used for examining the effects of population changes on the Nation's unemployment rate (Flaim, 1990). In addition, the technique used here was also used by Green and Welniak (1982) to examine the effects of changing family composition on income differentials between Black and White families.

The conceptual framework for the methodology is as follows. Mean household income in 1989, whether for Black or White households, is defined as a weighted average

$$\overline{Y}_{89} = \sum_{i=1}^{n} p_{i89} \, \overline{y}_{i89}$$

where $\overline{Y}_{89}$ is the overall mean income in 1989, p_{i89} is the proportional weight of the ith group in 1989, and $\overline{y}_{i89}$ is its mean income in 1989. Alternatively, we could write the formula for standardized mean income as

$$\overline{Y}_{89}^{*} = \sum_{i=1}^{n} p_{i69} \, \overline{y}_{i89}$$

where the p is the ith group's proportion of all households in 1969. An equivalent way to write this equation is

$$\overline{Y}_{89}^{*} = \overline{Y}_{69} + \sum_{i=1}^{n} p_{i69} \Delta \, \overline{y}_i$$

where $\overline{Y}_{69}$ is the overall mean income in 1969 and $\Delta \overline{y}_i$ is the change in mean income for the ith group between 1969 and 1989. This is a useful formulation for a later

Figure 3.
**Educational Attainment of Blacks and Whites Age
25 and Over: 1969 and 1989**

Percent

1969
1989

	4 years of high school or more	4 years of college or more
White		

	4 years of high school or more	4 years of college or more
Black		
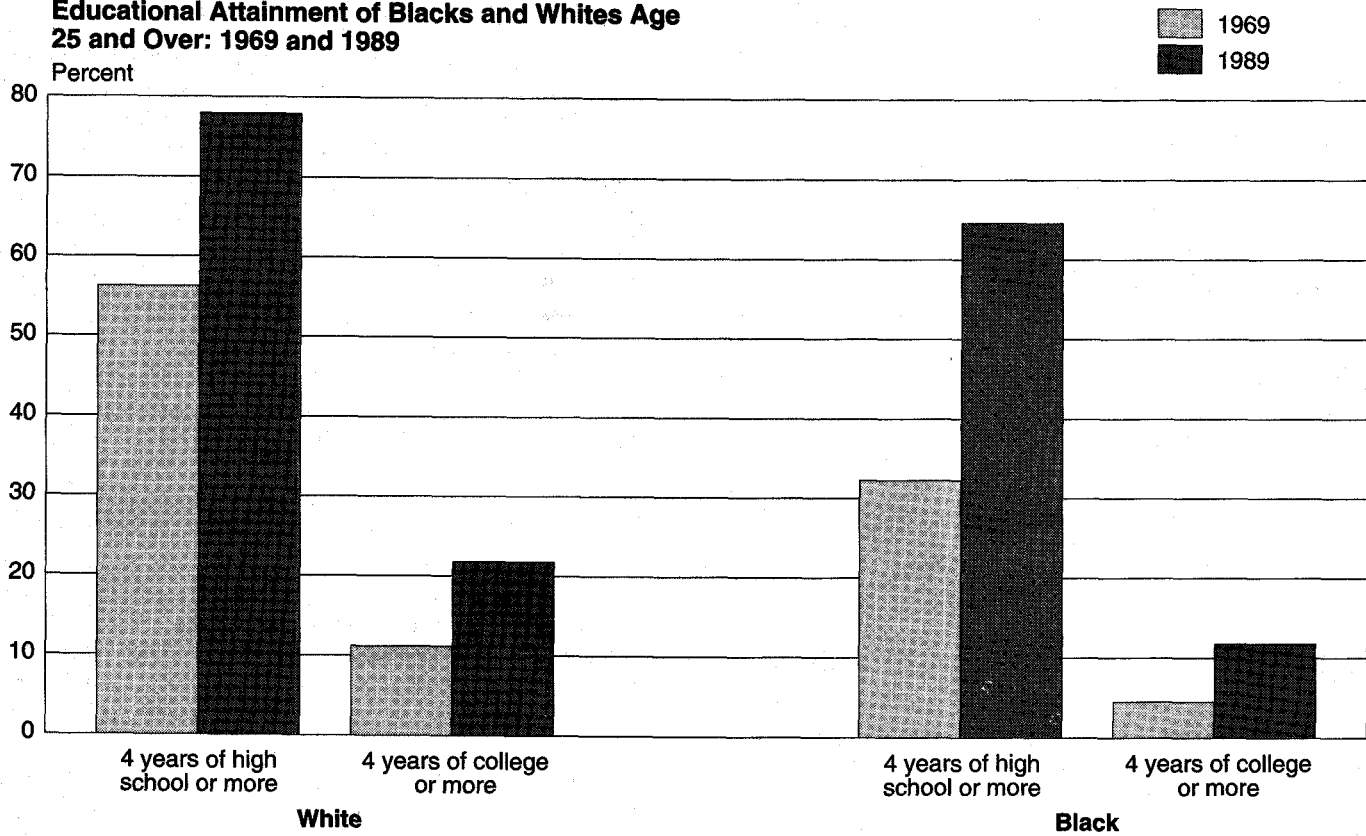
Figure 4.
**Work Experience of Black and White Family Householders
and Unrelated Individuals: 1969 and 1989**

Percent

1969
1989

	Family house-holders	Unrelated individuals
White		

	Family house-holders	Unrelated individuals
Black		
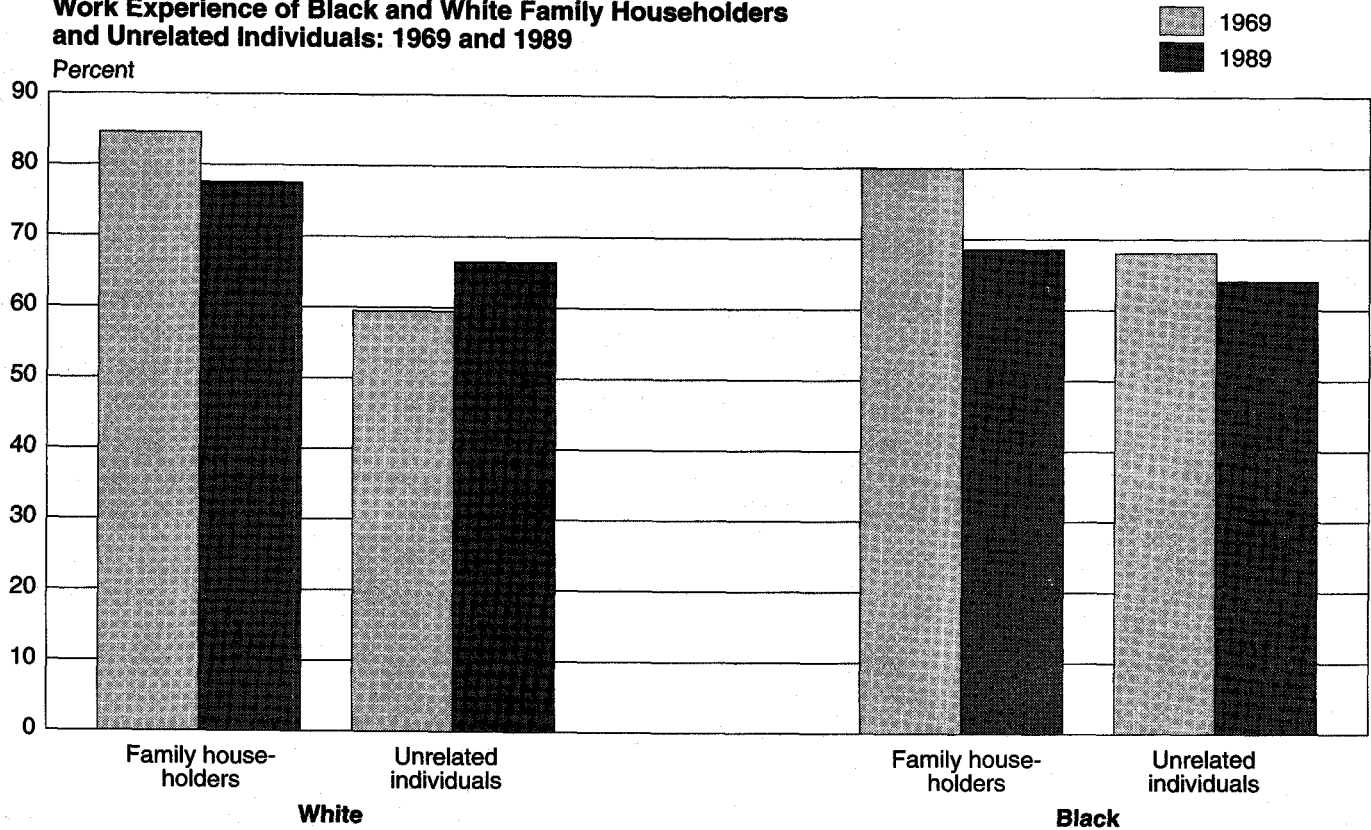
Figure 5.
Married-Couple Families with Working Wives as a Percent of All Households, by Race: 1969 to 1989
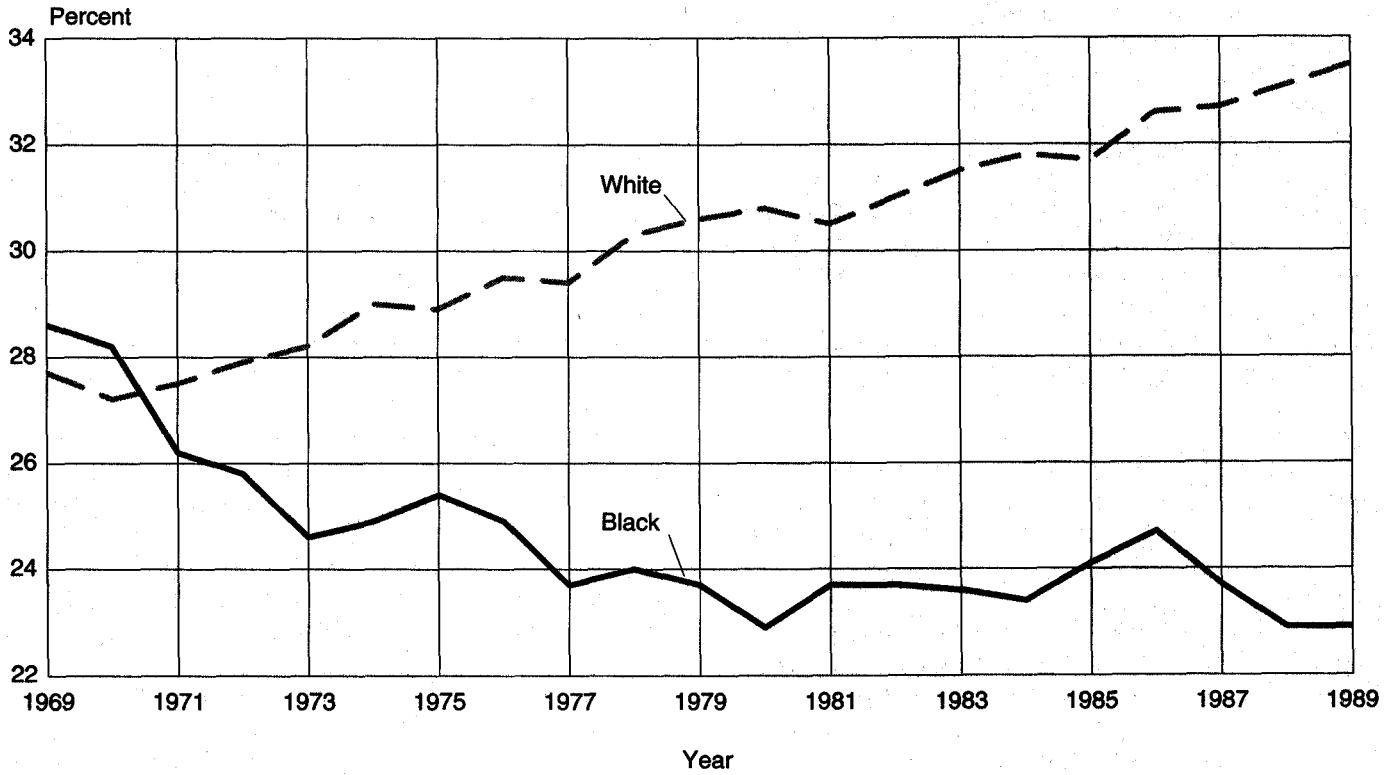
Figure 6.
Type of Industry for Black and White Workers: 1979 and 1989

discussion on changes in income between 1969 and 1989. Our standardized mean income for 1989, or $\overline{Y}_{89}$, therefore, is based on a fixed weight, or Laspeyres index, where base period weights, or in our case, the proportions of persons with certain characteristics in 1969, are used to weight the current incomes of groups.

Using data files from the March 1970 Current Population Survey (CPS) and March 1990 CPS, sample members who were householders and wives were categorized into a matrix of demographic, social, and economic characteristics of their households.[4] The characteristics used to create the matrices are indicated below:

Demographic	Social	Economic
Age	Education	Work Experience, Head
Under 25	12 years or less	Did not work
25 to 44	1 to 3 yrs., col.	Wkd., FTYR[1]
45 to 64	16 yrs. or more	Less than FTYR[1]
65 and over		
	Household Type	Work Experience, Wife
	Married couple	Not married couple
	Not married couple	Did not work
	Nonfamily hhld.	Wkd. FTYR[1]
		Less than FTYR [1]
		Industry
		Did not work
		Goods-producing
		Serv.-producing (1)
		Serv.-producing (2)

[1]Full-time (35 hours or more a week), year-round (50 to 52 weeks a year) employment.

Although most of these variables are self-explanatory, the goods-producing and service-producing industries require definition. Goods-producing industries are composed of agriculture, mining, construction, and manufacturing. Service-producing industries (1) are transportation, communication, and public utilities, wholesale trade, finance, insurance, and real estate, public administration, and professional and related services; service-producing industries (2) are retail trade, personal services, business and repair services, entertainment and recreation services. Annual earnings tend to be higher in the first service category than in the second and this is why the two service categories were treated separately.

Matrices of over 1,700 cells were produced for each racial group (see appendix A for a full description of the methodology). The proportion of persons in each cell for 1970 was divided by the proportion for 1990, thus producing a ratio for each cell in the matrix. The ratios represent the compositional shifting that took place among Black and White households between 1969 and 1989. These ratios, or adjustment factors, were then

multiplied by the sample weight of each sample member falling into a particular cell in the March 1990 CPS. This reweighting of the data file, therefore, allowed for the calculation of a variety of income measures such as the mean and median household income, shares of aggregate income by quintile, poverty rate, and Gini indexes.[5] In addition, it is possible to isolate the effects of demographic, social, and economic factors, both individually and collectively, on income measures.

