The Sensitivity of Proposed Social Security Benefit Formula Changes to Lifetime Earnings Definitions

by Hilary Waldron*

Several Social Security proposals have included benefit formula changes that apply to earners above a specified percentage of the combined male and female (unisex) lifetime earnings distribution. The unisex distribution is an average of two disparate groups with large lifetime differences in labor market participation. This study finds that if Social Security's median unisex average indexed monthly earnings (AIME) amount is used to define an earnings threshold below which benefits will be held roughly unreduced, the percentage of fully insured men subject to benefit reductions (70 percent) exceeds the unisex estimate of the population subject to benefit reductions (50 percent) by 20 percentage points. If policymakers wish to adjust future benefits and focus benefit reductions on middle or high primary or full-time wage earners in a household, the male, rather than unisex, AIME would come closer to achieving such a goal.

Introduction

Several Social Security proposals have included benefit formula changes that apply to earners above a specified percentage of the combined male and female (unisex) lifetime earnings distribution. Because this unisex distribution is an average of two disparate groups with large lifetime differences in labor market participation, the definition of a "high, middle, or low earner" derived from such an average can be difficult to interpret. For example, while women with historically low labor force participation and hours worked may have low lifetime earnings, they may not have low household income if they are married to a man with a lifetime of full-time employment at a high wage. When such women are averaged into a combined earnings distribution, the workers who are defined as *high, middle, and low earners* will differ from the workers who would have been so defined under a definition based on the earnings of the primary wage earner in a household. In other words, a man working full time at a low wage (as measured against other full-time workers) could be classified as a "middle lifetime earner" by virtue of the fact that his total number of years and hours worked is much larger than that of his female counterpart. His female counterpart, on the other hand, could be classified as a "low lifetime earner" even though her low lifetime earnings may be due to years of zero earnings in nonmarket work such as childcare (during which her spouse participated full time in the labor force), rather than actually being a low-wage earner at an equivalent full-time job to that of her male middle-lifetime-earner counterpart. In terms of lifetime income, the female "low earner" could be wealthier than the male "middle earner."

This study finds that if the median unisex average indexed monthly earnings (AIME) amount is used

Selected Abbreviations

AIME	average indexed monthly earnings
AWI	average wage index
CWHS	Continuous Work History Sample
DI	Disability Insurance
MBR	Master Beneficiary Record
MEF	Master Earnings File

* *Hilary Waldron is an economist with the Division of Economic Research, Office of Research, Evaluation, and Statistics, Office of Retirement and Disability Policy, Social Security Administration.*

Selected Abbreviations—*Continued*

OASDI	Old-Age, Survivors, and Disability Insurance
PIA	primary insurance amount
SSA	Social Security Administration

to define an earnings threshold below which benefits would be held roughly unreduced, approximately 70 percent of male workers newly eligible for retired-worker benefits in 2007 would have had their benefits reduced. The percentage of fully insured males subject to benefit reductions exceeded the unisex estimate of the population subject to benefit reductions (50 percent) by 20 percentage points. This result is driven by large differences in the number of lifetime hours worked and therefore lifetime earnings between men and women for birth cohorts that have recently reached age 61. In 2007, for example, while 46 percent of men would have had some earnings replaced at the current-law top primary insurance amount (PIA) factor of 15 percent, only 10 percent of women would have had any earnings replaced at the top bend point factor. A difference of 36 percentage points by sex at the top bend point implies that statistics reported at the unisex level have the potential to be misunderstood.

Some policymakers or analysts, for example, may have a goal of adjusting future benefit levels and may be interested in the effects of those adjustments at different levels of the earnings distribution. If benefit adjustments are based on observable unisex earnings-distribution levels, the distributional effects of those benefit adjustments will vary among workers with different lifetime histories of labor force attachment and hours worked. For example, if policymakers were to have a goal of focusing benefit adjustments, relative to those scheduled under current law, on middle- and high-earning Social Security–covered workers engaged in full-time work in the economy, a unisex median would overshoot that goal and expose full-time workers with more modest lifetime hourly wages to benefit changes as well. If policymakers were to design benefit adjustments based on observable data in Social Security's administrative files, the male AIME distribution, rather than the unisex AIME distribution, would come much closer to approximating such a hypothetical group of workers. Similarly, if policymakers were to identify workers by their position in the household income distribution and were using the AIME distribution as an approximation of that income distribution, the male AIME distribution would come much closer to approximating a household income distribution than the unisex AIME distribution. Both in the past and present, men are more likely to contribute the greater share of paid market hours worked and therefore are more likely to be the primary earner in the household. Regardless of the policy goal, large differences in labor market experience by sex imply that a sensitivity test of unisex distribution levels by sex has the potential to enhance the understanding of the public and policymakers.

Background

Several recommendations for achieving long-range solvency of the Social Security Trust Fund adjust the percent PIA factors of Social Security's PIA. The PIA is the amount from which all Social Security benefits payable on a worker's earnings record are based (SSA 2010a, Appendix D, D.2). As explained on the Social Security Administration (SSA) website,[1] to compute a PIA for a fully insured worker eligible for a retired-worker benefit, SSA takes the highest of up to 35 years of earnings of an individual,[2] indexes those earnings to general wage levels (as measured by the average wage index (AWI[3])), and divides by up to 35 years, resulting in an AIME amount. The PIA is calculated as the sum of three separate percentages of portions of the AIME.[4] The percentages of the PIA formula are fixed by law at 90 percent, 32 percent, and 15 percent (referred to here as PIA factors), while the dollar amounts (or bend points) in the formula are indexed to the AWI and adjust annually with changes in the AWI. For purposes of discussion, the AIME will also be referred to as a lifetime earnings measure in this article because it represents earnings averaged over a career.

Over the years, several Social Security solvency proposals have included provisions that adjust either the percent PIA factors or the bend points of the PIA formula. Those proposals have often been designed to reduce scheduled Social Security benefits while protecting low earners from reductions and/or apply benefit reductions exclusively to high earners. Typically, authors of those proposals have used the unisex earnings distribution to define a middle or high earner when explaining to the public the reasoning behind their choice of bend points. In other words, the definition of middle or high earners used in those provisions has been male and female insured workers with lifetime earnings replaced at or above either the 32 percent PIA factor or the 15 percent PIA factor,

or male and female earners with lifetime earnings above the median AIME, in the case of a proposal that introduces a new bend point.

For example, some members of the 1994–1996 Advisory Council on Social Security (1997) proposed that the 32 percent PIA factor and 15 percent PIA factor be gradually lowered to 22.4 percent and 10 percent, respectively. That option was described as slowing the growth of basic benefits, "mainly for middle- and high-wage workers." Similarly, the National Commission on Retirement Policy (1999) recommended that the 32 percent and 15 percent PIA factors be reduced by 2 percent a year from 2001 to 2020. In support of that reform, the commission writes, "this change reflects a belief, first, that the changes to the benefit level to accommodate the carve out of an individual account should be confined to the top two bend points in order to minimize the impact on low-income retirees."

Diamond and Orszag in their 2004 Social Security reform proposal described the highest tier of the PIA calculation as being "relevant only for relatively high earners" and recommended gradually reducing the top PIA factor from 15 percent to 10 percent. In a similar fashion, a proposal from the Debt Reduction Task Force (2010) reduced the top PIA factor from 15 percent to 10 percent over a 30-year period. According to the task force, "this proposal will affect only about the top 25% of beneficiaries…This moderate reform is a particularly progressive change to the benefit structure, and will hold harmless approximately the bottom 75 percent of beneficiaries." Also in 2010, authors of the report of the National Commission on Fiscal Responsibility and Reform recommended "gradually transitioning to a four-bracket formula by breaking the middle bracket [second bend point] in two at the median income level ($38,000 in 2010, $63,000 in 2050), and then gradually changing the replacement rates [PIA factors] from 90 percent, 32 percent, and 15 percent to 90 percent, 30 percent, 10 percent, and 5 percent." That change is described by the authors of the commission report as "gradually moving to a more progressive benefit formula that slows future benefit growth, particularly for higher earners."

Analytically, one difficulty with using a lifetime unisex distribution to define low, middle, and high earners involves a potentially large cohort effect, which, because of substantial changes in female labor force participation over time, would apply disproportionately to the lifetime earnings of women in the unisex distribution. For example, for the most recent solvency proposals, earnings data that SSA could have observed empirically ended in roughly 2010. Therefore, a worker eligible for retirement benefits at the early entitlement age (62) in 2010 would have been born roughly around 1948. Such a worker would have potentially entered the workforce at age 18 around 1966.

Labor force participation of females aged 16 or older was about 40 percent in 1966 and about 60 percent in 2008, compared with 80 percent and 73 percent for their male counterparts, respectively.[5] Even more important to the calculation of the unisex AIME distribution, labor force participation of workers during their prime earnings ages (25–54) was 45.2 percent in 1965 and 75.3 percent in 2005 for women and 96.7 percent and 90.5 percent for men, respectively. The gap between the male and female participation rates at those prime ages has been roughly constant since the mid-1990s.[6] Under current Social Security law, a worker needs 40 quarters of coverage (equivalent to 10 years of work) to be fully insured for retired-worker benefits. Because the AIME calculation averages the top 35 years of earnings, at one extreme, workers with just 10 years of earnings will have 25 years of zeroes averaged into their AIME. In contrast, workers with earnings credits for each year from ages 18 to 61 will have 8 years of low earnings dropped from their AIME. Lower labor force participation rates for women over their lifetime suggest more zeroes will be averaged into their AIME. Because the unisex AIME combines men and women, it follows that a unisex median number based on birth cohorts recently eligible for retired-worker benefits will include many years of zeroes, reflecting the many years of low labor force participation of women observed in the historical time series.

In addition to changes in the number of women participating in the labor force over time, there have been changes to differences in earnings levels between men and women over time. The female-to-male earnings ratio for full-time, year-round workers was about 0.58 in 1966 and 0.77 in 2008 (Denavas-Walt, Proctor, and Smith 2010, Table A-4). In other words, female birth cohorts currently reaching Social Security's early retirement age with a lifetime of full-time participation in the labor force will have had a larger part of their lifetime earnings depressed than cohorts who have not yet reached retirement because younger birth cohorts have had the benefit of greater equality of opportunity for women. Some of that difference

in equality of opportunity may be reflected in an increase in the number of college-educated women over the period. For example, at age 30 the percentage of women with a college education was 8 percentage points below that of men in 1968, about equal to men by around 1990 (this convergence included a decline for men from a Vietnam draft deferral-induced peak), and 8 percentage points above that of men in 2008 (Appendix, Chart A-1). Because a large part of a worker's wage reflects returns to experience, improvement in the full-time, female-to-male earnings ratio may also reflect stronger labor force attachment over a lifetime for women, independent of any improvements in gender discrimination in the workplace or trends in educational attainment.[7]

In addition to differences in earnings levels between male and female full-time workers, differences in the number of hours worked or in the number of full-time versus part-time workers by sex can also be an important contributor to differences in the level of AIMEs by sex. To understand why this would be true, it is necessary to understand how a worker earns Social Security coverage. In 2011, the amount of earnings needed to earn one quarter of coverage (sometimes referred to as a "Social Security credit") was $1,120. A maximum of four quarters could be earned a year at a minimum level of $4,480 in earnings in 2011. At the federal minimum wage rate of $7.25, approximately 154 hours of work or 19 days of full-time work would garner a worker an earnings credit. To earn the maximum of four earnings credits a year, a minimum-wage worker would need to work about 154 hours times 4 or 616 hours, or for a little less than 3 months at 40 hours per week. Halving the number of hours worked per week from 40 to 20 would mean that a 20-hour-a-week worker could reach four quarters of coverage in about 6 months. Clearly, many part-time workers will become fully insured for retired-worker benefits by the time they reach age 61 and thus will be included in a median unisex AIME estimate. If more women than men work part time, that would lower the female AIME and unisex AIME relative to the male AIME. If there are larger numbers of women working part time, as well as larger numbers of women with many zeroes in their earnings record who do not have low household income relative to their male counterparts, those two effects alone would also cause the unisex AIME to provide a poor mechanism for reducing benefits for middle- and high-income workers, *regardless of differences in earnings levels between women and men working full time.*

Trends in the average number of hours worked per week by sex indicate that the average hours worked for women aged 25–54 grew from about 16 hours in 1968 to about 25 hours in 1988, after which growth slowed and has hovered around 26 average hours per week since the mid-1990s (Chart 1). In contrast, the average hours worked for men aged 25–54 gradually declined from 40 hours per week in 1968 to 36 hours in the mid-1980s and has fluctuated around that level through the 1990s and 2000s.

