PROVIDING GUARANTEES IN SOCIAL SECURITY

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Abstract

Some Social Security reforms would provide guarantees that individuals would not receive less under a reformed system than would be provided by current law. However, the "current law" benefit formula increases benefits when wages rise. Any reform successfully adding to economic growth, therefore, would affect those promised levels of benefits, as well as revenues and the interest rates that determine what could be earned and paid out of individual accounts. This paper concludes that guarantees could add significantly to the costs of Social Security, reduce any reduction in budget imbalance achieved through other parts of a reform, and add to taxes, direct or implicit, that must be paid to cover those costs. Stock and bond market variation, as well as variation in returns on individual accounts, also add to costs when reform contains a guarantee, as government bears mainly downside risks. A variety of examples are provided for one generic type of reform.

Introduction

Proposals for Social Security reform entail many pieces. Not only are the formulas for benefits and taxes typically adjusted, tilted, and indexed differently, but sometimes participants are offered alternatives on a voluntary or mandated basis. Among the most discussed of such alternatives are deposits of money into individual accounts held by taxpayers. The deposits to these accounts, as well as the build-up in funds, are then often counted as alternative sources of funds to beneficiaries upon retirement.

Many advocates of an individual account component to Social Security are so convinced that it will generate large and significant returns to society because of additional saving that they are willing to provide a guarantee to the individual that he or she can only come out ahead. This article is not about the merits or problems of individual accounts. If designed well, they might lead to increases in national saving and in middle-class ownership of private wealth, and, if designed poorly, they might add undue risk to the retirement plans of individuals. Rather, it is about guarantees and their consequences, both when the desired increase in saving occurs and when it does not. The brief concludes that guarantees almost certainly raise the costs of a Social Security system, raise the taxes (sometimes implicit) necessary to support those costs, and make it very difficult to engage in future reforms of the system. As a corollary, it concludes that actuarial methods must account for those increased costs.

Background

A common calculation used by advocates for individual accounts is that deposits to those accounts will earn a significant return of several percentage points in real terms from investments in stocks and bonds. By way of contrast, a modest birth rate (and, correspondingly, a modest rate of growth of the total wage tax base) means that in a pay-as-you-go transfer system, taxes paid by future Social Security taxpayers will grow only modestly relative to taxes paid by current Social Security taxpayers when the tax rate remains constant. Current taxpayers can then only get what is called a "return" of, say, 2 percent or less when their tax dollars are compared to the taxes of future generations transferred to them.

Compare, then, a blended private market investment assumed to provide a return of 4 to 7 percent (on deposits) with a growth rate in transfers per capita of, say, 2 percent in a pay-as-you-go system with no saving. This contrast leads some to project that money needs merely be diverted to a higher paying investment. Take the money that might earn 2 percent and put it where it will earn 4 percent or more. But, of course, this presents a problem: there really is NO money being saved in a pay-as-you-go system, NO money to switch. Social Security is mainly a transfer system. (Social Security does have a small amount being saved temporarily because of the hump of baby boomers in the work force, but this does not affect the basic problem with comparing a rate of return on saving with a rate of growth of political promises based on a current transfer or pay-as-you-go system.)

If there is little or no additional money, then, as a next step, some imply that government can effectively arbitrage private markets. Some suggest that through additional arbitrage (essentially government borrowing at 2 or 3 percent to finance individual accounts hopefully earning 4 to 7 percent), the government will have additional money to pay off beneficiaries. Alternatively, some advocates are more willing to cut benefits or raise other taxes to pay for the deposits to such accounts. Either way, the net cost of any proposal for individual accounts is affected by whether the private sector adjusts its behavior, and how much additional saving is undertaken by society.

One temptation is to think that the arbitrage profits, the returns to additional net Social Security saving, or both are so sure that the government can offer guarantees that future benefits will never be lower than what is provided in current law.

Some formal proposals have, indeed, offered the promise that such a guarantee could be provided. For instance, Martin Feldstein and Andrew Samwick (2001) discussed a proposal with a 2-percentage point contribution to individual accounts and a guarantee that a new defined Social Security benefit plus retirement account benefit would not fall below what would be provided in current law. A bill put before the House of Representatives by Representative Clay Shaw (R-Fl), chairman of the Subcommittee on Social Security for the House Ways and Means Committee, would provide a 4-percent account (capped at $1,000 per year, indexed to inflation) and a guarantee that there would be no reduction in the amount of Social Security benefits scheduled under current law to current and future beneficiaries (2003).[1]

It should be noted that President George W. Bush's Social Security Commission did *not* provide such a guarantee in its various plans. It generally provided that investments in individual accounts would essentially reduce the value of future benefits by a factor related to how much was invested and a modest interest return (e.g., 2 percent) on that investment. Thus, there is no guarantee that if investment earned less than that or any other return, the government would make up any difference or top up any benefit. By the same token, when individuals were given the option of joining or not joining the new system, there did remain the problem that some individuals would interpret that choice as deterring forever any other reform of their benefit. For instance, in a plan where they were given an option, the very act of choosing may lead them to believe that their chosen benefit was guaranteed forever, regardless of future economic circumstances. We will not address this issue in any depth in this paper, since options, as opposed to guarantees, are not our focus. However, any time options are provided, they can raise some of the same issues as do guarantees.

[1] We recognize that proposals have changed over time and, thus, are more interested in raising issues with respect to guarantees than in focusing in on any one proposal. For instance, Martin Feldstein has not made this particular type of guarantee a part of some of his later proposals (perhaps in response to a comment we made orally to him awhile back, including the effect of wage indexing on the level of benefit provided in an expanding economy.

The type of guarantee we address here is one that relates a reformed benefit to the benefit provided under the current benefit formula. To understand the implication of such a guarantee, we must examine the potential effects of additional saving on the economy. More specifically, this paper addresses a number of questions that arise with guarantees, even if the government does succeed in making arbitrage profits or increasing societal saving.[2]

- Would a guarantee almost automatically raise the cost of Social and would a guarantee make it harder to enact future reforms of the system?
- What would be the potential impact of additional savings on future wages and interest rates, and how would a guarantee interact with those changes to increase the number of beneficiaries who need some top up to receive some guaranteed benefit?
- How are benefits and taxes affected by different assumptions about additional growth in the economy, and when are implicit taxes on private sector resources involved?
- Are costs further affected by fluctuations in the value of the stock market or by fluctuations that might come about when individuals are allowed to vary their portfolio investments?

