

## ISSUE BRIEF NO. 2

# SOCIAL SECURITY REFORM: A FRAMEWORK FOR ANALYSIS

## INTRODUCTION

This is the second in a series of Treasury issue briefs on Social Security reform. The first brief explained that the birth cohorts who will bear the financial consequences of reform must receive benefits whose present value is lower than the present value of the Social Security taxes they pay by more than \$13.6 trillion. This is necessary because Social Security has paid or promised earlier birth cohorts a net benefit of equal magnitude.<sup>1</sup> By looking at reform in terms of how it affects the well-being of different birth cohorts, the first brief demonstrated that reform can be fairer to future generations the sooner that it is initiated.

This brief seeks to advance the debate over Social Security reform by offering a top-down framework for designing and evaluating Social Security reform plans. This framework centers on the following four key questions that any plan must address.

1. **Fairness across generations.** How should the burden of the changes that are required to make Social Security solvent be distributed across generations? That is, how should current and future generations share the necessary adjustments to Social Security benefits and/or taxes?
2. **Fairness within generations.** How should Social Security's benefits and taxes be distributed across people *within* each generation? Put differently, how progressive should Social Security's tax and benefit structure be?
3. **Size of the safety net.** How large should Social Security's benefits be? Likewise, how large should the taxes needed to support these benefits be?
4. **Pre-funding future benefits.** Are Social Security surpluses set aside to help pay future Social Security benefits? More generally, do contributions in excess of benefits paid constitute true pre-funding of future Social Security benefits? If not, how are the answers to the first three questions affected?

Once agreement is reached on the answers to these questions, it should be possible to identify specific reforms that are consistent with them. Hence, these questions help to define a top-down framework for designing, debating, and evaluating Social Security reform plans.

The principal purpose of this brief is to introduce this approach to Social Security reform. The brief elucidates the four key questions identified above and develops objective metrics that can be used to assess how reform affects the well-being of entire birth cohorts, the well-being of groups within cohorts, and the adequacy of benefits.

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<sup>1</sup> As in the first issue brief, all present values discussed here are computed as of the start of 2007.

The brief stops short, however, of *answering* these questions. Later issue briefs will propose benchmarks for assessing fairness and benefit adequacy with an eye toward providing concrete demonstrations of how the framework can be used to design and evaluate particular Social Security reform plans. Another issue brief will explore alternative mechanisms for ensuring that attempts to pre-fund Social Security result in the accumulation of additional resources that can be used to finance future benefits.

A key message of this brief is that whether it is possible to truly pre-fund future benefits profoundly influences the choices that are available for ensuring fairness across generations and benefit adequacy. If it is not possible to safeguard Social Security surpluses, then there is little prospect for a Social Security reform that is fair to future generations. The discussion of the first three questions is therefore divided into two parts. First, each question is discussed under the assumption that attempted pre-funding is or can be made real. Next, how the absence of true pre-funding would affect the answers to these questions is considered when the fourth question is discussed. Organizing the brief in this way underscores its central point: that the ability to safeguard Social Security surpluses is an essential element in making Social Security fair to future generations.

## FIRST KEY QUESTION: HOW SHOULD THE SOCIAL SECURITY REFORM BURDEN BE DISTRIBUTED ACROSS GENERATIONS?

Treasury's first issue brief explained that the current and future generations who will bear the financial burden of making Social Security permanently solvent will face some combination of benefit and/or tax adjustments amounting to \$13.6 trillion in present-value terms.<sup>2</sup> These "reform cohorts" must in effect pay for the excess of benefits over contributions that Social Security conveyed or has promised to the generations who preceded them and who are not themselves subject to reform.

A natural measure of how Social Security affects the well-being of individuals and birth cohorts is the *lifetime net benefit rate*. For an individual, the lifetime net benefit rate is defined as the present value of net lifetime Social Security benefits (benefits less taxes) as a percentage of the present value of the individual's lifetime wages. This summarizes the difference between the benefits a person eventually receives in retirement and the taxes he or she pays into the system while working. The lifetime net benefit rate for a birth cohort is the same as that for an individual except that the numerator (net Social Security benefits) and the denominator (lifetime wages) are sums computed over all members of the birth cohort. Box 1 compares the lifetime net benefit rate with two other commonly used measures of Social Security's value to individuals.

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2 To put this number in perspective, permanent solvency could be achieved, for instance, with roughly a 20 percent reduction in scheduled (but not payable) benefits or an immediate and permanent 3.5 percentage point increase in the payroll tax rate on the share of earnings that is subject to tax under current law. These figures are used purely to illustrate the magnitude of the problem; in practice, a revenue adjustment could involve changes in the tax base—the taxable earnings share—as well as changes to the tax rate.

**BOX 1****SOCIAL SECURITY'S LIFETIME NET BENEFIT RATE COMPARED TO TWO COMMON ALTERNATIVE MEASURES OF SOCIAL SECURITY'S NET VALUE TO INDIVIDUALS**

Measures of the financial value of the Social Security program to an individual are useful in considering how to allocate the burden of Social Security reform across different groups. This issue brief focuses on the lifetime net benefit rate as an indicator of the relationship between lifetime benefits received and taxes paid. Two common alternative measures of Social Security's value to individuals are Social Security's "rate of return" and Social Security's "money's worth ratio." It is argued below that these measures are not as useful as the lifetime net benefit rate for assessing the fairness of Social Security reform.

Because Social Security must levy a net tax on cohorts who are subject to reform, the discussion is most naturally couched in terms of the lifetime net tax rate, which is simply the negative of the lifetime net benefit rate (the net tax rate is the excess of taxes over benefits divided by lifetime wages rather than the excess of benefits over taxes, with all values measured in present-value terms). The present values that are used to construct the net tax rate or net benefit rate are computed with a risk-free rate like that on long-term government bonds.

**SOCIAL SECURITY'S RATE OF RETURN**

Social Security's rate of return to an individual is the answer to the following question: If all of a worker's Social Security taxes were invested, what average annual rate of return must be earned in order for the investment proceeds to be just sufficient to finance that worker's Social Security benefits? If Social Security's rate of return is equal to the return on a long-term government bond, then individuals receive a return on their taxes that implies that their lifetime net tax rate is zero. In this case, Social Security is providing a return that is no better or worse than what workers could receive from directly investing their contributions in government bonds. If the Social Security rate of return is less than the government bond rate, however, then the lifetime net tax rate is positive, as workers earn a lower rate of return on Social Security taxes than what they could earn on an actual investment in government bonds and thus implicitly pay a "tax" that reflects the foregone return on the government bond. By contrast, a Social Security rate of return greater than the rate on government bonds implies that lifetime net taxes are negative and that workers are doing better by paying into the system and receiving benefits than what they could earn by directly investing in government bonds.