Trends in the share of different types of male and female workers by year (Chart 2) also show large changes for women aged 25–54 in contrast to only small changes for men in the same age range from 1975 through 2006. The percentage of women working full time, all year rose about 20 percentage points from 1975 through 2006. However, since 1999 there has been no increase, and women are still 23 percentage points below men in the share of the population working year round, full time. The percentage of women working part time declined by about 2 percentage points from 1976 through 2007 and remains a sizeable 16 percent of the female population aged 25–54 compared with a smaller 4.5 percent of the male population.

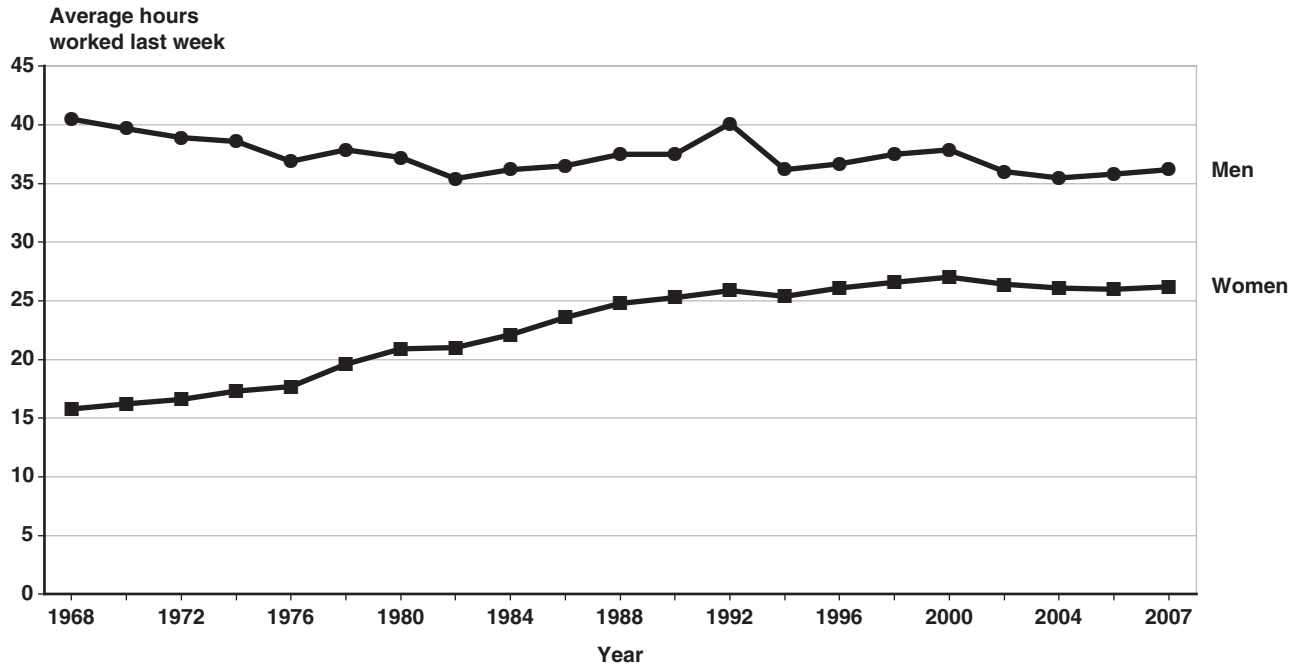
Given lifetime differences in number of hours worked between men and women, one can reasonably expect that the median unisex AIME for a birth cohort currently at the age of eligibility for Social Security retired-worker benefits is likely to inadequately represent either the median male AIME or the median female AIME, if one were to calculate them separately. In other words, we would expect the median female AIME to fall well below the male AIME, thus creating a unisex AIME that is not very close to either group's AIME. Thus, it is not clear how informative the unisex AIME is for policy evaluation. It may be difficult for both policymakers and the public to understand proposals in the context of an average lifetime measure that inadequately represents the labor market experience women or men have had historically or are likely to have in the future.

An additional analytical difficulty with using the unisex distribution to define low and high earners is the presence of couples in which the female worker has lower earnings from market work (often combined with higher hours of nonmarket work such as child rearing), and the male worker has higher earnings from market work. In this case, the couple as a unit is a "middle" or "high" earning household, but the woman is not herself a "high earner." Such

a woman would not be analytically equivalent to a single household low earner, even though her AIME would identify her as such. The presence of that type of household arrangement would lower the unisex AIME relative to the male AIME, independent of any cohort effects. Because under current law Social Security pays spouse and survivor benefits based in part on the PIA of the higher earner in either a current marriage of at least a year or a marriage that lasts at least 10 years in the case of divorce, benefit reductions for some women will occur more through the position their husbands hold in the male earnings distribution, rather than the position they hold in the unisex distribution. The extent to which those women are likely to be affected by benefit reductions that apply to their husband's PIA depends on the size of future female-to-male earnings ratios and gaps between the number of lifetime male and female hours worked, assuming women continue to live longer than men, on average (that is, thereby disproportionately qualifying women for the survivor's benefit).[8] There may be a mismatch between the current design of Social Security, which pays many spouse and survivor benefits based in part on the AIME of the highest earner, ostensibly recognizing the nonmarket contributions of the low-earner spouse and the use of the unisex distribution to define lifetime earnings, which ignores the nonmarket work performed disproportionately by women.

For example, when analyzing male earnings, labor economists tend to think of a male, part-time worker as a low-income worker who may not be able to participate in full-time work because of either weak labor demand for his skills or health issues. Such a worker would have a low AIME relative to other men and would appear at the low end of the male AIME distribution. Evidence from the American Time Use Survey indicates that such a story may not hold for many women working part time. As shown in Table 1, Krantz-Kent (2009) found that 93 percent of fathers with two children younger than age 18 living in their household were employed compared with 68 percent of mothers, a difference of 25 percentage points. Of employed fathers and mothers, only 3 percent of fathers were part-time workers compared with 22 percent of mothers. Finally, Krantz-Kent found a clear division of labor between fathers and mothers. While fathers spent 21.8 hours on nonmarket work and 43.8 hours on market work, mothers spent 39.5 hours on nonmarket work and 22.7 hours on market work. Those differences are far too stark to be explained by

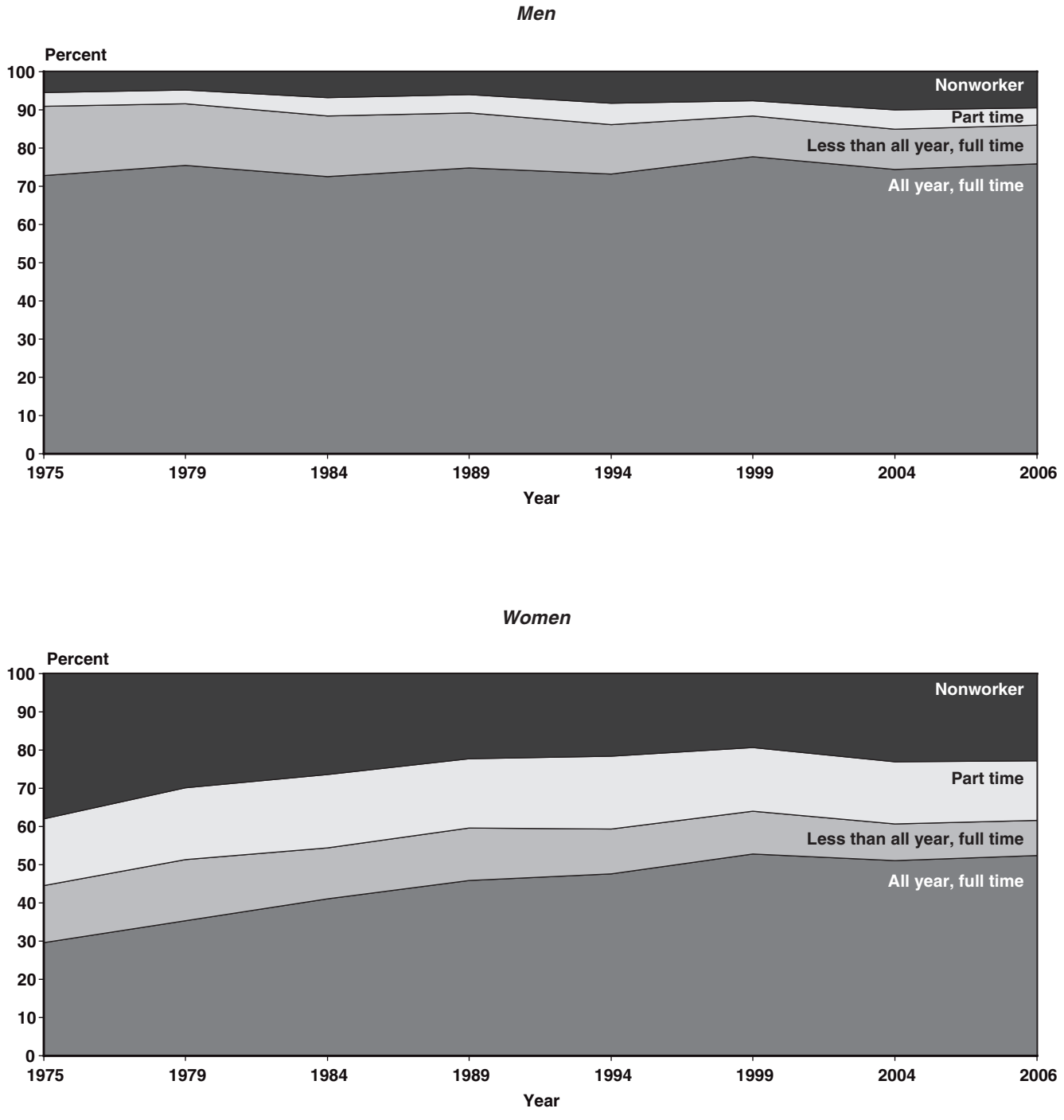
Chart 1.
Average number of hours worked "last week" for persons aged 25–54, by sex, selected years 1968–2007



SOURCES: Author's calculations based on selected years of the Census Bureau's March Supplement to the Current Population Survey (CPS), using Unicon Research Corporation's CPS utilities (2009), http://www.unicon.com.