The Basic Effect of Guarantees on Costs and on Future Reform

Even without performing any modeling, we can assess some of the effects of a guaranteed system. First, as a matter of simple mathematics, a combined Social Security-individual account system with guarantees will entail higher expected costs. Suppose under the regular formula a combined annual benefit of $10,000 has an 80-percent probability of occurring, while there is a 20 percent probability that the benefit will equal $7,500. Then the expected or average benefit will be $9,500. If $10,000 is a guaranteed benefit, then the expected cost will equal $10,000. Any actuarial calculation here must be careful when it calculates the cost of the median event ($10,000 in this example), not the average event ($9,500) when trying to determine the cost of a guarantee (on average $500).

One of the great dangers in offering guarantees is that they lock in the features of any new system much more than do the promises, implicit or explicit, in "current law." Suppose economic forecasters are just plain wrong in projecting future wage growth or returns on future stock market investment. Suppose there are large, unexpected, demographic, shifts as occurred in the 1970s. Suppose there is a deep recession. Suppose that the needs of the unemployed grow exponentially relative to the needs of the elderly. Under these or a variety of other circumstances society may want to adjust its

[2] A number of Technical Panels on Methods and Assumptions, convened on behalf of the Social Security Administration by the Advisory Panel on Social Security, have suggested that actuaries should first calculate all returns on an equal risk-adjusted basis. Arbitrage profits should not be treated as free, as they add risk in exchange for a higher return. One way to count the cost of that risk is to treat it as the differential between the expected rates of return on a risky asset and the return on a nonrisky asset. See, for instance, "1999 Technical Panel on Methods and Assumptions," p.11, Recommendation B.1.b.

social insurance and transfer systems. The current Social Security system could then be reformed. It provides no firm guarantee that some existing formula for benefits or retirement age will be used forever in determining benefit levels, and benefits and taxes have been adjusted when the Social Security trust fund is under threat of exhaustion. As one example, in 1983 a reform package effectively pared benefits through income taxation of those benefits and the introduction of a higher normal retirement age. The 1983 reform could not easily have been adopted if future benefits were "guaranteed."

One might be tempted to argue that a guarantee could also be overturned through future legislation. In theory this might be correct, but in practice it is not. The turnaround would be much more difficult because "guarantee" language would have been put into the law. It would be especially difficult to renege on a guarantee if citizens had made an explicit choice to opt into one benefit package in preference to another because of the guarantee. Suppose Congress gives a person the choice between plan A and plan B, with plan A providing, say, what the person expects to be $400,000 of lifetime benefits and plan B, $300,000. How could Congress come along later and reduce the value of plan A, if the person had chosen it on the basis of the given structure of the two plans? What would it say, "Gotcha!" One wonders if the court would be more tempted to intervene to prevent future reform when there are stated guarantees; so far, it has allowed traditional reforms to cut benefits and has indicated that the current type of benefit is not guaranteed.

Even if some reformed system did not need to be adjusted further for financial solvency reasons, a guarantee would make it almost impossible to enact future reforms aimed at removing known inequities in the program. For instance, suppose a reform containing a guarantee does not deal with the discrimination in current Social Security law against many single heads of household, who get fewer benefits than many spouses who work less, pay fewer taxes, raise fewer children, and have less need. (That is, there is no principled basis on which one can justify the discrimination inherent in the current spousal and survivor benefit.) A guarantee of current law benefit makes it almost impossible later to create greater parity between single heads of household and other Social Security beneficiaries. Similarly, guarantees would make it very difficult to ever adjust the benefit formula to increase the share of lifetime benefits paid in very old age, to reduce poverty rates, or to make more equal the benefits received by two-earner and one-earner couples paying the same amount of taxes (Steuerle and Carasso 2000).

Modeling the Dynamic Impacts of a Reform

The notion of a guarantee suggests there is some calculation against which to make a comparison. A common type of "guarantee" for those offering individual accounts is that one will get at least whatever is provided in the current benefit formula. But that formula is not stable: it adjusts over time with economic factors, in particular, wage growth. If wages grow faster because of the reform, then the level of guarantee provided by the formula is higher.

Indeed, the Council of Economic Advisers under President George W. Bush recently suggested that under certain assumptions the benefits from lowering taxes on capital income would over time almost all accrue to wage earners (Council of Economic Advisers, 2004, pp.111-113). The deepening of the capital stock, it suggests, eventually raises wages far more than it does capital income.

Methods. To see what the impact of wage growth could be on guarantees, we made use of two models. Under the first—a macroeconomic growth model developed by Gary Burtless and Barry Bosworth of the Brookings Institution (2000), we projected for the economy the impact of additional monies being put into savings accounts equal to 1 percent, 2 percent, and 3 percent of taxable wages. Savings were accumulated and then drawn down in annuities starting at retirement (or benefit take-up) age. We next varied our assumptions on how much national saving increased through use of these accounts, with options of 0 percent (no increase), 50 percent, and 100 percent of the amount put into the accounts. Thus, we effectively created nine simulations, or ten, counting current law. (Under current law, the model approximates the wage growth projected by the Social Security actuaries. With different saving and capital investment options, the wage growth will then vary from that base.) We did not address *how* the national saving would or would not increase—e.g., whether the government would prevent deficits from rising when money went into individual account or whether individuals would avoid switching money out of its private 401 (k) and other retirement accounts.

From this first model we took the change in wages and in the interest rate under the assumption of a closed economy. We recognize that one might also undertake research on the basis of a partially open economy, but, even here, some of the types of calculations we suggest are still required. For instance, if individual accounts are adopted widely on a worldwide basis, then the U.S. will still witness wage and interest rate changes partially on the basis of a closed world economy regardless of how open is the U.S. economy.

We then incorporated those wage and interest changes into a second model—the *Dynasim3* model developed by the Urban Institute to examine future changes in Social Security based upon a large sample of households and their socio-economic characteristics (Favreault and Smith 2004). The wage records of households are projected into the future using broad government estimates of demographic and economic changes over time, with the Dynasim3 model generating underlying distributions across a large number of factors such as marital status, child bearing history, disability, race, and education. We imposed on this model the average wage growth from the Burtless-Bosworth macroeconomic model under the alternative saving assumptions. The Dynasim model also allows us to build up for each individual an account balance, based upon the wage rates (which determines deposit amounts) and interest rates coming from the macroeconomic model.[3]

[3] For this analysis, we also assume that 60 percent of the contributions are invested in equities and 40 percent in bonds. Equity and bond investments grow at their respective projected interest rates or rates of return. We assume annual rebalancing between stocks and bonds to maintain this investment proportion. We also assume annual administrative costs of 3 basis points (0.3 percent).

Following this dynamic sample of households, we were able to project the benefits under current Social Security law, and the build-up of individual account balances. The annual benefit for each recipient now comes from three sources, which we will label (1) the DB (or defined benefit); (2) the annuity; and (3) the "guarantee amount"—here defined as any top-up amount resulting from providing a "guarantee benefit." (From now on, we employ this definitional distinction between guarantee amount and guarantee benefits.) Thus, the DB benefit is what falls out of the Social Security formula; the annuity is derived by annuitizing the individual account balance at retirement, and the guarantee amount is the difference between any guaranteed benefit and the sum of the DB plus annuity.

