Risk Tolerance and Retirement Income Composition

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Abstract

Proposed changes to the Social Security system will affect people across the income distribution differently. Such changes are also accompanied by changes in the financial risk workers will face in their retirement. This study examines levels of financial risk workers face at different points in the lifetime earnings distribution. To do so, we use a microsimulation model that projects individual demographic and economic characteristics within the context of the Social Security system and the macroeconomy to assess the impact of two policy changes on the levels of lifetime benefits available to current and future retirees. Further, we incorporate data on pensions and savings to illustrate differences in the level and distribution of retirement funds across the earnings distribution. This exercise allows us to assess the financial risk workers face in their retirement, both within the Social Security system itself and within a broader view of the stream of total available retirement funds. We also use survey data to show that low earners are the least willing to tolerate such risk.

I. Introduction

During the recent debate on the fiscal sustainability of the United States Social Security system, pundits and researchers devoted significant time discussing the role of risk in system reform proposals and in retirement behavior in general. While this focus is certainly warranted, the discussion often missed important differences in risk across observable characteristics and, most importantly, across the earnings distribution. In this paper, we examine two Social Security policy proposals that would impact workers across the lifetime earnings distribution differently. We link both of these possible system changes to supplemental financial data to explore overall risk at different points in the lifetime earnings distribution. We also use survey data to show that workers in the lowest quintile are probably less willing to tolerate risk than others in the distribution.

In the first of two policy proposals, we introduce a minimum benefit to all qualified beneficiaries at the bottom of the earnings distribution. This minimum benefit insures that all workers will have at least some minimum level of benefits in their retirement years, regardless of their past or current financial situation. In the second policy proposal, we revise the current system to include individual accounts. These accounts are designed to provide workers with possible additional returns to their existing defined benefits from the traditional system. Yet, as with any proposal that hopes to provide higher returns, higher risk is inherent, and this risk will differ across the lifetime earnings distribution.

Both policy proposals are designed with sustainable solvency in mind. Both proposals are constructed so that the ratio of the Social Security trust fund to annual outlays (the trust fund ratio) is stable by the end of the projection period. Using the stochastic capabilities of the model, we build confidence intervals around median estimates, which enables us to demonstrate both

uncertainty in the projections and differences in risk that workers would face upon retirement. Using Survey of Consumer Finance (SCF) data, we quantify the total potential retirement funds available to beneficiaries at both ends of the earnings distribution and show how these proposals affect the level of risk faced by both.

To estimate Social Security system finances, we use a microsimulation model that generates individual demographic and economic characteristics for a representative sample of the U.S. population. This microsimulation model allows us to generate earnings histories and future streams of benefits for each worker in the simulated economy and to examine how low earning Americans will fare in retirement. Further, by simulating the model using Monte Carlo methods, we are able to assess the level of risk in the existing system and under the two proposals.

One related strand of literature investigates individual beliefs about savings behavior and retirement security. Haider and Stephens (2004), for example, use Health and Retirement Survey data to show that survey respondents have significant uncertainty in their expected savings for retirement. Lusardi (2003) finds that about 30 percent of households nearing retirement have done little or no retirement planning. Furthermore, households with low levels of net worth are more likely not to plan for retirement and are less likely to hold stocks in their retirement portfolio.[1] We find similar trends in the Survey of Consumer Finances data set we use below: In the most recent SCF (2004), only 6 percent of respondents in the bottom quintile believe Social Security benefits are "very satisfactory" while 22 percent of respondents in the top quintile responded in the same way.

There is also, of course, a long literature that evaluates the risk associated with savings behavior, especially as it relates to retirement and Social Security. A number of papers in this

[1] Other papers in this line of research include Gustman and Steinmeier (1999) and Ameriks et al (2003).

area focus on the introduction of individual accounts to the Social Security system and the flurry of political action in 2005 highlighted many of these ideas. At the time, some of the proposals incorporated minimum benefits, benefit guarantees or combinations of a variety of items (Diamond and Orszag, 2004; Pozen, 2005; MacGuineas, 2005; Liebman, MacGuineas and Samwick, 2005); some focused on the disability portion of Social Security (Autor and Duggan, 2006) or the Supplemental Security Insurance program (McGarry, 2002); still others examined proposals that would modify behavior affecting system inputs, such as trends in work and earnings behavior (Butrica, 2006; Steuerle, 2005) or spousal and survivor benefits (Holden, 1999). There is also a wide variety in the proposed type of individual account: some proposals— the Kolbe-Stenholm 21st Century Retirement Security Act (Kolbe and Stenholm, 2002) and the 2001 President's Commission to Strengthen Social Security (CSSS), for example—would direct a portion of the existing Social Security tax is towards an account held in the worker's name (a "carve-out"). Others have suggested individual accounts that add to the traditional benefit structure, with contributions that are either voluntary or involuntary (Feldstein and Liebman, 2002; Tanner, 2004). Still other researchers have examined the combination of individual accounts with benefit guarantees, benefit floors or hybrid plans (Congressional Budget Office, 2006e; Sununu, 2005; Biggs et al, 2006).

Finally, there exists a body of research on the distributional impacts of Social Security and proposed changes to the system. Coronado et al (2000) examine the progressivity of the system by using lifetime earnings histories of 1,778 people in the Panel of Study of Income Dynamics (PSID). The authors introduce different features to the system (such as different measures of income or discount rates) to show that the current system does a poor job of redistributing funds from rich to poor. Liebman (2002), on the other hand, uses the Survey of

Income and Program Participation to analyze the progressivity of the Social Security system by simulating behavior for the 1925 to 1929 birth cohort; he finds evidence of a progressive system in some measures but a regressive system in others. Further, he shows the nearly 20 percent of people in the top lifetime income quintile receive benefits that are greater than the average in the lowest lifetime income quintile. Recent research (Congressional Budget Office, 2006d) has further demonstrated the progressivity of the system, largely driven by disabled-worker and auxiliary benefits.

There are perhaps two central points of contention in the debate over individual accounts. The first involves the very nature of the system and how it should go about serving the retirement needs of working Americans. Should Social Security be insurance? Should it be redistributive? Or should it be an investment? The second question is whether Social Security benefits would be higher were they invested in the stock market. The issue here is risk: investments that yield higher returns are going to have inherently higher levels of risk. The nature of that risk is difficult to quantify and research continues to investigate the premium associated with investing in equities (Zeldes,1989), the nature of investing in individual accounts (Munnell and Sass, 2006) and the potential transition costs of moving from the existing system to one with accounts (Feldstein and Samwick, 1998). It is also important to note that the existing system also has risk: uncertain demographics, earnings histories and worker behavior make projections of the system difficult to quantify precisely. As such, our estimates utilize the stochastic feature of our model to measure the level of uncertainty inherent in Social Security projections (Congressional Budget Office, 2005b; Harris et al, 2005).