The standardized income measure that is derived for Black and White households must be interpreted with care. The "fixed weighted" mean income for 1989 represents only the noncompositional changes that took place between 1969 and 1989. But it is not a pure measure of the change that would have occurred because of noncompositional reasons. If the composition of the population actually remained the same as in 1969, this would affect the supply of workers in different jobs, which could affect wages if there were not corresponding shifts in demand to offset these trends. Under such circumstances, actual incomes could be different than the ones derived from the fixed weight measure. This interaction would not be captured in the standardization; this can be shown with the following definition:

$$\overline{Y}_{89} - \overline{Y}_{69} = \sum_{i=1}^{n} (p_{i69} \Delta\overline{y}_i + \overline{y}_{i69}\Delta p_i + \Delta\overline{y}_i \Delta p_i)$$

Thus, the $\overline{Y}$'s represent mean income (of either White or Black households) in 1969 and 1989, the p's represent the proportion of the ith group, the $\overline{y}$'s their mean incomes, and Δ represent the change in either p_i or $\overline{y}_i$ between 1969 and 1989. As can be seen in the expression, the actual change in incomes between 1969 and 1989 consists of three components: The first term is the change in income if composition had remained unchanged and incomes for the groups had changed, or basically, the fixed weight mean income; the second term is the change that would have taken place if only the composition had changed and incomes remained the same as they were in 1969; and the third term is the interaction between changes in composition and changes in incomes. Only if the third term is zero or small can the first term be assumed to be a measure of the change that would have occurred because of noncompositional reasons. Since the interaction term has not been estimated but very likely is nonzero, the standardization results should be viewed as first approximations as to the true effect of compositional shifts on income measures.[6]

Other limitations of the standardization methodology exist. First, it is basically a static analysis as the above discussion implies. The results are necessarily partial

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[4]These characteristics from the March CPS are as of the survey date, but the income data relate to amounts received in the previous calendar year.

[5]The Gini index of income concentration, the measure of income inequality used here, is discussed in appendix B. Some Gini indexes (that have not been standardized) presented in this paper may differ slightly from published indexes because of differences in the way they were calculated.

[6]For an excellenct discussion of these points in the context of a weighted unemployment rate, see Antos, Mellow, and Triplett (1979).

equilibrium positions since interactions have not been captured. Second, the selection of the base year is arbitrary and the results would differ if years much earlier or later had been selected. We selected 1969 since it provides a significant amount of time for demographic, social, and economic characteristics to change, but also because it was around this time that the Black-White income ratio stopped rising. And third, the selection of characteristics is also arbitrary and constrained by the size of the CPS. It would have been possible to control for many more characteristics if data from the decennial census had been available.

IV. STANDARDIZATION RESULTS

Two sets of standardization results are presented in this section. First, we examine the effects on the 1989 Black-White income ratio of standardizing Black and White household incomes for demographic, social, and economic changes over the 1969-89 period. Separate effects as well as combined effects will be presented. And second, the effects of simply applying the 1989 demographic, social, and economic characteristics of White households to the 1989 incomes of Black households are discussed. This second standardization, consequently, does not involve any inter-temporal comparison.

A. Standardizing Black and White 1989 Household Incomes.

The real median income in 1989 for Black households was $18,146 compared to $30,413 for White households. This yielded a Black-White income differential of .597. Twenty years earlier the comparable differential was .604. Incomes for both grew very slowly, but even more slowly among Black households.

Demographic. Table A1 and A2 shows what happens to the 1989 median household incomes of both races when they are adjusted for changes in the age structure. As shown there, the effects of age are not very strong, although slightly stronger for Whites than Blacks. The resulting Black-White income differential would be .59, not much different than the actual differential. The effects on poverty rates and Gini indexes of these age structure changes were also negligible.

Social. As would be expected, the dramatic shifts in living arrangements that took place over the last 20 years had a profound impact on the standardized incomes of both Black and White households. Table B2 shows that the median income of Black households would have been about 15 percent higher if the same composition of household types existed in 1989 as in 1969. The median income of White households, shown in table B1, would have been 10 percent higher. The resulting effect on the income differential, therefore, is that it too would have been somewhat higher—.63 instead of .60. Also displayed in these tables is the effect of changes in household type on the races' income distributions, Gini indexes, and poverty rates. For both Whites and Blacks, income inequality and poverty would have been less had not household compositions changed.

The effects of standardizing incomes for changes in education are also what would be expected. The accumulation of human capital during the 1969-89 period continued and demonstrated its powerful effect. Median incomes for both White and Black households would have been less, almost to the same extent, if educational distributions had remained fixed in 1969. Consequently, the effect on the income differential was insignificant.

When the effect of changes in living arrangements is allowed to interact with the changes in education, there appears to be very little effect on White household incomes, but a fairly significant effect on Black household incomes. In other words, the effect of changes in household types appears to dominate the interaction. As a result, standardizing 1989 incomes for these two social changes would result in the Black-White income differential rising to .63.

Economic. Economic factors, of course, have been of primary importance in understanding the income changes taking place among Black households. Unemployment, low productivity, employment in low-wage jobs, and nonparticipation in the labor force, are just some of the labor market problems thought to be directly related to the Blacks' low-income problem.

Tables C1 and C2 examine the effects on the 1989 Black-White income differential of changes in the work experience of the householder, changes in work experience of wives, and changes in the industry of employment of householders. As was shown earlier, declines in the proportion of Black family householders and unrelated individuals who had some work experience over the course of a year have been somewhat greater than for Whites. This corresponds to the greater amount of structural change taking place in Black households than White households; nonfamily households and single-parent families became considerably more common among Blacks than Whites. To the extent that the householders of these household types are less likely to be working or working full time year round would imply a greater impact on Black incomes than White incomes. This is confirmed in the standardization. White incomes would have risen by 4.5 percent (table C1) had their householder's work experience remained unchanged

Table A1.White Household's Effect on Income and Poverty of Standardizing for Demographic Variables: Age

(1989 incomes standardized to 1970 composition, in 1989 dollars)

Measure	1989 Income		1969 Income
	Actual	Standardized for age	
Number of households (000)..	80,143	80,143	56,248
Median household income..	$30,413	$30,693	$29,581
Share of income received by:			
Lowest fifth..	4.1	4.1	4.3
Second fifth...	9.9	9.8	11.3
Third fifth..	16.0	15.9	17.6
Fourth fifth..	23.8	23.8	24.3
Highest fifth...	46.2	46.4	42.5
Gini index...	.420	.423	.383
Poverty rate...	9.8	9.9	12.0

Table A2. Black Household's Effect on Income and Poverty of Standardizing for Demographic Variables: Age

(1989 incomes standardized to 1970 composition, in 1989 dollars)

Measure	1989 income		1969 income
	Actual	Standardized for age	
Number of households (000)..	10,513	10,513	6,053
Median household income..	$18,146	$18,062	$17,880
Share of income received by:			
Lowest fifth..	3.2	3.1	3.9
Second fifth...	8.0	7.9	9.8
Third fifth..	15.2	15.1	16.6
Fourth fifth..	25.0	25.0	25.1
Highest fifth...	48.7	48.9	44.5
Gini index...	.459	.462	.410
Poverty rate...	29.7	29.9	32.7

Table B1. White Household's Effect on Income and Poverty of Standardizing for Social Variables: Type of Household and Education

(1989 incomes standardized to 1970 composition, in 1989 dollars)

Measure	1989 income				1969 income
	Actual	Standardized for--			
		Type of household	Education	Both	
Number of households (000)......................	80,143	80,143	80,143	80,143	56,248
Median household income.......................	$30,413	$33,480	$27,181	$30,315	$29,581
Share of income received by:					
Lowest fifth.....................................	4.1	4.5	4.1	4.5	4.3
Second fifth....................................	9.9	10.5	9.8	10.4	11.3
Third fifth......................................	16.0	16.4	16.0	16.4	17.6
Fourth fifth.....................................	23.8	23.7	24.1	24.0	24.3
Highest fifth....................................	46.2	45.0	46.0	44.7	42.5
Gini index......................................	.420	.403	420	403	.383
Poverty rate....................................	9.8	8.2	11.4	9.6	12.0

Table B2. Black Household's Effect on Income and Poverty of Standardizing for Social Variables: Type of Household and Education

(1989 incomes standardized to 1970 composition, in 1989 dollars)

Measures	1989 income					1969 income
		Standardized for--				
	Actual	Type of household	Education		Both	
Number of households (000).....................	10,513	10,513	10,513		10,513	6,053
Median household income........................	$18,146	$20,931	$16,288		$19,021	$17,880
Share of income received by:						
Lowest fifth......................................	3.2	3.3	3.2		3.4	3.9
Second fifth......................................	8.0	8.7	7.9		8.5	9.8
Third fifth..	15.2	15.8	14.9		15.6	16.6
Fourth fifth.......................................	25.0	25.2	24.9		25.2	25.1
Highest fifth......................................	48.7	47.0	49.1		47.3	44.5
Gini index..	.459	.441	.462		.443	.410
Poverty rate......................................	29.7	25.7	32.8		28.2	32.7

Table C1. White Household's Effect on Income and Poverty of Standardizing for Economic Variables: Work Experience and Industry

(1989 incomes standardized to 1970 composition, in 1989 dollars)

Measure	1989 income					1969 income
		Standardized for --				
	Actual	Work experience of householder	Work experience of wife	Industry	All three	
Number of households (000)	80,143	80,143	80,143	80,143	80,143	56,248
Median household income....................	$30,413	$31,773	$31,302	$31,946	$32,520	$29,581
Share of income received by:						
Lowest fifth....................................	4.1	4.3	4.5	4.4	4.4	4.3
Second fifth	9.9	10.2	10.2	10.9	10.4	11.3
Third fifth......................................	16.0	16.2	16.0	16.3	16.2	17.6
Fourth fifth	23.8	23.7	23.5	23.8	23.4	24.3
Highest fifth	46.2	45.5	45.9	45.1	45.5	42.5
Gini index	.420	.411	.412	.406	.409	.383
Poverty rate	9.8	8.9	8.9	8.9	9.1	12.0

Table C2. Black Household's Effect on Income and Poverty of Standardizing for Economic Variables: Work Experience and Industry

(1989 incomes standardized to 1970 composition, in 1989 dollars)

Measure	1989 income					1969 income
		Standardized for--				
	Actual	Work experience of householder	Work experience of wife	Industry	All three	
Number of households (000)	10,513	10,513	10,513	10,513	10,513	6,053
Median household income....................	$18,146	$19,681	$19,219	$19,659	$19,057	$17,880
Share of income received by:						
Lowest fifth....................................	3.2	3.3	3.4	3.3	3.2	3.9
Second fifth	8.0	8.6	8.7	8.6	8.5	9.8
Third fifth......................................	15.2	15.6	15.6	15.6	15.6	16.6
Fourth fifth	25.0	25.0	24.9	25.0	25.2	25.1
Highest fifth	48.7	47.5	47.3	47.5	47.5	44.5
Gini index	.459	.446	.442	.445	.447	.410
Poverty rate	29.7	26.9	27.2	26.9	28.8	32.7

between 1969 and 1989, but Black incomes would have risen by 8.5 percent (table C2). This further suggests that the income differential would have risen to almost .62.

Given the great increase in the participation of wives in the labor market over the last two decades, the expectation would be that median incomes for both Black and White households would have been lower if this had not occurred. The standardization results show just the opposite. This is because in standardizing for this effect, "nonmarried-couple households" had to be included as well. Since these types of households grew more common over the 1969-89 period and their average incomes are lower than married-couple households, they tended to drag down the overall median income. Therefore, the standardized result for working wives contains a "type of household" effect which apparently dominates the working wives effect.

When we examine the working wife effect purely within the context of married couples, however, the expected result appears, as is shown in the text table below.

	Married-couple families	
	Actual 1989 Income	Standard-ized 1989 Income
Black	$30,819	$26,756
White	39,351	36,332
B/W income ratio	.78	.74

Thus, the increase in working wives had a significant effect on the income levels of Black and White married-couple families.

The last economic factor accounted for was the employment shifts from goods-producing to service-producing industries that occurred over the last two decades. This shift appeared to have a bigger effect on Black household income than White household income. The Black-White income differential would have increased to about .62.

When these three economic factors are combined, the impact on White household income is even greater than the individual effects. Their median income would have risen by almost 7 percent. This probably occurs because of two reasons: First, many of the householders shifted into service-producing industries where wages were generally lower and, two, the "type of household" effect, which was embodied in the working wives standardization, dominated the effect of working wives. On the other hand, the median income for Black households would rise by only 5 percent, much less than their separate economic effects. This is probably because a relatively smaller proportion of Black householders shifted from goods-producing jobs to service-producing jobs simply because there weren't as many of them in

goods-producing jobs in the first place. All of these economic effects appear to offset one another when the 1989 standardized Black-White income differential is calculated—it would have been .586 compared to the actual .597.

Combining Demographic, Social, and Economic Factors. The standardization procedure allows us to combine these factors by pairs as well as let all three factors interact simultaneously. Tables D1 and D2 present the resulting 1989 standardized incomes on these bases.

In percentage terms, the pair-wise comparisons find standardized Black household incomes rising more than White household incomes suggesting that the compositional changes had a greater effect on the former than the latter. The resulting income ratios would range from .60 (the social-economic effects) to .64 (the demographic-economic effects).

When all of the factors are combined, the results suggest that shifts in the demographic, social, and economic characteristics of Black households between 1969 and 1989 were considerably more important than shifts taking place for White households. Real median income among Whites would have been virtually unchanged at about $30,400, while among Blacks it would have risen from $18,146 to $19,596, or 8 percent. The Black-White income differential would have reached .65.

In addition, while the effect on the median income level and poverty rate for White households would have been very small, their income distribution would have become somewhat more equal as measured by the Gini index. For Black households, however, inequality and poverty would have been lessened as well. The Gini index for Blacks would have been .431 instead of .459 and the poverty rate 26.3 percent instead of 29.7 percent.

B. Standardizing 1989 Black Incomes by White Household Characteristics

Another hypothetical question can be answered using the standardization technique: How would the various income measures for Black households change if Black households had the same characteristics as White households? Such an exercise was carried out using the 1990 CPS income data.