We do not model a decrease in saving, as might easily be the case if the account is entirely deficit financed and individuals additionally offset some portion of the deposits to individual accounts with lower deposits to their own 401(k)s and Individual Retirement Accounts (IRAs). Thus, all of our examples make a strong assumption about the success of the plan in preventing any decline in saving. We also assume that pre-retirement withdrawals from individual accounts would not be permitted. As noted, our goal here is not to assess the merit of these saving assumptions, but rather to note the additional economic factors that must be taken into account when making projections on benefit levels, costs, and revenues.

Results

We report results, first, on wages, interest rates, and the guaranteed benefit levels associated with higher wages; second, on number of beneficiaries getting a top up because of the guarantee; and, third, on revenues, expenses, and new budgetary balances of Social Security.

We assume that the personal account program begins in 2004. All workers born after 1947 in Social Security covered employment participate. All workers accumulate their account balances until they begin receiving Social Security benefits. We assume DI recipients wait until age 65 to receive their retirement annuity. Their accounts continue to accumulate investment returns until age 65. All survivors must wait until age 65 to receive an inherited annuity. At divorce, couples split account balances accumulated during the marriage.

We assume universal annuitization and do not reduce annuitized benefits by administrative costs or load factors beyond the administrative expenses already netted out of the rate of return on accounts. Account balances are converted into annuities based on mortality rates that vary by age and birth year. We assume a two-thirds joint and survivor annuity for all couples at retirement.

The mortality rates used to derive the annuity payments are calculated to weight each person equally. Given the correlation between lifetime income and mortality rates, however, individuals with larger account balances likely have longer life expectancies. Therefore, unless mortality rates are weighted by account balances, annuity payments may be too high (because given the same available account balance, longer life expectancies imply lower annual payments), and the present value of all annuity payments paid through personal account conversions will be greater than aggregate account balances. To account for this potential error, we apply adjustment factors to annuity payments such that the aggregate present value of annuity payments equals aggregate account balances. This adjustment factor, in effect, re-weights mortality rates by account balances. However, each dollar of account annuitized by a given cohort at a given point in time still receives the same level of annuity payment each year.

Changes in Wages, Interest Rates, and Benefit Levels. Figure 1 shows the effect *on wage levels* of the deposits in individual accounts under the three different assumptions about the extent to which additional saving are induced and the three different levels of deposits. Figure 2 demonstrates the effect *on interest rates*, with corresponding implications on the level of annuity that can be paid out of the balance in the individual accounts, assuming conversion to a fixed annuity based on interest rates prevailing at time of payout.

As might be expected, when there is no change in saving because of the reform, there is no change in the wage level or the interest rate. However, as the amount deposited and saved increases, then there is a corresponding increase in the wage level and decrease in the interest rate. (Note again that an increase in national saving and capital formation requires more than simply increasing private saving by some portion of what is put in the accounts, since there is also a higher potential government deficit because of the deposits.)

In 2050, for instance, the wage level increases by about 16 percent when deposits to accounts equal 3 percent of wages (about 1.5 percent of GDP) and net deposits (less later withdrawals) are saved. Eventually withdrawals from accounts will become high enough that the wages no longer automatically increase at a faster *rate* over time, although they will be at a higher overall *level*.

Similarly, rates of return to saving fall as the level of saving increases. The ultimate impact can be significant, especially when considering how much can be paid out as an annuity. With 3-percent contribution rates and 100 percent saved, the real interest return falls in 2050 from about 3.7 percent under current law to 2.5 percent. (The rate of return on a blended portfolio of stocks and bonds is not shown in the figures, but it falls even more.) The reduction in rate of return earned on the portfolio prior to retirement and in the interest rates at time of retirement both reduce the annual annuity that can eventually be paid out.

The proportionate increase in the level of total guaranteed benefit is shown in Figure 3. The differential arises because the higher wages shown in Figure 1 lead to a higher level of benefit under the old benefit formula, which is use to define this minimum or guarantee level.[4] That is, as wages rise through time, the wage-indexed formula will increase the level of guaranteed benefit.

So far we have established that when deposits to individual accounts are saved by society, the net effect (especially when the saving finances domestic investment) may

[4] Note that the increase in wages in the population does not translate precisely into the same percentage increase in promised or guaranteed benefits. Put another way, the wage indexing in Social Security does force the indexing of benefits at the same rate as the rise in annual wages, but there are a few lags and periods of time when wage indexing does not apply (e.g., after age 60). Demographics are also changing over time, so that the size of the taxpaying population grows at a different rate than the size of the beneficiary population. The benefits of those already retired, of course, are price indexed and, therefore, no longer affected by higher wage growth.

well be an increase in the DB benefit under current law (due to higher wages) and a reduction in the value of annuity payment (due to lower rates of return). We next consider the effects of providing a guarantee on the number of those who end up receiving some guarantee amount.

The Effect of a Guarantee on Number of Beneficiaries. When guarantees of "current law" are invoked loosely, they seem to imply that any benefit derived from a projection today would be protected. However, since the Social Security system is wage indexed, those who are promised "current law benefits" are not going to interpret that guarantee to mean "current law benefits as would apply if only the growth rate of the wages had been lower, according to some reformer's estimate 30 years ago of what that benefit would have been." One can just imagine someone in a Social Security office trying to explain that reduction to a beneficiary! That's the equivalent of arguing that Social Security beneficiaries retiring in 2000 would be glad to accept a lower level of wage replacement on the basis of a factor created by some economist in the 1960s who projected that Lyndon Johnson's tax cuts were going to make us all richer in the future.

A guarantee of current law benefits would inevitably be translated as those benefits determined under the benefit formula. No one in the future is going to calculate alternative benefits based upon some historic forecast of what the future might have looked like had some latest Social Security reform not been adopted.