Social Security's rate of return provides incomplete information, however, in terms of how Social Security reform plans affect the well-being of a particular individual or group. This can be seen with an example. Suppose that Social Security reform plan A assesses \$10,000 in taxes in year 1 and pays \$10,300 in benefits in year 2, while reform plan B assesses \$1,000 in taxes in the first year and pays \$1,010 in benefits in the second. In this example, then, Social Security's rate of return is 3 percent for plan A, and 1 percent for plan B. Then judged on the basis of rates of return, it would be concluded that reform plan A is better.

Why this conclusion is not necessarily correct can be seen from a comparison of lifetime net taxes under the two plans. If the government bond rate is 5 percent, for example, then the lifetime net taxes under reform plan A equal the cost of receiving 2 percentage points below the market return on \$10,000, which is \$200. Likewise, for reform plan B the lifetime net tax is the cost of receiving 4 percentage points below the market return on \$1,000, or \$40. Hence, reform plan B is more beneficial to the individual—that is, it is less costly. (In this example taxes are collected at a single point in time. Note that the cost of receiving a below-market return depends not only on the magnitude of the taxes paid, but also on the length of time over which the below-market return is earned.)

Social Security's rate of return also may not fully capture the differential effect a particular Social Security reform has on different individuals or groups. This can be seen in the context of an example comparing two members of a particular birth cohort—a low-income individual and a high-income individual. Suppose a particular reform plan results in the Social Security rate of return being 1 percent for the high-income person and 3 percent for the low-income person, and that the government bond rate is again 5 percent. As with the previous example, it would not be possible to infer the lifetime net taxes that each person pays without knowing how much gross tax each person contributes to the system.

**BOX 1** (CONTINUED)

## SOCIAL SECURITY'S MONEY'S WORTH RATIO

Social Security's money's worth ratio is the present value of lifetime Social Security benefits divided by the present value of lifetime Social Security taxes. As in the computation of Social Security's net lifetime taxes, the present values are computed with a risk-free rate like that on government bonds. Hence, a money's worth ratio greater than one implies that lifetime net taxes are negative, and a money's worth ratio less than one implies that lifetime net taxes are positive.

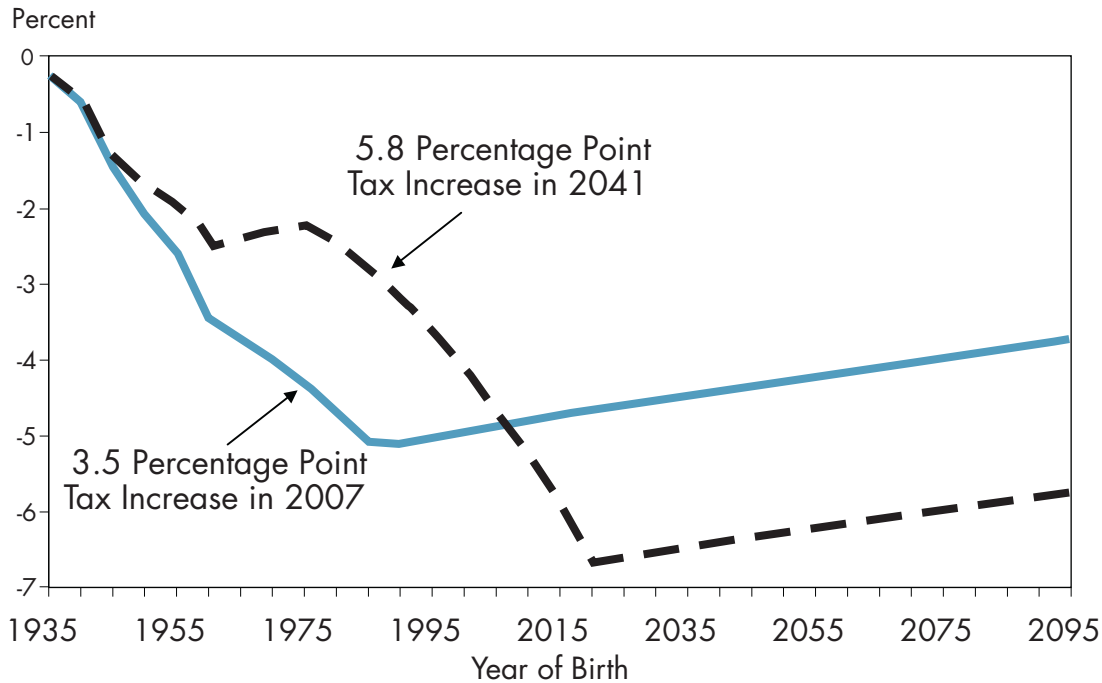
Like Social Security's rate of return, the money's worth ratio may not fully capture the effect of a particular Social Security reform. For example, if a person is offered the choice between two Social Security reforms, one in which benefits are 10 percent lower than taxes (yielding a money's worth ratio of 0.9), and the other in which benefits are 20 percent lower than taxes (a money's worth ratio of 0.8), it is not possible to infer which is better without having additional information. If, for example, the present value of gross taxes is \$100,000 when the money's worth ratio is 0.9 and \$10,000 when the money's worth ratio is 0.8, then the latter case results in smaller lifetime net taxes (\$2,000, computed as 20 percent of \$10,000) than the former case (\$10,000, computed as 10 percent of \$100,000) despite the latter plan's lower money's worth ratio.

This example makes clear that money's worth ratios are not sufficient to assess the fairness of Social Security's treatment of individuals at different points in the income distribution.

On average, people who share in the burden of reform must have a negative lifetime net benefit rate—that is, reform cohorts must on average receive benefits whose present value is less than the present value of the taxes they pay into the system. A negative lifetime net benefit rate essentially acts as a net tax rate. For example, if the lifetime net benefit rate for the 1980 birth cohort is negative 3 percent, then Social Security affects the cohort's well-being as if it were a 3 percent tax on the cohort's lifetime wages—for every \$100 in wages, \$3 are taken by Social Security to finance the excess of benefits over taxes that have been paid or promised to early birth cohorts (roughly, people born prior to 1930). In this framework, policymakers must choose lifetime net benefit rates for the various reform cohorts such that the total burden adds up to an amount exceeding \$13.6 trillion in present value.<sup>3</sup> Again, this can be achieved by adjusting benefits, taxes, or some combination of the two.

Figure 1 uses lifetime net benefit rates to help assess the intergenerational fairness of two illustrative policies that would make Social Security permanently solvent. The first policy immediately increases the payroll tax rate by 3.5 percentage points starting in 2007, while the second policy raises the payroll tax rate by 5.8 percentage points starting in 2041, which is the projected trust fund exhaustion date. (Again, these policies are used purely for illustration, and are not actual recommendations.) As can be seen from the figure, waiting to reform Social Security puts a lighter burden on cohorts born prior to 2005 and a heavier burden on cohorts born after this date.