This standardization was conducted by assigning White demographic, social, and economic characteristics (the same characteristics used earlier) to Blacks and recalculating overall Black household income. The standardized mean household income for Blacks, $\overline{Y}^B$, therefore, can be expressed as:

$$\overline{Y}^B = \sum_{i=1}^{h} p_i^w \overline{y}_i^B$$

Table D1. White Household's Effect on Income and Poverty of Standardizing for Demographic, Social, and Economic Variables

(1989 incomes standardized to 1970 composition, in 1989 dollars)

Measure	1989 income					1969 income
		Standardized for--				
	Actual	Demographic, social	Demographic, economic	Social, economic	Demographic, social, economic	
Number of households (000)	80,143	80,143	80,143	80,143	80,143	56,248
Median household income..................	$30,413	$30,721	$32,018	$30,703	$30,384	$29,581
Share of income received by:						
Lowest fifth.................................	4.1	4.5	4.3	4.6	4.5	4.3
Second fifth	9.9	10.4	10.1	10.6	10.5	11.3
Third fifth...................................	16.0	16.5	16.0	16.5	16.4	17.6
Fourth fifth	23.8	24.0	23.4	23.7	23.7	24.3
Highest fifth	6.2	44.6	46.1	44.6	45.0	42.5
Gini index	.420	.402	.416	.399	.404	.383
Poverty rate	9.8	9.5	9.4	9.8	10.0	12.0

Table D2. Black Household's Effect on Income and Poverty of Standardizing for Demographic, Social, and Economic Variables

(1989 incomes standardized to 1970 composition, in 1989 dollars)

Measure	1989 income					1969 income
		Standardized for--				
	Actual	Demographic, social	Demographic, economic	Social, economic	Demographic, social, economic	
Number of households (000)	10,513	10,513	10,513	10,513	10,513	6,053
Median household income..................	$18,146	$19,236	$20,437	$18,519	$19,596	$17,880
Share of income received by:						
Lowest fifth.................................	3.2	3.4	3.4	3.4	3.5	3.9
Second fifth	8.0	8.7	9.0	8.7	9.2	9.8
Third fifth...................................	15.2	15.9	15.8	15.8	16.0	16.6
Fourth fifth	25.0	25.3	24.9	25.3	24.9	25.1
Highest fifth	48.7	46.7	46.9	46.8	46.5	44.5
Gini index	.459	.438	.437	.439	.431	.410
Poverty rate	29.7	28.0	25.2	29.4	26.3	32.7

where p_i^w are the proportions of White households with the various characteristics in 1989 and $\bar{y}_i^B$ are the mean incomes actually received by Blacks in those groups in 1989.

The results of standardizing Black incomes according to the age structure of White households is shown in table E. Black median household income would fall from $18,146 to $17,350, or by 4.4 percent. The drop in income is probably due to the large proportion of elderly White householders. Little change would take place in the income distribution or in the percentage of Black households that were poor.

Applying the household type characteristics of White households and the White householders' educational characteristics to Black households has the expected effects. Table F shows that if Blacks had the same type of living arrangements as Whites, the Black median household income in 1989 would have been $22,236 instead of $18,146. If they had the White's educational characteristics, incomes would have increased to $20,884.

When both sets of characteristics are combined, the effect on Black median household income is even greater than the separate effects. Their income would have reached $24,561 and the Black-White income ratio would have been .81 in 1989. A strong effect is also observable in the Black household income distribution: The distribution would be more equally distributed with the second and third quintiles receiving a greater share of the aggregate income and the poverty rate for Black households would have been 19.8 percent instead of the actual 1989 rate of 29.7 percent.

Table E. Black Income and Poverty Standardized by White Demographic Variables: Age

(1989 income)

Measure	White	Black	
		Actual	Standardized by White age
Number of households (000)..	80,143	10,513	10,513
Median household income..	$30,413	$18,146	$17,350
Share of income received by:			
Lowest fifth	4.1	3.2	3.2
Second fifth..	9.9	8.0	7.8
Third fifth	16.0	15.2	14.8
Fourth fifth..	23.8	25.0	24.9
Highest fifth..	46.2	48.7	49.3
Gini index..	.420	.459	.464
Poverty rate..	9.8	29.7	30.0

Table F. Black Income and Poverty Standardized by White Social Variables: Type of Household and Education

(1989 income)

Measure	White	Black			
		Actual	Type of household	Education	Both
			Standardized by--		
Number of households (000)......................	80,143	10,513	10,513	10,513	10,513
Median household income......................	$30,413	$18,146	$22,236	$20,884	$24,561
Share of income received by:					
Lowest fifth	4.1	3.2	3.4	3.1	3.3
Second fifth......................................	9.9	8.0	9.0	8.3	9.2
Third fifth	16.0	15.2	16.1	15.4	16.1
Fourth fifth......................................	23.8	25.0	25.3	24.9	25.2
Highest fifth......................................	46.2	48.7	46.2	48.4	46.1
Gini index......................................	.420	.459	.433	.456	.431
Poverty rate......................................	9.8	29.7	22.3	25.7	19.8

Standardizing 1989 Black incomes for the economic characteristics of White households has a somewhat less strong effect on Black incomes than the social characteristics. Nevertheless, as is shown in table G, median incomes rise, ranging from 8 percent in the case of the industry standardization to 17 percent for the standardization involving the work experience of the householder. The combined effect of all three economic variables is again stronger than the individual effects. The median income of Black households rises to $22,213 in 1989, not quite as high as the effect of the social variables. Here too the Black income distribution becomes more equally distributed and the poverty rate would drop to 22.6 percent.

Table H contains the results of the standardizations when pairs of demographic, social, and economic variables are combined and when all characteristics are combined. All of the pair-wise combinations result in increases in median income, reductions in inequality, and declines in poverty rates. Overall, the median Black household income would rise to $23,648 and the Black-White income ratio would have been .78. The amount of inequality in the Black income distribution, as reflected by the Gini index, would be reduced to almost the same extent as the White's (Gini index equal to .420 for Whites and .428 for Blacks). And the Black poverty rate would have dropped by 10 percentage points to 19.0 percent.

V. SUMMARY AND DIRECTIONS FOR FUTURE RESEARCH

A central finding of the 1969-89 standardization exercise is that demographic, social, and economic changes have had a greater effect on Black household incomes than White household incomes. Our estimate of what the Black-White household income differential would have been in 1989, if the changes had not taken place, was .65. This compares to the actual differential of .60 in 1989.

Table G. Black Income and Poverty Standardized by White Economic Variables: Work Experience and Industry

(1989 income)

Measure	White	Black				
			Standardized by--			
		Actual	Work experience of householder	Work experience of wife	Industry	All three
Number of households.....................	80,143	10,513	10,513	10,513	10,513	
Median household income...................	$30,413	$18,146	$20,502	$21,300	$19,595	$22,213
Share of income received by:						
Lowest fifth................................	4.1	3.2	3.3	3.5	3.3	3.6
Second fifth	9.9	8.0	8.8	9.2	8.6	9.5
Third fifth.................................	16.0	15.2	15.9	16.0	15.6	16.2
Fourth fifth	23.8	25.0	25.0	25.0	25.0	25.1
Highest fifth	46.2	48.7	47.0	46.3	47.5	45.6
Gini index	.420	.459	.440	.431	.445	.422
Poverty rate	9.8	29.7	25.5	24.2	27.0	22.6

Table H. Black Income and Poverty Standardized by White Demographic, Social, and Economic Variables

(1989 income)

Measures	White	Black				
			Standardized by--			
		Actual	Demographic, social	Demographic, economic	Social, economic	Demographic, social, economic
Number of households(000)	80,143	10,513	10,513	10,513	10,513	10,513
Median household income...................	$30,413	$18,146	$23,590	$22,458	$23,204	$23,648
Share of income received by:						
Lowest fifth................................	4.1	3.2	3.3	3.9	3.4	3.6
Second fifth	9.9	8.0	8.8	9.6	9.2	9.3
Third fifth.................................	16.0	15.2	15.8	16.2	15.9	15.9
Fourth fifth	23.8	25.0	25.2	25.0	25.1	25.0
Highest fifth	46.2	48.7	47.0	45.4	46.4	46.2
Gini index	.420	.459	.440	.418	.432	.428
Poverty rate	9.8	29.7	20.4	20.4	20.5	19.0

Some of the more significant individual factors affecting Black incomes were related to both social and economic factors. The changes in the types of households Blacks live in appeared to have a major impact on their incomes. Similarly, the change in the work experience profiles of Black householders, which is no doubt related to changes in living arrangements, had a strong effect on their income levels. Both factors appeared to be important for lowering their poverty rates and levels of income inequality.

But a lot of the income gap between Black and White households has yet to be explained. Even when the 1989 incomes of Blacks are standardized on the basis of White characteristics the income differential rises only to .78. Other factors clearly are at work, factors not accounted for by the standardization.

As stated in the introduction, standardizations are only first approximations of the possible effects of various compositional shifts occurring in the country's demography, society, and economy. The results of the standardizations can tell us, in general terms, what these shifts have meant for our various income measures of Blacks and Whites. However, they leave us in the dark regarding the processes of change. For this we need more sophisticated measuring devices and data bases. Our findings suggest that the relationship between household type and the work experience of the householder requires further examination. A more detailed specification of these variables along with a more powerful methodology and a longitudinal data base might shed additional light on the recent trends in the Black-White income differential.

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APPENDIX A. STANDARDIZATION METHODOLOGY

The first standardization exercise used in this paper involved adjusting sample weights of Black and White households on a current microdata set to reflect past demographic, social, and economic characteristics of households. Weighting adjustment factors are merely ratios derived by comparing past characteristics of households to current ones. The basis of the adjustment for this paper is the March 1990 and March 1970 Current Population Surveys (CPS) microdata sets.

Weighting adjustment factors were derived from the set of demographic, social, and economic variables shown in table A-1.

Table A-1. Variables Used to Classify Households[1]

Variable	Definition
Demographic:	
Age	under 25 years
	25 to 44 years
	45 to 64 years
	65 years and over
Social:	
Education	Less than college
	1 to 3 years college
	4 or more years college
Hhld. type	Married-couple households
	Other family households
	Nonfamily households
Economic:	
Work experience	
Hhldr.	Did not work
	Year-round, full-time
	Other work experience
Wife	Not a wife
	Did not work
	Year-round, full-time
	Other work experience
Industry	Did not work
	Goods producing[2]
	Service sector 1[3]
	Service sector 2[4]

[1]Age, education, and industry variables are characteristics of the householder. In married-couple households, the husband was always designated the householder.
[2]Goods-producing industries include agriculture, forestry, fisheries, mining, construction, and manufacturing.
[3]Service sector 1 industries include transportation, communication, public utilities, wholesale trade, finance, insurance, real estate, professional and related services, and public administration.
[4]Service sector 2 industries include retail trade, business and repair services, personal services, entertainment and recreation services.

These variables, when cross-classified with each other, produce a 1,728 cell matrix (for Blacks and Whites separately) into which households from the March 1970 CPS and March 1990 CPS were categorized and tallied. These weighted tallies were then used to compute weighting adjustment factors that were applied to the March 1990 CPS microdata.

The adjustment factors can be expressed as:

$$F_i = \frac{P_{i70}}{P_{i90}}$$

where

$$P_i = \frac{t_i}{T} \quad \text{and} \quad T = \sum_{i=1}^{1728} t_i$$

for each of the years. t is the number of households in any given cell i, T is the total number of households for all cells in the matrix, and P is the proportion derived by dividing t by T. F is the adjustment factor derived by dividing P_{i70} by P_{i90}. The adjustment factors are then applied to weights on the March 1990 CPS.

The second standardization exercise involved adjusting sample weights of Black households on the March 1990 CPS microdata set to reflect the demographic, social, and economic characteristics of White households at that time. The same variables were used in the procedures as described above and adjustment factors were also derived as above except the adjustment factors are

$$F = \frac{P_{iWhite}}{P_{iBlack}}$$

where P_{iWhite} is the proportion of White households in cell i and P_{iBlack} is the comparable proportion of Black households. It is important to realize that not all of the 1,728 cells of the Black and White matrices necessarily contain any data. In fact, only 472 cells contained one or more sample cases. Table A-2 shows the number of cells containing data for each of the classification variables individually and in combination.

Table A-2. Total and Usable Cells for Classification Variables

Variable	Total cells	Usable cells
Economic	48	36
Social..................................	9	9
Demographic	4	4
Economic-Social	432	133
Economic-Demographic................	192	136
Social-Demographic	36	36
Demo.-Soc.-Econ......................	1,728	472

Cells not containing any observations were either unlikely combinations or in some cases impossible ones. For example, in the economic variables, householders or wives who did not work obviously could not be assigned to a particular industry. The variables were classified in the manner selected in order to be able to assign all households to each group in a mutually exclusive and exhaustive way.

To reduce the impact of high sampling variability in some of the more sparse cells of the matrix, a count of the number of sample cases within each cell was kept and only cells with 5 or more sample cases in both years were used to compute a weighting adjustment factor. Cells with fewer than 5 sample cases in either year were given a factor derived by collapsing the detail used to define the cell. The process of collapsing continued until a factor could be derived based on 5 or more sample cases. Although none of the demographic and social variables needed to be collapsed, approximately 14 percent of the economic variables were collapsed. Additional collapsing was done for combinations of these variables that did not have at least five sample cases in both years.

APPENDIX B. INCOME MEASURES

Household income. Income summary measures presented in this paper are limited to money income before payments of Federal, State, local, or Social Security taxes and before any other types of deductions, such as union dues and Medicare premiums. Total money income is the sum of the amounts received by all member of the housing unit age 15 years and over.[1] Income sources include: wages and salaries, self-employment income, Social Security, Supplemental Security income, public assistance, interest, dividends, rent, royalties, estates or trusts, Veterans' payments, unemployment and workers' compensations, private and government retirement and disability pensions, alimony, child support and any other source of money income which are regularly received. Capital gains (or losses) and lump-sum or one-time payments such as life insurance settlements are excluded.

Median income. The median income is the amount which divides the income distribution into two equal groups, one having income above the median, and the other having incomes below the median. All medians in this paper were derived from grouped data using linear interpolation. The income intervals used were $2,500 groupings beginning with under $2,500 and ending with an interval of $100,000 and over.

Gini ratio. The Gini ratio (or index of income concentration) is a statistical measure of income equality ranging from 0 to 1. A measure of 0 indicates prefect equality, i.e., all households having equal shares of income; a measure of 1 indicates perfect inequality, i.e., one household has all the income and the rest have none. Thus, higher levels of the Gini ratio indicate higher levels of income inequality. The Gini ratio is derived by calculating the ratio of the area between a Lorenz curve and a diagonal to the area below the diagonal.[2] As shown in figure 1, the Gini ratio can be expressed as:

$$G = \frac{A}{A+B} = \frac{\text{area between Lorenz curve and diagonal}}{\text{area under diagonal}}$$

Lorenz Curve

Percent of Aggregate Income

All Gini ratios presented in this paper were derived from grouped data. Basically, data in $2,500 intervals were interpolated to produce 100 percentile groupings. Mean incomes were then estimated for each percentile by either linear or Pareto interpolation. From these data, a Lorenz curve was developed and the area below the curve was estimated using trapezoidal approximation.

Income shares. Income shares are ratios of aggregate income for selected groups to the overall aggregate income of all groups and expressed as percentages. For this paper income shares are presented by income quintile. Quintiles are derived by ranking households by income and then dividing them into five groups with each group containing 20 percent of households. Aggregate income is then calculated for each of the five groups and expressed as a percentage of the total population aggregate income. All income shares presented in this paper were derived from grouped data.

Poverty definition. Official poverty estimates are based on money incomes of families and unrelated individuals. Families and unrelated individuals are considered to be

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[1] Income data for 1969 were collected for all persons age 14 years and over.