Guarantees of "current law" arise, of course, within the context of some new proposal. Individuals then compare the newly reformed system to an old one to see whether to invoke a guarantee. We have chosen a simple reform alternative as one way of demonstrating the impact of different saving assumptions on the likelihood that a guarantee would be invoked and the cost of that guarantee. The reform plan option we have modeled entails only a few parts. The current DB is exchanged for one that increases future benefits according to a price index rather than a wage index. This price index reform was the major component in the second option put forward by President George W. Bush's commission on Social Security.[5]

The alternative plan we model is then one with this new price-indexed DB, supplemented by the amount of annuity that would be provided through an individual account. It combines features from the original Feldstein/Samwick plan in 2001, the Clay Shaw proposal of 2003, and the second option put forward by President Bush's commission. It is *not* meant to represent any of them precisely, but rather to show the generic issues that arise with guarantees (as noted, the President's commission did avoid using guarantees, but its method of cost saving through price indexing of future benefits is likely to be replicated in future proposals). Here the switch from wage to price indexing starts in 2009, five years after individual account contributions are assumed to begin. The individual then compares a wage-indexed DB under old law to the new price

[5] Relative to current law, this particular index reduces the real benefit in each year by dividing the primary insurance amount (PIA) under current law by the ratio of wage to price growth. It is not quite the same as price indexing in the traditional sense, where the bracket amounts in the benefit formula would grow over time with prices rather than wages.

indexed DB plus annuity. The guarantee amount, if any, makes up the difference between the guaranteed benefit and the sum of the DB plus annuity.

For much of our analysis we assume that there are no variations in market returns due either to random fluctuations in overall market indices or differences in individual portfolios. Later we will modify this assumption. Figure 4 demonstrates the percentage of new beneficiaries who would make use of this guarantee even without these additional sources of fluctuation. Initially, around half of all beneficiaries make use of the guarantee. Thus, they would be better off under the old system if it were not for the guarantee (of course, remember that the old system is out of balance for the long run). The numbers quickly diverge under different scenarios and over time.

As the contribution level goes up, the likelihood of invoking the guarantee goes down, all other things being equal. An obvious reason is that more is built up in the individual account when there are higher rates of contribution. When assumptions are changed about the extent to which amounts put in the accounts add to national saving (because of other adjustments to national saving either through government or private saving), the likelihood of a guarantee being invoked is changed significantly. Remember that higher levels of saving generate higher levels of guaranteed benefits because of higher wages, as well as lower annuities because of lower interest rates. Take the case of a 3 percent contribution when nothing new is saved. The percent of new filers who claim the guarantee falls to about 15 percent by the late 2040s, largely due to the build up allowed by the higher contribution rate to the individual account. However, if 50 percent of the 3-percent contribution is saved by society, then the percentage claiming a guarantee rises to over 40 percent. If 100 percent is saved, then the vast majority (well over 70 percent) is still claiming a guarantee by the late 2030s. Again, the higher level of individual account contribution has increased the annuity benefit that can be paid, but additional saving effectively raises promised benefits and lowers annuity rates enough that the government must provide guarantees to many more people.

Perhaps the major reason put forward for individual accounts is that they will lead to increased national saving relative to a pure pay-as-you-go DB system. Interestingly, what we show here is that the increased saving will lead to a significantly higher level of expenditure, if a guarantee is added to the system.

Effect on Revenues and Expenses. Now let us look at some of the effects of the guarantee on Social Security revenues and expenses. With higher national output, there would also be more taxes paid into the system. Often reformers are hopeful that increased national output and taxes will help to pay for their reforms down the road, even if there are up-front financing problems. As noted, we have greatly simplified the analysis by assuming that net additional national saving would be a percentage of the amount that is put into the accounts (deposits and returns on those deposits). However, it is worth examining what happens to revenues down the road and their relationship to the Social Security DB benefit, including the guarantee. The revenues to pay for the DB plus guarantee, while higher when the economy expands, are also lower because some monies are shifted into individual accounts. Expenses for the DB and any guarantee amount

increase when the economy expands. The guarantee amount, in turn is lower when individual account balances are higher. But then the annuity will be lower, all other things being equal, when more money is saved—because interest rates will be lower. This increases the amount and number of guarantees that must be paid.

In effect, whether any new, guaranteed system is more or less in balance than the old system would require taking into account at least all of the following: (1) new, higher level of taxes; (2) returns on the additional saving as recognized in accounts; (3) the lower rate of return on saving due to more saving; (4) the lower annuity available at lower interest rates due to increased saving; and (5) the increase in promised benefits generated by the guarantee.

Let's now examine how these budgetary factors play out in the example of the individual account/price indexing option reform outlined earlier. Figure 5 and Appendix Table 1 shows what happens to total Social Security revenues both before and after IA contributions. In the "0% saved" cases, net revenues available to pay DB plus guarantee amounts are reduced essentially by the amount put in the individual accounts. When there is additional saving, on the other hand, revenues rise relative to the no-saving case. At least in this simulation, however, the growth in the economy is not sufficient to raise net Social Security revenue even as late as 2050 above where it was before any reform at all. One could have anticipated this result by noting that the percentage reduction in the taxes with individual account diversion (i.e., 1, 2, or 3 percentage points out of 12.4 percentage points) is still larger than the percentage growth in wages (and, hence, in the tax base) due to economic growth, as shown in Figure 1. This conclusion holds for all levels of contribution and all levels of additional saving induced (see, again, Figure 5).

Now let's turn to the expenditure side. We already know that beneficiaries on net are going to get as much or more than current law, since the DB plus guarantee plus annuity must be worth at least as much as the old DB. This is reflected in Figure 6. The bottom bars show how the level of promised benefits (the sum of all guaranteed benefits) rise when there is saving or growth in the economy. The top bars show how some will get annuities plus DB benefits that are higher even than promised or guaranteed benefits, which, in turn, are as high or higher than current law.

In our sample reform, the DB is price indexed. Accordingly, the cost of the DB, by itself, is the same in all reform scenarios since growth does not affect the real DB benefit available to each beneficiary (Figure 7 and Appendix Table 1). Figure 7 shows the same level of total benefit as in Figure 6, but it also allows us to exclude the annuity amount, so that we can separately show the total Social Security expense for the DB plus guarantee amount alone. (Recall that we already have treated the cost of the individual account as a reduction in revenue.) By 2050, that measure of government expense is below current law expense in all cases, mainly due to the saving attributable to price indexing. As might be expected, these expenses also decline the greater the amount put into individual accounts, and, hence, the greater of annuity that can be paid out because of the greater deposits over time. At the same time, for each assumed deposit level, these expenses rise as more of the individual accounts are saved. The additional savings raise

the guarantee benefit level, reduce the returns earned on balances in the individual accounts over time, and reduce the interest rate under which the annuity is calculated.

Now we can put together the revenue and expense sides to see what happens on net to Social Security finances. Figure 8 shows first that the shortfall in revenues over expenses is quite large in 2050 under current law. Under all the reform scenarios here, that shortfall is reduced with or without the guarantee. The price indexing of benefits is the main factor at play in generating the saving. Note, however, that once a guarantee is provided, it wipes out most of the saving due to the other parts of the reform.

