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How Will Recent Patterns of Earnings Inequality Affect Future Retirement Incomes?

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The Public Policy Institute, formed in 1985, is part of Policy and Strategy at AARP. One of the missions of the Institute is to foster research and analysis on public policy issues of importance to older Americans. This paper represents part of that effort.

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Foreword

The increase in income and earnings inequality —the gap between those at the top, middle and bottom of the income scale—over the last 30 years is one of the most discussed trends in the labor market. Current research shows that income inequality grew significantly throughout the 1980s and 1990s and remains higher than at any other time in post-war era.[1] Recent polling responses indicate the public's awareness of the phenomenon: "…more than four in ten Americans see society as divided between the "haves" and the "have-nots."[2] Scholars have speculated on the potential causes--demographic shifts, international trade, and skill-biased technological change; and researchers have identified trends that have influenced the increase--a rise in earnings of more educated workers compared to less educated workers, a rise in earnings of older workers compared to younger workers, a rise in single-headed families and an increase in female earnings in high-income families.

Another significant trend is that Americans, on average, are living longer than ever before. Life expectancy for the U.S. population in 1900 was only 47.3 years; by 1960 it had increased to 69.7 years; by 2000 life expectancy had reached a record high of 76.9 years.[3] [4] As life expectancy continues to increase,[5] the importance of stable, long-term retirement income increases as well. What is not yet understood is the relationship between income and earnings inequality and retirement income. What will be the impact of the equality gap? Will the trends toward greater income and earnings inequality change the income distribution of future retired populations? And, if so, how?

This Issue Paper, commissioned by AARP's Public Policy Institute and written by Karen Smith of the Urban Institute, provides one picture. By simulating economic and demographic events from 1992 to 2040 the paper illustrates how the complex interactions among earnings patterns of men and women, marriage and divorce, mortality, and Social Security policy affect the future distribution of retirement benefits.

DYNASIM3, the simulation model used in the research, takes into account numerous economic and demographic factors such as, lifetime earnings, marital histories, age of Social Security take-up and differences in life expectancy among subgroup s of the population. It uses the 2001 assumptions of the Socials Security Trustees on future wage, price, mortality, fertility, and labor force participation.

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[1] Bernstein et al, *Pulling Apart: A State-by-State Analysis of Income Trends* 2000.
[2] Pew Research Center for People and the Press, 1,200 adults nationally, June 2001, quoted in: http://www.demos-usa.org/pubs/poreport2/contents/default.asp?page=/pubs/poreport2/contents/summary.htm
[3] Due, in great part, to the progress in fighting diseases that account for a majority of deaths in the U.S.
[4] HHS' Centers for Disease Control and Prevention, "Deaths: Preliminary Data for 2000."
[5] The Social Security Administration actuaries note in their 2002 Trustees' Report (p. 77) discussion of assumptions and methods that: "There is a wide range of opinions of among experts on the likely rate of future decline in death rates."

This research is particularly relevant in the context of recent discussions about reforming the retirement income system. Social Security, pensions, and savings are considered the primary components of retirement income.[6] Social Security is currently the most important of the three. More than 90 percent of those over age 65 receive benefits. In contrast, the Bureau of the Census reports that only about half of all workers today are covered by employer-provided pensions and rates of coverage have remained stagnant for the last 20 years.[7] Additionally, there has been a major shift toward defined contribution plans, such as 401(k)s, and away from defined benefit plans in recent years. This change puts the burden of investment risk on the employee; and due to market fluctuations, the result is a less predictable retirement income.

The research shows recent increases in earnings inequality will become modest increases in retirement income inequality across most of the parts of the distribution and more unevenly distributed in other parts. Thus an aggregate statement about inequality is difficult. However, there are some clear statements that can be made. Among them: total retirement income is distributed more unequally among women, especially unmarried women, than for men. It is more unequally distributed for minorities than for whites and more unevenly distributed for high school dropouts than for those with more education. The identification of these inequalities underlines the importance of studying and understanding the implications to all segments of the population of changes to the retirement income system

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[6] This is assuming no income from work.
[7] Social Security Administration, *Income of the Aged Chartbook 2000*, Washington, DC, 2002, p. 3.

Acknowledgements

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EXECUTIVE SUMMARY

Introduction

Over the past three decades, the distribution of family income has become increasingly less equal. Researchers have identified several trends that have influenced this rising inequality, including a rise in the earnings of more educated workers compared to less educated workers, a rise in relative earnings of older workers compared to younger workers, a rise in the share of single-headed families, and an increase in female earnings in high-income families, among others.

After three decades of rising income inequality, it seems reasonable to infer that retirement income inequality of future retirees will increase. Whether or not this will happen, however, will depend on the extent to which cross-sectional income inequality has and will persist over individuals' lifetimes. It is possible that the increasing disparity of earnings of older and younger workers will have no impact on retirement income inequality, as workers are both young and old over their careers. It is possible that the increase in the share of single-headed families will have little impact on retirement income inequality because of entitlement to Social Security benefits in retirement from former spouses. On the other hand, permanent changes, such as increased returns to education, could result in persistent changes in lifetime earnings. Retirement income inequality will depend on the extent to which families experience both high and low earnings over their working lives and how this variance affects their pensions, savings, and Social Security benefits.

Purpose

This study uses a dynamic microsimulation model to analyze the impact of recent patterns of rising earnings inequality on the retirement incomes of aged cohorts over the next four decades.

This paper addresses the following questions:

- How does the distribution of lifetime earnings change over the next four decades among men, women, and families?
- How do Social Security replacement rates change over time, given changes in earnings, family composition, and Social Security program rules?
- How does the distribution of retirement income change? Here we look separately at Social Security benefits, non-Social Security income, and total retirement income.
- What do these changes imply for poverty rates of the future aged population?

Methodology

This study uses the latest version of the Dynamic Simulation of Income Model (DYNASIM3) to project individual lifetime earnings, taking into account changes in demographics over

time. The model also simulates Social Security and pension benefits, asset income, and income of co-resident family members.

The model is based on a sample of more than 44,000 families from the 1990 to 1993 Survey of Income and Program Participation linked to historic earnings records generated from the 1968 to 1994 Panel Study of Income Dynamics and the 1973 Current Population Survey linked with Social Security Administration Summary Earnings Records.

The model simulates demographic and economic events from 1992 to 2040 using a large set of behavioral equations estimated from longitudinal data sources. The results show patterns of average lifetime earnings and per capita and family retirement incomes for cohorts retiring in 2000, 2010, 2020, 2030, and 2040.

Principal Findings

Lifetime Earnings Inequality. DYNASIM3 projects that the inequality in men's lifetime earnings will remain fairly stable over time, while the inequality in women's lifetime earnings will decline considerably. The decline in female lifetime earnings inequality reduces family lifetime earnings inequality over time. Because men's earnings continue to dominate family earnings, the decline in family earnings inequality is not nearly as dramatic as the decline in women's earnings inequality. Family earnings generally are distributed more equally than both men's and women's earnings alone.

Despite dramatic changes in family composition and female earnings over time, family wage-adjusted lifetime earnings will increase only modestly over time. While women's earnings rise relative to the average, some of their gains have come at the expense of men's earnings. While the median of wage-adjusted lifetime earnings of men was historically above the average wage, this is no longer true for men in later cohorts. While women are making substantial gains in the labor market, their lifetime earnings remain below those of men.

The change in the distribution of lifetime earnings are similar to those found by Bosworth, Burtless, and Sahm (2001) based on the Social Security Administration's MINT model. Both models find that lifetime earnings are more equally distributed than cross-sectional earnings. Both models find a significant decline in female lifetime earnings inequality. While DYNASIM3 finds that men's lifetime earnings inequality remains fairly stable over time, MINT predicts that men's lifetime earnings inequality rises slightly over time. The differences in measured inequality are due to differences in the earnings measure, differences in the analysis sample, and structural differences between the models.

Replacement Rates. Social Security replaces less of individual earnings over time, and the gap between men's and women's replacement rates narrows. The replacement rate decline will be more severe for women than for men, as women in later cohorts have more lifetime earnings than earlier cohorts and move into higher lifetime earning brackets (with lower Social Security replacement rates). Furthermore, the increase in the normal retirement age

beginning in 2000 reduces the replacement rate for early retirees after 2000 compared to those collecting benefits before 2000.

Family earnings replacement rates (based on shared earnings while a couple is married) decline over time, but not as steeply as individual earnings replacement rates do. Shared earnings replacement rates fall for married couples over time, as increased wives' earnings in dual earner couples are not rewarded with higher Social Security benefits. However, auxiliary benefits still tend to dampen this effect relative to individual earnings replacement rates.

Retirement Income. Average real per beneficiary Social Security income will rise over time, but at a decreasing rate. Changes in the Social Security benefit formula, lifetime earnings, and demographic composition all affect the rate of growth over time. Real non-Social Security income also rises over time. Between 1992 and 2010, non-Social Security income grows faster than Social Security income. After 2010, non-Social Security income grows more slowly than Social Security income. While real Social Security income increases with cohorts as they age, real non-Social Security income and total retirement income both decline. Differential mortality affects both Social Security and non-Social Security income, but the reductions in earnings, asset income, and pension income dominate and cause total retirement income to decline as individuals age.

DYNASIM3 projects that between 1992 and 2000, Social Security income will become more unequally distributed, and between 2000 and 2040, it will become more equally distributed. Non-Social Security income is distributed much more unequally than Social Security income, but it is projected to become slightly more evenly distributed over time. The 80/20 ratio, for example, indicates that real per capita total income will become more unevenly distributed between 1992 and 2010, and then become slightly more evenly distributed through 2040, but at higher levels of inequality than in 1992. For all income sources, there are considerable differences in inequality by gender, marital status, education, and race. Income inequality is higher for women than for men, higher for high school dropouts than for higher-educated individuals, higher for blacks than for nonblacks, and higher for single individuals than for married couples.

Future Poverty. DYNASIM3 projects that poverty rates for individuals at or above the normal retirement age will fall from 12 percent in 1992 to 6 percent in 2020, and to 3 percent in 2040. Although the rates will decline, never-married and divorced women, high school dropouts, and older retirees remain at risk of absolute poverty in the future.

When we adjust poverty thresholds by wage growth rather than price growth, relative poverty rates remain at about 12 percent over the coming decades. Older retirees are still more likely than younger retirees to live in absolute or relative poverty, and single women are more likely than married women and men to be impoverished. Never-married women, high school dropouts, and retirees in the bottom lifetime earnings quintile will have higher relative poverty rates in 2040 than in 1992.

Conclusions

These DYNASIM3 projections show that recent increases in earnings inequality will translate into modest increases in retirement income inequality throughout most of the income distribution. Social Security and female earnings both equalize the distribution of retirement income. Social Security benefits equalize the distribution because of the progressive payment formula. Increased female earnings equalize the income distribution because they pull up the bottom of the distribution, especially among unmarried women in retirement. Increased Social Security coverage rates also make retirement incomes more equal as many low-income noneligible retirees die off.

While increased wage growth, increased female labor force participation, and increased Social Security coverage rates all raise the incomes of future retirees, many historically disadvantaged groups remain vulnerable to poverty. These include the oldest retirees, those with less education, and individuals without access to spousal Social Security benefits.

These projections demonstrate how the complex interactions among recent earnings patterns of men and women, marriage and divorce, mortality, and Social Security policy affect the future distribution of retirement benefits. Women's own earnings will matter more in the future, and spousal benefits will matter less. Persons retiring after 2000 will have lower replacement rates than their predecessors as a result of a 1983 change in Social Security. Any consideration of future changes in Social Security policy must take into account potential effects on retirement income adequacy in the context of a dramatically changing elderly population.

I. Introduction

Many have speculated that recent trends in earnings inequality could increase income inequality among future retirees since retirement benefits are based on lifetime earnings. Bosworth, Burtless, and Sahm (2001) show that earnings inequality increased dramatically between 1973 and the end of the 1990s for both men and women. For example, the ratio of the 90^{th} to the 10^{th} percentile wage increased by 38 percent for full-time, full-year male workers, and by 33 percent for their female counterparts. The trend toward greater wage inequality will affect the distribution of future retirement incomes, if these trends also result in an increase in lifetime earnings inequality. Bosworth, Burtless, and Sahm (2001) also found that lifetime earnings inequality increased slightly among men, but actually declined for women. The lifetime trend for women was driven primarily by the increase in female employment rates at every stage of the life cycle.

The effects of increased earning inequality on future retirement incomes are not always clear. They depend on the cumulative effects on Social Security benefits, pensions, and the accumulation of assets over a lifetime. Increased variation in annual incomes may even out by retirement, with high values offsetting low values over a career. Income inequality among retirees also depends on both individual patterns of inequality across a lifetime and patterns for married couples.

Social Security benefits are based on lifetime earnings, and changes in the pattern of work and earnings directly affect the adequacy and distribution of benefits. However, benefits are based on earnings averaged over 35 years, and the dispersion of Social Security benefits within a retirement cohort depends on the persistence of earnings inequality over a lifetime. Moreover, the progressive Social Security benefit formula and auxiliary benefits for spouses and survivors could mitigate some of the effects of increased dispersion of lifetime earnings on the dispersion of benefits for some individuals.

Lifetime earnings inequality also affects the accumulation of pension and financial assets. Most individuals with low lifetime earnings do not have pension coverage. Even among the fortunate few who work for an employer that offers coverage, many do not participate when a contribution is required. Finally, a widening distribution of lifetime earnings will further widen the gap in financial asset holdings outside of Social Security and private pensions. Low lifetime earnings make it difficult for workers to save other than for emergency needs or shorter-term saving goals, such as for home purchases or education.

This study projects the effects of recent patterns of earnings inequality on the incomes of future retiree cohorts. We use the latest version of the Dynamic Simulation of Income Model (DYNASIM3) to project individual lifetime earnings, taking into account changes in demographics over time. The model also simulates Social Security, pension benefits, asset income, and income of co-resident family members other than a spouse for future retirees. We show changes in income inequality and poverty rates for retired persons across the 1992-2040 period.

The projections show that as the cohorts with higher earnings inequality move into retirement, retirement income inequality increases. The progressive Social Security payment formula replaces a higher share of income to retirees in the bottom of the income distribution and mitigates to some extent the rising retirement income inequality in the future. Because wage growth is expected to outpace price growth, and family poverty thresholds are indexed by prices, future retirees will have higher real income than current retirees do and their income relative to poverty will increase. Poverty rates of the retired population decline over time, but despite real wage growth, some subgroups are still at high risk of poverty.

Section II of this paper describes some of the dominant economic and demographic trends that will influence family income in retirement of future retirees. These include increasing returns to education, differences in earnings of older versus younger workers, differences in men's earnings relative to women's earnings, and changes in labor force participation and family composition. It also includes some discussion on the Social Security payment formula and its impact on family benefits.

Section III, briefly describes the data and the DYNASIM3 model used to project family incomes out to year 2040. Section IV describes the results. Section IV.1 includes a discussion of the trends in men's, women's, and families' lifetime earnings. Section IV.2 describes the trends in Social Security projected replacement rates using both own earnings and benefits and family earnings and benefits. Section IV.3 describes how the age, racial, marital, and educational composition of the retired population changes over time as different cohorts move into and through retirement. Section IV.4 describes the aggregate trend in retirement incomes, including a separate discussion of Social Security income, non-Social Security income, total income, and total income adjusted by poverty thresholds. Section IV.5 looks at the distribution of retirement income for the aged population and for gender, marital, educational, racial, and age subgroups. Section IV.6 shows how family retirement incomes vary by subgroup and describes the poverty status of the aged population. Finally, Section V presents a summary and conclusions.

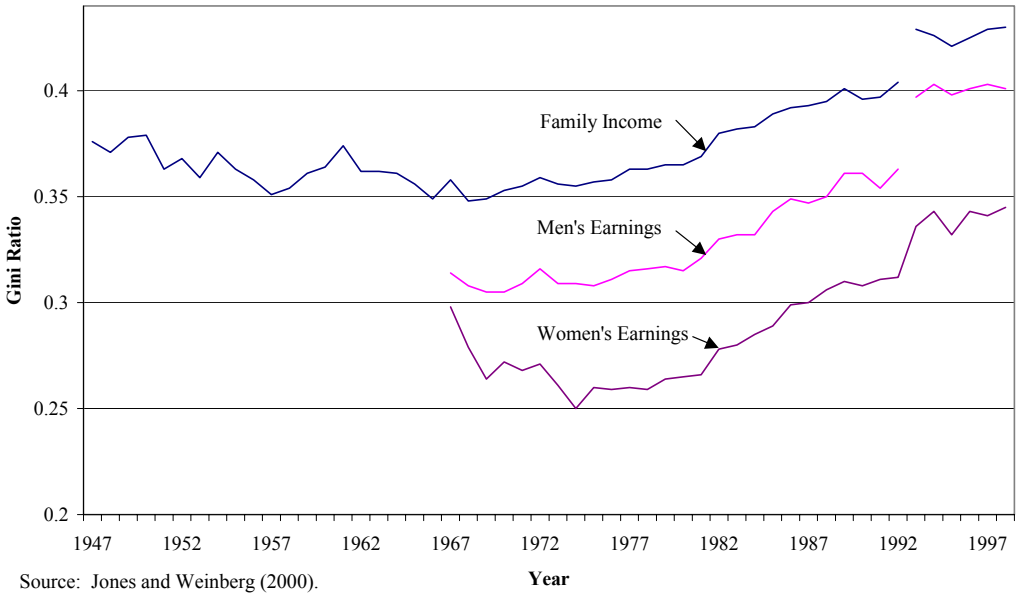
II. Background

Over the past three decades, the distribution of family income has become increasingly less equal. Since 1947, the U.S. Bureau of the Census has measured earnings inequality using Gini coefficients for the March supplement of the Current Population Survey (CPS). The Gini coefficient measures income dispersion and ranges from 0 to 1, with higher values indicating more inequality. The Gini coefficient for all families fell between 1947 and 1968, but has increased in almost every year since (see figure 1).[8] The Gini coefficient is just one of several measures of income inequality. Researchers commonly use other measures of inequality, and the choice of measure does affect the inequality estimate. For the period between 1967 and 1980, some measures show inequality increasing, and some show

[8] The discontinuity between 1992 and 1993 in figure 1 is due to changes in the survey that make the series not comparable between periods.

inequality decreasing, but the trend is unambiguously increasing from 1980 to 1990 (Jones and Weinberg 2000).

Figure 1
Gini Coefficient for Family Income: 1947-1998 and
Earnings of Men and Women Full Time, Year Round Workers: 1967-1998



Source: Jones and Weinberg (2000).
Note: The discontinuity between 1992 and 1993 is due to changes in the CPS that make the series not comparable.

For most families, earnings are the major source of income, and, as noted earlier, earnings of full-time workers became increasingly unevenly distributed between 1973 and the end of the 1990s. However, the pace of increasing inequality varied over this period (Mishel, Bernstein, and Schmitt 2001). From the early 1970s to 1995, wages were stagnant overall, and median wages fell. After 1995, wages changed course, rising strongly in response to the persistent low unemployment and faster productivity growth of recent years. These authors also show that family income growth was particularly unequal during the 1980s, when rapid income growth among upper-income families and stagnant or falling incomes for the bottom 60 percent of families led to sharp increases in inequality. Family income inequality continued to grow through the 1990s, although at a decelerated pace.

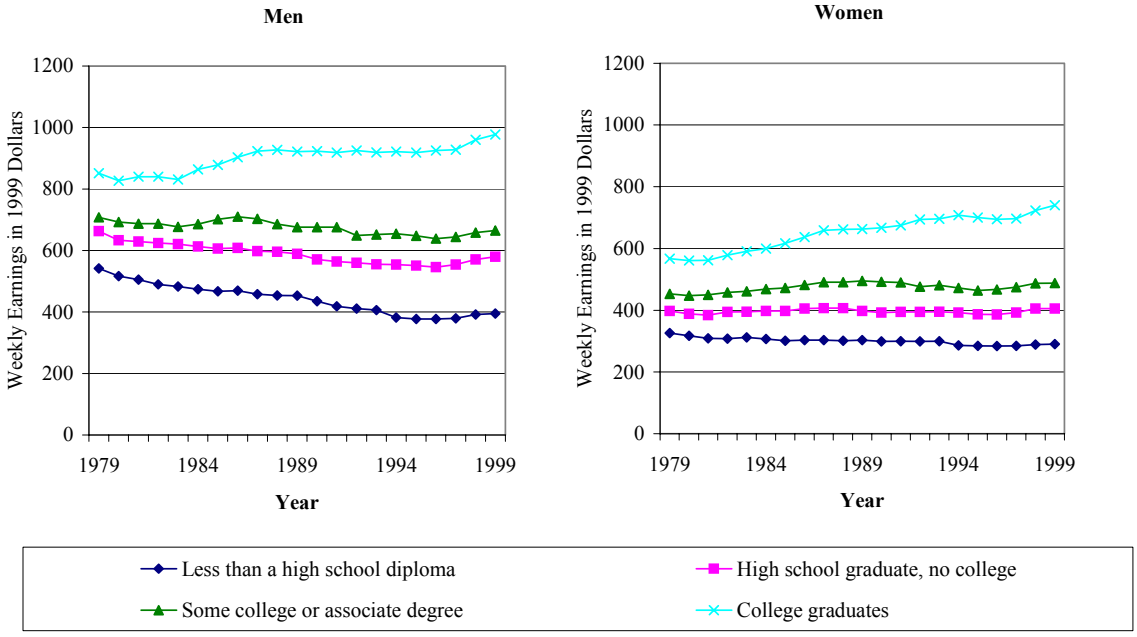
Researchers have identified several trends that have influenced wage and earnings inequality (Levy and Murnane 1992; Bound and Johnson 1995): the rise in relative earnings of more educated to less educated workers, the rise in relative earnings of older to younger workers among workers who are not college educated, the rapid increase in the ratio of women's earnings to men's earnings, and the increase in the variance of earnings among workers with similar characteristics such as education and age. Additional factors may affect family income inequality. For example, Karoly and Burtless (1995) find that increased income inequality after 1969 is partly due to the rise in single-head families, primarily because they have half as many potential earners. They also point to increased female earnings in high-income families as a factor in increasing inequality among family incomes.

The discussion below reviews the key factors identified as contributing to income inequality. These factors will continue to play a role in our projections of family income. For example, if individuals with particular characteristics tend to complete college more often than others, this will tend to increase their incomes relative to others over time. As the trends of decreased marriage and increased single-parenthood continue, this too will tend to increase family income inequality among the nonelderly over time. However, one must keep in mind potential mitigating effects from the Social Security system. The benefit formula is progressive so that low-wage workers get higher replacement rates than high-wage workers do. Also, some previously married single-earner families will benefit from the spousal benefit formula that provides a benefit equal to one-half the primary worker's benefit.