NOTES: Average hours include zero hours of work. *Last week* refers to the week prior to the week in which the CPS respondent participated in the March Supplement to the CPS.

Chart 2.
Share of type of male and female workers aged 25–54, selected years 1975–2006



SOURCES: Author's calculations based on selected years of the Census Bureau's March Supplement to the Current Population Survey (CPS), using Unicon Research Corporation's CPS utilities (2009), http://www.unicon.com.

NOTES: The CPS "weeks worked last year recode" variable used here is derived from self-reports on the number of weeks worked "last year" and the number of hours usually worked last year. *Last year* refers to the year prior to the year in which the CPS respondent participated in the March Supplement to the CPS.

differences in health or labor demand between men and women. Rather, the authors (ibid., 56) attributed those differences in hours of market and nonmarket work between men and women to the prevalence of traditional gender roles in American households from 2003 through 2007. In other words, lower earnings for women than men do not directly translate into lower income for women than men if a large number of women are performing nonmarket work such as childcare and have access to the higher earnings of a current or former spouse. In fact, a female "low earner," as defined by the unisex distribution, may be of higher income than a male "middle earner," given the higher likelihood that the female earner is married to someone who works more hours than she does. Thus, the combining of two disparate groups into one earnings category will tend to underestimate the extent to which proposed benefit reductions affect low-earning primary wage earners and to overestimate the progressivity of those reductions with regard to the household income distribution.

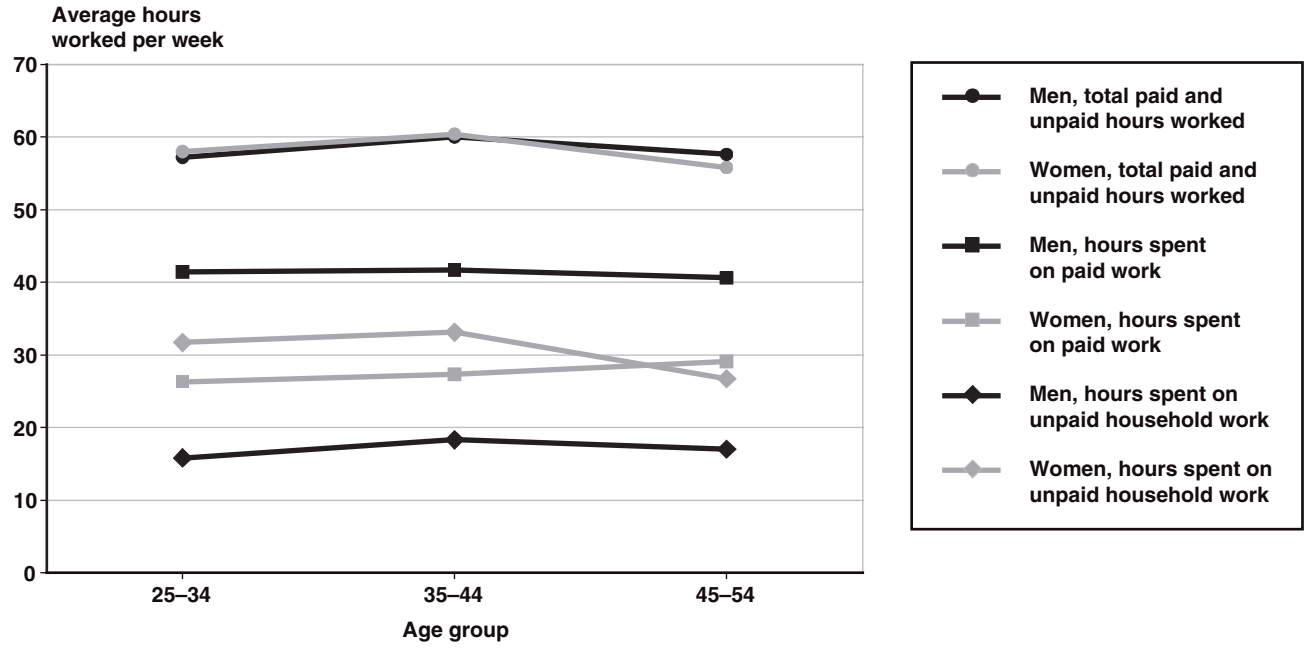
The persistence of traditional gender roles between husbands and wives may explain why increases in educational attainment for women have not translated into convergence in the number of hours spent on market work by sex. For example, the percentage of women completing at least 16 years of school (that is, a bachelor's degree) by age 30 has been trending upward and averaged about 5.5 percentage points higher than men during the 2002–2007 period (see the Appendix, Chart A-1). Over that same period, hours spent on paid work for women were 15 hours below those for men, at 26.3 hours per week (Chart 3). In contrast, hours spent on unpaid work for women were 15.9 hours above those for men, at 31.7. Overall, total hours of work for both men and women were roughly equal at around 60 hours for those aged 25–54; the difference was in the division between paid and unpaid work.

Table 1.
Employment characteristics of fathers and mothers with two children younger than age 18 living in the same household, 2003–2007

Characteristic	Fathers	Mothers
Percentage employed—		
Full time	90.0	46.0
Part time	3.0	22.0
Average number of weekly hours spent on—		
Unpaid household work	21.8	39.5
Paid work	43.8	22.7

SOURCE: Krantz-Kent (2009, Tables 1 and 3).

Chart 3.
Total paid and unpaid hours worked, by sex and age group, 2003–2007



SOURCE: Krantz-Kent (2009, Table 1).

Because only paid market work is observed and included in a unisex AIME calculation and the youngest birth cohorts measured in the American Time Use Survey from 2002 through 2007 were born in the 1970s, we may observe differences between male and female AIMEs for birth cohorts in generations born at least 20 years after the first baby boomers. Although trends in education appear to be moving toward more years of schooling for women than for men, which could theoretically reduce the prevalence of men as the primary earner in a household in the future, the division of household labor between men and women has not yet moved in that direction.[9]

In addition, tastes and preferences for number of hours worked do not appear to match upward trends in educational attainment for women over the past 10 years. For example, the percentage of working mothers with children younger than age 18 who said full-time work was the ideal situation for them declined from 32 percent in 1997 to 21 percent in 2007, while the percentage who preferred to work part time increased from 48 percent to 60 percent, respectively (Pew Research Center 2007). The percentage of women preferring not to work at all was fairly steady at about 20 percent. The percentage of nonworking mothers preferring full-time work also declined from 24 percent to 16 percent, and the percentage preferring not to work at all increased from 39 percent to 48 percent. Of mothers working part time, 80 percent preferred to work in that capacity, 15 percent preferred not to work at all, and only 5 percent preferred full-time work. Preferences for part-time work differed little by education or income level among women (ibid., 3). In addition, only 11 percent of working mothers and 10 percent of at-home mothers said a mother working full time is the ideal situation for children, and those views did not vary by education level (ibid., 5). Only 29 percent of mothers employed full time said that full-time work was the ideal situation for them, with 49 percent preferring part-time work and 21 percent preferring not to work at all (ibid., 3). If the tastes and preferences of women remain heavily in favor of part-time work and the real wage increases in the future, then an income effect could cause childbearing women to reduce hours of work in the future, even as their level of education increases. Tastes and preferences for full-time work between fathers and mothers differ by a wide margin. For example, 72 percent of fathers with children younger than age 18 preferred to work full time, 16 percent preferred not working at all, and only 12 percent preferred part-time work. This preference for full-time work among fathers exceeded that of mothers by 52 percentage points (ibid., 3).

One alternative to a unisex median AIME that would more closely match current Social Security law would be to calculate a median AIME that would be based on either (1) the highest AIME of a currently married couple or a divorced couple in which the marriage lasted 10 years or (2) on a worker's own AIME, in the case of a worker ineligible for benefits based on another worker's record. Unfortunately, such a measure cannot be calculated with Social Security administrative data for a risk pool consisting of fully insured workers newly eligible for retired-worker benefits at age 62. From the analyst's perspective, a severe drawback to Social Security administrative data is that earnings are reported annually to SSA's Master Earnings File on an individual basis with no marital information attached, but that Social Security benefits are payable based, in part, on marital status. From Social Security administrative data, one can only calculate the highest AIME of a couple for which there has been an auxiliary (or dependent) claim based on the earnings of the primary (or highest) earner. Such a sample would be skewed because an appropriate risk group should include all couples *eligible* to claim at a given age, not only all couples who have *already* claimed by a given age.

As discussed, historical data on number of hours worked by sex clearly shows men working more hours than women. Combining that fact with the inability to observe couples, rather than individuals, newly eligible for retired-worker benefits in Social Security's earnings records, we arrive at the conclusion that the closest approximation to the highest median AIME of the primary wage earner in a household in observable Social Security administrative data is much more likely to be the male, rather than the unisex, median AIME. In other words, if policymakers were to have a goal of adjusting future benefits by focusing PIA factor reductions on middle and high earners engaged in full-time work in the economy who have strong labor force attachment and perhaps private pensions and personal savings in addition to Social Security, using a unisex AIME distribution as a tool to achieve that end may result in a high likelihood of benefit formula proposals missing the goal for which they were theoretically designed. It follows that if one were to design a proposal to only affect the top half of the distribution of full-time primary wage earners in a household (of which the male earnings distribution is the best

available representation in Social Security administrative data), the reductions to the percent factors in the PIA formula and/or the new bend point(s) would have to be set at higher AIME levels than those used under a unisex definition.[10] Of course, mathematically, the estimate of the reduction in the actuarial deficit under such a prime wage-earner design would be less than the reductions scored when a unisex distribution is used to set new bend point levels and/or PIA factors because a smaller number of workers would reach the higher AIME levels.

For illustrative purposes, this analysis refers to a recently proposed benefit formula change analyzed by SSA's Office of the Chief Actuary.[11] In describing the proposal, the office writes, "This provision would introduce a new bend point at the 50th percentile level of AIME for newly eligible beneficiaries, starting in 2017. (The new bend point would be 61.5 percent of the way up from BP1 to BP2, or at a level equivalent to about $3,000 for workers newly eligible in 2010.)" Because the proposed new bend point is roughly set at the unisex median AIME observed for a recently eligible cohort of fully insured workers, the proposal lends itself well to a sensitivity test of alternative lifetime earnings measures.

