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Comparing Social Security Reform Options

by Craig Copeland, EBRI

- This *Issue Brief* seeks to provide answers to the question of how the public will be affected by fundamentally different approaches to Social Security reform. This analysis compares "Model 2" ***individual accounts*** from the 2001 President's Commission to Strengthen Social Security—the closest detailed proposal to what President Bush has endorsed—with three basic options:
  1) ***Raising taxes:*** "Current-law benefits with taxes raised," which would fully fund the program's shortfall over the 75-year actuarial period.
  2) ***Sharp benefit cuts:*** A "cliff benefit cut," which would maintain current benefits until the OASDI Trust Funds are depleted and then impose a sharp cut to bring benefits in balance with revenue.
  3) ***Gradual benefit cuts:*** A "gradual reduction in benefits," which would avoid the cliff benefit cut by gradually phasing in benefit reductions.

- ***Benefit levels and replacement rates***—This analysis also shows both benefit levels and "replacement rates" (or the percentage of a person's income that the initial retiree benefit represents of the prior year's earnings) by birth year. Generally, lower-earning workers would get a higher replacement rate of their previous salary under Model 2 individual accounts (assuming historical rates of return) than they would under the other options, compared with older and higher-earning workers; *however,* that would depend greatly on how the accounts are invested. For example, for someone born in 2015 and earning $55,000, the benefit he or she would receive under current law would be 31.3 percent of his or her preretirement income; under the individual account plan invested entirely in Treasury bonds, the replacement rate would be 16.7 percent.

- ***Uneven work/earning patterns***—This report also analyzes outcomes under uneven work histories and earning patterns, since individuals face uncertainty in their working careers. For instance, under uncertain work/earning patterns, 27 percent of 10-year-olds (those born in 1995) would have a higher initial retirement benefit under Model 2 individual accounts relative to current-law benefits with taxes raised, 93 percent relative to a cliff benefit cut, and 72 percent relative to a gradual reduction in benefits. Results for other birth-year cohorts are also shown, as well as other indicators of the success of a particular option.

- ***No simple answers—***This analysis finds there are significant differences in outcomes, which depend mainly on when someone is born and how much he or she earns. Nevertheless, a few basic conclusions can be drawn from this analysis:
  - Lower-income people are more likely to do better under an individual account plan structured like Model 2 than are higher-income individuals relative to the other options.
  - Twenty-something-year-olds and younger individuals (born in 1985 and after) will benefit the most from reform action now, as opposed to waiting.
  - Overall, the success of an individual account type of reform will depend in large part on whether the equity market continues to produce historical rates of return, and on the willingness of policymakers to subject a generation (or generations) of retirees to benefits that are potentially lower than currently prescribed under law. Ultimately, not everyone can be better off through changes in the program—no matter *how* Social Security is changed.

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Executive Summary

Social Security is widely recognized as the nation's most effective anti-poverty program for the elderly and widow(er)s. It is so popular that it has often been dubbed the "third rail" of American politics ("touch it and you die"). As a result, changes have come slowly.

For instance, in spite of years of warning in advance of the cash flow crisis of 1983, Congress waited until the last minute to act—and when it did, the action it took included a combination of tax increases and benefit reductions. By the mid-1990s, then-President Clinton was talking about the long-term financing issues faced by Social Security, but Congress did not act. President Bush has raised the same issues since 2000, and has now taken to the road to convince the nation that action should be taken now to assure the program's long-term solvency.

Because Social Security is a sensitive, complicated, and emotional political topic, many concepts have been discussed but few elected officials have been willing to put forth detailed plans for fear of political backlash. The public, quite naturally, wants to know how they will be affected by "reform."

In this introductory section, Figure S-1 seeks to provide a simple response to that question by following the method used in the Trustees' report, where earners maintain a constant percentage of the average wage.

Take the year closest to when you were born, the earnings closest to your expected earnings this year (2005), and follow across the columns to see how much your annual benefit would be in today's dollars if you start taking benefits at age 65. For an example of a specific individual: Your 30-year-old child (born in 1975) makes a 2005 salary around $16,500. Under current law, your child's initial annual Social Security retirement benefit would be $11,200 in today's dollars.[1]

However, given the projected funding shortfall currently facing the program, this promised benefit is not likely to materialize unless some sort of change is made to the program. This analysis compares "Model 2" from the President's 2001 Commission to Strengthen Social Security (which appears to have the principles for an ***individual account plan*** favored by the Bush administration)[2] with three basic options:

- ***Current-law benefits with taxes raised*** to cover the shortfall over the 75-year actuarial period, by removing the existing $90,000 annual wage cap and including all workers.
- Maintain current benefits until the revenue shortfall occurs, when a ***"cliff" benefit cut*** is imposed.
- A ***gradual reduction*** in current-law benefits.

Figure S-1

Initial Retiree Benefits For Those Retiring at Age 65
Under Various Options, by Birth Year and Earnings Levels

Birth Year	Income Level in 2005[a]	Current-Law Benefits (Taxes Raised)	Cliff Benefit Cut Post-2042	Gradual Reduction in Benefits	Model 2 Historical Rates	Model 2 100% Treasury Bonds
		Option				
		($ thousands, 2004)				
1955	$10,000	$7.6	$7.6	$7.5	$9.5	$9.4
	16,500	9.6	9.6	9.5	10.6	10.5
	36,500	15.9	15.9	15.7	14.8	14.4
	55,000	20.5	20.5	20.2	18.9	18.6
	72,500	23.2	23.2	22.9	21.3	21.0
	95,000	25.8	25.5	25.2	23.4	23.1
1965	10,000	7.9	7.9	7.3	9.6	9.1
	16,500	10.1	10.1	9.3	10.9	10.2
	36,500	16.6	16.6	15.3	15.1	13.8
	55,000	21.4	21.4	19.7	19.0	17.7
	72,500	24.2	24.2	22.3	21.2	20.0
	95,000	27.3	26.8	24.6	23.3	22.0
1975	10,000	8.8	8.8	7.5	10.5	9.3
	16,500	11.2	11.2	9.6	12.5	10.4
	36,500	18.5	18.5	15.8	18.0	14.3
	55,000	23.8	23.8	20.4	21.8	18.1
	72,500	26.9	26.9	23.0	24.1	20.4
	95,000	30.6	29.7	25.4	26.1	22.4
1985	10,000	9.8	6.1	7.7	12.5	9.5
	16,500	12.5	7.7	9.8	15.7	10.8
	36,500	20.6	12.8	16.2	23.7	14.9
	55,000	26.5	16.4	20.9	27.6	18.8
	72,500	30.0	18.6	23.6	29.8	21.1
	95,000	34.1	20.5	26.1	31.9	23.1
1995	10,000	10.9	6.8	7.9	13.1	9.6
	16,500	13.9	8.6	10.0	16.8	11.0
	36,500	22.9	14.2	16.5	25.6	15.3
	55,000	29.5	18.3	21.3	29.4	19.1
	72,500	33.3	20.7	24.1	31.7	21.4
	95,000	37.9	22.8	26.6	33.7	23.4
2005	10,000	8.6	7.5	8.1	13.6	9.7
	16,500	15.4	9.6	10.3	17.6	11.1
	36,500	25.5	15.8	17.1	26.9	15.4
	55,000	32.8	20.3	22.0	30.8	19.3
	72,500	37.1	23.0	24.8	33.1	21.6
	95,000	42.2	25.4	27.4	35.1	23.6
2015	10,000	13.5	8.4	9.1	13.9	9.8
	16,500	17.2	10.7	11.5	18.1	11.2
	36,500	28.4	17.6	19.0	27.9	15.6
	55,000	36.5	22.7	24.5	31.7	19.5
	72,500	41.3	25.6	27.7	34.0	21.8
	95,000	47.0	28.2	30.5	36.0	23.8

Source: Employee Benefit Research Institute estimates using SSASIM from the Policy Simulation Group.
[a] The $10,000 annual salary is 27 percent of the average wage, $16,500 is 45 percent of the average wage, $36,500 is 100 percent of the average wage, $55,000 is 150 percent of the average wage, $72,500 is 200 percent of the average wage, and $95,000 is 260 percent of the average wage. Each worker maintains this percentage of the average wage throughout his or her career.

30-Year-Olds

The remaining columns of Figure S-1 allow for the comparison of this child's projected $11,200 initial annual current law Social Security benefit:

- Under the cliff benefit cut, where the cut begins in 2042, your child's benefit would still be $11,200, since he or she would reach the normal retirement age before the steep cut goes in effect.
- If, instead, benefits are cut gradually, so that one generation doesn't face the full impact of the funding deficit, your child's benefit would fall to $9,600.
- Under Model 2, if approximately half of the individual account was invested in the equity market and historical rates of return were achieved, then your child's annual benefit would be $12,500. Instead, if the entire account were invested in Treasury bonds to avoid the risk of investing in the equity market, your child's annual benefit would be $10,400.

20-Year-Olds

However, if your child was in his or her 20s (born 10 years later, in 1985) and had the same earnings, the benefits under current law would be $12,500. What then?

- Because this child will reach the normal retirement age *after* the date when Social Security's revenues will fall below its costs, the steep reduction caused by the cliff benefit cut option would, in effect, reduce his or her initial benefit to $7,700.
- If the benefit reductions were gradual, the benefit would be $9,800.
- Under Model 2 individual accounts, the benefit would range from $10,800 to $15,700, depending upon the investment of the account assets.

50-Year-Olds

What about a higher-income, older individual? For example, your 50-year-old sister (born in 1955) and this year earning about $72,500, would have a current law benefit of $23,200—the same benefit as waiting until the revenue shortfall. Under the gradual in reduction in benefits, her benefit would be $22,900. Under Model 2 individual accounts, her annual benefit would range from $21,000–$21,300, depending on the investments.

Those Not Yet Born

What about the grandchild you hope will not be born until 2015? Assuming the grandchild has average annual earnings of $55,000 in 2005 dollars, his or her current-law benefit would be $36,500. Under the cliff benefit cut option, the benefit would fall to $22,700, and under the gradual reduction in benefits to $24,500. The individual account plan would provide benefits ranging from $19,500–$31,700, depending on the investments.

Replacement Rates

Since Figure S-1 is presented in today's dollars, "replacement rates" (or the percentage of income that this initial retiree benefit represents of the prior year's earnings) are presented in Figure S-2. For example, for your grandchild, the benefit he or she would receive under current law would be 31.3 percent of his or her preretirement income; under the individual account plan invested entirely in Treasury bonds, the replacement rate would be 16.7 percent.

Basic Findings

The bottom line: There are some significant differences in outcomes, which depend on when someone is born and how much they earn. Nevertheless, a few basic conclusions can be drawn from this analysis:

- Lower-income people are more likely to do better under an individual account plan structured like Model 2 than are higher-income individuals relative to the other options.
- Twenty-something-year-olds and younger individuals (born in 1985 and after) will benefit the most from reform action now, as opposed to waiting.
- Model 2 benefits reported in Figure S-1, with historic equity rates of return, are the *average* level of many possible scenarios; because there can be wide variations around an average, the resulting benefit could vary significantly from this average benefit.

Figure S-2

Replacement Rates For Those Retiring at Age 65
Under Various Options, by Birth Year and Earnings Levels

		Option				
Birth Year	Income Level in 2005[a]	Current-Law Beneifts (Taxes Raised)	Cliff Benefit Cut Post-2042	Gradual Reduction in Benefits	Model 2 Historical Rates	Model 2 100% Treasury Bonds
				(percentage)		
1955	$10,000	68.6%	68.6%	67.7%	85.6%	84.6%
	16,500	52.3	52.3	51.6	57.7	56.7
	36,500	38.8	38.8	38.3	36.1	35.3
	55,000	33.3	33.3	32.9	30.8	30.2
	72,500	28.3	28.3	27.9	26.0	25.6
	95,000	24.2	24.0	23.6	22.0	21.7
1965	10,000	64.5	64.5	59.4	77.8	74.3
	16,500	49.1	49.1	45.2	53.0	49.6
	36,500	36.5	36.5	33.6	33.1	30.4
	55,000	31.3	31.3	28.9	27.8	25.9
	72,500	26.6	26.6	24.5	23.3	21.9
	95,000	23.1	22.6	20.8	19.7	18.6
1975	10,000	64.5	64.5	55.1	77.0	67.9
	16,500	49.1	49.1	42.0	54.8	45.7
	36,500	36.5	36.5	31.2	35.4	28.1
	55,000	31.3	31.3	26.8	28.7	23.9
	72,500	26.6	26.6	22.7	23.8	20.1
	95,000	23.2	22.6	19.3	19.8	17.0
1985	10,000	64.5	40.0	50.8	82.0	62.5
	16,500	49.1	30.5	38.8	62.0	42.6
	36,500	36.5	22.6	28.8	42.0	26.5
	55,000	31.3	19.4	24.7	32.6	22.2
	72,500	26.6	16.5	21.0	26.5	18.7
	95,000	23.3	14.0	17.8	21.7	15.8
1995	10,000	64.5	40.0	46.6	77.5	56.9
	16,500	49.1	30.5	35.5	59.5	38.9
	36,500	36.5	22.6	26.4	40.8	24.3
	55,000	31.3	19.4	22.6	31.3	20.3
	72,500	26.6	16.5	19.2	25.3	17.1
	95,000	23.3	14.0	16.3	20.7	14.4
2005	10,000	64.5	40.0	43.2	72.1	51.5
	16,500	49.1	30.5	32.9	56.0	35.3
	36,500	36.5	22.6	24.5	38.6	22.1
	55,000	31.3	19.4	21.0	29.4	18.5
	72,500	26.6	16.5	17.8	23.7	15.5
	95,000	23.3	14.0	15.1	19.4	13.0
2015	10,000	64.4	39.9	43.1	66.2	46.5
	16,500	49.1	30.4	32.9	51.8	32.0
	36,500	36.5	22.6	24.4	35.8	20.1
	55,000	31.3	19.4	21.0	27.2	16.7
	72,500	26.5	16.5	17.8	21.9	14.0
	95,000	23.2	14.0	15.1	17.8	11.8

Source: Employee Benefit Research Institute estimates using SSASIM from the Policy Simulation Group.

[a] The $10,000 annual salary is 27 percent of the average wage, $16,500 is 45 percent of the average wage, $36,500 is 100 percent of the average wage, $55,000 is 150 percent of the average wage, $72,500 is 200 percent of the average wage, and $95,000 is 260 percent of the average wage. Each worker maintains this percentage of the average wage throughout his or her career.

The benefits and replacement rates presented above are for very specific individuals who have steady earnings. They are not the benefits individuals should expect if they have a very different earnings pattern.

