

**Evaluating Social Security Reforms
in the Age of Budget Deficits**

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Executive Summary

Congress is once again considering changes in Social Security in an attempt to “save” the program. Social Security benefit payments have exceeded tax revenues since 2010; the funding deficit is growing and, barring reform, will continue to grow indefinitely. Higher tax revenues are necessary to fund benefits as they are currently calculated.

When workers consider the retirement benefits they expect from Social Security they must also consider the taxes paid during their working years. Average-wage workers retiring today will have paid more Social Security taxes than they will receive in retirement benefits, so their net benefits are negative. For future workers, who will have to pay higher taxes to finance the program’s growing expenditures, net benefits will dip even lower. The system is financed on a pay-as-you-go basis where current tax payments are transferred to current retirees. Changing demographics have resulted in a reduction in the number of workers supporting each retiree and a corresponding need for higher tax rates. While the Social Security system cannot escape the ongoing demographic shift, its share of the economy can be reduced and workers can escape the higher taxes necessary to fund the current program, if the workers are willing to take lower Social Security benefits when they retire. As Congress tries to deal with this issue, many policy options are available, making it difficult to compare the alternatives.

This study introduces a methodology that provides a common ground to explore the exchange between accepting lower benefits or paying higher taxes. It addresses the question: How do current and future workers’ lifetime Social Security benefits and taxes compare under the current benefit structure, with the necessary tax increase to pay for those benefits, and an

alternative that scales back benefits such that they can be paid in the long run at the current tax rate?

Both the current program (the baseline) and the alternative achieve a balanced budget in the long run. Retaining the current benefit structure will require an immediate and permanent increase in the Social Security payroll tax of 3.3 percentage points. In contrast, a long-run balanced budget for Social Security could also be achieved with slightly less than the current tax rate and by making two benefit reforms: gradually raising the retirement age for workers who become eligible for benefits in 2023 and after, and making the benefit formula less generous for higher earning workers. Both political parties have proposed reforms with these attributes.

This report illustrates that both the current program with the taxes necessary to close its financing gap (the baseline program) and the reformed program produce comparable net results for workers across birth years and across income classes. For example,

- With the baseline program, average-earning men born in 1985 will have to pay 13.5 percent of their lifetime income in taxes and receive benefits equal to 9.6 percent of their income, resulting in a lifetime net tax of 3.8 percent (13.5 – 9.6).
- However, the same workers in the reformed program will pay a lower tax rate of 10.2 percent of their income to receive reformed benefits of 8.2 percent, resulting in a lower net lifetime tax of 2.0 percent (10.2 – 8.2).

For very low-earning men, the reforms retain the current program's progressivity. Specifically:

- In the baseline program, a very low-earning man born in 1985 will pay taxes equal to 13.5 percent of his lifetime income and receive benefits equal to 15.8 percent of his

income, resulting in positive net lifetime benefits equal to 2.4 percent of his lifetime earnings.

- In the reformed program, this worker would pay a lower tax rate of 10.2 percent of his income to receive reformed benefits of 14.5 percent, producing net lifetime benefits equal to 4.3 percent of his lifetime earnings.

These examples illustrate how the reformed program compares to the funded baseline program for two income classes born in 1985. Similar comparisons are made across all income classes, genders and birth years. Within each income class, the net results under the baseline and reformed program converge for later birth years.

The reformed and baseline programs produce similar lifetime progressivity due to the combination of the policies necessary for each to achieve solvency. The reformed program achieves solvency through the two changes in the benefit structure. The gradual rise in the retirement age affects all workers regardless of income. However, most of the reform's savings come through reduced benefits for higher earning workers. In contrast, the baseline program retains the current benefit formula, but requires a substantial payroll tax increase to achieve solvency. For lower earning workers, these higher payroll taxes outweigh the lower benefits acting through the higher retirement age component of the reformed program.

Finally, if the baseline and any reformed program are comparable in terms of net lifetime tax rates within income classes and birth years, is there a reason to prefer one to the other? The current retirement benefit structure could be fully funded with higher taxes to close the \$19.3 trillion shortfall (in present value). The funding gap could also be closed with the alternative. The reformed Old-Age and Survivor portion of the Social Security program would be about 25

percent smaller than the annual spending under the program as currently structured (baseline).

We suggest that the smaller reformed program is preferable primarily for the following reasons:

- Given the current fiscal challenges, reducing the size of the federal spending is critical in the long run.
- Collecting the higher tax revenues necessary to retain the current benefit formula inevitably produces welfare losses.
- Reducing the scope of a tax financed retirement program will result in the real prepayment of retirement benefits, leading to greater investment and higher national income.
- The reformed program can be complemented with voluntary, individually directed personal retirement accounts.

The Need for Deficit-Reducing Social Security Reforms

Social Security has been an extremely popular program over its 78 years of existence. It has provided retirement, life insurance and disability benefits to millions of workers and their families. Through the years, Congress has expanded and adjusted benefits, covering new groups of workers. Congress has also raised taxes on workers and some retirees to pay the program's costs. As the program's costs grew, so did its revenue base, as members of the Baby Boom generation matured and reached their peak annual earnings. For 26 straight years — 1984 to 2009 — Social Security payroll tax revenues exceeded its benefit payments, providing sufficient revenues to the Treasury to fund other programs in addition to Social Security benefits.

Largely driven by changes in demographics, however, Social Security has recently evolved from a system with annual surpluses to a system with annual deficits. If no changes are made, these deficits will continue in all future years. Rather than providing revenues to the rest of the federal budget, Social Security now requires \$75 billion in general revenues in addition to payroll taxes, which places considerable pressure on the overall federal budget. Historically, the debt held by the public in the United States has averaged below 40 percent of Gross Domestic Product (GDP), but is expected to reach 75 percent of GDP in 2013. As Congress considers ways to address the current federal deficit and rising future spending all programs are on the table.

In general, deficit-reducing Social Security reform can be achieved with some combination of benefit reductions and tax increases. While numerous policy options have emerged from the extensive debate on how to fix Social Security's financing, common reform proposals have included provisions to: raise the retirement age, make the benefit formula less generous for higher income workers, change the cost of living adjustment and eliminate the

ceiling on taxable income. Note that all these reform options are modifications of the current system rather than fundamental changes to it: Some parameters of the system are modified without changing the structure of the system.

The policy options frequently mentioned in recent years stand in contrast the previous era of proposed Social Security reforms that typically included an individual account component. These more aggressive proposals made sense in the past when the economic, political, fiscal and demographic conditions were ideal. A dozen years ago, the economy was growing, equity markets were booming, Social Security was running a budget surplus, and Baby Boomers were in their peak earnings years. But economic conditions have changed, and reform proposals must adjust to the current economic and political environment. Many of the earlier reform concepts relied on redirecting Social Security surpluses along with other additional savings into personal retirement accounts that would gradually replace future retirees' Social Security benefits. But deficits have now replaced surpluses, necessitating new types of reforms. Importantly, real prepayment can only be achieved if the individual account contributions reflect additional savings.

Guiding Principles for Social Security Reforms

While the current economic environment requires a new set of social security reforms aimed at reducing deficits rather than prepaying retirement, the guiding principles adopted in past proposals still apply and can be incorporated in the design and evaluation of new schemes. Simply put, these principles are intergenerational equity, intragenerational equity and efficiency.

The intergenerational equity principle states that current and future generations should be treated equally. Previous reform proposals based on prepayment adopted this principle explicitly.

They recognized that the current financing arrangement ensured that, on average, new groups of retirees and those to follow would pay more in Social Security taxes than they would receive in benefits from the program. Past reform proposals emphasized the fact that for most workers, investing the equivalent of their Social Security taxes in the capital market would make them better off. In principle, prepaying allows each generation to finance their retirement benefits by their own tax contributions. However, because the system is financed on a pay-as-you-go basis the accumulated debt in the system in the form of accrued benefits always posed a hurdle to full prepayment.

The intragenerational equity principle holds that workers with higher lifetime earnings should shoulder more of the burden of reform than those who earn less, while all workers should bear some costs. Previous prepayment reform proposals heeded this principle even in the case of personal retirement accounts. With the personal accounts, higher income workers ultimately prepaid a higher percentage of their retirement benefits than did lower income workers. Thus, the individual account proposals implicitly relied on means-testing in that the share of higher income workers' retirement benefits that was ultimately paid by taxpayers was greatly diminished.

The efficiency principle includes a host of time-tested economic lessons such as: Taxes generate welfare costs, and debt crowds out investment and impedes economic growth. Taxpayers bear the welfare costs, and those go beyond the tax revenues collected. And welfare costs include more than administration and compliance costs. Taxes cause taxpayers to change their behavior to legally reduce tax payments, and these welfare losses are associated with the distortionary effects of taxes. Tax rates, when viewed in the light of the welfare costs of taxation, as well as the percentage of the economy that is controlled by the government, should be kept as low as possible.