The paper begins with a description of the model and the distributional measures of benefits. This is followed by specific descriptions of each proposal and an evaluation of the long

run solvency of each. The fourth section evaluates the range of potential benefit levels and how these benefits fit into a larger picture of total retirement funds.

II. Modeling Social Security

To project Social Security outcomes over the next 100 years, we use a microsimulation model that projects demographic features such as marital status, childbearing, education, mortality, health and disability. The model also includes modeling of individual economic behaviors such as labor force participation rates, hours worked, full-time or part-time status, benefit claiming behavior and earnings (see Congressional Budget Office, 2006c). One advantage of the model over many other analyses is that it creates a lengthy series of demographic and economic information for each worker and beneficiary. Thus, it can accommodate significant micro variation and uncertainty from year to year and scenario to scenario (see also Sabelhaus and Topoleski, 2006; Congressional Budget Office, 2005a). Using this variation and uncertainty, we are able to model each process stochastically: this feature of the model generates separate probability distributions for a set of demographic and economic variables and uses 500 Monte Carlo simulations to generate a distribution of outcomes (Congressional Budget Office, 2005b).

Distributional Measures of Benefits

The root data file for the microsimulation model is the Social Security Administration's Continuous Work History Sample (CWHS), a one-in-one-hundred sample covering every Social Security number ever issued. While the main advantage of the CWHS is a more accurate picture of earnings than other public data sets, it lacks comprehensive demographic information on the

worker, a problem overcome by using various imputation and calibration processes using data from the Social Security Administration, the March Current Population Survey, the Survey of Income and Program Participation and a number of other sources (see Congressional Budget Office, 2006c). The process of matching demographic information to administrative earnings records generates annual earnings, taxes paid and benefit information for each individual in the model over each person's lifespan.

To assess each policy scenario's impact on beneficiaries, we measure the lifetime stream of benefits received by the individual, including benefits awarded to spouses and survivors.[2] Lifetime benefits reflect the individual's total receipt from the system and are a function of lifetime earnings, longevity and age of initial claim. The measure also captures potential phased-in changes in policy proposals—a tax cut or benefit enhancement that is slowly introduced over a ten- or fifteen-year span will not be fully captured by benefits measured at a single point in time.[3] Using the stochastic feature of the model, we also build a 90 percent confidence interval (by reporting the 10^{th} and 90^{th} percentile points) around the median estimate.

Other Retirement Finances

To place the microsimulation estimates in a broader context, we use pension data from the Survey of Consumer Finances (SCF) to construct a picture of total available retirement funds. The SCF is a triennial survey of roughly 4,000 households recording a wide array of income,

[2] An alternative measure of benefits is the level of benefits in the initial year of claim. The resulting patterns in these benefits for the three policy proposals are similar to those of the lifetime benefits; results are available upon request from the authors.

[3] To be specific, lifetime benefits are a function of lifetime household earnings, which equal the sum of real earnings over the person's lifetime plus, in any year he or she is married, the real earnings of his or her spouse. The decision to use household earnings to rank benefit levels is derived from the fact that an individual's marital status can change over time, which would result in a difference between individual and household earnings. Such differences could change the relative position of the individual in the earnings distribution based on his or her marital status.

wealth, pension and balance sheet information. Like other survey data, the SCF is subject to nonresponse bias and missing data issues; however, it is also known to do a good job of capturing the upper tail of the wealth distribution (Poterba and Samwick, 1997). For purposes of this exercise, we combine all six available SCF files (1989, 1992, 1995, 1998, 2001, and 2004) and place people into 10-year birth cohorts. Four measures of retirement funds are used in the analysis: the cash value of life insurance; other pensions (e.g., defined benefit plans); thrift pension plans, such as 401(k)s, 403(b)s and cash-balance plans; and IRAs, including Keoghs.[4] Each variable is deflated to 2006 dollars using the Consumer Price Index for Urban Wage Earners and Clerical workers (CPI-W) (as in the microsimulation model) and then, using a 3 percent real discount rate, is converted to the future value when the respondent turns 65. Mathematically,

$$\text{Future Value}_p = \text{Present Value}_p \times (1.03)^{65\text{-age}}$$

where the *p* subscript refers to each of the four pension variables. Using these four variables paints an admittedly limited picture of total retirement funds as we do not include other forms of savings such as checking and savings accounts, mutual fund or stock holdings, nor do we include possible earnings from work during retirement. We also do not include other non-monetary forms of compensation retirees may hold such as retiree health insurance, or measures of wealth such as housing. However, given our variable selections, the distribution of funds does reflect those found elsewhere (Social Security Administration, 2004) and demonstrates the importance of looking at least at some other forms of available retirement savings.

[4] Each pension variable is recorded separately for each member of the household and is then summed together. The questions for each pension variable are straightforward and for "other pensions" is phrased as follows: "About the largest benefit, is this from a pension plan where a certain amount of money is accumulated in an account for you, a formula plan that will give you a specific amount of income each month or year when you retire, or what?"

III. Long Run Solvency of Social Security

In order to compare different proposals that address the projected future insolvency of the Social Security system, we first determine whether each is sustainably solvent. That is, we determine whether under each scenario the trust fund ratio—the ratio of the trust fund balance to annual outlays—is flat at the end of the 100-year projection period (Lee and Yamagata, 2003). Having established that each proposal is sustainably solvent under this definition, we compare the impacts of each proposal on a level playing field.

Two Social Security Proposals

The projected path of the current Social Security system will result in an insolvent system in about forty years. This baseline environment can be evaluated in two ways: first, as "scheduled" benefits where benefits are paid in full regardless of the current state of the trust fund. When the trust fund is empty, benefits would be paid by revenues from outside the Social Security system or by additional borrowing. Under the second interpretation, equal benefit cuts are applied to all beneficiaries when the trust fund falls to zero; this is the "payable" benefits scenario. In this case—a scenario that is by definition sustainably solvent—benefits are cut by 21 percent when the trust fund is exhausted around 2050.[5, 6]

In the first of our two policies—the minimum benefit proposal—low earning workers (who have worked for at least 20 years) receive a phased-in increase to their Primary Insurance

[5] The Social Security Administration does not have the authority to borrow money or get automatic fund transfers in order to pay benefits. In other words, Social Security benefits can only be paid with money that exists in the trust fund; hence, these benefit cuts would be mandatory under current law.
[6] Possible ranges of trust fund ratios, as projected in the stochastic analysis, are not presented here but do suggest different levels of risk to the entire system over time.

