Key Points

- Many have offered Social Security reform proposals to keep the program financially sound before its trust fund becomes exhausted in approximately 25 years.

- Consistent quantitative measures allow for a better comparison of Social Security reform proposals. These measures fall in two broad categories: actuarial viability and distributional impact.

- Actuarial viability measures show whether a proposal could provide sufficient income to the Social Security system to support projected benefits and expenses. These measures include Social Security's Long-Term Adequacy, Long-Term Solvency, Sustainable Solvency, and Need for Large Scale General Revenue Participation.

- Distributional impact measures show well how a proposal could meet the financial needs and expectations of participants; these measures include Replacement Ratios, Purchasing Power at Older Ages, and Money's Worth Comparisons.

- Quantitative measures do not "favor" one proposal over another; rather, these measures provide an objective platform for assessing Social Security reform proposals.

Quantitative Measures for Evaluating Social Security Reform Proposals

Recent reports of the Social Security Board of Trustees estimate that the program's trust funds will be exhausted in approximately 25 years unless changes are made to the program. Various reforms have been proposed, including combinations that increase payroll taxes, raise the retirement age, lower benefits or allocate payroll taxes to individually owned accounts.

Social Security reform proposals come from a number of sources. President Obama's National Commission on Fiscal Responsibility and Reform, chaired by Erskine Bowles and Alan Simpson, published a report in 2010 that included a proposal to restructure Social Security. Members of Congress from both parties also have made proposals, and private think tanks have contributed to the public debate on Social Security.

Advocates of the various reforms all claim that their proposals would solve Social Security's financial problems while continuing to meet participants' financial needs in retirement. In the face of these competing claims, a set of guidelines of quantitative measures is needed for evaluating Social Security reform proposals. In this issue brief, the American

Academy of Actuaries' Social Security Committee describes a number of measures that can provide useful quantitative analysis of reform proposals. The issue brief explains how these measures can be used together to obtain a clearer picture of the relative advantages and disadvantages of the proposals for bringing long-term financial soundness to Social Security.

Because Social Security is such a large system, changes in the program are likely to have macroeconomic effects causing considerable debate among diverse stakeholders. The goal of establishing a quantitative framework is to promote consistent analysis of such proposals and to ensure proper comparability of proposals over the broad timeframes and range of provisions covered.

Based on the analyses done for past Social Security legislative proposals, the Social Security Committee recommends the use of a standard set of measurement tools that would clearly and objectively present the financial effects of Social Security reform proposals. While some of these measurement tools may not be appropriate for every reform alternative and may need to be adapted to a specific proposal, a balanced and clear analysis is important.

In general, two types of measurement standards can be applied to Social Security reform proposals. Measures of *actuarial viability* show whether income to the Social Security system would be sufficient to support the payment of projected benefits and other expenses. Measures of *distributional impact* show how well the system would meet the financial needs and expectations of participants. An example of the quantitative measurements considered and potential format for comparing potential proposals is included at the end of this issue brief.

Four Measures of Actuarial Viability

Understanding and balancing Social Security's benefit commitments with its financing sources should be the top priority of any reform. For this reason, any Social Security reform proposal should be analyzed according to the following four measures of actuarial viability:

1) Long-Term Adequacy
2) Long-Term Solvency
3) Sustainable Solvency
4) Need for Large-Scale General Revenue Participation

No single measure is necessarily determinative on its own, but reviewing all measures in context with each other can help provide clear and consistent input to decision-makers.

1) Long-Term Adequacy: Does a proposal achieve a positive long-term actuarial balance under the disclosed assumptions?

Actuarial balance refers to a long range comparison of the present values of the summarized income rate to the summarized cost rate. The summarized income rate is the ratio of the Social Security trust funds' current assets plus the present value of projected income to the present value of taxable payroll. The summarized cost rate is the ratio of the present value of projected outgo plus an ending trust fund balance equal to the next year's outgo to the present value of taxable payroll. Income primarily comprises payroll taxes, investment earnings and the income taxes paid on the Social Security benefits by higher income beneficiaries. Outgo comprises benefit payments and administrative expenses. When the summarized income rate exceeds the summarized cost rate, the system is said to have a positive actuarial balance.