The analysis performed in this article does not follow the phase-in provisions of the proposed new bend point provision and applies only to data currently observable in Social Security administrative data files. Conceptually, this analysis looks at what percentile of the male earnings distribution would have been affected by proposed changes to the PIA factors of the current-law bend point formula, if the reductions to those factors were effective immediately and applied to birth cohorts who attained age 62 in the 1999–2007 period and who survived to at least age 63. (The survival restriction ensures that all workers had an equal chance of claiming at age 62, the early entitlement age for Social Security retired-worker benefits.) This type of static analysis is intended to help inform policymakers and the public on the effects of a benefit formula change when it is fully phased in, while avoiding the uncertainty inherent in using projected earnings data. The use of the lifetime earnings of fully insured men is intended to provide an upper bound for the estimates. The estimate is an upper bound because the male estimate will exclude the earnings of women who are the prime earners in their households. Because earnings have been historically lower for women than for men for an equivalent number of hours worked, the exclusion of women with the highest AIME in their households (for example, single women) may cause the proxy for the prime earner distribution (that is, the male earnings distribution) to skew higher than it would if we could include those female, primary AIMEs in the average. The Social Security benefit formula is gender neutral; however, for the majority of couples that would appear in Social Security administrative data (unobserved) and who were fully insured at age 61 in 2010, the man is strongly expected to be the higher earner and the likeliest prime earner in the household.

Methodology

The data set used in this analysis merges several internal Social Security research files, all of which contain individuals selected based on SSA's Continuous Work History Sample (CWHS) selection criteria. The 1 percent CWHS sample "may be described as a stratified cluster probability sample of all possible SSN's [Social Security numbers]" (Smith 1989). To create the data set, a 2008 active[12] CWHS extract was merged with a 2010 Master Beneficiary Record (MBR) extract, 2009 Numident extract, and 2009 Master Earnings File (MEF) extract. When the files were matched, an individual had to appear on both the active CWHS extract and Numident extract and be born from 1937 through 1945 to be included in the data set (N = 272,234). For this study, the CWHS provides annual Social Security taxable earnings data and quarters of coverage information from 1951 through 2008. The MEF provides annual earnings reported to the Internal Revenue Service (IRS), including earnings in employment not covered by Social Security and earnings in Social Security–covered employment that exceeded the Social Security taxable maximum from 1982 through 2008.[13] The MBR is used to identify Social Security disabled-worker beneficiaries and as a source of demographic data. The MBR contains records of individuals who have filed Social Security Old-Age, Survivors, and Disability Insurance (OASDI) claims. The Numident is used as a source of demographic data and is the primary source of death data for individuals who do not have an MBR record.

In general, the legislative intent of policy options of the type examined in this article is to target the retired-worker risk pool. To create the final data set, Disability Insurance (DI) beneficiaries were deleted (N = 42,114) to match the specific option examined in this article, and, as described by SSA's Office of the Chief Actuary, which "create[s] a new bend point in the PIA formula at the AIME for the 50th percentile

of new retired worker awards."[14] Note that if a fully insured worker is receiving disabled-worker benefits when he or she reaches aged 62, that worker will not then receive a new retired-worker award (or be "newly eligible"[15]) because the retired-worker award would be lower than the disabled-worker award because of the early retirement reduction at age 62 for retired-worker awards. Administrative conversions of disabled-worker awards to retired-worker awards occur at the full retirement age—an age at which there is no benefit reduction for the beneficiary. Insured status at age 61 was calculated for the remaining individuals in birth cohorts 1937–1945, and only those fully insured for retired-worker benefits were included (N = 179,886).[16] Those individuals were newly eligible for retired-worker benefits at age 62 in the 1999–2007 period. Individuals had to live until at least age 63 to be included in the final data set, so that all workers had an equal opportunity to claim Social Security retired-worker benefits at the current-law early entitlement age of 62 (N = 164,777). That survival restriction does not match the Office of the Chief Actuary's methodology, but rather is employed so that the results from this article can be more easily compared with a companion article examining mortality differences by earnings decile. Sensitivity tests indicate that restricting survival to age 62 rather than age 63 results in only slight changes in the AIME distributions by decile (results available upon request).

To conduct the analysis, a new bend point is set at the median unisex AIME for workers first eligible for retired-worker benefits at age 62 during the 1999–2007 period (see the Appendix, Table A-1). That new bend point is about 52.7 percent of the way up from bend point 1 to bend point 2 in 1999 and about 57.2 percent of the way up from bend point 1 to bend point 2 in 2007. The median male AIME was about 94 percent of the way up from bend point 1 to bend point 2 during the 1999–2007 period, while the median female AIME grew from about 22.2 percent to 31.7 percent of the way up from bend point 1 to bend point 2 in the same period. To provide further information on the difference in earnings levels between men and women in the recent historical data, tabulations of AIMEs by percentile and sex are presented in the Appendix, Table A-2.

In addition to the main analysis in this article, which uses the AIME as a measure of lifetime earnings, this study also includes an alternative lifetime measure to provide policymakers and the public with an additional tool in which to evaluate the distributional impact of Social Security law changes. Classification of workers by AIME percentile, while informative given that the AIME is the number upon which retired-worker benefits are based, can be difficult to interpret analytically because earnings averaged into the AIME are censored at the Social Security taxable maximum. It seems entirely possible that the public is less than intimately familiar with all the intricacies of the retired-worker benefit formula. Thus, communication with the public may be difficult because the public may interpret "high earnings" to include all economy-wide earnings, not just Social Security taxable earnings. (For example, median earnings for both the 9th and 10th deciles (the top 20 percent of the male earnings distribution) for men born in 1945 at age 50 were over the Social Security taxable maximum.) Given the inherent ambiguity of the term *high earnings*, there is considerable advantage to providing readers with a detailed distributional estimate finely divided by earnings deciles so that policymakers and the public can reach their own conclusions as to the impact of a policy option on low, medium, and high earners.

Because the AIME is a lifetime measure, its interpretation is further complicated by large changes in the level of the Social Security taxable maximum over time. The Social Security taxable maximum was close to the average wage in the 1950s and 1960s and was not continuously indexed to the national average wage index until 1982 (see the Appendix, Chart A-2). The birth cohorts analyzed in this article (comprising persons aged 18 in the 1955–1963 period) experienced large growth in the taxable maximum relative to the national average wage index over their lifetimes. While a censor on earnings amounts will not affect a median, as long as the median is below the censor level, the censor will affect deciles above the median if the censor (that is, taxable maximum) is below the uncensored level of earnings for that decile. Accordingly, this article includes an alternative lifetime earnings measure that takes advantage of uncensored earnings data available in Social Security's MEF. While, under current law, Social Security's AIME is calculated based on Social Security taxable earnings, which are taxed only up to the OASDI taxable maximum ($106,800 in 2010), SSA's MEF contains earnings data on all earnings reported to the IRS, including earnings in OASDI-covered employment over the OASDI taxable maximum and earnings in employment not covered under OASDI from 1982 to the present.[17] Because earnings over the OASDI

taxable maximum are only observable beginning in 1982, a top 35-year measure more comparable to the AIME but including earnings above the taxable maximum cannot be calculated using Social Security administrative data for birth cohorts recently reaching age 61 without substantial imputation of earnings capped at the taxable maximum. Imputation techniques, by their nature, add more uncertainty to the data and are unlikely to achieve the precision needed to divide the earnings distribution into deciles, particularly at the upper end of the distribution and in years when the Social Security taxable maximum was low relative to the average wage. Results could also be sensitive to the choice of imputation technique to an unsatisfactory degree.

In order to create earnings deciles roughly based on all earnings in the economy, ages 45–55 are chosen as a proxy for lifetime earnings because those ages occur at the peak of the earnings distribution.[18] Peak earnings are a strong proxy for lifetime earnings because earnings at the peak will capture fulfilled earnings potential.[19] Earnings at ages 45–55 for each individual are measured relative to the national average wage index that corresponds to the year the earnings are recorded in the administrative earnings records. The earnings are then averaged over ages 45–55. To avoid unintended interactions between year of birth and earnings level, the percentile of the earnings distribution in which an individual falls is based on the distribution of average earnings for that individual's year of birth. Because average relative peak earnings are used to place workers into deciles, the peak measure would be most likely to differ from an uncensored top-35 measure (could one be calculated) in terms of assignment of workers to earnings deciles if an individual had high earnings at younger ages and low earnings in middle ages. Because an individual's wage reflects returns to experience, such a scenario is not representative of the typical age-earner profile, which tends to be hump shaped. Thus, in general, a peak lifetime earnings measure would be expected to be strongly correlated with a top-35 lifetime earnings measure, with workers who have high relative peak earnings also having high relative AIMEs. However, because of changes in Social Security coverage over time, certain groups, such as some state and local workers and federal employees hired before 1983, will have low AIMEs from Social Security–covered wages (that is, from jobs held when young) and high peak earnings from earnings not covered under Social Security (that is, from their primary non-Social Security–covered job). In addition, foreign-born workers who immigrate to the United States at older ages may have low AIMEs and high peak earnings because of a large number of zeroes in their earnings record at younger ages. To address these problems, this study shows results both with and without including these groups.

Results

As expected from known differences in female labor force participation and earnings levels, the percentage of workers newly eligible for retired-worker benefits in 2007 at current-law bend points varied by sex.[20] These differences can lead to substantial differences in the interpretation of earnings relative to the PIA bend points.

For example, consider a recent proposal to insert a new bend point at the "median income level."[21] In 2007, approximately half (46 percent) of male workers were already at the upper bracket (or at the 15 percent current-law replacement rate) and only about 6 percent of male workers were at the lowest bracket (or at the 90 percent current-law replacement rate); see Table 2.

Table 2.
Percentage of workers newly eligible for retired-worker benefits at age 62 with AIMEs at current-law bend points, by sex, 2007

Sex	N	AIME ≤ bend point 1 (90% PIA factor)	AIME > bend point 1 and AIME ≤ bend point 2 (32% PIA factor)	AIME > bend point 2 (15% PIA factor)
All	20,190	10.9	60.4	28.7
Men	10,365	5.7	48.2	46.1
Women	9,825	16.3	73.3	10.4

SOURCES: Author's calculations using Social Security administrative data files (1 percent 2008 active CWHS, 1 percent 2010 MBR, and 1 percent 2009 Numident).

NOTES: Sample consists of birth cohort 1945, newly eligible for retired-worker benefits in 2007. Sample excludes DI beneficiaries; survival to age 63 required.