II.1 Returns to Education

The gap between earnings of more educated workers and less educated workers has widened. Earnings of men with a college degree have historically been above those of men with less education, and the gap widened beginning in the 1980s (see figure 2). In 1980, of full-time wage and salary working-men age 25 and older, those with a college degree earned about 30 percent more than men with only a high school degree. Men with less than a high school degree earned about 22 percent less than men with a high school degree. These

Figure 2
Median Weekly Earnings of Full-Time Workers
by Gender and Educational Attainment: 1979-1999



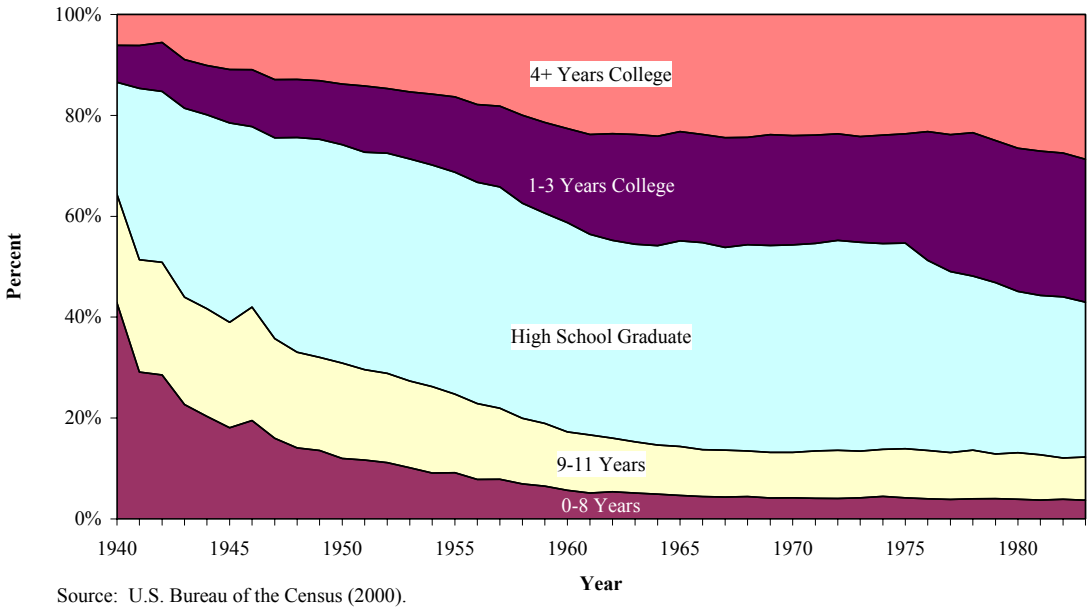
Source: U.S. Bureau of Labor Statistics (2000).

differences have widened over time, and in 1992, college-educated male full-time workers earned over 68 percent more than high school-educated men, and men with less than a high school education earned about 46 percent less than high school-educated men. As with men, college-educated women historically have earned more than lesser-educated women, and the returns to education widened in the 1980s.

Since 1940, when the Census Bureau first started collecting information on education, educational attainment has been increasing (see figure 3). The proportion of 25- to 34-year-olds with less than a high school education has fallen dramatically, from 64 percent in 1940 to 13 percent in 1999. The proportion with a college degree rose from 6 percent in 1940 to 30 percent in 1999, but the pattern of college attainment for men and women is different. While both are rising, men's attainment is characterized by a hump between 1973 and 1985, followed by a dip between 1985 and 1999. Women's college attainment has been rising steadily. More women now pursue higher education than in the past, to the point that they are now a majority of the college population and college degree recipients (see figure 4). These differences in educational attainment explain in part some of the increasing gap between older and younger workers.

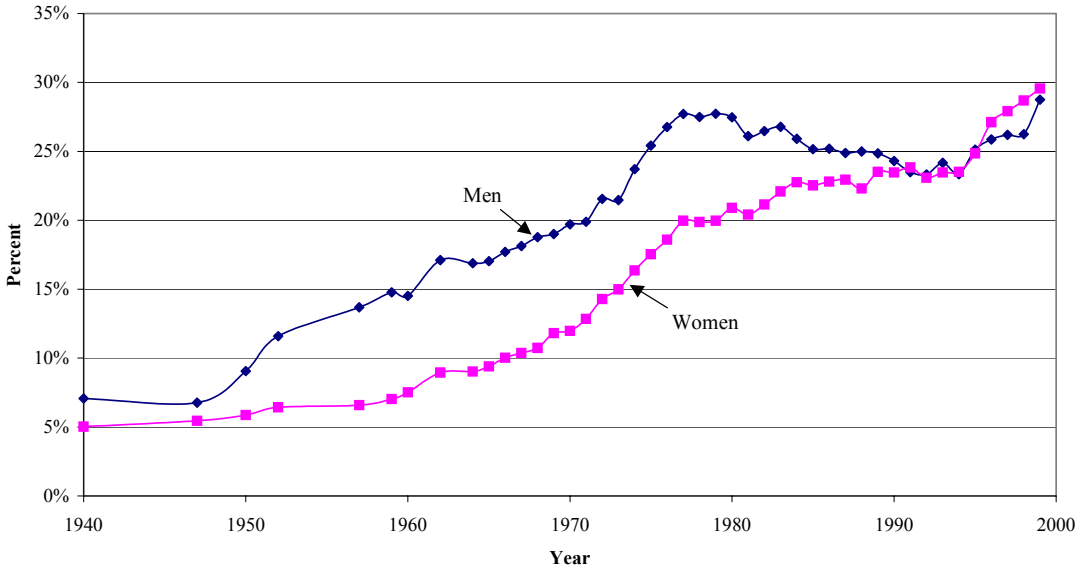
The increase in female educational attainment is an important factor in the increase in family income inequality. Because people tend to marry within race, religious, and educational attainment groups, the increased educational attainment of women has meant

Figure 3
Percent Distribution of Years of School Completed by 25- to 34-Years-Olds, Selected Years 1940 to 1999



Source: U.S. Bureau of the Census (2000).

Figure 4
Percent of 25- to 35-Year-Olds with a Bachelor's Degree or Higher by Gender: Selected Years 1940 to 2000



Source: U. S. Bureau of the Census (2000).

there are many more couples in which both spouses have some college or a college degree (Mare 1991; Winkler 1998; Qian 1998; Pencavel 1998; Lewis and Oppenheimer 2000). The percent of newly wed husbands with a college education who married college-educated women has increased over the last four decades. In 1940, 25 percent of college-educated (13-15 years of schooling) newly wed husbands married college-educated wives (see table 1). By the mid-1980s, the proportion had increased to 42 percent. The growth rate is higher among college graduates. In 1940, 32 percent of college-graduate newly wed husbands married college-graduate wives. By the mid-1980s, this proportion had increased to 61 percent.

II.2 The Gap in Earnings between Younger and Older Workers

A most noticeable change in relative median earnings among men has been the widening gap between earnings of younger and older workers that began after 1970. This widening gap occurred mostly among high school-educated workers. Using data from the March Current Population Survey (CPS) for various years, Levy and Murnane (1992) found that in 1971, the ratio of earnings of high school-educated men age 45 to 54 to earnings of high school-educated men age 25 to 34 was 1.08. By 1979, that ratio had climbed to 1.23, and by 1987, it had reached 1.33. In contrast, the earnings ratio for college-educated men, which was much higher to begin with, grew from 1.36 in 1971 to 1.47 in 1979 and remained at about that level until 1987. Similar trends were not apparent for women.

Table 1
Percent of College-Educated Newly Wed Husbands with College-Educated Wives by Year and Educational Attainment

	Year				
	1940	**1960**	**1970**	**1980**	**1987**
Percent of College-Educated (13-15 years) Newly Wed Husbands with College-Educated Newly Wed Wives	25%	33%	39%	42%	42%
Percent of College-Graduate Newly Wed Husbands with College-Graduate Newly Wed Wives	32%	39%	48%	54%	61%
Percent of College-Educated (13+) Newly Wed Husbands with College-Educated Newly Wed Wives	46%	55%	63%	69%	74%

Source: The Urban Institute tabulations from Mare (1991).

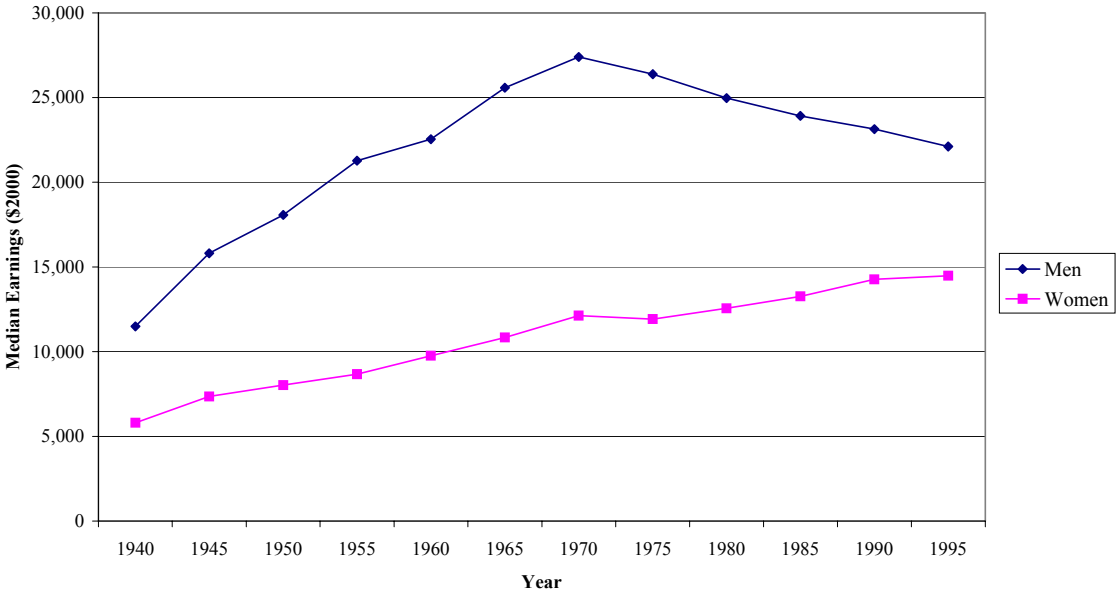
If the widening gap between the earnings of older and younger workers reflects an increasing return to experience, then younger workers can expect to "catch up" as they age. If the age gap is the result of differences among cohorts, then later cohorts of high school-educated workers will reach retirement with lower lifetime earnings (relative to workers with more education) than their predecessors.

II.3 The Narrowing Gap in Men's and Women's Earnings

Men earn more than women, but the gap is closing (see figure 5). In 1950, women earned about 44 percent of what men earned. By 1995, this differential had fallen to 66 percent of men's earnings. Average real earnings of women have increased in almost every year since 1940. This is not true for men. Men's real earnings increased from 1940 to 1970, but have declined since. Part of the decline in men's average earnings is due to the baby boom moving into the low earnings early part of their careers, but men in all age groups experienced declining real earnings beginning in the 1970s (see figure 6). The largest declines have been for men in the younger age groups. Age-specific earnings for women generally have increased in every year for every group, except for younger workers, who experienced a slight decline in real earnings in the 1990s. Both the 1990-91 recession and increased college enrollment contributed to this decline in young women's earnings (Hayghe 1997)

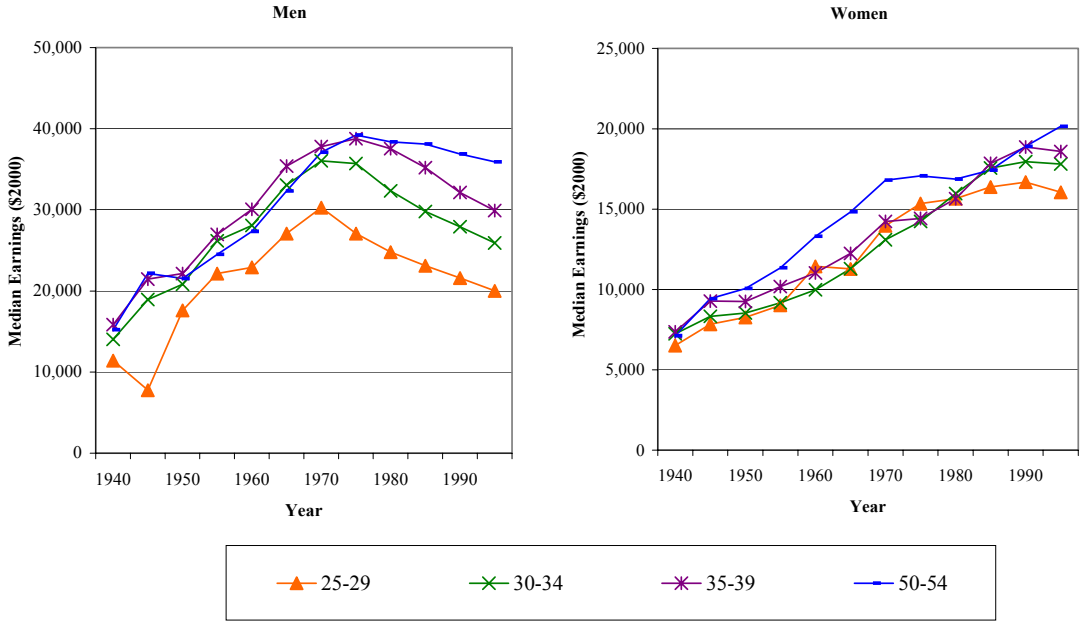
Some of the narrowing gap in earnings is due to the increased labor force participation of women. Female labor force participation has risen steadily and dramatically over the last four decades in all age groups (see figure 7). Thirty-seven percent of women age 20 to 64 worked in 1950, but this rate had increased to over 71 percent in 1995. Women born between 1926 and 1945 dominated the change in female labor force participation (Fullerton

Figure 5
Median Wage and Salary Earnings for Workers by Sex: 1940-1995



Source: Social Security Administration, Office of Research, Evaluation, and Statistics (1999).

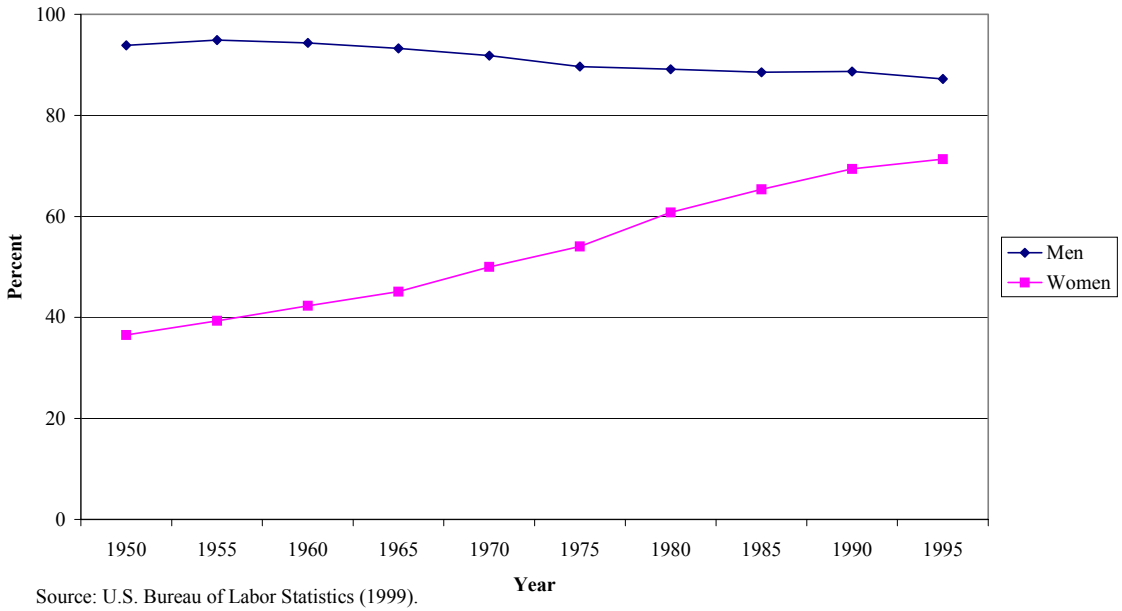
Figure 6
Median Wage and Salary Earnings of Workers by Gender and Age: 1940-1995



Source: Social Security Administration, Office of Research, Evaluation, and Statistics (1999).
Note: Age 40 to 49 earnings are similar to age 50 to 54 earnings and are excluded for clarity.

1999). For those born between 1921 and 1925, female labor force participation was characterized by a dip in participation through the childbearing years. Each subsequent cohort of women started working earlier and continued to work at higher rates at all ages than their predecessors did, and the dip throughout the childbearing years has all but disappeared.

Figure 7
Labor Force Participation Rates
for 20- to 64-Year-Old U.S. Residents by Gender and Year: 1950-1995



Source: U.S. Bureau of Labor Statistics (1999).

The increase in participation has come predominantly from increases by women with children (Hayghe 1997; U.S. Bureau of Labor Statistics 1989). For women with school-age children (ages 6 to 17), labor force participation increased from 44 percent in 1970 to 76 percent in 1995, and for women with children under age 6, labor force participation increased from 29 percent in 1970 to 62 percent in 1995. Women with no children are mostly composed of young women (under age 25) and older women (55 and older), both of whom have lower than average participation rates. While their participation rates have increased, they have not increased at the overwhelming rate experienced by women with children.

While the narrowing gap between men's and women's earnings does not affect earnings inequality per se, it does affect family income inequality in important ways. Two-earner couples have more total earnings as women have gained in the labor market, and more women will earn a Social Security benefit on their own record that exceeds their spousal benefit (one-half of the primary earner's benefit). In the long run, this will dampen the effect of Social Security spousal benefits on total family retirement income. Also, increasing earnings among women will reduce family income inequality if they are concentrated among families that would otherwise have low incomes and boost inequality if concentrated among otherwise higher-income families (Karoly and Burtless 1995).

II.4 Increased Variance of Earnings within Population Subgroups

Much of the increase in earnings inequality has come from a widening dispersion of earnings among workers with similar characteristics. Researchers have found that even after controlling for observable characteristics such as age, educational attainment, occupation, industry, and union status, the dispersion in earnings is still significant. Burtless (1994) calculates that about two-thirds of the increase in overall inequality among men between 1967 and 1989 is attributable to the rise in within-group inequality.

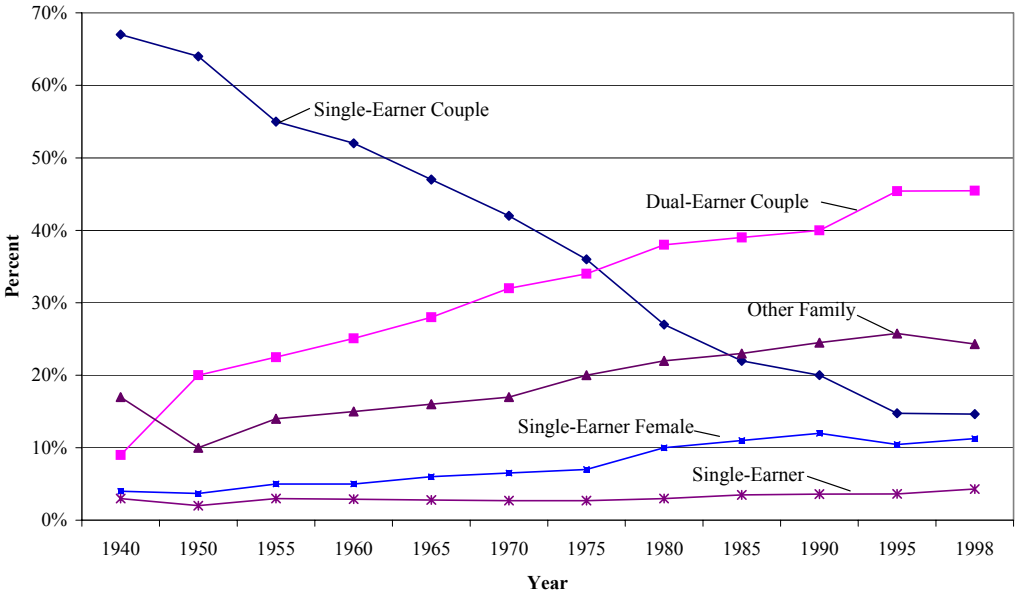
The implications of the rise in within-group inequality for future retirement incomes depends on whether this difference persists over workers' entire careers, or if it is only a transitory phenomenon. If it is a permanent difference in earnings based on skills and attributes that are not easily measured by characteristics such as age or years of education, such as the ability to adapt to new technology or new organizational structures, then the widening distribution of earnings will carry over into a wider distribution of economic resources in retirement. If there is simply more variability in earnings, but the variability is random among workers with similar characteristics, then it will not necessarily translate into a wider distribution of retirement incomes. If workers face more year-to-year variability in earnings, however, that could affect retirement resources in other ways, such as by changing how much people save. Research by Gottschalk and Moffitt (1994) suggests that the increase in within-group inequality is split equally between permanent and temporary effects.

II.5 The Impact on Family Earnings Inequality

With the rise in female labor force participation and single-head families, the nature of the American family has changed dramatically since the 1940s (Hayghe 1990). In 1940, almost 70 percent of families consisted of a working husband with a nonworking wife. By 1998, this fraction had dropped to about 15 percent (see figure 8). What had been the traditional family is now a minority. Now we have much more diverse family structures. Among working-age families there has been an increase in the number of dual-worker families. Higher divorce rates and out-of-wedlock births have increased the proportion of single-head working families, particularly female-head families. Increased labor force participation of married women has made dual-worker couples the predominant family type today, but such couples make up less than 50 percent of all families.

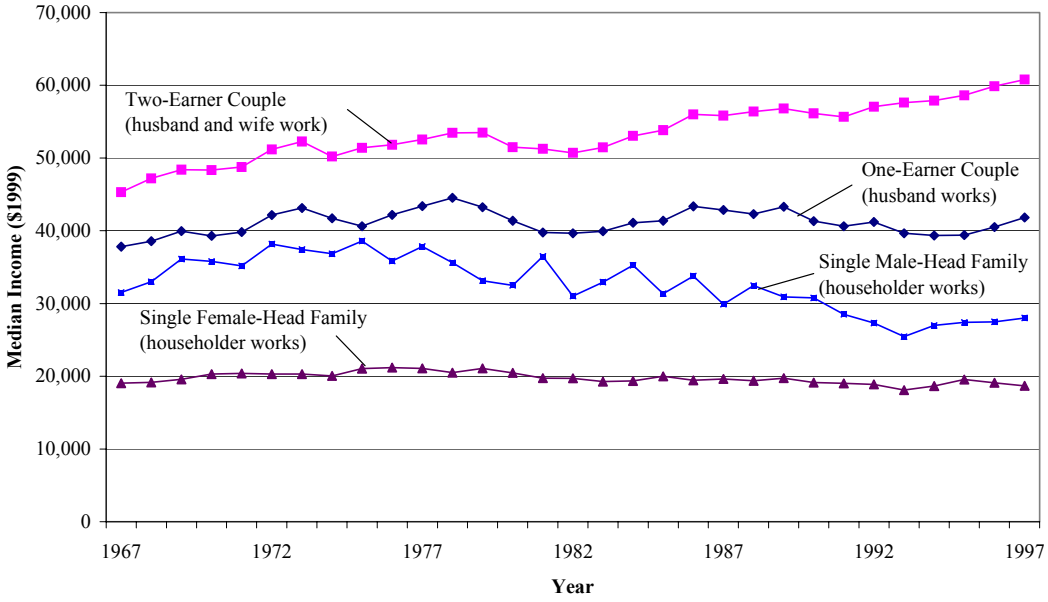
Among families that work, dual-earner couples earn more than single-earner couples, and single-earner couples earn more than single-head families (see figure 9). However, median real family income of two-earner couples has increased, while median real family income of single-earner families has decreased, particularly for male-head families. Some of these differences are due to choices families make about the number of hours worked.

Figure 8
Proportion of Families by Composition and Employment Status: 1940-1998



Source: Hayghe (1990); U.S. Bureau of Labor Statistics (1999).

Figure 9
Median Family Income by Family Type and Year: 1967 to 1997



Source: U.S. Bureau of Labor Statistics (1989, 1999).