For example, under current law, the Board of Trustees[1] evaluates the program annually over a mov-

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[1] The Board of Trustees of the Federal Old-Age and Survivors Insurance and Federal Disability Insurance Trust Fund.

ing 75 year projection period. This period was chosen because it encompasses the entire lifetime of virtually all current workers. The annual calculations use three sets of assumptions: low cost, high cost and intermediate (best estimate). Results under the intermediate projection are those generally cited in the media and used by policymakers when debating Social Security's future.

A proper perspective is needed when interpreting the results of these actuarial estimates considering that Social Security is about 75 years old. Many profound changes in U.S. society and the economy have occurred since the mid 1930s when the program was created:

■ In the 1930s, only about 6 percent of the population was over age 65, and many of these older Americans were still working. Few enjoyed long periods of retirement. Today, about 13 percent of the population is over age 65. Workers typically retire before age 65 despite longer life expectancies, and many live for decades after retirement.

■ In the 1930s, most women in the labor force left when they had children and rarely returned. Today, most women either continue working when they have children or return to the work force after their children enter school.

■ In the 1930s and early 1940s, birth rates were low because of decades of rapid urbanization followed by economic depression and World War II. From 1946 until the mid-1960s, the United States experienced a baby boom, followed by much lower birth rates in the '70s and '80s.

These unanticipated changes have profoundly affected Social Security's finances. Given the dynamic nature of our society and economy, further unanticipated changes will inevitably occur and render any long range projection uncertain at best. Still, the vast majority of workers who will receive Social Security retirement benefits in the next 75 years have already been born. Using a 75-year projection provides a

focus on the lifetime benefits for all currently living Americans on the valuation date.

In Table 1 below, the column "long-range actuarial balance" shows one metric, currently used by the Office of the Chief Actuary of Social Security, to measure long-term adequacy (currently measured over a 75-year period). The effect of a new proposal from the perspective of long-term adequacy can be assessed by comparing the present law, the effect of a new proposal, and the status of Social Security with the provision changes. For long-term adequacy to be achieved in a self-supporting manner (with no need for large-scale general revenue participation), the long-range actuarial balance must be positive. In the hypothetical example below, under current law the long-range actuarial balance is a 2.22% shortfall and the annual balance in the 75th year is a 4.24% shortfall (both as a percentage of taxable payroll). Under this hypothetical proposal, the long-term adequacy is improved by 1.22% so that the new shortfall is only 1% of taxable payroll while the improvement in the 75th year is 1.24% resulting in a new shortfall in the 75th year of 3% of taxable payroll. The "Annual balance in 75th year" columns will be described under the sustainable solvency section.

2) Long-Term Solvency: Will the projected trust fund balances remain positive at all times during the long-term projection period?

Even if the system is in actuarial balance over the long-term projection period, the trust fund balance may not be positive at all points during that period. If either the Old-Age and Survivors trust fund or the Disability Insurance trust fund runs out of money and the shortfall is determined to be temporary, Congress could authorize interfund borrowing (as it has on occasion in the past) or borrowing from general revenues or other sources to tide the system over until income catches up with expenditures. In evaluating a reform proposal, any period during the 75-year projection period when the trust fund is expected to run

Table 1: Sample Long-term Adequacy Metric[2]

Present Law		Change from Present Law		Results with New Provision	
Long-range actuarial balance	Annual balance in 75th year	Long-range actuarial balance	Annual balance in 75th year	Long-range actuarial balance	Annual balance in 75th year
-2.22%	-4.24%	1.22%	1.24%	-1.00%	-3.00%

Source: Social Security Office of the Chief Actuary

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[2]The percentages reflect a percentage of taxable payroll. Negative values reflect a deficit of income compared to costs and positive values reflect a surplus.

out of money should be identified, even if the situation is only temporary and the system is expected to be in long-term actuarial balance.