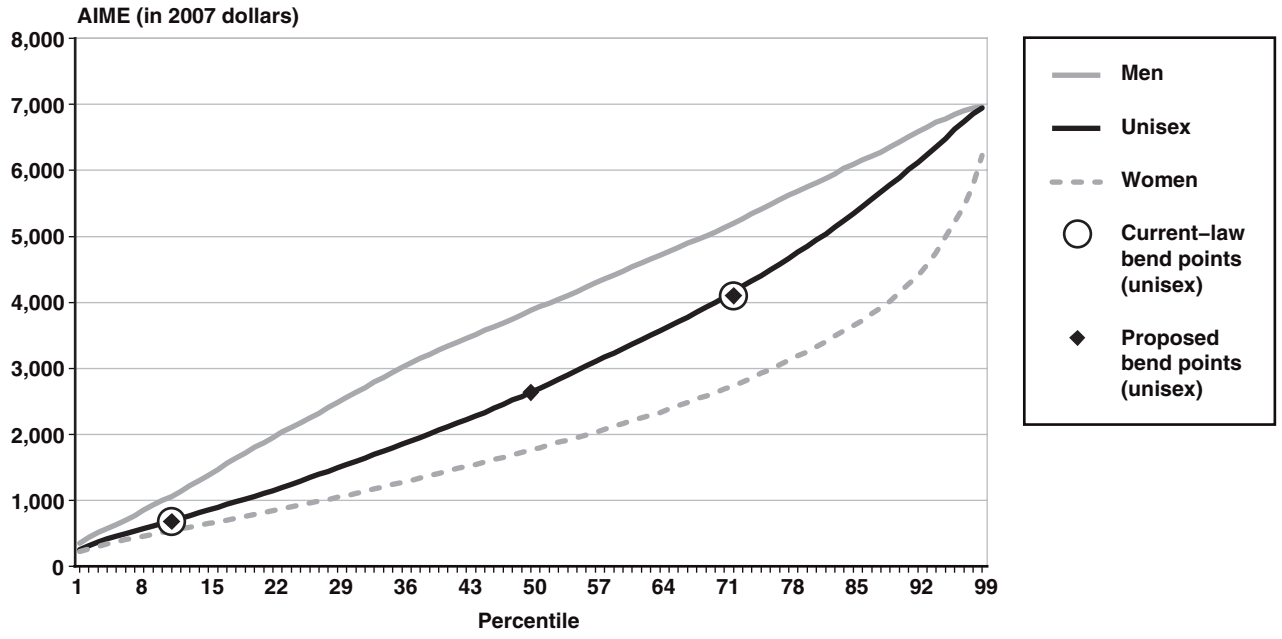
In other words, in 2007 the *upper* bend point under current law at the 54th percentile of the male earnings distribution was already close to the median for men (50 percent). For 50 percent of male earners to be unaffected by the proposed benefit formula change, a new bend point would have had to be introduced just below the current-law top bend point at about the 68th percentile of the unisex distribution (Chart 4).

As another example, consider a proposal that aims to leave the bottom 75 percent of earners unaffected by reducing the percent PIA factor at the current-law top bend point. Such a proposal appears to achieve its target under the unisex definition of lifetime earnings (where about 28 percent of all eligible workers were at the top bend point in 2007). On the other hand, for 75 percent of male earners in 2007 to be unaffected by the proposed change in the benefit formula, a new bend point would have had to be created *above* the current-law top bend point at about the 86th percentile of the unisex distribution (Chart 4).

In addition, while a proposal to create a new bend point at the unisex median AIME would have reduced the PIA factor for roughly the top half of unisex earners by 22 to 32 percentage points in 2007, about 69 percent of male workers would have faced those PIA factor reductions compared with only about 30 percent of female workers (Table 3). As discussed previously, some of the female workers facing cuts would not actually be paid on their own AIME, but rather on their husband's AIME. Therefore, the 16 percent of females at the first bend point could represent an overestimate of the number of female workers hypothetically protected from proposed PIA factor reductions in 2007, as could the 54 percent of female workers at the new 30 percent PIA factor bend point.

As expected, differences by sex in the number of years of Social Security–covered earnings accrued by age 61 were observed in 2007. Recall that the AIME formula averages the top 35 years of Social Security–covered earnings, but only 10 years of taxable earnings are required for fully insured status. In other words, women who have had zero years of earnings from nonmarket work such as childcare could easily have had enough earnings to qualify for retired-worker benefits, thus lowering the unisex average number of Social Security–covered work years, which would have put downward pressure on the unisex AIME relative to the male AIME. As shown in Table 4, men have had more work years than women at every percentile of the covered-work-year distribution measured; the gap was about 10 years at the median. At the median, women would have had five zeroes averaged into their AIME and, in contrast, men would have had 4 low-earnings years dropped from their AIME

Chart 4.
AIME distribution, by sex (2007), with current-law and proposed bend points



SOURCES: Author's calculations using Social Security administrative data files (1 percent 2008 active CWHS, 1 percent 2010 MBR, and 1 percent 2009 Numident).

computation. Because a worker's wage is partly based on labor market experience, diminished labor force participation would be expected to have a powerful effect on female wages relative to male wages over an individual's lifetime.[22]

Because Table 4 highlights an important link between years of Social Security–covered earnings and AIME levels, a tabulation of the median number of Social Security–covered work years at ages 14–61, by AIME decile[23] and sex, is presented in Table 5. As expected because of the link between labor market experience and wages, there is a strong positive correlation between years of Social Security–covered work and AIME levels for both men and women.[24]

While combining male and female earnings distributions has the advantage of greater brevity, these results suggest that the qualitative conclusions stemming from such an analysis may deviate from the actual effect on future beneficiaries of the change under consideration to a degree to which policymakers and the public may be currently unaware. To further enhance that understanding, I next examine the implications of the creation of a new bend point at the median unisex AIME using a definition of

Table 3.
Percentage of workers newly eligible for retired-worker benefits at age 62 with AIMEs at current-law and proposed new bend points, by sex, 2007

Sex	N	AIME ≤ current-law bend point 1 (90% PIA factor)	AIME > bend point 1 and AIME ≤ bend point 2A (proposed) (32% current-law factor reduced to 30% PIA factor)	AIME > bend point 2A (proposed) and AIME ≤ current-law bend point 2 (32% current-law factor reduced to 10% PIA factor)	AIME > current-law bend point 2 (15% current-law factor reduced to 5% PIA factor)	PIA factor reductions of 22–32 percentage points
All	20,190	10.9	39.2	21.3	28.7	50.0
Men	10,365	5.7	25.3	23.0	46.1	69.1
Women	9,825	16.3	53.8	19.5	10.4	29.9

SOURCES: Author's calculations using Social Security administrative data files (1 percent 2008 active CWHS, 1 percent 2010 MBR, and 1 percent 2009 Numident).

NOTES: Sample consists of birth cohort 1945, newly eligible for retired-worker benefits in 2007. Sample excludes DI beneficiaries; survival to age 63 required. Proposed new bend point is described in SSA (2010b), http://www.socialsecurity.gov/oact/solvency/index.html. PIA factors are those proposed for the benefit formula under fully phased-in conditions.

Table 4.
Distribution of the number of Social Security–covered work years for persons aged 14–61, by sex

Distribution	Unisex	Men	Women
10th	15.8	18.5	14.5
25th	24.8	31.0	21.3
Median	34.5	39.3	29.8
75th	40.8	42.5	36.5

SOURCES: Author's calculations using Social Security administrative data files (1 percent 2008 active CWHS, 1 percent 2010 MBR, and 1 percent 2009 Numident).

NOTES: Sample consists of birth cohort 1945, newly eligible for retired-worker benefits in 2007. Sample excludes DI beneficiaries; survival to age 63 required. An upward trend was observed in the number of work years at every percentile for women over birth years 1937–1945. Men experienced a slight downward trend in the number of work years over birth years 1937–1945 at the 10th and 25th percentiles, but not at higher percentiles.

Table 5.
Median number of Social Security–covered work years for persons aged 14–61, by AIME decile and sex

AIME decile	Unisex	Men	Women
1	14.0	15.3	13.3
2	20.0	25.0	18.3
3	26.3	34.0	22.5
4	30.8	39.0	26.5
5	34.3	40.8	29.5
6	37.5	41.3	32.0
7	39.5	41.5	34.0
8	40.3	41.3	36.3
9	41.0	41.8	37.0
10	41.6	41.8	38.9

SOURCES: Author's calculations using Social Security administrative data files (1 percent 2008 active CWHS, 1 percent 2010 MBR, and 1 percent 2009 Numident).

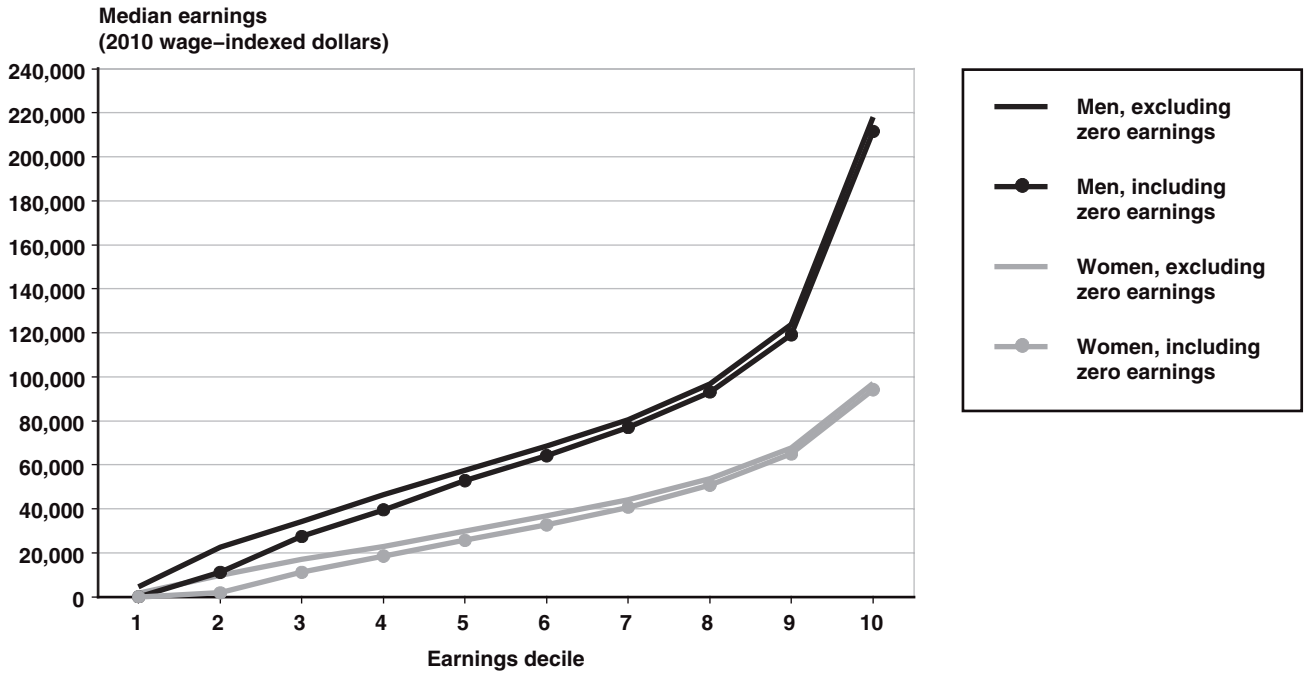
NOTES: Sample consists of birth cohort 1945, newly eligible for retired-worker benefits in 2007. Sample excludes DI beneficiaries; survival to age 63 required. Decile 1 = the 0–10th percentile of the sex-specific earnings distribution, decile 2 = the 11th–20th, and so forth; decile 10 = the 91st–100th percentile.

lifetime earnings perhaps more intuitive than Social Security's AIME. As discussed in the Methodology section, that alternative definition uses average earnings at ages 45–55 as a proxy for lifetime earnings—determined by an individual's relative position in the earnings distribution when in their peak earnings years. To provide an understanding of the differences in earnings amounts at the peak earnings age of 50, median earnings in 2010 wage-indexed dollars are presented for both men and women in Chart 5. To test the sensitivity of the earnings measure, the average was calculated both with and without zero earnings. Chart 5 shows that for the 1945 birth cohort, the median earnings for the male 5th decile were a little above median earnings for the female 8th decile. Median earnings for the female 5th decile were somewhat below the male 3rd decile median amount.