Government debt increases when government expenditure exceeds revenue. The government finances the deficit by issuing bonds that promise the bondholders will receive repayment of the principal plus interest. As the government absorbs resources, it crowds out capital investment. Social Security, by spending workers' contributions on current retirees, then promising workers future retirement benefits, functions exactly like government issuing bonds equal to the accrued benefits. Each year the Social Security Actuaries calculate the benefits that have already accrued to current workers and retirees. In 2012, the accrued benefits stood at \$27.1 trillion.¹ This amount equates to what a conventional pension plan would have in reserve to pay the Social Security benefits that current workers and retirees expect based on their participation in the program up to 2012, assuming a real return of 2.9 percent. (The \$27.1 trillion is the present value, assuming a 2.9 percent rate of return, after adjusting for projected inflation, of paying off the future benefits that have already been accrued.) The amount necessary to fund just the benefits of participants aged 62 and above is \$9.8 trillion, or 36 percent of the accrued benefit total of \$27.1 trillion.²

Previous prepayment proposals followed the efficiency principle by significantly reducing the required Social Security payroll taxes in the long run by paying off the accrued benefits of current participants and prepaying all future additional retirement benefits. Thus, these solutions eliminated or significantly reduced the debt implicit in a pay-as-you-go retirement program. Variants of these proposals partially prepaid Social Security benefits with higher earning workers prepaying a greater share of their benefits than lower earning workers.

¹ See "Unfunded Obligation and Transition Cost for the OASDI Program," Jason Shultz and Daniel Nickerson, Actuarial Note, Number 2012.1, July 2012, Social Security Administration, Office of the Chief Actuary.

² *Financial Reports of the United States Government, 2012*, Office of Management and the Budget, page 46.

All of the fundamental principles in the design of those individual account proposals remain relevant and can be incorporated into new, deficit-reducing Social Security reforms. Using the same guiding economic principles, the reforms studied here represent continuation of previous prepayment reform proposals in light of current economic reality.

The Baseline Program and the Solvency Tax

This paper first outlines a deficit-reducing reform that works by reducing the program's scheduled benefits. We then compare this program to the current program in terms of the outcomes for various generations and income classes within generations. To properly understand the effects of any Social Security reform, the reformed program must be compared to a before-reform baseline program.

However, the status quo expenditures and revenues cannot serve as such a baseline because the current course of Social Security is unsustainable. That is, the current program faces a financing gap, as current and growing future deficits will never be covered by future surpluses. Therefore, the status quo program cannot be compared to a reformed program with a smaller financing gap due to various deficit-reducing measures adopted in the reformed program.

In order to compare our reform proposal with the status quo benefit structure a baseline is used as a benchmark for comparison. The baseline assumes status quo benefit expenditures and covers the projected revenue shortfall with the addition of a solvency tax. This immediate and permanent tax rate increase is required to fully fund the current program. A solvency tax can be computed for any reform that does not achieve solvency on its own. While the solvency tax serves as one of many possible ways to make the status quo or a reformed program solvent, it

also meets the intergenerational equity principle, because all generations equally share the costs of paying for the financing gap.

Abrupt changes in the tax code are not without historical precedent. The 1983 reforms, which ushered in the years of Social Security surpluses, included statutory tax-rate increases, taxation of Social Security benefits, and delayed benefit reductions through increased in the full retirement age. These changes were intended to eliminate the 75-year actuarial deficit. The Social Security Trustees' Reports identify the tax rate increase that is necessary each year to make the program solvent over the next 75-year horizon and over the infinite horizon and present the results as the "actuarial balance." The infinite horizon amount represents the immediate increase in payroll taxes that would balance the program's future expenditures and revenues and the OASI portion of the infinite horizon estimate is the solvency tax used in the present study.

The 2013 Trustees Report indicates that to fund the Old Age, Survivors and Disability Insurance (OASDI) program over the next 75 years, the government must impose an immediate tax increase of 2.7 percent on taxable payroll. Further, to fund the current OASDI program permanently, a tax increase of 4 percent would be necessary.³ This is the percentage of taxable payroll that is required to cover the projected \$23.1 trillion unfunded obligation. The infinite horizon estimate is the relevant tax increase for our purposes because the proposed reforms balance the present value of benefits with the present value of tax revenues at about the current tax rate when evaluated over the infinite horizon.

³ For a discussion of the of the actuarial deficit and balance see pages 61-70 of *The 2013 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds*, May 31, 2013. Below, we limit the analysis to the OASI portion of the program and estimate the infinite horizon unfunded obligation and the tax rate increase necessary to fund OASI benefits indefinitely.

Rather than the immediate and permanent tax increase, the government could borrow to cover the current and near-future Social Security deficits, but increased borrowing then forces future generations to pay the entire financing gap. The government could implement many other options to close the financing gap in the status quo, such as an annual increase in the payroll tax rate to cover the expenditures or benefit cuts. However, alternative programs require a common denominator in order to make a meaningful comparison. Thus, a Social Security reform that identifies explicit changes to benefits or taxes and that ultimately balances the present value of all future expenditures and revenues can only be compared to a similarly balanced benchmark program.

Therefore, if currently scheduled benefits are the benchmarks to which other reforms' benefits are compared, the taxes necessary to fund these current benefits must be made explicit in the evaluation. Once the comparison identifies both the benefits and the taxes necessary to fund the reforms, we can calculate a net lifetime tax rate, defined as lifetime benefits less lifetime tax payments as a percent of lifetime income. Then, we can compare this net lifetime tax rate for each reform for individuals born in different years who had different lifetime earnings.

Ultimately, we can compare the set of all funded programs in which the present values of scheduled benefits and taxes are equal. The relevant components of such a comparison are the incidence across and within generations based on net lifetime taxes or benefits. As illustrated below, the distributional effects identified by net lifetime taxes are quite similar in both the baseline program and the reformed program with targeted benefit reductions. Importantly, however, a reform using targeted benefit reductions constrains the size of government spending, while the baseline program, with its required tax increases, expands government.

Deficit-Reducing Reforms

Four main policy options to reduce Social Security deficits are common to many recent reform proposals:

- raising the retirement age,
- making the benefit formula less generous for higher income workers (using progressive price indexing),
- changing the cost of living adjustment (COLA), and
- eliminating the taxable maximum.

This study focuses on the distributional effects of raising the retirement age combined with making the benefit formula less generous for higher income workers.

Reforms that include those two provisions — raising the retirement age and making the benefit formula more progressive — have broad appeal. Both the National Commission on Fiscal Responsibility and Reform chaired by Erskine Bowles and Alan Simpson and a plan developed by House Budget Chairman Paul Ryan contain these two provisions.⁴ While the Bowles-Simpson plan and the Ryan plan also include other provisions, we opt to illustrate the distributional effects of a reform that accomplishes a long-run balance using just these two.⁵

⁴ See “The Moment of Truth,” Report of the National Commission on Fiscal Responsibility and Reform, December 2010, pages 48-53. The report is available at: http://www.fiscalcommission.gov/sites/fiscalcommission.gov/files/documents/TheMomentofTruth12_1_2010.pdf. The plan outlined by Paul Ryan is detailed in a letter by Stephen Goss, the Chief Actuary with the Social Security Administration that summarizes the plan’s effects on the system’s finances. The letter is available at: http://www.ssa.gov/OACT/solvency/PRyan_20100427.pdf.

⁵ See “How Reforms Would Affect Social Security’s Funding Shortfalls, Total Spending, and Distribution of Benefits and Taxes,” Liqun Liu and Andrew J. Rettenmaier, NCPA Policy Report, No. 337, November 2011, for a comparison of several separate provisions.

This study has chosen to ignore the popular chained COLA reform. This reform immediately reduces the program's expenditures and thus involves current retirees as part of the solution to closing the funding gap. This is an important reform option, but changing Social Security indexing provision may ultimately include other federal programs that contain indexed thresholds, such as the tax code and various transfer programs.

Many proposals include a provision that raises the taxable maximum, seeing it as a way to immediately increase program revenues and make the program more progressive. While the increased revenues would mean additional benefits in the future, the benefit formula used by Social Security ensures that the combined effect of higher income individuals paying more in taxes and eventually getting higher benefits would, in the long run, reduce Social Security deficits.

This option seems attractive because it raises immediate revenues without requiring a tax rate increase below the maximum, and the payment of additional benefits occurs much later. In addition, this option would not affect low-income workers. However, this approach has other drawbacks and is dominated by the option of making the benefit formula more progressive.

Raising the taxable maximum and making the benefits formula less generous for high-income workers does increase those groups' net lifetime taxes. However, the former results in an even larger program in terms of future annual spending while the latter reduces the program's future annual spending. The option of eliminating the taxable maximum increases Social Security annual spending in the future by making the system reward benefits based on more earnings of high-income workers. And this increase creates a larger implicit debt in the form of new accrued benefits. Both theoretical analysis and empirical evidence show that U.S. national savings and its aggregate capital stock are lower than they would be if the system had originally

been set up as a prepaid system. Therefore, increasing the scale of the program without a prepaying reform would only further reduce productive capital investment and impede economic growth.⁶

Also, the existence of a taxable maximum means that, for workers whose earnings exceed the maximum, Social Security taxes are like lump-sum taxes in that the amount they pay is fixed. The additional Social Security taxes for workers who earn above the maximum are zero and, thus, importantly, Social Security taxes do not distort the decision of the biggest contributors to the nation's output to work more. In contrast, eliminating the taxable maximum suddenly imposes a 10.6 percent (the OASI portion) marginal tax rate on high-income earners. Although the effective marginal OASI tax rate is below the statutory level due to the formula linking OASI taxes and future benefits, it would still be substantial, especially for high-income workers. Thus, it generates additional welfare costs.