For example, the Office of the Chief Actuary of Social Security uses trust fund ratios as a measure of whether there will be sufficient funds to pay benefits at every point in time. Trust fund ratios are equal to fund assets at the beginning of the year divided by costs payable during the year. By comparing trust fund ratios using present law and with the provision change, a reasonable assessment can be made of the effect of a proposal in each year from the perspective of solvency. If the trust fund assets remain greater than 0 throughout the entire projection period, the system has achieved "long-term solvency." As shown in Figure 1 below, long-term solvency is not achieved in this sample because the top line reaches 0 in about 2060.

Figure 1: Sample Long-Term Solvency Metric
(OASDI trust fund ratio with assets as a percentage of annual expenditures)
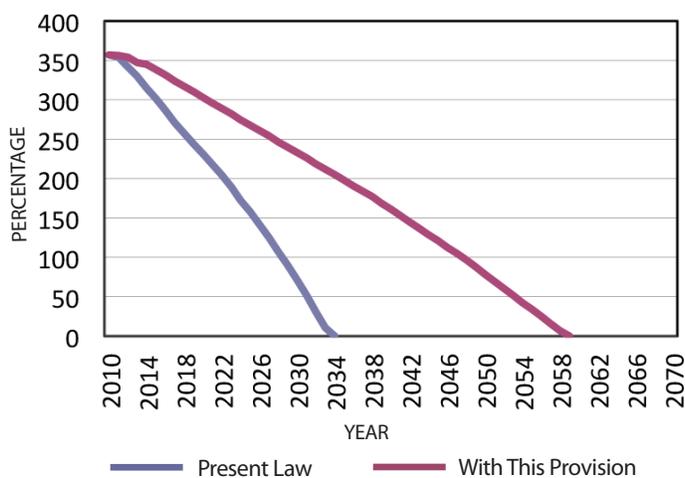
Source: Social Security Office of the Chief Actuary

(3) Sustainable Solvency: Will trust fund ratios be stable or increasing at the end of the projection period?

As each year passes, a fixed projection period of the trust fund ratio moves forward one year – the first year from the previous year's valuation becomes part of the past, and a new year is added at the end of the previous year's projection period. A potential danger is that, if projected expenditures exceed projected income in the new ending year, this could reduce the actuarial balance in the new valuation, compared to the previous one, all other things being equal. If this

occurs many years in a row, a projected positive actuarial balance will turn into a negative actuarial balance. In fact, this happened after the Social Security Amendments of 1983 were enacted.

Initially, the system was in actuarial balance due to adoption of these amendments but soon the system fell out of balance again. This occurred in part because each new year added to the projection period was a deficit year. Therefore, it is important to pay attention to the trend in the trust fund ratio at the end of the projection period to see if a continuation of this trend could change the actuarial balance in the future. If the ratio of projected income to projected expenditures remains the same or increases at the end of the projection period, then sustainable solvency has been achieved. As each new year emerges into the projection period, the financial position of the system would be expected to remain the same or improve.

Table 1 (shown on page 3) can also be used as a metric for sustainable solvency. The column, "Annual balance in 75th year," under the "Results with New Provision" columns should be greater than or equal to the second to last column, "Long-range actuarial balance," in order for the system to be sustainably solvent. Sustainable solvency also requires that both the actuarial balance and the annual balance in the 75th year be greater than 0%. In this example, the system is not sustainably solvent.

Alternatively, Graph A can be used as a metric for sustainable solvency. A positive slope in the "With this provision" line in Graph A will also indicate sustainable solvency because the trust fund balance at the end of the projection will be at least as large as the immediately previous balance.

(4) Need for Large-scale General Revenue Participation: Does a proposal require the transfer of general revenues into the trust fund to achieve long-term adequacy and solvency or require Treasury to borrow and then repay large amounts?

Since its inception, Social Security has been financed primarily by payroll taxes, separate from general government revenue, that are collected at the same tax rate from employers and employees. Any excess payroll-tax receipts over amounts needed for paying Social Security benefits and administrative expenses goes into a trust fund, which invests in special-issue U.S. Treasury securities. (A small part of the trust fund's portfolio has been invested in certain government agency bonds.) The trust fund's investment income and assets can be drawn upon whenever payroll-tax receipts are insufficient to cover current outgo.