Amount (PIA) equal to 40.4 percent. The phase-in begins in 2009 and is fully in place by 2018.[7] The increase is designed to give these workers a minimum benefit that is equal to 140 percent of the (real-dollar value) poverty line. Additionally, benefits are indexed for longevity to account for longer life expectancies.[8] In addition to these two benefit adjustments, all workers receive a one-time benefit cut of 19 percent in 2013 in order to make the system sustainably solvent.[9]

The second proposal adds individual accounts (IA) to the traditional Social Security system. Under this plan, IAs would be created in 2013, and workers born after 1958 (hence, only affecting those currently under 55) would have 2 percent of their payroll taxes diverted into the accounts; benefits would then be offset with a notional account that grows at the Treasury rate. The notional account is an accounting device: A "mirror" deposit is made in the individual's notional account and, for our purposes, is also assumed to grow at the same Treasury rate. Thus, the individual's actual benefit equals the scheduled (traditional) benefit plus an annuity from the individual account minus an annuity from the notional account.

In order to make the system sustainably solvent under the IA plan, the individual accounts are accompanied by a one-time, across-the-board benefit cut of 15 percent in 2013. The IAs are assumed to be invested in a custom portfolio of 50 percent equities, 30 percent corporate bonds and 20 percent Treasury bonds. For simplicity, these IAs have been constructed with the

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[7] This particular minimum benefit proposal is based on Plan 2 of the President's Commission to Strengthen Social Security (2001); see also Congressional Budget Office (2004).

[8] The longevity index is created by dividing the life expectancy of 62 year olds in 2008 (the 1946 cohort) by the life expectancy of the cohort reaching age 62 three years prior to the cohort of interest (for example, the denominator of the longevity adjustment for the 1980 birth cohort uses the projected life expectancy of 62 year olds in the 1977 birth cohort); this ratio is then multiplied by the worker's Primary Insurance Amount (PIA). Life expectancy is calculated for each sex in each year depending on projected mortality rates generated by the Social Security Administration. Implementing the minimum benefit provision without the longevity index requires a one-time benefit cut of about 28 percent for sustainable solvency. Under this single provision the trust fund ratio exceeds nine for a significant portion of the projection period.

[9] Introducing the benefit cut in 2013 assures that no worker currently over age 55 is affected by the change and because of the increased benefit to low-earning workers is larger than under the payable scenario.

following characteristics: the 2 percent of diverted payroll taxes is applied equally to all payroll up to the taxable maximum; workers are not allowed to make additional voluntary contributions to the accounts; there are no allowances for early-withdrawals from the accounts; and all account distributions would be taxed as if they were traditional Social Security benefits.[10] Workers will recoup some (or all) of this cut in the traditional benefit with proceeds from their individual accounts.

Social Security Trust Fund Ratios

We rely on the ratio of the Social Security trust fund to annual outlays to assess the overall fiscal sustainability of the system. The bold line in Figure 1 shows the path of the trust fund under the existing system, and is projected to rise from about 3.3 in 2006 to a peak of 4.4 in 2017. As workers from the baby boom generation retire and draw benefits from the trust fund, the ratio falls steadily eventually reaching zero in the middle of the century. Under the payable benefits scenario, where only those funds that exist in the trust fund are paid to beneficiaries, the trust fund ratio is flat over the latter half of the projection period, necessarily making it sustainably solvent.

Trust fund ratios for the two policy proposals are also shown in Figure 1. The proposal that introduces a minimum benefit (with longevity) plus a one-time 19 percent benefit cut generates a trust fund ratio that continues to increase after the hump under the payable scenario, but is then flat over most of the period at just under 5. The ratio for the individual accounts plan declines at the introduction of the plan in 2013 as money is moved out of the trust fund into

[10] There are a wide variety of IA proposals in the public sphere and vary on a number of dimensions: voluntary versus mandatory contributions; varying percentage carve-outs, add-ons or benefit offset; benefit guarantees; and method of benefit payouts (e.g., annuities). For examples of these, see Feldstein (1998).

individual accounts. The ratio remains lower than the minimum benefit proposal during the first half of the century, falling between 2013 and 2045 before rising slightly over the latter half of the decade, ultimately stabilizing at about 4. The relative positions of the various trust fund ratios demonstrate the sensitivity of the Social Security system to different types of changes and both are illustrative of the benefit cuts necessary to put the system on sustainably solvent paths.

IV. Assessing the Impact of Social Security Reforms on Low-Earners

Having established that both policy proposals are sustainably solvent, this section evaluates the lifetime benefits received for the lowest and highest lifetime earnings quintile and by 10-year birth cohort. We focus on stochastic model results in order to demonstrate the sensitivity of the projections to future uncertainty and the differences in the estimates for workers in different parts in the earnings distribution. The lifetime benefit measures are then compared to pension data from the Survey of Consumer Finances to assess the overall distribution of retirement funds for retirees at the top and bottom of the distribution.

Lifetime Benefits

Under the existing system, lifetime benefits for low earning workers slowly increase between the 1940s, 1950s and 1960s birth cohorts (Table 1). When the trust fund exhausts and benefit cuts are required, lifetime benefits fall beginning with the 1970s birth cohort. Such declines are less pronounced at the top of the distribution where benefits decline only slightly between the 1960s and 1970s cohorts. The rise in lifetime benefits for the last two cohorts under consideration (the 1990s and 2000s)—at both ends of the distribution—reflects higher real earnings and improved longevity.

In running the model stochastically, we are also able to estimate the 10th and 90th percentiles of the lifetime benefits for each cohort. The range of values show significant uncertainty in the projection of lifetime benefits and illustrates the potential risk that is inherent even in the existing system. Obviously, the level of uncertainty grows as a greater portion of each cohort is projected; for example, the range of benefits for low earners in the 2000s cohort spans $115,000 compared to a $9,000 difference for the 1960s cohort where there is less uncertainty in demographics, earnings and retirement estimates. Further, this range is larger for beneficiaries at the top of the distribution than for those at the bottom, although on a percentage basis the ranges are approximately the same at both points of the distribution.[11]

The first proposal that would directly affect low earning workers is the minimum benefit proposal, which, even with a longevity index and a sustainably-solvent 19 percent benefit cut, serves to increases benefits for low earning workers relative to the current system. Under the minimum benefit proposal, benefits are lower for the 1950s and 1960s birth cohorts—these beneficiaries are generally hit hardest by the one-time benefit cut but do not have enough time remaining in retirement to fully realize the minimum benefit enhancement—thereafter however, benefits under the minimum benefit plan are higher than under the current system.