A reform featuring continued increases in the retirement age and a less generous benefit formula for higher income workers shares the burden of the reform within generations. Increases in the retirement age would mean that all workers contribute to the deficit reduction, and less generous benefits for high-income workers means that they pay for an even larger portion of the reduction.

Comparing the Baseline and Reformed System

The following exercise compares a baseline Social Security program to a reformed program that features increases in the normal retirement age and progressive price indexing. The programs are defined by their respective benefit and revenue schedules. This analysis is limited

⁶See Martin Feldstein, "Social Security, Induced Retirement and Aggregate Capital Accumulation," *Journal of Political Economy*, 82 (1974): 905-926.

to the OASI portion of Social Security. The baseline's annual expenditures are scheduled benefits based on the current benefit formula and its revenues are equal to annual current taxes plus the OASI infinite horizon actuarial balance. The reform's annual expenditures are derived from estimates made by the Social Security Administration's Office of the Actuary and annual revenues are equal to current taxes less a modest tax reduction given that the two reform provisions more than close the infinite horizon funding gap.

The Social Security actuaries identify and calculate the effects of numerous changes to the program's benefit formula, retirement age, tax sources and coverage. The most recent set of estimates, based on the 2012 Trustees Report, covered over 100 different provisions.⁷ This study analyzes the specific provisions based on the Social Security Administration's (SSA) estimates of provisions B1.3 and C1.3. The SSA summarizes each provision this way:⁸

Progressive Price Indexing

Provision B1.3 – Progressive price indexing (40th percentile) of PIA formula factors beginning with individuals newly eligible for OASDI benefits in 2019: create a new bend point at the 40th percentile of the AIME distribution of newly retired workers. Maintain current-law benefits for earners at the 40th percentile and below. Reduce the 32 and 15 percent formula factors above the 40th percentile such that the initial benefit for a worker with AIME equal to the taxable maximum grows by inflation rather than the grow in the SSA average wage index.

Retirement Age

Provision C1.3 – After the normal retirement age (NRA) reaches 67 for those age 62 in 2022, index the NRA to maintain a constant ratio of expected retirement years (life expectancy at NRA) to potential work years (NRA minus 20). We assume the NRA will increase 1 month every 2 years.

⁷ All of the provisions and estimates are available at <http://www.ssa.gov/OACT/solvency/provisions/index.html>, Office of the Chief Actuary, Social Security Administration (SSA). The Committee for a Responsible Federal Budget (CRFB) has developed a convenient web-based interactive program that allows users to compare and develop alternative reform proposals based on the SSA's scores of numerous provisions. The CRFB's interactive Social Security Reform tool is available at <http://crfb.org>.

⁸ See progressive price indexing provision B1.3 at <http://www.ssa.gov/OACT/solvency/provisions/benefitlevel.html> and retirement age provision C1.3 at <http://www.ssa.gov/OACT/solvency/provisions/retireage.html>.

The combination of these two reforms essentially eliminates the long run actuarial deficit associated with the Old-Age and Survivors Insurance (OASI) portion of the Social Security system. Figure I depicts the program's current and reformed cost and income rates.⁹ As seen in the figure, the reformed income and cost rates equalize by the end of the projection period, while the difference between the current cost rate and income rate under current law grows at the end of the horizon.

Identifying the solvency taxes necessary to maintain the current OASI benefit schedule and the reformed benefit schedule permanently requires projections beyond the Trustees' 75-year horizon into the indefinite future. Defining the solvency tax over the infinite horizon rather than a shorter period like the 75-year horizon is necessary if the program extends indefinitely and the specified tax rate is not identical to the cost rate in the long-run.¹⁰

⁹ The reformed cost and income rates are derived from the Social Security Actuaries' estimates of provisions B1.3 and C1.3. The single year estimates for 2012 are first rescaled to the 2013 estimates. The OASI portions of the program (benefits, payroll taxes, and benefit taxes) with each provision are assumed to be proportional to the OASI portions of the current program. Combining the effect of the two provisions assumes that the retirement age adjustment affects the progressively price indexed aggregate benefits in the same proportion as the retirement age adjustment of reform C1.3 affects the current scheduled benefits.

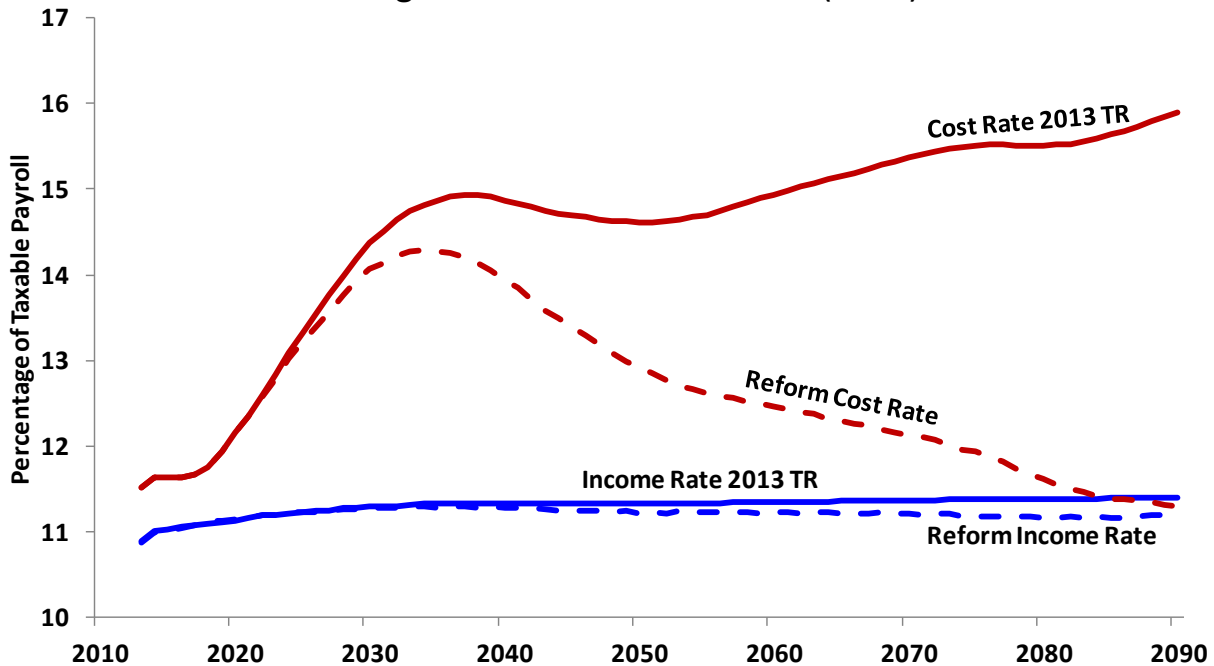
¹⁰ The infinite horizon estimates are built by extending the per capita GDP series combined with an extension of the population series as presented in *The 2013 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Funds*, May 31, 2013 and the single year tables available at: <http://www.ssa.gov/OACT/TR/2013/lrIndex.html>. The extension of the population series and the per capita GDP series are combined to produce the aggregate GDP series. The present values of our projected GDP, taxable payroll, and the OASDI unfunded obligation over the infinite horizon are benchmarked to the estimates in Table IV.B6. in the 2013 Trustees Report. The revenues and expenditures associated with the OASI of the program are the calculated for the current and reformed cost and revenue series.

Figure I

Social Security's Costs and Income

Current and Reformed Program

Old-Age and Survivors Insurance (OASI)



Source: OASI cost and income rates from the 2013 Trustees Report and reformed cost and income rates estimated by authors based on reform provisions (B1.3 and C1.3) estimates from the Social Security Administration's Office of the Chief Actuary. <http://www.ssa.gov/OACT/solvency/provisions/index.html>

Table I presents the present value of the current and reformed programs' funding deficits as well as the solvency tax rates necessary to fund the two alternatives indefinitely. The current program has a \$21,912 billion gap between benefits and tax revenues while the reformed program has a \$248 billion deficit. The trust fund offsets the deficits such that the tax necessary to make the current or baseline program solvent indefinitely is 3.29 percent of taxable payroll.¹¹

¹¹ The Trust Fund offset is included in the estimates of the solvency taxes because the tax rates identified for past contributions are based on the payroll taxes that produced the current Trust Fund balance. Also, the concept of the solvency tax, or the actuarial deficit as calculated in the Trustees Reports, implicitly assumes an ongoing Trust Fund.

Thus, the tax rate on taxable payroll will have to rise to 13.89 percent (10.6 + 3.29), to fund the current OASI program indefinitely. In contrast, the reformed program allows for a modest tax reduction of 0.4 percent of taxable payroll. The table illustrates the tradeoffs necessary to produce a solvent program. Retaining the current benefit formula indefinitely requires additional taxes while the reformed program attains solvency by reducing benefits. Therefore, the individual taxpayer must ask the question: What is the net effect of the higher taxes or lower benefits over my lifetime?