From about 1960 until 1993, the trust fund's assets were generally sufficient to cover no more than the

next year's outgo. When assets exceeded this level, Congress usually adopted benefit increases or other changes that absorbed the excess assets. Thus, the trust fund served primarily as a buffer between the tax-collection and benefit-payment processes during this period in what was essentially pay-as-you-go financing.

Actuarial valuations of Social Security since the 1970s have shown that maintaining pay-as-you-go financing after the baby-boom generation began retiring in large numbers would be difficult because that would leave too few workers to support benefit payments at the current payroll-tax rate. The first baby boomers reached Social Security normal retirement age in 2012, and many had already begun receiving early retirement benefits before then. In 1977 and 1983, Congress enacted changes to Social Security's tax and benefit provisions that had the effect of modifying the system's pay-as-you-go financing by increasing payroll taxes in anticipation of the retirement of the baby boomers. These changes eventually led to the current build-up in trust fund assets, which will be used to supplement payroll-tax receipts when these are no longer sufficient to pay all benefits. Actuarial estimates made at the time of the 1983 legislation showed that the system would remain solvent for 75 years, until 2058. Later developments, primarily changes in the assumptions used to predict the system's future financial condition, moved the estimated year of trust fund exhaustion to 2038. The estimated date of trust fund exhaustion has remained relatively unchanged since 2001 with the estimated date of exhaustion moving from 2038 to 2036.

When Social Security's income from the payroll tax exceeds its expenses, as was the case from 1984 until 2009, the trust fund purchases more government bonds and reduces the revenue that the government needs to raise either through taxation or by selling bonds to the public. Beginning in 2010, however, the government has had to use money from other sources to pay some of the interest on the bonds held by the trust funds. Eventually, the government will have to start redeeming the bonds in the trust funds in order to continue making scheduled benefits payments. This borrowing and repayment by the General Fund of the Treasury affects generations of taxpayers differently. Taxpayers in the years that the Social Security trust fund is lending money to the federal government will pay less to receive the same level of services; taxpayers in the years when the trust fund is being repaid will pay more. Because of this impact on generations of taxpayers, it is important for policymakers to have a metric that shows the years and amounts involved if a reform proposal will build up a trust fund balance. Reform proposals should measure and disclose trust fund income (including interest net of costs) in each future year as a percentage of GDP. This metric would present positive amounts in years that Social Security's scheduled income is greater than scheduled expenditures and negative amounts in the years when its scheduled income is less than scheduled expenditures.

Achieving long-term adequacy and solvency, as described in the first two measures above, requires that trust fund assets be sufficient to pay benefits and administrative expenses at all times over the long-term projection period. Any reform proposal, as well as the current Social Security system, can be made to meet these criteria simply by adding a provision that covers any shortfall with transfers from the government's general revenues. The existence of such transfers can be difficult to discern. One suggestion, for example, is to increase the interest rate payable on the special-issue government bonds held by the trust fund assets to above-market rates. The additional interest would be a subsidy from the government's general revenue. Other proposals are more direct, calling for outright transfers of funds from general revenues to the trust funds. Such transfers would sooner or later be funded either through increases in current taxation or by selling government bonds.

In general, reform proposals that retain the basic defined-benefit structure of the current Social Security system have so far not included substantial transfers from general revenues. Instead, they usually opt to achieve long-term actuarial balance by some combination of tax increases, benefit decreases and additional income through investment of trust fund assets in the stock market. The Simpson-Bowles Commission's proposals, for example, retain the defined-benefit structure. This proposal increases retirement age, decreases cost-of-living increases on benefits being paid, and reduces the benefits of high-wage earners. Additional taxes are collected by subjecting more wages to payroll taxes than under the current law partially by increasing the limit on taxable wages and partially by including all new state and local government workers in Social Security.

Social Security reform proposals almost always continue the current system for workers receiving benefits as well as active workers above a cutoff age such as 55.

To finance Social Security without raising payroll taxes, an offset individual account plan usually needs substantial new income from general revenue beyond what would be needed to restore the current system to actuarial balance without reducing benefits. This is because some of the current payroll-tax revenue, which would otherwise be available to pay benefits

to current retired workers and dependents, would be shifted to provide individual accounts for younger workers who will not retire until well into the future. As a result, the basic defined-benefit part of Social Security would soon need an alternate source of cash income to pay ongoing benefits and expenses.