[2] The Lorenz Curve is obtained by plotting the cumulative percent of households against the cumulative percent of aggregate income.

in poverty if their annual incomes fall below Federally established poverty thresholds. Weighted average poverty thresholds are displayed in Table B-1.

Table B-1. **Weighted Average Poverty Thresholds in 1989**

Size of family unit	Threshold
One person (unrelated individual)	$6,311
Two persons..................................	8,076
Three persons	9,885
Four persons	12,675
Five persons.................................	14,990
Six persons..................................	16,921
Seven persons...............................	19,162
Eight persons................................	21,328
Nine persons or more.........................	25,480

Poverty estimates in this paper are not official. Currently, no official poverty definition for households exists. The poverty definition presented in this paper is an adaptation of the current official poverty definition applied to the household concept. The poverty status of a household was determined by the poverty status of the primary family or primary unrelated individual residing in the housing unit. Furthermore, the poverty status of the primary family or individual for the year 1969 and 1979 was determined by applying current criteria for poverty instead of the criteria in place at that earlier time. This involved the use of a condensed set of poverty thresholds currently in place and deflating them to a 1969 and 1979 standard of living level as measured by the Consumer Price Index for All Urban Consumers (CPI-U, 1982-84=100).

INTERNATIONAL COMPARISONS OF EARNINGS INEQUALITY FOR MEN IN THE 1980's

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ABSTRACT

This paper presents a comparative analysis of earnings inequality during the 1980's among prime age men who headed households and worked year round full time from five industrialized countries—Canada, Sweden, Australia, West Germany, and the United States. The data were obtained from the Luxembourg Income Study (LIS) database, a multinational collection of microdata sets from various countries which have been assembled for the primary purpose of making cross-national comparisons of economic and social well-being. The results of the comparison indicated that during the mid-1980's, the United States had the most unequal distribution of earnings and Sweden the least unequal. Between the early-1980's and mid-1980's, however, the earnings distributions in all five countries showed evidence of becoming more unequal, and especially so in the United States, Canada, and Sweden.

INTRODUCTION

Growing inequality in the distribution of labor market earnings in the United States has become one of the more popular research topics in labor economics in recent years. Researchers in the early 1980's first observed rising earnings inequality among men (e.g., Henle and Ryscavage, 1980; Plotnick, 1982;). Since that time many papers, articles, and books have been written about the increase in earnings inequality during the 1980's and the possible explanations for the development (Levy and Murnane, 1991).

The analytical framework for explaining the greater dispersion in the earnings distribution has typically involved identifying the sources—or groups of workers—responsible for the growing inequality. Initially, an analysis of variance approach was suggested (Dooley and Gottschalk, 1982), but other decomposition techniques have been used. Sources of change in inequality measures are typically decomposed into those generated between and within specific groups of workers. These groups are typically defined on the basis of human capital attributes, such as age, experience, and education.

This new literature, of course, focuses almost exclusively on increasing earnings inequality in the U.S. over the last 20 years or so, with particular emphasis on its acceleration in the 1980's. In this paper, trends in earnings inequality during the 1980's for men from five industrialized countries—Canada, Sweden, Australia, West Germany, and the U.S.—are presented. While our analysis does not involve decomposing changes in inequality, it may prove useful in understanding the changes occurring in the U.S. If a pattern of rising inequality is observed in other developed nations, it may be that the same phenomena causing it there is also at work in the U.S. (e.g. skill-biased technological changes). Or if there has been no change in earnings inequality in these other nations, the reason for growing inequality in the U.S. may be due to problems unique to the U.S. (e.g. import trade imbalances).

Analyses of changes in the inequality of earnings distributions in other countries are rare.[1] Some related evidence, however, was made available by the Organisation for European Co-operation and Development (OECD) in their Employment Outlook for 1987 (OECD, 1987). The OECD examined earnings differentials between non-manual and manual workers in 16 of its member countries over the last two or three decades. Their analysis revealed that in 8 of the 16 countries studied, the trend in the differentials since 1980 was upward. These countries were Canada, Denmark, West Germany, Italy, the Netherlands, Norway, the United Kingdom, and the United States. Although the OECD data are only suggestive at best (given comparability problems, the aggregative nature of the data, and so on), they may reflect underlying changes taking place in the earnings and wage distributions of these countries.

This paper begins with a brief discussion of the various measures of inequality used in the comparison, followed by a section which discusses the data from the Luxembourg Income Study (LIS) that was used in the analysis. The next section presents the results of the comparison and consists of first determining how much

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[1]Cross-national comparisons of "income" inequality, however, are more common. For example, see O'Higgins, Schmaus, and Stephenson (1989).

inequality existed in each nation's earnings distributions in the mid-1980's and second, whether or not inequality changed in these countries between the early-1980's and mid-1980's. The final section summarizes the findings and discusses their implications for further research.

MEASURES OF EARNINGS INEQUALITY

Numerous indices exist for measuring the degree of inequality in an earnings distribution. They range from simple measures like the share of aggregate earnings received by each quintile, the coefficient of variation, and the variance of the natural logarithm of earnings, to more complex measures such as the Gini, Theil, Atkinson measures, and generalized entropy indices. All have different mathematical constructions and can lead to different assessments concerning the degree of inequality (Slottje, 1989). For this reason, multiple measures of inequality are examined in our cross-national comparison of earnings inequality in the interest of robustness.

Four of these measures of inequality deserve discussion since they have particular properties that some readers may not be aware of.[2] The variance of the natural logarithm is a popular measure of inequality but does not always satisfy the "principle of transfers." When income is transferred from a high paid worker to a less highly paid worker, earnings inequality should be reduced, however, in some instances this inequality measure can produce the opposite finding. In addition, this measure is particularly sensitive to changes in earnings levels in the lower end of the distribution.

The Gini index, while always satisfying the principle of transfers, is more sensitive to changes in the middle of the earnings distribution rather than the tails. This is because it is derived from the Lorenz curve which expresses the relationship between the cumulated percentage of aggregate earnings and cumulated percentage of earners. An increase or decrease in earnings in the middle of the distribution will have a greater impact on the measure than a similar change at either end since there are more earners in the middle ranks.

The Theil index also satisfies the principle of transfers but is also most sensitive to movements within the middle of the distribution. Its primary advantage in analyses of inequality is its property of decomposition: Overall inequality can be decomposed into "between" and "within" groups comprising the distribution.

Both the Gini and Theil indices, however, have a common disadvantage. if they are derived from distributions with intersecting Lorenz curves, that is, curves showing the relationship between the cumulated percentage of earnings and the cumulated percentage of earners, meaningful comparisons of the indices become problematic (Braun, 1988). This is commonly referred to as Lorenz dominance.

The Atkinson measures were developed to overcome this problem. Basically, the Atkinson measures allow one to shift the "weight" given to the middle ranks of the distribution to either the lower or upper ends of the distribution. The researcher can specify the degree of sensitivity to transfers within the distribution. In this paper three different values of "epsilon," or the weight, were chosen—0.5, 0.8, and 1.5. As the value of epsilon rises, the measure becomes increasingly sensitive to inequality among low earners.

THE DATA

The data for our comparison have been obtained from the Luxembourg Income Study (LIS), a multinational collection of microdata sets from various countries (Coder, Rainwater, and Smeeding, 1988). All of the data were collected in household surveys or surveys of administrative systems (Sweden) by institutions in countries participating in LIS. Each survey used different questionnaires, collection, and processing techniques, and differences also existed in population universes, variable definitions, and response rates. To the extent possible, however, definitions of income sources and family and household characteristics have been placed on a common foundation.

As of mid-1990, the LIS database consisted of microdata sets for 14 countries.[3] The countries of Canada, Australia, Sweden, West Germany, and the United States were selected for comparison because it is only for these countries that data were available covering two different periods of time in the 1980's. We refer to these periods as the early 1980's and mid-1980's, the former comprising 1979 to 1981 and the latter 1984 to 1987.[4] The following are the specific years used for each country:

	Early-1980's	Mid-1980's
Canada	1981	1987
Australia	1981	1985
Sweden	1981	1987
West Germany	1981	1984
United States	1979	1986

The universe initially selected for examination was adult men age 25 to 54 who headed households, worked year round, full time, and received no social insurance pension or private pension. This universe was chosen since the objective of the analysis was to focus on, as closely as possible, distributions of labor income which reflected standardized units of labor input (e.g., an hourly wage rate). In other words, by identifying a

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[2]Their mathematical constructions are given in the Appendix.

[3]The countries are Luxembourg, Italy, Poland, France, Israel, Netherlands, Norway, Switzerland, the United Kingdom, Canada, Australia, Sweden, West Germany, and the United States.

[4]A brief description of the surveys from each country is contained in the Appendix.

universe fully committed to the work force it was possible to minimize the confounding effect of differences in annual hours worked on annual wage and salary earnings.[5]

In defining the universes for analysis, however, a number of potentially troublesome comparability problems were encountered.[6] The most important related to the lower tail of the distributions where sampling and data collection problems tend to be most conspicuous. Since the universe being analyzed was composed of prime-age men, who were household heads and work year round, full time, it would be expected that the lower tail of the earnings distribution would be truncated at a "minimum wage" level or its equivalent. As shown in Table 1a, unreasonably low amounts of earnings for men were observed for Sweden at the 1st percentile of the distribution; in addition, particularly low levels were also observed at the 1st percentile for Canada and Australia. After investigating the data for Sweden in some detail it was found that this problem was caused by self-employed workers (farmers and other entrepreneurs) who had also received small amounts of wage and salary income. This finding was suggestive of a more general problem which applied to the other countries, that is, year-round, full-time "self-employed" workers with wage and salary income from other jobs.

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[5]There is, no doubt, variation across countries in the definition of year-round, full-time employment. For example, in the United States the definition was 50 or more weeks of employment at 35 hours or more a week. In Sweden, on the other hand, the definition is 1,872 hours of employment or more during the year. In Canada, Australia, and West Germany precise details concerning the definition of year-round, full-time employment was not provided in the dataset, although variables identifying year-round, full-time workers were provided.

[6]All of the microdata were weighted using sample weights and all the data presented, therefore, are weighted estimates.

Other potential problems concerned the upper tail of the distribution where data problems are often concentrated. One of these problems concerns "topcoding." In some countries, such as the United States, earnings in excess of certain levels may be topcoded, that is, all amounts higher than the specified limit are reduced to the limit before the data are released to the public. This practice is a means of preserving the confidentiality of survey respondents. However, it does introduce a bias into the data and affects measures of inequality. The presence of topcoding is clearly evident in the data for the U.S. shown in Table 1a where the topcode in 1979 was $50,000 and in 1986, $100,000. In the other countries it is not so evident given the differences between the maximum value of wage and salary earnings reported and the earnings at the 99th percentile.

While no adjustments were made for the problem of topcoding, it was possible to adjust the data for those year-round, full-time self-employed workers with wage and salary income.[7] In each country, they were excluded from the universe of male heads of households, age 25 to 54, who worked year round, full time. The results of this exclusion on the distributions can be seen in Table 1b.

The adjusted data in Table 1b also provide some preliminary evidence as to how these earnings distributions changed during the 1980's. The mean-to-median ratio for each country rose during the 1980's indicating that the mean in these distributions were being "pulled" up by increasingly high earnings values (Col. H). The highest-to-lowest decile ratio increased in all countries except Australia, indicative of greater dispersion in the

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[7]Another procedure for reducing "survey noise" and data collection and processing problems is simply to censor the distributions at the lower and upper ends (e.g., 1st and 99th percentiles). We rejected this procedure on the grounds of its arbitrariness.

Table 1a. **Summary Earnings Measures for Men, Heads of Households, Age 25 to 54 Years, Who Worked Year Round, Full Time in Selected Countries, Early-1980's and Mid-1980's**

(All numbers in currency of specified country)

| Country/year | A median | B mean | Decile* | | Percentile* | | G max. value | In percent | | | |
			C low	D high	E 1st	F 99th		H B/A	I D/C	J E/A	K F/A
US79	18,700	20,079	9,750	32,000	3,000	50,000	50,000	107	328	16	267
US86	27,500	30,848	13,000	50,600	5,200	100,000	100,000	112	389	19	364
SW81	81,900	87,185	55,808	126,272	1,807	238,212	700,000	106	226	2	291
SW87	129,800	140,629	86,607	207,963	924	387,609	1,800,000	108	240	1	299
CN81	23,510	24,761	13,501	37,539	4,590	57,835	105,000	105	278	20	246
CN87	31,410	33,398	14,430	52,210	1,765	95,122	260,000	106	362	6	303
AS81	17,490	18,292	10,971	27,213	2,224	42,000	170,000	105	248	13	240
AS85	23,290	24,763	14,088	37,190	1,318	59,352	200,000	106	264	6	255
WG81	36,700	40,071	25,680	58,680	10,000	88,300	200,000	109	229	27	241
WG84	41,200	46,173	28,900	69,300	18,000	107,900	236,000	112	240	44	262

* Figures for deciles and percentiles are upper limits of the specified group.
NOTE: U.S. = United States, 1979 and 1986; SW = Sweden, 1981 and 1987; CN = Canada, 1981 and 1987; AS = Australia, 1981 and 1985; WG = West Germany, 1981 and 1984.

Table 1b. **Summary Earnings Measures for Men, Heads of Households, Age 25 to 54 Years, Who Worked Year Round, Full Time in Selected Countries, After Exclusion of the Self-Employed, Early-1980's and Mid-1980's**

(All numbers in currency of specified country)

| Country/year | A median | B mean | Decile* | | Percentile* | | G max. value | In percent | | | |
			C low	D high	E 1st	F 99th		H B/A	I D/C	J E/A	K F/A
US79	18,750	20,118	9,800	32,000	3,000	50,000	50,000	107	327	16	267
US86	27,950	31,140	13,000	52,000	4,806	100,000	100,000	111	400	17	358
SW81	84,700	93,149	64,000	131,500	40,300	242,025	700,000	110	205	48	286
SW87	135,900	152,379	103,400	215,400	69,324	399,594	1,800,000	112	208	51	294
CN81	23,610	24,922	13,730	37,640	4,691	58,058	105,000	106	274	20	246
CN87	32,760	35,094	17,485	53,000	5,810	97,985	260,000	107	303	18	299
AS81	17,510	18,429	11,020	27,270	2,709	42,013	170,000	105	247	15	240
AS85	24,000	25,601	15,588	37,672	5,118	59,962	200,000	107	242	21	250
WG81	36,880	40,104	25,730	58,570	10,000	88,300	200,000	109	228	27	239
WG84	41,600	46,508	29,300	69,800	20,800	105,104	236,000	112	238	50	253

* Figures for deciles and percentiles are upper limits of the specified group.
   NOTE: U.S. = United States, 1979 and 1986; SW = Sweden, 1981 and 1987; CN = Canada, 1981 and 1987; AS = Australia, 1981 and 1985; WG = West Germany, 1981 and 1984.

distributions (Col. I). The 1st percentile-to-median ratio (Col. J) reflects the spread or distance between the bottom and middle of each distribution. This measure shows that this distance increased dramatically in West Germany and slightly in Australia and Sweden. In Canada and the United States the change in the distance between these two points of the distribution was not very large. The 99th percentile-to-median ratio (Col. K) reflects the gap in the distribution between the median and the top of the distribution. In each country, the distance between these two points increased from the early-1980's to the mid-1980's, with the largest increases occurring in the United States and Canada. Consequently, in each country there was preliminary evidence that distributions of earnings of prime-age men who headed households and were fully committed to the labor force had become more unequal during the 1980's.