Table I
Current and Reformed Infinite Horizon OASI Deficits and
Solvency Tax Rates
(Billions in 2013)

	Deficit	Trust Fund	Shortfall	Solvency Tax Rate
Current	21,912	2,610	19,302	3.29
Reformed	248	2,610	-2,362	-0.40

Comparing Baseline and Reformed Lifetime Taxes, Benefits, and Net Benefits. With the respective solvency tax rates defined for the baseline and the reformed programs, lifetime taxes can be calculated for hypothetical workers born in different years and who have different income.¹² In the year 2013 and later, the baseline program tax rate is 13.9 percent while the reformed program's tax rate is 10.2. Historical statutory taxes rates are used for 2012 and

¹² See the Appendix for a discussion of the hypothetical earnings profiles used to estimate taxes and benefits under the two alternative programs considered here.

earlier.¹³ The additional solvency tax of 3.29 percent is but one way to identify the distribution of taxes necessary to maintain the current program's benefit structure. The immediate and permanent tax increase brings forward the cost of paying for currently scheduled benefits. Another solution would allow the higher taxes necessary to fund currently scheduled benefits to be distributed across future generations as the costs come due. That is, in the future, workers could simply pay the cost rate as depicted in Figure I. Elected officials could also postpone paying the current costs by continuing to borrow or legislate funding through general revenues — in particular by raising income taxes.

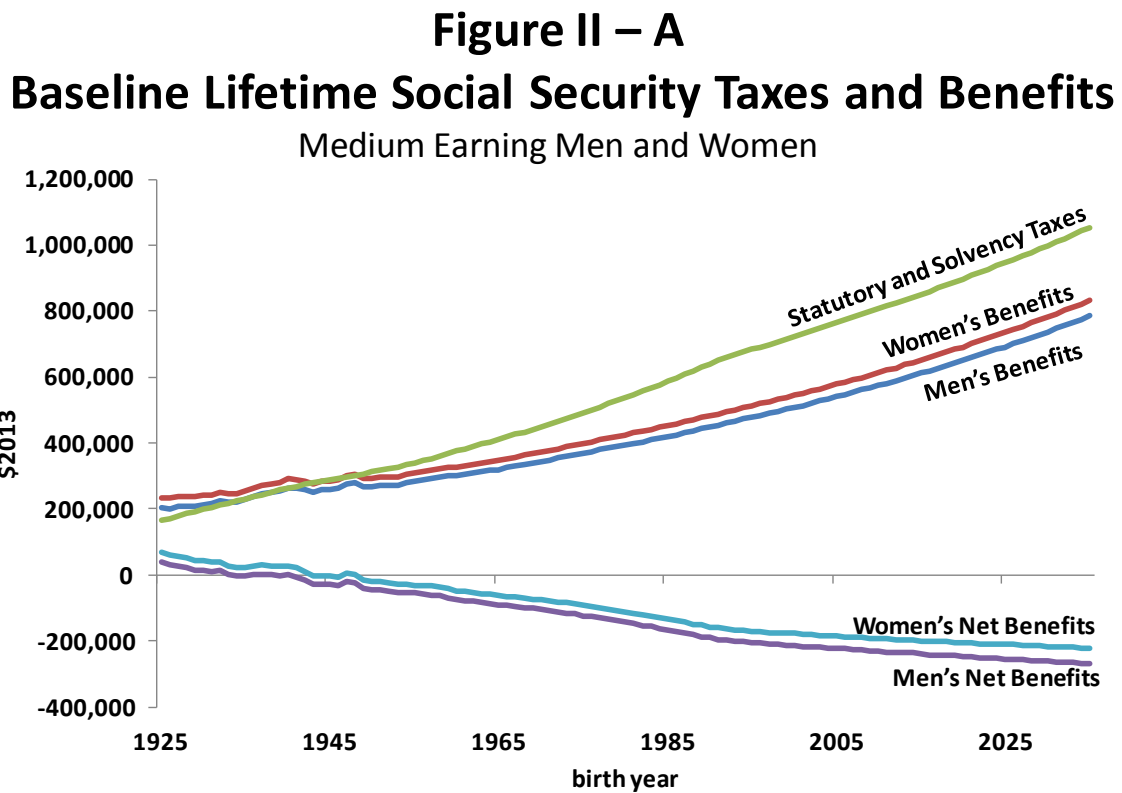
Each option has differing distributional effects on which generations pay the burden of the program. However, the immediate and permanent solvency taxes identified in Table I provide a way to identify when and on whom the necessary taxes are imposed, and it follows in the tradition of the last major reform (1983) and the Trustees' annual estimation of the actuarial balance. For the baseline program, initial benefits at the full retirement age for each type of hypothetical worker born in each year are estimated by applying the current benefit formula. For the reformed program, benefits are also estimated and are based on the two provisions that raise the full retirement age and initiates progressive price indexing at the 40th percentile.

The reform provisions considered identify when the benefit adjustments are made and on whom those adjustments fall. This study shows that the distributions of lifetime net tax rates across and within generations are similar whether the baseline or the reformed program is

¹³ For this exercise we follow convention by accounting for workers' past Social Security tax contributions as taxable wages times the past tax rates. This means that the tax contributions from 1984 to 2009 were in excess of the costs of the program. Similarly, the way we account for the solvency tax is similar to the 1983 reform in that surpluses will exist for the next 30 years, but these taxes are attributed to the workers who pay them. As specified here, the solvency tax, produces the distinct generational distribution of net benefits to which the reform's net benefits are compared and illustrates the trade-off between higher taxes and lower benefits. The other funding options that assure a long-term balanced budget will have burdens within and across generations, but the important points that meaningful comparisons of the program's net burden on workers (lifetime benefits less lifetime taxes) are limited to comparisons between fully funded programs.

chosen. And, as we argue, the reformed program is preferable, because it reduces economic distortions, boosts investment, and constrains government growth.

Figure II-A presents the lifetime taxes and benefits with the baseline program for men and women born in different years and who earn average wages. The figure depicts the present value of lifetime Social Security retirement benefits, lifetime statutory and solvency taxes and the difference between the lifetime benefits and taxes or net lifetime benefits. All present values are identified for each birth year at age 65 and are converted to 2013 dollars. [See the Appendix for the methodology used to estimate income adjusted life expectancies and the hypothetical earnings profiles.]



Authors' estimates assume income adjusted life expectancies, 2.9 percent real discount rate, present values at age 65, and benefit receipt beginning at the current or reformed normal retirement ages.

Recall that the baseline estimates retain the current benefit schedule and require the additional solvency tax of 3.29 percent. For simplicity in making estimates, we assumed that medium earning men and women have identical earnings profiles up to the specified normal retirement age. Thus, the only difference between the lifetime benefits for men and women results from their different life expectancies. [Note: These estimates are for single men and women. Results for married couples are provided in the appendix.]

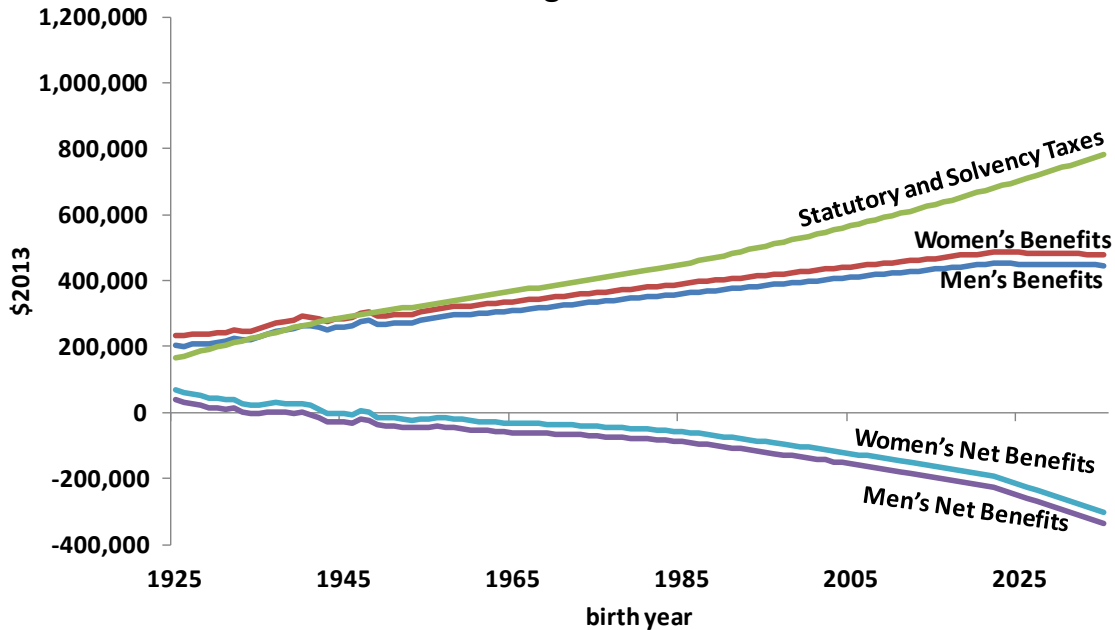
As indicated in the figure, women's lifetime benefits exceed men's due to longer life expectancies. For example, with the current benefit formula, the expected lifetime benefits for single men born in 1985 reach about \$421,000 at age 65, while the expected benefits for women are almost \$454,000. To fund the benefits through the statutory and solvency taxes, these workers would have to pay lifetime taxes that would equal \$587,000 by age 65.