Uncertain Earnings and Employment

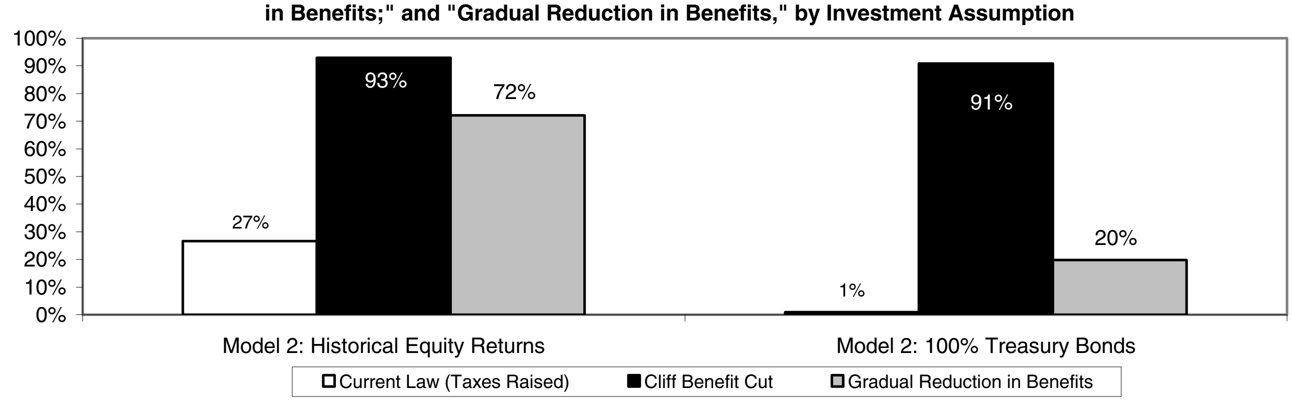
While the above numbers give a simple response to the question of how individuals fare under reform, they actually only answer the question for very specific individuals who work every year from age 22 to age 64, and who have earnings that start at a certain percentage of the average wage and remain at the level throughout their working years.

Since individuals face uncertainty in their earnings patterns, as well as whether they will be working in a given year or when they will retire, a specific number will not be a reliable indicator of how their benefits will compare across these options. Therefore, this analysis determines the probability that an individual will have a higher benefit under the individual account plan relative to the comparison benefit levels, since all workers face uncertainty in their future careers.

This is particularly relevant for the young who have not yet started working. For example, the earnings path that a 10-year-old child of today (born in 1995) will have is unknown. Therefore, how these options compare, based on earnings, is not helpful. Consequently, this analysis uses historical data on earnings histories and work patterns for a sample of the entire population of those born in 1995 to simulate what their resulting benefit level will be under the various benefit structures.

Figure S-3

Percentage of Those Born in 1995 Who Would Have a Higher Initial Retiree Benefit Under Model 2, Relative to: "Current-Law Benefits With Taxes Raised;" "Cliff Reduction in Benefits;" and "Gradual Reduction in Benefits," by Investment Assumption



Source: Employee Benefit Research Institute analysis using GEMINI from the Policy Simulation Group.

Figure S-3 shows the percentage of those born in 1995 who will have a higher benefit under Model 2 individual accounts:

- Assuming historical equity market returns, this 10-year-old has a 27 percent chance of having a higher initial retiree benefit under Model 2, compared with current-law benefits with taxes raised.
- This likelihood jumps to 93 percent compared with the cliff benefit cut option.
- The likelihood of a higher initial retiree benefit is 72 percent under Model 2, compared with the gradual reduction in benefits option.

An important fact to keep in mind is that the cliff and gradual cut options will either provide the same benefits as current law or have a 100 percent chance of having lower benefits than current-law benefits.

This analysis builds upon this likelihood of those born in 1995 having higher benefits under Model 2 compared with the other options by examining other birth years and demographic breaks in the sample, as well as other indicators of the success of a particular option.

Introduction

The Social Security program has received a great deal of attention recently as President Bush has been pushing for the inclusion of individual accounts within the program. The president has not specified a detailed proposal, but one of the reform models (Model 2) that was outlined by his Commission to Strengthen Social Security in December 2001 has elements that are closest to what the administration is advocating. As documented in the Social Security Trustees' annual reports, the program faces undeniable long-term financial challenges, especially as the post-World War II baby boom generation begins to retire in large numbers. Consequently, sooner or later some changes will need to be made to the Social Security system to place it on solid long-term fiscal footing.

This *Issue Brief* compares the Model 2 individual account option with three other Social Security options that provide benchmark levels of benefits for comparison. These options are:

- Funding current-law benefits (current-law benefit with taxes raised).
- A gradual reduction in benefits.
- "Cliff'' benefit cuts, at the date of the depletion of the OASDI Trust Fund.[3]

Since virtually no individuals begin working at age 21 and work every year until they retire, with their wages growing at exactly the same rate as the average wage of those covered by Social Security, this analysis accounts for all types of earnings patterns and work histories by examining a large sample of individuals that is representative of the entire population. Individuals cannot be certain what their career path will follow, as some will have time away from work (voluntarily or involuntarily), while others will experience periods of rapid increases in wages and/or periods of slumping or stagnant wages. Therefore, picking just one number for all workers would be misleading.

In reality, what individuals face is some probability of having higher or lower benefits under the various options in this analysis. Thus, a more thorough examination of individuals born in specific years is conducted to see what percentage of those born in these years would have higher initial benefit levels among the various options. This effort allows for the examination of the differing effects on certain subgroups (gender, educational level, and lifetime earnings levels) of the population from the various options. In addition, other methods are used to compare the options as well as to look at the impact of equity market rates on how the benefits of the individual account plan compare with other options used in this study.

Analysis Overview

This analysis uses the economic and demographic assumptions used in the *2004 Report of the OASDI Trustees of the OASDI Trust Funds* as the basis of its simulations. The models used for generating the results are SSASIM and GEMINI, which are simulation models that can evaluate both the aggregate impact of the policy changes on the system and the impact on individual beneficiaries. SSASIM provides individual results for stylized workers or workers with predetermined earnings histories, while GEMINI is able to simulate a large sample of individuals that is representative of the total population of individuals born in a specific year.[4, 5] This sample of individuals would include individuals who have irregular work histories (are in and out of the work force for whatever reason) and irregular earnings patterns (high earnings periods with low-earnings periods, steady earnings, low-earning periods with some periods of high earnings, etc.), instead of just focusing on individuals who have some preset level of steady earnings. This type of analysis is particularly important for options with individual accounts, because *when* the dollars go into the account is important in determining the benefit from the individual account, as the dollars that go in first will add more to the benefit than those that go in last, due to the compounding of those first dollars.[6]

Comparison of Initial Retiree Benefit Levels

In this report's executive summary, stylized individuals with steady wage growth relative to the average wage of those whose wages are covered by Social Security were developed for simple comparisons across the various Social Security options. In this section, initial retiree benefits under Model 2 individual account option, with two assumptions on investments received by all individuals who were born in a specific year and collect only retiree benefits, are compared with what they would receive under the three other options.[7] The comparisons in this section are of benefit levels for a large sample of workers with earnings histories and work patterns that have been derived from actual historical worker profiles.[8] Consequently, the percentage of all individuals who have a higher benefit under the Model 2 individual account option is determined relative to these options. This percentage represents the probability that an individual born in a given year will have a higher benefit under Model 2.[9] An important result for consideration in these comparisons is that once the benefit cuts go into effect in the benefit reduction options, individuals in those birth years are certain of having lower benefits than they would under current law.

Looking first at Model 2 compared with current-law benefits with taxes raised, 21.8 percent of individuals born in 1955 would have higher initial retiree benefits under Model 2, when historical equity market returns are assumed; however, this decreases to 20.0 percent when the risk of investing in equity markets is accounted for by assuming all individual account assets are invested in Treasury bonds (Figure 1). For individuals born in 1985, 32.1 percent would have higher benefits under Model 2, when assuming historical returns; for those born in 2015, 15.5 percent would have higher benefits under Model 2. These rates fall for all age groups if they were to invest entirely in Treasury bonds, reaching virtually zero for those born in 2005 and after.

The percentage of individuals who would have a higher benefit under Model 2 would jump substantially for those born in 1985 and later compared with the cliff benefit cut option, when benefits would be suddenly reduced upon the date of Trust Fund depletion (Figure 2). Among those born in 1985, 96.4 percent would have a higher benefit under Model 2, assuming historical equity returns, and 94.9 percent would have a higher benefit assuming 100 percent Treasury bond investment. A substantial majority of individuals younger than those born in 1985 would still have a higher benefit under Model 2 when assuming historical equity market returns—but this decreases significantly if they invested entirely in Treasury bonds, especially as the year of birth is further into the future.

Compared to a gradual reduction in benefits, a greater share of those born in 1985 would have higher benefits under Model 2 (assuming historic equity returns), but this share falls for those in the younger age groups (for those born after 1985) (Figure 3). The percentage with a higher benefit stays relatively constant assuming 100 percent Treasury bond investment, but drops for the youngest individuals examined (those born in 2015).

Magnitude of Benefit Level Differences

The above findings show the likelihood that one would have a higher benefit under Model 2 relative to each of the three options, but that type of comparison does not indicate how much higher (or lower) the benefits would be. This section summarizes the percentage difference in the benefits for each individual under each benchmark option and Model 2 by showing the median percentage difference between the benefit levels.[10]

For those born in 1955, the median difference in benefits under Model 2 (historical equity market returns) relative to each of the options studied would be approximately 7 percent to 9 percent lower (Figure 4). For those born in 1975 under Model 2 compared with current law with taxes raised, the median difference in the benefits is 16.1 percent lower; compared with the cliff reduction, it is 12.6 percent lower; compared with the gradual reduction in benefits, it is 3.5 percent higher

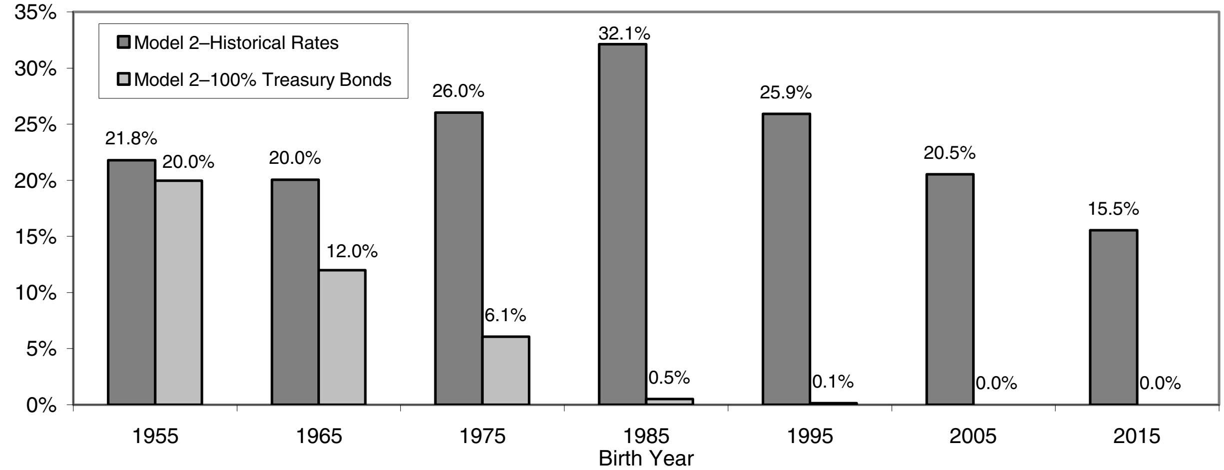
The median benefit differences change dramatically for those born in 1985. Under Model 2, the median difference is 30.7 percent higher compared with the cliff reduction option; 13.0 percent higher compared with the gradual reduction in benefits; but 14.7 percent lower compared with current law with taxes raised.

For those born in 2015, the median benefit difference under Model 2 would be 44.9 percent lower compared with current-law benefits with taxes raised; 14.0 percent higher compared with the cliff reduction option; and 7.0 percent higher compared with the gradual reduction option.

For younger individuals, results change dramatically if they were to minimize investment risk by investing entirely in Treasury bonds. For those born in 2015, the median difference in benefits reaches 90 percent lower under Model 2 compared with current-law benefits with taxes raised (Figure 5). Furthermore, the

Figure 1

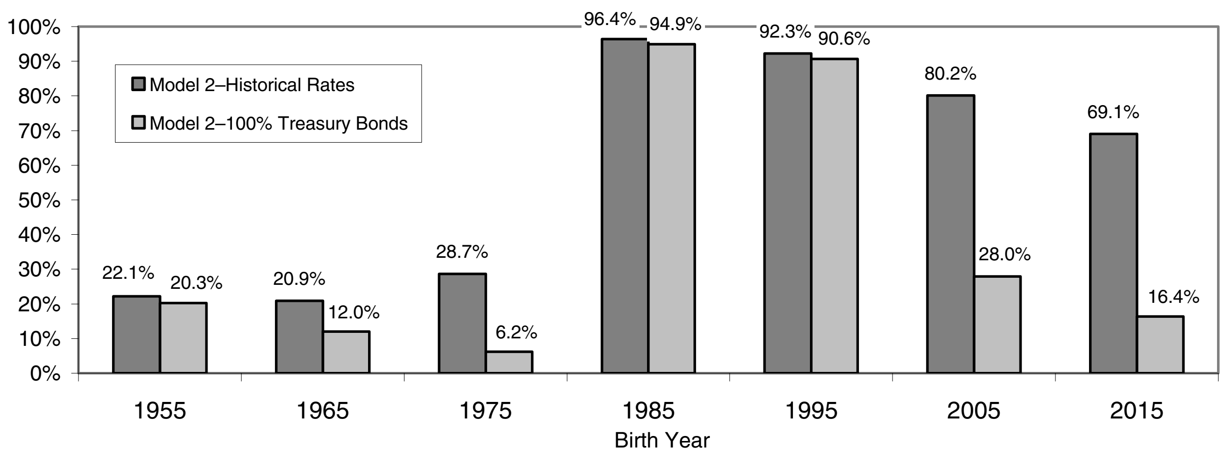
Percentage of Individuals Who Would Have a Higher Initial Retiree Benefit Under Model 2, Assuming Both Historical Equity Market Rates of Return and 100% Treasury Bond Investment, Compared With "Current Law Benefits With Taxes Raised," by Birth Year 1955–2015



Source: Employee Benefit Research Institute analysis using GEMINI from the Policy Simulation Group.