3 As noted in Treasury's first issue brief, current law already imposes a small net tax on the reform cohorts; relative to current law, it is necessary to raise the present value of contributions made by the reform cohorts and/or reduce the present value of their scheduled benefits by \$13.6 trillion. For ease of exposition, the current issue brief assumes that the net tax that the reform cohorts must pay is exactly equal to \$13.6 trillion.

**Figure 1: Lifetime Net Benefit Rates by Birth Cohort**

Source: Department of the Treasury

Under both policies, lifetime net benefit rates are reduced in accordance with how long a birth cohort faces higher taxes. In the case of the immediate tax increase, the lifetime net benefit rate bottoms out at negative 5.1 percent for people born in 1985 (the 1985 birth cohort), who are assumed to begin work at age 22 in 2007. The lifetime net benefit rate increases (becomes less negative) for later birth cohorts because increasing longevity implies that they will receive benefits over a longer period of time. Under the delayed tax increase, the lifetime net benefit rate bottoms out for the 2019 birth cohort.<sup>4</sup>

The estimates shown in Figure 1 are very approximate. Disability benefits and taxes as well as the taxes on Social Security benefits are not included in the calculations, and it is assumed that the tax increases necessary to make the overall program solvent fall entirely on the retirement portion of the program. (In general, Treasury's issue briefs are focused on potential reforms to the retirement income portion of Social Security, not the disability insurance portion.) Nevertheless, the basic lesson of the chart is robust: The smaller is the reform burden imposed on early birth cohorts, the larger must be the burden that is placed on later birth cohorts.

Finally, it should be noted that how the Social Security reform burden is allocated across generations has implications for economic efficiency as well as fairness. This topic is discussed in a future issue brief.

4 Figure 1 assumes that the additional tax revenues under the two policies result in lower issuance of publicly held debt—that is, the additional revenues are truly saved. As is discussed below with respect to the fourth key question (regarding pre-funding), if trust fund accumulations are not truly saved then the effect that Social Security policy has on the well-being of future generations is undone by changes in spending and taxes in other parts of the federal budget. In that case, the usefulness of accounting measures such as those shown in the figure will be greatly reduced.

## SECOND KEY QUESTION: HOW SHOULD THE SOCIAL SECURITY REFORM BURDEN BE DISTRIBUTED *WITHIN* GENERATIONS?

Once a decision is made as to how the Social Security reform burden should be distributed *across* reform cohorts, the natural next question is how the burden should be distributed *within* birth cohorts. This brief (together with future briefs) focuses on how the burden is distributed across income groups within generations—that is, how “progressive” Social Security should be.<sup>5</sup>

For example, imagine that policymakers decide on fairness grounds that the lifetime net benefit rate should be the same for all reform cohorts—that is, they decide that all generations affected by the reform should face an equal net tax rate in the form of higher contributions and/or lower benefits. (This example is purely illustrative; it may or may not be a desirable outcome in practice.) Suppose further that the present value of wages earned by reform cohorts were projected to equal \$340 trillion and that the burden that must be imposed on the reform cohorts is precisely \$13.6 trillion (as explained in footnote 3, the true burden is somewhat larger). Then the lifetime net benefit rate that should be imposed across all reform cohorts in order to make Social Security solvent is negative 4 percent (computed as negative \$13.6 trillion divided by \$340 trillion, which is  $-0.04$ ). This means that each reform cohort would be asked to contribute 4 percent of their lifetime wages to make Social Security permanently solvent through benefits that have a lower present value than the present value of taxes paid.

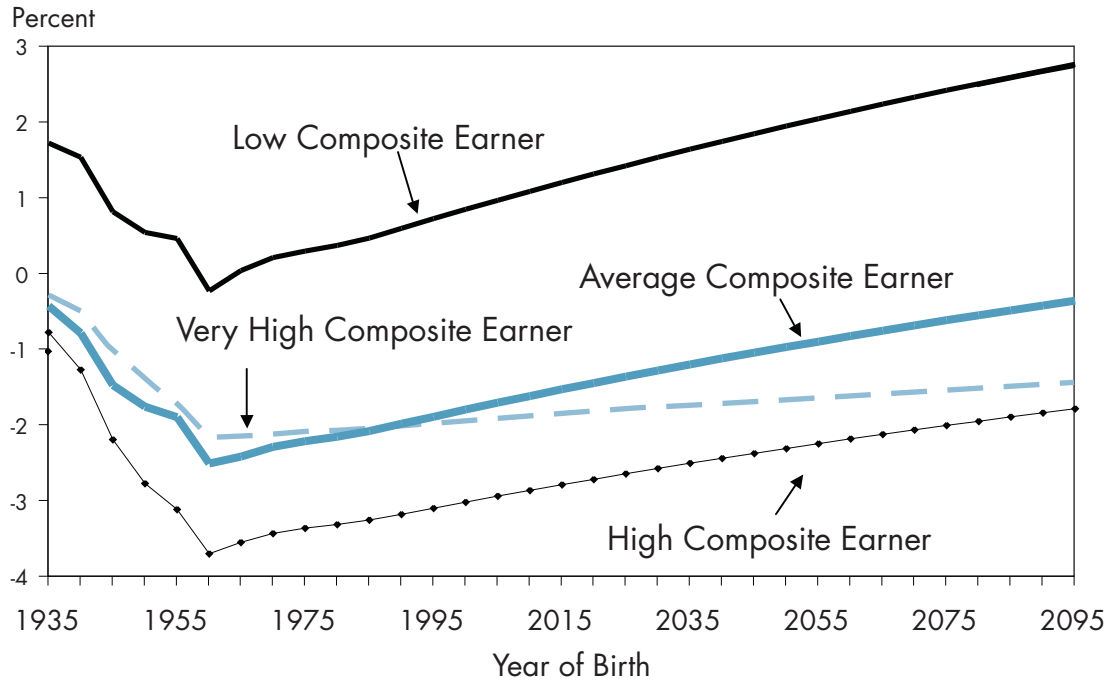
Once the decision is made that a cohort should contribute 4 percent of its wages to making Social Security solvent, it must be decided how to distribute that burden *within* the birth cohort. It is reasonable to expect that this burden will be apportioned in a progressive fashion, with lower-income workers relatively more shielded from the effects of the reform. Retirees who had lower lifetime earnings would get a net lifetime benefit that is larger relative to their lifetime wages than people with higher lifetime earnings; that is, the lifetime net benefit rate would be more negative as individuals’ lifetime income increases (and might even be positive for the lowest income groups). Progressivity can be achieved in any number of ways. For example, under current law it is primarily implemented with a progressive benefit formula, but in principle it could be achieved by varying payroll tax rates as well.