There is another way to explain this transition. Under the system as now constructed, each generation largely pays for the benefits of the preceding generation. Under an individual account system, each generation pays for its own benefits. During the transition from defined-benefit to individual account, there will inevitably be a transition generation that must pay for both the preceding generation's benefits and its own. This additional burden is called the "transition cost." While the amount varies among proposals, liabilities in the range of $10 trillion are not atypical. Proponents of individual accounts often say this liability already exists and is not created by the transition to individual accounts. However, the issue here is not the existence of the liability, but the timing of when it comes due. The transition to individual accounts places the burden of the Social Security liabilities of two generations on one generation.

Any fair analysis of the financial effects of a reform proposal should take into account any subsidy from general revenues included in the proposal. One metric that can be used to show the impact of general revenue subsidies would show the year-by-year additional income required under the proposal from the government's general account to the trust fund and the present value of this additional income. Some reform proposals eliminate the need for this subsidy altogether, so that general revenues are not expected to be required to pay benefits. Other proposals, particularly those involving individual accounts, greatly expand the use of general revenues to fund Social Security benefits.

There is no specific metric currently used by the Office of the Chief Actuary of Social Security to measure General Revenue Subsidies. One example of a metric with "General Revenue Subsidies" as a percentage of GDP is shown below in Table 2. For example, in 2035, there is no expected general revenue transfer anticipated; however, if the new law were passed it is expected that a general revenue transfer equal to 0.8% of GDP would be required..

Gauging the Distributional Impact of Reforms

The distributional impact on individuals should also be considered before enacting any reforms since Social Security covers nearly all working Americans at all income levels and in virtually all family situations. Because the federal government has always tried to achieve a balance between social adequacy and individual equity in the program, Social Security benefits vary, both in dollar amounts and as percentages of previous earnings levels, for participants in different situations.[3] Policymakers naturally want to know the impact of various reform proposals on participants in different situations and need suitable tools for this purpose. These additional measurement tools would provide policymakers with information about the effect of proposed changes on current and future workers in various situations.

Because U.S. families are extremely diverse, measuring and illustrating the impact of Social Security reform proposals on prototypical workers with all possible combinations of earnings histories and family situations is impossible. Only a small sample can be included in a reasonable-sized study. Traditionally, such studies have concentrated on hypothetical workers with steady earnings, i.e., earnings that remain constant as a percentage of national average wages over the worker's career. Traditional studies have shown results for four wage levels: low (45 percent of the average wage); average (equal to the average wage); high (160 percent of the average wage) and maximum (equal to the maximum earnings recognized for taxation and benefit-computation purposes under current law). However, steady earnings, while easy to conceptualize and explain, are not typical

Table 2: Sample General Revenue Subsidy Metric

General Revenue Subsidies During the Long-term Period (as a percentage of GDP)			
Year	Present Law	Change from Present Law	Results with New Provision
2015	0.00%	0.50%	0.50%
2020	0.00%	0.60%	0.60%
2025	0.00%	0.70%	0.70%
2035	0.00%	0.80%	0.80%

[3]See American Academy of Actuaries, *Social Adequacy and Individual Equity in Social Security,* January 2004.

among actual workers. More often, workers' earnings increase relative to the national average early in their careers, peak sometime in mid-career and may even decline as workers approach retirement. As a result, some recent studies by Social Security actuaries and others have utilized scaled earnings patterns, where earnings vary as a percentage of average wages over a worker's career. These studies use statistical analyses of the earnings histories of large numbers of workers to derive earnings patterns more typical of actual workers. In Social Security Administration studies, the scales are unisex and are designed to yield career-average earnings levels equivalent to the low, medium, high, and maximum steady earnings levels described above. Similar studies by other groups have separate scales for male and female workers, recognizing the different earnings patterns of the sexes. Of course, no one can know whether historical earnings patterns will change over time.