At the top of the gender-specific earnings distributions, median earnings of the female top decile were equivalent to median earnings of about the male 8th decile, and median male earnings in the top decile were above the 2010 current-law Social Security taxable maximum of $106,800 at $211,521.[25] Because women had lower earnings than men, 90 percent of the total earnings of the unisex distribution at age 50 in 1995 (wage indexed to 2010) would have been equivalent to roughly 83 percent of the male earnings distribution and 97.5 percent of the female earnings distribution.

Next, to proxy for prime wage earners, I examine how proposed changes to the PIA formula would have affected men who attained age 62 in 2007 and who were newly eligible for Social Security retired-worker benefits, by lifetime earnings decile. In Chart 6, the two gray sections of each bar in the chart add up to current-law bend point 2 and reflect the splitting in two of the 2nd bracket of the benefit formula at the new bend point 2A, created at the unisex median AIME.[26] At the 5th decile, only about 10 percent of men would have been excluded from large PIA factor reductions, and about 90 percent would have faced a factor reduction of at least 22 percentage points. In fact, at the 3rd decile, about 40 percent of men would have faced large reductions, and by the 4th decile the vast majority of men would have experienced large reductions. The 1st decile of men is the only decile for which more than 90 percent would have been held relatively harmless under the fully phased in proposal that is simulated

Chart 5.
Median earnings at age 50 for the 1945 birth cohort, by lifetime earnings decile and sex



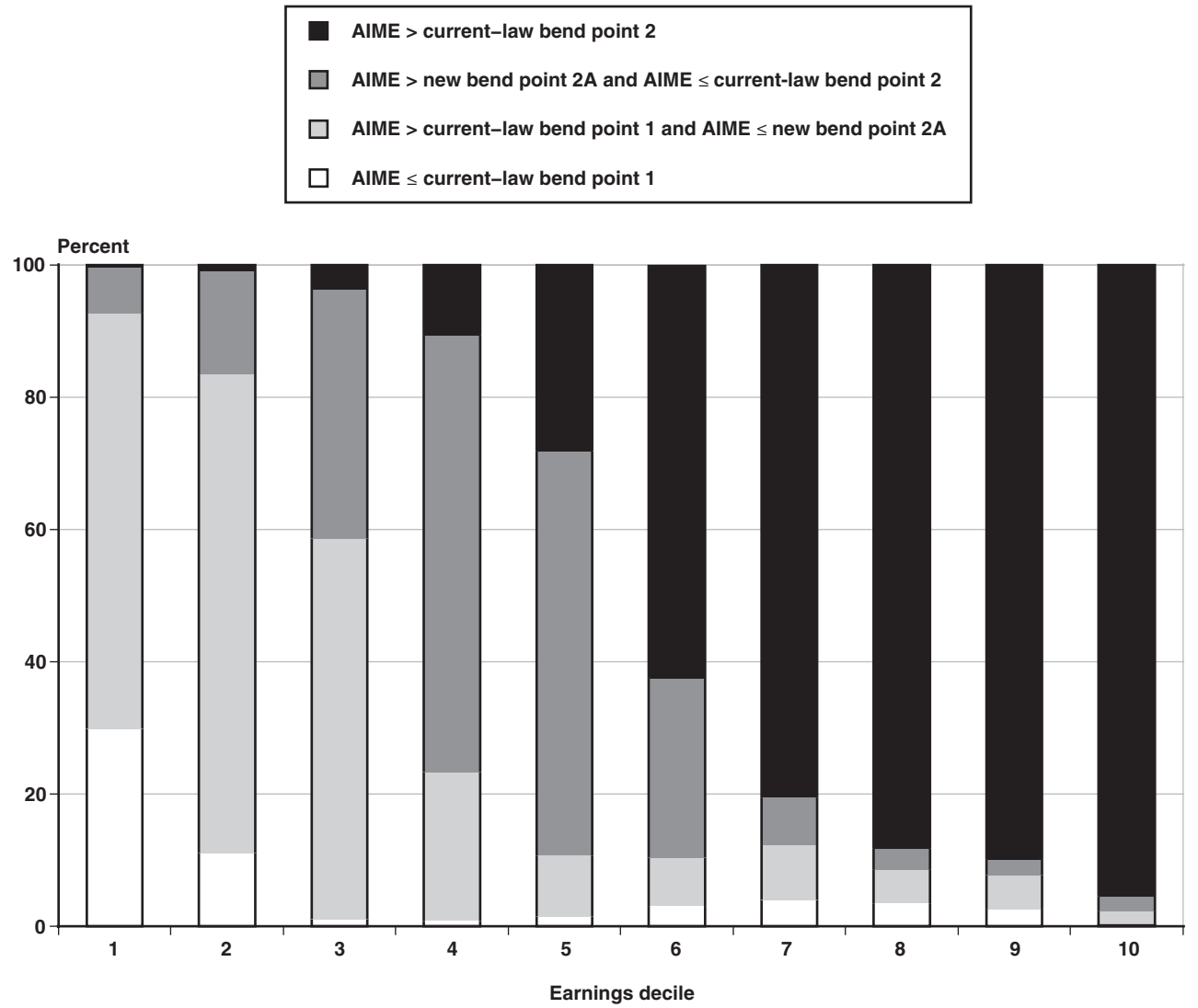
SOURCES: Author's calculations using Social Security administrative data files (1 percent 2008 active CWHS, 1 percent 2010 MBR, and 1 percent 2009 Numident).

NOTES: Sample consists of birth cohort 1945, newly eligible for retired-worker benefits in 2007. Sample excludes DI beneficiaries; survival to age 63 required.

here, with PIA factor reductions of about 2 percent for the vast majority of that decile.[27]

There are several cases in which prime-earning men may have low AIMEs, but may still be considered high earners. Recall that the lifetime earnings measure used in Chart 6 does not distinguish between earnings at ages 45–55 in Social Security–covered employment and earnings in noncovered employment. Therefore, workers with high uncovered earnings and low Social Security–covered earnings (perhaps from jobs held at younger ages), could have low AIMEs, but appear in higher earnings deciles under the alternative lifetime earnings measure used here. Some of those workers will not actually receive a 90 percent PIA factor on their Social Security taxable earnings, but will instead be subject to the Windfall Elimination Provision and Government Pension Offset provision of current law. In addition, foreign-born workers who enter the country at older ages could have high earnings in Social Security–covered employment, but have a large number of zeroes averaged into their AIME amount and hence a low AIME. Accordingly, a more analytically clean sample is displayed in Chart 7, in which the foreign born and workers who had mostly non-Social Security taxable earnings for at least 5 years from ages 45 through 55 are eliminated from the sample.

Chart 6.
Percentage of men at the current-law and proposed PIA bend points, by male earnings deciles



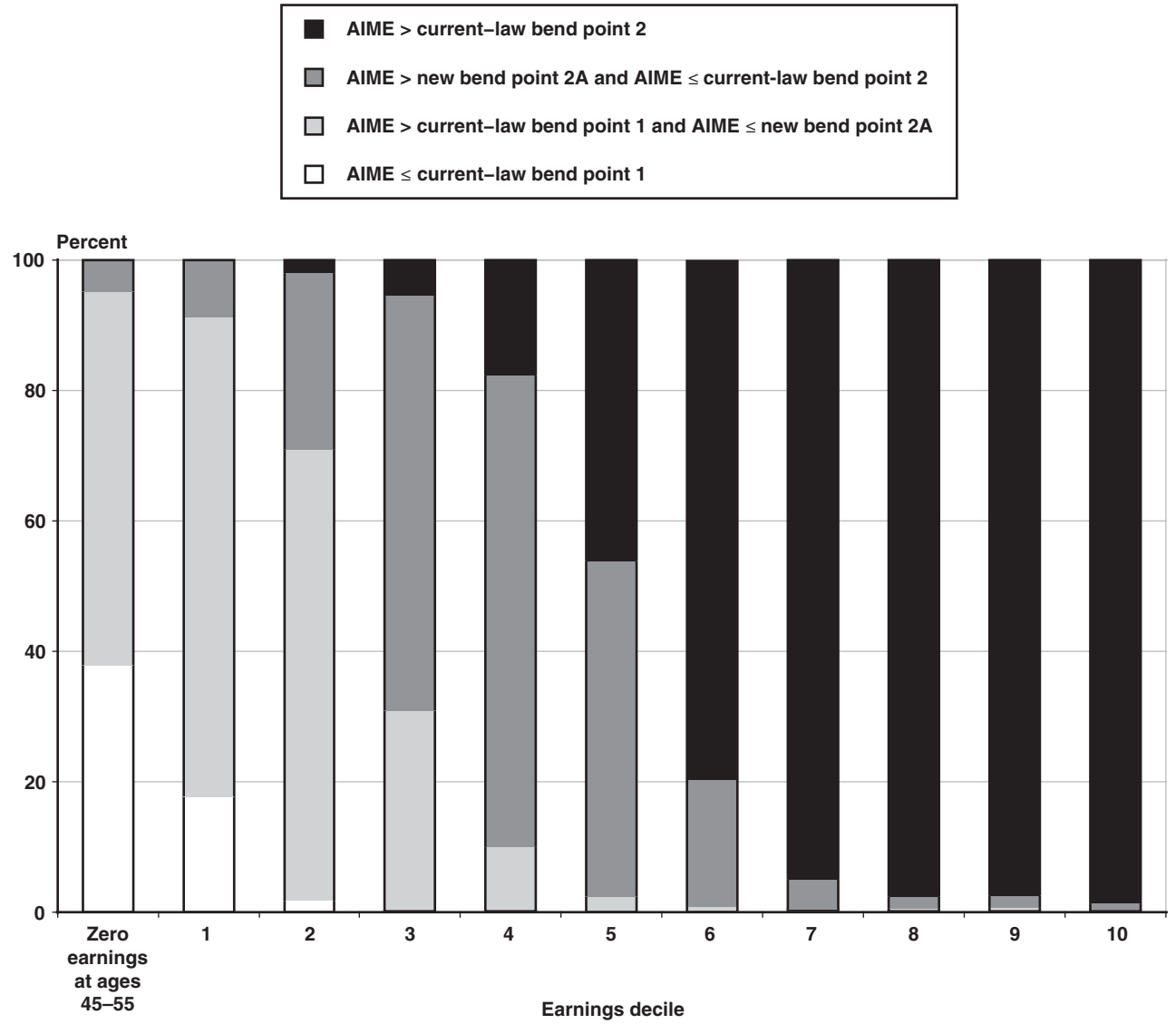
SOURCES: Author's calculations using Social Security administrative data files (1 percent 2008 active CWHS, 1 percent 2010 MBR, and 1 percent 2009 Numident).

NOTES: Sample consists of birth cohort 1945, newly eligible for retired-worker benefits in 2007. Sample excludes DI beneficiaries; survival to age 63 required. Male earnings deciles show relative average earnings from ages 45 through 55, with zeroes included in the average.

The sample is further restricted through the use of a lifetime earnings average that excludes zeroes that occur from ages 45 through 55, out of concern that some of the zeroes could represent early retirement.