Figure 2

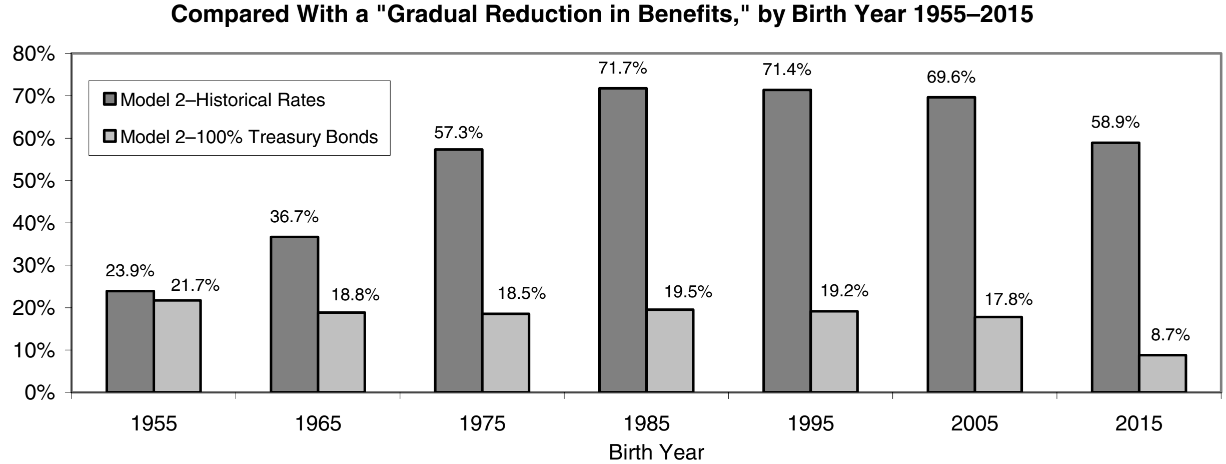
Percentage of Individuals Who Would Have a Higher Initial Retiree Benefit Under Model 2, Assuming Both Historical Equity Market Rates of Return and 100% Treasury Bond Investment, Compared With a "Cliff Reduction in Benefits" When Program Costs First Exceed Revenues, by Birth Year 1955–2015



Source: Employee Benefit Research Institute analysis using GEMINI from the Policy Simulation Group.

Figure 3

Percentage of Individuals Who Would Have a Higher Initial Retiree Benefit Under Model 2, Assuming Both Historical Equity Market Rates of Return and 100% Treasury Bond Investment, Compared With a "Gradual Reduction in Benefits," by Birth Year 1955–2015



Source: Employee Benefit Research Institute analysis using GEMINI from the Policy Simulation Group.

median difference in benefits between the gradual reduction in benefits option and Model 2 is at least 9.0 percent lower under Model 2 for each of the birth years. In comparison with the cliff reduction in benefits, the median difference is still positive under Model 2 with all-Treasury bond investments (Model 2 benefits being higher), but at a much lower level than under equity investments with historical rates assumed. This median difference becomes negative (cliff-reduction benefits are higher) for those born in 2005, unlike the situation under historical equity market rates.

Other Comparison Measures

While initial retiree benefits under the various options are important, they are not the only comparison measure. Another is the relative cost of providing the different benefit levels. A measurement of this cost is a ratio of benefits received to the taxes paid. The current-law benefits with taxes raised option does not compare as well when using the benefits-to-taxes paid measure because the taxes paid by higher earners are increased. For example, for those born in 1985, 32.1 percent would receive a higher benefit under the current-law benefits with taxes raised option, but 43.5 percent would have a higher benefit-to-taxes ratio under Model 2 (Figure 6). Consequently, some of the individuals who received higher benefits under the current-law benefits with taxes raised option had to pay more in taxes than the amount received back as benefits from those higher taxes.

For the other two options, the ratio of benefits-to-taxes comparison does not provide significant new information, as the tax rates across those options are all the same. Consequently, the percentage with higher benefits would translate to the percentage with higher benefit-to-tax ratios.[11]

Characteristic Effects

All individuals within a birth year who receive retiree benefits would not have the same likelihood of having a higher initial benefit or higher benefit-to-tax ratio under any single Social Security reform option. Demographic and economic characteristics of individuals within a particular birth year play an important role: Everybody has different characteristics, even if they are the same age.

The characteristic that has the largest impact on Social Security benefits is the amount of earnings that the individual receives over his or her career (Figure 7). When ranking individuals by career earnings, those who earned the least were more likely to have a higher benefit under Model 2 relative to current-law benefits with taxes raised than those with higher earnings (46.8 percent of the lowest-earners would have a higher benefit under Model 2, compared with 11.6 percent of the highest-earners). In contrast, those in lower- and highest-income ranks were more likely to have a higher benefit-to-tax ratio under Model 2 (approximately 50 percent) than those in the middle-income ranks (around 40 percent).[12]

Longer Time Horizon for Determining Actuarial Balance

If a longer horizon for the testing of solvency is used (beyond the current 75-year period used to gauge actuarial balance of the Social Security program), the results for the current-law benefits with taxes raised option and Model 2 diverge significantly. Over 150 years, the current–law/taxes raised option goes into a deficit, while the Model 2 option goes into a surplus.

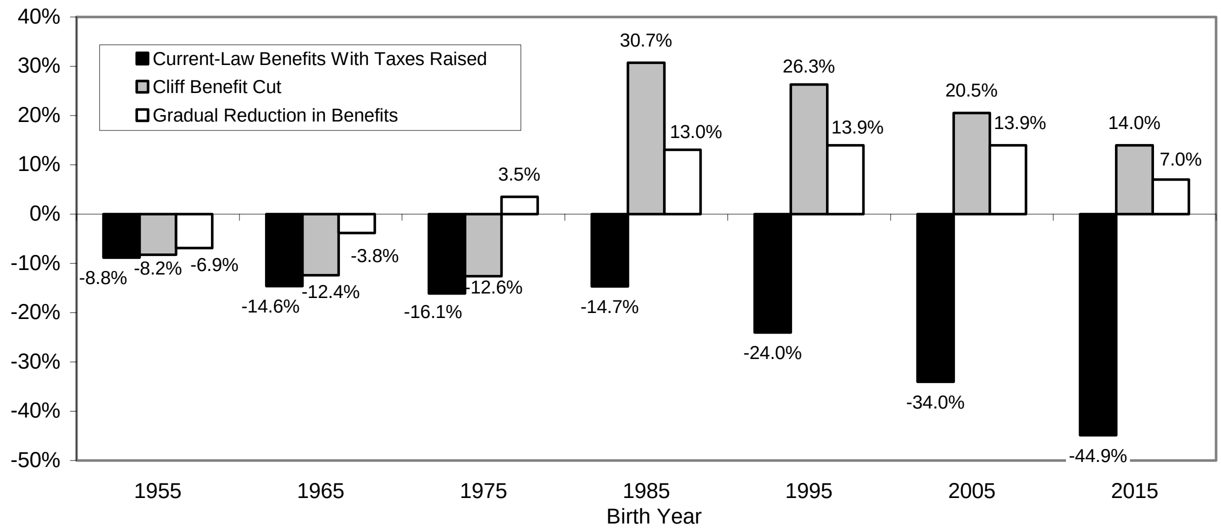
For purposes of this longer time horizon analysis, a few ad hoc adjustments are made to these two options to achieve a zero actuarial balance over the 150 years. The adjustment to the current-law option to account for longevity is a reduction in benefits by reducing benefits cumulatively by reducing the primary insurance amount (PIA) factors (used to determine benefits) by 2 percent per year from 2081 to 2100 and then leaving the PIA factors at their 2100 level for the remainder of the 150 years. Model 2 adjustments include: switching back to wage indexing and a reduction of the payroll tax by 3 percentage points starting in 2081.

With these adjustments, the comparison of benefits and benefit-to-tax ratios change dramatically under a 150-year actuarial balance scenario. Individuals born in 2050 have a 50/50 likelihood of having a higher benefit under current law and Model 2 with these adjustments (Figure 8). However, the benefit-to-tax ratio will be higher under Model 2 for at least 80 percent for individuals born in 2040 or after.[13]

Figure 4

Median Percentage Difference in Initial Retiree Benefits Under Model 2 Relative to "Current-Law Benefits With Taxes Raised," "Cliff Benefit Cut," and "Gradual Reduction in Benefits," by Birth Year 1955–2015

(Historical Equity Market Returns)

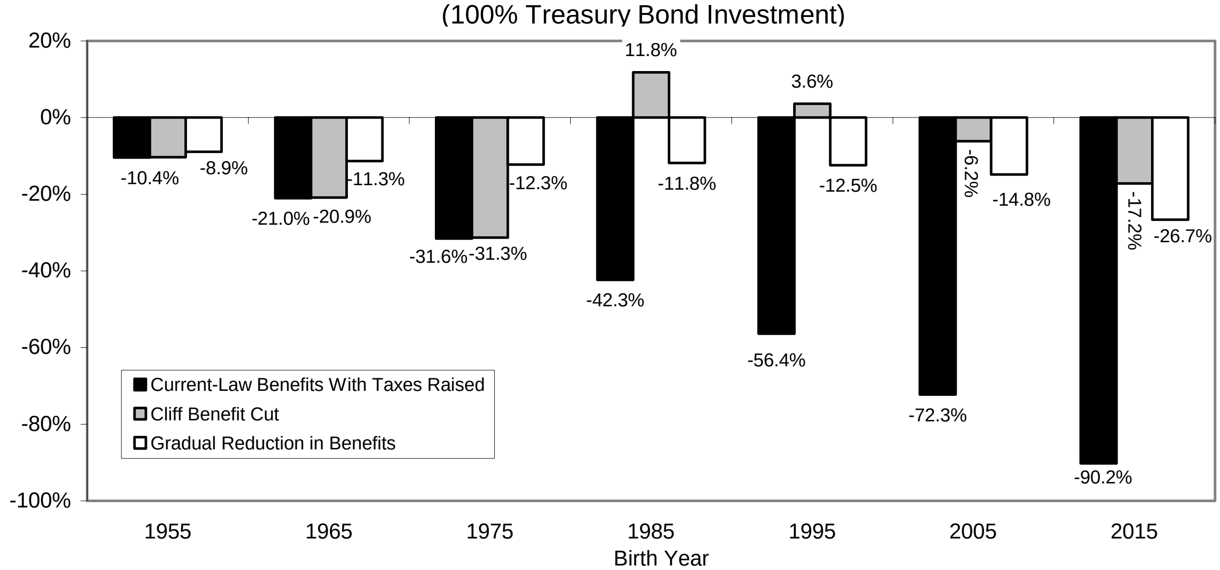


Source: Employee Benefit Research Institute analysis using GEMINI from the Policy Simulation Group.

Figure 5

Median Percentage Difference in Initial Retiree Benefits Under Model 2 Relative to "Current-Law Benefits With Taxes Raised," "Cliff Benefit Cut," and "Gradual Reduction in Benefits," by Birth Year 1955–2015

(100% Treasury Bond Investment)



Source: Employee Benefit Research Institute analysis using GEMINI from the Policy Simulation Group.

Range of Benefits in Individual Accounts

The benefits that would result from an individual account plan are not solely dependent upon an individual's earnings history, as they are currently. Other factors would affect an individual's ultimate benefit: First, the costs of *administering the account* could have a significant effect on the benefit, if they are not controlled. Second, the *rates of return* on the invested assets in the account would also greatly affect the ultimate benefit an individual receives. The section above used two examples of investment assumptions for the individual account plan—historical equity rates of return, and 100 percent Treasury bond investment (to account for investment risk). However, for the historical rates of return, only one outcome for each individual was compared with the outcomes under the other options, not the entire range of benefits that could result for a given individual. The range of benefits that could result from each of these two factors is presented next.

Administrative Cost Effect

To show the potential impact of administrative costs on total benefits from an individual account plan, two alternative sets of assumptions for the costs of administering the individual accounts and for providing annuities from these accounts are used. The baseline assumptions for this analysis of Model 2 are that the accounts would be administered for 30 basis points annually (0.30 percent of assets), with no loading factor for the provision of the annuity. The first set of higher assumptions is 60 basis points (0.60 percent) for administration and a 5 percent annuity loading factor, while the second set of higher assumptions is 90 basis points (0.90 percent) and 10 percent, respectively.[14]

Using the benefits from Model 2 for those born in 2015 and assuming historical equity market returns, individuals who receive the median benefit would have their benefits reduced by 6.0 percent for the first set of higher assumptions (60 basis points/5 percent loading factor) and 11.5 percent for the second set of higher assumptions (90 basis points/10 percent loading factor) (Figure 9). Those receiving the highest 5 percent of benefits would have their benefits reduced by 7.6 percent and 14.1 percent, respectively.

Range of Benefit Outcomes Due Equity Returns

The two outcomes for the Model 2 results (historic equity returns/100 percent Treasury bonds) are only two of the many possibilities that could result for benefit levels and replacement rates for these stylized earners. The benefits from the historical equity return figures are the average benefits over 1,000 possible scenarios of equity return paths that result from a distribution of possible outcomes created from the historical returns. Since numerous outcomes could result on the basis of the distribution of returns created from historical returns, an entire range of benefit levels could result due to the uncertainty of future equity returns. For the average earner born in 1985 under Model 2, the benefit would range from $15,000 for a low-market outcome to $34,700 for a high-market outcome (Figure 10).[15] The range of outcomes widens with time; for those born 2005, the benefit outcomes would range from $15,800 to $43,400, depending on low/high market results.

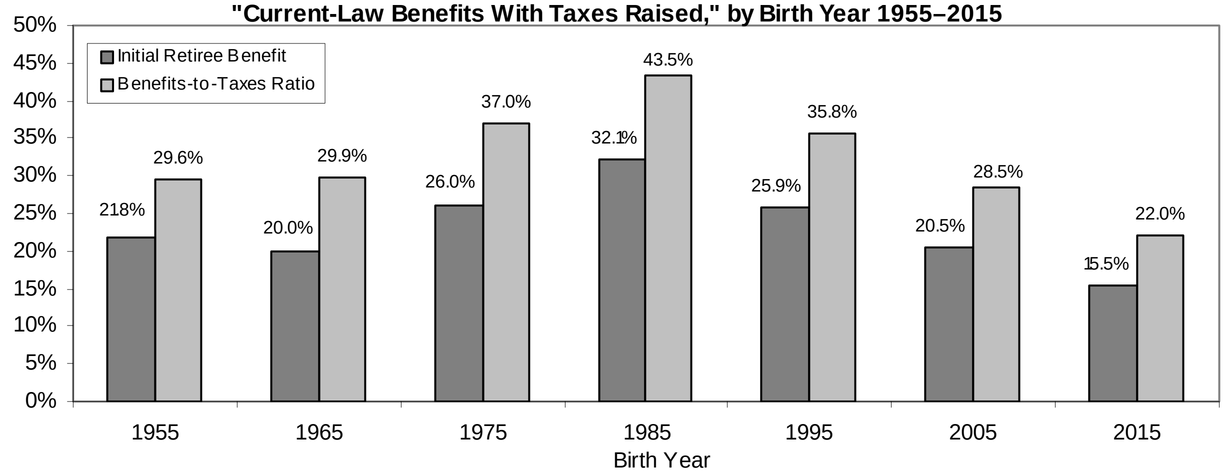
Since the benefits would face a possible range of values, the resulting replacement rates from those benefit levels would also have a range of possible outcomes. For average earners born in 1955, when not many of their working years would be covered by the individual account, the range of possible replacement outcomes is rather narrow—34.9 percent to 37.4 percent (Figure 11). But for younger workers who would have more of their working years covered by the individual account, the ranges broaden. For those born in 1985, replacement rates range from 26.6 percent to 61.6 percent, while for those born in 2015, the range goes from 20.3 percent to 55.8 percent.