While lifetime benefits for those at the bottom of the distribution increase under the minimum benefit proposal, benefits fall for almost every cohort at the top of the distribution. This implies that the one-time benefit cut at trust fund exhaustion has a large impact on these workers. In fact, while on average the ratio of lifetime benefits between the top and bottom of the distribution is about 3.3 under the payable scenario, the same calculation shows a much smaller 2.9 ratio of under the minimum benefit proposal. This shift demonstrates how the minimum

[11] Harris et al (2005) reach similar conclusions.

benefit proposal makes the system slightly more progressive in nature by raising benefits at the bottom and decreasing benefits at the top. At the same time, the uncertainty in the system is lowered under the minimum benefit proposal (the 10th percentile is higher and the 90th percentile lower for both points and nearly all birth cohorts) because the benefit cuts effectively decrease the size of the system and hence lower the level of uncertainty in the projections.

The individual account proposal generates the largest differences in lifetime benefits relative to the payable scenario. The combination of a 2 percent IA benefit carve-out and the one-time benefit cut in 2013 results in a large decline in lifetime benefits for earlier cohorts (prior to 1980) because these workers receive the full cuts over the 2013-2028 period but do receive a relatively small annuity from their IAs. Later cohorts—those born after 1980—appear better off than previous cohorts because the relative benefit cut is smaller and they have also begun to receive benefits from their IAs. Later cohorts in the higher lifetime earnings quintiles receive much larger benefits than workers in other parts of the distribution, receiving 34 percent higher benefits under the IA proposal than in the payable scenario. Lifetime benefits for workers in the lowest earnings quintile meanwhile, receive total benefits that are 18 percent higher than in the payable scenario.

The addition of individual accounts to the existing structure introduces a level of uncertainty to lifetime benefits that is not uniform across the distribution. As an example, take those born between 2000 and 2009: the gap between the 90th and 10th percentile values for the bottom quintile is $115,300 in the current system, $87,700 under the minimum benefit proposal, and $114,300 with IAs. At the top of the distribution however, the same gaps are $344,400, $241,300 and $487,500. The ratio of the two—3.0, 2.8 and 4.3—further demonstrates the unequal treatment of risk and uncertainty between the to earnings quintiles. Thus, while IAs

could yield significant gains to beneficiaries at both ends of the distribution, the range of benefits—and hence the additional risk inherent in such IAs—is significantly larger for those at the top of the distribution.

Distribution of Retirement Funds

Having shown that while lifetime benefits are significantly higher for those at the top of the lifetime earnings distribution but that replacement rates are much larger at the bottom quintile, this section looks at the entire distribution of retirement funds available to workers upon retirement. We combine the lifetime benefit estimates from the microsimulation model shown above with pension and savings data from the Survey of Consumer Finances to demonstrate how the disparate levels in lifetime Social Security benefits are only part of the overall story of differences in retirement funds at different points in the earnings distribution.

It is interesting to note that the level of financial risk workers are willing to face is clearly a function of the worker's place in the income distribution. In Figure 2, we tabulate, by income quintile, the level of risk workers report taking with their investments from the 2004 SCF.[12] Over two-thirds of respondents in the bottom income quintile report that they are unwilling to take any financial risk; only 2.9 percent of low-income respondents report taking substantial risk. The distribution of risk basically reverses as one moves up the income distribution: 10 percent of respondents in the top quintile report taking substantial risk with their investments while only 7 percent report taking no risk at all.

The differences in attitudes towards financial risk across the income distribution are also

[12] The SCF asks the following: "Which of the statements on this page comes closest to the amount of financial risk that you and your (spouse/partner) are willing to take when you save or make investments?" Possible responses are: take substantial financial risks; take above average financial risks; take average financial risks; not willing to take any financial risks.

reflected in the distribution of total retirement funds. The distribution of retirement monies at the top and bottom of the distribution for each 10-year birth cohort are shown in Figures 3 and 4.[13] While workers in the top earnings quintile are more likely to take on more financial risk, Social Security benefits also make up a larger part of their total retirement package, having increased from 25 to 45 percent over the five birth cohorts shown in Figure 3. Thrift plans have grown as a share of the total pool over time, from 20 percent to 30 percent, while Individual Retirement Accounts (IRAs) and defined benefit plans have declined, mirroring trends found in the pension literature (Gale et al, 1999).

The distribution is quite different for the bottom quintile (Figure 4) where Social Security benefits account for the vast majority of funds, accounting for more than 90 percent of total funds available for most cohorts. And while the share of IRAs has declined across these birth cohorts, cash life insurance, defined benefit and thrift plans have remained relatively stable, accounting for between 4 and 6 percent of the total. Hence, workers at the bottom of the distribution, who are less likely to take on financial risk, appear to be more likely to rely on safer sources of income—Social Security benefits—as their primary source of retirement income.

In the last two figures, we plot total lifetime retirement money for each earnings quintile for the 1960s and 1980s cohorts, categorized by source. These distributions mimic those found in the previous two figures but show the growth in both the *level* of funds and the *changes* of those funds across the distribution. We further decompose Social Security benefits into the amount of benefits under the payable scenario and the IA proposal. As was demonstrated in Table 1, payable benefits are larger than under the IA proposal for the 1960s cohort (Figure 5) but are

[13] Given that the most recent SCF survey was conducted in 2004, neither the 1990 nor 2000 birth cohorts are shown in these figures.

smaller for the cohort born twenty years later (Figure 6).[14] Once again, the estimates show higher levels of lifetime retirement money—for every source—for those at the top of the distribution. For the 1960s birth cohort, total lifetime retirement funds for high earners are nine times the level for those in the bottom quintile ($957,300 versus $105,900) and more than twice the level for those in the fourth quintile ($957,300 versus $437,800).

Using the results from the stochastic model, we have also drawn the 90 percent confidence interval around the Social Security benefits from the IA proposal. While the range of these confidence intervals are directly related to position in the lifetime earnings distribution, they also demonstrate that for low earners the lower bound estimate of total Social Security benefits is a larger portion of total retirement income than for others higher in the earnings distribution. That is, using the 10th percentile stochastic results, those in the bottom quintile are left with a possible total retirement pool of under $80,000 while workers in the top quintile have nearly $900,000 in total available lifetime retirement monies. This discrepancy, while still as large as with median estimates, shows how low earning workers face higher risk with their retirement funds with uncertainty in Social Security.[15]

V. Conclusion

In this paper, we have examined two Social Security policy proposals that would impact workers across the lifetime earnings distribution differently. Under the current system, the trust

[14] In the figures, the IA proposal includes benefits from both the traditional benefits and benefits from the IAs. The share of total benefits paid via the worker's individual account grows over time from about 9 percent for the 1960s cohort to about 45 percent for the 2000s cohort. Using the stochastic results, these shares are lower at the 10th percentile (about 7 and 28 percent, respectively) and higher at the 90th percentile (about 10 and 57 percent, respectively).