To illustrate how progressivity can be assessed, Figure 2 gives Treasury estimates of lifetime net benefit rates by income level for the birth cohorts included in Figure 1.<sup>6</sup> A lifetime net benefit rate profile is computed for each of four income levels, denoted as low, average, high, and very high. Each profile is calculated as a weighted average of several representative (but not exhaustive) family types. For example, the high-wage composite earner is a weighted average of the lifetime net benefit rate for five family types: a single high-wage female; a single high-wage male; a one-earner couple headed by a high-wage male; a dual-earner couple with both earning high wages; and a dual-earner couple made up of a female with average earnings and a male with high earnings.

5 Although the focus here is on redistribution across income groups within a generation, one could also consider the distributional impact of Social Security along many other dimensions (sex, race, family structure, career length, and so on).

6 The measures shown in Figure 2 use current-law scheduled benefits and taxes. Social Security will certainly not evolve in accordance with current-law benefits and taxes given that the system is insolvent; nevertheless, the figure is useful because we are concerned with the *relative* differences in lifetime net benefits across income groups, not the absolute levels of lifetime net benefits that are relevant for solvency.

**Figure 2: Lifetime Net Benefit Rates by Birth Cohort and Earner Type**



Source: Department of the Treasury

The progressive nature of Social Security under current law is verified by the results given in Figure 2, which show that the lifetime net benefit rate profile for the low-earner composite is above the profile for the average-earner composite, which in turn is above the profile for the high-earner composite. (The very-high-earner composite has earnings far above the maximum level subject to tax and is discussed below.) That is, lower-income workers receive net benefits under Social Security that are larger as a share of lifetime income than those received by higher-income workers. Lifetime net benefit rates rise for successive birth cohorts because of increasing longevity. People living longer receive benefits over additional years, and the effect on the value of benefits is most pronounced for people with lower earnings, as longevity increases the present value of benefits proportionately but has little effect on the contributions they make to the system because the retirement age is not changed in this calculation. Since low earners have a relatively high ratio of benefits to lifetime wages, a proportionate increase in the present value of benefits has a relatively large effect on their lifetime net benefit rate.<sup>7</sup>

While the current-law Social Security program is progressive overall, it is regressive (as measured by the net benefit rate) for income levels that exceed the maximum taxable earning threshold. This reflects Social Security's original historical design: The program was intended to provide a basic level of social insurance, not to have its contributions and benefits be based on total earnings (though rising wage inequality in recent years has left a smaller share of earnings subject to tax than in the past). In the figure, the lifetime net benefit rate profile for very high earners lies above the corresponding profile for high earners and average earners born prior to about 1990. Intuitively, since net benefits "bottom out" once

<sup>7</sup> The lifetime net benefit rate profiles shown in Figure 2 assume that mortality probabilities do not depend on income. There is some evidence that mortality rates are lower for higher-income groups, but not by enough to change the general implications of the figure. See Congressional Budget Office, "Is Social Security Progressive?" December 15, 2006.

the taxable maximum is reached—neither benefits nor contributions increase further after this point—they represent a smaller fraction of lifetime earnings the higher these earnings become. The very-high-earner composite shown in Figure 2 has earnings far above the taxable maximum. Its lifetime net benefit rate profile lies above the profile for the average composite up to the 1990 birth cohort, and above the profile for the high-earner composite for all cohorts shown. This pattern reflects two independent factors.

- First, very high earners do not pay tax or accrue benefits on the portion of their earnings that is above the taxable maximum (\$97,500 in 2007). To see how this is relevant, compare a person earning an amount that is exactly equal to maximum taxable earnings in every year of his or her life with someone whose earnings are many multiples higher in every year and who retires at the same time. Both individuals pay the same tax and receive the same benefits. For incomes above the maximum taxable earnings level, therefore, net taxes paid to Social Security become smaller as a share of lifetime wages—that is, the lifetime net benefit rate becomes less negative—the higher are earnings above the maximum taxable earnings threshold. This explains how it is possible under current law for the lifetime net benefit rate profile for the very-high-earner composite to be higher than the lifetime net benefit rate profiles for some of the lower-income composites.
- Second, increasing longevity has relatively less effect on the lifetime net benefit rate of the very-high-income composite because they have a relatively low ratio of benefits to lifetime wages. Hence, future increases in longevity cause the lifetime net benefit rate for the very high earners to rise more slowly than the rate for the other earners, which is why the lifetime net benefit rate profiles for these two groups cross in the figure.

A future issue brief will consider the implications of progressivity for economic efficiency.

### THIRD KEY QUESTION: HOW LARGE SHOULD SOCIAL SECURITY'S BENEFITS BE?

Once it is decided how to allocate the burden of reform across generations and across different people within generations (by choosing lifetime net benefit rates for reform cohorts and by income level within each cohort), the next question to consider relates to the size of retirement benefits and the corresponding taxes needed to fund them. The choice of lifetime net benefit rates for birth cohorts and income groups within birth cohorts is consistent with any level of benefits. For example, suppose policymakers decide that the lifetime net benefit rate for a particular income group within the 2000 birth cohort should be negative 4 percent. Then one possibility is that this group could face a 12.4 percent payroll tax rate and receive benefits with an expected present value equal to 8.4 percent of lifetime wages. (For simplicity, this assumes that taxable wages equal total wages.) Alternatively, one could envision having a system with higher benefits and taxes—for example, a system with a payroll tax rate of 15 percent and benefits whose present value equaled 11 percent of wages; still another possibility is for a low-benefit system where the tax rate is 8 percent and benefits are 4 percent of wages. There are innumerable alternatives, each resulting in a different level of benefits and all with the same implications for the long-term solvency of Social Security and the allocation of the Social Security reform burden across cohorts.

Put another way, once it is decided how to allocate the burden of paying for the existing financing gap of \$13.6 trillion, the Social Security system can be made large or small depending on society's evaluation of the pros and cons of mandating that workers put a particular share of their earnings into the Social Security system to fund retirement benefits. Specifically, one's judgment as to what role Social Security should play in providing retirement security and social insurance and how much choice individuals



should have in making their saving and spending decisions will determine whether one prefers a system in which high taxes finance a high level of benefits, or an alternative (but still solvent) system in which low taxes finance a more modest level of benefits. If one believes that individuals should be allowed to choose to save or spend their earnings as they wish, one might prefer lower taxes and benefits. If one instead believes that workers generally do not save enough for retirement, then one might prefer higher benefits (and thus higher taxes) since this protects workers from the consequences of their failing to save.

The fact that benefit levels can be decided entirely independently of how Social Security's reform burden is allocated reflects the fact that contributions to Social Security made while working can in general be thought of as comprising a "net tax" component that goes to make the system permanently solvent and a "forced saving" component that funds retirement benefits. In the case of a payroll tax rate of 12.4 percent and benefits that have a present value equal to 8.4 percent of wages, the net tax amounts to 4 percent of wages while forced saving is 8.4 percent of wages. For the forced-saving component, Social Security is acting like a savings account receiving 8.4 percent of wages in every working year (albeit one that the worker is required to pay in to) that then finances benefits in retirement. By contrast, the remaining 4 percent is a pure tax from the worker's perspective, since he or she never sees it returned in the form of benefits. Importantly, it is the forced-saving component of Social Security contributions made while working that determines the level of benefits in retirement.