Percentage of Total Benefit Coming From the Defined Benefit Portion

Most individual account plans (including Model 2) would derive part of the total Social Security benefit from the individual account and part from the traditional defined benefit portion. The relative percentages of the benefit portions indicate how much of the total benefit would be dependent upon equity market returns (and investment decisions) as opposed to the defined benefit formula. For each subsequent generation of workers, the defined benefit portion under Model 2 becomes smaller for two reasons. First, their individual

Figure 6

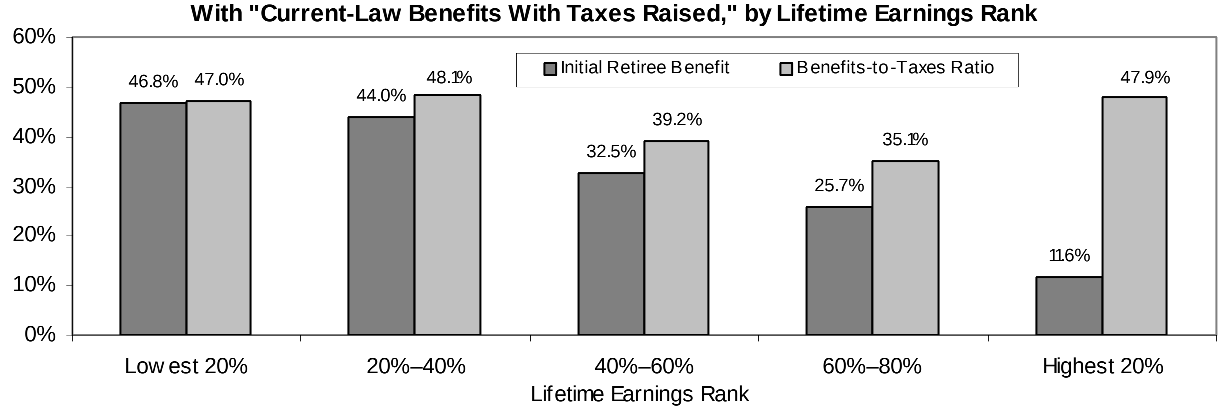
Percentage of Individuals Who Would Have a Higher Initial Retiree Benefit, and Ratio of the Present Value of OASI Benefits Received to OASI Taxes Paid Under Model 2, Assuming Historical Equity Market Rates of Return, Compared With "Current-Law Benefits With Taxes Raised," by Birth Year 1955–2015



Source: Employee Benefit Research Institute analysis using GEMINI from the Policy Simulation Group.

Figure 7

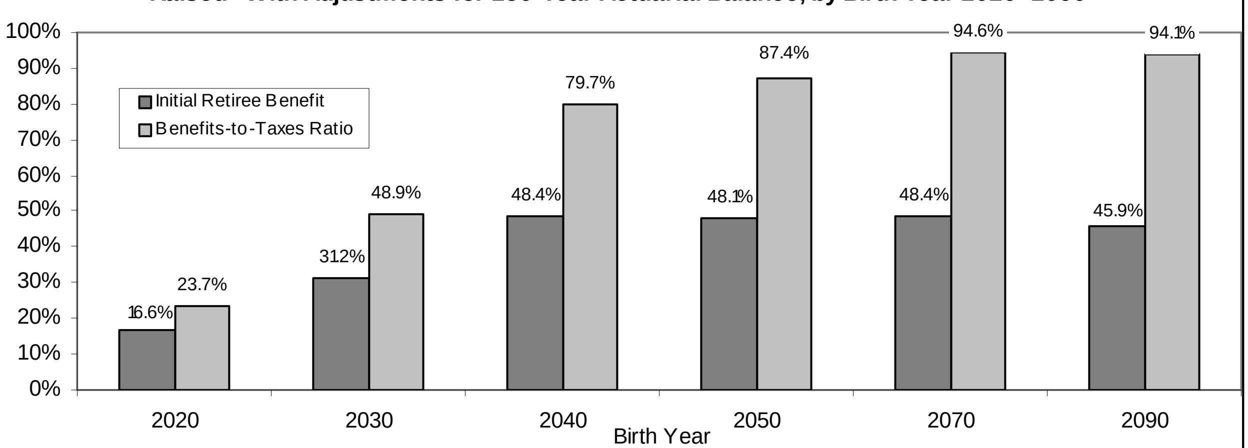
Percentage of Individuals Born in 1985 Who Would Have a Higher Initial Retiree Benefit, and Ratio of the Present Value of OASI Benefits Received to OASI Taxes Paid Under Model 2, Assuming Historical Equity Market Rates of Return, Compared With "Current-Law Benefits With Taxes Raised," by Lifetime Earnings Rank



Source: Employee Benefit Research Institute analysis using GEMINI from the Policy Simulation Group.

Figure 8

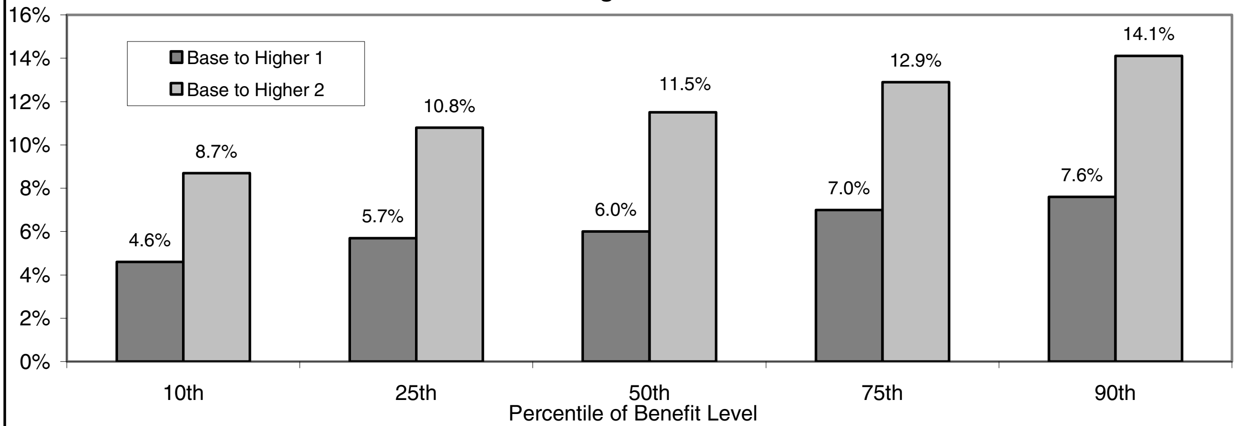
Percentage of Individuals Who Would Have a Higher Initial Retiree Benefit, and Ratio of the Present Value of OASI Benefits Received to OASI Taxes Paid Under Model 2, With Adjustments for 150-Year Actuarial Balance Assuming Historical Equity Market Rates of Return, Compared With "Current-Law Benefits With Taxes Raised" With Adjustments for 150-Year Actuarial Balance, by Birth Year 2020–2090



Source: Employee Benefit Research Institute analysis using GEMINI from the Policy Simulation Group.

Figure 9

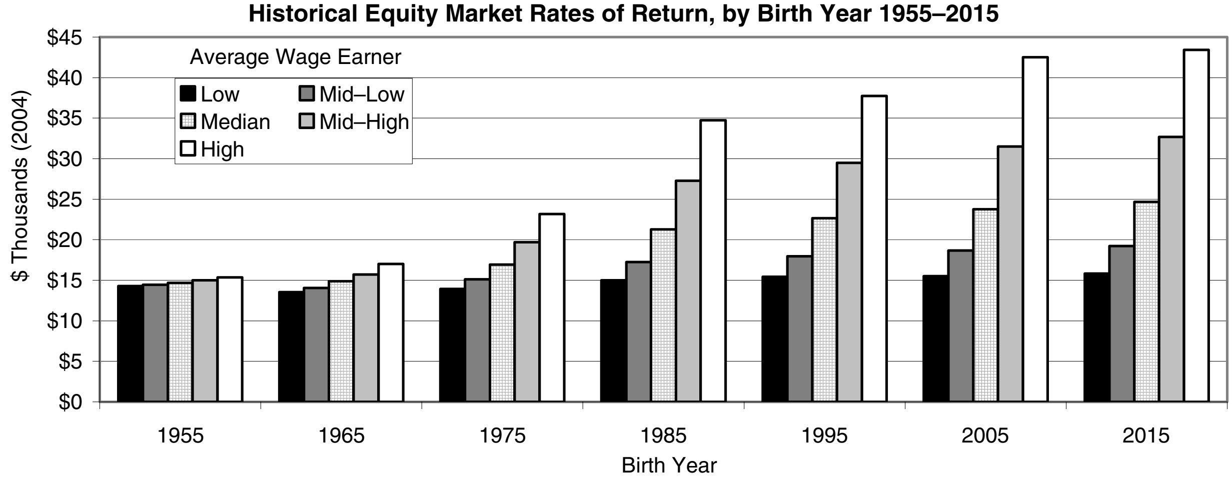
Percentage Reduction in Initial Retiree Benefit Under Model 2, Assuming Historical Equity Market Returns When Going From Base Administrative Costs to Higher dministrative Cost: Examples For Various Percentiles of the Resulting Benefit Levels for Those Born in 2015



Source: Employee Benefit Research Institute analysis using GEMINI from the Policy Simulation Group.

Figure 10

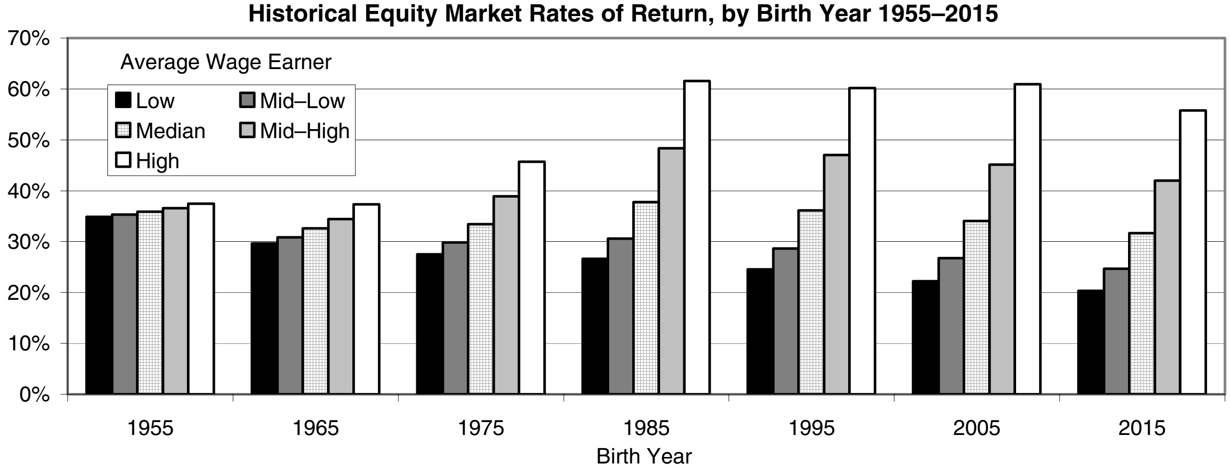
Range of Initial Retiree Benefits for the Average Wage Earner (From Low to High), Resulting Equity Market Rates of Return Under Model 2 Assuming Historical Equity Market Rates of Return, by Birth Year 1955–2015



Source: Employee Benefit Research Institute analysis using SSASIM from the Policy Simulation Group.

Figure 11

Range of Replacement Rates for the Average Wage Earner (From Low to High), Resulting Equity Market Rates of Return Under Model 2 Assuming Historical Equity Market Rates of Return, by Birth Year 1955–2015



Source: Employee Benefit Research Institute analysis using SSASIM from the Policy Simulation Group.

account becomes larger because they have been in the system longer and more money can be contributed due to the indexing of the maximum contribution. Second, Model 2's movement from wage to price indexing reduces the relative amount of the defined benefit portion. Furthermore, the percentage of the defined benefit portion is different across the lifetime earnings of workers: Those with lower or higher lifetime earnings have higher percentages of defined benefit portions of their Social Security benefit, while those in the middle have lower percentages. This is a result of the maximum contribution limit within the plan.

These general results are illustrated in Figures 12–14, which show the percentage of the total benefits deriving from the defined benefit portion under Model 2, assuming both historical equity returns and 100 percent Treasury bond investment, by lifetime earnings rank for those born in 1955, 1985, and 2015. For those born in 1955, approximately 95 percent of the total benefit is from the defined benefit portion because of the short period of accumulation under an individual account (Figure 12).[16] There is a slight decrease in the percentage as the earner rank increases to the middle fifth of earners, before increasing again for the highest earners.

For those born in 1985, the percentage of the defined benefit portion of the total Social Security benefit for the middle lifetime earners falls to 50 percent (when assuming historical equity market returns), while the lowest- and highest-earners' percentage would be at about 60 percent (Figure 13). These percentages are higher when assuming 100 percent investment in Treasury bonds, ranging from 63.9 percent to 74.7 percent. These defined benefit percentages fall again for those born in 2015—ranging from 39.9 percent to 52.6 percent when assuming historical equity returns, and from 53.2 percent to 66.6 percent when assuming 100 percent Treasury bond investment (Figure 14).

Conclusion

An individual account plan structured like the PCSSS Model 2 compares very favorably for the lowest earners, due to the plan's lower-earner benefit enhancement. However, the comparison for those earning above that threshold is strongly dependent on equity market returns. This becomes even more important for younger workers, who would have more years of their career under an individual account regime. One clear result is that some thoughtful action to reform Social Security taken sooner instead of later would be better for today's younger workers in terms of the benefits they are likely to receive.[17] Furthermore, a gradual reduction in benefits leads to more generations being affected by the changes, but reduces the chance of a very large impact falling on any one generation, as would happen under a cliff reduction in benefits.

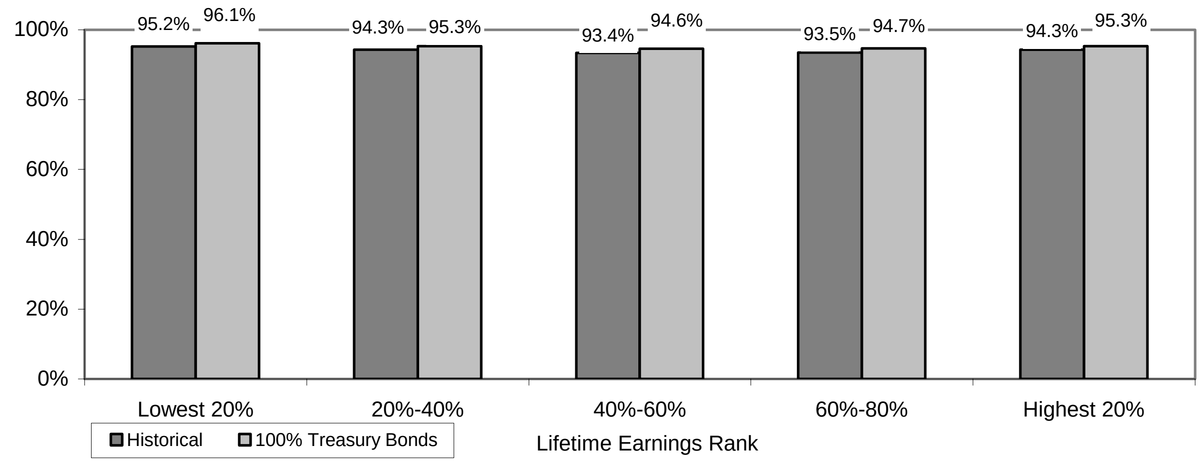
This study compares the initial benefit levels and replacement rates of various stylized workers to give a picture of the results of three basic options (raising taxes and cutting benefits suddenly or gradually) compared to an individual account plan (Model 2). However, a deficiency of this type of analysis is that virtually no worker stays at the same percentage of the average wage throughout his or her career. Furthermore, the stylized individuals do not account for these changing earnings levels. Consequently, the analysis of a sample that is representative of the entire population can determine the probability that individuals in an entire birth year will be comparable under the various options examined. In terms of the population, the individual account plan does not compare as well, particularly if historical equity returns are not repeated.