CROSS-NATIONAL COMPARISONS OF EARNINGS INEQUALITY MEASURES

The results of the comparative analysis of earnings inequality in Canada, Sweden, Australia, West Germany, and the United States is presented in two parts. First, various earnings inequality measures are presented for these countries as of the mid-1980's which address the question as to whose distribution was the most unequal and whose was the most equal. Naturally, differences are expected given the differences in each countries' economic structure (e.g., industrial composition, extent of unionization, compensation practices) and other factors that influence the shape of the earnings distribution. Second, we compare these mid-1980's earnings inequality measures to their counterparts as of the early 1980's and address the more

interesting question as to whether or not the distributions changed over this period of time. Here, our expectations are less certain, although the preliminary evidence presented above suggests changes have indeed taken place.

Earnings Inequality in the Mid-1980's

Table 2 shows the share of aggregate wages and salaries received in each decile by men who were heads of households and worked year round full time in Canada, Sweden, Australia, West Germany, and the United States in the 1984-87 period. The distributions were arrayed (from left to right) on the basis of which country had the smallest proportion of aggregate earnings in it's lowest decile. In other words, in which country did workers at the bottom of the earnings distribution receive the smallest share of total earnings? As shown in the Table, in the U.S. the lowest decile of men received only 3.0 percent of all earnings, followed by Canada at 3.4 percent. Australia's and West Germany's lowest deciles, respectively, received the next largest shares, with Sweden's lowest decile, on the other hand, obtaining 5.9 percent.

Turning to the shares received by the highest deciles in each country produces a somewhat different ranking of countries. Once again the U.S. would occupy the first position since it's highest decile of earners received 23.3 percent of the aggregate followed by Canada whose highest decile received 20.7 percent. Thereafter, the ranking changes. Sweden's 19.4 percent share would now occupy the third position (if the table were rearranged), followed by Australia and West Germany with shares of 19.0 and 18.9 percent, respectively.

Indeed, careful inspection of these distributions reveals that it is difficult to compare the degree of inequality in

Table 2. Percentage Share of Aggregate Wage and Salary Income Received by Men, Heads of Households, Age 25 to 54 Years, Working Year Round, Full Time, by Deciles for Selected Countries, Mid-1980's

Decile	U.S.	Canada	Australia	West Germany	Sweden
Lowest........	3.0	3.4	4.4	5.4	5.9
Second	4.9	5.7	6.6	6.7	7.1
Third..........	6.1	6.8	7.4	7.1	7.6
Fourth	7.2	7.9	8.2	8.3	8.1
Fifth	8.3	8.8	8.9	8.5	8.7
Sixth..........	9.5	9.9	9.8	9.4	9.2
Seventh.......	10.7	10.9	10.6	10.3	10.0
Eighth.........	12.2	12.1	11.7	11.7	11.1
Ninth..........	14.8	13.8	13.4	13.7	12.9
Highest	23.3	20.7	19.0	18.9	19.4

NOTE: United States, 1986; Canada, 1987; Australia, 1985; West Germany, 1984; Sweden, 1987.

countries can be seen to intersect (see Figure). Consequently, to completely answer the question as to whose distributions were the most equal and unequal, more sophisticated measures of earnings inequality must be used.

Table 3 presents a ranking of the five countries, with respect to earnings inequality, using several earnings inequality measures, specifically, the variance of the logarithm of annual earnings, the Gini and Theil indices, and three Atkinson measures. The table indicates that regardless of measure, the U.S. distribution of earnings showed the highest level of inequality in it in the mid-1980's. The country with the second most unequal distribution among these five countries was Canada. Although these results were anticipated from the share analysis above, these earnings inequality measures quantify how much more unequal the U.S and Canadian distributions are from one another as well as the other countries.

Lorenz Curves, Five Nations: Mid-1980's

Percent of aggregate earnings
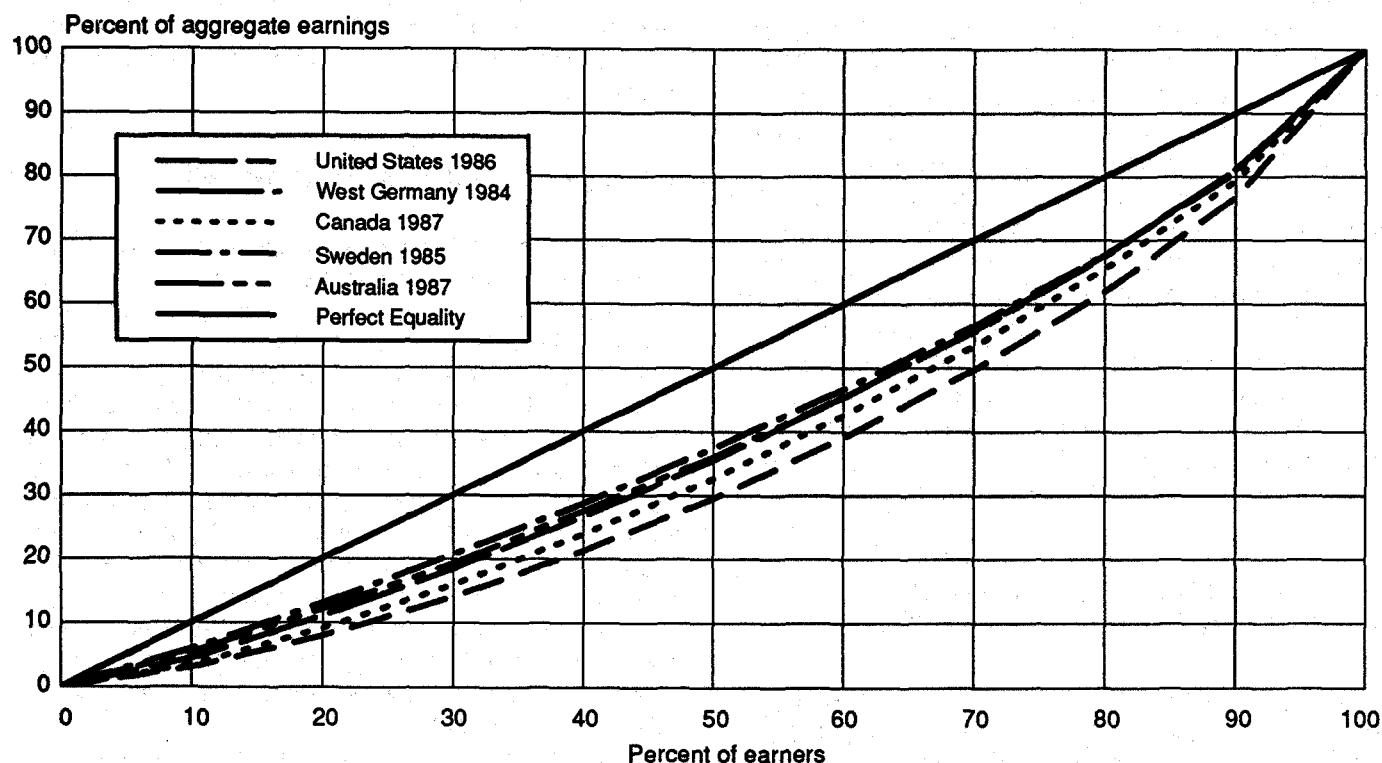
Note: Men, age 25 to 54, heads of households, year around, full time.

the distributions of Australia, West Germany, and Sweden. For example, if the criteria for judging which distribution was more unequal was based on the shares of earnings received by the lowest and highest deciles, an unambiguous ranking could not be arrived at. In the first instance, Sweden's distribution would be considered the most equal, but in the second it would be West Germany's. Furthermore, the Lorenz curves for these

For Australia, West Germany, and Sweden, the earnings inequality measures provide a somewhat clearer picture of whose distribution was the most unequal and most equal than the share analysis did. All of the measures indicate that Australia's was the most unequal followed by West Germany and then Sweden. The readings from the Gini and Theil indices, of course, should be viewed cautiously since Lorenz dominance

Table 3. **Measures of Earnings Inequality for Men, Heads of Households, Age 25 to 54, Working Year Round, Full Time for Selected Countries: Mid-1980's**

Rank	Ln Y	Gini	Theil	Atkinson (0.5)	Atkinson (0.8)	Atkinson (1.5)
1...............	.453(US)	.298(US)	.149(US)	.074(US)	.120((US)	.341(US)
2...............	.280(CN)	.253(CN)	.116(CN)	.057(CN)	.091(CN)	.185(CN)
3...............	.210(AS)	.212(AS)	.087(AS)	.042(AS)	.067(AS)	.146(AS)
4...............	.133(WG)	.204(WG)	.071(WG)	.034(WG)	.053(WG)	.097(WG)
5...............	.111(SW)	.190(SW)	.071(SW)	.032(SW)	.049(SW)	.082(SW)

NOTE: US = United States, 1986; CN = Canada, 1987; AS = Australia, 1985; WG = West Germany, 1984; SW = Sweden, 1987.

was present in the these distributions. Each of the Atkinson measures produced the same ranking of countries, although the magnitude of the differences varied between the measure which gives more weight to the low end of the distribution and the measure which weights the upper end more heavily.

Earnings Inequality: Early-1980's vs. Mid-1980's

Among the many factors that can influence changes in a Nation's distribution of earnings are changes in the health of the economy. Although measures of earnings inequality for these countries are compared over somewhat different time periods, the economies of these countries in the early-1980's and mid-1980's were, generally speaking, in similar phases of the business cycle (OECD, 1990). In each country, the mid-1980's represented years of economic growth and recovery from recessions in the early 1980's. Gross domestic products were rising and inflation had moderated relative to the early 1980's. In the early 1980's, on the other hand, economic growth was less robust and inflation more problematic as each country was in or about to enter a period of economic slowdown.

The data presented in Table 4 show the percentage share of aggregate wages and salaries by quintile for men age 25 to 54 who headed households and worked full time, year round in Canada, Sweden, Australia, West Germany, and the U.S. in the early-1980's and mid-1980's.[8] In each country there is evidence to varying degrees of a greater concentration of earnings in the upper quintiles of the earnings distributions. For the U.S., Canada, and Sweden, the share of earnings received by each of the lowest three quintiles declined while the share for the top quintiles increased. In the U.S., for example, the share of aggregate wage and salary earnings received by the top one-fifth of earners increased from 35.0 percent to 38.1 percent, or 3.1 percentage points. Canada had a 2.1 percentage point increase in the share going to the highest earners. The increase in the share going to Sweden's top earners, however, was only 0.7 percentage points.

In the case of Australia and West Germany, the patterns of change in the distributions were somewhat different than in the other countries. In Australia, the

[8]Quintiles instead of deciles are examined here since the changes in this unit of measurement over time are larger and can be more easily seen.

Table 4. **Shares (in percent) of Aggregate Wage and Salary Income Received by Men, Heads of Households, Age 25 to 54, Working Year Round, Full Time, by Quintile for Selected Countries, Early-1980's and Mid-1980's**

Country/year	Total	Quintile				
		Lowest	Second	Third	Fourth	Highest
United States						
1986......................	100.0	7.9	13.3	17.8	22.9	38.1
1979......................	100.0	8.9	14.6	18.6	22.9	35.0
Canada						
1987......................	100.0	9.1	14.7	18.7	23.0	34.5
1981......................	100.0	10.1	15.5	19.0	23.0	32.4
Sweden						
1987......................	100.0	13.0	15.7	17.9	21.1	32.3
1981......................	100.0	13.2	16.1	18.1	21.0	31.6
Australia						
1985......................	100.0	11.0	15.6	18.7	22.3	32.4
1981......................	100.0	10.8	15.9	19.0	22.7	31.6
West Germany						
1984......................	100.0	12.2	15.4	17.9	22.0	32.6
1981......................	100.0	12.0	16.0	18.3	21.8	31.9

share received by the highest fifth of earners increased and the share increased (slightly) for the lowest fifth of earners as well. A similar pattern of change was evident in West Germany, except that the share also rose slightly in the fourth quintile. In other words, in these two countries the middle quintiles received slightly smaller shares of aggregate earnings. It is also important to note that Lorenz curves for the early-1980's and mid-1980's in both Australia and West Germany crossed at the lower end of the distributions.

The above share analysis strongly suggests that earnings of the highest paid men in each of the countries examined were becoming more concentrated in the 1980's. This development was particularly acute in the United States and Canada. Nevertheless, some change towards greater earnings inequality was detected in Sweden, Australia, and West Germany as well. More sophisticated measures of inequality, however, are required to confirm this finding.

Table 5 displays the inequality measures that were previously discussed in connection with the question of which country had the most and least amount of inequality in its distribution. This Table, however, now includes the values of these measures for the early 1980's, and the percentage change in the measures between the early-1980's and mid-1980's. As might be expected from the share analysis, all of the measures indicate a strong increase in inequality in the United States and Canada. The percentage increases in the measures for the United States ranged from 16 percent (the Gini index) to 34 percent (Atkinson, 1.5 epsilon); for Canada, they ranged from 14 percent (the Gini index) to 38 percent (the Theil index).

All of the inequality measures for Sweden registered increases as well, but they were not as large as for the North American countries. They ranged from as little as 4 percent (Atkinson, 1.5 epsilon) to 13 percent (the Theil index). Interestingly, the increases in both the variance of the logarithm of annual earnings and the Atkinson measure (1.5 epsilon)—two measures sensitive to the low end of the distribution—were on the low side of this range reflecting the small change that occurred in the share of aggregate earnings received by the lowest quintile.

In Australia four of the six measures increased and in West Germany three measures moved higher. The increases for both were generally smaller than in the other countries (except the Theil measure for Australia). It should be remembered, however, that the span of years comprising the comparisons for these two countries is relatively short. Again, the measures sensitive to the bottom of the distribution—the variance of the logarithm and the Atkinson measure (1.5 epsilon)—registered declines in inequality reflecting the share increases at the bottom of the distributions discussed earlier.

IMPLICATIONS OF RESULTS

The growth of earnings inequality in the U.S. in recent years has been well-documented and the subject of much concern in both the research and policy communities. One of the concerns has been whether or not the millions of jobs created in the U.S. during the 1980's were primarily of the "low paying, low productivity" variety. Another related concern, of course, is how much of the growing earnings inequality was responsible for the growing inequality of incomes among families and households.