[15] Also note that we do not estimate risk-adjusted pension data from the SCF. Given uncertainty in employment, longevity and these financial investments, the differences in risk generated by our stochastic results could be exacerbated by adjusting the other pieces of retirement funds for risk.

fund is projected to exhaust around 2040; the two policy proposals are designed in order to make the system sustainably solvent.

Estimates of lifetime benefits show changes both across the income distribution and across birth cohorts as effects of the minimum benefit, longevity index, individual account and one-time benefit cuts are implemented. Lower earning workers, who are less likely to take on financial risk, appear to rely more heavily on traditional Social Security benefits. We also use survey data to show that these low earning workers are also less willing to tolerate this risk; thus, uncertainty in available retirement funds is important as is the level of funds itself.

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Figure 1. Social Security Trust Fund Ratios, 1985-2105

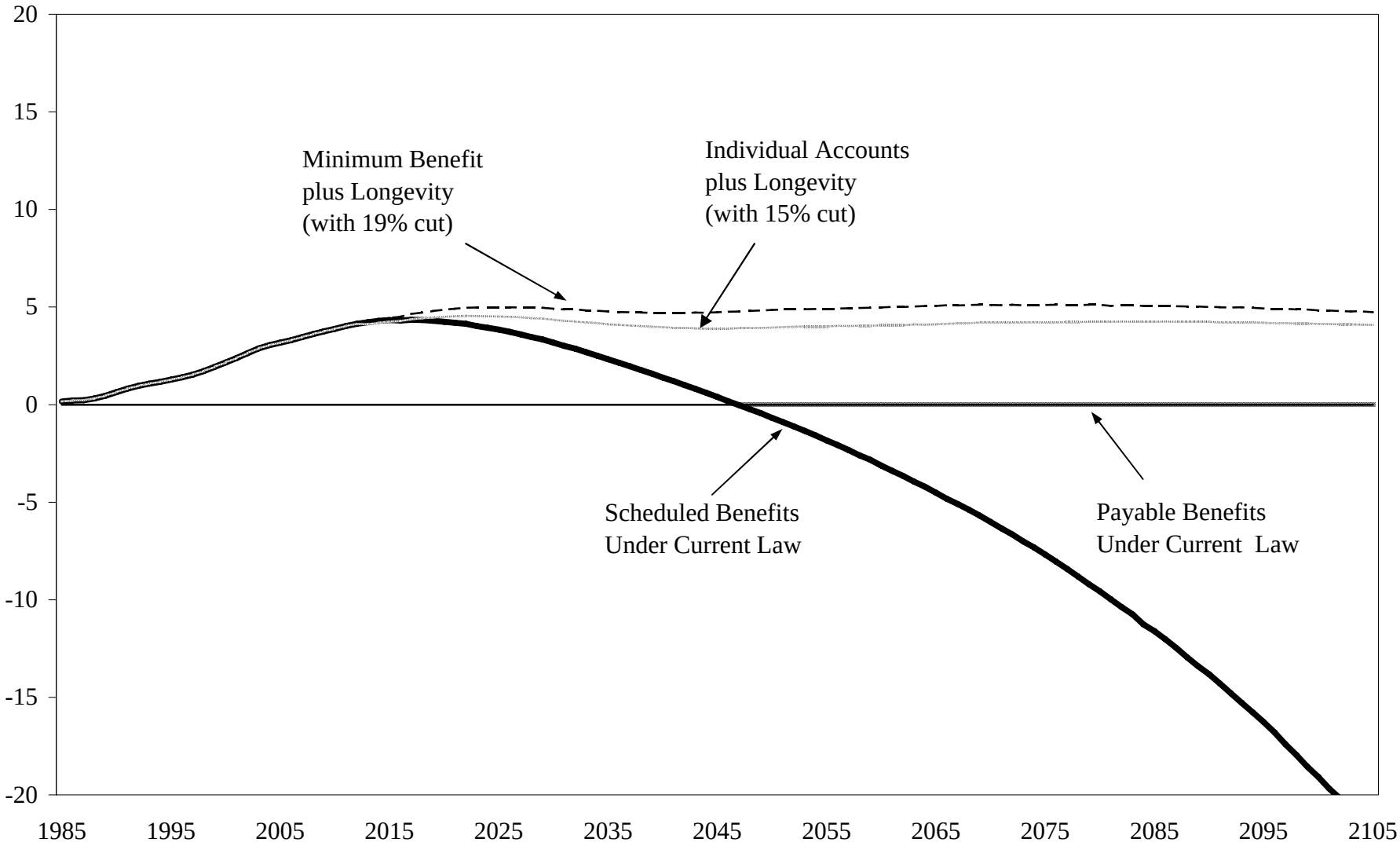
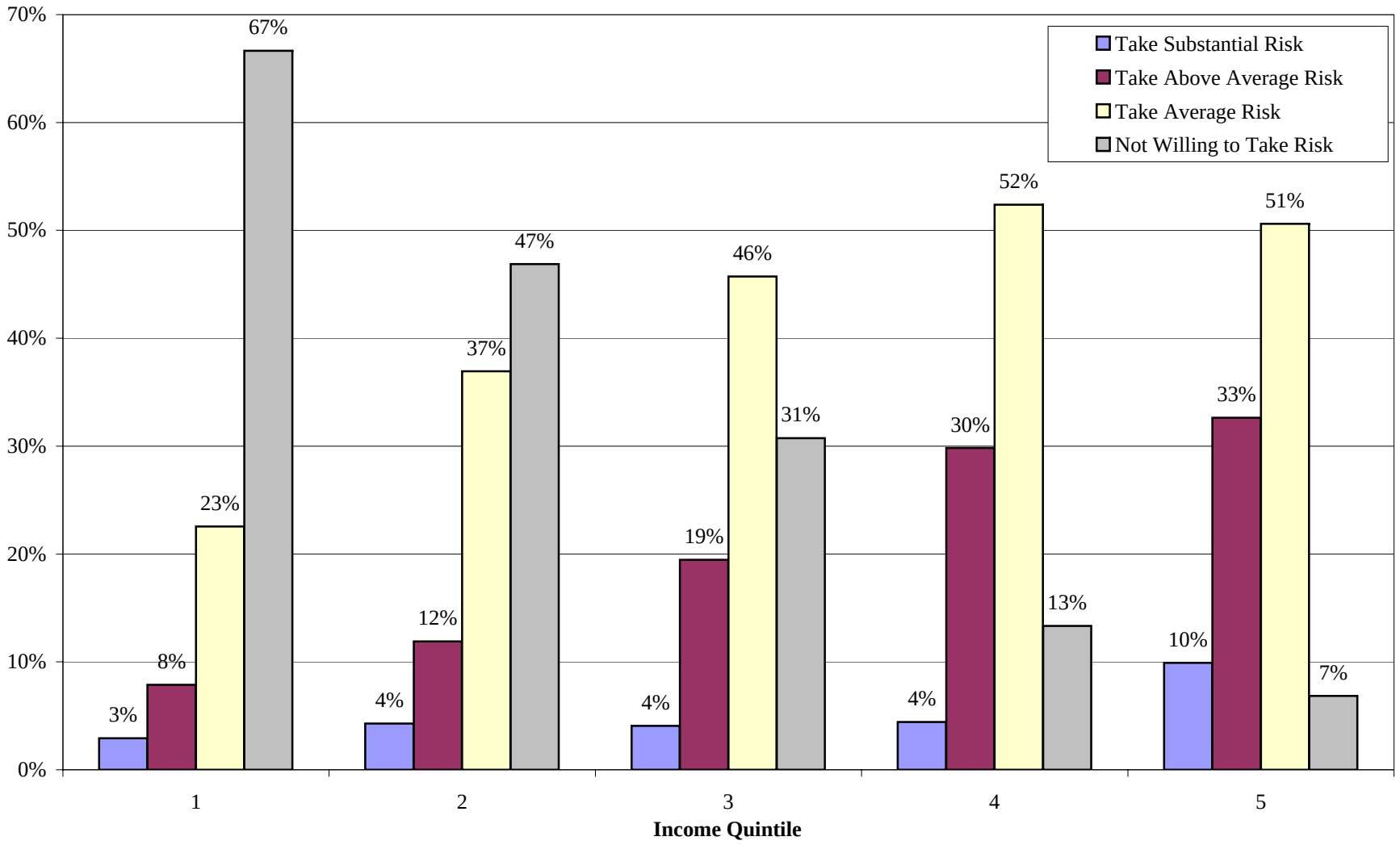