The use of steady versus scaled earnings models, and the scaling methodology itself, can influence the apparent impact of Social Security reform proposals on workers' benefits. For example, in both the current system and an individual account system, benefits are based on earnings over a worker's entire career. However, the current system gives equal weight to all earnings (after indexing for changes in average wage levels), while an individual account system gives greater weight to earnings early in a worker's career, because compounding of investment earnings has more time to operate, and lesser weight to earnings that are closer to retirement. Earnings under a steady model start higher and peak lower than under a scaled earnings model. Because an individual account system would give greater weight to the higher earlier earnings and lesser weight to the lower later earnings under a steady model, such models show an apparent advantage of individual account proposals over the current system or other career average defined-benefit proposals.

However, scaled earnings models have several drawbacks. Scaling adds another dimension to career earnings patterns, greatly multiplying the number of possible earnings profiles and increasing the difficulty of choosing a small number of profiles representative of the broad population of covered workers. Further, scaled earnings models developed today may not accurately represent the earnings patterns of future generations of workers. Given the wide latitude available for choosing a scaling model, study authors could choose a scaling model that subtly enhances the performance of the Social Security proposal that they favor. Even recognizing these shortcomings, a scaled earnings model generally produces more reliable results than a steady model, especially when comparing

defined benefit and individual account plans, provided that both the scale and the methodology for developing the scale are disclosed.

Because benefits vary not only by earnings history but also by family situation, any comprehensive analysis of the effects of a reform proposal must show results for a variety of common family situations. These may include: single workers, both male and female; married workers, both male and female, with non-working spouses; and married couples with two wage-earners. The last category can be further subdivided to take into account differences in the spouses' earnings levels. Other situations, such as workers becoming disabled or divorced or dying at various ages, may also be included. Following these suggestions would require calculations of many different worker profiles.

Instead of or in addition to analysis using prototypical workers, microsimulation models provide another tool for examining the effects of Social Security reform options. In contrast to analysis using a small sample of prototypical workers, population-based microsimulation models simulate the lifetime earnings, wealth, and demographic profiles for large samples of families representing different cohorts and subgroups within the worker population. By showing the effects of changes in Social Security rules on the lifetime incomes and benefits of large groups instead of specific representative families, such models facilitate analysis of a broad array of demographic subgroups rather than focusing only on the most common situations. Because microsimulation models also include population weights, they automatically determine the share of the population that each subgroup represents.

Any analysis using prototypical workers or microsimulation models requires using assumptions regarding future economic and demographic experience. Testing the sensitivity of a proposal to different possible economic and demographic assumptions can provide useful information. All of these calculations can be difficult and costly to perform and interpret. The use of graphical presentation techniques can make the resulting large volume of data easier to comprehend and analyze.

Under the current Social Security program, workers may retire with unreduced benefits beginning at age 66. This age is scheduled to increase in steps to age 67 for workers born in 1960 and later. Many reform proposals would change the age at which unreduced benefits are first paid for some or all future retirees, usually to a later age. To achieve comparability between different reform proposals and among workers in different situations, these calculations should use a uniform retirement age.

Three Measures of Distributional Impact

Since changing Social Security rules will affect various groups in different ways, it is vital to study the effect of reform proposals on benefits. Measures of distributional impact include:

1) Replacement Ratios

2) Purchasing Power at Older Ages

3) "Money's Worth" Comparisons

(1) Replacement Ratios: How will a proposal affect Social Security retirement benefits at a disclosed consistent age, expressed as a percentage of earnings? How will a proposal change replacement ratios over a long-term period?

Replacement ratios are frequently used by actuaries and economists to measure the adequacy of retirement income. A replacement ratio is the ratio of a worker's income in the first year of retirement to earnings that, in the steady case, is represented by earnings in the last year before retirement. Retirement income is derived from a combination of Social Security, employer-sponsored retirement plans, personal savings, and earnings from continuing to work. Thus, changes in the Social Security portion of a worker's replacement ratio will affect how much the worker needs from these other sources.