The small amount of reduction in system imbalance may be especially disappointing when one remembers the rather sanguine assumption made in all the model runs done here: that society somehow came up with enough saving to offset the large shortfall of government Social Security revenues over expenses in the early years, once individual accounts were introduced. With a guaranteed system, at least in this simplified reform option, the societal adjustment of reducing other government expenditures, raising taxes, or otherwise increasing private saving, ends up doing little to bring the Social Security system into long-run balance.

Other Implicit Taxes from Arbitrage. At this point, we need to qualify our analysis of changes in revenues and expenditures. In many ways, simply counting the amount of dollars paid or collected directly by the government understates the extent to which the governmental system is larger. Taxes may be increased implicitly.

When individual accounts invest in stocks and government is assumed to benefit from arbitrage, then the public must be selling stock to the individual accounts in exchange for bonds. Private returns to capital then fall if returns to individual accounts rise. In effect, the public sector has imposed a tax on ownership of private capital to subsidize ownership through individual accounts.

Alternatively, suppose that the money deposited to individual accounts does increase national saving. Unless the national saving increases by the full extent of the deposits to the individual accounts, there is still an implicit tax on the private sector if the individual accounts involve purchases of stocks. After all, the private sector must still reduce its holdings of stock outside of the individual accounts. There is nothing inherently wrong with such portfolio shifts in the presence of the individual accounts (although a guarantee would distort the choices made). The point here is that any arbitrage gains for the individual accounts are matched by a reduction in other private returns.

The effect on savings creates an interesting dichotomy. The higher the level of saving generated in the economy, the larger the increase in promised benefits due to the guarantee and the lower the annuity rate. Hence, the more the expense of the system rises. The lower the level of additional saving, the more the switch to individual accounts relies upon an additional tax in the form of arbitrage gains.

Fluctuations in Value of Individual Accounts

So far we have assumed away any market fluctuations in the value of assets that might reside in individual accounts. Here we consider market-wide fluctuations into two parts. First are market-wide fluctuations, as reflected in the stock market averages or in bond market averages associated with fluctuations in the interest rate. Second are individual fluctuations that would come about if individuals held different portfolios of assets. Interestingly, the effect of each on costs to the trust funds depends on the likelihood that the guarantee will be invoked.

The more likely that guarantees are to be invoked, generally the less likely is it that the fluctuations will have as significant an impact on trust fund balances. (We ignore for the moment problems of "moral hazard," discussed briefly below.) This relationship can best be understood by a very simple example. Suppose that in absence of any fluctuation the DB plus annuity is either (1) exactly equal to the guaranteed benefit so that no additional guarantee amount is required, or (2) so low that a large guarantee is always required. Now consider a stock market decline in one year, followed by a significant stock market increase the following year. In case 1, if everyone holds the same portfolio, then everyone retiring in the first year, and no one in the second year, would invoke the guarantee. However, the Social Security trust funds will have to pay out more money regardless, since the second set or retirees might have a windfall, so to speak, while the first set will have a loss that is offset by the guarantee. The greater the stock market fluctuation, the greater the gains to second year retirees and the greater the cost to the Social Security trust funds.

In case 2, where the guarantee is invoked by almost everyone every year, the stock market fluctuation around some average may make less of a difference in overall cost. That is, the gains and losses each year may all accrue to the trust funds. Still, the higher the degree of risk in the market, the greater the risk to the government. In the more extreme cases, even when everyone is getting a guarantee in a normal market, the government still bears some risks from a severely depressed market that will not be offset by their gains in a bubble market. Correspondingly, individuals garner more benefits on average, since they still have some potential to gain from the upside risk.

Now let us turn to individual fluctuations in portfolio value, as would come about if individuals are allowed to choose the assets into which their individual accounts are invested. In case 1, where on average people have just enough DB plus annuity to avoid invoking the guarantee, the addition of individual variation essentially puts all the downside risk on the government while all of the gains on the upside would accrue to the individuals.

Economists note that this type of insurance or guarantee contains moral hazard. Individuals have a powerful incentive to invest in risky portfolios, since they can play, "heads, I win; tails, you lose."

In case 2, the individuals may be less likely to gain much from the risky investment. The government is so far into the guarantee range that it may garner almost

all the gains, as well as losses. Nonetheless, here the individuals still have an extraordinary incentive to invest in the riskiest portfolio possible. They may only win when there is an exceptional year and asset prices skyrocket, but the lottery is free, so they may as well play.

In Figure 9, we provide a very partial demonstration of some effects of these types of fluctuations on the percent of people who would get guarantees. The figure treats only two saving assumptions and one level of contributions (3 percent) and makes some fairly arbitrary assumptions with respect the variance in returns and the years to which it would apply. To perform a more complete analysis would require stochastic simulation with a micro-simulation model.

In the case of the market variation, the figure merely shows the additional percent who would get the guarantee in any year when a 30 percent crash in the market occurs. It does not show the opposite effect in years when the market might perform better than average. In effect, the graphical representation is nothing more than the percent of beneficiaries who would claim a guarantee under one particular type of adverse market. Given the likelihood of good stock market years, as well, it is not representative of what would happen over time. The only point to be made is that estimates must also take this type of circumstance into account.

In the individual variation case, the variance assumption was also fairly arbitrary. In the end, how much individual variation would occur would depend upon how many choices were allowed to individuals and their likely patterns of investment under those circumstances—a study unto itself.[6] In this example, unlike the example we used for a depressed stock market, the market gains for some are matched by losses for others. The numbers who make use of the guarantee could go up or down. This calculation does not account for the further costs associated with moral hazard—the added incentive for people to take risks when the downside costs would be borne at least in part by the government.

Our goal here is not to perform comprehensive estimates related to market and individual fluctuation but merely to demonstrate additional factors that must be taken into account when estimates are made for a proposal with guarantees. As noted, a logical extension of our analysis would treat individual and market variation together and perform (stochastic) runs multiple times over all the years.

What stands out, of course, is that fluctuations in value—whether from market or individual variation in rates of return—likely add to the cost of the system, especially when individuals have protection against downside risks but are allowed by a guarantee to benefit on the upside.

Conclusion

[6] We add random variance to individual account equity and bond account balances consistent with historic market variance (standard deviation of 0.1728 on equities and 0.1060 on bonds).

Several conclusions can now be made about guarantees:

(1) By its very nature, any guarantee at all raises the expected cost of a Social Security system (both expected benefits to be paid and expected taxes or mandates to be collected).

(2) Guarantees tend to lock in inequities, reduce flexibility, and make it much harder to enact future reforms of the system.[7]

(3) Guarantees that benefits will be maintained as under the existing wage-indexed benefit formula must take into account that higher saving can lead to higher wages and guaranteed benefit amounts, as well as lower interest rates and annuity payments.