The one thing that does not result from the comparison over the 75-year actuarial balance analysis is the potential of prefunding to reduce the Social Security program's future revenue needs. In the 150-year actuarial balance analysis, the impact of this prefunding is shown to occur. However, a sizable number of individuals across birth years would experience significant benefit cuts, and even more so if historical rates of return are not repeated.

Overall, the success of an individual account type of reform will depend in large part on whether the equity market continues to produce historical rates of return, and on the willingness of policymakers to subject a generation (or generations) of retirees to benefits that are potentially lower than currently prescribed under law. Ultimately, not everyone can be better off through changes in the program—no matter *how* Social Security is changed. As demonstrated by this analysis, there is no simple answer to the question of how the options compare: Comparing the different outcomes is complex, and depends on many different factors (primarily age and income); ultimately, the options will affect different individuals in different ways.

Figure 12

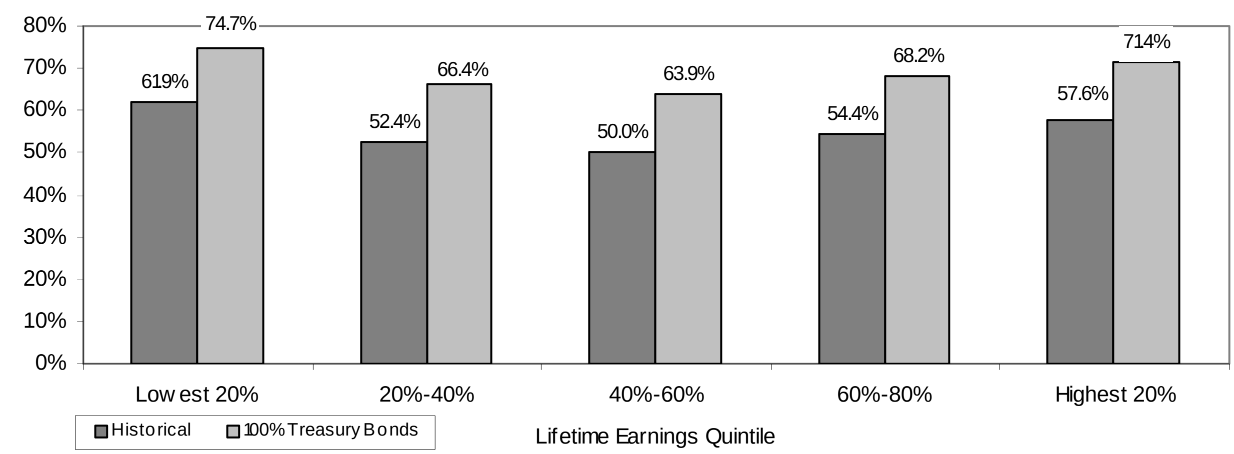
Average Percentage of Total Benefit Coming From the Defined Benefit Portion After the Offset Under Model 2, For Those Born in 1955, by Lifetime Earnings Rank and Investment Assumptions for Model 2



Source: Employee Benefit Research Institute estimates using GEMINI from the Policy Simulation Group.

Figure 13

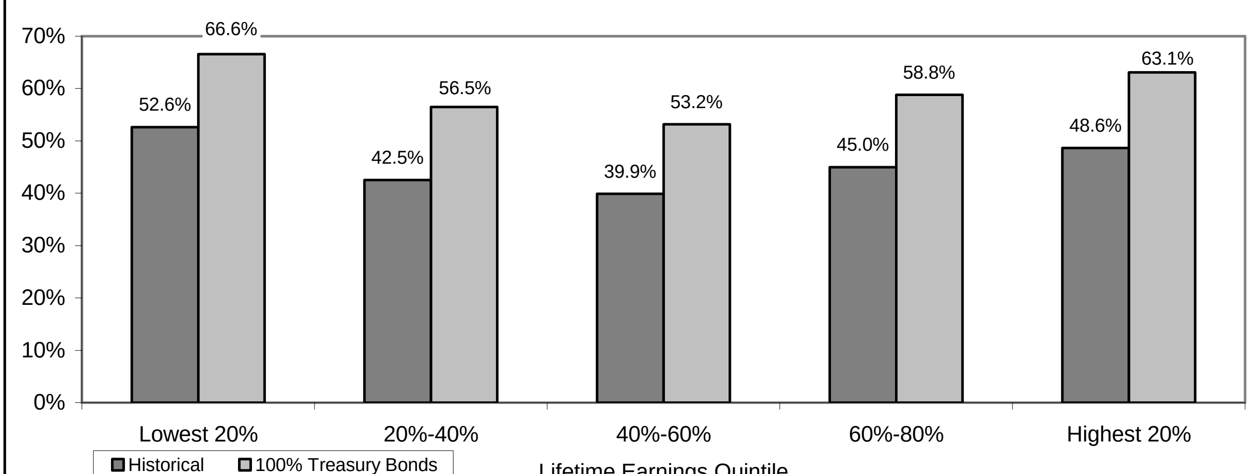
Average Percentage of Total Benefit Coming From the Defined Benefit Portion After the Offset Under Model 2, For Those Born in 1985, by Lifetime Earnings Rank and Investment Assumptions for Model 2



Source: Employee Benefit Research Institute estimates using GEMINI from the Policy Simulation Group.

Figure 14

Average Percentage of Total Benefit Coming From the Defined Benefit Portion After the Offset Under Model 2, For Those Born in 2015, by Lifetime Earnings Rank and Investment Assumptions for Model 2



Source: Employee Benefit Research Institute estimates using GEMINI from the Policy Simulation Group.

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Appendix

Comparison Options of the Study[18]

Current-Law Benefits With Taxes Raised—This option shows a fully funded option for maintaining current-law benefits over the standard 75-year evaluation period for the Social Security program. The benefits would be approximately the current-law benefits, except that those with the highest earnings would have higher benefits, as those higher-earners would be taxed under this option. Specifically, under this option, the $90,000 annual wage cap (maximum taxable earnings) that is currently in the program would be lifted, so that all earnings would be subject to the Social Security payroll tax. Furthermore, all uncovered government (state, local, and federal) workers would also be included in the Social Security system.[19] This would result in all earnings by all workers being subject to the payroll tax, without any exceptions for earnings levels or source of the earnings. Furthermore, all of these earnings would be used in the calculation of benefits.

Cliff Benefit Cut Upon Trust Fund Depletion—The cliff benefit cut option entails a one-time cut in the currently scheduled benefits for those reaching normal retirement age in 2042 (the estimated Trust Fund deletion date) and thereafter by 38 percent to eliminate the deficit in the 75-year actuarial balance. It leaves benefits unchanged for those reaching normal retirement age before 2042 and represents the outcome if no changes in costs or revenues are made before the OASDI Trust Fund projected depletion date of 2042, as reported in the *2004 OASDI Trustees Report*. Under this option, the primary insurance amount (PIA) factors that are used to calculate a beneficiary's benefit would be reduced to 62 percent of their current-law level and would remain at that level. This steep reduction in benefits would be a proxy for the commonly referred-to *payable benefits*, as the resulting benefits under this option would be reduced to match program revenues.

Gradual Reduction in Benefits Option—This option provides a midrange adjustment in benefits that allows for the current tax revenue to remain unchanged, while eliminating the deficit in the actuarial balance. Under this option, benefits would be cut in total by 33 percent by gradually reducing benefits from 2015 to

2065; in 2065, the benefits would be lower than those scheduled in current law by 33 percent. The PIA factors are cumulatively reduced by 0.66 percent each year from 2015 to 2065 until a 33 percent reduction in the factors is reached.

President's Commission to Strengthen Social Security Model 2—Model 2 is used as a proxy for an individual account program in Social Security that meets the key elements of what the Bush administration has expressed as desirable features for a potential proposal. The main attribute of the plan is a voluntary individual account option, with 4 percent of earnings being contributed up to $1,000 annually, and indexed for wage growth thereafter. The traditional defined benefit would be reduced by an amount equal to the value of a CPI-indexed life annuity purchased with a hypothetical accumulation of this account, assuming a 2 percent real rate of return.[20] Furthermore, the traditional (or defined benefit) amount calculation would be changed from wage indexing (as done currently) to price indexing, so that each subsequent generation would receive the same real level of benefits. In addition, a low-earner enhancement is added so that career minimum-wage workers would have a benefit equal to approximately 120 percent of the federal poverty level. Lastly, an increased benefit for widow(er)s would be added by increasing this benefit amount to 75 percent of the combined couple's benefit when both spouses were alive.[21]

This model is simulated under two different assumptions on the equity returns in the individual accounts. First, historical rates of return are used to define a distribution of possible returns, which then allows for the rates of return to increase and decrease annually while using what has historically occurred in the stock market to determine the range of the annual returns that the account would receive. Second, to account for the risk of investing in the equity market, an alternative is shown that has the individual account assets invested exclusively (100 percent) in Treasury bonds.[22]

Simulation Models

GEMINI is a dynamic microsimulation model for analyzing the lifetime implications of Social Security policies for a large sample of people born in the same year. Each birth-year cohort (those born in the same year) sample is generated to be representative both economically and demographically of the entire cohort, which allows for analysis of individuals with all types of worker histories and earnings patterns. Consequently, detailed information is produced about the life events and annual OASDI program experience for each individual in the cohort sample.

GEMINI was developed by the Policy Simulation Group, and their Web site contains a technical guide to the model at www.polsim.com/guide2.pdf. This model's structure is similar to that of the model the Congressional Budget Office uses for their Social Security analysis.

GEMINI is used in conjunction with SSASIM to produce its output. SSASIM is a Social Security policy simulation model under continuous development since 1994, when it was started as part of the SSA Advisory Council's work. Further development of the model has been funded by many organizations, including EBRI, SSA, GAO, AARP, IMF, Concord Coalition, and the Policy Simulation Group.

The model contains two components: a macro component to evaluate aggregate program finances, and an embedded micro component for analyzing individuals under a wide range of policy reforms, including individual accounts. The macro component operates in cell-based actuarial (CBA) mode by default or in overlapping cohorts (OLC) mode with GEMINI. Both modes allow for representation of the systemic risks facing the program using Monte Carlo simulation of 13 key demographic and economic assumptions plus equity returns. It produces output like that in the OASDI Trustees' reports.

The micro component operates in exemplary cohort individuals (ECI) mode by default, or in representative cohort sample (RCS) mode with GEMINI. Both modes use logic similar to other microsimulation models of birth-year cohorts and projects all the systemic risks simulated by the macro model onto individuals. The RCS mode (GEMINI) also represents idiosyncratic risks facing individuals regarding mortality, disability, labor-force participation, earnings fluctuations, marriage, divorce, and childbirth. A wide array of benefit adequacy and contribution return (i.e., "money's worth") statistics for individuals and couples can be produced from the model. For more technical information about SSASIM, see the technical documentation at www.polsim.com/guide.pdf.

Assumptions

The assumptions on the basic demographics and economy of the United Sates are those from the 2004 OASDI Trustees' report of the OASDI Trust Funds. For further information on those assumptions, see www.ssa.gov/OACT/TR/TR04/. However, since GEMINI's model logic follows that of the Congressional Budget Office's Social Security model, the 75-year actuarial balance is somewhat different for changes to the program relative to what would be coming from the Social Security Administration Office of the Actuary's model used in the Trustees' report. For example, the tax changes outlined for the current law benefits with taxes raised option results in a very small positive 75-year actuarial balance under GEMINI, but under the Office of the Actuary's model, a negative actuarial balance, albeit very small, would result. See the Congressional Budget Office (2004b) report on the outlook for Social Security, where a discussion of the differences in the models is included.

Distribution of the Magnitudes of Differences

In Figures A1–A6, the full distribution of the magnitude of differences between the benefit levels for each individual under Model 2 relative to the three other options is shown for three different birth years—1955, 1985, and 2015—and for the two investment assumptions of Model 2. For example in Figure A1, about 20 percent to 25 percent of the individuals had a higher benefit under Model 2 relative to each of the three options. The differences in percentage terms for those individuals are the ones on the right above zero and range from just above no difference to more than a 15 percent higher. However, for the approximately 75 percent to 80 percent of the individuals with higher benefits under the other three options, Model 2 has a benefit that is more than 10 percent less for the benefit cut options and 30 percent less for the current-law benefits with taxes raised. Each of the remaining five figures follows this set-up.

Detailed Comparisons of Model 2 and the Other Options

In Figures A7–A16, detailed comparisons of the initial retiree benefits, present value of lifetime benefits, and the ratio of retiree benefits received to OASI taxes paid are presented across birth years, investment assumptions for Model 2, and demographic characteristics of the individuals. Furthermore, these breakdowns are presented for Model 2 and current-law benefits with taxes raised with ad hoc adjustments that bring both options to a zero 150-year (longer than the standard 75-year measure) actuarial balance. These provide more insight into how individuals with certain characteristics are likely to fare under the options studied.

Endnotes

[1] The $10,000 annual salary is 27 percent of the average wage, $16,500 is 45 percent of the average wage, $36,500 is 100 percent, $55,000 is 150 percent, $72,500 is 200 percent, and $95,000 is 260 percent. Each worker maintains this percentage of the average wage throughout his or her career.

[2] See the President's Commission to Strengthen Social Security report for a further discussion of this model, as well as the other models that were offered by the commission at www.csss.gov/reports/Final_report.pdf.

[3] See the appendix for a detailed description of each of the options. None of these options are proposals, but simply options that provide benchmark levels of benefits for comparison to the individual account plan.

[4] For more information on these models, see the appendix section on simulation models or the Policy Simulation Group's Web site: www.polsim.com, the developers of the model. For SSASIM, see www.polsim.com/guide.pdf and, for GEMINI, see www.polsim.com/guide2.pdf.

[5] EBRI has done numerous studies using SSASIM. For example, see Copeland (1999) for a comparison of specific legislative proposals and Copeland (2004) for an analysis of the affects of the inflation rate assumption on the Social Security program's actuarial balance.

[6] See Hungerford (2005) for further discussion on this topic.

[7] A meaningful initial benefit and replacement rate comparison to that of the first section is not possible as earnings in reality grow at rates that are not consistent with the growth in the average wage. Therefore, because a worker is earning the average wage today, it does not follow that his or her wages in the year before retirement (or for that matter of all the years in between) can be predicted to also be at the average wage. Consequently, there is a sizable range in benefits and replacement rates for individuals earning a similar amount in any given year.