For individuals who would not save enough on their own for retirement, Social Security's forced saving element has two important consequences. First, Social Security increases these individuals' total retirement income (albeit at the cost of their having less disposable income before retirement). Hence, to the extent that the interests of society are served by ensuring that all persons have income in retirement that is at least partly related to their earnings while working, the forced saving component of Social Security represents a useful and important feature of the program. Second, forced saving affords access to Social Security's relatively advantageous annuity terms. The retirement benefit paid by Social Security is a real annuity; that is, it is paid out as long as the retiree is alive and is indexed to inflation once benefits commence with retirement. Because of the program's relatively low administrative costs and inflation-indexation provisions—and because forcing nearly all workers to participate eliminates the adverse selection problems that affect private annuities—it is likely that Social Security can transform a given amount of forced savings into a more generous real annuity than could a private company.

For individuals who would have saved on their own, Social Security mainly acts to displace private saving rather than to increase retirement income—someone forced to save through Social Security will simply save less on their own. If a hypothetical change to Social Security increases taxes and benefits by an equivalent amount, people are in essence being forced to do a larger portion of their retirement saving through the Social Security system. People who were already happy with the amount of retirement saving that they were doing would therefore be expected to simply unwind a modest increase in forced saving by reducing the amount of savings that they hold elsewhere in comparable investments.<sup>8</sup> Making such adjustments to one's asset holdings might involve some costs; for example, young people wishing to invest their full portfolio in equities would have to borrow to neutralize their safe Social Security assets and buy equities with the proceeds. That said, Social Security's forced saving might still be beneficial to this group to the extent that the system's annuity terms are better than what can be obtained in the private sector and to the extent that they would want to fully annuitize this portion of their retirement savings.

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8 If Social Security surpluses do not cause larger non-Social Security deficits, then such an increase in forced saving would mean higher government saving that is offset by lower private saving (for individuals who would have saved on their own). In this case, there would be no change in national saving.

## MEASURING BENEFIT ADEQUACY

One measure of benefit adequacy is the ratio of benefits to the amount of retirement income that would be needed to sustain a person's living standard while working—what will be referred to as the “benefit replacement rate.” As a proxy for the standard of living attained while working, the measure uses the constant level of real consumption that would be possible between the ages of 21 and 65 if all pre-tax wages earned during those years were consumed; this then forms the denominator of the benefit replacement rate while the numerator is the level of benefits.<sup>9</sup> Note that this measure understates the size of benefits relative to a retiree's actual standard of living while working, because it assumes all wage income is available for consumption when in reality some income goes to pay taxes.

Figure 3 plots the benefit replacement rate under current-law scheduled benefits for the low-, average-, high-, and very-high-earning composite earners shown in Figure 2 under the assumption that all workers retire at age 65.<sup>10</sup> As can be seen from the figure, the benefit replacement rate falls as lifetime income within each cohort rises: Social Security's progressive benefit formula implies that an increase in lifetime earnings results in a less-than-proportionate increase in benefits. For each composite earner, the replacement rate varies a small amount for cohorts born between 1935 and 1965 before leveling out for later birth cohorts.<sup>11</sup> For individuals turning 62 in 2007, the estimated benefit replacement rates for the low-, average-, high-, and very high composite earners are 67 percent, 51 percent, 44 percent, and 19 percent, respectively.

Benefit replacement rates tend not to change much for successive birth cohorts—the profiles shown in Figure 3 are basically flat—because the measure of wages that enters into the benefit calculation (average indexed monthly earnings, or the AIME) tends to grow for successive birth cohorts at the same rate as do actual real wages for successive birth cohorts.<sup>12</sup> In addition, the benefit formula is adjusted each year to ensure that its progressivity remains unchanged for successive birth cohorts.

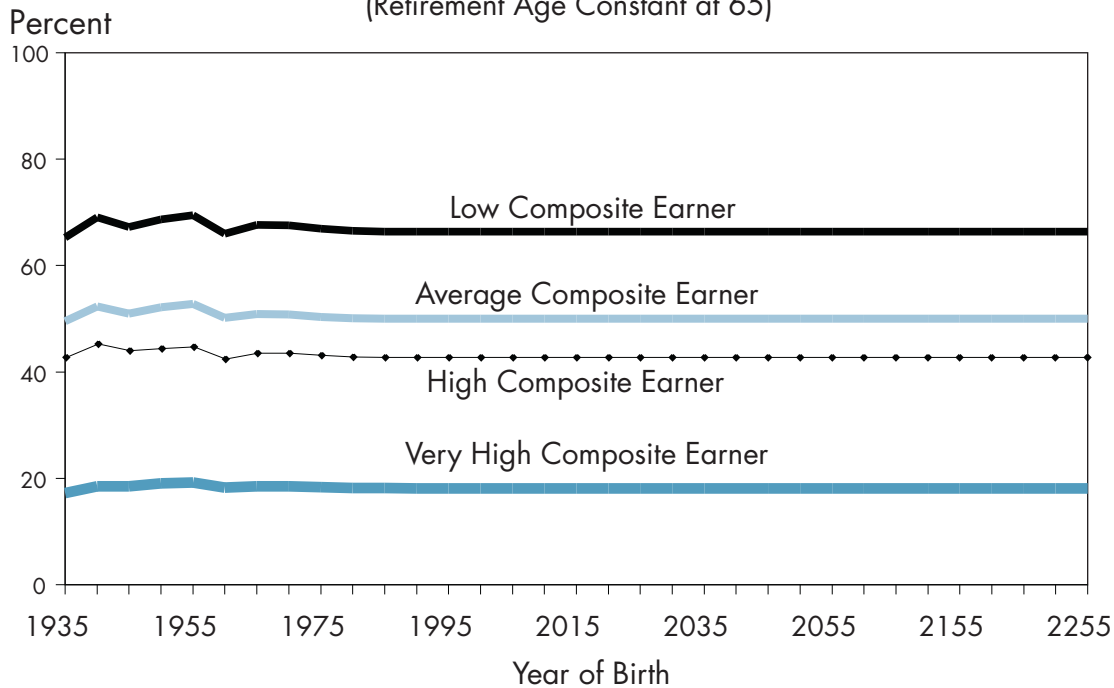
9 This concept of the replacement rate is not the same as the replacement rates reported in various editions of the Trustees Report. The Trustees Report estimates are made for hypothetical single workers rather than the composite workers used here. In addition, there are other important technical differences between the two measures.