(4) When individual accounts vary in value because of market fluctuations and different patterns of individual investment, the costs to government may rise, but the pattern depends upon both how many people likely fall back on guarantees regardless of these fluctuations and on the extent to which moral hazard problems can be contained.

Actuarial estimates must take all these factors into account when estimating the budgetary effect of a reform containing a guarantee. In some cases, the cost of a guarantee may almost totally wipe out any reduction in Social Security imbalances achieved through other parts of the reform.

[7] To the extent that options are provided to beneficiaries, they can tend to be interpreted as guarantees and end up creating a similar lock-in effect, although we do not pursue this issue further in this paper.

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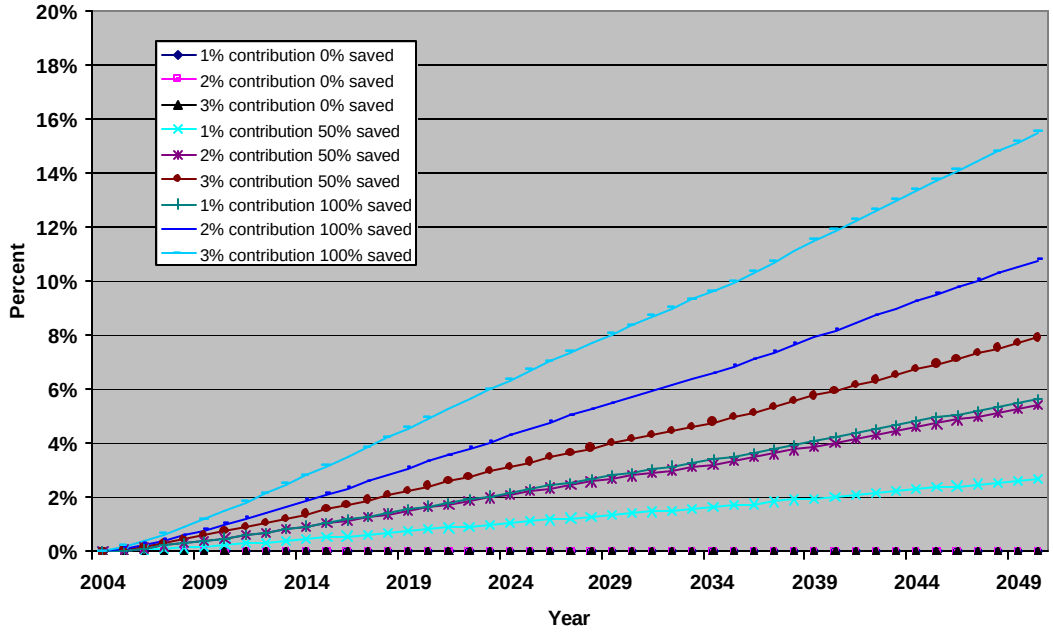
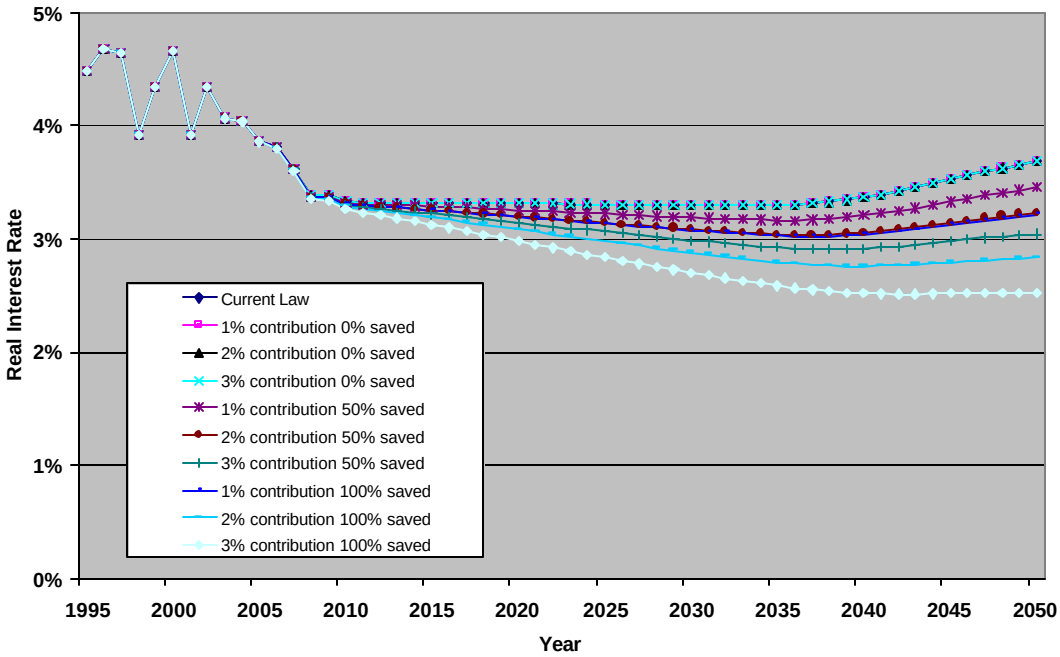
Figure 1
Percent Increase in Average Wage Under Various Reforms by Year



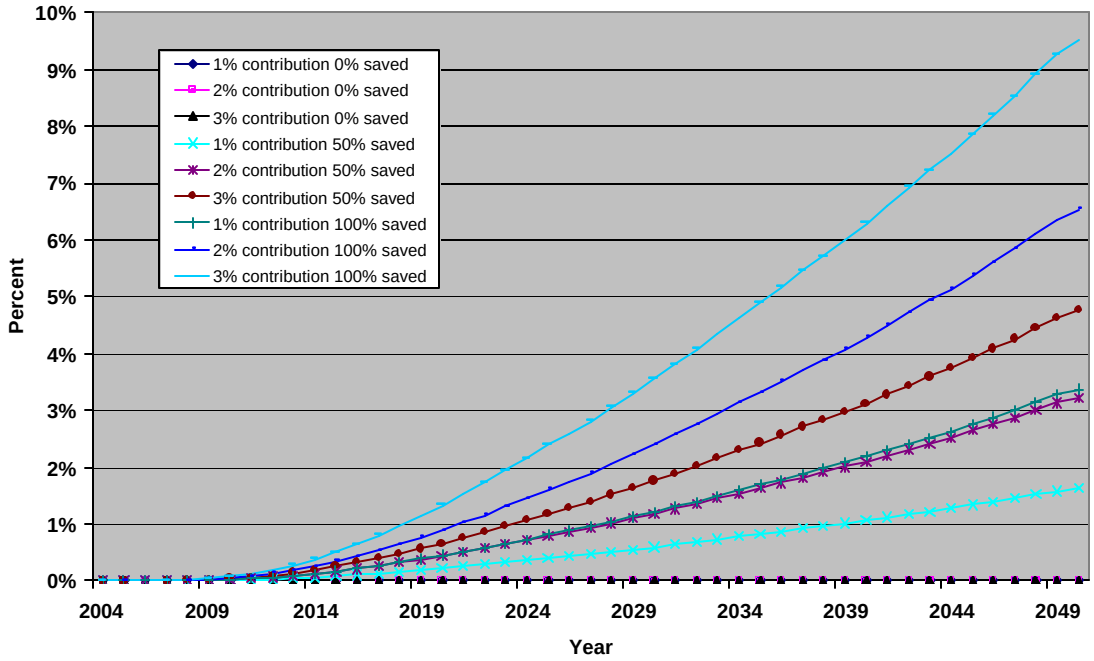
Source: Brookings Macro Model (Burtless and Bosworth 2000).