Table 3 below shows the portion of pre-retirement income replaced by Social Security at retirement age 66 for a worker earning 100% of the scaled earnings in the table developed by the Social Security Office of the Actuary. The Social Security replacement ratio is only one component of total retirement assets. Therefore, this number alone should not be expected to fully replace needed replacement ratios. However, consideration of the change in the replacement ratio associated with a proposal provides a good measurement of the effect of a proposal on a worker's retirement income. In the example in Table 3, the proposed change replaces only 35.5% or a worker's pre-retirement income versus 36.4% under current law.

2) Purchasing Power at Older Ages: How will a proposal affect the purchasing power of Social Security retirement benefits after initial benefit commencement, for example at ages 75, 85, and 95?

In recent years more attention has been paid to the automatic annual cost-of-living adjustment (COLA) applied to Social Security benefits. Cost-reduction proposals often include measures to decrease the annual COLA to help achieve actuarial solvency. Other proposals provide a "bump up" in benefits to those who have reached an advanced age. Some recent proposals increase the cost of living by using a Department of Labor index reflecting the spending patterns of consumers over age 62 (CPI-E). With more scrutiny on the COLA provision, additional measures of benefit comparison have become necessary.

Analysis of COLA adjustment proposals requires measurements at multiple future points. Analysis of proposals comparing the annual income received at sample ages (75, 85, and 95) under the current system to the income under a proposal for various wage earner profiles previously discussed provides some general idea of the distributional impact of the proposals. This analysis resembles the replacement ratio analysis in many regards. Use of projections that show expected benefits at various future ages can adequately compare both overall adjustments to the COLA calculation method or basis as well as provisions providing for one-time future benefit increases or application of potential minimum benefits. Sensitivity tests to demonstrate the actual COLA effects over time should be included in this measurement.

Table 3: Replacement Ratio Metric

Monthly Scheduled Benefits for Worker Assuming 100% of Scaled Earnings Retiring at Age 66						
	Current Law				Proposed Change	
Age	Scheduled benefit	Wage immediately before retirement	Wage at retirement age adjusted to reference age with inflation (CPI)	Replacement ratio	Scheduled benefit with change from a proposal	Replacement ratio after change
66	800	2,200	2,200	36.4%	780	35.5%

Source: Social Security Office of the Chief Actuary

Table 4: Purchasing Power Metric

Scheduled Benefits for Worker Assuming 100% of Scaled Earnings Retiring at Age 66								
			Current Law			Proposed Change		
Age	Sched-uled benefit	Base wage*	Base wage* adjusted with inflation (CPI)	Purchasing power replace-ment ratio	Sensitivity test**	Scheduled benefit with change from proposal	Purchasing power re-placement ratio after change	Sensitivity test**
66	800	2,200	2,200	36.4%	36.4%	780	35.5%	35.5%
75	1,103		3,033	36.4%	34.8%	1,009	33.3%	31.9%
85	1,412		3,882	36.4%	33.2%	1,230	31.7%	28.9%
95	1,807		4,969	36.4%	31.6%	1,499	30.2%	26.2%

* Wage immediately before retirement.
**Assumes expense increases of sample beneficiary are 0.5% per year higher than CPI.
Source: Social Security Office of the Chief Actuary

In Table 4 above, the column, "Purchasing Power Replacement Ratio," shows the portion of inflation adjusted pre-retirement income replaced by Social Security at various ages in retirement. Consideration of these metrics allows for comparison of purchasing power later in retirement and facilitates comparison of proposals that not only adjust initial benefits, but also those that change the cost-of-living provisions and/or provide for one-time benefit increases later in retirement.

(3) "Money's Worth" Comparisons: Two of several money's worth measures are money's worth ratios and the internal real rate of return.

A money's worth ratio is equal to the present value of expected benefits from Social Security for a sam-ple individual divided by the present value of future payroll taxes of the individual. Table 5 below shows a sample of the money's worth ratio metric produced for current Social Security benefits by the Social Security Office of the Actuary.