As a result, medium earning workers under the baseline program pay more in taxes than they receive in benefits. Medium earning men born in 1985 would pay \$167,000 and women pay \$134,000 more in taxes than they receive in benefits. This is the result of pay-as-you-go financing in which the implied return is lower than the 2.9% discount rate used to make these present value calculations. However, the negative net benefits are not just the result of adding the solvency tax to the equation. In general, medium earning men born in 1934 (79 today) and later and women born in 1943 (70 today) and later have already experienced negative net benefits just by paying the statutory taxes over their lifetimes.

Figure II – B

Reformed Lifetime Social Security Taxes and Benefits

Medium Earning Men and Women



Authors' estimates assume income adjusted life expectancies, 2.9 percent real discount rate, present values at age 65, and benefit receipt beginning at the current or reformed normal retirement ages.

Figure II-B depicts the reformed estimates. It shows the lower lifetime benefits that result from the progressive price indexing reform combined with the retirement age increase. The lifetime benefits at age 65 for men born in 1985 are valued at \$361,000 and women's are \$391,000. These amounts are \$60,000 and \$63,000 less, respectively, than the benefits resulting from the current benefit formula. However, their lifetime taxes are \$449,000 or \$138,000 less than those necessary to fund the current benefits of the baseline program. As a result, lifetime net taxes are \$89,000 for men and \$57,000 for women. For medium earning women and men born in 1985, the reformed program's net lifetime taxes are lower than what they would be with the funded baseline program. Table II summarizes the estimates for average earning men and women under the reformed and baseline programs. [Appendix Table I and IA present results for other

income groups.] Next, we consider how the net benefits under each option depend on workers' income classes and birth years.

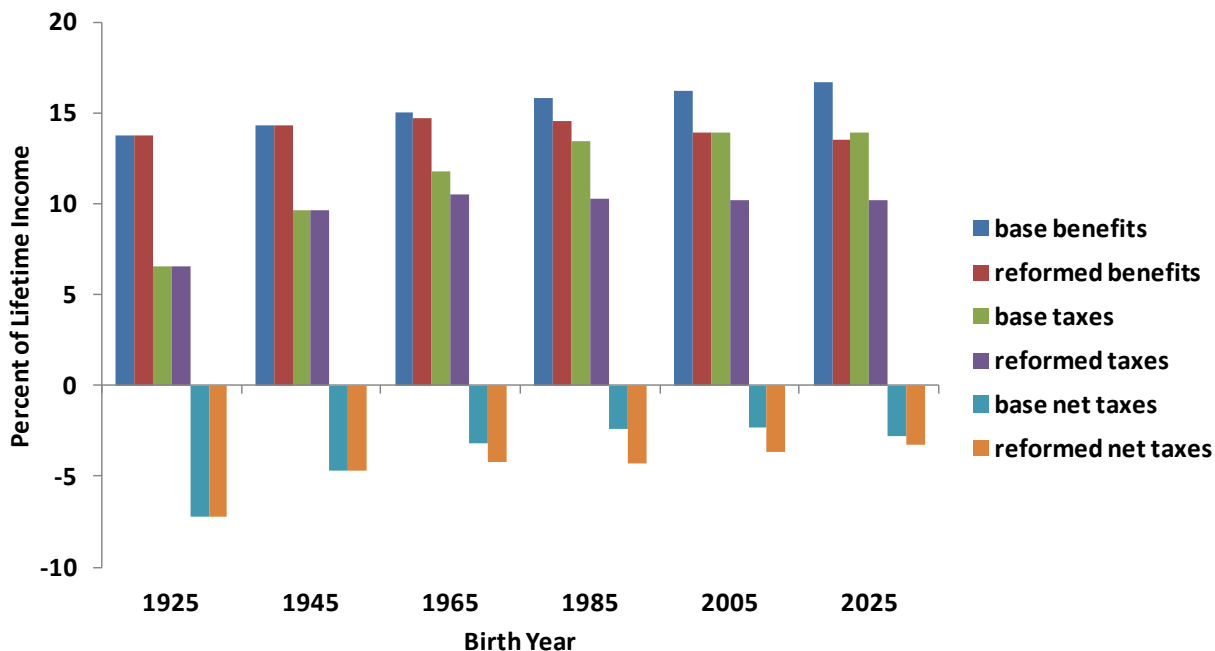
Table II

Projected Baseline and Reformed Lifetime Social Security Taxes and Benefits
Medium Earning Men and Women Born in 1985
2013 Dollars

Baseline			
	Benefits at Age 65	Taxes Paid by Age 65	Benefits Less Taxes Paid
Men	\$420,749	\$587,450	-\$166,701
Women	\$453,612	\$587,450	-\$133,838
Reformed			
Men	\$360,632	\$449,490	-\$88,858
Women	\$390,876	\$449,490	-\$58,615
Baseline Less Reformed			
Men	\$60,116	\$137,960	-\$77,843
Women	\$62,736	\$137,960	-\$75,223

Figures IIIA to III-C depict the baseline and reformed lifetime benefits, taxes and net benefits expressed as percentages of lifetime earnings for very low and medium earning men and men who earn the taxable maximum each year. Expressing the benefits and taxes as percentages of lifetime income allows us to identify the progressivity of the alternative programs as well as their net tax rates.

Figure III - A
Lifetime Benefits, Taxes, and Net Taxes
as Percentages of Lifetime Income
Men, Very Low Earnings



Authors' estimates assume income adjusted life expectancies, 2.9 percent real discount rate, present values at age 65, and benefit receipt beginning at the current or reformed normal retirement ages.

Figure III-A illustrates the results for very low earning men. The 1985 birth year will serve as an example. First, consider the base and reformed benefits. Reformed benefits are lower than base benefits due to the retirement age increase alone. The very low income workers are unaffected by the progressive price indexing provision but are affected by FRA increases. Second consider the base and reformed taxes. Base taxes are higher than the reformed taxes because to pay base benefits a 3.3 percent solvency tax is required in addition to the statutory tax (13.9 in 2013 and later). The reformed taxes are 10.2 in 2013 and later. Last, consider the net benefits. The base benefits less the base taxes produce slightly lower negative net taxes (positive net benefits) than does the difference between the reformed benefits and taxes.

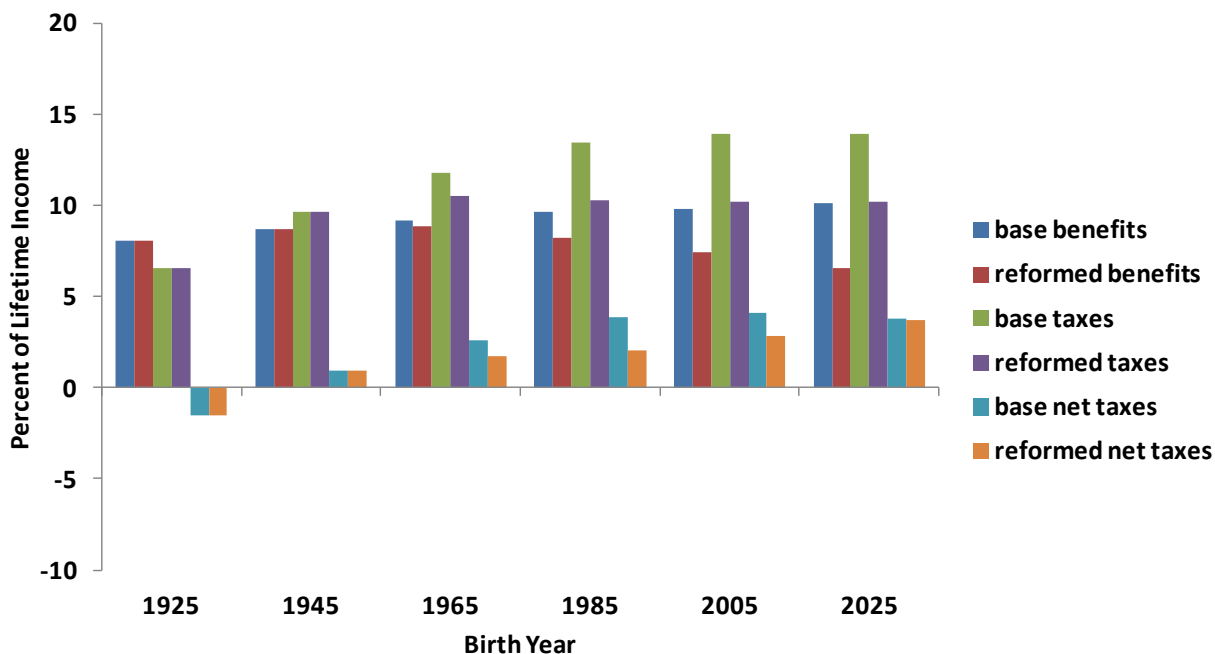
The figure shows the modest reduction in lifetime benefits relative to the baseline, moving from early to later birth years. The progressive price-indexing portion of the reform program does not affect these low-income workers; thus, the relative decline in benefits comes from the increase in the retirement age.¹⁴ However, note the similarities in lifetime benefits as a percent of lifetime income for later birth years under the reform when compared to those of the earlier birth years in the current program. Thus, real benefits under the reform as a percent of income do not decline when compared to current retirees. Again, the reform program produces lower lifetime taxes than the baseline program, producing higher net benefits.