Figure 2
Real Interest Rate by Year



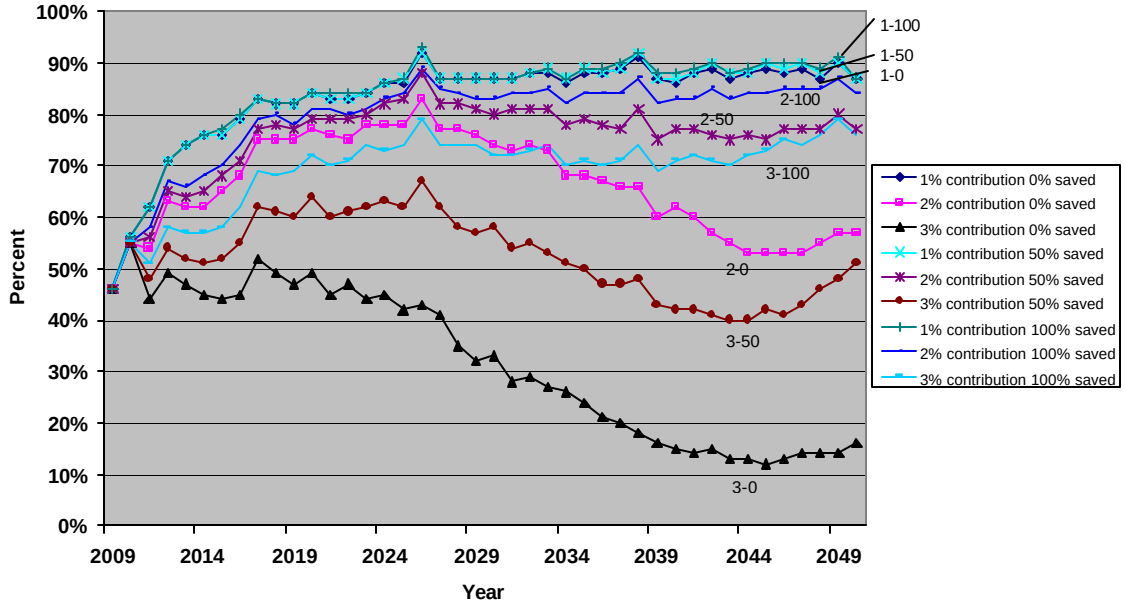
Source: Brookings Macro Model (Burtless and Bosworth 2000).

Figure 3
Percent Increase in Total Guaranteed Benefit Under Various Reforms by Year



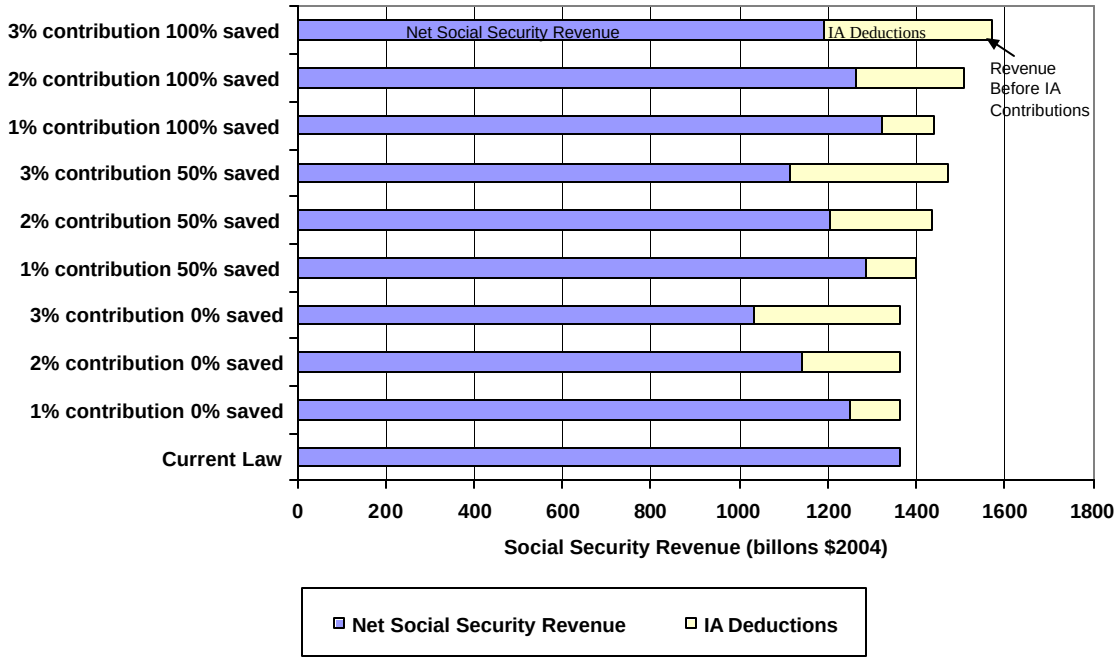
Source: DYNASIM3 (Favreault and Smith 2004) and Brookings Macro Model (Burtless and Bosworth 2000).