10 This measure of the replacement rate is developed here to illustrate how to evaluate the impact of various changes to the system. Because scheduled benefits are not payable (the system is insolvent), actually maintaining the constant replacement rates shown in the figure would require higher revenues than what are provided for under current law.

11 The variation in replacement rates for the 1935-1965 birth cohorts reflects variation in real wage growth that causes variations in the denominator in the replacement rate calculation, together with changes in the normal retirement age and price inflation that cause variation in the numerator. By contrast, for individuals born in 1965 and later the normal retirement age is constant at 67 and real wage growth and price inflation for most or all of peoples' lives accord with current Social Security Administration projections, which show little variation.

12 To calculate the AIME, taxable wages at each age prior to age 60 are indexed to the level of economy-wide average wages in the year the person is age 60 before they are averaged together. While this indexation causes the AIME to be larger than more straightforward measures of average actual taxable real wages while working, this overstatement occurs for all birth cohorts and does not have any systematic effect on the rate at which benefits rise for successive birth cohorts.

**Figure 3: Benefit Replacement Rates**  
(Retirement Age Constant at 65)

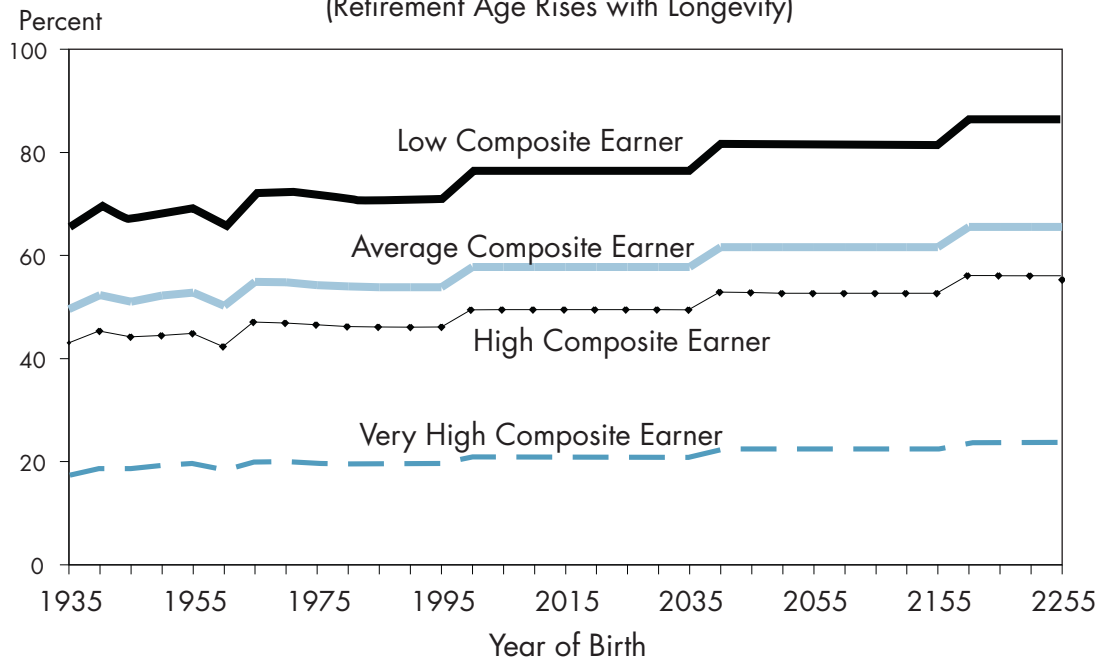


Source: Department of the Treasury

By assuming that all workers retire at age 65, the calculations in Figure 3 do not allow for the possibility that people will work longer as expected lifespans increase. Figure 4 therefore shows benefit replacement rates for the same set of composite earners under the alternative assumption that workers work longer as their life expectancies increase beginning with the 1946 birth cohort (who become eligible for benefits in 2008). Specifically, Figure 4 assumes that workers born prior to 1946 work until age 65, and that later cohorts work an additional year for every two-year increase in their projected life expectancy at age 62 relative to the 1945 birth cohort. As can be seen from the figure, replacement rates slowly rise as individuals work longer.<sup>13</sup> Because the calculations assume retirement on a birthday, the assumed retirement age jumps in discrete one-year intervals, which makes the calculated benefit replacement rates trend upward in steps.

<sup>13</sup> To keep the yardstick against which benefit adequacy is measured constant across cohorts, the denominator in the benefit replacement rate calculation is the same in Figure 4 as was used in Figure 3. That is, the denominator in both cases is the level of real consumption possible between the ages of 21 and 65 if all wages during those years were consumed. The increase in benefit replacement rates as people live and work longer thus reflects both a somewhat higher level of lifetime wages being used in the benefit computation, as well as—and more importantly—actuarial adjustments that are made to initial benefits and that depend on the age that benefits commence.