[8] For this analysis, approximately 100,000 births were simulated for each birth year, creating a large sample of different individuals with various work histories and earnings patterns.

[9] All workers are assumed to elect to participate in the individual account, so that the comparison is consistent across the plans.

[10] In appendix figures A1–A6, the complete distribution of benefit differences are presented for birth years 1955, 1985, and 2015 between Model 2 historical rates and each of the other options and Model 2 100 percent Treasury investment and each of the other options. These figures show how broadly the distribution of differences is distributed over all of the individuals in the sample. As would be expected, the distribution is broader for the comparison with Model 2, assuming historical equity market returns.

[11] In appendix figures A7–A13, initial retiree benefits, present value of life-time benefits, and the ratio of present value of benefits to the present value of OASI taxes paid are presented for the various comparisons of options to Model 2 under historical equity market returns and 100 percent Treasury investment.

[12] In appendix figures A7–A13, initial retiree benefits, present value of life-time benefits, and the ratio of present value of benefits to the present value of OASI taxes paid are presented for the various comparisons of options to Model 2 under historical equity market returns and 100 percent Treasury investment. These figures include a breakdown for gender, educational attainment, and lifetime earnings rank.

[13] In appendix figures A14–A16, the percentage of both the initial retiree benefit levels and the ratio of the present value of benefits to the present value of OASI taxes that are higher under Model 2 with the 150-year actuarial balance adjustments are presented. These percentages are broken down across the worker characteristics previously listed.

[14] Each set of administrative cost assumptions are strictly for comparison purposes and are not intended to be a prediction of possible outcomes for these costs.

[15] The benefit levels presented in the figure are the 10th percentile of benefits, 25th percentile, 50th percentile, 75th percentile, and 90th percentile. Or, stated differently, the low outcome is the benefit level that corresponds to the benefit where only 10 percent of the 1,000 scenarios resulted in a lower benefit, the mid-low benefit level is where only 25 percent of the resulting benefits were less, etc.

[16] This defined benefit percentage is calculated for each earnings group by averaging the defined benefit portion of the total benefit over every beneficiary in each of the earnings groups. Consequently, not every member of a specific earnings group would have the exact percentage of that reported in the figure.

[17] This study does not look at the budget impact of these various options. The Congressional Budget Office (CBO) did a budgetary analysis of the PCSSS Model 2: See www.cbo.gov/ftpdocs/56xx/doc5666/07-21-CraigLetterUpdated.pdf.

[18] None these options should be construed as a proposal by any group or favored by any group. They were simply selected to provide benchmark levels of benefits for comparison with the individual account plan.

[19] The removal of the wage cap eliminates approximately 90 percent of the deficit in the actuarial balance under the methodology used in this study, while the coverage of the government workers eliminates the remainder. The use of this option in this study in no way advocating for such a change (nor is it for any of the other options), as there are many factors associated with these tax increases that are not accounted for by comparing Social Security benefits. This option is an empirically simple way to show funded current-law benefits for a benchmark comparison to other options.

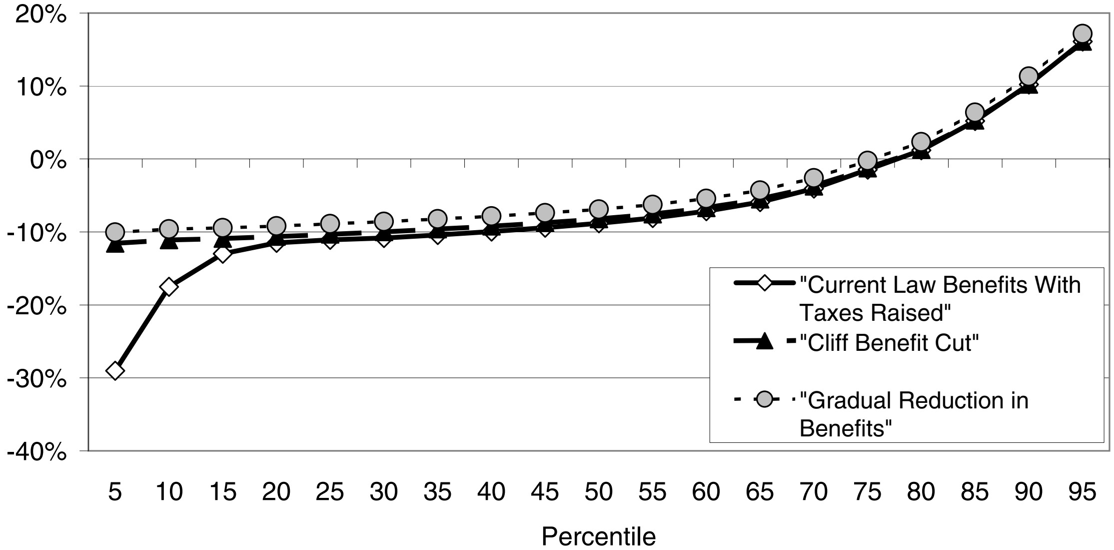
[20] This 2 percent real rate of return for the offset calculation is lower than the assumption for the real Treasury bond rate. Consequently, there has been discussion within the Bush administration of increasing the offset real rate of return to 3 percent to match the Treasury bond assumption rate. With the higher offset rate, the results for each of the Model 2 comparison percentages would decrease as benefits under Model 2 would decrease as more of the defined benefit amount would be offset due to the higher offset rate.

[21] See the President's Commission to Strengthen Social Security for a further discussion on this model, as well as the other models that were offered by the commission at www.csss.gov/reports/Final_report.pdf.

[22] See Holmer (2005), "Introductory Guide to SSASIM," for a description of the stochastic estimation of equity market returns in SSASIM that used in this analysis. Briefly, the process for generating the equity returns is a lognormal fixed-mean random walk with a mean of 6.5 percent and standard deviation of 20.27 percent, historical values from 1926 to 1990. Under a 55 percent equity and 45 percent Treasury bond asset allocation, the expected rate of return under the accounts in this analysis would match the 4.9 percent rate of return used in the PCSSS' report to evaluate Model 2. This allocation is assumed across all individuals for all of their working years. The real Treasury bond rate of return is assumed to be 3.0 percent, matching the 2004 OASDI trustees' report assumption. The 100 percent allocation to Treasury bonds is a strategy for accounting for the risk of investing the equity market in simulations, and that is what is used in the alternative assumption on asset returns.

Figure A1

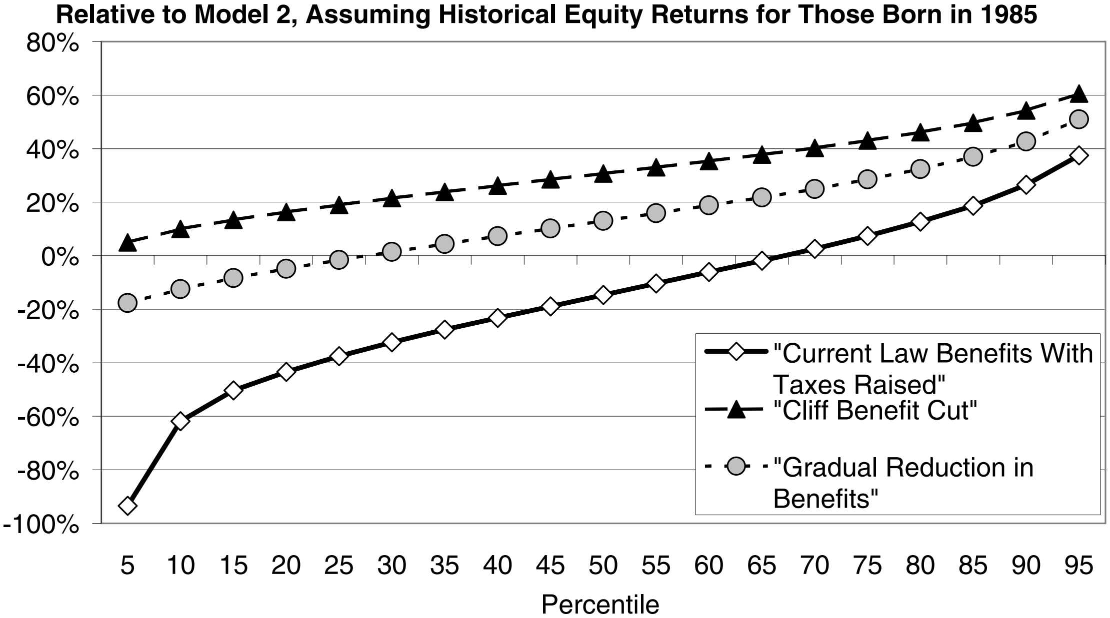
Distribution of the Percentage Differences in Initial Retiree Benefits Under "Current-Law Benefits With Taxes Raised," "Cliff Benefit Cut," and "Gradual Reduction in Benefits" Relative to Model 2, Assuming Historical Equity Returns for Those Born in 1955



Source: Employee Benefit Research Institute estimates using GEMINI from the Policy Simulation Group.

Figure A2

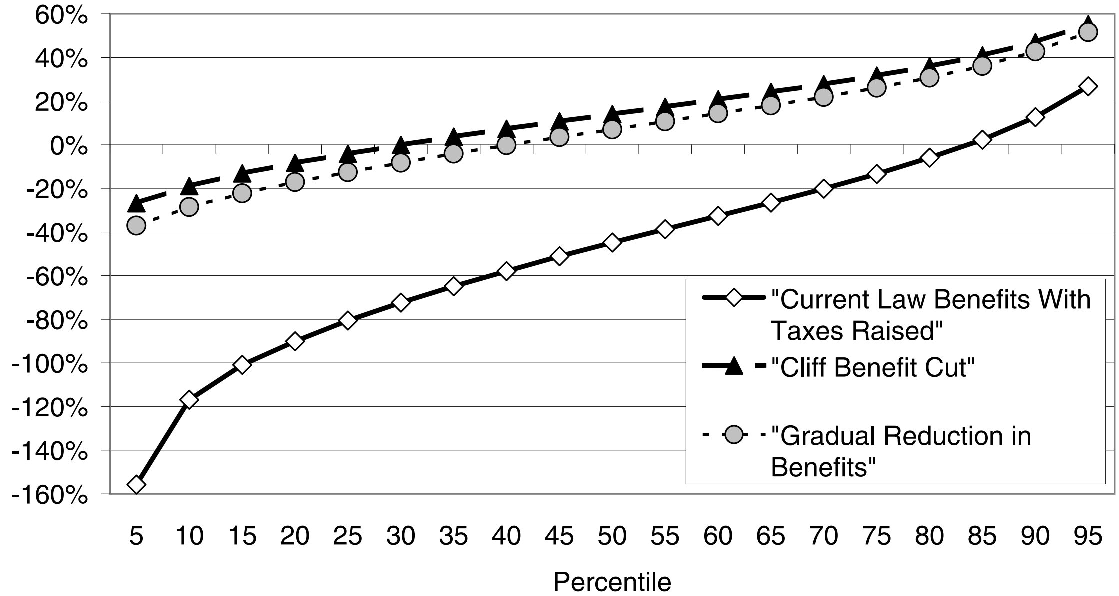
Distribution of the Percentage Differences in Initial Retiree Benefits Under "Current-Law Benefits With Taxes Raised," "Cliff Benefit Cut," and "Gradual Reduction in Benefits" Relative to Model 2, Assuming Historical Equity Returns for Those Born in 1985



Source: Employee Benefit Research Institute estimates using GEMINI from the Policy Simulation Group.

Figure A3

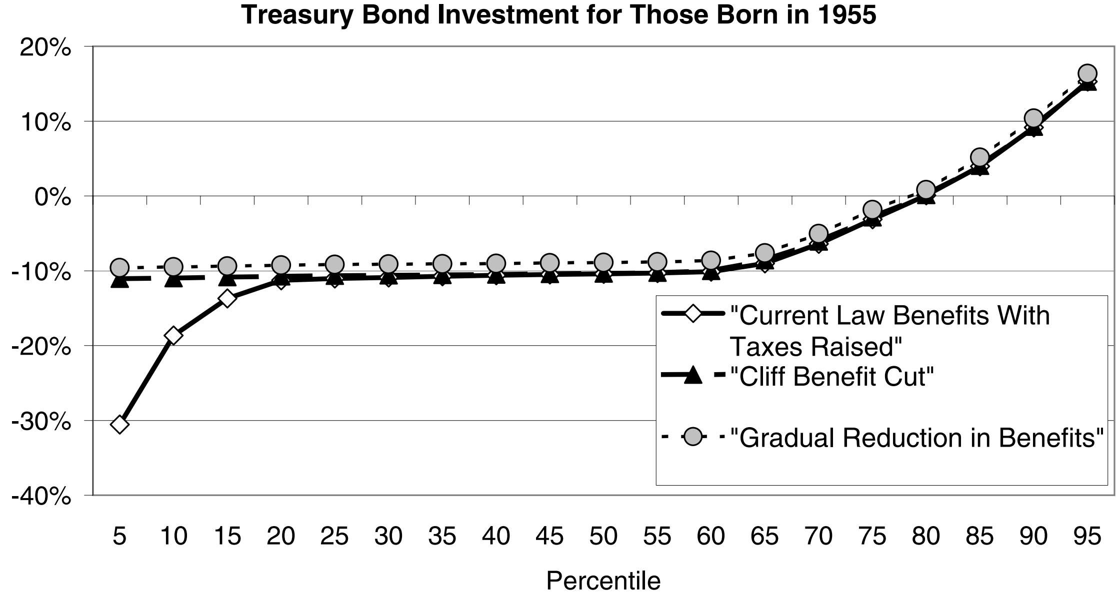
Distribution of the Percentage Differences in Initial Retiree Benefits Under "Current-Law Benefits With Taxes Raised," "Cliff Benefit Cut," and "Gradual Reduction in Benefits" Relative to Model 2, Assuming Historical Equity Returns for Those Born in 2015



Source: Employee Benefit Research Institute estimates using GEMINI from the Policy Simulation Group.