Figure 2. Amount of Financial Risk, by Income Quintile



Source: Author's calculations from the 2004 Survey of Consumer Finances.

Figure 3. Distribution of Lifetime Retirement Funds for the Top Quintile, by Birth Cohort

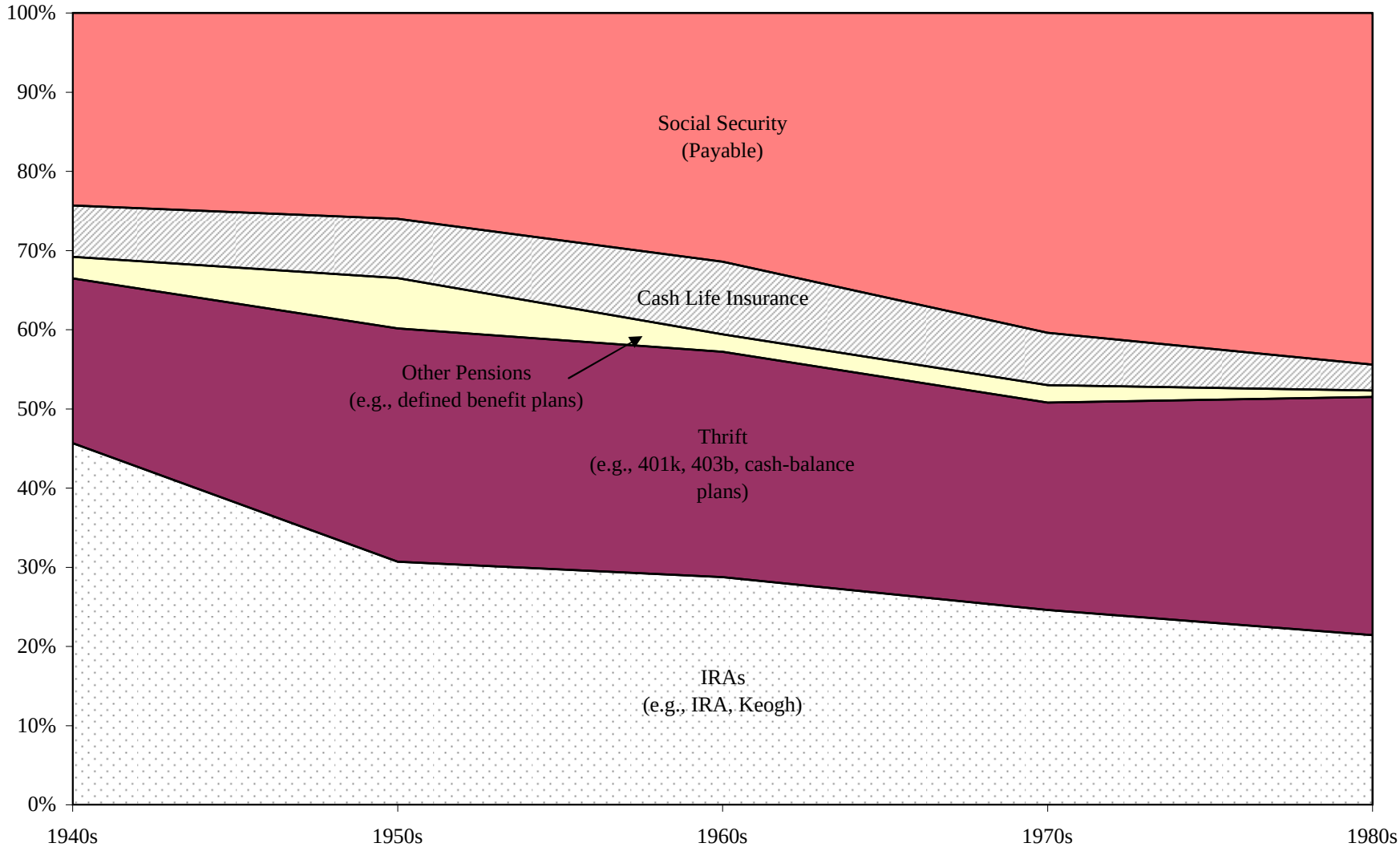


Figure 4. Distribution of Lifetime Retirement Funds for the Bottom Quintile, by Birth Cohort