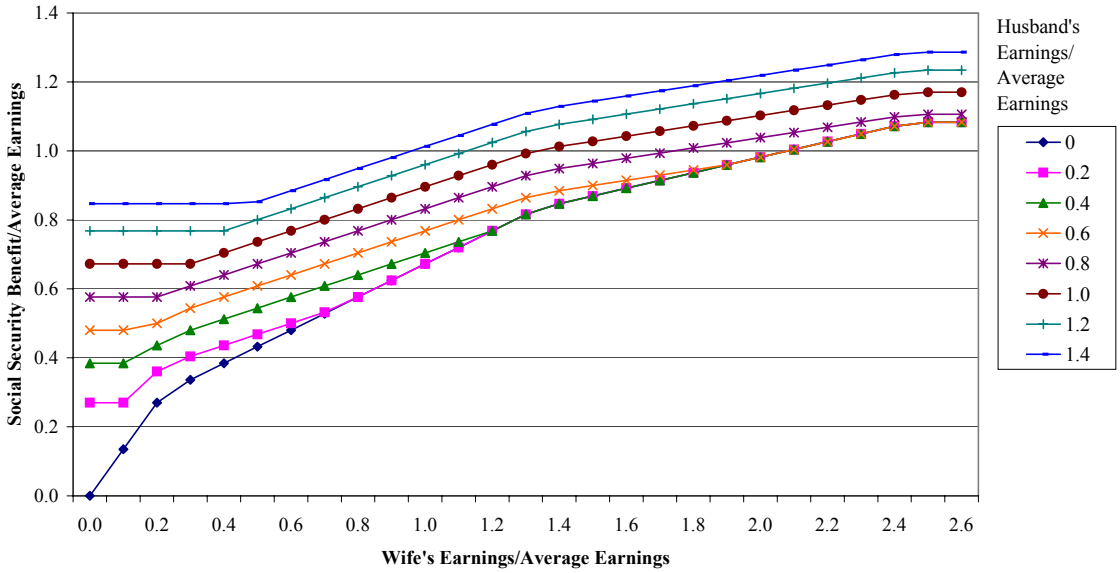
Also, married couples are more likely to be older than single workers and, therefore, earning higher wages. They also reflect underlying differences in education and other factors that affect earnings opportunities.

Part of the increased earnings among dual-earner couples is due to an increasing correlation between husbands' and wives' earnings. Using earnings data from the March CPS for 1968-1994, Cancian and Reed (1999) report an increase in the correlation of spouses' earnings beginning in the mid-1970s, although the correlation was still relatively low (approximately 0.25 at its peak in 1990). There has been a particularly large increase in the correlation between husbands' and wives' earnings for husbands with a college education. For college-educated husbands in 1960, the correlation between couples' earnings was 0.04. By 1990, this correlation increased to 0.13, though most of the increase occurred between 1980 and 1990. Some of this is due to increasing labor force participation and rising relative earnings of women. However, the trend also reflects other influences such as the increased tendency for higher-educated men to marry higher-educated women. The correlation of years of education for spouses (about 0.60) is much higher than the correlation of earnings, however (Mare 1991).

II.6 Impact of Increased Earnings Inequality on Social Security Benefits

The impact of increased inequality of earnings on the distribution of Social Security benefits is unclear. Under a certain set of assumptions, the dispersion of Social Security could increase. Under other assumptions, the dispersion could decrease. The bend points in the Social Security primary insurance amount (PIA) formula are indexed to growth in wages. If there is no change in the dispersion of earnings over time, there would be no change in the dispersion of Social Security benefits relative to the average wage, even with rising real wages. If, however, women's earnings increase and men's remain unchanged, then the dispersion in benefits for couples depends on women's earnings relative to men's earnings. For example, if a husband's average indexed monthly earnings (AIME) was 100 percent of the average wage, the couple's benefit is unchanged for any amount of wife's earnings where the wife's PIA is below 50 percent of the husband's PIA (about 30 percent of the average wage [see figure 10]). The couple's earnings would increase; yet average Social Security benefits would not. As the wife's earnings increase such that her PIA exceeds 50 percent of her husband's, the couple's Social Security benefits would increase. Because of the Social Security taxable maximum, there is a maximum benefit payable. Above this maximum, further increases in earnings have no effect on the Social Security benefit. The net impact of changes in the earnings distribution on the distribution of Social Security benefits depends on the relative earnings of husbands and wives and of single workers and married couples, and on the relative size of these groups. If changes in earnings shift families along the flat sections of the payment formula shown in figure 10, then the distribution of Social Security benefits will be unchanged. In all cases, however, the progressive payment formula produces a constrained distribution of benefits.

Figure 10
Couple's Social Security Benefit by Husband's and Wife's Lifetime Earnings
(Ratio of Benefits and Earnings to the Economy-Wide Average Earnings)



Source: The Urban Institution calculations.

III. Data Sources

In this report, we project future retirement income using the latest version of the Urban Institute's Dynamic Simulation of Income Model (DYNASIM3). The model starts with a self-weighting sample of more than 44,000 families from the 1990 to 1993 Survey of Income and Program Participation (SIPP). Synthetic earnings records, which enable the user to calculate Social Security benefits, are attached to each person's record using a statistical matching algorithm. The earnings records are statistically matched from longitudinal earnings histories taken from the 1968 to 1994 Panel Study of Income Dynamics (PSID) and the 1973 March Current Population Survey matched to the Social Security Administration Summary Earnings Record. The final file has historic individual earnings from 1951 to 1992 and projected earnings from 1993 to 2040. The imputed historic earnings compare very closely with actual earnings histories by gender, race, education, and marital status. See Smith, Scheuren, and Berk (2001) for more details.

DYNASIM3 ages this population year-by-year using parameters estimated from longitudinal data sources. The model integrates all of the important trends and differentials in life course processes, including birth, death, schooling, leaving home, first marriage, remarriage, divorce, disability, and labor market characteristics. Table 2 shows the basic processes modeled in DYNASIM3, along with the data sources used to estimate these models and a short description of the different forms of models used within DYNASIM3. See Favreault et al. (2001) for a fuller description of each of the modules used in DYNASIM3.

Table 2
Summary of Core Processes Modeled in DYNASIM3

Process	Data	Form and predictors
Birth	NLSY (1979-94), VS, OACT	7-equation parity progression model; varies based on marital status; predictors include age, marriage duration, time since last birth; uses vital rates after age 39; sex of newborn assigned by race; probability of multiple birth assigned by age and race
Death	NLMS (1979-81), VS, OACT	3 equations; time trend from Vital Statistics 1982-1997; includes socioeconomic differentials; separate process for the disabled based on age, sex, and disability duration derived from Zayatz (1999)
Schooling	NLSY (1979-94), CPS (1995-98)	10 cross-tabulations based on age, race, sex, and parents' education
Leaving Home	NLSY (1979-94)	3 equations; family size, parental resources, and school and work status are important predictors
First Marriage	NLSY (1979-93)	8 equations; depends on age, education, race, earnings, presence of children (for females); uses Vital Statistics rates at older ages
Spouse Selection	NA	Closed marriage market (spouse must be selected from among unmarried, opposite-sex persons in the population); match likelihood depends on age, race, education
Remarriage	VS (1990)	Table lookups; separate by sex for widowed and divorced
Divorce	PSID (1985-93)	Couple level outcome; depends on marriage duration, age and presence of children, earnings of both spouses
Labor Supply and Earnings	PSID (1980-93), NLSY (1979-89)	Separate participation, hours decisions, wage rates for 16 age-race-sex groups; all equations have permanent and transitory error components; key predictors include marital status, education level, age splines, region of residence, disability status, whether currently in school, birth cohort, job tenure, and education level interacted with age splines; also number and ages of children
Retirement	RHS (1969-79)	Considers value of postponing retirement one year
Disability	PSID (1969-72)	Separate entry and exit equations; incorporate socioeconomic differences
Living Arrangements	SIPP (1990-93)	Predictors include number of children ever born, income sources, and demographic characteristics
Assets	PSID (1984-94)	Separate models estimated for housing and nonhousing wealth based on income and demographic characteristics
Pensions	SIPP, SCF (1990-93)	Accumulation of defined contribution plans based on self-reports; assignment of replacement rates for defined benefit plans with reductions in replacement rates based on number of job changes

Abbreviations: CPS: Current Population Survey; NLMS: National Longitudinal Mortality Study; NLSY: National Longitudinal Survey of Youth; OACT: Intermediate assumptions of the OASDI Trustees; PSID: Panel Study of Income Dynamics; SCF: Survey of Consumer Finances; VS: Vital Statistics.

DYNASIM3 also simulates the accumulation of assets and pensions, and includes a detailed Social Security benefit calculator. A retirement decision module predicts the date of retirement and, subsequently, annual retirement income. Retirement income includes income from earnings, Social Security, pensions, private savings, and other family members. It also includes a rate of return on owner-occupied home equity. After first benefit receipt, Social Security income is indexed by CPI. Pensions are indexed by the individual's pension plan's automatic cost of living adjustment (COLA), which may be zero. Assets are updated annually as seniors spend down their private savings in retirement. For further discussion of simulating assets, see Appendix.

Key events simulated in DYNASIM3 are aligned to control totals developed from administrative data through the historic simulation period (1992 through 1999). The model also requires macroeconomic assumptions to predict future earnings and income. We use the intermediate assumptions from the Social Security Administration's 2001 Trustees report to predict price growth (3.3 percent per year), real wage growth (1 percent above prices), and age- and gender-specific employment rates in the future (Board of Trustees [OASDI] 2000).

Outcome Measures. We calculate average lifetime earnings by taking the average of all earnings between ages 25 and 62 divided by the year-specific economy-wide average earnings. We call this measure AIE.[9] This measure is different from the average indexed monthly earnings (AIME) that is used to calculate Social Security benefits. AIE excludes earnings before age 25 and includes all 38 years of earnings between ages 25 and 62, rather than the top 35 years or computation years that are used for disabled beneficiaries in the AIME calculation. The two measures are similar, but AIE allows us to compare career earnings for the same age span and to better compare the lifetime earnings of disabled beneficiaries with nondisabled beneficiaries.

We describe retirement income using three different measures: real per capita income, real per beneficiary income, and family income divided by the family poverty threshold. We limit the sample to individuals at or above the Social Security normal retirement age. For per capita income, we divide total income by two for couples and by one for singles. This allows us to compare incomes of couples with incomes of singles in price-adjusted dollars. For per beneficiary income, we divide the total Social Security benefits by two if the both husband and wife receive Social Security, and by one if only one receives Social Security (usually when one spouse is below the retirement age). This allows us to compare older beneficiaries with younger beneficiaries. In all cases, husbands and wives share the couple's income from all sources.

We use the family poverty thresholds as an equivalence scale to assess the well-being of family units of different sizes. The poverty thresholds are based on the notion that larger

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9 $$AIE = \sum_{a=25}^{62} \frac{e_a}{w_a}$$

where e is annual earnings, w is the economy-wide average wage, a is age. Historic earnings from the PSID are not available for youths. Starting the AIE calculation at age 25 minimizes this censoring problem.

families need fewer resources per person than smaller families do, because larger families gain some efficiencies in sharing the home and other resources. In 2000, the poverty threshold for a couple age 65 and older was $10,419, and $8,259 for a single individual age 65 and older (Dalaker 2001). The single threshold is 79 percent of the couple threshold. A couple with a combined income of $12,000 would have an income that is 115 percent of poverty (above the poverty threshold). A single individual with half of the couple's income ($6,000) would have income that is 73 percent of poverty (below the poverty threshold). On a per capita basis, the well-being of these single and married individuals is the same. On a poverty-equivalent basis, the single individual is considerably worse off. In assessing well-being, poverty-adjusted income is perhaps a better measure than per capita income.

Inequality measures. In measuring the trend in inequality, one needs some measure of inequality. Unfortunately, there is no one universally accepted measure of inequality. The measures commonly used (Gini coefficient, coefficient of variation squared (CV^2), ratio of the 80th percentile to the 20th percentile, variance of the logarithm of income) do not always result in the same trend in inequality (Levy and Murnane 1992; Karoly 1993). The variance of the logarithm is responsive to changes in the lower tail of the distribution, since small changes in income at the bottom of the distribution represent a large proportional change. The Gini coefficient is more responsive to changes in the middle of the distribution. The coefficient of variation squared is equally responsive to changes throughout the distribution.

An alternate approach is to compare percentiles of the distribution. The advantage of this approach is that it maintains the same proportion of the population in all of the groups. The trend in the level of the percentiles reveals if a particular group is doing better or worse than a different group, and the ratio of the percentile to the median shows how the shape of the distribution is changing. Another advantage of this approach is that it is easy to examine changes at the top, middle, and bottom of the distribution.

It is easy to evaluate trends in inequality when the various measures of inequality show the same result. It becomes more complicated when the measures disagree. In evaluating the trends in inequality, I use the coefficient of variation squared, Gini coefficient, and the ratio of the 80th percentile to the 20th percentile. When these measures show different trends, I disaggregate the distribution to allow for more detailed analysis of the shifts in the distribution.

IV. Results

IV.1.1 Distribution of Lifetime Earnings

Patterns of lifetime earnings are considerably different for men and women over time. As more women work at higher wages, average lifetime earnings of women will rise. As these women enter the labor force, their earnings affect the average wage of all workers. These women also compete with men for jobs and affect the average earnings of men. DYNASIM3 projects that the median wage-adjusted lifetime earnings will decline for men

and rise for women over time. When we let husbands and wives share earnings in years they are married, gains in female earnings outweigh losses in male earnings, and real median family lifetime earnings will rise over time.

The inequality in men's lifetime earnings will remain fairly stable over time, while the inequality in women's lifetime earnings will decline considerably. Because men's earnings continue to dominate family earnings, the trend in family earnings more closely mirrors that of men's lifetime earnings, but family earnings generally are more equally distributed than both men's and women's earnings alone.

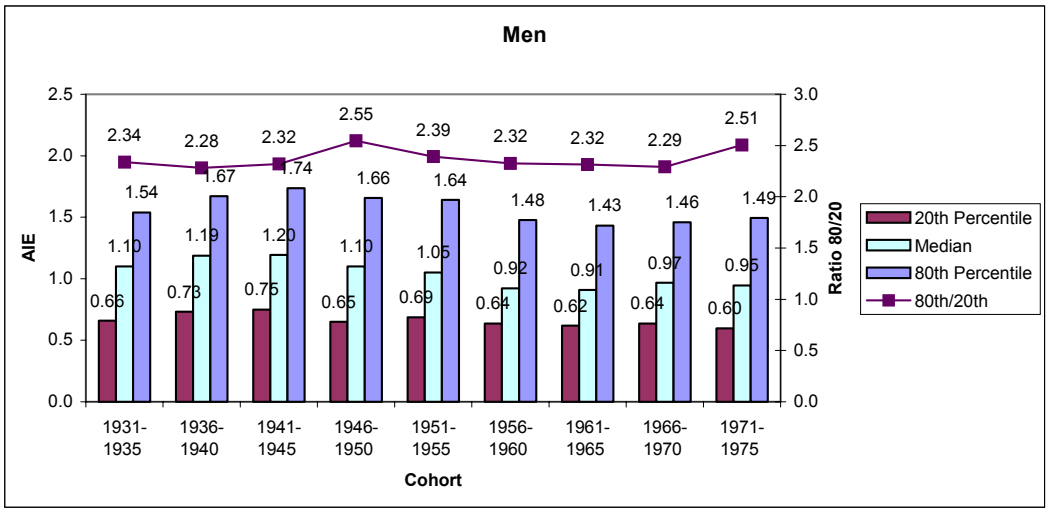
IV.1.2 Men's Lifetime Earnings

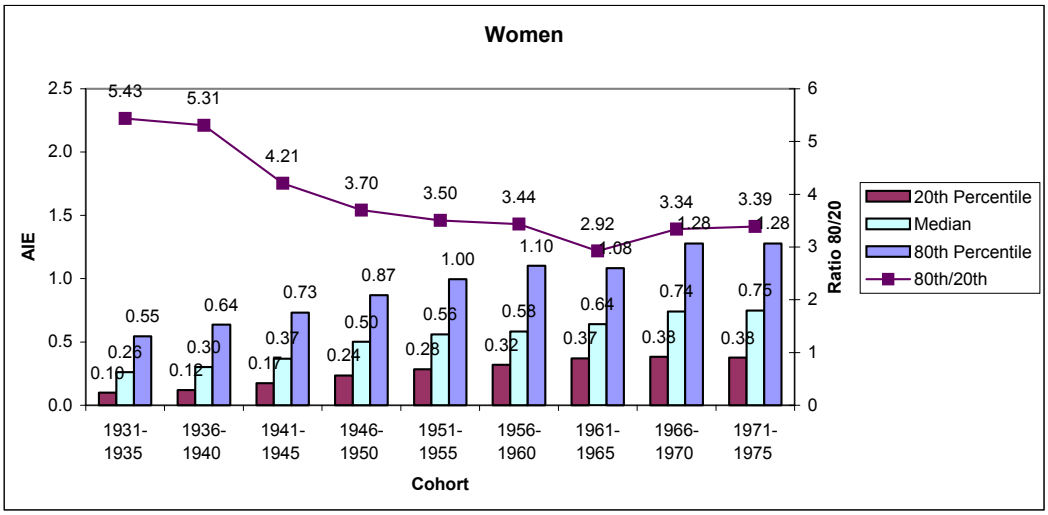
DYNASIM3 predicts that median wage-adjusted lifetime earnings (AIE) will fluctuate between 1.2 times the average wage and 0.91 times the average wage for new Social Security beneficiary men age 62 or older born between 1931 and 1975 (see figure 11). The 80th percentile of AIE for men born between 1931 and 1935 was 1.54 times the average wage, or 40 percent above the median. The 80th percentile peaks at 1.74 for men born between 1941 and 1945, before it declines to around 1.4 to 1.5 for later cohorts. The 20th percentile AIE for men born between 1931 and 1935 is 0.66 times the average wage, or 40 percent lower than the median. The 20th percentile AIE peaks at 0.75 for men born between 1941 and 1945, before it declines to about 0.6 for men born in later cohorts.

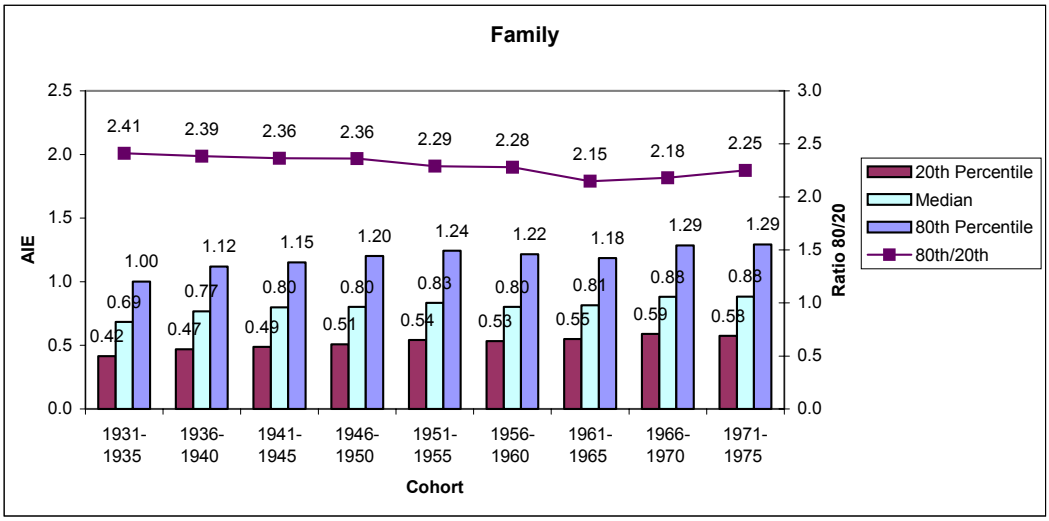
When we look at the distribution of men's lifetime earnings, we see that both the 80th percentile and 20th percentile AIE will rise slightly relative to the median for men born between 1931 and 1960 (see figure 12). Then, for men born after 1960, DYNASIM3 projects that both the 80th percentile and the 20th percentile AIE will decline slightly relative to the median. When the ratio diverges from one (the median), inequality increases. Conversely, when the ratio converges toward one, inequality decreases. Generally, between the 1931 and 1960 cohorts, inequality is decreasing in the bottom of the distribution (ratio moves closer to one) at the same time inequality is increasing in the top of the distribution (ratio moves farther from one). The projected increased inequality in the top of the distribution relative to the median is slightly greater than the decreased inequality in the bottom of the distribution for men born in later cohorts, and overall inequality will increase slightly over time, though the changes are very small.

When we look at three different aggregate measures of inequality (ratio of the 80th percentile to the 20th percentile, Gini coefficient, and the CV^2) we see that most measures show a slight decline in inequality for men born between 1936 and 1940, compared to men born between 1931 and 1935, followed by relatively stable inequality for men born between 1945 and 1970 (see figure 13). Inequality then rises for men born after 1970. For example, for men born between 1931 and 1935, the Gini coefficient for new Social Security beneficiaries is 0.28. It declines to 0.26 for men born between 1936 and 1940, before it returns to 0.28 for men born between 1941 and 1960. It then rises to 0.30 for men born between 1971 and 1975. The CV^2 and ratio of the 80th to the 20th percentile show a similar pattern.