The more restrictive sample used in Chart 7 eliminates the presence of men at low bend points at higher earnings deciles observed in Chart 6. It is also observed that when men with zero earnings from ages 45 through 55 (about 2.7 percent of the total sample) are removed, the proposed PIA factor reductions are more severe for those who remain—men with some earnings at ages 45–55. Almost all men in deciles 4–10 would be affected by PIA factor reductions of at least 22 percentage points in the more restrictive sample. In addition, at the 3rd decile, roughly 70 percent of men would now face large reductions, rather than the 40 percent observed under the less restrictive sample. Moreover, about 30 percent of the 2nd decile would face large reductions. Thus, the empirical data observed here suggests

Chart 7.
Percentage of men at current-law and proposed PIA bend points, by male earnings deciles: Restricted analytical sample



SOURCES: Author's calculations using Social Security administrative data files (1 percent 2008 active CWHS, 1 percent 2010 MBR, and 1 percent 2009 Numident).

NOTES: Sample consists of birth cohort 1945, newly eligible for retired-worker benefits in 2007. Sample excludes DI beneficiaries, the foreign born, and workers with mostly non–Social Security taxable earnings; survival to age 63 required. Male earnings deciles show relative average earnings from ages 45 through 55, with zeroes included in the average.

that reductions in the OASDI actuarial shortfall that are the result of benefit formula changes above either the median unisex AIME or at the middle or highest current-law PIA factors may be achieved through the application of the reductions toward a larger percentage of the prime full-time working population than may be apparent when one parses the data by the unisex distribution.

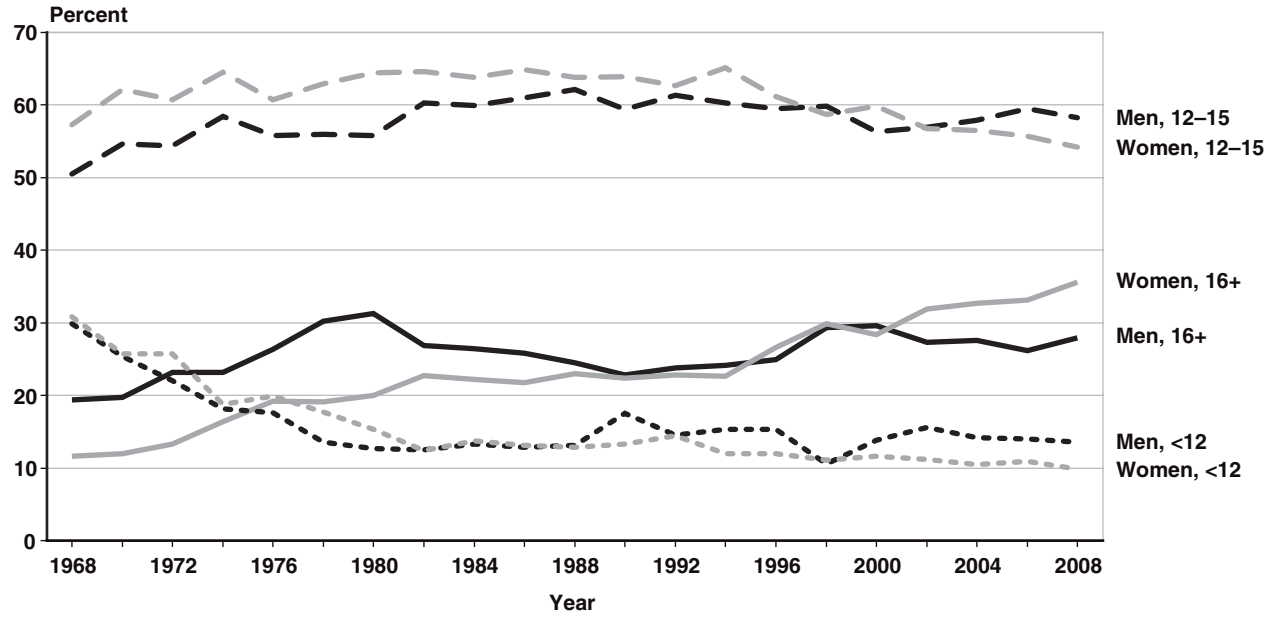
Conclusion

In policy debates, the terms "low earner" and "low income" are often used interchangeably. However, the continued presence of traditional gender roles in the division of labor between market and nonmarket hours of work suggests that for both birth cohorts currently reaching retirement and those currently of childbearing age, a sizeable number of women may have low earnings without actually being of low-income. While the number of women participating full time, all year in the labor force has increased greatly since the 1960s, men still outnumber women by about 23 percentage points at the prime earnings ages, and the trend has been flat for the past 10 years.

If policymakers wish to adjust future benefits by reducing them and focus those benefit reductions on middle or high primary wage earners in a household using lifetime earnings estimates available in Social Security administrative data, the male average indexed monthly earnings (AIME) amount, rather than the unisex AIME, would come closer to achieving such a goal. The male AIME distribution would be an upper bound because of the inability of researchers to separate primary female wage earners from secondary female wage earners in Social Security earnings data. Because Social Security earnings records lack information on both marital status and number of hours worked, the best available proxy for a prime wage earner is a male worker. That may cause the male AIME to be somewhat higher than it would be if female prime earners had been included because women earn less than men for an equivalent number of hours of work. In any case, sensitivity tests of unisex distributional levels by sex have the potential to enhance the understanding of policymakers and the public regarding the distributional effects of proposed Social Security benefit formula changes.

Appendix

Chart A-1.
Percentage of population at age 30 with various years of school completed, by sex, selected years 1968–2008



SOURCES: Author's calculations based on selected years of the Census Bureau's March Supplement to the Current Population Survey (CPS), using Unicon Research Corporation's CPS utilities (2009), http://www.unicon.com.

Table A-1.
Median AIME for workers newly eligible for retired-worker benefits at age 62, by sex, 1999–2007

Year	Current-law bend point 1	Current-law bend point 2	New bend point = median unisex AIME	Median male AIME	Median female AIME	Percent of the way up from current-law bend point 1 to current-law bend point 2		
						Median unisex AIME [a]	Median male AIME	Median female AIME
1999	505	3,043	1,844	2,840	1,069	52.7	92.0	22.2
2000	531	3,202	1,951	3,018	1,193	53.2	93.1	24.8
2001	561	3,381	2,073	3,191	1,244	53.6	93.2	24.2
2002	592	3,567	2,202	3,349	1,341	54.1	92.7	25.2
2003	606	3,653	2,282	3,490	1,412	55.0	94.7	26.5
2004	612	3,689	2,378	3,587	1,486	57.4	96.7	28.4
2005	627	3,779	2,475	3,653	1,561	58.6	96.0	29.6
2006	656	3,955	2,533	3,750	1,663	56.9	93.8	30.5
2007	680	4,100	2,635	3,878	1,763	57.2	93.5	31.7

SOURCES: Author's calculations using Social Security administrative data files (1 percent 2008 active CWHS, 1 percent 2010 MBR, and 1 percent 2009 Numident). Current-law bend points are available at http://www.socialsecurity.gov/OACT/COLA/bendpoints.html.

NOTE: Sample excludes DI beneficiaries; survival to age 63 required.

a. To calculate: (median unisex AIME − current-law bend point 1) / (current-law bend point 2 − current-law bend point 1).

Table A-2.
AIME for workers newly eligible for retired-worker benefits at age 62, by sex-specific AIME percentile, 1999–2007

Year	10	20	30	40	50	60	70	80	90
					Unisex				
1999	468	739	1,054	1,419	1,844	2,299	2,807	3,358	3,962
2000	493	793	1,138	1,522	1,951	2,441	2,997	3,582	4,271
2001	518	839	1,200	1,615	2,073	2,594	3,196	3,835	4,502
2002	543	881	1,258	1,708	2,202	2,754	3,354	4,049	4,854
2003	560	907	1,302	1,767	2,282	2,855	3,514	4,192	5,017
2004	592	958	1,380	1,862	2,378	2,949	3,596	4,332	5,198
2005	609	1,001	1,437	1,925	2,475	3,072	3,723	4,470	5,378
2006	631	1,030	1,492	1,999	2,533	3,123	3,834	4,654	5,628
2007	652	1,063	1,542	2,063	2,635	3,298	4,000	4,851	5,890
					Men				
1999	866	1,497	2,036	2,458	2,840	3,200	3,530	3,886	4,284
2000	885	1,543	2,099	2,579	3,018	3,411	3,792	4,189	4,597
2001	924	1,625	2,230	2,745	3,191	3,597	4,006	4,426	4,880
2002	956	1,669	2,328	2,874	3,349	3,816	4,270	4,769	5,257
2003	965	1,728	2,408	2,962	3,490	3,960	4,413	4,922	5,461
2004	995	1,823	2,478	3,059	3,587	4,077	4,566	5,101	5,634
2005	1,014	1,826	2,542	3,134	3,653	4,161	4,684	5,254	5,828
2006	1,003	1,799	2,510	3,146	3,750	4,295	4,904	5,511	6,160
2007	999	1,803	2,561	3,280	3,878	4,472	5,065	5,757	6,431

(Continued)

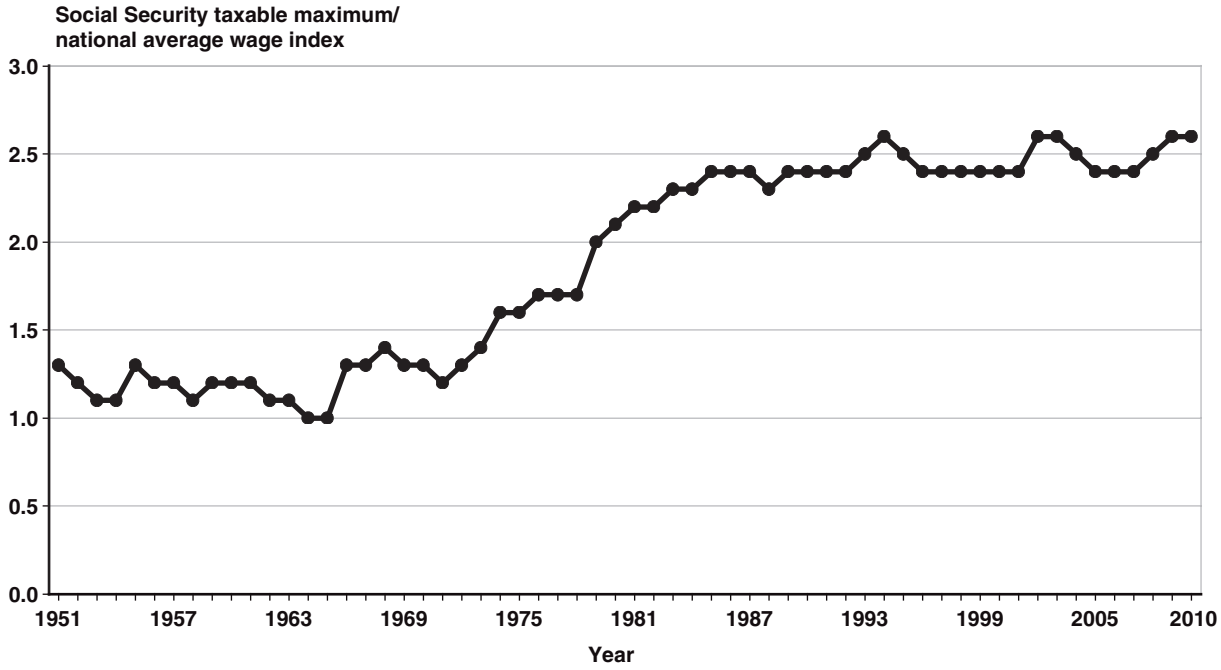
Table A-2.
AIME for workers newly eligible for retired-worker benefits at age 62, by sex-specific AIME percentile, 1999–2007—*Continued*

Year	10	20	30	40	50	60	70	80	90
					Women				
1999	352	514	684	872	1,069	1,324	1,604	1,989	2,549
2000	380	546	745	963	1,193	1,450	1,766	2,160	2,762
2001	397	577	791	1,003	1,244	1,527	1,862	2,262	2,951
2002	405	607	825	1,074	1,341	1,653	2,010	2,481	3,149
2003	437	639	866	1,121	1,412	1,738	2,132	2,629	3,400
2004	459	687	928	1,193	1,486	1,822	2,212	2,714	3,469
2005	463	696	966	1,243	1,561	1,901	2,322	2,871	3,674
2006	486	749	1,022	1,332	1,663	2,048	2,485	3,008	3,891
2007	514	787	1,073	1,412	1,763	2,168	2,630	3,253	4,155

SOURCES: Author's calculations using Social Security administrative data files (1 percent 2008 active CWHS, 1 percent 2010 MBR, and 1 percent 2009 Numident).