In the case of the very low earning workers, lifetime benefits exceed lifetime taxes, producing negative net taxes with both the baseline and the reformed program. Negative net taxes could also be termed positive net benefits and indicate that that lifetime benefits exceed lifetime taxes. For very low earning men, the net benefits with reform are higher for all affected birth years than with the baseline program.

The results for medium earning men are shown in Figure III-B. Moving from the men born in 1925 to those born in 2035 we see that the base lifetime benefits for these men rise as a percentage of lifetime income, due to rising life expectancies and given the static full retirement age of 67 for all birth years after 1960. Lifetime benefits under the current program are 8.1 percent of lifetime income for medium earning men born in 1925 and are expected to be 9.6 percent and 10.1 percent for those born in 1985 and 2025, respectively.

¹⁴ See the discussion in the appendix concerning the income related longevity assumption. Here we assume that lower income men and women have shorter life expectancies than higher income men and women, but that the percentage differential between the lower and higher earning workers is not growing over time.

Figure III - B
Lifetime Benefits, Taxes, and Net Taxes
as Percentages of Lifetime Income
Men, Medium Earnings



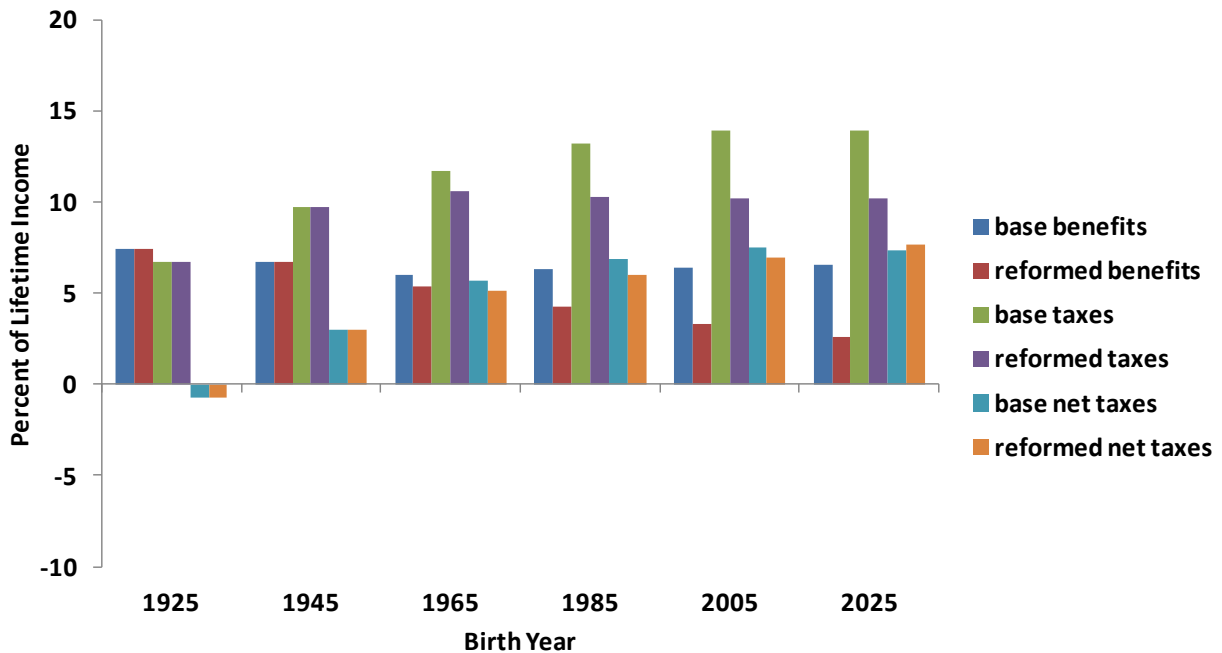
Authors' estimates assume income adjusted life expectancies, 2.9 percent real discount rate, present values at age 65, and benefit receipt beginning at the current or reformed normal retirement ages.

Under the reformed program with the retirement age adjustment and the progressive price indexing that affects workers above the 40th percentile, medium earning men's benefits are 8.2 percent and 6.5 percent of lifetime earnings for men born in 1985 and 2025, respectively.¹⁵ But, as the figures illustrates, lifetime taxes under the reformed program decline by more than benefits relative to the baseline so that the net lifetime tax rate is lower for these workers under the reformed program.

¹⁵ Hypothetical medium earning workers are at about the 56th percentile in the distribution of lifetime earnings. The scaled earnings profiles are from "Scaled Factors for Hypothetical Earnings Examples Under the 2012 Trustees Report Assumptions," by Michael Clingman and Kyle Burkhalter, Actuarial Note, Number 2012.3, November 2012.

The results for men at the taxable maximum shown in Figure III-C illustrate the reduction in reformed lifetime benefits relative to baseline lifetime benefits and the comparatively high lifetime net taxes under both the baseline and the reformed program. The net tax rate for the cohort born in 2025 is higher under the reform than under the baseline program. In general, for later birth years, the lifetime tax rates under the reform are higher than under the baseline program for the workers whose earnings are at the average or above.

Figure III - C
Lifetime Benefits, Taxes, and Net Taxes
as Percentages of Lifetime Income
Men, Taxable Maximum Earnings



Authors' estimates assume income adjusted life expectancies, 2.9 percent real discount rate, present values at age 65, and benefit receipt beginning at the current or reformed normal retirement ages.

The figure also illustrates that both the baseline and the reformed program are “progressive” in that very low earning workers will be net lifetime beneficiaries, because they receive benefits in excess of their tax payments. This is true now and will continue to be true for

future birth years, with either option. As income rises, net lifetime benefits turn to net lifetime taxes, as net tax rates rise along with income.¹⁶

Comparing the net lifetime tax rates for the baseline and reformed program for various birth years and income classes indicates that the reformed program has a slight advantage among the birth years considered here.¹⁷ But just as importantly, the analysis illustrates the tradeoff between the higher taxes necessary to fund the current program and the lower benefits of a reformed program. [See Appendix Tables II and III for results for single men and women and for married couples.]

Lastly, the two programs produce comparable net lifetime tax rates, but in the long run the reformed program is significantly smaller in terms of its annual expenditures and therefore more efficient. Further, the reformed program retains safeguards for lower earning workers, and higher earning workers will likely be glad to exchange lower lifetime Social Security benefits if they can avoid paying the higher taxes necessary to fund currently scheduled benefits. The immediate imposition of the solvency tax for the baseline program brings forward the long run financing burden necessary to support scheduled benefits and, as mentioned, other ways of

¹⁶ Note that in “How Reforms Would Affect Social Security’s Funding, Shortfalls, Total Spending and the Distribution of Benefits and Taxes” by Liqun Liu and Andrew J. Rettenmaier, NCPA Policy Report No. 337, November 2011, workers with earnings above the taxable maximum are shown to have lower lifetime tax rates than workers at the taxable maximum. This is due to the limit on their lifetime taxes. However, it remains the case that Social Security is progressive up to the taxable maximum. As discussed in the previous and current report, there are numerous reasons to retain the taxable maximum in lieu of removing it altogether.

¹⁷ These comparative results are based on the particular structure of the exercise which defines the timing and the incidence of the constant statutory and solvency taxes that begin in 2013 and in the case of the reform, the timing and incidence of the benefit reductions. Income taxes on Social Security benefits are not included in the net lifetime tax estimates. While other assumptions would lead to different incidence of net taxes, the critical point is that lifetime comparisons require solvent programs in which the present value the programs’ revenues and expenditures are equal.

distributing this burden are possible. However, for the aforementioned reasons, the solvency tax equalizes the explicit payroll tax burden across future generations.¹⁸

Conclusion

The Social Security reform illustrated here takes care of the poorest elderly, and retains Social Security's role as a component of a planned retirement, but it puts the Social Security system on a path that assures its solvency for the indefinite future. The reformed program's costs and income are equalized in the long run, and the net lifetime tax rates (benefit rates) for workers with different lifetime earnings who are born in different years remain comparable to the net tax rates (benefit rates) under the baseline program that retains the current benefit formula.

The reform includes two provisions common to most leading reform proposals: gradually raising the retirement age, and making the benefit formula less generous for high income workers. These reforms have been proposed by both political parties.