Figure 11
Distribution of Wage-Adjusted Lifetime Earnings by Cohort and Gender

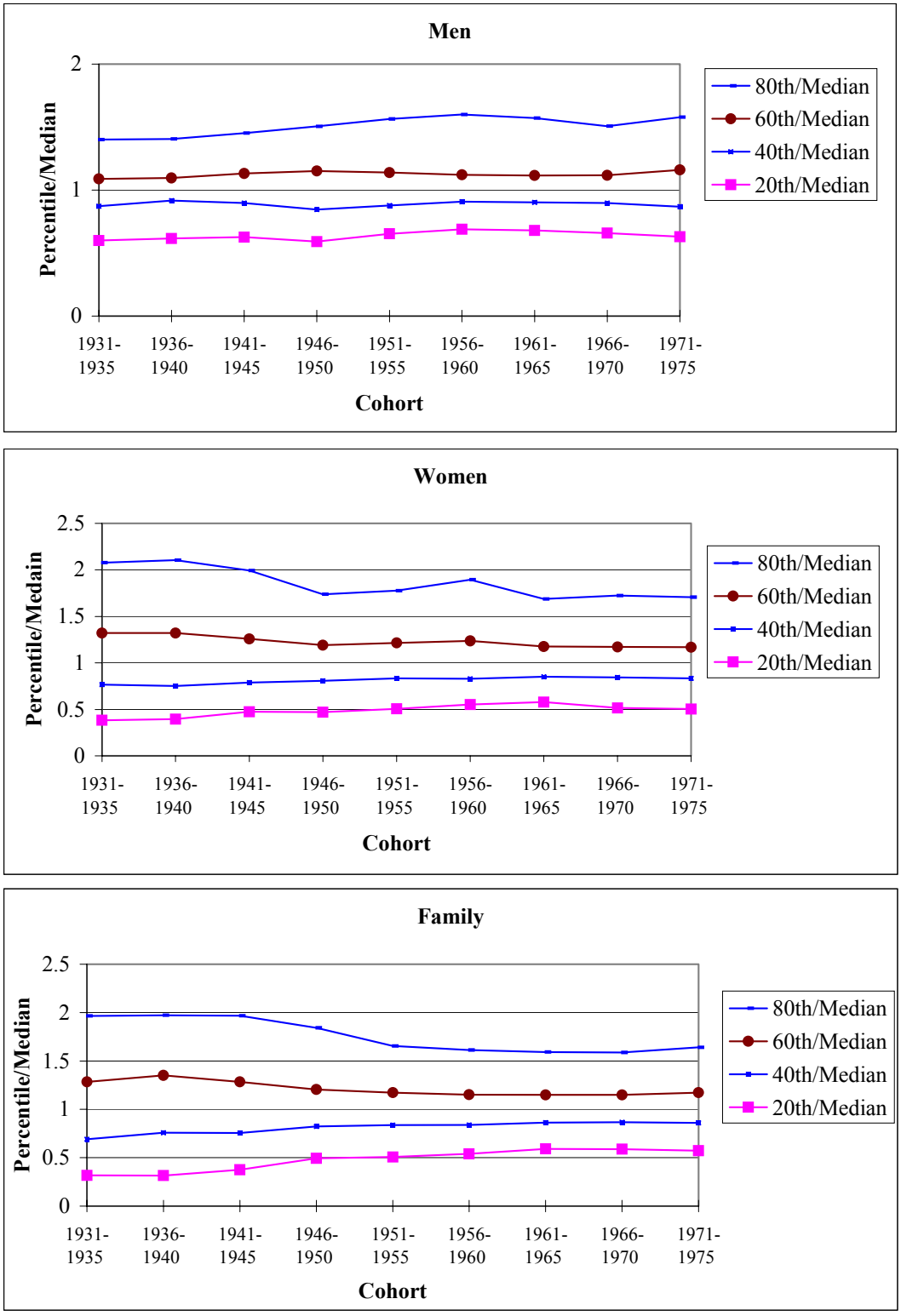






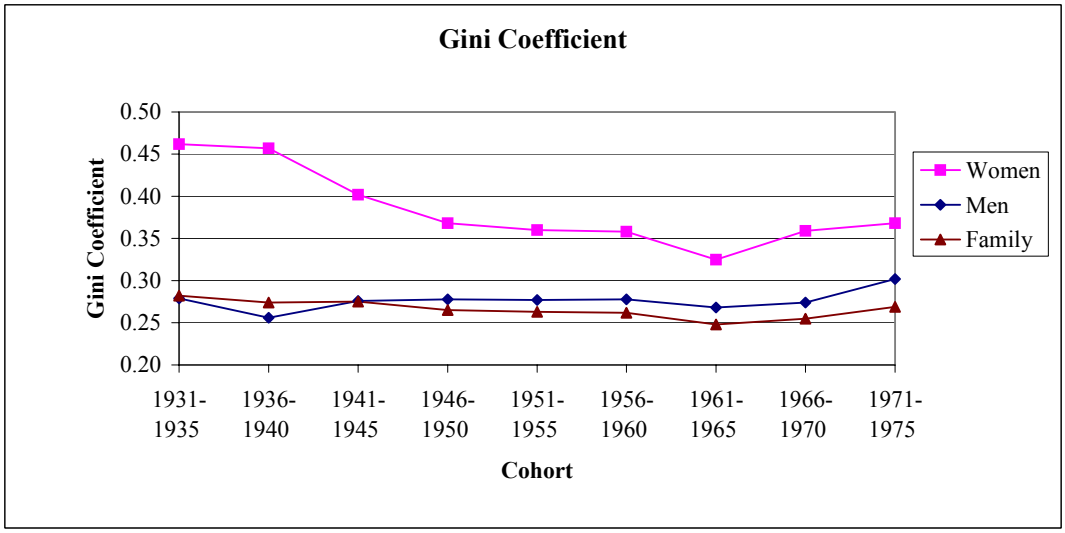
Source: The Urban Institute tabulations of DYNASIM3.

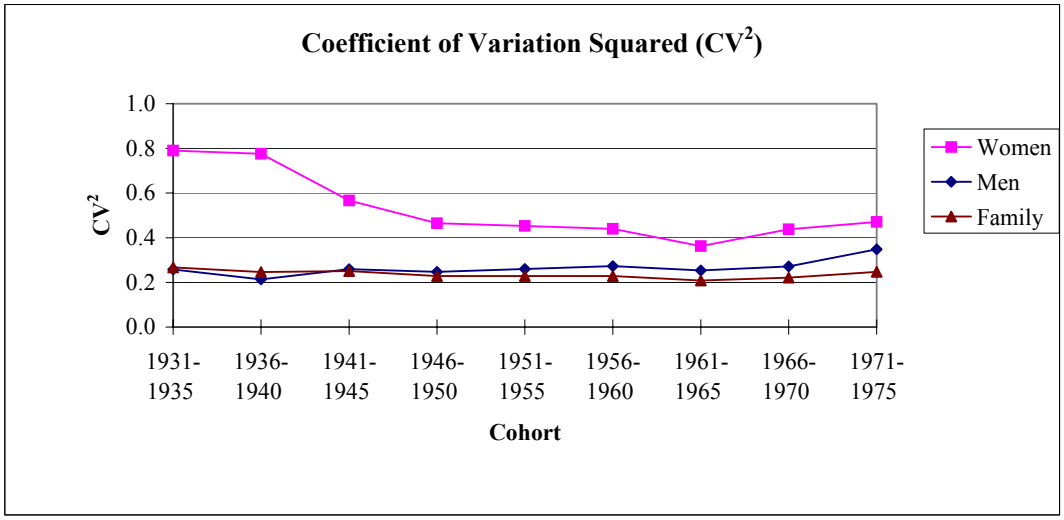
Figure 12
Distribution of Lifetime Earnings by Cohort and Gender
Percentiles Relative to the Median

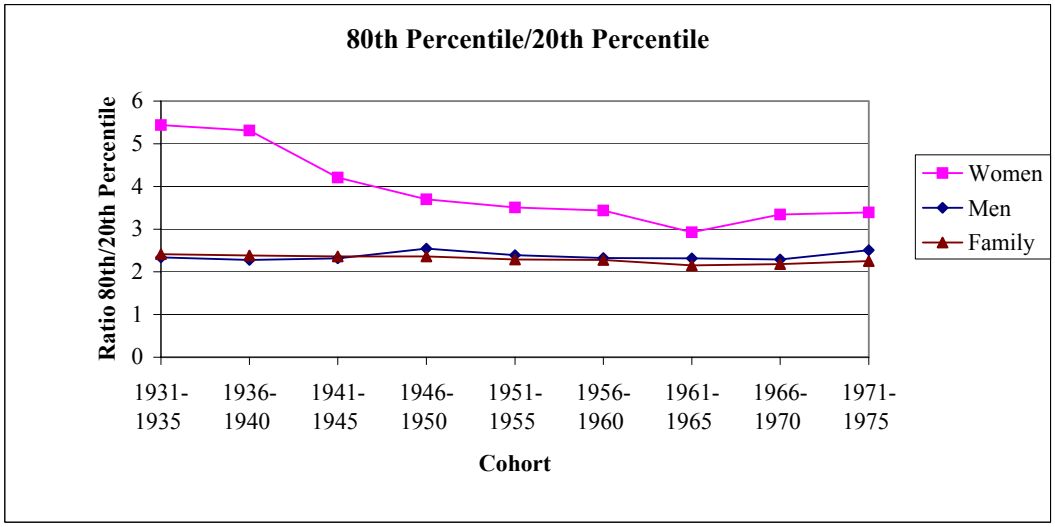


Source: The Urban Institute tabulations of DYNASIM3.

Figure 13
Aggregate Measures of Inequality for Lifetime Earnings by Gender and Cohort







Source: The Urban Institute tabulations of DYNASIM3.

While cross-sectional inequality in men's earnings increased between 1968 and 1992, men's lifetime earnings are distributed more equally than cross-sectional earnings, and the distribution remains relatively flat. The Gini coefficient for men's annual earnings in DYNASIM3 compares very closely with the historic Gini coefficient displayed in figure 1, yet the Gini coefficient for lifetime earnings remains relatively flat. This implies that the extreme earnings values that influence the distribution in the cross-section are more moderate when averaged over a career. This result is consistent with Gottschalk and Moffit's (1994) finding on the importance of transitory variance in explaining part of the rise in inequality.[10] Transitory variance increased over the period, especially for younger and lower-educated men. This transitory variance includes low values for periods of unemployment and high values for periods with bonuses. Looking over men's careers, permanent income is more stable.

IV.1.3 Women's Lifetime Earnings

In contrast to men, DYNASIM3 predicts that median AIE monotonically increases for new Social Security beneficiary women age 62 or older born between 1931 and 1975. Median AIE for women born between 1931 and 1935 is 0.26 times the economy-wide average wage (see figure 11). It then rises to 0.75 times the average wage for women born between 1971 and 1975. The 80th percentile of AIE for women born between 1931 and 1935 was 0.55 times the average wage (over two times the median). The 80th percentile is projected to rise across cohorts to a peak of 1.28 times the average wage for women born between 1966 and 1975. The 20th percentile AIE for women is 0.10 times the average wage (62 percent lower than the median). The 20th percentile monotonically rises to 0.38 times the average wage for women born between 1966 and 1975.

Women's lifetime earnings are becoming more equally distributed over time. AIE in the 80th percentile will fall relative to the median (inequality declines) for women born between 1931 and 1950 and then remain fairly flat (see figure 12). At the same time, the 20th percentile will rise relative to the median (inequality declines) for women born between 1931 and 1965. The earnings distribution is projected to become more compact (evenly distributed) relative to the median with both the top falling and the bottom rising with most dramatic changes occurring for women born between 1931 and 1950.

When we look at the aggregate measures of inequality, we see that inequality is higher for women than for men, and it unambiguously declines for women born between 1931 and 1965 (see figure 13). Inequality then rises for women born after 1965. For example, for women born between 1931 and 1935, the Gini coefficient for new Social Security beneficiaries is 0.46 (about two-thirds higher than for men). It declines to 0.33 for women born between 1961 and 1965. It then increases to 0.37 for women born between 1971 and

[10] Gottschalk and Moffit (1994) looked at earnings of nonimmigrant white males. DYNASIM3's results include immigrants and nonwhites, who are more likely to have more variable labor market experience than white males.

1975. The CV^2 and 80/20 ratio show a similar pattern. Both measures show declining inequality for women born between 1931 and 1965 and increasing inequality for women born between 1966 and 1975, but inequality for women in the later cohorts is substantially less (more equal) than inequality for women in the early cohorts.

The most important factor driving the decline in women's lifetime earnings inequality is increased labor force participation. As the proportion of women with extremely low lifetime earnings declines over time, inequality declines. As women's wage and participation rates approach those of men, the rate of earnings growth relative to the economy-wide average earnings declines. The rate of decline in inequality also slows.

While the Gini coefficient for annual earnings of **full-time** female workers rises between 1974 and 1992 (as in figure 1), the Gini coefficient is considerably higher for **all** female workers, and it declines over time. As with men's lifetime earnings, women's lifetime earnings are distributed more evenly than cross-sectional earnings.

IV.1.4 Family Lifetime Earnings

DYNASIM3 projects that median family lifetime earnings will rise over time, and inequality will decline. When we let husbands and wives share earnings in the years they are married and use only own earnings in years they are single, median family AIE will rise from 0.69 times the average wage for individuals born between 1931 and 1935 to 0.88 times the average wage for individuals born between 1966 and 1975 (see figure 11). The 80^{th} percentile of family AIE for individuals born between 1931 and 1935 was 1.0 times the average wage (about 45 percent higher than the median). The 80^{th} percentile is projected to rise to 1.29 times the average wage for individuals born between 1971 and 1975. The 20^{th} percentile AIE for family earnings is 0.42 times the average wage (40 percent lower than the median). The 20^{th} percentile will rise across cohorts to 0.58 times the average wage for individuals born between 1971 and 1975. The rise in female lifetime earnings more than offsets the decline in men's lifetime earnings, and family wage-adjusted lifetime earnings will rise across the distribution over time.

When we compare changes in the distribution of family AIE relative to the median AIE, we see that earnings in the 80^{th} percentile hold steady for individuals born between 1931 and 1945 (see figure 12). The ratio then declines for individuals born between 1946 and 1975. At the same time, the 20^{th} percentile rises relative to the median family AIE for individuals born between 1931 and 1965 and then declines slightly for later cohorts. DYNASIM3 projects that family AIE becomes more evenly distributed for individuals born between 1931 and 1965 as both the top of the distribution falls and the bottom of the distribution rises relative to the median (as seen by the convergence of the ratio toward the median in both the top and bottom of the distribution). The gap widens slightly for individuals born after 1965.

When we look at the aggregate measures of family earnings inequality, we see that inequality is declining for individuals born between 1931 and 1965 and rising for cohorts born after 1965 (see figure 13). For example, for individuals born between 1931 and 1935, the Gini coefficient for new Social Security beneficiaries is 0.28 (equal to that of men). It declines to 0.25 for individuals born between 1961 and 1965. It then increases to 0.27 for individuals born between 1971 and 1975. The CV^2 and 80/20 ratios show a similar pattern. Both show declining inequality for individuals born between 1931 and 1965 and increasing inequality for individuals born between 1966 and 1975, but at slightly lower levels of inequality than for individuals born between 1931 and 1935.

Despite dramatic changes in family composition and female earnings over time, family wage-adjusted lifetime earnings will increase only modestly over time. If women's earnings had remained unchanged relative to men's earnings, and only female labor force participation had increased, average wages would decline, and both men's and women's earnings would rise relative to average earnings.[11] While women's earnings do rise relative to the average, some of their gains have come at the expense of men's earnings. While the median of wage-adjusted lifetime earnings of men was historically above the average wage, this is no longer true for men in later cohorts. While women make substantial gains in the labor market, their lifetime earnings remain below those of men.

High levels of female earnings inequality had little, but rising, impact on family earnings inequality. Among the three measures of inequality, family earnings inequality closely matches men's earnings inequality. Women's earnings become a more important factor in family lifetime earnings over time, as women make up a larger share of the workforce, women's earnings rise relative to men's, and as women spend fewer years married because of higher divorce rates and forgone marriage. The decline in women's earnings inequality plays a bigger role in the trend in family earnings inequality over time as the three measures of family earnings inequality decline compared to men's over time.

IV.2.1 Future Replacement Rates

Due to changes in both earnings patterns and legislation, Social Security will replace less income of individuals in later cohorts than early cohorts, and women will lose more than men. The Social Security replacement rate, the proportion of preretirement earnings Social Security replaces, shows how well Social Security will meet the needs of beneficiaries. For a hypothetical worker, Social Security provides higher replacement rates for lower-wage workers and lower replacement rates for higher-wage workers. Workers are eligible for their full benefit if they retire at the normal retirement age (NRA), but their benefit is reduced (a lower replacement rate) for every month they retire before the NRA, with early retirement

[11] For example, if two men earn $10,000 and one woman earns $5,000, then the average wage is $8,333. Men's earnings are 1.2 times the average wage, and women's earnings are 0.6 times the average wage. If two women earned $5,000, then average wage would fall to $7,500, and men's earnings would rise to 1.33 times the average wage, and women's earnings would rise to 0.67 times the average wage.

available at age 62. In the year 2000, Social Security replaced 52.8 percent of earnings for a low-wage worker (earning 45 percent of the average wage throughout a career), 39.2 percent for an average-wage worker, and 23.7 percent for a high-wage worker (earning the taxable maximum throughout a career) (Committee on Ways and Means, U.S. House of Representatives 2000). Real labor market experience of individuals varies a great deal, however, from the hypothetical workers used in these replacement rate examples (see Toder et al. 1999; Grad 1990). Many workers experience time out of the labor force and declining earnings late in their careers, and some dependents receive Social Security without ever having contributed to the system. Replacement rates are undefined for these individuals.

DYNASIM3 projects replacement rates based on the actual patterns of work across a lifetime. We calculate replacement rates using two different statistics for new beneficiaries (age 62 and older). First, we calculate the individual's own benefit (including any auxiliary benefits) and divide this by the worker's own average indexed earnings between ages 25 and 62. This represents the proportion of own lifetime earnings initial benefits replace. In this calculation, we limit earnings to Social Security-covered earnings below the taxable maximum. Second, we calculate the per capita Social Security benefit divided by the average lifetime indexed family earnings. This represents the proportion of family lifetime earnings family Social Security benefits replace.[12] In this calculation, we include both uncovered earnings and earnings above the taxable maximum.

IV.2.2 Own Earnings Replacement Rates

Based on own earnings replacement definition (definition 1), replacement rates decline over time, and the gap between the men's and women's rate declines. For example, the median replacement rate for new beneficiaries born between 1931 and 1935 is about 47 percent; it declines to about 37 percent for new beneficiaries born between 1971 and 1975 (see table 3). The decline is projected to be more severe for women than for men. For the earliest cohorts, the median replacement rate for women is about 70 percent, compared to 40 percent for men (30 percentage point difference). For new beneficiaries born between 1971 and 1975, the median replacement rate declines to 39 percent for women and 35 percent for men (4 percentage point difference). The decline for women occurs because women in later cohorts have more lifetime earnings and will move into higher lifetime earning brackets (with lower Social Security replacement rates), so survivor benefits matter less.

The Social Security replacement rate formula is indexed by wage growth, so replacement rates should be constant relative to wage growth. Replacement rates decline, however, when **average lifetime earnings** within a cohort rise relative to **economy-wide average earnings** of workers. As more women work for higher wages over time, their

[12] In all cases, Social Security benefits and earnings are adjusted by wage growth. For average lifetime indexed earnings, husbands and wives share earnings in years they are married, and we use their own earnings in years when they are single.

Table 3
Median Social Security Replacement Rate by Year
Own Social Security Benefit/Own Average Lifetime Earnings between Ages 25 and 62
for New Social Security Beneficiaries (Age 62 and Older)

	Cohort				
	1931-1935	**1941-1945**	**1951-1955**	**1961-1965**	**1971-1975**
All	0.47	0.44	0.42	0.38	0.37
Gender					
Men	0.40	0.36	0.38	0.36	0.35
Women	0.70	0.58	0.47	0.41	0.39
Gender by Marital Status					
Married Men	0.39	0.36	0.37	0.36	0.35
Single Men	0.43	0.38	0.39	0.37	0.36
Married Women	0.70	0.57	0.47	0.41	0.38
Divorced Women	0.62	0.52	0.47	0.41	0.38
Widowed Women	0.81	0.78	0.59	0.50	0.47
Never-Married Women	0.71	0.56	0.42	0.40	0.38
Social Security Benefit Type					
Male Worker	0.40	0.36	0.38	0.36	0.35
Female Worker Only	0.59	0.50	0.44	0.40	0.37
Dual Worker	1.16	0.93	0.82	0.72	0.68
Dual Survivor	0.91	0.96	0.73	0.64	0.59
Wife Only	4.63	2.98	2.40	1.91	2.06
Surviving Wife	5.45	5.14	4.39	2.67	2.94
Age of First Social Security Benefit					
<=62	0.55	0.51	0.43	0.39	0.37
63	0.41	0.41	0.38	0.36	0.34
64	0.45	0.41	0.39	0.36	0.36
65	0.43	0.43	0.43	0.39	0.37
66	0.41	0.39	0.40	0.40	0.38
67+	0.44	*	0.43	0.40	0.38

Source: The Urban Institute tabulations of DYNASIM3.
* Sample size is too small to be statistically significant.

average lifetime earnings will rise, and their replacement rate will fall. In addition, as the normal retirement age increases, early retirees will have an increasing actuarial reduction. This lowers their replacement rate more than similar retirees in earlier cohorts. For individuals born before 1938, the normal retirement age (NRA) is 65.[13] This rises to age 67 for individuals born in or after 1960.

[13] For individuals born between 1938 and 1943, the NRA increases in two-month intervals to

DYNASIM3 also projects that between ages 62 and 67, replacement rates will decline. This is true despite the actuarial reduction that reduces the replacement rate for early retirees. This counter-intuitive result is a function of who retires early. That is, lower-income workers are more likely to retire early than higher-income workers because their replacement rate is high. This is particularly true for low-income women. Median replacement rates for women receiving survivor benefits and spouse-only benefits are considerably higher than for other Social Security benefits types, though these rates drop considerably over time as more women work at higher wages.

With the rise in dual-earner families, more married women have higher earnings but without similar increases in their Social Security benefits, and their replacement rates decline (see figure 10). For example, the median replacement rate for married women born between 1931 and 1935 was 70 percent. This is projected to decline to only 38 percent for married women born between 1971 and 1975. As lifetime earnings of women rise over time, a much larger share of their earnings is replaced at lower rates. The replacement rate for never-married women declines from 71 percent for never-married women born between 1931 and 1935 to 38 percent for never-married women born between 1971 and 1975. This is a much greater reduction than for single men over the same time period, even though never-married women likely would have reasonably stronger labor force attachment. Rising female earnings push more never-married women into the lower replacement rate section of the Social Security payment formula.

IV.2.3 Family Earnings Replacement Rates

Based on the shared earnings replacement definition (definition 2), replacement rates are 10 percentage points lower (37 percent versus 47 percent) for new beneficiaries born between 1931 and 1935, compared to own earnings replacement rates (see table 4). These replacement rates decline too, but not as steeply as own replacement rates. Many of the high replacement rates using own-earnings are for women who receive spousal Social Security benefits on the basis of a higher-income spouse. When we account for these earnings, these high replacement rates decline. For example, the median replacement rate for married women falls from 70 percent using the own earnings definition to 30 percent using the shared earnings definition for women born between 1931 and 1935. The median replacement rate for widowed women falls from 81 percent using their own earnings to 50 percent using the shared earnings definition.[14]

Shared earnings replacement rates fall for married men over time, as increased earnings in dual-earner couples are not rewarded with higher Social Security benefits. Based on the husband's earnings only, the median replacement rate declines by 4 percentage points for early cohorts compared to late cohorts (39 percent to 35 percent). When we add in the

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age 66. For individuals born between 1955 and 1960, the NRA again increases in two-month intervals to age 67 (Committee on Ways and Means, U.S. House of Representatives 2000).

[14] Replacement rates for never-married women differ between the two replacement rate definitions because of the inclusion of uncovered earnings in the lifetime earnings definition.

Table 4
Median Social Security Replacement Rate by Year
per Capita Social Security Divided by Average Lifetime Shared Income
for New Social Security Beneficiaries (Age 62 and Older)

	Cohort				
	1931-1935	1941-1945	1951-1955	1961-1965	1971-1975
All	0.37	0.34	0.34	0.33	0.32
Gender					
Men	0.36	0.31	0.33	0.32	0.31
Women	0.39	0.36	0.34	0.34	0.33
Gender by Marital Status					
Married Men	0.32	0.27	0.28	0.26	0.23
Single Men	0.50	0.42	0.41	0.38	0.37
Married Women	0.30	0.30	0.26	0.27	0.28
Divorced Women	0.39	0.38	0.38	0.35	0.33
Widowed Women	0.50	0.47	0.45	0.44	0.44
Never-Married Women	0.69	0.55	0.41	0.39	0.37
Social Security Benefit Type					
Male Worker	0.36	0.31	0.33	0.32	0.31
Female Worker Only	0.32	0.33	0.32	0.32	0.31
Dual Worker	0.44	0.39	0.37	0.37	0.35
Dual Survivor	0.50	0.49	0.46	0.45	0.46
Wife Only	0.52	0.42	0.34	0.38	0.48
Surviving Wife	0.75	0.53	0.43	0.59	0.70
Age of First Social Security Benefit					
<=62	0.37	0.33	0.32	0.32	0.32
63	0.34	0.34	0.32	0.32	0.30
64	0.37	0.35	0.34	0.33	0.32
65	0.38	0.37	0.37	0.36	0.34
66	0.37	0.34	0.33	0.35	0.33
67+	0.42	0.39	0.37	0.34	0.33

Source: The Urban Institute tabulations of DYNASIM3.

wife's earnings, married men's median replacement rate declines by 9 percentage points (32 percent to 23 percent). Shared earnings replacement rates for single men (never-married, widowed, and divorced) are higher than for married men and higher than their own earnings replacement rate. This is because married men share the low earnings and benefits of their wives and single men do not. For divorced and widowed men, their denominator declines as we factor in the lower earnings of the wife. For married men, both the numerator and denominator change.