Table 5. **Changes in Measures of Earnings Inequality for Men, Heads of Households, Age 25 to 54 Years, Working Year Round, Full Time for Selected Countries, Early-1980's and Mid-1980's**

Country/year	Ln Y	Gini	Theil	Atkinson (0.5)	Atkinson (0.8)	Atkinson (1.5)
United States						
1986	.453	.298	.149	.074	.120	.341
1979	.354	.258	.111	.057	.094	.254
Percent change	28.0	15.5	34.2	29.8	27.7	34.3
Canada						
1987	.280	.253	.116	.057	.091	.185
1981	.225	.222	.084	.043	.071	.148
Percent change	24.4	14.0	38.1	32.6	28.2	25.0
Sweden						
1987	.111	.190	.071	.032	.049	.082
1981	.105	.180	.063	.029	.045	.079
Percent change	5.7	5.6	12.7	10.3	8.9	3.8
Australia						
1985	.210	.212	.087	.042	.067	.146
1981	.234	.208	.075	.040	.065	.155
Percent change	-9.3	1.9	16.0	5.0	3.1	-5.8
West Germany						
1984	.133	.204	.071	.034	.053	.097
1981	.162	.195	.068	.033	.054	.114
Percent change	-17.9	4.6	4.4	3.0	-1.9	-14.9

The results presented above suggest that the U.S. was not the only industrialized country during the 1980's to experience an increase in earnings inequality among prime age men who head families that were fully committed to the labor force. It was shown that the wage and salary earnings distributions for similar men from Canada and Sweden became more unequal as well. In addition, there was evidence that inequality was growing for these groups of men in Australia and West Germany. These findings may be further evidence of underlying structural changes taking place in the distributions of labor market incomes in many developed countries.

Table 6. **Average Annual Growth Rates in Total Employment for Selected Countries, Early-1980's to Mid-1980's**

Country	Period	Average annual growth rate
United States........................	1979-86	1.49
Canada	1981-87	1.28
Australia	1981-85	1.08
Sweden..............................	1981-87	.43
West Germany.......................	1981-84	-.77

Clearly, the "job quality" issue as a cause of growing earnings inequality in the U.S. loses credibility when rates of employment growth in these other countries are compared to the U.S. experience. Each country had quite different employment experiences during the periods in which inequality was rising, as shown in Table 6 (OECD, 1990). In the U.S. and Canada, the annual average rate of growth was in the 1.3 to 1.5 percent range and in Australia it was 1.1 percent. In Sweden employment growth was meager, while in West Germany it was declining.

The fact that rising earnings inequality occurred in other industrialized countries with different job creation experiences suggests that rising inequality may be related to more general phenomena occurring across nations. One possibility involves changing technologies. Computer and communication technologies have changed dramatically in recent years and these may have altered the demand for different skill classes of labor. Production processes may have been so altered that companies and factories now require more highly skilled and educated workers, while the demand for less well-trained labor associated with older production processes has declined. At the same time these shifts in demand have taken place, the supply of workers in various skill classes may have changed less rapidly thereby increasing inequality in the earnings distribution. This, of course, is speculation. Nevertheless, evidence now exists that the phenomenon of growing earnings inequality may have an international dimension.

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APPENDIX. INEQUALITY MEASURES AND DATA SOURCES

INEQUALITY MEASURES

The mathematical construction of four inequality measures used in this paper are discussed below.

Variance of the Natural Logarithm of Annual Earnings

This is a popular measure of relative earnings dispersion because earnings distributions are approximately lognormal and the lognormal distribution has particular properties conducive for analysis. The measure is written as

$$\text{Var ln } Y = \frac{\sum_{i=1}^{n} (\ln y_i - \ln \bar{y})^2}{n}$$

where $\ln y_i$ is the natural logarithm of person i's annual earnings, $\ln \bar{y}$, is the mean of annual earnings, and n is the number of persons with earnings.

The Gini Index or Coefficient of Income Concentration

The Gini index is also a popular measure of inequality. It can be written as

$$G = 1.0 - \sum_{i=1}^{n} f_i (p_i + p_{i-1})$$

where f_i is the proportion of earners in interval i and p_i is the proportion of total earnings received by earners in interval i and all lower intervals.

Theil's "Entropy" Index of Inequality

The Theil index can be written as

$$T = (1/n) \sum_{i=1}^{n} (y_i / \bar{y}) \log (y_i/\bar{y})$$

where y_i is the annual earnings of the ith earners, $\bar{y}$ the mean annual earnings, and n, the number of earners.

Atkinson's Measures of Inequality

The family of Atkinson measures are constructed as

$$A = 1 - [(1/n) \sum_{i=1}^{n} (y_i /\bar{y})^{1-\epsilon}]^{\frac{1}{1-\epsilon}}$$

with the similar notation found in the other measures, except for the ϵ, or epsilon. As the value of the epsilon rises, the measure becomes increasingly sensitive to inequality among low earners. Low values of epsilon produce results similar to the Gini index.

DATA SOURCES

The following is a brief description of the household surveys which were the source of the earnings data. Household sample sizes do not necessarily reflect the size of the original sample in all cases, but rather the number of households comprising the country's micro-data set in the LIS database.

Australia

The Australian data for both 1981 and 1985 were obtained from The Income and Housing Survey. The sample size in 1981 was 15,985 households and in 1985, 7,560.

Canada

Earnings data for Canada were obtained from The Survey of Consumer Finances and refer to 1981 and 1987. Sample sizes for the LIS data base were 15,136 and 10,999.

West Germany

Data for West Germany for the year 1981 were taken from the 1981 German Transfer Survey and based on a household sample size of 2,727. The German Panel Survey (Wave 2) was the source of the data for 1984 and 5,174 households from it comprised the LIS data base.

Sweden

The Swedish Income Distribution Survey in both 1981 and 1987 was the source of the data for Sweden. The LIS database used data from 9,625 households in 1981 and 9,421 households in 1987.

United States

The data for the United States come from the Work Experience and Income Supplement to the March Current Population Survey and relate to the years 1979 and 1986. In 1979, the sample consisted of 15,225 households and in 1986, 13,707.

TRENDS IN INCOME AND WEALTH OF THE ELDERLY IN THE 1980's

by Paul Ryscavage

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The 1980's contained one of the longest periods of economic expansion in recent history. The economy, after experiencing back-to-back recessions in the opening years, grew (as measured by the gross national product) between 1983 and 1989 at an average rate of almost 4.0 percent a year. Millions of jobs were created, inflation was held in check, and prices on the stock market soared to all time highs. But as is frequently pointed out today, the expansion was not without its flaws. The Federal government's fiscal deficit mushroomed as did the Nation's trade deficit. And one of the more disturbing developments was that not all groups in society shared equally in the benefits of the economic growth. Income inequality among households increased during the 1980's and the incidence of poverty was reduced only slightly.

Because not everyone benefited from the prosperity of the 1980's, it is of interest to find out how the elderly, or persons age 65 and over, fared in these years. After all, unlike the nonelderly most of the elderly are retired and are somewhat removed from the day-to-day workings of the economy. Did they share in the general rise in economic well-being or were they left behind?

This question takes on added significance, today, in the decade of the 1990's. In the second half of 1990 the economy slumped into a recession and, at the same time, the budget and trade deficits continued to impact on the country's economic performance. Furthermore, the financial costs of the Persian Gulf war and the savings and loan crisis represent an additional strain on the economy. Where the elderly stood economically as they left the 1980's and entered the 1990's becomes even more important, if the recession deepens, the deficits fail to shrink, and the other economic burdens are not resolved. A second and more difficult question, therefore, might be asked: Are the elderly prepared for "hard times" if indeed the economic climate worsens?

Comprehensive answers to these two questions are difficult since the economic well-being of the elderly, or any group, is so multifaceted.[1] In the following pages,

however, we examine two aspects of the economic expansion of the 1980's which have been discussed frequently in the media—income growth and wealth accumulation—and assess what they meant for the elderly in the previous decade. In so doing, implications of these developments for the current decade will emerge. Data from Census Bureau surveys are used in this assessment.

Income Growth for the Elderly—The Big Picture

Real incomes (incomes adjusted for price changes) of most Americans began to grow again in the 1980's, after periods of economic recession and rampant inflation in the 1970's and early 1980's. The real annual median household income of all households rose by 10.5 percent between 1982 and 1989.[2] Previous to this, income growth had been erratic at best, affected by the country's sluggish economic performance. What happened to the incomes of the elderly?

Perhaps the best source of information to answer this question, or for that matter any question relating to the income of specific population groups, is the March Current Population Survey (CPS) conducted by the Census Bureau. This is a sample survey of approximately 60,000 households throughout the country and is also the source of the Nation's statistics on poverty, labor force activity, and other socio-economic characteristics of the population.

The CPS allows one to examine income trends in a variety of ways and for a variety of groups. For example, we can examine the median or mean income of households with an elderly householder, or we can look at the incomes of all elderly persons living in households.[3] In addition, the CPS allows us to examine different groups

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[1] For a comprehensive review of the research on the elderly, including their economic status, see Michael D. Hurd, "Research on the Elderly: Economic Status, Retirement, and Consumption and Saving," *Journal of Economic Literature*, June 1990, pp. 565-637.

[2] All nominal income data cited in this paper can be found in various editions of Current Population Reports, Series P-60, U.S. Bureau of the Census, USGPO, Washington, D.C. Real annual income data are in terms of 1989 dollars and have been adjusted for inflation by the Bureau of Labor Statistics' Consumer Price Index (CPI-U-X1).

[3] A householder is a person in whose name the residence being surveyed is owned or rented.

among the elderly. The elderly, of course, are a heterogeneous group. Many are very old and live alone, others may have just retired and live as married couples, and still others may live as single individuals in their son's or daughter's family.

The CPS income data, however, do have their limitations. These limitations become particularly troublesome when the emphasis of the analysis is on income comparisons between groups, and issues of "well-being" are being examined. One limitation is that the CPS excludes the value of certain "noncash" income items, such as food stamps, Medicare, Medicaid, employer-provided health insurance and pension plans. Some of these items are important to the elderly. A second limitation is that the CPS income data relate to incomes before taxes. Obviously, a "disposable income" concept would be more desirable for determining the elderly's resources for immediate consumption. A third limitation concerns income underreporting in the CPS. It is well known that some income items, such as income from certain assets, are underreported by survey respondents. And a last limitation concerns the adjustments to the reported income data which should be made for "economies of scale" in households of different sizes and compositions. All of these limitations are important to the extent that they have differential effects on population groups. The emphasis of the analysis in this section of the paper, however, is the trend in income for the elderly relative to the population as a whole. While it is recognized that if the above limitations were accounted for the quantitative results would be somewhat different from what is presented, it is most likely that the basic relationship between income trends would not be much different.

Median Incomes of Households and Persons. Table 1 shows the real annual median incomes of all households in the country and elderly households between 1979 and 1989. In 1989, the median income of the 93.3 million households in the country was $28,906, compared to $15,571 for the 20.2 million elderly households. When the trends in incomes for all households and elderly households are examined over this period some interesting patterns emerge.

Between 1979 and 1989, the real median income of elderly households increased by 19.5 percent comapred to a 4.8 percent increase in the real median income of all households. Between 1982 and 1989, however, there was no significant difference in the rates.[4] This, of

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[4]Statistical significance is a concept concerning the amount of confidence we have in an estimate derived from a sample. Confidence in an estimate is expressed in terms of a confidence interval. In the case above, if all possible samples were surveyed under the same conditions, statistically significant changes in incomes would occur in 90 percent of the samples. Unless, otherwise stated, all statistical comparisons in this paper have been tested for statistical significance at the 10 percent level.

Table 1. **Real Median Household Income for Elderly Households and All Households: 1979 to 1989**

(In 1989 dollars)

Year	Elderly households		Total households	
	Income	Index (1979 = 100.0)	Income	Index (1979 = 100.0)
1989	$15,771	119.5	$28,906	104.8
1988	15,642	118.5	28,537	103.5
1987	15,765	119.4	28,447	103.1
1986	15,664	118.6	28,168	102.1
1985	15,274	115.7	27,218	98.7
1984	15,275	115.7	26,751	97.0
1983	14,905	112.9	26,167	94.9
1982	14,321	108.5	26,163	94.9
1981	13,629	103.2	26,251	95.2
1980	13,230	100.2	26,683	96.7
1979	13,203	100.0	27,583	100.0
Percent change in income:				
1982-89	10.1	(NA)	10.5	(NA)
1979-89	19.5	(NA)	4.8	(NA)

Note: Median household incomes have been adjusted for inflation using the Bureau of Labor Statistics' CPI-U-X1.

Source: U.S. Bureau of the Census, Current Population Survey.

course, was a period of economic recovery. It was in the 1979 to 1982 period—years containing two recessions— that the median for all households declined while the median for the elderly increased (figure). This illustrates the elderly's greater insulation from downswings in economic activity.

Table 2 contains data for all persons age 15 and over and elderly persons by sex. (Differences in income when measured on a person basis are smaller than when measured on a household basis.) During the 1982 to 1989 period real median annual incomes for elderly men and women and for men of all ages rose by similar rates—10 percent. For women of all ages, real incomes rose by 26 percent, no doubt reflecting the gains made by women in the job market during these years. It should be noted that even during the early part of the decade—1979 to 1982—women's incomes continued to rise faster than the other groups.

Trends in Income Inequality. Although real household incomes, on average, grew in the 1980's, the Census Bureau reported that income inequality had increased as well. How were the elderly affected?

A frequently used measure of income inequality is the share of "aggregate" income received by each quintile of the population, or in this case households. What this involves is a ranking of all households on the basis of income and then dividing this distribution into five equal parts or quintiles. As shown in table 3, the overall share of aggregate income received by the highest quintile in

Trends in Real Median Income in Elderly and All Households: 1979 to 1989 (1979=100)

Percent

Note: Elderly householders are age 65 years or more.

Source: U.S. Bureau of the Census, Current Population Survey

Table 2. Real Median Income for Elderly Men and Women and All Men and Women (age 15 and over): 1979 to 1989

(In 1989 dollars)

Year	Elderly persons		All persons	
	Men	Women	Men	Women
1989............	$13,107	$7,655	$19,893	$9,624
1988............	13,072	7,445	19,819	9,312
1987............	13,019	7,527	19,414	9,054
1986............	13,061	7,269	19,363	8,610
1985............	12,561	7,275	18,797	8,317
1984............	12,472	7,185	18,618	8,197
1983............	12,320	7,111	18,253	7,974
1982............	11,917	6,959	18,094	7,636
1981............	11,248	6,547	18,542	7,512
1980............	11,062	6,367	18,879	7,413
1979............	10,780	6,302	19,738	7,293
Percent change in income:				
1982-89.........	10.0	10.0	9.9	26.0
1979-89.........	21.6	21.5	0.8	32.0

Note: Median incomes have been adjusted for inflation using the Bureau of Labor Statistics' CPI-U-X1.