Given that the baseline and reformed program produce comparable net lifetime taxes for various income groups, but the reformed program's expenditures are 25 percent smaller towards the end of the 75 year projection period, we can conclude that the reformed program is preferred. Annual spending under the reformed program gradually declines relative to the spending based on the current program. It is especially important to keep the size of Social Security in check in light of Medicare's rising long run financing requirements and other rising federal expenditures

¹⁸ The same exercise as summarized here was also estimated using the 75-year solvency taxes rather than the infinite horizon solvency taxes for the baseline and the reformed programs. The net lifetime tax rates within each earnings classification are almost identical under the reformed and the baseline program for all of the birth years who are born in 1988 and earlier or those birth cohorts reaching 100 years of age by the end of the 75 year horizon. Thus, the higher taxes necessary to fund current benefits are essentially the same as the lower benefits with the reforms. However, the reformed program's expenditures and revenues are equalized at the end of the horizon, but the baseline would require a benefit cut or a tax increase in the subsequent years.

on new health care initiatives. A smaller program means a lower tax rate, which in turn means lower welfare costs of taxation. Moreover as time goes on, a smaller program implies a smaller implicit debt in the form of accrued benefits.

In this study, workers expecting less government-provided retirement income have to save more for retirement on their own. This additional savings can translate into real investment, achieving implicit prefunding. Workers, particularly those above the 40th percentile in the distribution of lifetime earnings, will have the incentive to replace the benefits that are gradually scaled back through progressive price indexing. The saving incentive will be highest for workers who have higher incomes and for whom benefits are scaled back the most. This all translates into a higher level of investment and higher economic growth.

The reformed program can be easily complemented with voluntary, individually directed personal retirement accounts and these account balances would reflect additions to national savings. These voluntary accounts can be encouraged through enhanced tax incentives that are proportional to the amount by which a worker's benefits are expected to be scaled back.

The reformed Social Security program is similar in principle to previous reforms that included personal retirement accounts. The previous personal account reforms typically specified contributions to accounts that were a fixed proportion of income. With most of these proposals, the resulting flows from the accounts paid for a portion of workers' expected Social Security benefits the workers' retirement years. The flows from the accounts of workers with higher lifetime earnings would have offset a greater share of their benefits than would the flows from the accounts of lower income workers. This meant that the taxpayer financed portion of high income workers' benefits were reduced by more than the benefits of lower income workers.

Means-testing has the same basic structure with higher income workers facing the largest benefit reduction.

Appendix

Earnings Profiles. The earnings profiles used here are based on the scaled earnings factors developed by the Office of the Chief Actuary at the Social Security Administration.¹⁹ The scaled factors are available for hypothetical workers with very low, low, medium and high earnings series. Workers with very low earning scaled earnings are at the 12th percentile in the lifetime taxable earnings distribution, those with low scaled earnings are at the 25th percentile, those with medium scaled earnings are at the 56th percentile, and those with high scaled earnings are at the 81st percentile.

Annual earnings are derived by multiplying age-specific factors by the Social Security average wage to ultimately produce age-earnings profiles for each birth year considered. The profiles allow for the calculation of lifetime statutory and solvency taxes for workers with different life-cycle earnings. The profiles are also used to calculate initial benefit payments under the two programs assuming that workers begin collecting benefits at current or the reformed the normal retirement age. The initial annual benefit is then combined with conditional life expectancies at age 65. Life expectancies are adjusted by birth year, sex and lifetime earnings to account for longer life expectancies for higher earning workers.

The hypothetical workers, both men and women, are assumed to earn the specified earnings in each year between the ages of 21 and the current or reformed normal retirement age and pay program-specific solvency taxes and statutory taxes in each year. The accumulated taxes are valued at the age of 65 for all birth years and are converted to 2013 dollars. For

¹⁹ See Michael Clingman and Kyle Burkhalter, “Scaled Factors for Hypothetical Earnings Examples Under the 2012 Trustees Report Assumptions,” Actuarial Note, Number 2012.3, November 2012.

consistency with the estimates of the unfunded obligations and the resulting solvency taxes presented in Table I, tax payments associated with each earnings profile accumulate at a real rate of 2.9 percent — the long-run assumption used in the 2013 Trustees Report. For the baseline estimates, the representative workers, by hypothetical earnings series, are assumed to begin receiving benefits at the currently scheduled normal retirement age that are calculated using the current benefit formula. Under the reformed program, workers benefits are calculated assuming that progressive price indexing starts at the 40th percentile, and they begin receiving the benefits at the adjusted normal retirement age.²⁰ In both cases workers are assumed to receive benefits up to the income-adjusted conditional life expectancy at age 65. The present values of the benefits are also evaluated at the age of 65.

The use of the scaled earnings profile to identify the distribution of lifetime taxes and benefits follows the convention established by the Social Security Actuaries. The Social Security Administration's Actuarial Note, Number 2012.7, March 2013 identifies money's worth ratios for hypothetical workers born in various years based on the scaled earnings profiles. Actuarial Note Number 2012.5, March 2013 identifies internal rates of return. Similar actuarial notes are available from 2005 to the present at:

<http://www.ssa.gov/OACT/NOTES/actnote.html>

²⁰ The two provisions considered here are provisions B1.3 and C.13 as summarized by the Office of the Chief Actuary at <http://www.ssa.gov/OACT/solvency/provisions/index.html>. Progressive price indexing begins at the 40th percentile in the distribution of average indexed monthly earnings which is estimated to be 45.6 percent of the way between the current law's first and second bend points based on the reported distribution of earnings in Actuarial Note 2012.3. A new bend point is created at the 40th percentile. All workers with earnings above this point receive lower benefits, with workers at the taxable maximum affected the most, receiving constant real benefits rather than wage indexed benefits. This part of the reform does not affect low or very low-scaled workers. The progressive price indexing reform affects newly eligible workers in 2019, workers born in 1957 and later. Relative to the current normal retirement age schedule, the retirement age reform only affects workers born in 1961 and later.

The Actuaries compare three scenarios “Present Law Scheduled, Increase Payroll Tax, and Payable Benefits.” The present law scheduled scenario compares lifetime scheduled benefits to scheduled taxes but this scenario does not achieve solvency. The increase the payroll tax scenario compares scheduled benefits to scheduled taxes up to 2032 when the OASDI Trust Fund is exhausted. In all years beyond 2032, the tax rate follows the cost rate. The payable benefits scenario cuts benefits across the board once the Trust Fund is exhausted. This scenario could also be interpreted as “Current Law.” These latter two scenarios are “solvent” programs.

The approach here is similar to the approach the Social Security Actuaries have used in the past to evaluate different reforms and the approach that underlies their actuarial notes, but with a few modifications. The actuaries use the same life expectancies across income classes, but here an adjustment for differential life expectancies is made as discussed below. As a point of reference, calculating the money’s worth ratios based on the results in our Appendix Table 1 produces ratios similar to the actuaries’ estimates for medium earning men, but the money’s worth ratio for the very low earning men is lower than the actuaries because of the adjustment for lower life expectancy.

Income-adjusted life expectancy at age 65. The conditional life expectancies were estimated as follows. Life expectancies at age 65 for men and women born in different years are from Table V. A4. *2013 Social Security Trustees Report*. These factors are then adjusted by income levels. Research by Waldron (2007) indicates that longevity gains among more recent retirees are greater for higher earning men than of lower earning men and that the longevity gap

is growing.²¹ The longevity adjustment factors used here for men remain constant across birth years born after 1937, and are guided by Waldron's findings.

In previous work we estimated how differential mortality affects Social Security's progressivity.²² In that paper we employed a different mortality adjustment than is used here, and found that the program remains progressive even when adjusted for differential mortality. We also noted that the direction of causality between lifetime earnings and longevity can be difficult to determine. First, in economic terms, good health may be a normal good, in that higher income individuals tend to make greater investments in health care and fitness. Second, individuals in better health may earn more and live longer. Third, those whose own assessment of their longevity is higher may invest more in education and achieve higher lifetime earnings as a result.

Several other aspects of the growing gap in income-related longevity, particularly for men, deserve discussion. Namely, the increase in the longevity gap between men with high and low incomes may well reflect the growing gap in lifetime incomes as we move from older to younger birth years. With a constant income elasticity of demand for life-extending health interventions, a growing gap in lifetime income would result in a widening longevity gap. Further, the longevity gap would also result if lifetime earnings have simply become a better signal of worker's underlying longevity potential over time.

Here we utilize scaled earnings factors that are constant across birth years, so while the actual gap between high and low earners may be growing, the relative relationships between the scaled earnings profiles are fixed at each age, suggesting the use of static income-adjusted

²¹ Hilary Waldron, "Trends in Mortality Differentials and Life Expectancy for Male Social Security – Covered Workers, by Socioeconomic Status," *Social Security Bulletin*, Vol. 67, No. 3, 2007.

²² See "Lifetime Income, Longevity and Social Security Progressivity," Liqun Liu, Andrew J. Rettenmaier and Thomas R. Saving, NCPA Policy Report No. 342, December 2012.

longevity factors. Our income adjusted longevity factors for men are derived from Waldron's (2007) estimates of conditional life expectancies at age 65 for men.²³ Waldron reports both cohort life expectancies at age 65 for men in the top and bottom halves of the lifetime earnings distribution who were born between 1912 and 1941 (Table 4) as well as period life expectancies by earnings quartiles (Table 7). We use the dispersion from the period life table to provide an estimate of the dispersion within birth cohorts given that we are analyzing five alternative earnings profiles for each birth year. This identifies a set of factors that are then used to adjust the cohort life expectancies from the Trustees Report.