The internal rate of return (IRR) metric for evaluating the Social Security system is used to compare Social Security to other investment opportunities. An IRR is calculated where the present value of employee and employer payroll taxes equals the present value of expected distributions including the value of expected spouse and survivor insurance benefits. In comparing the current Social Security program to a proposal that shifts the program toward a greater investment orientation, features of societal value are not easily measured

Table 5: Money's Worth Ratio Metric

OASDI Program – Present Law Scheduled Scenario (Ratio of Present Value of Benefits to Present Value of Contributions)						
Earnings level	Year of birth	Year attains age 65	Single male	Single female	One-earner couple	Two-earner couple
Very Low	1920	1985	2.52	3.07	5.55	2.92
	1930	1995	1.57	1.83	3.32	1.82
	1937	2002	1.45	1.63	2.99	1.68
	1943	2008	1.33	1.48	2.70	1.52
	1949	2014	1.36	1.51	2.70	1.52
	1955	2020	1.46	1.64	2.83	1.61
	1964	2029	1.63	1.81	3.04	1.77
	1973	2038	1.71	1.91	3.13	1.86
	1985	2050	1.71	1.87	3.05	1.83

Source: Social Security Office of the Chief Actuary

in monetary terms. Table 6 below shows a sample of the IRR metric produced for current Social Security benefits by the Social Security Office of the Actuary.

Investors will accept risk to achieve additional returns; however, when analyzing a Social Security reform proposal from a IRR perspective, one needs to consider the possibility that an individual's distribution might be less than promised under the system because of a loss on a risky investment. Any risky asset return should be adjusted to an equivalent nonrisky return to reflect the guaranteed nature of Social Security benefit payments.

Several potential pitfalls must be avoided in applying money's worth analysis:

- As noted above, some reform proposals include subsidies from the Treasury's general revenues. Any such general revenues would represent an investment in the system that, if ignored, could be manipulated to produce any desired rate of return. In practice, money's worth calculations customarily count only payroll taxes as revenue. Further, it is unclear how any general revenue subsidy would be allocated among participants for purposes of these calculations because income taxes and Social Security payroll taxes are levied on very different bases. In applying the money's worth analysis to any reform proposal, all outside subsidies must be identified, regardless of whether the subsidy is funded by current taxation or by additional government debt. The analysis should, if possible, show how the outside subsidies contribute to the investment return in each hypothetical family situation. If not possible, then

the analysis should at least describe in general terms how the outside subsidies affect investment returns.

- A special case of the above problem presents itself with regard to the current Social Security program. Because the program is not in actuarial balance, its funding deficit represents an effective subsidy of the current generation by future generations. Therefore, values calculated from benefits versus payroll taxes for the current program must be modified to reflect either increases in the employer/employee payroll-tax rate or decreases in benefits necessary to bring the program into actuarial balance. Several approaches have been used to accomplish this by either assuming reduced benefits or increased taxes in the future.[4]

- The current Social Security program includes important nonretirement benefits, such as disability, and family member and survivor benefits. Some reform proposals reduce these benefits. Therefore, to obtain a valid comparison, the expected value of nonretirement benefits must be included on the benefit side of the comparison.

Conclusion

The Social Security Committee recommends that, whenever practical, the measurement tools described in this issue brief be applied to major Social Security reform proposals, including those intended to provide fundamental structural changes. To do so would provide policymakers and the public with important information needed to fairly evaluate each proposal.

Table 6: Internal Real Rates of Return Metric

OASDI Program – Present Law Scheduled Scenario and Increased Payroll Taxes (Percent)						
Earnings level	Year of birth	Year attains age 65	Single male	Single female	One-earner couple	Two-earner couple
Very Low	1920	1985	5.45	6.18	9.18	6.53
	1930	1995	4.49	5.00	7.48	5.23
	1937	2002	4.41	4.76	7.12	5.02
	1943	2008	4.28	4.59	6.81	4.80
	1949	2014	4.30	4.59	6.70	4.73
	1955	2020	4.38	4.72	6.65	4.78
	1964	2029	4.41	4.76	6.52	4.79
	1973	2038	4.50	4.86	6.49	4.85
	1985	2050	4.63	4.93	6.55	4.93
	1997	2062	4.68	4.94	6.51	4.94
	2004	2069	4.72	4.98	6.52	4.98

Source: Social Security Office of the Chief Actuary

[4]Interested readers may refer to the *Report of the 1994–96 Advisory Council on Social Security,* Volume 1, Appendix 2.