The Employee Benefit Research Institute (EBRI) was founded in 1978 to present “just the facts” on financial security issues. We are non-partisan. Our incorporation guidelines state: “In all its activities the Institute shall function strictly in an objective and unbiased manner and not as an advocate or opponent of any position.” Full information on EBRI can be found online at www.EBRI.org.

EBRI published its first work on Social Security in 1979, and its first work on individual accounts in 1982. During the Clinton Administration EBRI published a great deal on individual accounts which can be found online at: www.EBRI.org/SSProject/report.htm This includes analysis of past proposals for “USA Accounts” in addition to broader Social Security reform options.

EBRI provided financing for the development of a model – SSASIM - during that period in order to be able to analyze proposals using stochastic or Monte Carlo analysis that takes risk and uncertainty into consideration. GEMINI, an enhanced model for doing Social Security analysis, was subsequently developed by the Policy Simulation Group and has been used by GAO and SSA. GEMINI is the simulation model used for the basis of this analysis. GEMINI allows many reform alternatives to be tested. We would be pleased to discuss any analysis ideas that we have not investigated today.
How Does an Individual Account Social Security Plan Compare in Retiree Benefit Levels Over All Retirees?

• Compared to What?  Current Law Benefits? “Payable Benefits”?
• What Are the Equity Rate of Return Assumptions?
• When Were the Retirees Born?
• What is the Timeframe for the Actuarial Balance Calculation?

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While “sound bites” frequently make the Social Security discussion seem simple, you all know how complex the program is.

How an individual account plan compares with other types of options cannot be answered with a simple answer such as it is better or worse. The parameters of the comparison must be specified such as:

• Are the benefits being compared to current law or some other option?
• What is the equity market return assumption and is the additional investment risk being accounted for in the comparison?
• Which age group of retirees are being compared?

Different options have different long-term effects on benefits, and will have different implications for benefits and financing further into the future.
Comparison Options

- **Individual Account Model** (President’s Commission to Strengthen Social Security Model 2).
- **“Tax All Earnings”** (current law proxy but funded over 75 years).
- **“Do Nothing”** (payable benefit proxy when Trust Fund is depleted)
- **“Gradual Reduction in Benefits”** (spreading the payable benefits across more cohorts)

The analysis we are presenting here uses the President’s Commission to Strengthen Social Security Model 2 as the individual account option being compared, as it is the one that has many of the attributes that the administration has mentioned are being considered under their plans.

It is certainly true that any plan adopted by Congress is likely to be different from this proposal, but it presents a base for consideration.

Three alternative options are considered that would provide various levels of benefits while bringing the program into fiscal balance.

- A “Tax All Earnings” option that would provide a proxy for current law benefits that has an ability to be funded under the standard 75-year time frame. This would provide the highest level of comparison benefits.
- A “Do Nothing” option leaves benefits unchanged until the Trust Fund is depleted in 2042, then benefits are cut by 38% for those reaching normal retirement age after 2042 and subsequent cohorts. This would provide the lowest benefits for the cohorts reaching normal retirement after 2042.
- A “Gradual Reduction in Benefits” scales back benefits over many more cohorts, so no one cohort is hit with a sharp reduction in benefits.
Equity Rates of Return

- Equity Market Returns Are *Not* Constant and Have Risk.
- Two Methods To Address These Issues:
  - Equity market returns where the rates of return are randomly generating from a distribution using historical equity market returns (stochastic).
  - Risk-adjusted equity market return approximated by 100% investment in Treasury bonds.

A critical assumption in analyzing any individual account plan relates to expected equity market returns and whether or not the investment risk of using this type of investment vehicle is accounted for.

In this analysis, two approaches are analyzed:

1) A stochastic analysis is used, where equity market returns that are randomly generated from a distribution based on historical values of equity returns, so the way the market moves in real life is more accurately represented than in doing a straight-line or “smoothed” projection of a constant equity return.

2) A risk-adjusted approach that is approximated by investment of 100% of the accounts in Treasury bonds.
Individual Account Model

- President’s Commission to Strengthen Social Security (PCSSS) Model 2
  - Voluntary 4% account with $1,000 limit (indexed thereafter) with a 2 percent real offset (100% participation assumed in analysis).
  - Move from wage indexing to price indexing.
  - Low earner enhancement benefit.
  - Enhanced widow(er) benefits (75% of pre-death combined benefit).