The estimated life expectancies at age 65 for the first and second quartile are applied for the workers with very low and low earnings. The estimates for the third and fourth quartile are applied for the workers with high and taxable maximum earnings. Workers with medium earnings are assumed to have the cohort specific condition life expectancies from the 2013 Trustees Report. Before birth year 1937 the longevity gap follow Waldron's the birth year estimates, but beyond 1937 the income adjustment is static. The following factors are applied to the birth cohort specific conditional life expectancies at age 65 for born men born in 1937 and later: 0.87, 0.88, 1, 1.11, and 1.14 for men with very low, low, medium, high and earnings at the taxable maximum, respectively.

The relationship between lifetime income and longevity for women is not as well defined as it is for men. We rely on our results for county-level differences in women's longevity based on county-level Social Security benefits as reported in our previous study to estimate the relative

²³ Hilary Waldron, "Trends in Mortality Differentials and Life Expectancy for Male Social Security – Covered Workers, by Socioeconomic Status," *Social Security Bulletin*, Vol. 67, No. 3, 2007.

difference in longevity.²⁴ The county-level estimates suggest that the mortality differences for women that are related to lifetime income are smaller than they are for men and those estimates are used to adjust the estimates for men.

²⁴ See “Lifetime Income, Longevity and Social Security Progressivity,” Liqun Liu, Andrew J. Rettenmaier and Thomas R. Saving, NCPA Policy Report No. 342, December 2012.

Appendix Tables

Appendix Table I

Projected Reformed and Baseline Lifetime Social Security Taxes and Benefits

Single Men Age born in 1985, Valued at Age 65, (2013 Dollars)

Earnings Level	Lifetime Taxes \$	Lifetime Tax Rate	Lifetime Benefits \$	Lifetime Benefit Rate	Net Benefits \$	Net Benefit Rate
<u>Reformed</u>						
Very Low	\$112,393	10.2%	\$159,317	14.5%	\$46,924	4.3%
Medium	\$449,490	10.2%	\$360,633	8.2%	-\$88,858	-2.0%
Taxable Maximum	\$1,270,154	10.3%	\$525,969	4.3%	-\$744,186	-6.0%
<u>Baseline</u>						
Very Low	\$146,890	13.5%	\$172,719	15.8%	\$25,830	2.4%
Medium	\$587,450	13.5%	\$420,749	9.6%	-\$166,701	-3.8%
Taxable Maximum	\$1,607,030	13.2%	\$767,856	6.3%	-\$839,174	-6.9%
<u>Reformed Less Baseline</u>						
Very Low	-\$34,497	-3.3%	-\$13,402	-1.3%	\$21,095	1.9%
Medium	-\$137,960	-3.3%	-\$60,116	-1.4%	\$77,843	1.8%
Taxable Maximum	-\$336,876	-2.9%	-\$241,887	-2.0%	\$94,989	0.9%

Note: The baseline program retains the current benefit formula and is funded by statutory taxes and an immediate increase in the solvency tax. The reformed program includes two provisions: progressive price indexing and future increases in the retirement age and is funded by statutory taxes less a small decrease in the solvency tax. Estimates assume a 2.9 percent real discount rate, present values at age 65, benefit receipt beginning at scheduled or reformed normal retirement ages, and income adjusted life expectancies. See text for further discussion.

Appendix Table IA
Change in Lifetime Social Security Taxes and Benefits
Single Men, Valued at Age 65 (2013 Dollars)
Reformed Taxes and Benefits less Baseline Taxes and Benefits

Earnings Level	Lifetime Social Security Taxes	Lifetime Social Security Benefits	Net Change
<u>25 Years of Age in 2013</u>			
Very Low	-\$38,501	-\$15,455	\$23,046
Medium	-\$153,976	-\$69,137	\$84,838
Taxable Maximum	-\$386,278	-\$272,718	\$113,559
<u>40 Years of Age in 2013</u>			
Very Low	-\$18,879	-\$6,106	\$12,773
Medium	-\$75,502	-\$28,553	\$46,949
Taxable Maximum	-\$182,768	-\$127,493	\$55,276

Note: The baseline program retains the current benefit formula and is funded by the current statutory tax plus an immediate 3.3 percentage-point payroll tax increase to make the program solvent for a total tax rate of 13.9 percent. The reformed program includes two provisions: progressive price indexing and future increases in the retirement age and is funded by current statutory taxes less a small decrease. Estimates assume a 2.9 percent real discount rate, present values at age 65, benefit receipt beginning at scheduled or reformed normal retirement ages, and income-adjusted life expectancies. See the text of the study for further discussion.

Appendix - Table II
 Net Lifetime Social Security Tax Rates for Single Men and Women
 Baseline and Reformed Program

birth year	Very Low Scaled Earnings				Low Scaled Earnings			
	Baseline		Reformed		Baseline		Reformed	
	Men	Women	Men	Women	Men	Women	Men	Women
1925	-7.2%	-10.4%	-7.2%	-10.4%	-3.6%	-5.8%	-3.6%	-5.8%
1945	-4.7%	-7.5%	-4.7%	-7.5%	-0.9%	-2.9%	-0.9%	-2.9%
1965	-3.2%	-6.1%	-4.2%	-7.1%	0.7%	-1.3%	-0.4%	-2.3%
1985	-2.4%	-5.2%	-4.3%	-7.1%	1.8%	-0.2%	-0.5%	-2.4%
2005	-2.3%	-5.0%	-3.7%	-6.4%	1.9%	0.1%	-0.1%	-1.9%
2025	-2.8%	-5.6%	-3.3%	-6.0%	1.5%	-0.3%	0.2%	-1.6%

birth year	Medium Scaled Earnings				High Scaled Earnings			
	Baseline		Reformed		Baseline		Reformed	
	Men	Women	Men	Women	Men	Women	Men	Women
1925	-1.5%	-2.8%	-1.5%	-2.8%	-1.2%	-2.2%	-1.2%	-2.2%
1945	1.0%	0.1%	1.0%	0.1%	1.8%	1.4%	1.8%	1.4%
1965	2.6%	1.8%	1.7%	0.9%	3.5%	3.2%	2.8%	2.5%
1985	3.8%	3.1%	2.0%	1.3%	4.8%	4.5%	3.7%	3.5%
2005	4.1%	3.4%	2.8%	2.2%	5.1%	4.8%	4.8%	4.6%
2025	3.7%	3.1%	3.7%	3.2%	4.8%	4.6%	5.7%	5.6%

birth year	Taxable Maximum Earnings			
	Baseline		Reformed	
	Men	Women	Men	Women
1925	-0.7%	-1.6%	-0.7%	-1.6%
1945	2.9%	2.7%	2.9%	2.7%
1965	5.7%	5.6%	5.2%	5.0%
1985	6.9%	6.8%	6.0%	5.9%
2005	7.5%	7.4%	6.9%	6.9%
2025	7.3%	7.2%	7.6%	7.6%

Scaled earnings factors are from “Scaled Factors for Hypothetical Earnings Examples Under the 2012 Trustees Report Assumptions,” by Michael Clingman and Kyle Burkhalter, Actuarial Note, Number 2012.3, November 2012. See text for discussion.

The baseline program retains current benefit formula funded by statutory taxes and an immediate increase in solvency taxes.

Reformed program includes two provisions: progressive price indexing and future increases in the retirement age funded by statutory taxes less a small solvency tax. See text for further discussion.

Appendix – Table III
 Net Lifetime Social Security Tax Rates for Married Couples
 Baseline and Reformed Program

Women's Earnings > Men's Earnings >	Very Low	Low	Low	Medium	Medium	High	High
	Low	Low	Medium	Medium	High	High	Tax Max
birth year	Baseline						
1925	-6.4%	-4.7%	-3.2%	-2.2%	-2.0%	-1.7%	-1.4%
1945	-3.6%	-1.9%	-0.4%	0.5%	1.1%	1.6%	2.3%
1965	-2.0%	-0.3%	1.3%	2.2%	2.8%	3.3%	4.8%
1985	-1.0%	0.8%	2.5%	3.4%	4.1%	4.6%	6.0%
2005	-0.8%	1.0%	2.7%	3.7%	4.4%	4.9%	6.5%
2025	-1.3%	0.6%	2.4%	3.4%	4.1%	4.7%	6.3%
birth year	Reformed						
1925	-6.4%	-4.7%	-3.2%	-2.2%	-2.0%	-1.7%	-1.3%
1945	-3.6%	-1.9%	-0.4%	0.5%	1.1%	1.6%	2.4%
1965	-3.1%	-1.3%	0.3%	1.3%	2.1%	2.7%	4.2%
1985	-3.1%	-1.5%	0.5%	1.7%	2.8%	3.6%	5.2%
2005	-2.6%	-1.0%	1.3%	2.5%	3.8%	4.7%	6.1%
2025	-2.3%	-0.7%	2.0%	3.4%	4.7%	5.7%	6.9%

Note: The baseline program retains the current benefit formula and is funded by statutory taxes and an immediate increase in the solvency tax. The reformed program includes two provisions: progressive price indexing and future increases in the retirement age and is funded by statutory taxes less a small decrease in the solvency tax. Estimates assume a 2.9 percent real discount rate, present values at age 65, benefit receipt beginning at scheduled or reformed normal retirement ages, and income adjusted life expectancies. See text for further discussion.