Unlike own earnings replacement rates, there is no dramatic pattern in replacement rate by age of benefit take-up. This reflects the complex interaction of couples' benefits and

their retirement decisions. In family replacement rates, both the numerator and denominator change for very diverse combinations of husband and wife earnings, and the age pattern is much less apparent. However, the replacement rate by age at benefit take-up does not equal the rate of the actuarial reduction. As with own earning replacement rates, this reflects selection in who takes up benefits early. Specifically, people with higher replacement rates are more likely to retire early than people with low replacement rates.

As with own replacement rates, shared earnings replacement rates decline for later cohorts compared to earlier cohorts. The biggest reduction is for individuals taking up benefits at age 67. For individuals born between 1931 and 1935, their NRA was 65, and beneficiaries who delay benefits get an increase in benefits through the delayed retirement credit. Individuals have to wait longer for this credit as the NRA increases. Also, in 2000, Congress repealed the retirement earnings test for individuals at or above the NRA. This substantially reduces the penalty for starting benefits for individuals who continue to work. As a consequence, DYNASIM3 projects a smaller share of individuals forgoing benefits past the NRA, despite the increased benefits available through the delayed retirement credit.

IV.3.1 Characteristics of Future Retirees

In any year, the population of Social Security beneficiaries is a mix of young and old with different earnings histories and replacement rates. As the baby boom moves through retirement, the characteristics of the retired population will change over time. This population will become older, more educated, more ethnically diverse, more single, and more balanced between men and women (see table 5).

Women historically live longer than men, but the gap is closing. While both male and female life expectancy are projected to increase, male life expectancy is projected to increase faster than female life expectancy, causing the gender mix to become more equal over time. In 1992, 41 percent of the population at or above the normal retirement age was male and 59 percent was female. By 2040, the proportion of men is projected to increase to 44 percent while women's share will decline to 56 percent.

The retired population will become older. In 1992, 33 percent of the population at or above the NRA were 65- to 69-years-old. By 2040, with the combined effect of the increase in the NRA to age 67, the baby boom growing older, and increased life expectancy, the youngest group shrinks to only 16 percent of the population. The share of the population age 85 and older will increase from 7 percent in 1992 to 16 percent in 2040.

The combined effect of increased divorce rates, increases in the share of retirees forgoing marriage, and mortality changes will alter the marriage composition of retirees over time. DYNASIM3 projects that the share of individuals at or above the normal retirement age who are divorced and never-married will double between 1992 to 2040, while the share who are married and widowed will decline.

Table 5
Percent of Individuals at or above the Normal Retirement Age
by Demographic Characteristic and Year

	Year					
	1992	**2000**	**2010**	**2020**	**2030**	**2040**
ALL	100%	100%	100%	100%	100%	100%
Age						
65-69[1]	33%	28%	27%	28%	19%	16%
70-74	27%	26%	26%	30%	30%	26%
75-79	20%	22%	19%	20%	23%	23%
80-84	13%	14%	15%	12%	16%	19%
85+	7%	10%	13%	10%	11%	16%
Gender						
Male	41%	41%	42%	43%	43%	44%
Female	59%	59%	58%	57%	57%	56%
Marital Status						
Married	56%	50%	50%	51%	49%	45%
Widowed	31%	36%	33%	27%	27%	29%
Divorce	7%	10%	13%	15%	15%	15%
Never-Married	6%	4%	4%	6%	9%	12%
Marital Status by Gender						
Male Married	31%	29%	29%	28%	27%	25%
Male Widowed	5%	7%	7%	6%	7%	8%
Male Divorced	3%	4%	5%	5%	5%	5%
Male Never-Married	2%	2%	2%	3%	4%	6%
Female Married	25%	21%	21%	23%	22%	20%
Female Widowed	25%	29%	26%	21%	20%	21%
Female Divorced	4%	6%	8%	10%	10%	10%
Female Never-Married	4%	2%	2%	3%	5%	6%
Race						
White non-Hispanic	86%	83%	81%	78%	75%	72%
Hispanic	4%	5%	7%	9%	10%	12%
Black non-Hispanic	8%	8%	8%	9%	10%	11%
Other	2%	3%	4%	5%	5%	5%
Education						
High School Dropouts	38%	31%	22%	14%	11%	10%
High School Graduates	49%	53%	57%	59%	60%	57%
College Graduates	13%	16%	21%	27%	29%	33%

Source: The Urban Institute tabulations of DYNASIM3.

[1] As the normal retirement age increases over time, younger individuals are excluded from the table.

IV.4.1 Future Retirement Income

Changes in both the composition and life histories of the retired population will affect the incomes of future retirees. Increases in Social Security coverage rates have fundamentally changed the relationship between Social Security benefits and earnings. When

Social Security coverage rates were low, families saved more outside of Social Security through both private pensions and private savings. As coverage rates increase, families need to save less in private savings because Social Security will meet more of their needs. Along with the increased coverage, Social Security payroll tax rates also increased. This reduces families' ability to save privately. Over time, both the level and mix of family income will change. This section discusses the trends in Social Security income, non-Social Security income, total income, and total income divided by poverty for all individuals at or above the normal retirement age between 1992 and 2040.

IV.4.2 Social Security Benefits

DYNASIM3 projects that average real per beneficiary Social Security income will increase from about $8,200 in 1992 to $11,800 in 2020 and to more than $14,300 by 2040 (see table 6). Real benefits grow by about 1.3 percent per year between 1992 and 2020, with the biggest gains occurring between 2010 and 2020. Real benefits grow by only 1 percent per year from 2020 to 2040. This rise in real benefits is a result of wage growth outpacing price growth. Since current benefits are updated by prices, growth beyond prices occurs

Table 6
Average Real Social Security Benefits by Age and Year
All Individuals at or above the Normal Retirement Age
with Family Social Security Income: 1992-2040

		Age					Age 65-69
Year	**All**	**65-69**	**70-74**	**75-79**	**80-84**	**85+**	**Age 75-79**
		Real per Beneficiary Social Security Benefit ($2000)					
1992	8,220	7,910	8,215	8,624	8,373	8,201	0.92
2000	9,093	9,386	9,214	8,716	8,819	9,191	1.08
2010	10,230	11,241	10,689	9,577	9,525	9,015	1.17
2020	11,787	12,651	12,180	11,578	11,002	9,574	1.09
2030	12,995	13,412	13,327	13,326	12,476	11,461	1.01
2040	14,328	15,567	15,090	13,975	13,733	13,163	1.11
		Annual Average Percent Change					
1992-2000	1.3%	2.2%	1.4%	0.1%	0.7%	1.4%	
2000-2010	1.2%	1.8%	1.5%	0.9%	0.8%	-0.2%	
2010-2020	1.4%	1.2%	1.3%	1.9%	1.5%	0.6%	
2020-2030	1.0%	0.6%	0.9%	1.4%	1.3%	1.8%	
2030-2040	1.0%	1.5%	1.3%	0.5%	1.0%	1.4%	

Source: The Urban Institute tabulations of DYNASIM3.
Note: The highlighted areas reflect the transition of specific cohorts through time.

mostly through new cohorts entering the system with higher lifetime earnings.[15] The slowdown in the overall growth rate reflects three factors: a reduction in replacement rates for later cohorts compared to earlier cohorts; a slowdown in the growth rate of lifetime earnings of new beneficiaries in later years relative to earlier years; and a change in the proportion of younger beneficiaries relative to older beneficiaries as the baby boom moves through retirement, and increased longevity swells the share of older retirees.

The benefits of younger retirees compared to those of older retirees fluctuate over time. In 1992, 65- to 69-year olds received about 8 percent less than 75- to 79-year-olds ($7,910 versus $8,624). By 2010, the average benefits for 65- to 69-year olds are projected to be 17 percent more than for 75- to 79-year-olds ($11,241 versus $9,577). The difference declines to only 1 percent by 2030, and rises again to 11 percent by 2040.

These changes in relative incomes by age reflect a number of important legislative and demographic factors. First, the 1977 Social Security Reform Act, which was enacted to ensure stable replacement rates, changed the way benefits were calculated. Beneficiaries who became eligible for Social Security before 1978 had benefits calculated under the average monthly wage (AMW) formula. Retirees eligible for benefits after 1983 have benefits calculated under the average indexed monthly earnings (AIME) formula, and retirees eligible between 1978 and 1983 could choose the better of the AMW or the AIME formula. In fact, the AMW is almost always superior to the AIME, and the change in payment formula effectively cut benefits for retirees eligible after 1983 (the younger retirees in 1992).

Second, the increasing ratio of younger to older beneficiaries peaks in 2010 and corresponds to retirement of the cohorts that experienced the fastest growth in lifetime earnings, that is, workers who experienced the rise in men's real earnings in the mid-1970s followed by the increasing disparity of older to younger workers. This rise in earnings coincided with a rise in the Social Security taxable maximum, which effectively increased the replacement rate for higher-wage workers. The difference is smaller by 2020, as later cohorts enter retirement with more similar lifetime earnings than those who entered retirement in 2010. These benefits grow more slowly between 2020 and 2030, as the normal retirement age increases from age 66 to age 67, which reduces replacement rates for later cohorts. By 2040, the system reaches more of a steady state. Wage growth again increases benefits for younger retirees compared to older retirees, and the gap between older and younger beneficiaries rises.

Third, with the legislated removal of the earnings test for Social Security beneficiaries above the normal retirement age in 2000, DYNASIM3 projects that a larger share of younger retirees with high earnings will begin to accept Social Security at the normal retirement age rather than delaying acceptance for older ages. This effectively increases the average Social Security benefits of younger beneficiaries because these high-earning beneficiaries also have high Social Security benefits. The impact of each of these

[15] Beneficiaries who work may increase their benefits because of increased earnings.

influences changes over time as different cohorts move through retirement and comprise larger and smaller proportions of the beneficiary population.

We get the same basic pattern of rising real benefits and fluctuating benefits of younger retirees relative to their older counterparts over time using per capita benefits instead of per beneficiary Social Security benefits. The per capita measure reduces benefits more for younger beneficiaries who are more likely to have younger, nonbeneficiary spouses.

Mortality plays an important role in the income statistics of the elderly. Older beneficiaries are more likely to be widowed than younger beneficiaries. When both husband and wife are alive, the wife typically receives a lower Social Security benefit than the husband. If the husband dies first, the wife receives a survivor benefit equal to the husband's benefit. For example, if a husband received $10,000 and the wife received $5,000, on a per capita basis, the couple receives $7,500. When the husband dies, the wife receives $10,000 (a 33 percent increase in her per capita income). Differential mortality also plays an important role. Black and lower-income individuals have shorter life expectancy than white and higher-income individuals. When looking at the incomes of older retirees, we are looking systematically at more advantaged individuals. For example, if there are two Social Security beneficiaries at age 65 and one receives $10,000 in Social Security income and the other receives $5,000, the average benefit would be $7,500. If the beneficiary who received $5,000 died the next year, the average benefit of the survivors would increase to $10,000.

The pattern of increasing per beneficiary income can be seen by following the average per beneficiary Social Security income across cohorts (represented by the highlighted cells in table 6). For example, the average per beneficiary income of 65- to 69-year-olds in 1992 was $7,910. This income increases to $8,716 for 75- to 79-year-olds in 2000 (a 10 percent increase) and to $9,015 for retirees age 85 and older by 2040. The increasing diagonal pattern is true across all years, but the difference declines over time, as women's earnings increase relative to men's earnings and men's mortality rates become more similar to women's mortality rates.

IV.4.3 Non-Social Security Income

Non-Social Security income includes income from earnings; defined benefit pension plans; income from assets, including cash, stocks, bonds, retirement savings accounts; equity in business; and other property and vehicles. It includes a rate of return on home equity (imputed rental income) to reflect the fact that homeowners are better off than nonhomeowners (see Appendix for more details). Finally, it includes income from co-resident family members other than a spouse (usually a sibling or adult child).

DYNASIM3 projects that real per capita non-Social Security income will increase from about $13,200 in 1992 to $20,500 in 2020 and $23,600 in 2040 (see table 7). Between 1992 and 2020, real per capita non-Social Security income will grow about 1.6 percent per year, with the biggest gains occurring between 2000 and 2010, when DYNASIM3 projects

real income to grow by 2.0 percent per year. The growth rate slows between 2020 and 2040, where it averages about 0.7 percent per year.

Table 7
Average Real per Capita Non-Social Security Income by Age and Year
All Individuals at or above the Normal Retirement Age: 1992 to 2040

Year	Age						Age 65-69
	All	65-69	70-74	75-79	80-84	85+	Age 75-79
	Real per Capita Non-Social Security Income ($2000)						
1992	13,246	16,866	12,836	11,243	9,827	10,074	1.50
2000	14,846	19,345	16,048	12,780	10,451	9,834	1.51
2010	18,126	21,782	20,317	17,562	14,141	11,500	1.24
2020	20,464	24,044	21,007	18,950	17,953	14,813	1.27
2030	21,746	24,748	22,817	21,869	18,688	17,993	1.13
2040	23,609	28,940	25,722	22,591	20,884	19,820	1.28
	Annual Average Percent Change						
1992-2000	1.4%	1.7%	2.8%	1.6%	0.8%	-0.3%	
2000-2010	2.0%	1.2%	2.4%	3.2%	3.1%	1.6%	
2010-2020	1.2%	1.0%	0.3%	0.8%	2.4%	2.6%	
2020-2030	0.6%	0.3%	0.8%	1.4%	0.4%	2.0%	
2030-2040	0.8%	1.6%	1.2%	0.3%	1.1%	1.0%	

Source: The Urban Institute tabulations of DYNASIM3.
Note: The highlighted areas reflect the transition of specific cohorts through time.

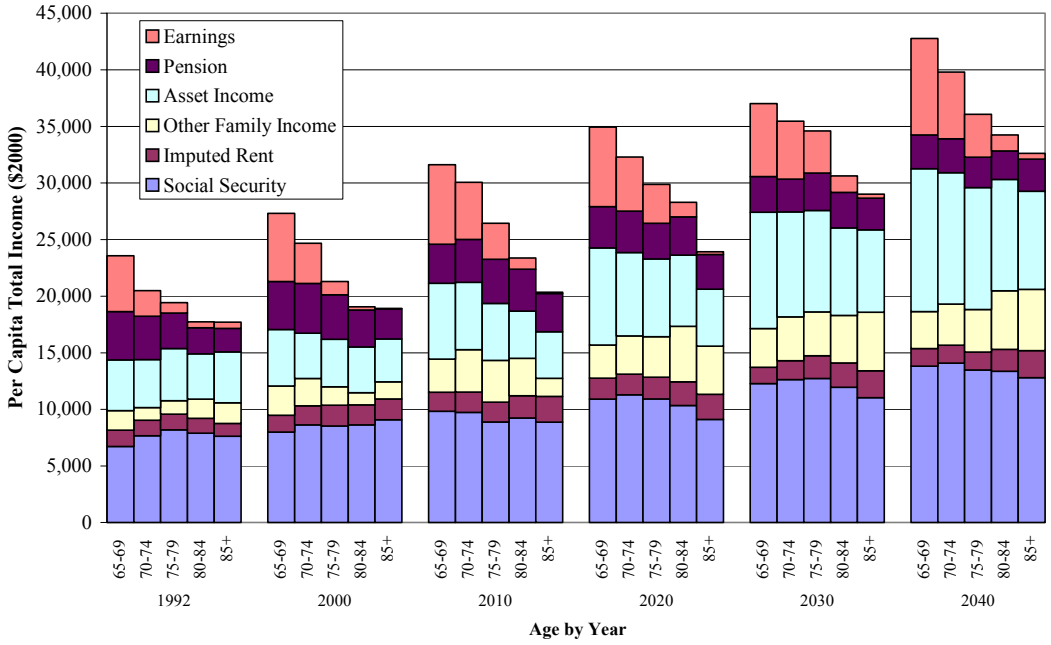
In 1992, real per capita non-Social Security income was about 61 percent higher than real per beneficiary Social Security income. This difference increases to 77 percent in 2010 before it declines to 65 percent in 2040. Between 1992 and 2010, non-Social Security income grows faster than Social Security income. After 2010, non-Social Security income grows more slowly than Social Security income. We see large gains in real non-Social Security income among the 70- to 74-year-olds between 1992 and 2010 (1918 to 1940 cohorts). These are the cohorts that experienced the fastest rise in family lifetime earnings. DYNASIM3 projects a large rise in real non-Social Security income in all age groups between 2000 and 2010. This is mostly due to the economic growth (historic and projected), where real wages grow by more than 1 percent above prices between 1995 and 2004. This real growth differential causes earned income, income from assets, and income from other family members to rise faster than prices.

Among new retirees (age 65 to 69), non-Social Security income increases about 1.7 percent per year between 1992 and 2000 and then slows to about 1.2 percent between 2000 and 2020. New retirees experience almost no growth (0.3 percent) in non-Social Security income between 2020 and 2030. This is the period when individuals born between 1951 and 1965 retire. It coincides with the bottom of the decline in men's lifetime earnings and a

reduction in the rate of increase in women's lifetime earnings. The growth rate for new retirees increases to about 1.6 percent per year between 2030 and 2040, as lifetime earnings for both men and women rises.

For all years in our projections, younger retirees have higher real per capita non-Social Security income than older retirees. In 1992, the youngest age group (65- to 69-year-olds) received about 50 percent more than the middle age group (75- to 79-year-olds) ($16,866 versus 11,243). By 2010, the youngest age group is projected have only 24 percent higher non-Social Security income than the middle age group ($21,782 versus $17,562). The difference continues to decline to 13 percent in 2030 before it rises to 28 percent in 2040. Despite its decline, the gap between young and old is much greater for non-Social Security income than for Social Security income. Most of this difference between young and old is due to the substantial loss of earned income as individuals age and retire fully (see figure 14).

Figure 14
Average Real per Capita Total Income by Source, Age, and Year
All Individuals at or above the Normal Retirement Age: 1992 to 2020



Much of the decline in the gap between young and old is due to changes in private pensions and co-resident income. First, defined benefit pensions decline less over time in later years than in early years. This is due partly to the increased acceptance of joint and survivor pensions over time and partly to composition changes in industries that offer defined benefit pensions. DYNASIM3 also projects an increase in co-resident income in later years. This is due partly to an increase the proportion of nonmarried and minority retirees who are more likely to co-reside; partly to an increase in the number of offspring available for co-

residing, as the parents of the baby boom move into retirement; and partly to an increase in the earnings of co-residents through higher wage growth.

While real Social Security income increases with cohorts as they age, real non-Social Security income declines. Differential mortality is still a factor for non-Social Security income, but the reductions in other sources of income dominate the trend. For example, the average per capita non-Social Security income of 65- to 69-year-olds in 1992 was $16,866. This income decreases to $12,780 for 75- to 79-year-olds in 2000 (24 percent decrease) and to $11,500 for retirees age 85 and older by 2040 (10 percent decline).

IV.4.4 Total Retirement Income

When we combine Social Security with non-Social Security income, many of the growth rate and age differentials discussed earlier are offset, with an overall mitigating result on total income. DYNASIM3 projects that real per capita total income will increase from about $20,700 in 1992 to $31,200 in 2020 and to more than $37,100 in 2040 (see table 8). Between 1992 and 2010, real per capita total income will grow about 1.5 percent per year. The growth rate declines to about 1.3 percent per year between 2010 and 2020 and to only about 0.9 percent per year between 2020 and 2040.

Table 8
Real per Capita Total Income by Age and Year
All Individuals at or above the Normal Retirement Age: 1992 to 2040

		Age					Age 65-69
Year	All	65-69	70-74	75-79	80-84	85+	Age 75-79
		Real per Capita Total Income ($2000)					
1992	20,729	23,581	20,493	19,420	17,736	17,713	1.21
2000	23,316	27,328	24,679	21,302	19,076	18,908	1.28
2010	27,535	31,609	30,060	26,441	23,372	20,358	1.20
2020	31,236	34,941	32,297	29,879	28,300	23,934	1.17
2030	34,039	37,019	35,454	34,596	30,641	29,024	1.07
2040	37,161	42,762	39,808	36,065	34,248	32,610	1.19
		Annual Average Percent Change					
1992-2000	1.5%	1.9%	2.4%	1.2%	0.9%	0.8%	
2000-2010	1.7%	1.5%	2.0%	2.2%	2.1%	0.7%	
2010-2020	1.3%	1.0%	0.7%	1.2%	1.9%	1.6%	
2020-2030	0.9%	0.6%	0.9%	1.5%	0.8%	1.9%	
2030-2040	0.9%	1.5%	1.2%	0.4%	1.1%	1.2%	

Source: The Urban Institute tabulations of DYNASIM3.
Note: The highlighted areas reflect the transition of specific cohorts through time.

The high growth rate in non-Social Security income between 2000 and 2010 (2 percent per year) is offset by a lower growth rate in Social Security income (1.2 percent per year) during this period, so that total income is projected to grow by about 1.7 percent per year. In contrast, the lower growth rate in non-Social Security income between 2020 and 2040 (0.7 percent per year) is offset by higher growth rate in Social Security income (1 percent per year), so that total income is projected to grow by 0.9 percent per year.

Younger (65- to 69-year-old) retirees had higher non-Social Security income and lower Social Security income than 75- to 79-year-old retirees. When we combine the income, the 65- to 69-year-old retirees have about 21 percent higher total income than the 75- to 70-year-old retirees. As with Social Security and non-Social Security income, the gap between young and old declines over time, so that by 2030, younger retirees' real per capita total income is only 7 percent higher than their older counterparts. The gap rises to 19 percent by 2040, as lifetime earnings of later cohorts increase.

IV.4.5 Total Income Divided by Poverty

Because the cost of living for singles does not equal half the cost of living for couples, we divide family income by the poverty threshold to calculate equivalent income. This produces a ratio of income to poverty and should not be confused with the poverty rate, which is the percent of the population below the poverty threshold. Equivalent income allows us to better compare the well-being of married couples with single individuals.

Using poverty-adjusted income, total income will increase over time, but at a slightly lower rate than real per capita income, and the income ratio of younger to older retirees will decline over time (see table 9). In 1992, the average ratio of family income divided by poverty for individuals at or above the normal retirement age was 3.15 (more than three times poverty). This increases to 5.45 by 2040, and, as with per capita income, adjusted income will grow faster between 1992 and 2020 and slower between 2020 and 2040. Over the 48-year period, however, income divided by poverty is projected to increase by 1.15 percent per year, compared to 1.22 percent per year for real per capita income.

Because older retirees are more likely to be widowed than younger retirees, they systematically have a higher denominator than younger retirees. The couples' poverty threshold is only 26 percent higher (not twice) than the single threshold. This denominator change increases the relative difference between younger and older retirees. The poverty-adjusted income in 1992 for 65- to 69-year-olds was 1.3 times higher than the incomes of 75- to 79-year-olds (9 percentage points higher than for real per capita income).