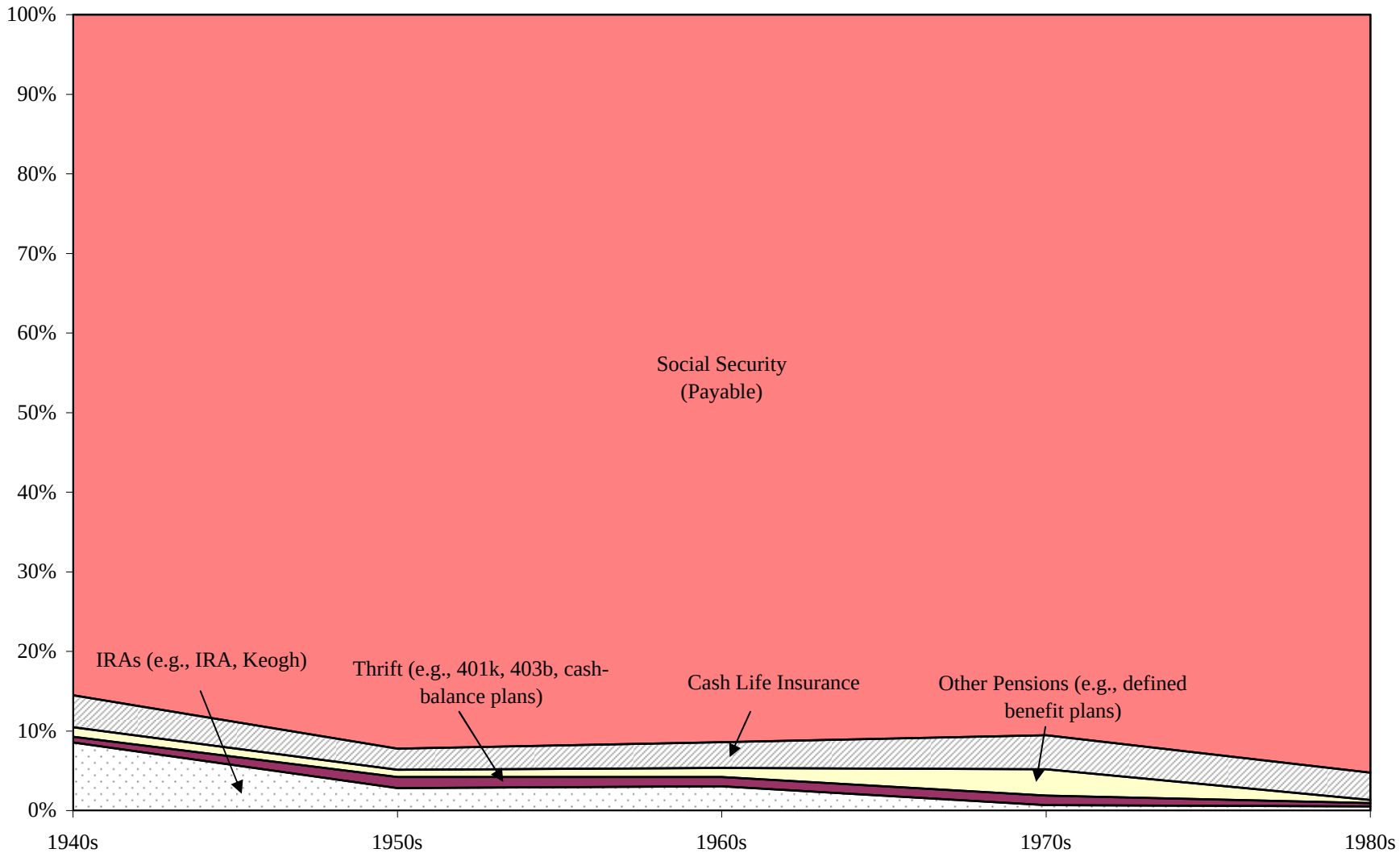
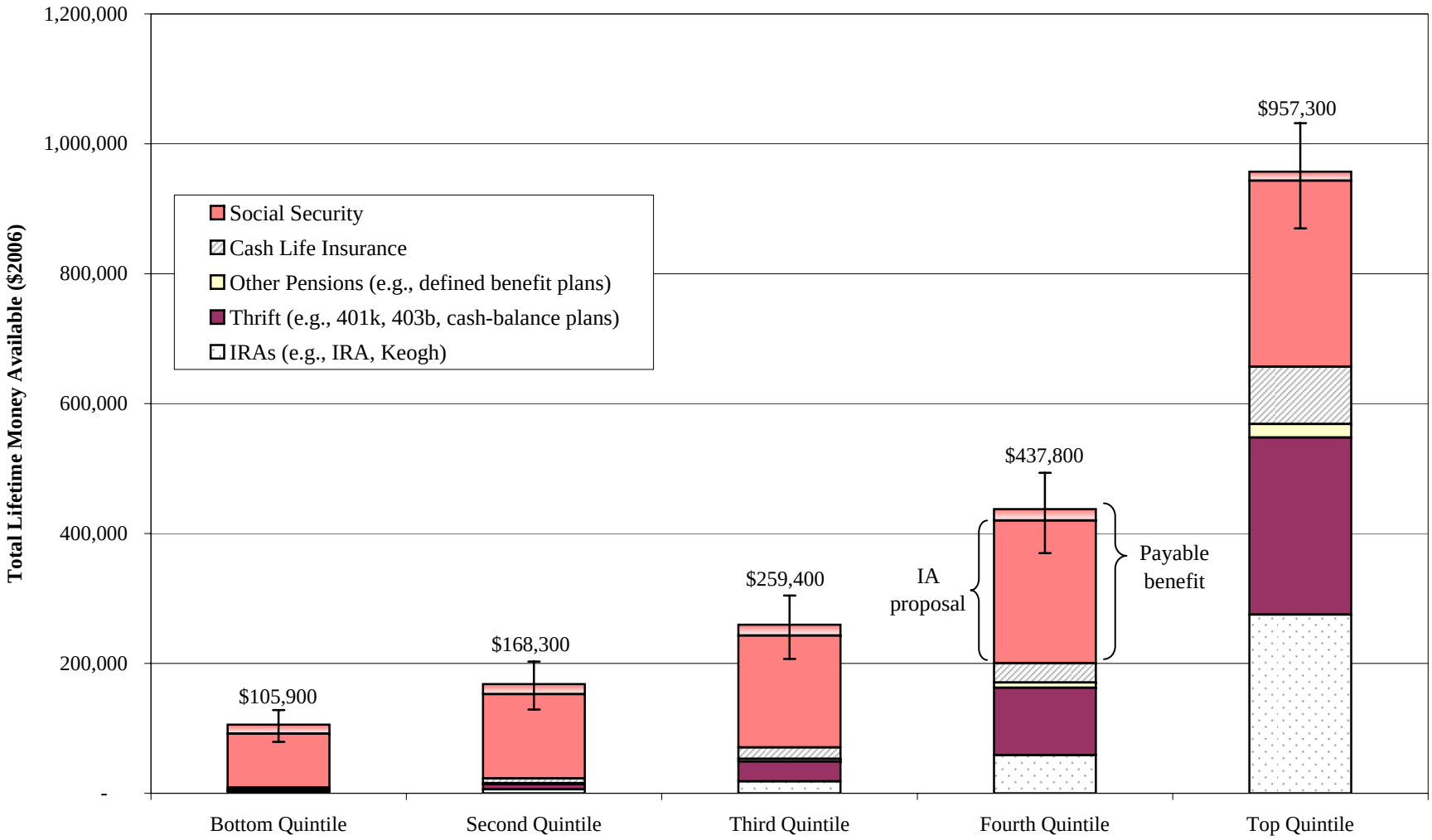
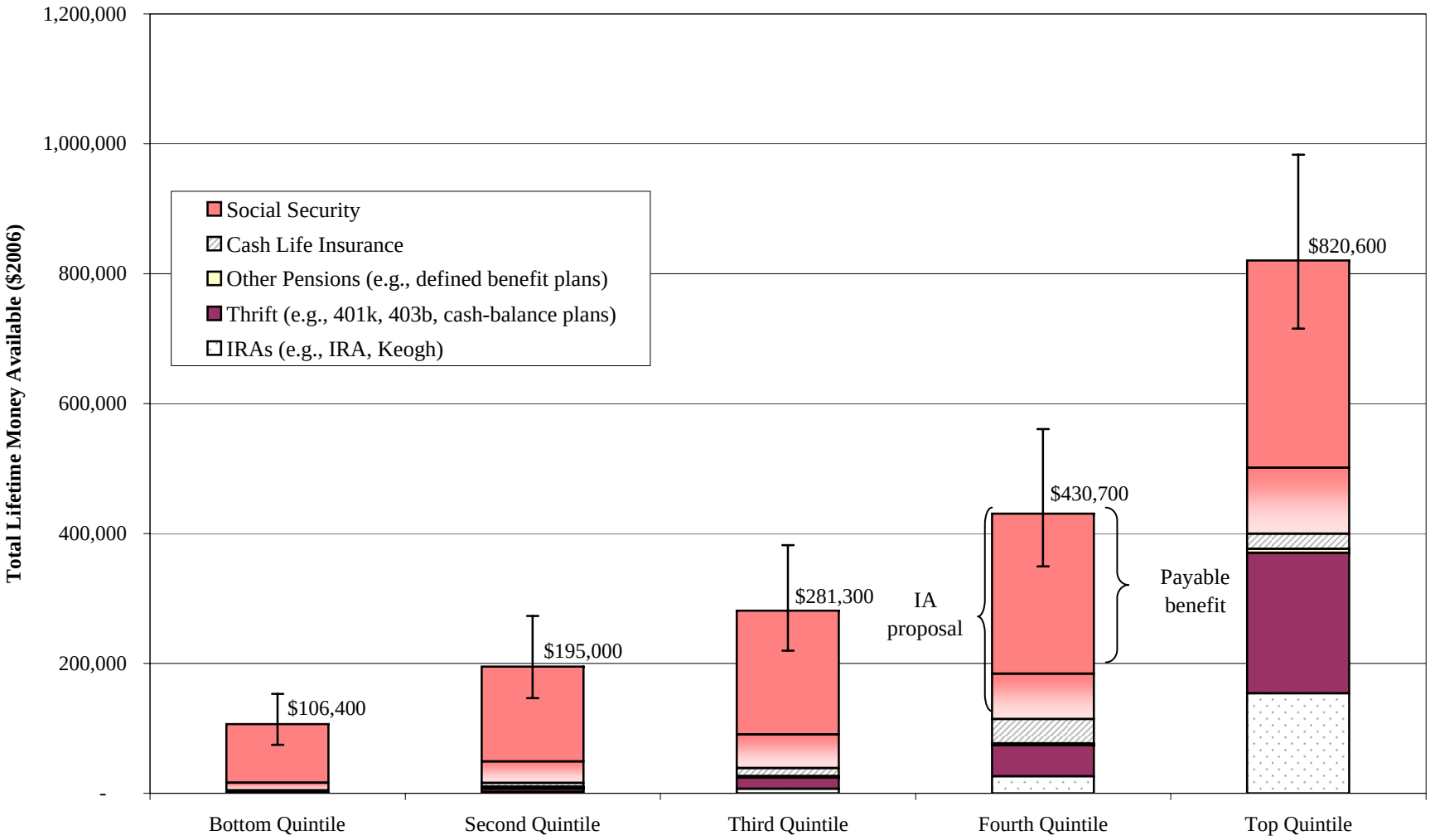