Figure A4

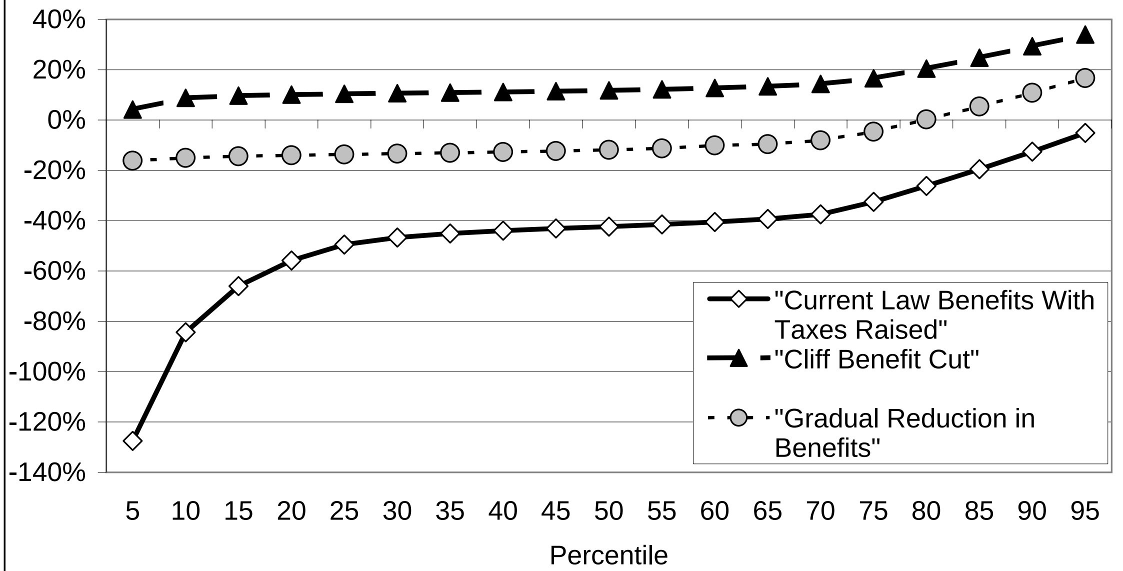
Distribution of the Percentage Differences in Initial Retiree Benefits Under "Current-Law Benefits With Taxes Raised," "Cliff Benefit Cut," and "Gradual Reduction in Benefits" Relative to Model 2, Assuming 100% Treasury Bond Investment for Those Born in 1955



Source: Employee Benefit Research Institute estimates using GEMINI from the Policy Simulation Group.

Figure A5

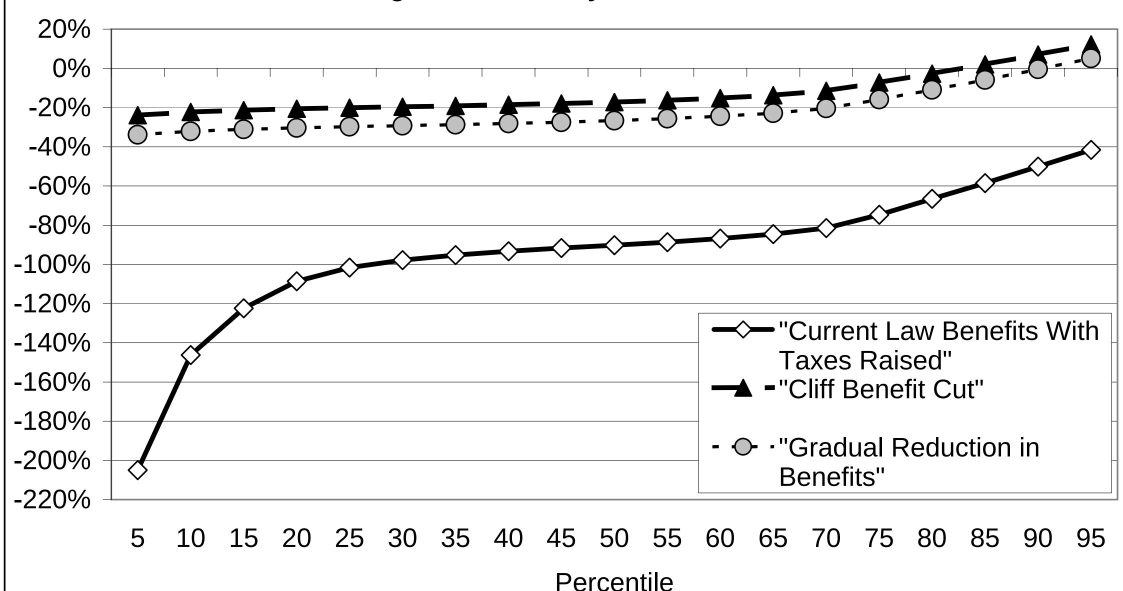
Distribution of the Percentage Differences in Initial Retiree Benefits Under "Current-Law Benefits With Taxes Raised," "Cliff Benefit Cut," and "Gradual Reduction in Benefits" Relative to Model 2, Assuming 100% Treasury Bond Investment for Those Born in 1985



Source: Employee Benefit Research Institute estimates using GEMINI from the Policy Simulation Group.

Figure A6

Distribution of the Percentage Differences in Initial Retiree Benefits Under "Current-Law Benefits With Taxes Raised," "Cliff Benefit Cut," and "Gradual Reduction in Benefits" Relative to Model 2, Assuming 100% Treasury Bond Investment for Those Born in 2015



Source: Employee Benefit Research Institute estimates using GEMINI from the Policy Simulation Group.

Figure A7

Percentage of Retirees in Various Birth Years Who Have a Higher Initial Retiree Benefit Under Model 2 Relative to "Current-Law Benefits With Taxes Raised"

	Historical Equity Market Returns							100% Treasury Bond Investment						
	Birth Year							Birth Year						
	1955	1965	1975	1985	1995	2005	2015	1955	1965	1975	1985	1995	2005	2015
All	21.9%	20.1%	26.1%	32.2%	26.0%	20.6%	15.6%	20.1%	12.1%	6.2%	0.6%	0.2%	0.0%	0.0%
Gender														
Male	22.5	20.8	27.1	32.4	25.9	20.2	15.1	21.7	14.0	7.8	0.8	0.6	0.2	0.2
Female	21.3	19.5	25.2	32.1	26.1	21.1	16.2	19.9	11.6	6.0	1.8	1.3	0.4	0.2
Education														
No HS diploma	37.6	35.7	39.3	40.4	31.8	24.5	18.6	35.8	25.3	14.2	2.0	1.1	0.4	0.3
HS diploma	28.7	28.8	34.2	39.0	31.9	25.3	19.1	27.0	19.1	10.2	1.5	1.1	0.3	0.1
Some college	18.6	15.5	21.9	30.3	24.2	19.4	14.6	17.5	8.7	4.4	1.2	0.9	0.2	0.2
College degree	12.3	10.5	17.1	23.9	19.4	15.6	11.8	12.0	5.8	3.1	1.0	0.7	0.5	0.2
Graduate degree	12.5	10.0	16.8	24.4	19.7	15.3	12.2	11.9	5.8	2.8	1.0	0.7	0.3	0.2
Lifetime Earnings Rank														
Lowest 20%	42.5	47.7	47.5	46.9	36.3	27.6	20.4	41.2	39.9	28.3	2.0	1.0	0.4	0.2
20%–40%	53.6	38.5	40.0	44.1	36.6	29.5	23.3	50.4	20.1	3.0	1.6	1.2	0.3	0.2
40%–60%	11.0	9.1	22.9	32.6	27.4	22.3	17.0	9.0	2.0	1.5	1.5	1.3	0.3	0.2
60%–80%	1.7	4.4	15.3	25.8	20.4	15.8	11.8	1.9	1.2	1.0	1.1	0.9	0.3	0.2
Highest 20%	0.7	1.0	5.0	11.7	9.4	8.0	5.7	1.2	0.6	0.4	0.5	0.3	0.4	0.3

Source: Employee Benefit Research Institute estimates using GEMINI from the Policy Simulation Group.

Figure A8

Percentage of Retirees in Various Birth Years Who Have a Higher Present Value of Lifetime Total Retiree Benefits Under Model 2 Relative to "Current-Law Benefits With Taxes Raised"

	Historical Equity Market Returns							100% Treasury Bond Investment						
	Birth Year							Birth Year						
	1955	1965	1975	1985	1995	2005	2015	1955	1965	1975	1985	1995	2005	2015
All	24.6%	21.7%	28.0%	33.8%	27.5%	21.7%	16.5%	22.3%	12.7%	6.5%	1.1%	0.2%	0.0%	0.0%
Gender														
Male	23.2	20.8	27.6	33.0	26.7	20.8	15.8	22.0	13.1	7.3	1.4	0.5	0.3	0.2
Female	26.0	22.4	28.3	34.5	28.2	22.6	17.1	23.9	13.6	7.1	2.2	0.8	0.3	0.1
Education														
No HS diploma	40.7	37.1	41.0	41.5	33.1	25.8	19.8	38.8	26.0	15.3	3.7	1.4	0.6	0.3
HS diploma	31.6	30.1	36.3	40.4	33.2	26.6	19.8	29.5	19.8	10.8	2.6	1.0	0.4	0.2
Some college	21.6	17.2	23.8	31.8	25.7	20.5	15.5	20.0	9.5	4.6	1.3	0.5	0.2	0.1
College degree	14.9	11.9	18.6	26.1	21.2	16.2	12.2	13.6	6.3	3.1	0.8	0.3	0.1	0.1
Graduate degree	14.2	11.9	18.5	25.8	21.2	16.0	13.2	13.3	6.0	3.0	1.0	0.2	0.1	0.0
Lifetime Earnings Rank														
Lowest 20%	43.7	44.1	44.3	44.8	34.9	26.9	20.0	41.9	36.4	25.1	5.1	1.8	0.7	0.4
20%–40%	55.4	40.9	42.9	45.3	37.9	30.7	24.5	52.3	23.3	6.9	2.5	1.2	0.4	0.2
40%–60%	19.3	14.8	27.4	36.1	30.2	24.5	18.7	16.1	4.4	2.2	0.8	0.2	0.1	0.1
60%–80%	4.6	7.4	18.8	29.2	23.5	17.9	13.2	3.8	2.1	1.2	0.5	0.1	0.1	0.1
Highest 20%	0.2	1.1	6.4	13.5	10.9	8.3	5.9	0.8	0.5	0.5	0.1	0.0	0.0	0.0

Source: Employee Benefit Research Institute estimates using GEMINI from the Policy Simulation Group.

Figure A9

Percentage of Retirees in Various Birth Years Whose Ratio of the Present Value of Retiree Benefit Received to OASI Taxes Paid Are Higher Under Model 2 Relative to "Current-Law Benefits With Taxes Raised"

	Historical Equity Market Returns							100% Treasury Bond Investment						
	Birth Year							Birth Year						
	1955	1965	1975	1985	1995	2005	2015	1955	1965	1975	1985	1995	2005	2015
All	29.7%	30.0%	37.1%	43.6%	35.9%	28.6%	22.1%	26.7%	17.8%	10.3%	4.6%	2.7%	1.7%	1.2%
Gender														
Male	29.2	30.0	38.0	43.9	35.6	28.0	21.6	26.4	17.9	10.4	3.9	2.2	1.5	1.0
Female	30.2	30.0	36.2	43.2	36.1	29.2	22.7	26.9	17.8	10.2	5.3	3.2	2.0	1.4
Education														
No HS diploma	42.5	39.2	43.1	44.2	35.5	28.0	21.3	39.7	26.5	15.6	4.1	1.6	0.8	0.3
HS diploma	35.1	34.8	41.0	45.7	37.9	30.5	23.1	31.7	21.8	11.8	3.9	1.9	1.1	0.6
Some college	26.6	26.0	33.5	42.6	34.9	28.2	21.7	23.5	14.2	7.9	4.5	3.1	2.0	1.4
College degree	22.8	25.6	34.4	41.6	34.7	27.4	21.4	19.9	14.0	9.2	5.4	3.5	2.3	2.0
Graduate degree	22.4	25.8	34.2	42.7	35.0	26.7	22.5	19.6	14.5	9.0	6.2	3.8	2.6	1.9
Lifetime Earnings Rank														
Lowest 20%	44.0	45.0	45.8	47.1	37.8	29.8	22.3	41.5	36.6	25.8	6.4	3.6	2.1	1.4
20%–40%	55.6	41.9	44.6	48.2	40.8	33.6	27.2	51.9	23.6	7.8	4.2	2.6	1.8	1.3
40%–60%	19.7	16.0	29.4	39.3	33.4	27.6	21.4	15.8	4.6	3.0	2.3	1.6	1.1	0.8
60%–80%	6.0	11.2	23.8	35.2	28.8	21.9	16.9	4.1	2.9	2.6	2.5	1.6	1.1	0.9
Highest 20%	23.4	35.7	41.8	48.0	38.6	30.0	22.9	20.1	21.5	12.3	7.7	4.1	2.5	1.6

Source: Employee Benefit Research Institute estimates using GEMINI from the Policy Simulation Group.

Figure A10

Percentage of Retirees in Various Birth Years Whose Initial Retiree Benefit and Ratio of the Present Value of Lifetime Benefits Received to OASI Taxes Paid Is Higher Under Model 2 Relative to the "Cliff Benefit Cut" Option

(Assuming Historical Equity Returns)

	Initial Retiree Benefit							Ratio of Present Value of Benefits to OASI Taxes						
	Birth Year							Birth Year						
	1955	1965	1975	1985	1995	2005	2015	1955	1965	1975	1985	1995	2005	2015
All	22.2%	21.0%	28.8%	96.5%	92.4%	80.3%	69.2%	25.2%	23.0%	32.4%	96.2%	93.7%	82.9%	72.5%
Gender														
Male	22.6	21.4	29.9	97.8	92.4	80.1	69.7	23.6	22.0	32.6	97.8	93.5	82.0	72.0
Female	21.9	20.5	27.7	95.3	92.4	80.4	68.6	26.7	24.0	32.2	94.7	93.9	83.8	73.0
Education														
No HS diploma	38.1	36.1	40.1	95.9	93.7	84.7	74.2	41.3	37.8	43.8	95.9	94.4	85.5	75.5
HS diploma	29.1	29.5	36.1	96.7	93.5	83.8	73.3	32.3	31.3	39.9	96.5	94.4	85.7	75.7
Some college	19.0	16.4	24.8	96.3	91.8	79.1	67.4	22.1	18.6	28.3	95.8	93.2	82.0	70.9
College degree	12.6	11.5	21.0	96.7	91.4	76.1	64.8	15.4	13.5	24.3	96.4	93.2	79.9	69.3
Graduate degree	12.7	10.9	20.6	96.9	91.1	76.0	64.6	14.5	13.7	24.5	96.6	93.0	80.0	69.8
Lifetime Earnings Rank														
Lowest 20%	43.1	48.4	48.9	94.0	94.1	86.1	76.5	44.6	45.2	48.5	93.9	94.2	85.4	75.6
20%–40%	54.2	39.5	41.4	97.0	95.5	87.2	78.2	56.4	42.1	46.0	96.6	95.9	88.4	79.9
40%–60%	11.4	9.4	23.9	96.6	91.5	78.6	68.2	19.9	15.6	29.9	96.2	93.5	82.5	72.5
60%–80%	1.8	4.9	17.0	97.3	90.7	75.4	62.6	4.9	8.6	21.5	97.1	92.7	79.9	68.2
Highest 20%	0.7	2.5	12.8	97.8	90.1	74.0	60.3	0.4	3.5	16.1	97.5	92.2	78.4	66.1

Source: Employee Benefit Research Institute estimates using GEMINI from the Policy Simulation Group.

Note: The percentage with a greater present value of lifetime benefits under the "cliff benefit cut" option is the same as the ratio of the present value of benefits to OASI taxes, since the taxes are the same under the two options.