Table 9
Total Family Income Divided by Poverty by Age and Year
All Individuals at or above the Normal Retirement Age: 1992 to 2040

Year	Age						Age 65-69
	All	65-69	70-74	75-79	80-84	85+	Age 75-79
				Total Family Income/Poverty			
1992	3.15	3.73	3.17	2.87	2.47	2.40	1.30
2000	3.45	4.39	3.76	3.04	2.53	2.27	1.44
2010	4.09	5.01	4.64	3.88	3.17	2.43	1.29
2020	4.65	5.48	4.94	4.39	3.87	2.92	1.25
2030	5.04	5.78	5.46	5.15	4.24	3.65	1.12
2040	5.45	6.71	6.11	5.37	4.78	4.13	1.25
				Annual Average Percent Change			
1992-2000	1.2%	2.1%	2.2%	0.7%	0.3%	-0.7%	
2000-2010	1.7%	1.3%	2.1%	2.5%	2.3%	0.7%	
2010-2020	1.3%	0.9%	0.6%	1.2%	2.0%	1.8%	
2020-2030	0.8%	0.5%	1.0%	1.6%	0.9%	2.3%	
2030-2040	0.8%	1.5%	1.1%	0.4%	1.2%	1.2%	

Source: The Urban Institute tabulations of DYNASIM3.
Note: The highlighted areas reflect the transition of specific cohorts through time.

The decline in poverty-adjusted income over a lifetime is greater than the decline in real per capita income. For example, the 65- to 69-year-olds in 1992 experience a 34 percent decline in poverty-adjusted income by age 85 (highlighted cells in table 9), while they experience only a 14 percent decline in real per capita income (highlighted cells in table 8). The difference declines for later cohorts as more individuals enter retirement unmarried (increasing the share of young singles), and men's mortality rates improve relative to women's (increasing the share of older married couples). The poverty-adjusted income of 65- to 69-year-olds in 2020 will decline by only 24 percent by the time they reach age 85 in 2040.

IV.5.1 Changes in Inequality

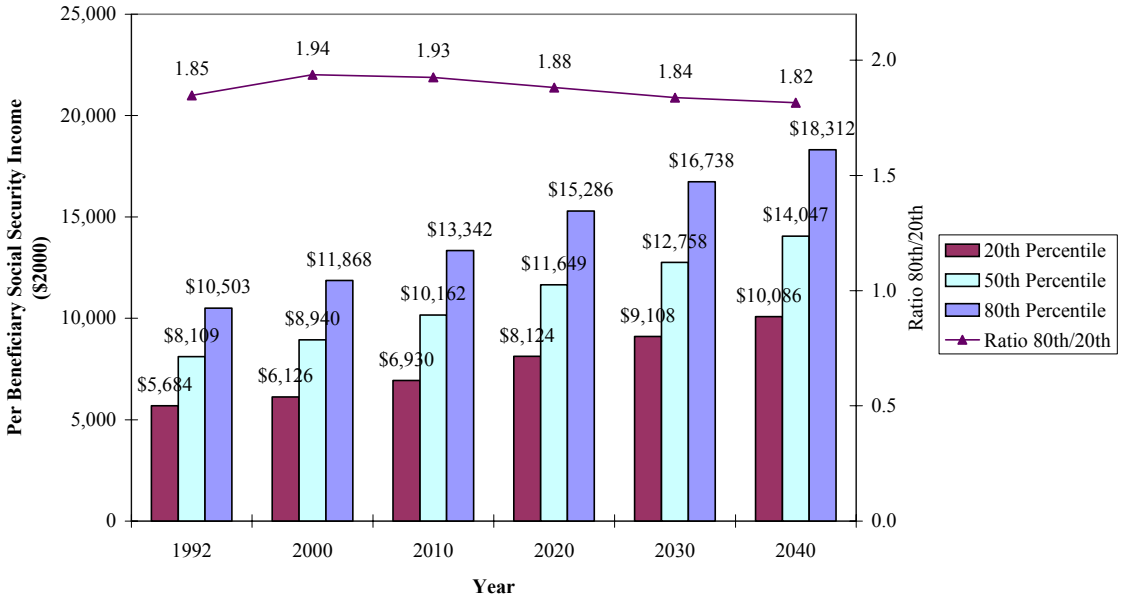
While the preceding section looked at aggregate trends in income of the aged population, this section looks at changes in the distribution of income of the aged population. DYNASIM3 projects that between 1992 and 2000, Social Security income will become more unequally distributed, and between 2000 and 2040, it will become more equally distributed. Non-Social Security income is distributed much more unequally than Social Security income, but it is projected to become slightly more evenly distributed over time. The trend is more mixed for total income, with some measures showing increasing inequality and some showing decreasing inequality. When we adjust total income by the poverty threshold,

inequality is higher than for real per capita total income, and like total income, its inequality trend is sensitive to the measure used. For all income sources, there are also considerable differences in inequality by gender, marital status, education, and race.

IV.5.2 Social Security Income

DYNASIM3 projects that, after an initial rise, real per beneficiary Social Security income will become more equally distributed, with benefits in the bottom fifth of the distribution rising faster than benefits in the top fifth of the distribution (see figure 15). In 1992, the 80th percentile benefit was 1.85 times higher than the 20th percentile ($10,503 versus $5,684). In 2000, DYNASIM3 projects that inequality will increase, but this ratio will decline after 2000, so that the 80th percentile will be only 1.82 times the 20th percentile ($18,312 versus $10,086) in 2040. The initial rise in inequality reflects both the increase in covered earnings through the 1970s and the increase in the Social Security taxable maximum, which increased benefits paid to those in the top quintile. It also reflects the increase in the unmarried female beneficiary population, which typically has lower Social Security benefits than married women. The subsequent reduction in inequality reflects faster gains in the bottom fifth of the distribution, given increases in female earnings and increases in Social Security-covered employment.

Figure 15
Distribution of Real per Beneficiary Social Security Income and Ratio of 80th Percentile to 20th Percentile
Years 1992 to 2040



The pattern of Social Security inequality differs by subgroup. Table 10 shows the ratio of the 80th percentile to the 20th percentile of real per beneficiary Social Security income for different subgroups. The Gini coefficient and CV^2 show similar patterns of inequality. (These results are displayed in the Appendix table A1.)

Table 10
Ratio of 80th Percentile to 20th Percentile of Real per Beneficiary Security Income for Gender, Marital Status, Race, Education, and Age Subgroups

	Year					
	1992	**2000**	**2010**	**2020**	**2030**	**2040**
	Ratio 80th Percentile/20th Percentile					
All	1.85	1.94	1.93	1.88	1.84	1.82
Gender						
Men	1.83	1.86	1.80	1.78	1.74	1.76
Women	1.84	1.95	1.98	1.96	1.89	1.85
Marital Status and Gender						
Married Men	1.76	1.78	1.74	1.71	1.68	1.70
Single Men	2.08	2.06	1.90	1.87	1.84	1.87
Married Women	1.74	1.77	1.77	1.73	1.69	1.69
Divorced Women	2.18	2.06	2.25	2.17	2.14	2.07
Widowed Women	1.82	1.99	1.97	2.00	1.98	1.87
Never-Married Women	2.67	2.53	2.33	2.49	2.27	2.22
Education						
High School Dropouts	1.85	1.97	2.01	1.99	1.87	1.86
High School Graduates	1.78	1.84	1.83	1.79	1.74	1.72
College Graduates	1.80	1.75	1.61	1.60	1.56	1.55
Race						
White Non-Hispanic	1.77	1.86	1.84	1.79	1.75	1.74
Black Non-Hispanic	1.99	2.12	2.12	1.94	1.89	1.91
Hispanic	2.03	2.27	2.29	2.08	1.92	1.88
Age						
65-69	1.92	1.95	1.91	1.82	1.76	1.80
70-74	1.83	1.97	1.87	1.87	1.82	1.75
75-79	1.91	1.88	1.94	1.87	1.81	1.76
80+	1.75	1.92	1.95	1.95	1.94	1.87

Source: The Urban Institute tabulations of DYNASIM3.

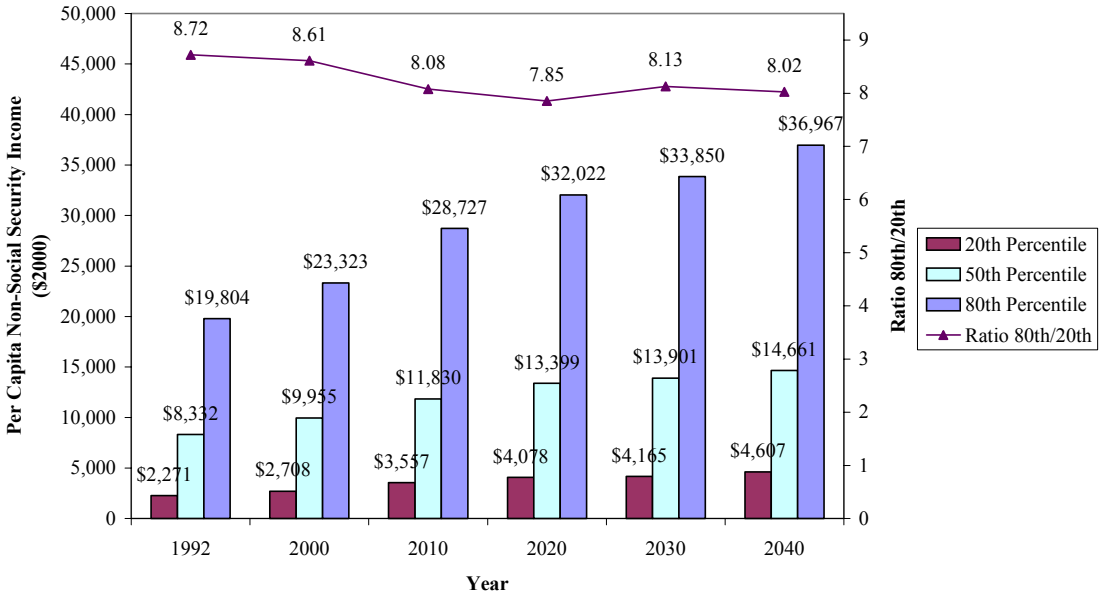
The 80/20 ratio is higher (more inequality) for women than for men, higher for high school dropouts than for college-educated retirees, and higher for blacks and Hispanics than for white non-Hispanic retirees. Inequality is higher for single women than for married women, with never-married women having the most unequally distributed benefits. DYNASIM3 projects that inequality will rise for women from 1992 to 2010 and then decline. Men, on the other hand, have initially rising inequality from 1992 to 2000, but it declines for

men until 2030. Social Security inequality declines slightly for college-educated beneficiaries as the gains in benefits at the bottom end of the distribution outpace the gains at the top end of the distribution. This happens as the Social Security taxable maximum limits the replacement rate for a larger share of college-educated retirees.

IV.5.3 Non-Social Security Income

The distribution of real non-Social Security income is more unequal than Social Security income. Non-Social Security income is both higher in the top fifth of the distribution and lower in the bottom fifth of the distribution than Social Security income, and non-Social Security income inequality is projected to decline slightly over time (see figure 16). In 1992, the 80th percentile of real non-Social Security income was 8.72 times higher than the 20th percentile ($19,804 versus $2,271). This is almost five times greater than the ratio for Social Security income in the same year. The 80/20 ratio declines to 7.85 by 2020 ($32,022 versus $4,078) and to 8.02 in 2040. The decline comes through increases in equality in the bottom third of the distribution (percentiles converging to the median). These increases are large enough to offset slight decreases in equality in the top half of the distribution (percentile diverging from the median).

Figure 16
Distribution of Real per Capita Non-Social Social Security Income and Ratio of 80th Percentile to 20th Percentile
Years 1992 to 2040



As with Social Security income, inequality of non-Social Security income differs by subgroup. Table 11 shows the ratio of the 80th percentile to the 20th percentile of real per capita non-Social Security for different subgroups. The Gini coefficient and CV^2 show similar patterns of inequality. (These results are displayed in the Appendix table A2.)

Table 11
Ratio of 80th Percentile to 20th Percentile of Real per Capita Non-Social Security Income for Gender, Marital Status, Race, Education, and Age Subgroups

	Year					
	1992	**2000**	**2010**	**2020**	**2030**	**2040**
	Ratio 80th Percentile/20th Percentile					
All	8.72	8.61	8.08	7.85	8.13	8.02
Gender						
Men	7.45	6.53	6.12	5.97	6.63	7.12
Women	10.03	10.07	8.97	8.94	8.92	8.40
Marital Status and Gender						
Married Men	6.47	5.33	5.49	5.43	5.92	6.01
Single Men	16.48	10.95	8.38	7.38	8.23	8.23
Married Women	6.77	5.96	5.54	5.38	5.80	5.78
Divorced Women	76.90	32.72	18.58	16.17	15.90	14.98
Widowed Women	12.39	9.63	8.59	9.48	8.90	7.90
Never-Married Women	10.86	24.88	15.30	17.31	13.03	14.75
Education						
High School Dropouts	13.13	12.42	12.10	12.24	12.55	10.72
High School Graduates	6.06	6.55	6.66	7.14	7.85	8.17
College Graduates	5.07	4.32	4.53	4.70	4.84	5.23
Race						
White Non-Hispanic	7.29	7.10	6.80	6.76	6.83	6.76
Black Non-Hispanic	50.88	36.52	23.37	17.99	15.86	15.33
Hispanic	164.63	29.97	16.85	10.80	10.43	10.14
Age						
65-69	7.08	6.67	6.75	6.11	7.00	6.24
70-74	8.01	7.96	7.13	7.77	7.93	6.88
75-79	8.77	8.00	8.90	7.75	7.92	8.43
80+	12.46	9.59	7.75	8.36	7.96	8.14

Source: The Urban Institute tabulations of DYNASIM3.

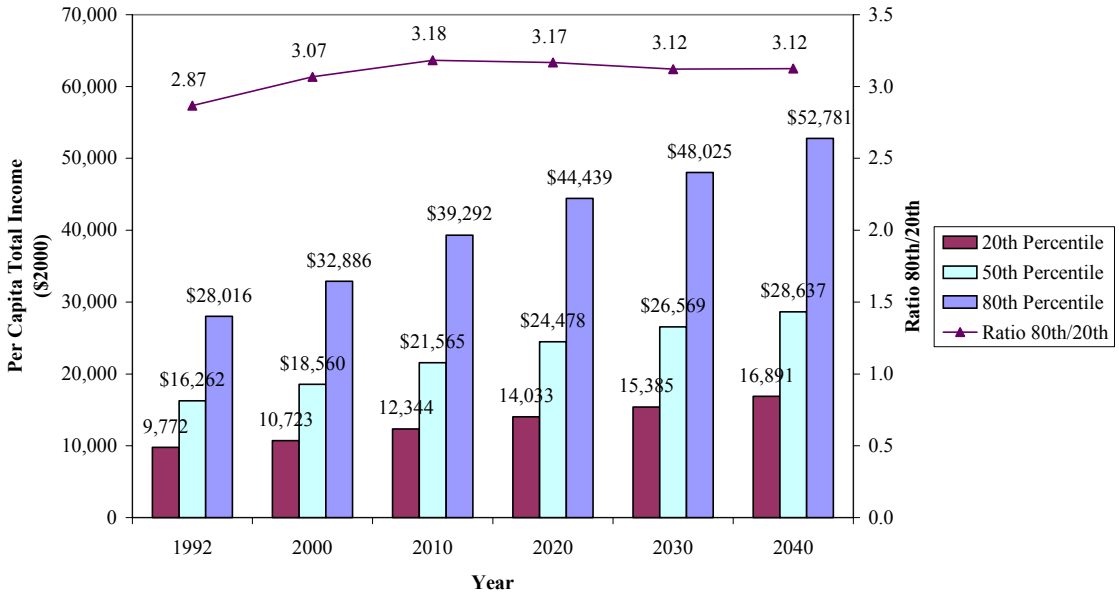
The 80/20 ratio is higher (more inequality) for women than for men, higher for high school dropouts than for college-educated retirees, and higher for blacks and Hispanics than for white non-Hispanic retirees. Inequality is higher for unmarried retirees than for married women, with widowed women having the most unequally distributed non-Social Security income. Non-Social Security income inequality increases with increased age. DYNASIM3 projects that non-Social Security income inequality will decline for both men and women

between 1992 and 2020. Inequality then increases for men, while it continues to decline for women. Non-Social Security income inequality increases slightly for both college-educated and high school graduates, but declines for high school dropouts. These patterns occur as more women accrue pension assets over time, thereby reducing inequality for women and for younger retirees relative to older retirees.

IV.5.4 Total Retirement Income

DYNASIM3 projects that real per capita total income will be distributed more equally than non-Social Security income, but more unequally than Social Security income. The 80/20 ratio indicates that real per capita total income will become more unevenly distributed between 1992 and 2010, and then become slightly more evenly distributed through 2040 (see figure 17). Unlike Social Security income and non-Social Security income, the trend in inequality differs depending on how inequality is measured. This happens when the income becomes distributed more equally in some parts of the distribution and more unequally in other parts of the distribution. Both the Gini coefficient and CV^2 show little change in the distribution of total income over time.

Figure 17
Distribution of Real per Capita Total Inome and
Ratio of 80th Percentile to 20th Percentile
Years 1992 to 2040

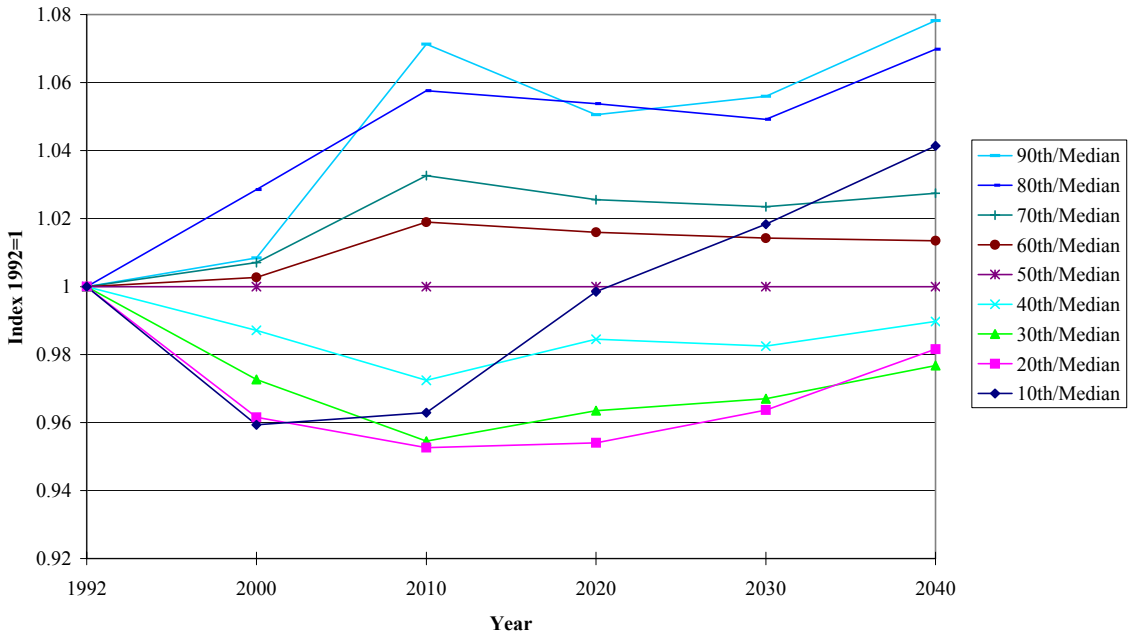


In 1992, the 80th percentile real per capita total income was 2.87 times higher than the 20th percentile ($28,016 versus $9,772). This is 50 percent higher than the Social Security income ratio and 33 percent higher than the non-Social Security income ratio in the same

year. The 80/20 ratio for real per capita total income will increase to 3.18 by 2010 ($39,292 versus $12,344) and decrease to 3.12 by 2030, remaining level through 2040. The rise in inequality between 1992 and 2010 is due to both an increase in the top half of the distribution (upper percentiles increasing relative to the median) and a decline in the bottom half of the distribution (percentiles dropping relative to the median), although the decline in the bottom is greater than the increase in the top. The decline in inequality comes through both decreased inequality in the bottom half of the distribution and decreased inequality in the top half of the distribution, with gains in the bottom (particularly the bottom 10 percent) of the distribution exceeding losses in the top part of the distribution. Between 2030 and 2040, the top 30 percent increases relative to the median, and the bottom 30 percent decreases relative to the median.

While the 80/20 ratio shows inequality increasing for the total population, the Gini coefficient and CV^2 do not.[16] This happens when inequality increases in some parts of the distribution and decreases in other parts of the distribution. Figure 18 shows the distribution relative to the median indexed to 1992 to display changes within the distribution more readily. As figure 18 shows, the 90th percentile falls relative to the 80th percentile between 1992 and 2000, then the 10th percentile rises relative to the 20th and 30th percentile after 2000. The Gini coefficient and CV^2 capture these changes and conclude that inequality

Figure 18
Real per Capita Total Income Percentile/Median



[16] See Formby (1997) for more discussion of the difficulty of interpreting inequality when Lorenz curves cross.

is not growing. Aside from the extremes in the distribution, figure 18 tells a clear story of increasing inequality, as both the bottom of the distribution falls and the top of the distribution rises relative to the median.

As with Social Security and non-Social Security, inequality for real per capita total income differs by subgroup. Table 12 shows the ratio of the 80th percentile to the 20th percentile of real per capita total income for different subgroups. (The results for the Gini coefficient and CV^2 are displayed in the Appendix table A3.) While the Gini coefficient and CV^2 generally show similar patterns of inequality as the 80/20 ratio, this is not true for some subgroups.

Table 12
Ratio of 80th Percentile to 20th Percentile Real per Capita Total Income for Gender, Marital Status, Race, Education, and Age Subgroups

	Year					
	1992	**2000**	**2010**	**2020**	**2030**	**2040**
	Ratio 80th Percentile/20th Percentile					
All	2.87	3.07	3.18	3.17	3.12	3.12
Gender						
Men	2.84	2.93	2.99	2.90	2.96	3.08
Women	2.83	3.04	3.22	3.24	3.17	3.11
Marital Status and Gender						
Married Men	2.73	2.84	2.88	2.76	2.85	2.95
Single Men	3.42	3.17	3.24	3.22	3.16	3.22
Married Women	2.65	2.83	2.79	2.67	2.64	2.70
Divorced Women	3.37	4.05	4.20	4.14	4.27	4.11
Widowed Women	3.45	3.51	4.37	4.44	4.36	4.14
Never-Married Women	3.46	4.12	4.89	5.32	4.21	4.47
Education						
High School Dropouts	2.67	2.85	3.07	3.13	3.52	3.24
High School Graduates	2.59	2.71	2.85	2.82	2.82	2.88
College Graduates	2.86	2.77	2.83	2.66	2.60	2.67
Race						
White Non-Hispanic	2.72	2.89	2.99	2.99	2.95	2.94
Black Non-Hispanic	3.59	3.47	3.76	3.46	3.38	3.34
Hispanic	4.23	4.40	4.22	3.46	3.44	3.38
Age						
65-69	3.06	3.42	3.25	2.95	3.10	3.09
70-74	2.75	3.12	3.15	3.13	3.20	3.04
75-79	2.79	2.70	3.35	3.07	3.02	3.05
80+	2.71	2.66	2.78	3.05	2.97	3.00

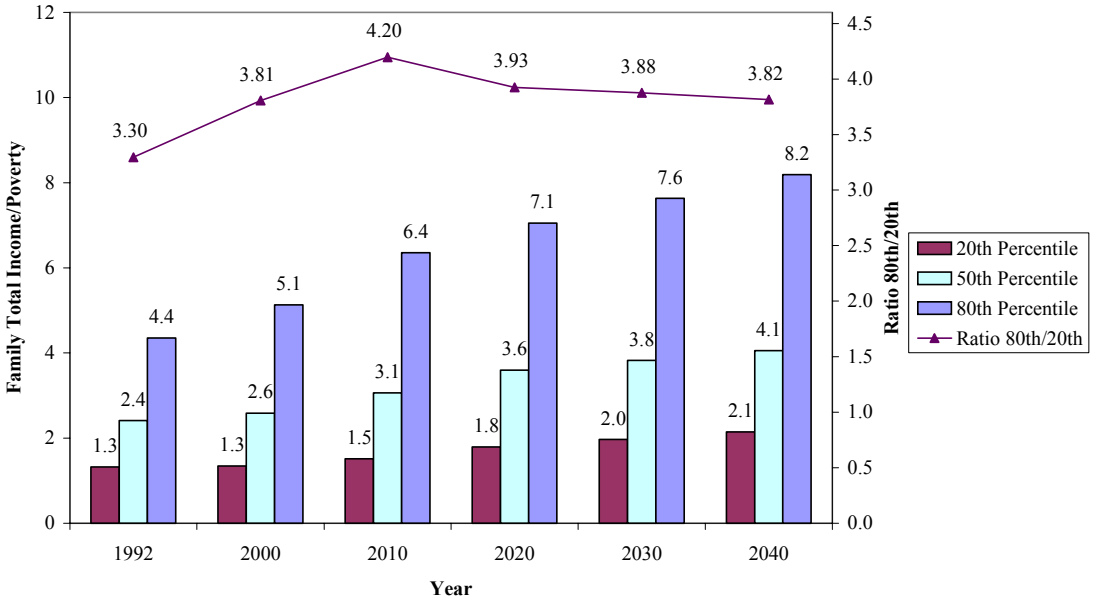
Source: The Urban Institute tabulations of DYNASIM3.