The individual account model in this analysis is the PCSSS Model 2. It includes as its primary features:

- A voluntary 4% account with a $1,000 annual limit (indexed thereafter) with a 2 percent real offset (100% participation assumed in analysis).
- Move from wage indexing to price indexing for the future benefits formula. Benefits will no longer have real increases for future cohorts. The benefits will remain at the same real level for future cohorts.
- A low-earner enhancement benefit to maintain progressiveness for low-income workers.
- And, an enhanced widow(er) benefit (75% of pre-death combined benefit) intended to reduce elderly poverty.

Reports have suggested that the President is now considering a 3 percent real offset. This would result in fewer individuals doing better under the PCSSS Model 2 relative to the results presented here.
Equity Market Return Results
(Stochastic)

Stochastic analysis: Equity market rates of return are randomly generating from a distribution using historical equity market returns.

The first set of results is going to compare the individual account plan with the benefit levels from the other options using the stochastic or random rates of return in the equity market based on historical data.

The process for generating the equity returns is a lognormal fixed-mean random walk with a mean of 6.5% and standard deviation of 20.27%, historical values from 1926 to 1990. Under a 55% equity and 45% Treasury bond asset allocation, the expected rate of return under the accounts in this analysis would match the 4.9% rate of return used in the PCSSS’ report to evaluate Model 2. (The real Treasury bond rate of return is assumed to be 3.0%).
“Tax All Earnings”

- Current-law proxy, but funded over 75 years.
- Remove the Social Security wage cap (all earnings taxed).
- Include all government employees (all state, local, and federal employees).

The first option is to tax all earnings to fund current law through:

- Current-law proxy, but funded over 75 years.
- Remove the Social Security wage cap (all earnings taxed).
- Include all government employees (all state, local, and federal employees).

Note: The benefits will be somewhat higher under this option than under current law, because once the wage cap is lifted benefits will be higher for those with earnings above the current wage cap.
Most of the analyses of proposals that have been published to date take a limited number of career examples and look at what proposals might do if you happen to match the example decades from now.

Our analysis simulates the birth of all individuals in a cohort and bases projections on historical patterns (the model simulates the types of earnings histories and work patterns that actually occur over an individual’s lifetime) and calculates the benefits that each and every individual would get. This is done for each option. We then compare the benefits under the two options to see which one is higher. This is not the only measure for comparing options, as will be discussed later in the presentation.

For those born in 1955, 77.4% would receive a higher benefit under the “Tax All Earnings” option relative to the PCSSS Model 2. Each column shows the proportion of subsequent age cohorts that do better under this option than under PCSSS Model 2.

The percentage that do better under this option declines to 67.1% for those born in 1985 before increasing to 83.7% for those born in 2015.

Further investigation of the benefit comparison by lifetime income quintiles will be presented later.

Should the 2% real offset contained in this proposal be increased to 3%, then the percentage that would receive a higher benefit under the “Tax All Earnings” proposal would be higher.
“Do Nothing”

- Payable Proxy When Trust Fund is Depleted
  
  ➢ *Maintain benefits* at current-law level for those who reach normal retirement age through 2042.
  
  ➢ *Reduce benefits* for those reaching normal retirement age after 2042 a 38% benefit cut.

The second option run through the model assumes that nothing is done until the trust fund is depleted in 2042 under Trustee assumptions (CBO’s analysis sets the year at 2052, but 2042 is used to match the 2004 Trustees report and the assumptions used in the model). Individuals who would reach normal retirement age before 2042 would not have their benefits affected by this proposal.

Those individuals reaching normal retirement age after 2042 would have their benefits cut by 38 percent.

Note: This cut is larger than the approximate 30 percent benefit reduction mentioned in the Trustees’ report because the benefits under our analysis are only being cut for those reaching normal retirement age after 2042. The Trustees assume retroactive cuts for those who reached normal retirement age prior to 2042. That option is not modeled.
“Do Nothing” Versus PCSSS Model 2
Percentage With Higher Benefit Under the “Do Nothing” Option
(stochastic equity returns)

This slide shows the percentage of retirees who would have a higher benefit under the “Do Nothing” option.

Over 70 percent of the older cohorts (1955-1975) do better under the “Do Nothing” option.

However, for the 1985 birth cohort, virtually no one (2.8%) receives a higher benefit under the “Do Nothing” option, since that is the first cohort examined that reaches the NRA after 2042.

The situation then improves for the later birth cohorts (1995-2015), as the PCSSS Model 2 continues with benefit cuts for later cohorts and the “Do Nothing” option has no further benefit cuts after the initial cut in benefits.
“Gradual Reduction in Benefits”

- Spreading benefit reductions over more birth cohorts for payable benefits, given current tax revenues.
- Gradual reduction of benefits starting in 2016 by a cumulative 0.73% per year until 2060, when benefits will be 67% of those in current law.