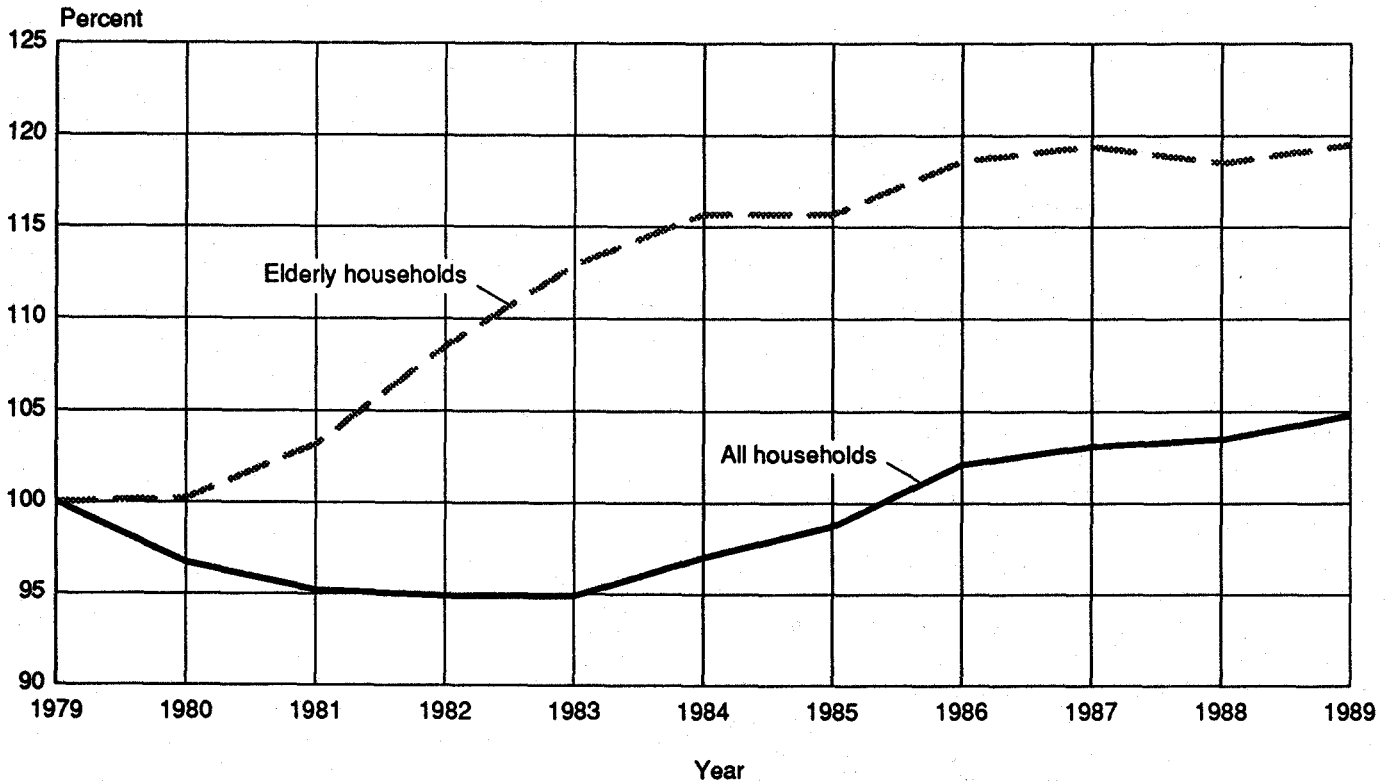Source: U.S. Bureau of the Census, Current Population Survey.

1979 was 44.2 percent, but 10 year later the proportion had increased to 46.8 percent, a statistically significant change. This share increase for the richest households occurred while households in the middle three quintiles and the lowest quintile experienced slight declines.

Table 3 also shows the number of elderly households in these quintiles in 1979 and 1989 and the fact that in both years more than 1 out of every 3 elderly households was in the lowest quintile of the Nation's income distribution. It also shows the relatively small number of elderly households in the top part of the income distribution.

The tabulation below looks at these data a different way. It shows the proportion of elderly households in the lowest quintile, the middle three quintiles, and the top quintile of the Nation's income distribution in 1979 and

Year	Proportion of Elderly Households in		
	Lowest quintile	Middle quintiles	Highest quintile
1989......................	41.6	19.2	8.7
1979......................	46.2	16.7	5.9

1989. Although the elderly are heavily represented in the lowest part of the income distribution, between 1979 and 1989 proportionally fewer of the elderly were in the lowest quintile and proportionally more were in the

Table 3. **Distribution of Aggregate Household Income, by Quintile and the Number of Elderly Households Represented in Each Quintile: 1979 and 1989**

Year		Distribution by quintile			
	Total	Bottom	Middle three	Top	Gini index
AGGREGATE INCOME OF ALL HOUSEHOLDS (in percent)					
1989..................	100.0	3.8	49.3	46.8	.431
1979..................	100.0	4.1	51.7	44.2	.404
ELDERLY HOUSE-HOLDS (in thousands)					
1989..................	20,156	7,759	10,778	1,619	(NA)
1979..................	16,544	7,457	8,118	969	(NA)

NA Not applicable.
Source: U.S. Bureau of the Census, Current Population Survey.

middle and highest quintiles of the distribution. In other words, the elderly, while still very common at the bottom of society's income ladder, made progress in climbing to higher rungs of that ladder during the 1980's.

Also shown in table 3 are the Gini indexes, or the shorthand measures of how much inequality exists in the country's income distribution.[5] If each household had the same income—perfect equality—this index would have a value of 0.0; however, if one household received all the income—perfect inequality—then the Gini index would be 1.0. In other words, the measure is bounded between 0 and 1. The Gini index for the U.S. household income distribution rose from .404 to .431 between 1979 and 1989, a statistically significant increase. According to the Census Bureau, the rate of increase was twice as great as the increase during the 1970's, so during the 1980's there was an acceleration in income inequality.

Poverty. Table 4 presents the trend in poverty for the elderly during the 1980's. In terms of the total population in 1989, 31.5 million persons were considered poor based on the Federal government's poverty definition, or 12.8 percent of the population. This poverty rate was slightly higher than that in 1979 (11.7 percent), but considerably lower than the rate in 1983 (15.2 percent) which reflected the economic downturn experienced in the opening years of that decade.

[5]The Gini index can be written as

$$G = 1.0 - \sum_{i=1}^{m} f(y_i + y_{i-1})$$

where f is the proportion of income recipients in interval i and y_i is the proportion of aggregate income received by the recipients in interval i and all lower intervals.

Among the elderly, 3.4 million persons had incomes below the poverty line in 1989, or 11.4 percent of all the elderly. This rate was well below that for the Nation as a whole and was well below the elderly's rate in 1979 of 15.2 percent.[6] The economic downturn of the early 1980's had less of an impact on the elderly than the population primarily because a smaller proportion of the elderly are in the work force and susceptible to periods of unemployment.

Indeed, the improvement in the poverty picture for the elderly during the 1980's stands out in sharp contrast to that of the nonelderly. The tabulation below shows that over the 10 year period the incidence of poverty worsened for nonelderly persons between the ages of 18 and 64 and for persons under age 18 (the majority of whom were children).[7]

Group	Percentage poor in	
	1979	1989
Total population.....................	11.7	12.8
Persons under 18	16.4	19.6
Persons 18 to 64..................	8.9	10.2
Persons 65 and older..............	15.7	11.4

These differential changes in poverty rates, of course, reflect the changing composition of the poverty population. The elderly's share of it in 1979 was 14.1 percent and by 1989 it was 10.7 percent.

Special Problem Groups Among the Elderly

The foregoing suggests that the elderly, on average, did quite well in the 1980's relative to the population. It should be remembered, however, that their average income is still far below that for all households in the Nation (46 percent below)[8] and that 2 out of every 5 households in the lowest income quintile are elderly households. Furthermore, not everyone within the elderly population shared equally in the income gains of the 1980's.

[6]According to the Bureau of the Census, the rate in 1989 for the elderly would have been 5.1 percent and 8.9 percent for the Nation if the value of certain noncash benefits were included and other adjustments to the poverty definition had been made. See "Measuring the Effect of Benefits and Taxes on Income and Poverty: 1989," Current Population Reports, Series P-60, No. 169-RD, U.S. Bureau of the Census, USGPO, Washington, D.C. 1990.

[7]Just as for the total population, poverty rates increased for persons aged 18 to 64 and persons under 18 during the early 1980's as a result of the economic slowdown in those years, and then the rates declined as the recovery began.

Poverty rates in 1989 for the groups shown here would be much lower if data on taxes, capital gains, and the value of certain noncash benefits were included in the CPS income concept. See "Measuring the Effect of Benefits and Taxes on Income and Poverty: 1989," Current Population Reports, Series P-60, No. 169-RD, U.S. Bureau of the Census, USGPO, Washington, D.C., 1990.

[8]Research has shown that this income differential is smaller if the CPS income were "adjusted" for some of the limitations discussed earlier. See Michael D. Hurd, "Research on the Elderly," cited in footnote 1, above.

Table 4. **Number of Persons With Incomes Below the Poverty Level and the Poverty Rate for Elderly Persons and All Persons: 1979 to 1989**

Years	Elderly persons		All persons	
	Number (thous.)	Rate (percent)	Number (thous.)	Rate (percent)
1989..........	3,369	11.4	31,534	12.8
1988..........	3,481	12.0	31,745	13.0
1987..........	3,563	12.5	32,221	13.4
1986..........	3,477	12.4	32,370	13.6
1985..........	3,456	12.6	33,064	14.0
1984..........	3,330	12.4	33,700	14.4
1983..........	3,625	13.8	35,303	15.2
1982..........	3,751	14.6	34,398	15.0
1981..........	3,853	15.3	31,822	14.0
1980..........	3,871	15.7	29,272	13.0
1979..........	3,682	15.2	26,072	11.7

Source: U.S. Bureau of the Census, Current Population Survey.

Table 5 shows the distribution of aggregate income by quintiles for elderly households in 1979 and 1989, just as was shown for all households in table 3. The first thing to note is that when measured by the Gini index, the elderly have a somewhat more unequal distribution of income than society as a whole. Their Gini index in 1989 was .467. But, more importantly, even among the elderly there was some evidence of an increase in inequality over 1979-89 period. According to the Gini index, inequality in the elderly's distribution rose from .446 to .467 (the increase, however, was not statistically significant).[9] Some groups among the elderly were left behind also. Who were they?

Elderly Women Living Alone. There are a number of ways to answer this question. One way is to look at the data by the elderly's living arrangements and marital status. (Unfortunately, the only published data available from the Census Bureau at the time of this writing was for 1987. Nevertheless, these data are useful.)

Table 6 shows that real median annual incomes between 1979 and 1987 rose by only 12.9 percent for elderly female unrelated individuals, or from $6,966 to $7,863. For female family householders in which the husband was absent, incomes rose but the increase was not statistically significant. These are sizable groups when compared to all elderly families and unrelated individuals. The increases in their income levels were far

[9]The change in the Gini index for elderly households was on the borderline of statistical significance. Other researchers have observed growing inequality of income among elderly households during the 1980's. See Daniel B. Radner, "Changes in the Incomes of Age Groups, 1984-89," Social Security Bulletin, Vol. 54, No. 12, December, 1991, pp. 2-18.

Table 5. **Distribution of Aggregate Household Income, by Quintile for Households With an Elderly Householder: 1979 and 1989**

(In percent)

Quintile	1979	1989
Total.................	100.0	100.0
Lowest.................	4.8	4.5
Second	9.0	8.5
Third...................	14.3	13.5
Fourth	22.0	21.7
Highest	50.0	51.9
Mean	$11,144	$23,452
Gini index	.446	.467

Source: U.S. Bureau of the Census, Current Population Survey.

below the increases experienced by elderly married couple families.

The relatively poor income growth performance of elderly women during the 1980's is also reflected in their poverty statistics. As shown in table 7, while their poverty rate fell from 30.4 to 23.4, it still remains very high. And the economic situation for elderly Black women who are poor has been particularly intractable. The poverty rate for the 371,000 Black elderly women in 1989 was 59.8 percent; in 1979 the comparable figure was 64.8 percent, not significantly different. The vast majority of these women are widowed and live alone. Clearly, the income picture for elderly Black women did not brighten much in the 1980's.

Table 6. **Real Median Income of Elderly Families, by Type and Elderly Unrelated Individuals, by Sex: 1979 and 1987**

(In 1987 dollars)

Type of family and sex	1979		1987	
	Number (thous.)	Income	Number (thous.)	Income
FAMILIES				
Total	8,792	$17,362	10,502	$20,813
Married-couples	7,248	17,330	8,631	20,996
Male householder, no wife..	304	18,606	391	24,946
Female householder, no husband	1,240	17,235	1,479	18,761
UNRELATED INDIVIDUALS				
Total	7,656	7,141	9,330	8,205
Male	1,666	7,961	2,158	9,584
Female...................	5,990	6,966	7,173	7,863

Source: U.S. Bureau of the Census, Current Population Survey.

The Elderly "Slightly Above" the Poverty Line. Another way to find out who was left behind is to look at how far

Table 7. **Poverty Levels and Poverty Rates of Elderly Families, by Type and of Elderly Unrelated Individuals, by Sex: 1979 and 1989**

Type of family and sex	1979		1989	
	Number (thous.)	Rate (per-cent)	Number (thous.)	Rate (per-cent)
FAMILIES				
Total	797	9.1	703	6.6
Married couples	594	8.2	495	5.6
Male householder, no wife..	35	11.7	28	7.8
Female householder, no husband	168	13.5	180	12.2
UNRELATED INDIVIDUALS				
Total	2,243	29.3	2,166	22.0
Male	421	25.3	385	17.3
Female	1,822	30.4	1,780	23.4
Black	295	64.8	371	59.8

Source: U.S. Bureau of the Census, Current Population Survey.

above and below the poverty line the elderly were located in 1979 and 1987. (Again, we must rely on data for 1987.) To do this the ratio of income to the poverty line is computed for elderly householders and unrelated individuals.[10]

As was indicated earlier, income levels of the elderly rose during the 1980's but at different rates for different groups of the elderly. The data in table 8 show that the proportions of elderly family householders with income to poverty line ratios of under 2.0 (or incomes below twice the poverty line) declined between 1979 and 1987. Moreover, the proportion with income to poverty ratios of 2.0 or more rose from 62 to 70 percent of all the elderly.

But when we examine the data for elderly unrelated individuals, the improvement is less impressive, especially just slightly above the poverty line. The proportion of unrelated individuals with income-to-poverty line ratios of between 1.26 and 2.00 was not significantly different during the 1980's, vis-a-vis the situation for all elderly households. Almost 25 percent of all elderly unrelated individuals were located in this part of the distribution in both 1979 and 1987. This lack of identifiable change was particularly obvious among elderly women who were unrelated individuals (most of whom live alone), as is shown in table 8. These are probably persons with Social Security income as their only source of income.

In contrast, the proportions of elderly unrelated individuals located below 1.25 of the poverty line did decline significantly between 1979 and 1987, while the proportion above 2.0 of the poverty line increased. In consequence, the general improvement in the income situation of the elderly was not necessarily shared by groups with incomes slightly above their poverty lines.