**Figure 4: Benefit Replacement Rates**  
(Retirement Age Rises with Longevity)



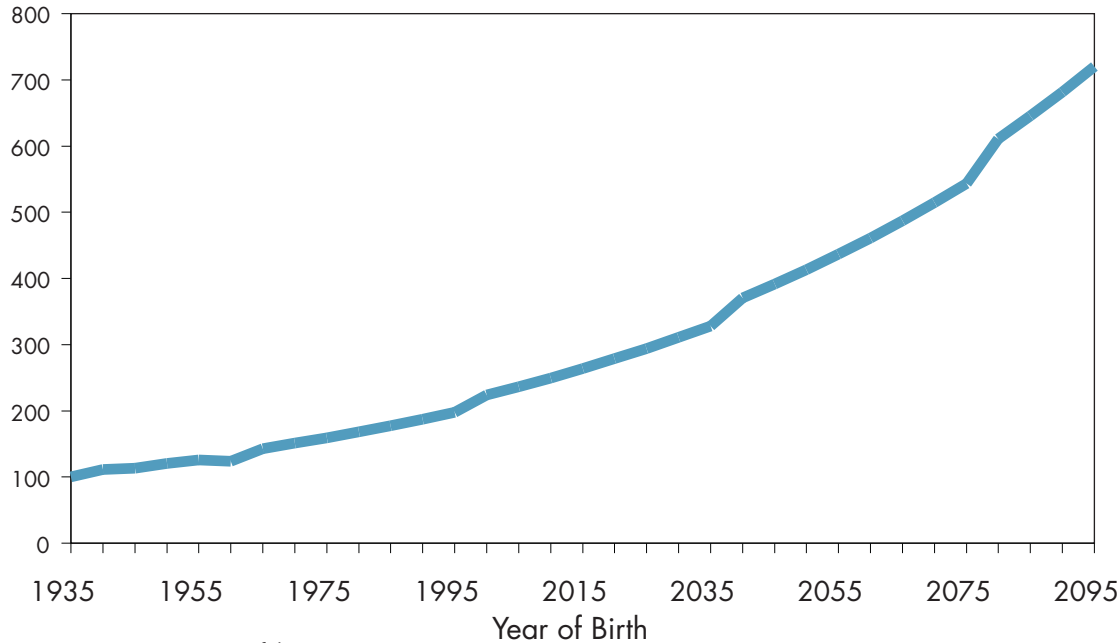
Source: Department of the Treasury

Because wages tend to rise faster than inflation over time (reflecting increased labor productivity), lifetime earnings—and thus benefits—will rise more rapidly than inflation for each cohort. As a result, the absolute *level* of real benefits for successive birth cohorts will rise more rapidly than the replacement rate. That is, Social Security is set up to provide each new generation of retirees with higher real benefits than what previous generations received. This can be seen in Figure 5, which plots real benefit levels for the average composite worker in the case where the age at which individuals retire is assumed to rise with longevity. Because absolute real benefit levels are difficult to interpret by themselves, benefits for the 1935 birth cohort are scaled to equal 100 and the benefits of all other cohorts are expressed relative to this one; in addition, only the average composite earner is shown because profiles for the other three composites are essentially the same.

A future issue brief will use the concept of the benefit replacement rate to assess the effect of specific reform provisions on benefit adequacy and compare the impact of various reform plans on both the replacement rate and the level of real benefits.

**Figure 5: Real Benefit Level**  
(Average Wage Composite Worker, Retirement Age Rises With Longevity)

Index: 1935 Birth Cohort = 100



Source: Department of the Treasury

## FORCED SAVING AND ECONOMIC EFFICIENCY

The size of benefits (or equivalently, the amount of forced saving) has a direct relationship with the size of the trust fund, because an increase in the amount of forced saving implies a corresponding increase in the amount of attempted pre-funding of Social Security benefits. (Whether this attempted pre-funding constitutes true pre-funding is discussed with reference to question four, below.) In the current system, any increase in forced saving accumulates in the trust fund; under some reform proposals, some or all of the increased forced saving would go into an alternative saving vehicle, such as personal retirement accounts.

A simplified example is useful to illustrate the relationship between benefit levels and the size of the trust fund. Suppose that for people born in 1980 one-third of the payroll taxes that workers pay under a reformed Social Security system are net taxes to make the system permanently solvent and two-thirds constitute forced saving to provide retirement benefits (using the example from above, this could involve 4 percentage points of earnings going to solvency and 8 percentage points that eventually come back as retirement benefits). Then it would be possible to eliminate two-thirds of this cohort's payroll taxes and all of its benefits without affecting the long-term solvency of Social Security (whether this would be a good idea is a different matter). In this case, the trust fund would have less revenue up front and a correspondingly lower benefit obligation in the future; the result is a lower trust fund balance at all dates between when the 1980 birth cohort first contributes taxes and when its last member dies. The same conclusion applies to other birth cohorts and for less drastic reductions in forced saving. This illustrates that the magnitude of retirement benefits has a direct impact on the size of the trust fund.

The Social Security system must impose a net tax exceeding \$13.6 trillion on reform cohorts (through benefits that have a lower present value than taxes paid), and the net tax will be related to wages if it is to be fair. Taxing work discourages work, with the magnitude of this economic impact depending on the precise way that the burden of reform is allocated across and within generations. These incentive effects of reform will be discussed in a future issue brief.

Social Security reform involves work disincentives because the net tax burden associated with reform must ultimately be imposed. The size of retirement benefits, on the other hand, derives from forced saving that is not related to the net taxes that affect work incentives. Provided that forced savings add to true pre-funding and that individuals understand that the part of their payroll taxes that constitutes forced saving will be returned to them as benefits in retirement, having higher or lower benefit levels does not have an additional impact on work incentives.<sup>14</sup> If either of these conditions does not hold, however, increasing benefits while keeping net taxes unchanged (that is, increasing forced saving) will result in additional economic distortions.

To illustrate this point, imagine a reform plan—call it “Plan A”—that levies a \$13.6 trillion-plus net tax on reform cohorts in a progressive manner and that involves a small amount of forced saving and thus modest retirement benefits. This could be a plan with a 6 percent payroll tax, where 4 percentage points go to make the system solvent and 2 percentage points fund future retirement benefits. Then Plan A can be modified by introducing a second tier of benefits that is crafted so as to have potentially no additional effect on work incentives. Specifically, the second tier of benefits would be funded with an additional payroll tax that accumulates in the trust fund (or in another saving vehicle, such as a personal retirement account), and each person’s additional benefits would equal the annuity value of a hypothetical account balance computed under the assumption that their own additional payroll taxes earn the same return as do trust fund securities (when done through the trust fund, such an arrangement is often referred to as a “notional account” or a “cash balance account”). So long as people understand the direct relationship between taxes and future benefits, these taxes should have no effect on work incentives.

It is worth emphasizing once again that increasing taxes beyond the amount needed to achieve permanent solvency in order to fund benefits does not discourage work effort only if two key assumptions are satisfied. First, individuals must understand that additional forced saving will be returned to them in the form of additional benefits—put differently, they must recognize that this truly represents forced saving, not a pure tax. Second, the additional forced saving must add to true pre-funding dollar for dollar. That is, the additional revenues must be kept secure so that they are available to fund future benefits. (In the context of the current system, this is the same task as ensuring that Social Security surpluses are saved.) The possibility that this latter assumption does not hold true will now be considered.

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14 In addition to these key conditions, this conclusion requires that individuals put the same value on the benefits Social Security provides them in retirement as they do on income received while working.

## FOURTH KEY QUESTION: IS ATTEMPTED PRE-FUNDING REAL? IF NOT, HOW DOES THAT AFFECT THE ANSWERS TO THE QUESTIONS ABOUT FAIRNESS AND BENEFIT SIZE?

How one answers the questions about intergenerational fairness and benefit size will be profoundly influenced by whether attempts to pre-fund future benefits by collecting current contributions in excess of current benefits are in fact successful. The imminent retirement of the relatively large baby-boomer cohorts and sustained improvements in longevity are expected to cause the ratio of retirees to workers to rise rapidly over the next 30 years. In these circumstances, maintaining Social Security contributions and benefits that are stable relative to peoples' wages while working implies that the system will collect more revenues than it pays out as benefits in the near term when the ratio of retirees to workers (the old-age dependency rate) is relatively low. It also implies that the system will pay more benefits than it collects in taxes later when the old-age dependency rate is relatively high. This financing strategy is reasonable *provided that the near-term surplus revenues are safeguarded in a way that allows them to be used in the future to pay for benefits.*

If Social Security surpluses accumulate in the trust fund, these surpluses will increase the government's capacity to pay benefits in the future *only* to the extent that they result in smaller amounts of public debt issuance than would occur if there were no surpluses. This is because reducing near-term public debt issuance would increase the government's capacity to issue debt in the future to help pay benefits (see Box 2 for additional discussion of this point). The result would be an accumulation of real resources now (through higher government saving) that can then be drawn upon in the future to finance benefits.