The “Gradual Reduction in Benefits” option reduces benefits over many cohorts by doing a small percentage decline each year that accumulates over the 45 years. Benefits are reduced each year by 0.73% until the total adjustment reaches 33% by 2060.
Under the “Gradual Reduction in Benefits” option, 75.3% of those born in 1955 would have a higher benefit than they would under PCSSS Model 2.

For those born in 1985, this percentage falls to 27.5%, so that 72.5% would have the same or a higher benefit under PCSSS Model 2.

For birth cohorts after 1985, the percentage with a higher benefit under the “Gradual Reduction in Benefits” increases steadily reaching 40.3% for those born in 2015, but the analysis shows that a majority of all cohorts between 1985 and 2015 would be better off under PCSSS Model 2 than under the “Gradual Reduction in Benefits.”

While there has been substantial debate about the “risk” introduced by moving money into the stock market, in this analysis, the model incorporates market fluctuations. It does not assume the “smoothed” market returns assumed by most of the work published to date. However, the risk of investing in equity markets is not accounted for in this portion of the analysis. The next section of the analysis looks at the results when accounting for investment risk.
Equity Market Return Results  
(Risk-Adjusted)

Approximated by 100% investment in  
Treasury bonds

The investment in equities involves risk. Individuals may have bad outcomes. Under these comparisons, the risk is adjusted to account for the “riskiness” of equity investment by assuming 100% allocation in Treasury bonds. This is a common selection for a “risk-free” asset.
“Tax All Earnings” (Current Law Benefit Proxy) 
Versus PCSSS Model 2
Percentage With Higher Benefit Under “Tax All Earnings” 
(risk adjusted returns: 100% Treasury bonds)

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

Under 100% investment in Treasury bonds, the percentage having a higher benefit under the “Tax All Earnings” increases from 79.2% for those born in 1955 to virtually 100% for those born in 2015.

A comparison of these findings with those in slide 8, where PCSSS Model 2 was assumed to have stochastic equity market returns, shows that virtually all those who would have a higher benefit under the PCSSS Model 2 for birth cohorts after 1965 would have a higher benefit under the “Tax All Earnings” option when accounting for risk.
“Do Nothing” Versus PCSSS Model 2
Percentage With Higher Benefit Under the “Do Nothing” Option
(risk adjusted returns: 100% treasury bonds)

Under the “Do Nothing” option, the percentage with a higher benefit increases from 78.9% for those born in 1955 to 93.0% for those born in 1975. However, the first cohort hit by the reduction in benefits under this option sees virtually nobody (4.3%) having a higher benefit than they would under PCSSS Model 2. The younger cohorts do see a much more dramatic likelihood of having a higher benefit under this option, reaching 82.8% for those born in 2015.

A comparison with the findings in slide 10, which includes stochastic equity market returns, reveals more individuals having higher benefits under PCSSS Model 2 relative to the percentage when risk is accounted for in the analysis. In other words, when not adjusting for risk, a higher percentage of individuals would be predicted to have higher benefits under the individual account approach relative to other options.
When controlling for risk under the “Gradual Reduction in Benefits” option, 80% of the individuals within each of the cohorts would have higher benefits relative to PCSSS Model 2, with an increase to 90% for those born in 2015.

A comparison with the findings in slide 12 for this option, where stochastic equity returns are assumed, shows much higher rates of individuals with higher benefits under the PCSSS Model 2. In other words, the use stochastic equity market returns in Model 2, as opposed to a risk-adjusted rate of return, increases the number of individuals who have a higher benefit under the individual account approach.
Differences Within Cohorts

- Gender
- Educational Status
- Lifetime earnings

Within a cohort individuals with different demographic and economic characteristics are affected differently under the plans. This analysis examines three particular characteristics: gender, educational status, and lifetime earnings.
This slide gives an example of the differences within a cohort by lifetime earnings. The 1985 cohort is broken down into lifetime earning quintiles. The individuals in the lowest income quintiles, meaning they earned the least over their careers, were less likely to have a higher benefit under the “Tax All Earnings” option. This can be largely explained by the enhanced lower-earning benefit that was specified in PCSSS Model 2. Furthermore, the benefits for those in the highest quintile under the “Tax All Earnings” option increase relative to current law due to the removal of the wage cap and are most affected by the benefit cuts under PCSSS Model 2.
What Beneficiaries Have The Biggest Stake in the Individual Account, in Terms of Their Total Benefit?

- **Higher-earners**: Affected most by the limit on the account contributions.
- **Lower-earners**: Earnings may be too low to take full advantage of the individual account.