NOTE: Sample excludes DI beneficiaries; survival to age 63 required.

Chart A-2.
Ratio of the Social Security taxable maximum to the national average wage index, 1951–2010



SOURCE: Author's calculations using SSA's Office of the Chief Actuary historical series, http://www.socialsecurity.gov/OACT/COLA/wageindexed.html.

Notes

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[1] See http://www.socialsecurity.gov/oact/COLA/Benefits.html#aime.

[2] Under current law, the minimum number of years of earnings required to become fully insured for Social Security retired-worker benefits for persons born in 1929 or later is 10 years (40 quarters of coverage).

[3] As described in the Social Security *Trustees Report* (Board of Trustees 2010), the AWI is "a series that generally increases with the average amount of total wages for each year after 1950, including wages in non-covered employment and wages in covered employment in excess of the OASDI contribution and benefit base." Wage indexing brings nominal wages in a person's earnings record up to near-current wage levels. Wages are always indexed to the average wage level 2 years before the year of first eligibility. For example, for a worker retiring in 2011, wages would be indexed to the AWI for 2009. As described by the Office of the Chief Actuary, a factor will always equal 1 for the year in which the person attains age 60 and all subsequent years, http://www.socialsecurity.gov/OACT/ProgData/retirebenefit1.html. The indexing factor for a prior year *Y* is the result of dividing the AWI for the year in which the person attains age 60 by the AWI for year *Y*.

[4] For example, for an individual who first becomes eligible for Old-Age and Survivors Insurance benefits or Disability Insurance benefits in 2011, his or her PIA will be the sum of (a) 90 percent of the first $749 of his or her AIME, plus (b) 32 percent of the next $3,768 of his or her AIME, plus (c) 15 percent of his or her AIME above $4,517.

[5] See the Bureau of Labor Statistics website, http://www.bls.gov/data/.

[6] See Mosisa and Hipple (2006, Table 1).

[7] "Returns to experience" is a term used by economists that describes the fact that workers tend to achieve wage increases as they gain more on-the-job skills and establish a track record of competency at various on-the-job tasks. Workers who drop out of the labor force for long periods of time will be at a competitive disadvantage compared with those who have remained in the workforce because employers will have less observable information regarding the competency and job skills of less-attached workers. Thus, the wages those less-attached workers can demand will be lower than those of more-attached workers. In a similar way, young workers are less able to demand high wages than mid-career workers because young workers lack observable on-the-job experience and skills.

[8] In 2008, 40 percent of all female retired workers were dually entitled retired-worker beneficiaries (meaning they were receiving a secondary benefit based on their husbands' PIA). Overall, 97.8 percent of all dually entitled workers were women in 2008 (SSA 2010a, Tables 5.G1 and 5.G2). Note that the 40 percent dually entitled figure includes both spouse (wife) benefits and survivor (widow) benefits. The wife benefit will top off the retired-worker benefit payable on a women's own record if one-half of the husband's PIA is greater than the retired-worker benefit payable on her record. The survivor's benefit equals 100 percent of the husband's PIA and would top off the retired-worker benefit payable on a women's record if that benefit is less than the husband's PIA. Reductions for an early retirement claim of a husband (or wife or surviving widow) will lower the amount payable on spouse and survivor benefits (see http://www.socialsecurity.gov for more details).

[9] Empirically, this observation highlights the need for users of projections produced by microsimulation models to understand the assumptions that are being made about future female earnings trajectories. In other words, for younger birth cohorts, modelers cannot yet observe a full lifetime of earnings and so must project those earnings. Typically, those earnings are projected roughly based on the earnings patterns of observable (older) birth cohorts. For women, this cannot be done without adjustment because of the large increase in labor force participation between older female birth cohorts and younger female birth cohorts. If microsimulation modelers continue to project the differences in hours worked between men and women observed since the mid-1990s, men would be the primary earners in the majority of projected married couples. In such a case, a projected unisex distributional estimate of retired-worker benefits would be as uninformative as a unisex estimate based on recently eligible birth cohorts. On the other hand, microsimulation modelers may project that female earnings and number of hours worked will increase above what has been observed historically, so that for birth cohorts for whom retired-worker benefits are being estimated, earnings and number of hours worked are projected to be equal by sex. In that case, a projected unisex distributional estimate would be appropriate to the underlying assumptions of the model.

[10] Because the full-time, female-to-male earnings differential is presently less than 1, if we assume that the differential does not converge to 1, then the male earnings distribution proxy will produce a higher median for men than for their female counterparts. In other words, median earnings of a man will not necessarily proxy for an identical woman in terms of labor force attachment, occupation, and number of hours worked, if wage discrimination persists. Of course, the full-time, female-to-male earnings differential does not speak to the degree to which the gap between full-time male and female earnings reflects differences in total years of experience in the workforce versus pay differences based solely on sex and the extent to which

differences in total years of work experience are correlated with marital status and nonmarket work, such as child rearing. See Juhn and Potter (2006), Hoffman (2009), and Macunovich (2010) for a discussion of labor force trends by marital status and decade. Trends have not been stable over time for women. Favreault and Steuerle (2008) found that having a child reduced the average number of work years for women born between 1935–1958.

[11] SSA (2010b, 7), http://www.socialsecurity.gov/oact/solvency/index.html. Estimates are based on the intermediate assumptions of the Board of Trustees (2010), http://www.socialsecurity.gov/oact/TR/2010/index.html.

[12] The term "active" means that an individual had to have at least one earnings report from 1951 through 2008 to be included in the 2008 active CWHS.

[13] Technically, this type of earnings data exists in the MEF beginning in 1978, but non–Old-Age, Survivors, and Disability Insurance taxable earnings data from 1978 through 1981 are subject to reporting errors and are not used in this analysis.

[14] SSA (2010b, 2), http://www.socialsecurity.gov/oact/solvency/index.html.

It is possible that a worker becomes entitled to disability, recovers, and then later becomes "newly eligible" for a retired-worker award. That population, which is expected to be small, is deleted under my methodology.

[15] Ibid.

[16] Under current law, DI beneficiaries are fully insured for retired-worker benefits because of the disability freeze provision of the Social Security Act (Title II). Therefore, *fully insured* as used in this article is more restrictive than the legal definition in the Social Security Act.

[17] See note 13.

[18] Before calculating average earnings, the sample is restricted to individuals who survived to at least age 63, so that each decile contains 10 percent of the sample in the year individuals are newly eligible for Social Security retired-worker benefits. (The force of differential mortality will cause the number of people in deciles calculated at any given age to eventually decline more at the bottom than the top of the deciles, as the sample population ages.) Earnings censored at the Social Security taxable maximum from 1982 through 1993 (ranging from 0.45 percent of the sample in 1982 to 2.2 percent in 1990 to 0.6 percent in 1993) are imputed with a tobit regression before averaging. While wage earnings are reported over the OASDI taxable maximum beginning in 1982, self-employment earnings are reported only up to the Hospital Insurance (HI) taxable maximum prior to 1994. See Pattison and Waldron (2008) for more details on MEF earnings. For further discussion on the tobit regression, see Waldron (2004, Appendix).

[19] For example, it is not clear that a college student working part time is a *low earner* in the same way that a man with low earnings at age 50 is a *low earner*. Many young workers may have high earnings potential; in contrast, by the peak of the age-earner profile, adult socioeconomic status is essentially set, on average. Earnings after the peak are problematic because some workers may retire early with pensions and still be healthy and of high-income status. A zero in the earnings record because of voluntary retirement would not be equivalent to a zero resulting from unemployment or a health shock, but there is no way of distinguishing between the two zeroes in Social Security data.

[20] Changes in the percentage of workers at bend points from 1999 through 2007 ranged from 1 to 5 percentage points. Women experienced a decline in the percentage at the bottom two brackets and a 5 percentage point increase at the upper bracket, reflecting growing earnings for female birth cohorts over birth years 1937–1945. Men experienced a 3 percentage point decline at the 2nd bracket, split between a 1.4 percentage point increase in the proportion at the 1st bracket and a 1.6 percentage point increase in the proportion at the top bracket. The combined (unisex) measure showed a decrease in the percentage of workers at the bottom two brackets and a 3 percentage point increase in the proportion of workers in the top bracket between 1999 and 2007.

[21] Authors of the report of the National Commission on Fiscal Responsibility and Reform (2010) proposed to "break the middle bracket in two at the median income level."

[22] An upward trend was observed in the number of work years at every percentile measured for women born over birth years 1937–1945. On the other hand, men experienced a downward trend in the number of work years over the same birth cohorts at the 10th percentile, but not at higher percentiles measured in Table 4. The strong trend in number of female work years over time highlights the problems with trying to use a distribution that is moving over time and for which the future is uncertain, as female cohorts for whom societal changes have most fully applied have not yet reached the peak earnings ages. Favreault and Steuerle (2008) found an upward trend in average covered work years for females in birth cohorts 1935–1965 and no trend in average covered work years for men over the same birth cohorts.

[23] Decile 1 = the 0–10th percentile of the sex-specific earnings distribution, decile 2 = the 11th–20th, decile 3 = the 21st–30th, decile 4 = the 31st–40th, decile 5 = the 41st–50th, decile 6 = the 51st–60th, decile 7 = the 61st–70th, decile 8 = the 71st–80th, decile 9 = the 81st–90th, and decile 10 = the 91st–100th percentile.

[24] Favreault and Steuerle (2008, Figures 8 and 9, 25) found a similar positive correlation between cumulative Social Security–covered work years and earnings levels.

[25] This figure includes years of zero earnings in the average lifetime earnings measure. If zeroes are excluded, the corresponding figure is $217,995.

[26] The new bend point is described in SSA (2010b), http://www.socialsecurity.gov/oact/solvency/index.html.

The simulation in this article does not follow the phase-in provisions of the plan, but instead represents the effect of the benefit formula change if it had been fully phased in by 2007.

[27] In general, percent PIA factor reductions would have been deeper to deciles 1–3 for birth year 1937 than for birth year 1945 (depicted in Chart 6). This result is driven by a decline in lifetime earnings at the lowest deciles for men over the period observed.

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