Figure A11

Percentage of Retirees in Various Birth Years Whose Initial Retiree Benefit and Ratio of the Present Value of Lifetime Benefits Received to OASI Taxes Paid is Higher Under Model 2 Relative to the "Cliff Benefit Cut" Option

(Assuming 100% Treasury Bond Investment)

	Initial Retiree Benefit							Ratio of Present Value of Benefits to OASI Taxes						
	Birth Year							Birth Year						
	1955	1965	1975	1985	1995	2005	2015	1955	1965	1975	1985	1995	2005	2015
All	20.4%	12.1%	6.3%	95.0%	90.7%	28.1%	16.5%	22.7%	12.9%	7.8%	94.1%	92.9%	36.2%	18.7%
Gender														
Male	21.1	13.3	7.4	97.9	91.1	27.1	17.7	21.5	12.6	8.4	97.8	93.2	31.7	17.7
Female	19.7	11.0	5.4	92.3	90.4	29.0	15.3	23.9	13.2	7.2	90.5	92.7	40.7	19.6
Education														
No HS diploma	35.5	24.8	13.7	94.4	91.7	48.3	31.5	38.6	25.4	16.6	94.4	92.2	51.9	33.1
HS diploma	26.7	18.6	9.7	94.9	93.2	39.5	24.8	29.3	19.4	11.5	94.2	94.1	46.5	26.4
Some college	17.2	8.0	4.0	94.8	90.1	22.1	11.1	19.7	8.9	5.1	93.4	92.5	31.1	13.8
College degree	11.5	5.0	2.6	95.6	88.5	14.6	8.0	13.4	5.6	3.3	94.3	92.3	24.8	10.4
Graduate degree	11.3	5.1	2.2	95.6	88.4	14.6	7.1	12.8	5.7	3.2	94.6	92.4	24.6	9.8
Lifetime Earnings Rank														
Lowest 20%	41.1	39.5	28.1	90.7	88.8	63.2	47.5	41.9	36.3	28.0	90.3	87.8	60.4	43.6
20%–40%	50.5	19.7	2.4	93.9	94.5	62.5	30.1	52.5	22.9	7.5	93.2	95.1	65.0	34.4
40%–60%	8.6	1.2	0.9	95.5	92.7	8.0	1.8	15.7	3.9	2.1	94.3	94.4	26.0	7.0
60%–80%	1.2	0.4	0.4	97.0	89.4	3.6	1.7	3.2	1.5	1.0	95.7	93.7	17.6	5.0
Highest 20%	0.5	-0.2	-0.2	98.0	88.4	3.0	1.4	0.2	0.0	0.4	96.7	93.6	11.9	3.4

Source: Employee Benefit Research Institute estimates using GEMINI from the Policy Simulation Group.

Note: The percentage with a greater present value of lifetime benefits under the "cliff benefit cut" option is the same as the ratio of the present value of benefits to OASI taxes, since the taxes are the same under the two options.

Figure A12

Percentage of Retirees in Various Birth Years Whose Initial Retiree Benefit and Ratio of the Present Value of Lifetime Benefits Received to OASI Taxes Paid Is Higher Under Model 2 Relative to the "Gradual Reduction in Benefits" Option

(Assuming Historical Equity Returns)

	Initial Retiree Benefit							Ratio of Present Value of Benefits to OASI Taxes						
	Birth Year							Birth Year						
	1955	1965	1975	1985	1995	2005	2015	1955	1965	1975	1985	1995	2005	2015
All	24.0%	36.8%	57.4%	71.8%	71.5%	69.7%	59.0%	27.5%	40.5%	61.3%	75.0%	71.5%	72.8%	62.4%
Gender														
Male	24.3	36.9	58.2	72.7	72.1	70.0	59.4	26.0	39.4	61.1	75.3	74.8	72.2	61.8
Female	23.8	36.7	56.6	71.1	70.9	69.4	58.6	28.9	41.6	61.5	74.8	75.1	73.4	63.1
Education														
No HS diploma	40.5	54.4	68.6	76.9	76.4	75.1	64.2	44.2	56.9	71.1	78.5	77.9	76.3	65.4
HS diploma	31.0	46.4	64.7	76.1	76.1	74.5	64.0	34.8	49.6	67.7	78.7	78.6	76.5	66.5
Some college	20.8	32.0	54.1	70.1	69.6	68.0	56.9	24.4	35.7	58.2	73.7	73.4	71.5	60.7
College degree	14.1	25.7	48.7	67.3	66.9	64.8	53.8	17.4	30.1	53.7	71.2	71.5	69.3	58.6
Graduate degree	13.8	25.0	49.3	67.2	66.4	64.0	54.2	16.1	30.0	54.4	71.3	71.7	68.2	59.1
Lifetime Earnings Rank														
Lowest 20%	44.8	61.0	71.0	79.4	78.7	77.7	68.4	47.0	59.7	70.0	78.8	77.9	76.6	67.0
20%–40%	58.1	64.6	74.6	81.5	81.3	78.7	69.5	60.2	65.3	76.1	83.4	83.1	80.0	71.3
40%–60%	14.1	26.9	54.1	70.8	70.5	68.3	57.8	23.2	35.9	60.8	75.4	75.5	72.7	62.5
60%–80%	2.2	18.6	46.4	65.4	65.1	63.5	51.4	6.3	25.2	53.0	70.7	70.9	68.7	57.6
Highest 20%	0.9	13.0	40.9	62.1	61.9	60.4	48.0	0.8	16.5	46.5	66.9	67.4	65.9	53.9

Source: Employee Benefit Research Institute estimates using GEMINI from the Policy Simulation Group.

Note: The percentage with a greater present value of lifetime benefits under the "gradual reduction in benefits" option is the same as the ratio of the present value of benefits to OASI taxes, since the taxes are the same under the two options.

Figure A13

Percentage of Retirees in Various Birth Years Whose Initial Retiree Benefit and Ratio of the Present Value of Lifetime Benefits Received to OASI Taxes Paid Is Higher Under Model 2 Relative to the "Gradual Reduction in Benefits" Option

(Assuming 100% Treasury Bond Investment)

	Initial Retiree Benefit							Ratio of Present Value of Benefits to OASI Taxes						
	Birth Year							Birth Year						
	1955	1965	1975	1985	1995	2005	2015	1955	1965	1975	1985	1995	2005	2015
All	21.8%	18.9%	18.6%	19.6%	19.3%	17.9%	8.8%	24.5%	21.0%	21.2%	22.8%	22.8%	20.1%	9.7%
Gender														
Male	22.5	20.1	20.2	21.0	20.7	19.2	9.8	23.4	20.4	20.7	22.2	22.1	19.2	9.5
Female	21.2	17.8	17.0	18.3	17.9	16.5	7.9	25.6	21.6	21.6	23.3	23.5	21.0	9.9
Education														
No HS diploma	37.5	36.4	37.5	38.9	36.7	34.3	17.4	40.9	38.9	40.3	41.2	39.3	35.8	18.7
HS diploma	28.4	28.4	27.8	28.5	28.9	26.8	13.9	31.4	30.6	30.6	31.6	32.0	28.8	14.6
Some college	18.6	13.4	13.0	14.2	13.8	12.3	5.5	21.4	15.4	15.6	17.7	17.7	14.8	6.5
College degree	12.5	8.7	7.7	8.5	8.0	8.0	3.9	14.9	10.6	10.1	11.6	18.1	10.6	4.4
Graduate degree	12.3	8.0	7.1	9.4	8.9	8.3	3.5	13.9	9.9	9.5	12.5	12.9	10.5	4.6
Lifetime Earnings Rank														
Lowest 20%	42.4	49.2	50.2	53.4	52.3	49.4	34.0	44.1	46.8	47.4	50.4	48.6	45.9	30.4
20%–40%	54.0	42.9	41.0	41.6	41.2	35.6	7.6	56.0	45.2	44.3	44.7	44.3	38.1	12.7
40%–60%	10.7	1.9	1.2	1.5	2.0	1.9	0.9	18.5	9.3	9.2	10.3	11.3	8.2	2.6
60%–80%	1.3	0.7	0.6	0.9	0.7	1.4	1.0	3.9	3.5	4.2	6.2	6.9	5.2	1.7
Highest 20%	0.5	0.0	-0.2	0.2	0.1	1.1	0.7	0.2	0.3	0.8	2.2	3.1	3.1	1.1

Source: Employee Benefit Research Institute estimates using GEMINI from the Policy Simulation Group.

Note: The percentage with a greater present value of lifetime benefits under the "gradual reduction in benefits" option is the same as the ratio of the present value of benefits to OASI taxes, since the taxes are the same under the two options.

Figure A14

Percentage of Retirees in Various Birth Years Who Have a Higher Initial Retiree Benefit Under Model 2 Relative to "Current-Law Benefits With Taxes Raised" After Adjustments for 150-Year Actuarial Balance

	Historical Equity Market Returns						100% Treasury Bond Investment					
	Birth Year						Birth Year					
	2020	2030	2040	2050	2070	2090	2020	2030	2040	2050	2070	2090
All	16.7%	31.3%	48.5%	48.2%	48.5%	46.0%	0.2%	0.3%	5.6%	5.7%	5.7%	5.6%
Gender												
Male	16.3	31.6	49.2	48.5	48.9	46.6	0.2	0.4	6.9	6.9	6.9	6.8
Female	17.0	30.9	47.7	48.0	48.2	45.4	0.2	0.5	4.2	4.5	4.6	4.5
Education												
No HS diploma	20.4	37.6	57.7	56.4	58.3	55.6	0.2	0.3	12.0	11.6	11.5	12.5
HS diploma	20.4	37.0	56.1	55.8	56.1	53.7	0.2	0.2	8.5	8.9	9.1	8.7
Some college	15.6	29.4	46.0	45.6	46.0	43.2	0.2	0.3	3.6	3.5	3.6	3.4
College degree	12.3	24.6	40.1	40.0	39.1	36.8	0.2	0.2	2.1	2.2	2.1	2.1
Graduate degree	12.7	24.7	38.8	39.7	39.9	37.3	0.2	0.2	2.1	2.3	2.3	2.1
Lifetime Earnings Rank												
Lowest 20%	21.4	41.0	62.3	60.3	63.0	60.1	0.3	0.4	26.0	25.6	26.4	26.1
20%–40%	24.4	42.1	61.7	62.0	62.1	60.0	0.2	0.2	1.7	2.1	1.7	1.6
40%–60%	18.8	33.9	51.2	50.6	50.6	48.4	0.2	0.2	0.0	0.3	0.1	0.1
60%–80%	12.7	25.5	42.9	44.0	42.9	40.9	0.2	0.2	-0.1	0.3	0.3	0.2
Highest 20%	6.0	13.8	24.3	24.3	23.9	20.5	0.2	0.3	0.1	0.1	0.1	0.2

Source: Employee Benefit Research Institute estimates using GEMINI from the Policy Simulation Group.

Figure A15

Percentage of Retirees in Various Birth Cohorts Who Have a Higher Present Value of Total Lifetime Retiree Benefits Under Model 2 Relative to "Current-Law Benefits With Taxes Raised" After Adjustments for 150-Year Actuarial Balance

	Historical Equity Market Returns						100% Treasury Bond Investment					
	Birth Year						Birth Year					
	2020	2030	2040	2050	2070	2090	2020	2030	2040	2050	2070	2090
All	17.7%	32.9%	50.1%	50.0%	50.2%	47.6%	0.1%	0.5%	5.5%	5.8%	5.8%	5.6%
Gender												
Male	17.1	32.9	50.2	49.2	49.6	47.1	0.2	0.6	6.1	6.2	6.2	6.0
Female	18.3	33.0	50.1	50.8	50.7	48.1	0.1	0.4	4.8	5.5	5.4	5.1
Education												
No HS diploma	21.2	38.8	58.2	57.2	58.6	55.5	1.0	1.0	12.1	11.6	12.1	12.5
HS diploma	21.6	38.4	57.2	57.1	57.5	54.9	0.7	0.7	8.5	9.3	9.4	8.7
Some college	16.7	31.1	47.9	47.6	47.9	45.0	0.1	0.4	3.4	3.8	3.7	3.3
College degree	13.4	26.7	42.1	42.4	41.4	39.2	0.1	0.2	1.8	1.9	1.9	1.8
Graduate degree	13.5	26.9	41.6	42.1	41.8	40.3	0.1	0.2	1.9	2.4	2.0	2.0
Lifetime Earnings Rank												
Lowest 20%	21.1	39.6	58.8	57.3	59.5	57.1	0.3	1.0	21.9	22.3	22.7	22.3
20%–40%	25.7	43.4	62.4	63.0	63.0	60.5	0.2	0.8	4.6	5.7	5.6	5.1
40%–60%	20.7	37.0	54.9	53.7	54.2	51.8	0.1	0.3	1.5	1.6	1.6	1.3
60%–80%	14.8	29.3	47.3	48.5	47.3	45.2	0.1	0.2	1.0	1.0	1.0	0.8
Highest 20%	6.4	15.3	27.3	27.6	26.8	23.6	0.0	0.1	0.3	0.4	0.3	0.3

Source: Employee Benefit Research Institute estimates using GEMINI from the Policy Simulation Group.

Figure A16

Percentage of Retirees in Various Birth Years Whose Ratio of the Present Value of Benefits is Higher Under Model 2 Relative to Retiree Benefits Received to OASI Taxes Paid to "Current-Law Benefits With Taxes Raised" After Adjustments for 150-Year Actuarial Balance

	Historical Equity Market Returns						100% Treasury Bond Investment					
	Birth Year						Birth Year					
	2020	2030	2040	2050	2070	2090	2020	2030	2040	2050	2070	2090
All	23.8%	49.0%	79.8%	87.5%	94.7%	94.2%	1.3%	4.1%	32.1%	58.5%	93.7%	93.7%
Gender												
Male	23.6	49.9	80.5	87.9	95.4	94.9	1.1	3.8	31.9	57.1	95.2	95.3
Female	24.0	48.2	79.0	87.1	93.9	93.4	1.5	4.5	32.3	60.0	92.1	92.1
Education												
No HS diploma	23.3	48.9	80.0	87.7	94.8	94.3	0.6	2.8	40.2	65.1	93.2	93.0
HS diploma	25.3	51.1	80.8	88.2	95.0	94.4	0.8	3.1	34.3	61.8	94.1	94.3
Some college	23.3	47.9	78.7	86.2	94.3	93.7	1.6	4.5	28.1	54.2	93.5	93.2
College degree	23.2	48.1	79.8	88.3	94.6	94.3	1.7	5.3	30.9	57.0	93.5	94.0
Graduate degree	22.6	47.7	79.3	87.8	94.6	94.3	2.0	5.5	30.8	56.9	93.7	93.9
Lifetime Earnings Rank												
Lowest 20%	23.9	49.0	77.0	83.3	92.4	92.0	1.6	4.5	48.0	63.8	87.7	87.9
20%–40%	28.5	52.7	81.8	89.5	94.8	94.3	1.2	3.4	37.1	72.6	92.4	92.3
40%–60%	23.7	46.9	77.4	85.3	93.6	92.7	1.0	2.4	13.2	39.8	94.0	94.1
60%–80%	18.5	42.4	76.5	86.2	94.7	94.3	0.8	2.3	15.3	40.4	96.0	95.9
Highest 20%	24.5	54.3	86.3	93.2	97.7	97.6	1.9	8.2	47.0	76.1	98.3	98.4

Source: Employee Benefit Research Institute estimates using GEMINI from the Policy Simulation Group.

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