Under the PCSSS Model 2, the amount an individual can contribute is a percentage of earnings up to an indexed maximum, so the level of the total benefit that comes from the individual account under this model will be different across the earnings levels of the individuals. Higher earners are limited by the indexed maximum, while lower earnings cannot take full advantage due to the lower earnings.
This slide shows the percentage of the total benefit under PCSSS Model 2 coming from the defined benefit portion under both the stochastic and risk-adjusted results. The middle-income earners will receive a larger portion of their benefit from the individual account, while the higher- and lower-income individuals will receive about the same percentage of their total benefit from the defined benefit portion. The indexed maximum contribution on the account limits the percentage higher earners can receive from the individual account, while the lowest earners can only take advantage of the account to the extent of their earnings. Therefore, the earners who earn right up to the maximum contribution will receive the most from the individual account.

Moving from a 2% offset to a 3% offset would lead to lower percentages of the total benefit coming from the defined benefit portion for all income quintiles.
Individual Accounts Create New Functions for Social Security That Have a Cost

- Base Cost Assumptions
  - 30 basis points (0.30%) and no annuity loading factor
- Higher-1 Cost Assumptions
  - 60 basis points (0.60%) and 5% annuity loading factor
- Higher-2 Cost Assumptions
  - 90 basis points (0.90%) and 10% annuity loading factor

New functions include investing the funds in the market, new bookkeeping measures to track the balance of the individual account for each worker, etc. The base assumptions follow those used by the Social Security actuaries to evaluate PCSSS Model 2 in the Final Report of the PCSSS. There is much discussion of the potential for costs that are not at this level but somewhat higher depending upon the ultimate design and options available. Furthermore, annuitization of the individual account portion could entail a loading factor and the size of the loading factor will depend upon who is providing the annuity and the options available within the annuities offered. Two alternative assumptions on the administrative costs are examined.
This slide shows the percentage reduction in total benefits from the two higher administrative cost assumptions. For those receiving benefits that are at the lowest 10% of benefits among the 2015 cohort, their total benefit would be reduced by 4.6% under higher-1 assumptions and 8.7% under higher-2 assumptions. These percentages increase to 7.6% and 14.1% for those receiving benefits that are at the 90th percentile (top ten 10%) of benefit levels among those born in 2015.

These numbers suggest the motivation for proposals that seek to “ride” the current payroll tax collection process and “mirror” the investment options and administrative approach of the Federal Thrift Savings Plan.
Initial Retiree Benefits Are Not the Only Comparison Measure

- Level of taxes paid to receive the benefits.
- Longer-term financing.
- Effects on the other benefits provided under Social Security.

Initial retiree benefits are not the only comparison among various options. The level of taxes necessary to support the respective benefit levels is another measuring. What will happen in the longer term is also important. Does an option place the program on a course that supports future benefit levels or are benefits headed in a direction that may not be considered adequate? The Social Security program has many other functions besides just retiree benefits, mainly disability benefits and survivor benefits. Many proposals would lead to cuts in these benefits as well as in those for retirees.
This slide compares the ratio of the present value of benefits to the present value of OASI taxes paid under the “Tax All Earnings” and PCSSS Model 2 options.

From the individual’s perspective, the higher the ratio the better. For those born in 1955, almost 70% had a higher ratio under the “Tax All Earnings” option relative to PCSSS Model 2.

Again, this is using stochastic (random) equity market analysis, so in comparison to slide 8, the percentage doing better under “Tax All Earnings” is lower due to the increased taxes from lifting the wage cap. However, the overall pattern still emerges and roughly 60% have a better benefit to tax ratio under the “Tax All Earnings” option than under PCSSS Model 2.

Moving from a 2% offset to a 3% offset would lead to an even higher percentage having a better ratio under “Tax All Earnings.”
Longer-Term Financing Effects

• Instead of an infinite horizon, an alternative length of 150-year actuarial balance
  ➢ “Tax All Earnings” has a 150-year actuarial deficit:
    • Adjust benefits for longevity by reducing benefits cumulatively by 2% per year from 2081 to 2100.
  ➢ PCSSS Model 2 has a 150-year actuarial surplus:
    • In 2081, switch back to wage indexing and reduce the payroll tax by 3 percentage points.

• Longer-term financial considerations can change the comparisons substantially

Many have described the Social Security reform debate as being about future generations. This has led to advocacy for thinking about solvency over periods exceeding 75 years.