The Elderly and Wealth

Another important dimension of the economic well-being of the elderly is their wealth or net worth. While the incomes of the elderly are lower than the nonelderly, on average, their net worth is much higher simply because they have had a longer period of time to accumulate assets. This wealth is an important source of income and security for the elderly.

There is a general impression that asset holdings appreciated across society during the 1980's. Real estate values and stock market prices did rise, while investment opportunities abounded given the expansion in corporate indebtedness. Of interest, of course, is what happened to the asset position of the elderly during this period.

The Census Bureau's Survey of Income and Program Participation (SIPP) periodically surveys households about their economic well-being, including wealth holdings or net worth.[11] The Census Bureau defines net worth as the value of assets minus liabilities. Specifically, interest-earning assets, stocks and mutual fund shares, real estate, own businesses or professions, mortgages held by sellers, and vehicles, minus debts secured by any asset, credit card or store bills, bank loans, and other unsecured debts equals net worth. The Bureau recently released the results of their wealth survey for 1988 and it is possible to compare it to the results of the same survey in 1984.

What the Elderly Have. Before we examine what happened to the net worth of the elderly in the 1980's it would be useful to take an inventory of their assets as compared to the rest of the population. The total value of the elderly's net worth, of course, is twice as high as that of all households—the median net worth for the elderly was $73,471 compared to $35,752 for all households. Table 9 displays the distribution of net worth in 1988 by asset type for all households in the population as well as those households with elderly householders. Also shown are the median values of these assets.

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[10]The poverty index, of course, varies by family size, number of children, and age of householder for one or two person households. In 1987, the poverty line for an elderly unrelated individual was $5,447; for an elderly two-person household, it was $6,865.

[11]See Household Wealth and Asset Ownership: 1988, Current Population Reports, Series P-70, No. 22, U.S. Bureau of the Census, USGPO, Washington, D.C., 1990, and Household Wealth and Asset Ownership: 1984, Current Population Reports, Series P-70, No. 7, U.S. Bureau of the Census, USGPO, Washington, D.C., 1986.

Table 8. **Distribution of Elderly Family Households, Elderly Unrelated Individuals, and Elderly Persons by Their Income-to-Poverty Line Ratio, 1979 and 1987**

(In percent)

Ratio	Elderly households		Elderly unrelated individuals		Elderly female unrelated individuals		Elderly persons	
	1979	1987	1979	1987	1979	1987	1979	1987
Total.........................	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Less than .50......................	1.6	1.4	4.0	2.9	3.8	3.0	2.4	1.9
.50-1.00..........................	7.4	5.7	25.3	21.1	26.5	22.4	12.7	10.3
1.01-1.25.........................	6.2	4.5	17.1	15.0	17.8	15.4	9.6	8.0
1.26-1.50.........................	6.9	5.7	11.7	11.0	11.7	11.7	8.2	7.2
1.51-2.00.........................	15.7	12.8	14.3	13.8	14.2	13.7	15.3	13.1
2.00 or +.........................	62.1	69.8	27.7	36.1	25.8	33.8	51.9	59.4

Source: U.S. Bureau of the Census, Current Population Survey.

Table 9. **Distribution of Net Worth, by Asset Type and Median Value for Elderly Households and All Households: 1988**

Asset type	Elderly households		All households	
	Total (percent)	Median value	Total (percent)	Median value
Total..	100.0	$73,471	100.0	$35,752
Interest earning assets[1].................................	22.4	14,560	14.1	3,494
Other interest earned[2]...................................	6.8	24,080	4.2	10,911
Checking accounts.....................................	0.5	605	0.6	487
Stocks, mutual funds...................................	8.2	11,017	6.5	4,510
Home equity..	40.4	55,447	43.1	43,070
Rental property equity..................................	6.7	45,075	7.9	37,439
Other real estate equity................................	2.6	17,417	4.3	18,064
Vehicles...	3.1	3,834	5.8	4,416
Business equity.......................................	3.0	10,662	8.8	10,446
U.S. savings bonds....................................	0.6	1,430	0.6	546
IRA/Keogh...	2.8	12,155	4.2	9,016
Other financial investments.............................	3.5	26,891	3.0	16,204
Unsecured assets.....................................	-0.5	(NA)	-2.9	(NA)

1/Includes savings accounts, money market deposit accounts, certificates of deposit, and interest earning checking accounts.
2/Includes money market funds, government securities, corporate or municipal bonds, and other interest earning assets.
Source: U.S. Bureau of the Census, Survey of Income and Program Participation.

As is well known, the single most important component of the average household's assets is the equity in the home—43 percent of total net worth. This is also true for the elderly, although to a slightly lesser extent. Interest earning assets, however, are a very important element of the elderly's net worth vis-a-vis the population in general. Almost 25 percent of the elderly's net worth is comprised of passbook savings accounts, money market deposit accounts, certificates of deposit, and other interest earning assets held at financial institutions. Only 14 percent of all households' net worth is comprised of these assets.

Changes in the Elderly's Net Worth, 1984 to 1988.
So did "wealth" increase during the 1980's and what happened to the elderly's net worth? Table 10, which shows the median net worth for all households and elderly households by monthly income quintiles, attempts to answer to that question. (As with the income data, net worth data are presented in "real" terms.) [12]

The table shows that despite the economic expanison of the 1980's, wealth did not change. The real median net worth of all households in the country was about $36,000 in both 1984 and 1988. (The difference shown in the table was not statistically significant.) For the elderly, however, median net worth rose from $68,600 to $73,471, a statistically significant increase. In addition, the elderly in the third and highest monthly income quintiles also experienced statistically significant increases in their net worth. Net worth increased from roughly $110,000 to $142,000 in the third quintile and from

[12]The net worth data for 1984 are expressed in terms of 1988 dollars having been adjusted for inflation by the Bureau of Labor Statistics' Consumer Price Index (CPI-U).

Table 10. Median Value of Household Net Worth, by Monthly Income Quintile and Median Value of House-hold Net Worth After Excluding Home Equity, by Monthly Income Quintile for Elderly Households and All Households: 1984 and 1988

(In 1988 dollars)

Year	Total	Monthly income quintile				
		Bottom	Second	Third	Fourth	Highest
NET WORTH						
Elderly Households						
1988....................................	$73,471	$25,220	$76,050	$141,811	$201,562	$343,015
1984....................................	68,600	25,088	73,814	109,998	194,876	273,982
All Households						
1988....................................	$35,752	4,324	19,694	28,044	46,235	111,770
1984....................................	37,012	5,130	21,248	29,459	49,947	98,411
NET WORTH (excluding home equity)						
Elderly Households						
1988....................................	$23,856	3,536	28,168	57,026	100,480	208,789
1984....................................	21,557	3,193	26,200	51,827	97,677	185,844
All Households						
1988....................................	$9,840	1,152	5,454	8,418	14,376	40,688
1984....................................	8,800	1,112	5,320	7,938	12,406	35,744

Source: U.S. Bureau of the Census, Survey of Income and Program Participation.

$274,000 to $343,000 in the highest. Only about 17 percent of all elderly households fall in the third quintile and only 8 percent in the highest. So, it was only in these relatively small groups of the elderly population that gains in net worth were registered.

Also shown in table 10 is the median net worth position of the elderly and the population as a whole, excluding the equity in the home. Obviously, these medians are much lower reflecting the importance of the home in an elderly household's net worth. What is of interest for the elderly is that, although the medians had increased between 1984 and 1988, none of the changes were statistically significant.

Other Aspects of the Elderly's Net Worth

As indicated above, while the net worth position of the elderly did increase "on average" during the heart of the 1980's, it was not a uniform increase across all income groups. In general, the improvement was found among those in the middle and upper monthly income brackets of society. But as was also pointed out earlier, the elderly are more commonly found in the lower portion of the income distribution.

Table 11 shows two other dimensions of the increase in the real net worth of the elderly between 1984 and 1988. First, the increase was concentrated among those households in which the householder was 70 to 74 years of age. Real net worth rose from $68,500 to $82,111. Changes for the other age groups were not statistically significant. The same pattern was observed when home equity was excluded from net worth: only

Table 11. Median Value of Net Worth and Median Value of Net Worth After Excluding Home Equity for Elderly Households, by Age and Type of Household: 1984 and 1988

(In 1988 dollars)

Age and type of household	Net worth		Net worth (excluding home equity)	
	1984	1988	1984	1988
AGE				
65 and over...............	$68,600	$73,471	$21,557	$23,856
65 to 69..................	75,992	83,478	24,757	27,482
70 to 74..................	68,514	82,111	21,321	28,172
75 and over...............	62,865	61,491	19,469	18,819
TYPE OF HOUSEHOLD				
Married couple	98,128	124,419	39,270	45,890
Male householder	47,504	48,883	14,448	15,914
Female householder	48,386	47,233	11,622	10,693

Source: U.S. Bureau of the Census, Survey of Income and Program Participation.

among those elderly households in which the householder was 70 to 74 did net worth increase. (Table 11 also shows how net worth drops after age 74—from roughly $82,000 to $61,000. Those householders age 75 and over are a growing proportion of the elderly.)

A second dimension of the table, net worth by type of household, also illustrates the rather narrowly based increase in net worth for the elderly. Only among elderly married couple households did real median net worth increase. It rose from $98,128 in 1984 to $124,419 in

1988. These types of households, of course, make up less than half of all elderly households and are comprised of 65 to 74 year olds. For single male and female householders, on the other hand, little change was observed in their net worth positions. This pattern was also evident after the exclusion of home equity. (The table also demonstrates how much lower wealth holdings are for these single householders, especially women, as compared to married couple households.)

Conclusions

In general, the 1980's were relatively good years for the elderly, at least in terms of income growth and increases in net worth or wealth. Broad measures of income and net worth for elderly households increased more than they did for all households. However, as was true concerning the entire population, the gains in income and wealth associated with the economic expansion of the 1980's were not shared by all elderly households.

Growth in real income was weakest for elderly single householders, especially women, and those elderly households slightly above the poverty line. The situation was particularly acute for elderly Black women living alone—a group whose poverty rate changed very little in the decade. Elderly married couple households, on the other hand, appeared to have fared best during the decade. Income inequality became somewhat more acute for the elderly as well.

Although data on net worth, or wealth, are not as readily available as income data, survey data for 1984 and 1988 provide two points in time by which we might obtain a glimpse of what was happening in the decade. The data showed that for all households there was very little change, and only among the highest income households did median net worth increase. In contrast, among elderly households net worth increased and was up particularly for middle income and high income elderly households. The increase was confined generally to married couple households and those with householders aged 70 to 74.

As the elderly left the 1980's and entered the 1990's, therefore, it appears that, on average, they were better off, at least with respect to income and wealth, then when they entered the 1980's. But the 1990's began on less than a sanguine note—recession, indebtedness, and unexpected costs. For those among the elderly who did not share in the benefits of the economic expansion of the 1980's, the years immediately ahead may produce considerable economic stress. Indeed, these groups would appear to be the most economically vulnerable.

Source and Accuracy of Estimates for Studies in the Distribution of Income

SOURCE OF DATA

Most estimates in this report come from data obtained in March of 1970 through 1990 in the Current Population Survey (CPS). The Bureau of the Census conducts this survey every month, although this report uses only March data for its estimates. The March survey uses two sets of questions, the basic CPS and the supplement. The basic CPS collects labor force data for the civilian noninstitutional population. In March, supplemental data is collected on money income received during the previous calendar year.

Some estimates in this report come from data obtained in the 1984, 1986, and 1987 Survey of Income and Program Participation (SIPP) topical module, Assets and Liabilities. The 1984 data were collected during the fourth interview of the 1984 panel. The 1988 data were collected during the seventh interview of the 1986 panel and the fourth interview of the 1987 panel.

Another source of data for this report is the Luxembourg Income Study (LIS). The LIS is a multinational collection of microdata sets from various countries. All of the data were collected in household surveys or surveys of administrative systems by institutions in countries participating in LIS.

Survey Estimates. The estimation procedures used for CPS and SIPP data inflate weighted sample results to independent estimates of the civilian noninstitutional population of the United States by age, sex, race, and Hispanic/non-Hispanic categories. These independent estimates are based on statistics from decennial censuses; statistics on births, deaths, immigration, and emigration; and statistics on the size of the Armed Forces. The estimation procedure for 1980 through 1990 data used independent estimates based on the 1980 decennial census; 1970 through 1979 data used independent estimates based on the 1970 decennial census. This change in independent estimates had relatively little impact on summary measures, such as medians and percent distributions, but did have a significant impact on levels. For example, use of the 1980 based population controls resulted in about a 2 percent increase in the civilian noninstitutional population and in the number of families and households. Thus, estimates of levels for 1980 and later will differ from those for earlier years by more than what could be attributed to actual changes in the population. These differences could be disproportionately greater for certain population subgroups than for the total population.

ACCURACY OF ESTIMATES

Since the CPS and SIPP estimates are based on samples, they may differ somewhat from the figures from a complete census using the same questionnaires, instructions, and enumerators. There are two types of errors possible in an estimate based on a sample survey: sampling and nonsampling. The standard errors provided in most Current Population Reports primarily indicate the magnitude of the sampling errors. They also partially measure the effect of some nonsampling errors in response and enumeration but do not measure any systematic biases in the data. Bias is the difference, averaged over all possible samples, between the estimate and the desired value. The accuracy of a survey result depends on the net effect of sampling and nonsampling errors. Particular care should be exercised in the interpretation of figures based on a relatively small number of cases or on small differences between estimates.

Nonsampling Variability. As in any survey work, the results are subject to errors of response and nonreporting in addition to sampling variability. Nonsampling errors can be attributed to many sources, e.g., inability to obtain information about all cases in the sample, definitional difficulties, differences in the interpretation of questions, inability or unwillingness on the part of the respondents to provide correct information, inability to recall information, errors made in collection such as in recording or coding data, errors made in processing data, errors made in estimating values for missing data, and failure to represent all units with the sample (undercoverage).

Comparability of Data. Data obtained from sample surveys and other sources are not entirely comparable. This is due largely to differences in interviewer training and experience and in differing survey procedures. This is an additional component of error that is not reflected in the standard errors. Therefore, caution should be used in comparing results among these sources.

Sampling Variability. Standard errors are primarily measures of sampling variability, that is, of the variations that occur by chance because a sample rather than the entire population is surveyed. Standard errors are not given in this report because of the wide range of topics included and the wide variety of data sources. Standard errors may be found in the publications that are noted at the end of each section or by contacting John Coder, Gordon Green, Paul Ryscavage, or Edward Welniak.

Some statements may contain estimates followed immediately by another number in parenthesis. For those statements one needs only to add to and subtract from the estimate that number to calculate upper and lower bounds of the 90-percent confidence interval. For example, if a statement contains the phrase "grew by 1.7 (±1.0) percent," the 90-percent confidence interval for the estimate, 1.7 percent, would be from 0.7 percent to 2.7 percent.

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