**BOX 2****TRUST FUND ACCOUNTING: HOW IT WORKS AND WHAT IT MEANS**

As required by law, excess revenues from Social Security taxes are used to purchase special-issue federal securities that are held in the Social Security trust fund and redeemed as needed to pay future benefits. The trust fund is credited with interest at a rate comparable to that paid on federal debt issued to the public. Social Security benefit payments are automatically authorized provided there are sufficient assets in the pertinent trust fund.

Because trust fund securities are themselves federal securities, they are often dismissed as IOUs that the government has made out to itself that do not increase its ability to pay benefits. This is true in the following sense: If information about trust fund holdings were somehow lost, there would be no impact on the government's ability to finance its overall operations going forward because government assets and liabilities would be reduced by identical amounts. But it does not necessarily follow that Social Security surpluses cannot increase the government's ability to pay future Social Security benefits. Social Security surpluses increase the government's capacity to pay future benefits to the extent that they reduce publicly held federal debt. If they reduce the issuance of publicly held federal debt now when the old-age dependency ratio is relatively low, it would be possible to issue more publicly held debt in the future to help finance benefits when the old-age dependency ratio is relatively high. (These effects arise from the surpluses, not from the trust fund accounting or the issuance of trust fund securities.)

The degree to which today's Social Security surpluses result in additional resources in the future depends on the effect that they have on spending and taxes in the rest of the federal budget. This is an empirical question that involves the political economy of government finance. If Social Security's finances do not influence the non-Social Security portion of the federal budget, then Social Security surpluses pay down publicly held debt dollar-for-dollar, and the trust fund balance at each point in time is a precise measure of how much the program has reduced publicly held federal debt up to that point. The trust fund balance at the end of 2006 was \$2 trillion. Hence, if Social Security does not influence non-Social Security fiscal decisions, then Social Security has increased the government's capacity to issue publicly held debt for the sake of paying Social Security benefits by \$2 trillion as of the end of 2006. To the extent, however, that Social Security surpluses result in higher deficits in the non-Social Security portion of the budget, then government saving is not increased by higher Social Security surpluses. In that case, future Social Security benefits that would have been financed with higher issuance of publicly held debt will instead have to be financed with reductions in non-Social Security spending or increases in non-Social Security taxes.

Many analysts believe Social Security surpluses do not increase the government's capacity to pay future Social Security benefits. Under this view, Social Security surpluses are offset in the rest of the federal budget by some combination of higher non-Social Security spending and/or lower non-Social Security taxes. To the extent that this is true, Social Security's surpluses do not increase the government's capacity to pay future Social Security benefits. The future benefit payments that would have been financed with public debt issuance had Social Security surpluses truly been saved must instead be financed with lower non-Social Security spending and/or higher non-Social Security taxes. In this case, the existence of the present Social Security surplus causes the non-Social Security budget to be more profligate, and the future Social Security cash deficit would be expected to cause the non-Social Security budget to become more austere. Under this scenario, an attempt to make Social Security fair to future generations by accumulating near-term surpluses in the trust fund would be undone by a non-Social Security policy that is less fair to future generations. Rather than resulting in resources that provide future benefits, running a Social Security surplus today would instead lead to more debt outside the trust fund that must be paid off by future generations, leaving them with no net gain.



## THE IMPLICATIONS FOR REFORM OF NOT BEING ABLE TO EFFECTIVELY PRE-FUND BENEFITS

If Social Security surpluses are not truly saved in the trust fund and if it is not possible to put in place some other mechanism to ensure that future Social Security benefits are pre-funded (such as personal retirement accounts or some other “lockbox” provisions), then it would be reasonable to compromise other reform objectives so as to limit trust fund accumulations. This can be accomplished in two ways: by reducing benefit levels while holding reform burdens constant, and/or by reducing the share of the Social Security reform burden that is imposed on early birth cohorts while keeping benefit levels constant. However, as will be discussed, only the first method of reducing trust fund accumulations would benefit future generations.

### *Reducing Benefit Levels Holding Reform Burdens Constant*

An inability to pre-fund Social Security benefits has an important effect on the decision of how large to make benefits. Compared with a reform that would be best overall if pre-funding were real, lowering each person’s taxes paid while working and benefits received in retirement in an actuarially equivalent manner (that is, reducing forced saving) would greatly reduce trust fund accumulations without affecting Social Security’s solvency or changing the distribution of Social Security’s net taxes across birth cohorts or income groups within birth cohorts. This policy change would have little effect on the well-being or retirement incomes of individuals who increase their private saving by the amount of their tax reductions—such people would do less forced saving through Social Security but make it up by saving more on their own. Individuals who do not save their tax reductions, however, might have inadequate income in retirement. That downside must be weighed against the increased fairness of overall fiscal policy toward future generations.

### *Changing the Distribution of the Reform Burden Holding Benefit Levels Constant*

Suppose the level of benefits (that is, forced saving) is held constant. Then trust fund accumulations could be reduced by shifting reform burdens only if payroll taxes were reduced for early birth cohorts and increased for later birth cohorts. Clearly, this policy change would not benefit future generations.

However, it is worth noting that shifting the payroll tax burden from early to later generations would also not harm later generations if trust fund accumulations are not truly saved. To see this, suppose payroll taxes are reduced in the near term and increased in the longer term so that the present value of payroll tax revenues is unchanged, and that the near-term payroll tax increases are exactly offset by higher non-Social Security revenues in every year. Then the amount of publicly held debt that future generations inherit would not be changed, and nor would their benefit payment obligations. It follows that those generations are made no better or worse off by the policy change.<sup>15</sup>

## HOW CAN EFFECTIVE PRE-FUNDING BE ACHIEVED?

If true pre-funding is not possible, the prospects for Social Security reform that is fair to future generations and that ensures adequate retirement incomes are greatly hindered. Rather than compromise on these

<sup>15</sup> While total publicly held debt would be unchanged, the amount that would be attributable to past Social Security cash flows would be larger, and the amount that would be attributable to past non-Social Security cash flows would be smaller. So while future generations would pay higher payroll taxes to make up for the higher amounts of public debt attributable to Social Security policy, they would pay lower non-Social Security taxes to service public debt attributable to non-Social Security policy.

goals, a better option would be to find a mechanism that provides more confidence that surplus revenues are truly saved. A future Treasury brief will explore this topic in detail.

## CONCLUSION

This issue brief has posed four key questions that policymakers should consider as a first step to deciding on the particular details of Social Security reform, and has offered an analytical framework to help answer them. Answers to these four questions will help define achievable goals for Social Security reform and help guide the process of crafting a reform package.