When looking at the PCSSS Model 2 and the “Tax All Earnings” option over a longer time horizon than 75-years, there are two completely different paths. Model 2 heads into surplus over the second 75-years, while “Tax All Earnings” heads into deficit. A couple of ad hoc adjustments are made to each option as outlined in the slide. This leads to the results being substantially different for the cohorts in this second 75 years.
“Tax All Earnings” Versus PCSSS Model 2 After Adjustments for 150-Year Actuarial Balance
Percentage With Higher Benefit Under “Tax All Earnings” With Adjustments (stochastic equity returns)

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

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After the adjustments are in full effect (birth cohorts 2040 and later), the percentage of individuals who receive a higher benefit under the “Tax All Earnings” is about 50%, compared with the about 70% in the 2040 birth cohort, which means that the percentage receiving a higher benefit under the PCSSS Model 2 rises from about 30% to 50% between those cohorts.
“Tax All Earnings” Versus PCSSS Model 2 After Adjustments for 150-Year Actuarial Balance
Percentage With Higher Ratio of Present Value of Retiree Benefits to Present Value of Taxes Paid Under “Tax All Earnings” With Adjustments (stochastic equity returns)

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

For the youngest cohorts, those born after 2040, only 5% of individuals will have a higher benefit to tax ratio under the “Tax All Earnings” plan with adjustments relative to the PCSSS Model 2 with adjustments. In contrast, for the older birth cohorts (2020 and 2030), the percentage having a higher ratio under the “Tax All Earnings” option was at least 50%.
Magnitude of the Differences

• The previous slides only showed the percentage of retired beneficiaries with a higher benefit under the various options.

• However, the magnitude of difference between the benefits in each of the options is also important for a complete analysis of the options.

• The distribution of differences in benefits over all retirees under each option can be displayed to show this magnitude.

The previous slides just showed the percentage of individuals who did better under the various options relative to the PCSSS model. This does not show the magnitude of the differences between the benefits under the various options. Each individual has an initial benefit level that can be compared under each option, so that the percentage difference between the benefit levels can be calculated. Two examples follow.
This shows the magnitude of the differences between the benefit levels under the “Tax All Earnings” and PCSSS Model 2 (75-year actuarial balance) options on a percentage difference basis for the 2015 birth cohort with stochastic (random) equity market assumptions. The differences that are negative are for the individuals with a higher benefit under the PCSSS Model 2 option, while the positive difference is for the individuals with a higher benefit under the “Tax All Earnings” option. These differences between the two options are ordered from the lowest to the highest. Therefore, the highest 50% of the differences in benefits are at least 45% greater under the tax all earnings option relative to the PCSSS Model 2. Furthermore, lowest 25% would receive at most a 13% greater benefit under the “Tax All Earnings” option.
This slide shows the percentage difference in benefits under the “Do Nothing” option and the PCSSS Model 2 (75-year actuarial balance). From slide 15, less than 5% of the individuals born in 1985 who received retiree benefits had a higher benefit under the “Do Nothing” option. Thus, all of the differences shown are negative since the PCSSS Model 2 had higher benefits up to the 95th percentile. Of those born in 1985 who would receive retiree benefits, 60 percent would have a lower benefit of approximately 10% to 15%. Ten percent would have a benefit that is less than 10 percent lower under the “Do Nothing” option, while 30 percent would have a lower benefit of more than 15% under the “Do Nothing” option.
Assumptions

• Base assumptions for the analysis are those from the 2004 Report of OASDI Trustees.

• Dynamic simulation model-GEMINI.
GEMINI

• A dynamic microsimulation model for analyzing the lifetime implications of Social Security policies for a large sample of people born in the same year (similar to the Congressional Budget Office’s model to analyze Social Security).
• Developed by the Policy Simulation Group.
• Birth cohort samples generated to be representative (demographically and economically) of the entire cohort.
• Produces detailed information about the life events and annual OASDI program experience of each individual in the cohort sample.

For more information about GEMINI see visit the Policy Simulation Group’s website at www.polsim.com/guide2.pdf. GAO has also conducted various analyses using GEMINI.
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This analysis compares the benefit levels under an individual account model relative to alternative benefit levels within the Social Security program. It presents a picture of the percentage of individuals who will have a higher benefit under the various benefit options relative to the individual account model when one considers actual earnings histories and job patterns of workers and actual movements in the equity markets. Whereas most other analyses published to date look at various snapshots of a limited set of stylized individuals and tell you what that individual would have as a benefit under different alternatives (assuming a fixed rate of return on assets) over either a 75-year or infinite time horizon. Consequently, this analysis gives a more complete picture of the effects on individuals under various reform options, instead of just on stylized or median individuals.