As with Social Security and non-Social Security income, the 80/20 ratio of total income is higher (more inequality) for women than for men, higher for high school dropouts than for college-educated retirees, and higher for blacks and Hispanics than for white non-Hispanic retirees. The 80/20 ratio indicates that inequality will increase for both men and women between 1992 to 2010. Inequality then decreases for women, while, after a brief decline between 2010 and 2020, it continues to increase for men. Total income inequality decreases slightly for college-educated retirees, but increases for high school dropouts. Inequality increases the fastest for never-married and divorced women whose earnings change dramatically over time.

IV.5.5 Total Retirement Income Divided by Poverty

When we use the poverty thresholds to adjust total income for cost of living differences between living alone versus living with others, DYNASIM3 projects that family income will be distributed more unequally than per capita income in all years. The 80/20 ratio indicates that family income divided by poverty will become more unevenly distributed between 1992 and 2010, and then slightly more evenly distributed through 2040 (see figure 19). Like real per capita income, the trend in inequality differs in some subgroups, depending on how inequality is measured, with some measures showing rising inequality and some showing decreasing inequality.

Figure 19
Distribution of Family Income Divided by Poverty and Ratio of 80th Percentile to 20th Percentile
Years 1992 to 2040



In 1992, the 80th percentile family income divided by poverty was 3.3 times higher than the 20th percentile (4.4 versus 1.3). The 80/20 ratio will increase to 4.2 by 2010 (6.4 versus 1.5) and then decline to 3.82 by 2040. The changes in the distribution of income divided by poverty are similar to those of real per capita income, but the rate of growth in inequality for poverty-adjusted total income is steeper than for per capita income. For example, between 1992 and 2010, the 80/20 ratio increases 27 percent for poverty-adjusted income and only 11 percent for per capita income, and between 1992 and 2040, the 80/20 ratio increases 16 percent for poverty-adjusted income and only 9 percent for per capita income. Once we account for family need, income in retirement will become distributed more unequally over time, with the peak in inequality occurring in 2010. While the 80/20 ratio shows inequality increasing, the Gini coefficient and CV^2 do not.

Table 13 shows the ratio of the 80th percentile to the 20th percentile of family income divided by poverty for different subgroups. (The results for the Gini coefficient and CV^2 are displayed in Appendix table A4.) While the Gini coefficient and CV^2 generally show similar patterns of inequality as the 80/20 ratio, this is not true for some subgroups.

As with real per capita total income, the 80/20 ratio is higher (more inequality) for women than for men, higher for high school dropouts than for college-educated retirees, and higher for blacks and Hispanics than for white non-Hispanic retirees. The 80/20 ratio indicates that inequality will increase for both men and women between 1992 to 2010. Inequality then decreases for women, while, after a brief decline between 2010 and 2020, it continues to increase for men. Total income inequality remains fairly stable for college-educated retirees, but increases for high school dropouts. As with per capita income, inequality increases the fastest for never-married and divorced women whose earnings change dramatically over time. Inequality is highest among individuals born between 1925 and 1935. This inequality progresses through the years among different age groups as these cohorts age over time.

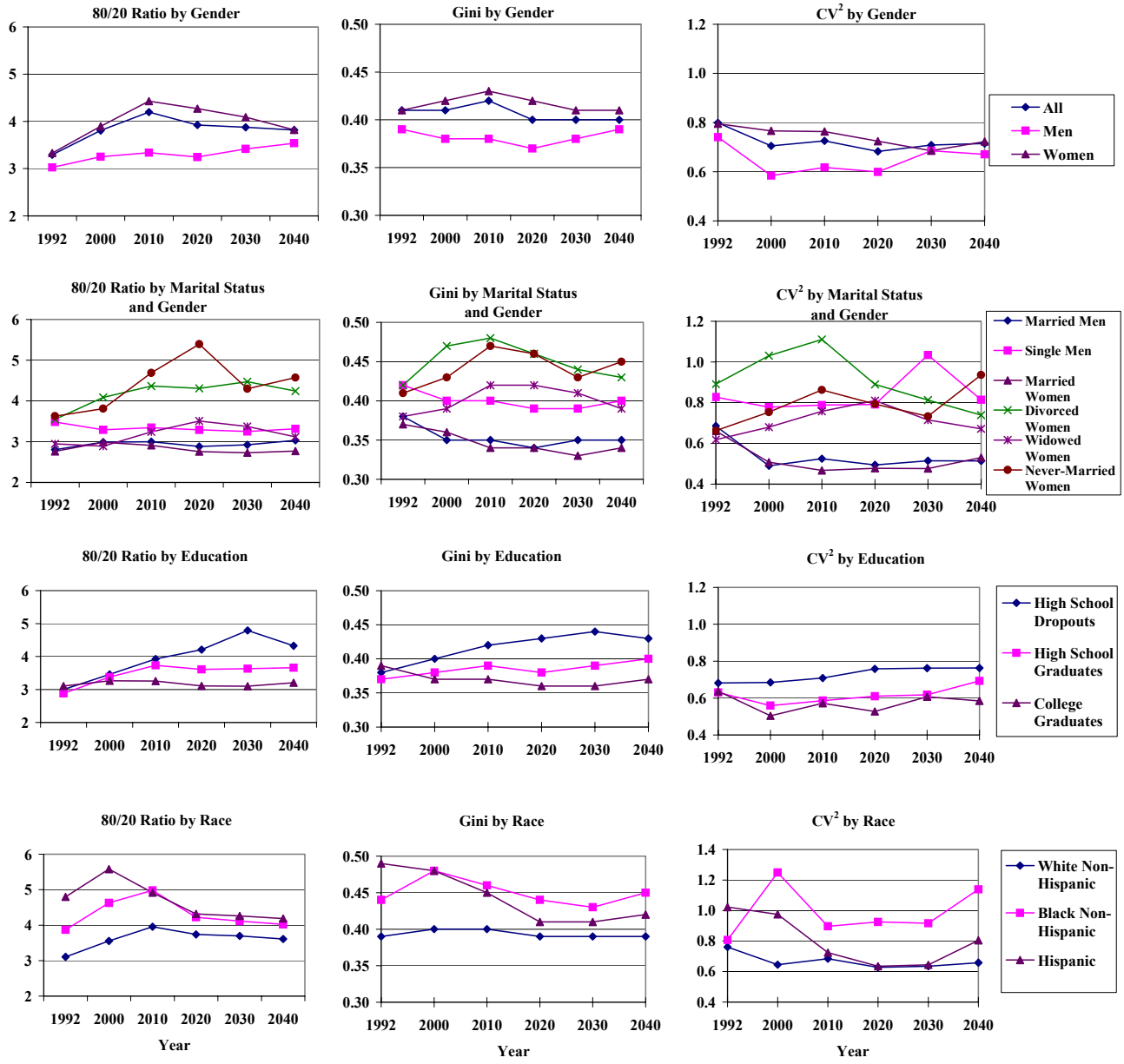
Figure 20 shows a graphical interpretation of these inequality trends using the ratio of the 80th percentile to 20th percentile, Gini coefficients, and coefficient of variation squared for different subgroups. It shows how the inequality results differ among the three inequality measures. As with per capita total income, however, the 90th percentile moves closer to the 80th percentile, and the 10th percentile moves closer to the 20th percentile, but otherwise the distribution diverges from the median, with the bottom falling and the top rising. The alternate measures are most dissimilar by gender. They are more similar by education, race, and age.

Table 13
Ratio of 80th Percentile to 20th Percentile of Family Income Divided by Poverty for Gender, Marital Status, Race, Education, and Age Subgroups

	Year					
	1992	**2000**	**2010**	**2020**	**2030**	**2040**
	Ratio 80th Percentile/20th Percentile					
All	3.30	3.81	4.20	3.93	3.88	3.82
Gender						
Men	3.03	3.25	3.34	3.24	3.42	3.54
Women	3.33	3.90	4.43	4.27	4.09	3.82
Marital Status and Gender						
Married Men	2.80	2.99	3.00	2.88	2.92	3.03
Single Men	3.48	3.29	3.34	3.29	3.25	3.32
Married Women	2.76	2.98	2.91	2.76	2.73	2.77
Divorced Women	3.55	4.09	4.36	4.31	4.47	4.24
Widowed Women	2.95	2.89	3.24	3.51	3.37	3.12
Never-Married Women	3.63	3.81	4.69	5.39	4.30	4.57
Education						
High School Dropouts	3.00	3.46	3.92	4.21	4.79	4.32
High School Graduates	2.88	3.38	3.73	3.61	3.63	3.66
College Graduates	3.10	3.27	3.26	3.11	3.10	3.20
Race						
White Non-Hispanic	3.11	3.56	3.96	3.74	3.70	3.61
Black Non-Hispanic	3.87	4.63	4.98	4.23	4.12	4.02
Hispanic	4.80	5.58	4.92	4.32	4.26	4.18
Age						
65-69	3.34	3.96	3.72	3.45	3.69	3.53
70-74	3.10	3.83	3.75	3.70	3.72	3.49
75-79	3.15	3.17	4.34	3.74	3.63	3.74
80+	3.07	2.97	3.43	3.82	3.79	3.66

Source: The Urban Institute tabulations of DYNASIM3.

Figure 20
Inequality of Family Income Divided by Poverty
for Gender, Marital Status, Race, and Education Subgroups
Years 1992 to 2040



Source: The Urban Institute tabulations of DYNASIM3.

IV.6.1 Changes in Family Income and Poverty

The rise in family income divided by poverty over time affects subgroups differently. As real family incomes rise over time, the proportion of the aged population living below poverty declines, though poverty in certain subgroups remains high.

IV.6.2 Change in Family Income

The increase in female earnings increases the income of all families with women, and poverty-adjusted income of male-only families declines relative to other family types. For example, the average family income divided by poverty for married men was 3.97 in 1992 and 7.42 in 2040 (see table 14); this is an 87 percent increase. Poverty-adjusted income of never-married men, on the other hand, rises from 2.62 in 1992 to 4.23, a 61 percent increase (less than the rate of real wage growth).

Table 14
Average Family Income/Poverty, Percent of Individuals in Poverty, and Contributions to Poverty
All Individuals at or above the Normal Retirement Age
by Demographic Characteristic and Year

	Family Income/Poverty			Percent in Absolute Poverty			Percent in Wage-Adjusted Poverty		
	1992	2020	2040	1992	2020	2040	1992	2020	2040
ALL	3.14	4.65	5.45	12%	6%	3%	12%	13%	12%
Age									
65-69[1]	3.73	5.48	6.71	9%	3%	3%	9%	7%	8%
70-74	3.17	4.94	6.11	11%	5%	2%	11%	11%	8%
75-79	2.87	4.39	5.37	14%	6%	2%	14%	14%	12%
80-84	2.47	3.87	4.77	16%	8%	3%	16%	17%	15%
85+	2.40	2.91	4.13	20%	15%	5%	20%	28%	20%
Gender									
Male	3.66	5.35	6.13	9%	2%	2%	9%	6%	8%
Female	2.78	4.12	4.93	15%	9%	4%	15%	18%	16%
Marital Status by Gender									
Male Married	3.97	6.04	7.42	5%	1%	0%	5%	3%	2%
Male Widowed	2.73	4.35	4.67	17%	5%	2%	17%	12%	14%
Male Divorced	2.82	3.74	4.22	19%	5%	3%	19%	14%	18%
Male Never-Married	2.62	3.79	4.23	22%	6%	5%	22%	17%	18%
Female Married	3.70	5.57	6.65	5%	1%	0%	5%	3%	2%
Female Widowed	2.13	3.15	3.83	21%	11%	4%	21%	25%	22%
Female Divorced	1.73	3.17	4.25	37%	16%	6%	37%	32%	23%
Female Never-Married	2.21	3.27	4.23	22%	22%	11%	22%	32%	26%
Education									
High School Dropouts	2.24	2.97	4.05	20%	17%	9%	20%	30%	26%
High School Graduates	3.28	4.18	4.73	8%	5%	3%	8%	13%	15%
College Graduates	5.37	6.51	7.09	5%	1%	1%	5%	3%	3%
Race									
White non-Hispanic	3.30	4.88	5.74	9%	4%	2%	9%	10%	9%
Black non-Hispanic	1.95	3.42	4.09	32%	15%	9%	32%	26%	28%
Hispanic	2.33	3.67	4.94	33%	12%	5%	33%	22%	18%

Source: The Urban Institute tabulations of DYNASIM3.

[1] As the normal retirement age increases over time, younger individuals are excluded from the table.

Economic status improves faster for divorced women than for never-married women. Average poverty-adjusted income of divorced women rose from 1.73 times poverty in 1992 to 4.25 times poverty in 2040; this is almost a 150 percent increase. Poverty-adjusted income of never-married women increases only 91 percent (from 2.21 to 4.23) between 1992 and 2040. This difference reflects the dramatic compositional changes among women over time. Never-married women are increasingly likely to have had children, be less educated, and have interruptions in their work histories compared to never-married women in earlier years. Divorced women in later years, on the other hand, are more likely to have worked and have access to a pension than divorced women in earlier years.

DYNASIM3 also projects greater improvements in family income for high school dropouts than for college graduates, and for racial minorities than for whites, largely because of increased female earnings.

IV.6.3 Change in Poverty

DYNASIM3 projects that absolute poverty rates for individuals at or above normal retirement age will fall from 12 percent in 1992 to 6 percent in 2020, and to 3 percent in 2040. Although the rates will decline, never-married women, high school dropouts, and older retirees remain at risk of absolute poverty in the future.

When poverty thresholds are increased by wage growth rather than price growth, relative poverty rates remain at about 12 percent over the coming decades. Older retirees are still more likely than younger retirees to live in absolute or relative poverty, and single women are more likely than married women and men to be impoverished. Never-married women, high school dropouts, and retirees in the bottom lifetime earnings quintile have higher relative poverty rates in 2040 than in 1992. Although all long-term projections are tentative, these results show that Social Security is not using its substantial growth in benefits and revenue to improve the relative standing of more vulnerable groups over time.

While certain subgroups remain economically vulnerable, their contribution to overall poverty depends on their size relative to the overall population. High school dropouts have higher poverty rates than more-educated retirees. However, because high school dropouts make up a smaller share of the future population, they contribute 0.9 percent to absolute poverty in 2040, while high school graduates contribute 1.7 percent to absolute poverty in 2040 (not shown in table). Even though the poverty rates of female widows decline substantially over time, and the group declines as a share of the retired population, these women still contribute more to poverty than do all other marital groups in all years. Despite dramatic gains in female earnings and labor force participation, women will continue to be about twice as likely as men to be in both absolute and relative poverty.

V. Comparison to Alternate Projections

DYNASIM3 provides one possible outcome of future retirement income. Many of the results from DYNASIM3 concur with those found by Bosworth, Burtless, and Sahm (2001) using in the Social Security Administration's MINT model. Both models are designed to analyze the distribution of retirement income in the future. DYNASIM3 projects lower lifetime earnings inequality compared to MINT. Both models agree that women's lifetime earnings inequality will decline substantially over time. DYNASIM3 finds that men's lifetime earnings inequality remains fairly stable over time, while MINT finds that it rises slightly over time. The two models use different underlying data and a different projection methodology. These differences are described in more detail in Appendix B. While both models are speculative, neither shows dramatic increases in lifetime earnings inequality that one might presume from the three-decade rise in cross-sectional income inequality. This implies that the much of the increase in income inequality was due to greater cross-sectional variation rather than career-long changes. Both models agree that lifetime earnings are more equally distributed than cross-sectional earnings.

VI. Summary and Conclusions

These DYNASIM3 projections show that recent increases in earnings inequality will translate into modest increases in retirement income inequality throughout most of the income distribution. Increased retirement income in the very bottom of the distribution and decreased retirement income in the very top blur the inequality results when aggregate inequality measures are used. The extent of retirement inequality increases when we control for cost of living differences by family size. Social Security tends to equalize the distribution of retirement income. Increased female earnings and the impact these earnings have on male earnings affect overall family retirement income.

Men's lifetime earnings inequality remains fairly flat despite increased inequality among full-time workers in annual cross-sections, while women's lifetime earnings inequality declines dramatically. This difference is driven primarily by increased female labor force participation and earnings, which affects both economy-wide average earnings and family earnings. As more women work for higher wages, men's earnings decline. As more individuals get a college degree, the education premium among all workers declines. When individuals from later cohorts enter the job market with higher education levels, the age premium relative to lower-educated older workers declines. All of these effects have an inequality-reducing impact on family income.

Changes in the Social Security payment formula combined with changes in family earnings reduce the Social Security replacement rate over time, especially for women. Increased female earnings are largely uncompensated by the current Social Security system, as increases in women's worker benefits are largely offset by reductions in their spousal benefits. When family earnings do rise, the progressive payment formula returns less Social Security income to the family.

Despite reductions in Social Security replacement rates, average real Social Security income still increases over time, as earnings growth outpaces price growth. Aggregate measures, however, mask changes in Social Security benefits between cohorts. Non-Social Security income is greater than Social Security income, but non-Social Security income declines slightly as a percent of total income over time. Social Security is a larger share of total income for lower-income retirees and a smaller share for higher-income retirees. Many of the gains in Social Security income are offset by reductions in non-Social Security income. Adjusting family income by poverty reduces the extent of the gains in total income over time.

DYNASIM3 projects that between 1992 and 2000 Social Security income will become more unequally distributed, and between 2000 and 2040 it will become more equally distributed. Non-Social Security income is much more unequally distributed than Social Security income, but it is projected to become slightly more evenly distributed over time. The trend is more mixed for total income, with some measures showing increasing inequality and some showing decreasing inequality. A close inspection of the distribution, however, shows that between 1992 and 2010, except for the top and bottom 10th percentiles, family income (adjusted and unadjusted by poverty threshold equivalencies) is projected to become more unevenly distributed as both family income in the bottom half of the distribution falls relative to the median and family income in the top half of the distribution increases relative to the median. After 2010, family income is projected to become more evenly distributed in parts of the distribution and more unevenly distributed in other parts of the distribution, leaving the aggregate result on inequality trends somewhat ambiguous.

Regardless of the inequality measure, total retirement income is distributed more unequally for women, especially unmarried women, than for men. It is more unequally distributed for high school dropouts, blacks and Hispanics, and the 1925 to 1935 cohorts than for higher educated, whites, and later cohorts.

As real family incomes rise, aggregate poverty rates decline from 12 percent in 1992 to only 3 percent in 2040. Some subgroups, however, continue to have high poverty rates. Women are twice as likely to be in poverty as men, with divorced and never-married women having the highest poverty rates. Poverty rates of the oldest retirees decline considerably over time, but the rate continues to increase with increased age. Lack of education and access to spousal Social Security benefits remain the major causes of poverty in the future.

The data underlying these results are from DYNASIM3, a simulation model that takes account of lifetime earnings, marital histories, age of Social Security take-up, and differences in life expectancy among subgroups of the population. DYNASIM3 carefully combines detailed data on demographic characteristics, income, and earnings histories from longitudinal data with projections of future trajectories of earnings, pension and wealth accumulation, and life events (marriage, divorce, and death). It uses the 2001 assumptions of the Social Security trustees on future wage, price, mortality, fertility, and labor force participation. Of course, projections are sensitive to the aggregate assumptions and the specifics of the behavioral equations in the model. The results presented in this paper

provide one picture of future inequality. They also compare closely to results from the Social Security MINT model (Toder et al. 2002). Future research should examine the sensitivity of the results to the assumptions. In addition, as better understanding of asset and pension accumulation becomes available over time, new projections should examine their implications for retirement income inequality.

Appendix A: Simulating Assets

For the retired population, DYNASIM3 calculates major sources of income; these include Social Security, private defined benefit pensions, income from assets, and income from other relatives living in the household. In addition, we calculate imputed rental income. This is based on a 2.7 percent real rate of return on owner-occupied home equity.

Our measure of financial assets is the sum of family IRA, Keogh, and 401(k) balances; vehicle, other real estate, and farm and business equity (value minus debt); stock, mutual fund, and bond values; and checking, saving, money market, and certificate of deposit account balances, less unsecured debt. For simplicity, we call this sum "financial assets," but it really represents a more general definition of wealth.

We calculate income from financial assets by determining the annual fixed annuity amount the family could buy if it annuitized 80 percent of its financial assets. Financial assets are updated annually based on the MINT1 model of the decay of financial assets (Toder et al. 1999). The annuity calculation is simply a method of transforming these assets into income to measure well-being. This allows us to say that families with more financial assets are better off than families with fewer assets, and that families with longer life expectancy must make these assets last longer than families with shorter life expectancy.

The annuity value is a function of both life expectancy and a rate of return on assets. We use life expectancy projections based on the individual's age, gender, race, and educational attainment (Panis and Lillard, 1999). For married couples, we use the joint life expectancy and assume a 50 percent survivor annuity. We assume a real rate of return of 2.7 percent per year and CPI growth of 3.3 percent per year. While the annuity assumes a fixed annual per capita income over the individual's or couple's lifetime, we update income from assets annually for both changes in wealth amounts, based on our model of wealth spend down, and changes in life expectancy, given that person has attained an additional year of age. Because the annuity value takes into account life expectancy, given the same starting asset amount, individuals with longer life expectancy will have lower income from assets than individuals with shorter life expectancy.

We project co-residency based on probabilities estimated from the Survey of Income and Program Participation (SIPP) that account for number of children, income resources, and demographic characteristics. For retirees projected to co-reside with other family members, we impute other family member income by statistically matching similar families from the 1990 to 1993 SIPP panels. We impute both the other family income and the family poverty threshold for these co-residing individuals.