Figure 5. Total Lifetime Retirement Money Available, 1960s 10-Year Birth Cohort



Notes: Error bars represent 10th and 90th percentile estimates of total Social Security benefits.
Benefits under IA proposal includes traditional benefits and benefits from the IAs.

Figure 6. Total Lifetime Retirement Money Available, 1980s 10-Year Birth Cohort



Notes: Error bars represent 10th and 90th percentile estimates of total Social Security benefits.
Benefits under IA proposal includes traditional benefits and benefits from the IAs.

Table 1. Lifetime Benefits for Workers in the Lowest and Highest Lifetime Earnings Quintiles, by Birth Cohort with Confidence Intervals

10-Year Birth Cohort Starting in Year	Payable Current Law			Minimum Benefit plus Longevity			Individual Accounts plus Longevity		
	Lowest Household Earnings Quintile								
	10th	**50th**	90th	10th	**50th**	90th	10th	**50th**	90th
1940	74,100	**78,500**	83,100	74,200	**78,500**	83,100	73,800	**78,200**	82,800
1950	75,900	**87,600**	97,400	69,100	**78,500**	87,200	65,600	**74,300**	82,000
1960	70,200	**96,800**	119,000	75,100	**91,900**	110,400	67,000	**82,800**	100,000
1970	59,400	**92,700**	127,100	75,600	**94,300**	119,900	68,300	**88,700**	111,900
1980	58,400	**90,300**	136,900	79,200	**102,400**	131,100	73,000	**101,900**	133,400
1990	61,500	**99,000**	163,600	90,100	**118,200**	156,900	87,900	**130,500**	178,000
2000	68,900	**110,700**	184,200	98,800	**134,700**	186,500	99,600	**150,200**	213,900
	Highest Household Earnings Quintile								
	10th	**50th**	90th	10th	**50th**	90th	10th	**50th**	90th
1940	238,900	**254,100**	268,900	240,400	**255,200**	269,000	240,600	**256,300**	270,100
1950	245,600	**289,100**	325,100	212,400	**238,700**	266,000	224,600	**253,200**	281,000
1960	213,300	**300,600**	375,200	204,300	**247,900**	301,500	224,700	**286,700**	348,700
1970	201,100	**299,500**	422,000	215,000	**268,800**	338,700	242,700	**339,400**	445,900
1980	214,100	**319,200**	482,000	241,900	**308,600**	394,200	275,100	**420,800**	589,200
1990	224,800	**347,900**	550,400	259,900	**342,800**	447,200	314,500	**489,200**	733,000
2000	240,500	**379,800**	584,900	278,400	**381,300**	519,700	340,400	**542,700**	827,900