Table A1
Gini Coefficient and Coefficient of Variation Squared
for Real per Beneficiary Social Security Income
for Gender, Marital Status, Race, Education, and Age Subgroups

	Year					
	1992	2000	2010	2020	2030	2040
			Gini Coefficient			
All	0.21	0.22	0.21	0.20	0.19	0.19
Gender						
Men	0.20	0.20	0.19	0.18	0.17	0.18
Women	0.21	0.22	0.21	0.21	0.20	0.19
Marital Status and Gender						
Married Men	0.19	0.19	0.18	0.18	0.17	0.17
Single Men	0.23	0.22	0.20	0.18	0.19	0.19
Married Women	0.19	0.19	0.18	0.17	0.16	0.16
Divorced Women	0.26	0.25	0.25	0.24	0.23	0.21
Widowed Women	0.21	0.23	0.22	0.22	0.21	0.20
Never-Married Women	0.29	0.28	0.26	0.27	0.25	0.24
Education						
High School Dropouts	0.20	0.22	0.22	0.22	0.21	0.20
High School Graduates	0.20	0.20	0.19	0.19	0.18	0.17
College Graduates	0.21	0.19	0.17	0.16	0.15	0.15
Race						
White Non-Hispanic	0.20	0.20	0.20	0.19	0.18	0.17
Black Non-Hispanic	0.23	0.25	0.24	0.21	0.20	0.21
Hispanic	0.25	0.27	0.25	0.23	0.21	0.20
Age						
65-69	0.21	0.21	0.20	0.19	0.18	0.18
70-74	0.20	0.22	0.20	0.19	0.19	0.18
75-79	0.22	0.20	0.20	0.19	0.18	0.18
80+	0.21	0.23	0.21	0.21	0.20	0.19
			CV^2			
All	1.42	1.66	1.35	1.22	1.11	1.08
Gender						
Men	1.37	1.31	1.14	1.02	0.95	0.98
Women	1.46	1.90	1.41	1.33	1.22	1.15
Marital Status and Gender						
Married Men	1.22	1.19	1.07	0.96	0.86	0.88
Single Men	1.68	1.47	1.19	1.04	1.06	1.12
Married Women	1.17	1.08	1.00	0.92	0.83	0.81
Divorced Women	2.34	2.16	2.04	1.78	1.59	1.41
Widowed Women	1.42	2.35	1.50	1.44	1.33	1.19
Never-Married Women	2.61	2.47	2.22	2.21	1.93	1.77
Education						
High School Dropouts	1.38	2.19	1.51	1.56	1.40	1.33
High School Graduates	1.35	1.40	1.18	1.08	0.98	0.95
College Graduates	1.46	1.14	0.91	0.75	0.69	0.67
Race						
White Non-Hispanic	1.33	1.32	1.20	1.07	0.96	0.95
Black Non-Hispanic	1.75	2.88	1.77	1.39	1.30	1.38
Hispanic	2.22	2.83	1.92	1.69	1.39	1.26
Age						
65-69	1.39	1.32	1.22	1.07	0.99	1.05
70-74	1.25	1.46	1.21	1.14	1.09	0.97
75-79	1.56	1.34	1.27	1.17	1.02	0.96
80+	1.51	2.54	1.46	1.39	1.24	1.16

Source: The Urban Institute tabulations of DYNASIM3.

Table A2
Gini Coefficient and Coefficient of Variation Squared
for Real per Capita Non-Social Security Income
for Gender, Marital Status, Race, Education, and Age Subgroups

	Year					
	1992	2000	2010	2020	2030	2040
			Gini Coefficient			
All	0.56	0.53	0.53	0.52	0.53	0.54
Gender						
Men	0.54	0.50	0.49	0.49	0.50	0.51
Women	0.56	0.55	0.55	0.55	0.55	0.55
Marital Status and Gender						
Married Men	0.53	0.46	0.46	0.46	0.48	0.48
Single Men	0.59	0.57	0.54	0.53	0.55	0.55
Married Women	0.54	0.48	0.46	0.46	0.47	0.48
Divorced Women	0.64	0.66	0.65	0.62	0.61	0.60
Widowed Women	0.58	0.57	0.58	0.59	0.58	0.57
Never-Married Women	0.54	0.58	0.59	0.59	0.57	0.59
Education						
High School Dropouts	0.59	0.59	0.60	0.61	0.61	0.60
High School Graduates	0.51	0.49	0.50	0.52	0.53	0.55
College Graduates	0.47	0.43	0.44	0.45	0.46	0.47
Race						
White Non-Hispanic	0.54	0.51	0.51	0.51	0.51	0.51
Black Non-Hispanic	0.66	0.65	0.63	0.62	0.62	0.64
Hispanic	0.66	0.64	0.59	0.56	0.57	0.57
Age						
65-69	0.54	0.49	0.49	0.48	0.50	0.50
70-74	0.54	0.52	0.50	0.51	0.52	0.51
75-79	0.55	0.53	0.54	0.53	0.53	0.54
80+	0.58	0.54	0.55	0.57	0.56	0.56
			CV^2			
All	1.55	1.25	1.25	1.27	1.40	1.36
Gender						
Men	1.48	1.08	1.13	1.16	1.43	1.27
Women	1.55	1.36	1.32	1.34	1.33	1.43
Marital Status and Gender						
Married Men	1.38	0.87	0.94	0.92	1.00	0.99
Single Men	1.77	1.63	1.54	1.61	2.17	1.71
Married Women	1.46	0.96	0.85	0.94	1.00	1.14
Divorced Women	2.41	2.23	2.16	1.75	1.66	1.58
Widowed Women	1.56	1.59	1.55	1.66	1.52	1.52
Never-Married Women	1.29	1.42	1.44	1.40	1.39	1.78
Education						
High School Dropouts	1.76	1.74	1.65	1.83	1.73	1.67
High School Graduates	1.24	1.01	1.08	1.21	1.31	1.47
College Graduates	0.93	0.73	0.89	0.92	1.13	1.04
Race						
White Non-Hispanic	1.48	1.12	1.16	1.13	1.18	1.23
Black Non-Hispanic	2.15	2.34	1.75	1.99	1.95	2.53
Hispanic	1.99	1.94	1.39	1.33	1.36	1.59
Age						
65-69	1.36	1.04	1.11	0.99	1.09	1.20
70-74	1.47	1.12	1.04	1.11	1.13	1.24
75-79	1.44	1.29	1.39	1.36	1.30	1.35
80+	1.80	1.31	1.35	1.93	2.23	1.51

Source: The Urban Institute tabulations of DYNASIM3.

Table A3
Gini Coefficient and Coefficient of Variation Squared
for Real per Capita Total Income
for Gender, Marital Status, Race, Education, and Age Subgroups

	Year					
	1992	**2000**	**2010**	**2020**	**2030**	**2040**
			Gini Coefficient			
All	0.38	0.37	0.38	0.37	0.37	0.37
Gender						
Men	0.38	0.36	0.36	0.35	0.36	0.36
Women	0.37	0.38	0.39	0.38	0.38	0.38
Marital Status and Gender						
Married Men	0.37	0.34	0.34	0.33	0.34	0.34
Single Men	0.41	0.39	0.39	0.38	0.38	0.39
Married Women	0.36	0.34	0.33	0.33	0.33	0.33
Divorced Women	0.41	0.46	0.47	0.44	0.43	0.42
Widowed Women	0.37	0.37	0.39	0.40	0.39	0.37
Never-Married Women	0.40	0.43	0.46	0.45	0.42	0.44
Education						
High School Dropouts	0.35	0.37	0.39	0.40	0.42	0.40
High School Graduates	0.36	0.33	0.33	0.33	0.33	0.33
College Graduates	0.36	0.35	0.36	0.36	0.35	0.36
Race						
White Non-Hispanic	0.36	0.35	0.36	0.36	0.35	0.36
Black Non-Hispanic	0.42	0.44	0.44	0.43	0.41	0.43
Hispanic	0.47	0.47	0.43	0.40	0.39	0.39
Age						
65-69	0.39	0.38	0.37	0.35	0.36	0.37
70-74	0.37	0.37	0.36	0.36	0.36	0.36
75-79	0.36	0.35	0.39	0.37	0.36	0.37
80+	0.37	0.34	0.36	0.39	0.38	0.37
			CV^2			
All	0.65	0.57	0.61	0.60	0.63	0.61
Gender						
Men	0.68	0.54	0.57	0.57	0.67	0.60
Women	0.62	0.58	0.61	0.62	0.58	0.61
Marital Status and Gender						
Married Men	0.64	0.46	0.49	0.47	0.49	0.49
Single Men	0.78	0.71	0.72	0.73	0.94	0.76
Married Women	0.61	0.47	0.44	0.45	0.45	0.50
Divorced Women	0.83	0.95	1.03	0.82	0.75	0.70
Widowed Women	0.58	0.59	0.64	0.69	0.62	0.59
Never-Married Women	0.63	0.72	0.81	0.76	0.71	0.90
Education						
High School Dropouts	0.56	0.61	0.65	0.72	0.74	0.70
High School Graduates	0.52	0.44	0.49	0.53	0.54	0.61
College Graduates	0.53	0.42	0.49	0.48	0.55	0.49
Race						
White Non-Hispanic	0.62	0.51	0.56	0.53	0.54	0.56
Black Non-Hispanic	0.76	0.96	0.80	0.86	0.79	1.02
Hispanic	0.90	0.95	0.69	0.61	0.61	0.70
Age						
65-69	0.68	0.59	0.59	0.52	0.54	0.61
70-74	0.61	0.54	0.53	0.53	0.53	0.57
75-79	0.56	0.51	0.68	0.61	0.58	0.59
80+	0.64	0.46	0.53	0.82	0.89	0.62

Source: The Urban Institute tabulations of DYNASIM3.

Table A4
Gini Coefficient and Coefficient of Variation Squared
for Family Income Divided by Poverty
for Gender, Marital Status, Race, Education, and Age Subgroups

	Year					
	1992	2000	2010	2020	2030	2040
			Gini Coefficient			
All	0.41	0.41	0.42	0.40	0.40	0.40
Gender						
Men	0.39	0.38	0.38	0.37	0.38	0.39
Women	0.41	0.42	0.43	0.42	0.41	0.41
Marital Status and Gender						
Married Men	0.38	0.35	0.35	0.34	0.35	0.35
Single Men	0.42	0.40	0.40	0.39	0.39	0.40
Married Women	0.37	0.36	0.34	0.34	0.33	0.34
Divorced Women	0.42	0.47	0.48	0.46	0.44	0.43
Widowed Women	0.38	0.39	0.42	0.42	0.41	0.39
Never-Married Women	0.41	0.43	0.47	0.46	0.43	0.45
Education						
High School Dropouts	0.38	0.40	0.42	0.43	0.44	0.43
High School Graduates	0.37	0.38	0.39	0.38	0.39	0.40
College Graduates	0.39	0.37	0.37	0.36	0.36	0.37
Race						
White Non-Hispanic	0.39	0.40	0.40	0.39	0.39	0.39
Black Non-Hispanic	0.44	0.48	0.46	0.44	0.43	0.45
Hispanic	0.49	0.48	0.45	0.41	0.41	0.42
Age						
65-69	0.41	0.4	0.39	0.37	0.38	0.39
70-74	0.39	0.4	0.39	0.39	0.39	0.38
75-79	0.39	0.39	0.42	0.4	0.39	0.4
80+	0.4	0.36	0.4	0.42	0.41	0.4
			CV^2			
All	0.80	0.71	0.73	0.68	0.71	0.71
Gender						
Men	0.74	0.58	0.62	0.60	0.69	0.67
Women	0.80	0.77	0.76	0.72	0.69	0.72
Marital Status and Gender						
Married Men	0.69	0.49	0.52	0.49	0.52	0.51
Single Men	0.83	0.78	0.79	0.79	1.03	0.81
Married Women	0.66	0.51	0.47	0.48	0.48	0.53
Divorced Women	0.89	1.03	1.11	0.89	0.81	0.74
Widowed Women	0.62	0.68	0.76	0.81	0.72	0.67
Never-Married Women	0.66	0.75	0.86	0.79	0.73	0.94
Education						
High School Dropouts	0.68	0.69	0.71	0.76	0.76	0.76
High School Graduates	0.63	0.56	0.59	0.61	0.62	0.69
College Graduates	0.64	0.50	0.57	0.53	0.61	0.58
Race						
White Non-Hispanic	0.76	0.64	0.68	0.63	0.64	0.66
Black Non-Hispanic	0.81	1.25	0.90	0.93	0.92	1.14
Hispanic	1.02	0.97	0.72	0.63	0.64	0.80
Age						
65-69	0.78	0.63	0.65	0.57	0.58	0.67
70-74	0.74	0.64	0.60	0.59	0.61	0.66
75-79	0.67	0.65	0.75	0.72	0.71	0.69
80+	0.84	0.54	0.66	0.89	0.93	0.69

Source: The Urban Institute tabulations of DYNASIM3.

Appendix B: Comparison of DYNASIM3 and MINT

All long-term projections are speculative, and this paper describes one possible outcome of the economic circumstances of the future retired population. The results are based on a microsimulation model that uses a vast number of assumptions about economic and demographic trends and behavioral relationships, any one of which may be incorrect. While we believe that microsimulation models are the best tools available for projecting the distribution of demographic and economic characteristics of the future population, they are imprecise at best. One way to judge our predictions is to compare our results to alternate projections.

Given the complexity of this type of modeling effort, relatively few available models are capable of performing these types of projections. The Social Security Administration's MINT model provides one alternate projection of lifetime earnings inequality results for comparison.[17]

Bosworth, Burtless, and Sahm (2001), using MINT, find that lifetime earnings inequality will increase by about 10 percent (based on the Gini coefficient) for men born in the late 1960s compared to men born in the early 1930s (see figure 21). They find the opposite result for women, with inequality declining by 18 percent. DYNASIM3 finds that lifetime earnings inequality will decrease by about 3 percent for men and by 30 percent for women over the same period. These differences reflect both differences in the models and the underlying datasets.

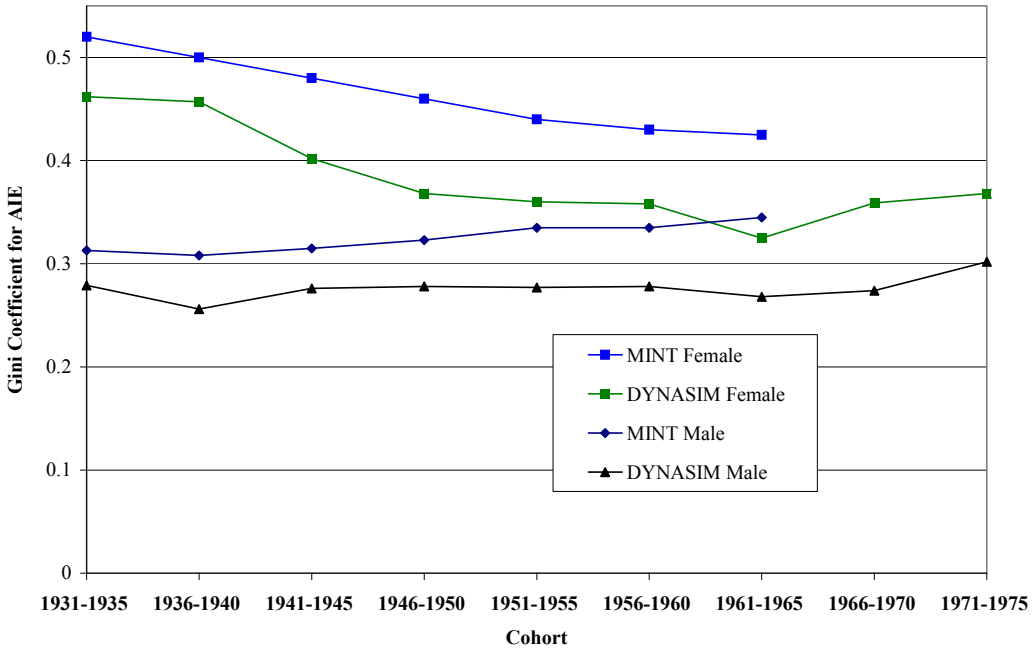
A closer inspection of the distribution of average lifetime earnings between MINT and DYNASIM3 show a number of similarities, but that DYNASIM3 has higher earnings all along the distribution especially at the bottom of the distribution (see figure 22). There are basic differences in these two models and their underlying data that may cause these differences, which I explore below.

MINT is a microsimulation model based on individuals born between 1926 and 1965 on the 1990 to 1993 Survey of Income and Program Participation data matched to the Social Security Administration's Summary Earnings Record (SER). The latter provides an exact match to SIPP respondents' actual Social Security covered earnings from 1951 to 1998. MINT then projects earnings after 1998 using a repeated statistical matching algorithm to splice part of the earnings record of an older worker to that of a younger worker based on observed SER earnings between 1989 and 1998. The variation in projected earnings is based on the earnings observed from similar aged individuals in earlier cohorts. These earnings are generated from the period with the highest historic cross-sectional inequality.

The statistical match takes into account gender, age, years of earnings in the 5-year matching period, average earnings quintile in the 5-year matching period, race and ethnicity,

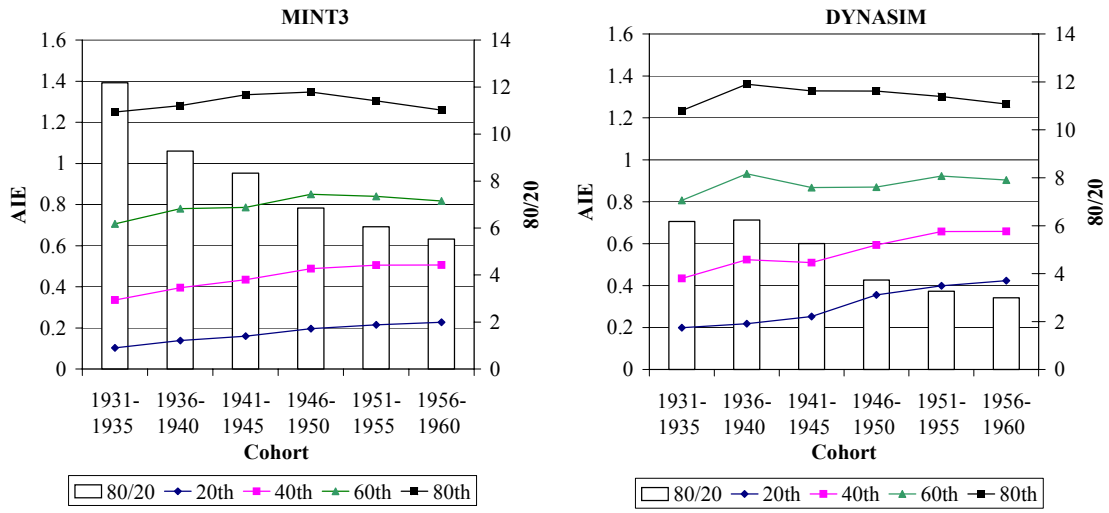
[17] Other models capable of generating this type of projection include the Cornell Microsimulation Model (CORSIM) and the Social Security Administration's Projected Cohorts Model (PCM). See Toder et al (2000) for more information on these models.

Figure 21
Gini Coefficient for AIE



Source: The Urban Institute tabulations of DYNASIM3 and MINT3.

Figure 22
Distribution of AIE: MINT3 versus DYNASIM



Source: The Urban Institute tabulations of DYNASIM3 and MINT3.

and education. MINT does not externally control for projected economic growth or labor force participation. Furthermore, the projected earnings do not account for marital status, spousal earnings, or spousal labor force participation.[18]

DYNASIM3 generates earnings using a series of sequential econometric relationships that account for both historic and current family and individual circumstances. Annual earnings are the combined result of projected labor force participation, wage rate, and annual hours worked. Each year, labor force participation rates and average earnings of workers are aligned to external rates projected by the Social Security Administration's Office of the Chief Actuary (OCACT).

Besides these differences in the basic earnings generating process, there are a number of other key differences between MINT and DYNASIM3. Some of these differences include the following:

- MINT includes only individuals born between 1926 and 1965. This prevents MINT from performing any internal calibration of earnings to external targets. DYNASIM3 includes individuals of all ages and the earnings and labor force participation rates are calibrated annually against Social Security Office of the Chief Actuary targets.

- DYNASIM3 projects educational attainment as a function of parental education. College attainment peaked for men age 25 to 35 in the late 1970s followed by a trough. DYNASIM3 projects that the children of the more highly-educated 1970s graduates will be more highly educated than the children of the 25- to 35-year olds in the early 1990s (figure 4). These younger, more-educated workers enter the labor force and compete for jobs with the older, lower-educated workers. This lowers the wages of older workers relative to the younger workers and reduces earnings inequality. MINT has no capacity to adjust the relative earnings of older and younger workers because the younger workers are absent from the model.

- The lifetime earnings within MINT are based on Social Security Summary Earnings Record (SER). These earnings are capped at the taxable maximum, and thus censored at the high end of the distribution. Furthermore, they include only covered earnings. Uncovered earnings appear as zeros in the earnings record. DYNASIM3 estimates the lifetime earnings distribution based on the observed distribution of total earnings on the Panel Study of Income Dynamics (PSID). The false reporting of zero earnings significantly reduces measured lifetime earnings for individuals working in uncovered employment. These false zeros significantly pull down the bottom of the lifetime earnings distribution. The lifetime earnings distribution between MINT and DYNASIM3 compare fairly closely above the bottom 20th percentile. MINT, however, has lower lifetime earnings in the bottom 20th percentile compared to

[18] MINT uses a second process to project earnings after age 50 that does account for spousal characteristics. See Toder et al (2002). The results reported in Bosworth, Burtless, and Sahm (2001) do not use these adjusted earnings.

DYNASIM3. This could reflect the mismeasurement of uncovered earnings in MINT.

- The higher lifetime earnings from DYNASIM3 compared to MINT may be due, in part, to attrition bias in the PSID. The PSID, which is the source of historic earnings for DYNASIM3, collects earnings data only for family heads and spouses. The historic earnings are generated from individuals who remain in the PSID sample from 1968 to 1993. It is reasonable to expect that only more stable individuals remain in the sample over this long time period. These stable individuals may also have higher lifetime earnings compared to the individuals who left the survey through attrition.

- MINT does not explicitly account for spousal characteristics in projecting future earnings. It does not control for changes in earnings based on changes in marital status (marriage, divorce, or widowhood)--DYNASIM3 does. DYNASIM3 projects labor supply responses to marital changes, childbirth, and increased educational attainment.

- MINT does not incorporate immigration after baseline (1993). DYNASIM3 does. Immigrants tend to have lower earnings compared to their native-born counterparts. MINT systematically misses these lower earning workers.

- Bosworth, Burtless, and Sahm restrict their analysis of inequality to the never Social Security disabled population (DI) surviving to age 62. I include disabled survivors in the DYNASIM3 analysis. The disabled population tends to have higher than average earnings, because in order to be entitled to DI, one must have earnings and these earnings must be recent. Excluding the DI population is likely to exclude mostly middle-income individuals rather than low-income individuals. This will affect the measured lifetime earnings inequality.

Both MINT and DYNASIM3 are powerful models for projecting future economic well-being, but underlying differences will lead to different results. MINT uses actual earnings from 1951 to 1998 and projects the future. Its sample frame, however, has some limitations that introduce some bias in the results. These biases will influence the inequality results. DYNASIM3 does not have the sample frame limitations, but both its historical and future earnings are projected.

Both models agree that women's lifetime earnings inequality will decline over time, while the trend for men is less certain. While both models are speculative, neither shows dramatic increases in lifetime earnings inequality that one might presume from the three-decade rise in cross-sectional income inequality. This implies that the much of the increase in income inequality was due to greater cross-sectional variation rather than career-long changes. The basic results are similar across the two models. Because of these similarities, we have more confidence in both models' predictions.

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