Figure 4
Percent of New Beneficiaries Who Get the Guarantee
Current Law Benefit > Price Indexed Benefit+Annuity
No Variation in Market Returns



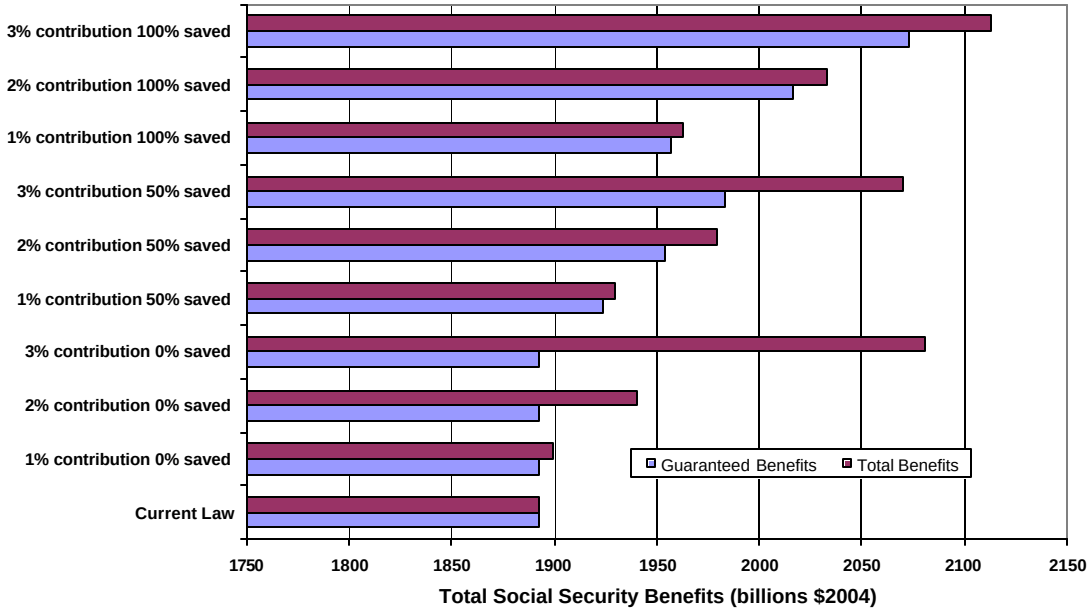
Source: DYNASIM3 (Favreault and Smith 2004) and Brookings Macro Model (Burtless and Bosworth 2000).

Figure 5
Total Social Security Revenue
(in 2050 billions $2004)



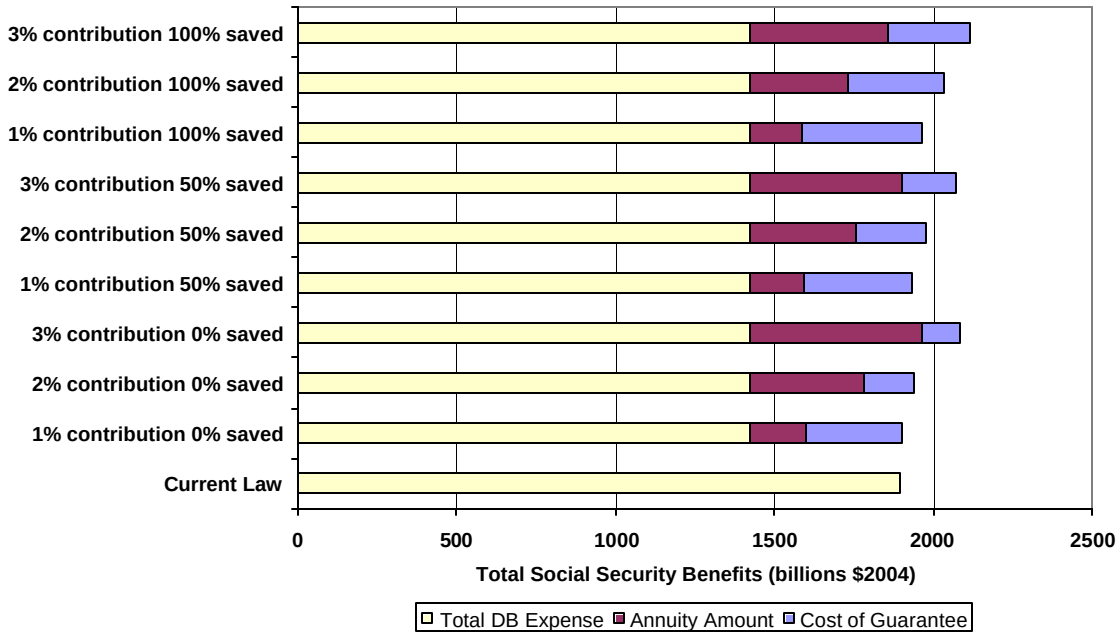
Source: DYNASIM3 (Favreault and Smith 2004) and Brookings Macro Model (Burtless and Bosworth 2000).

Figure 6
Total Social Security Benefits (DB + Annuity + Guarantee)
Versus Guaranteed Benefits (in 2050 billions $2004)



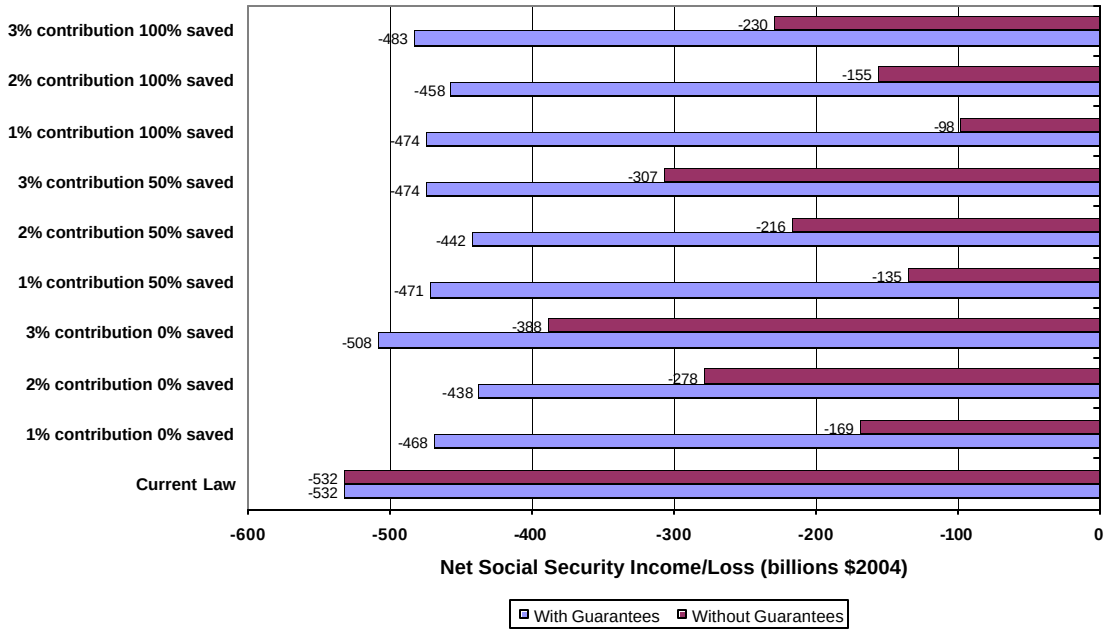
Source: DYNASIM3 (Favreault and Smith 2004) and Brookings Macro Model (Burtless and Bosworth 2000).

Figure 7
Total Social Security Benefits (DB + Annuity + Guarantee)
(in 2050 billions $2004)



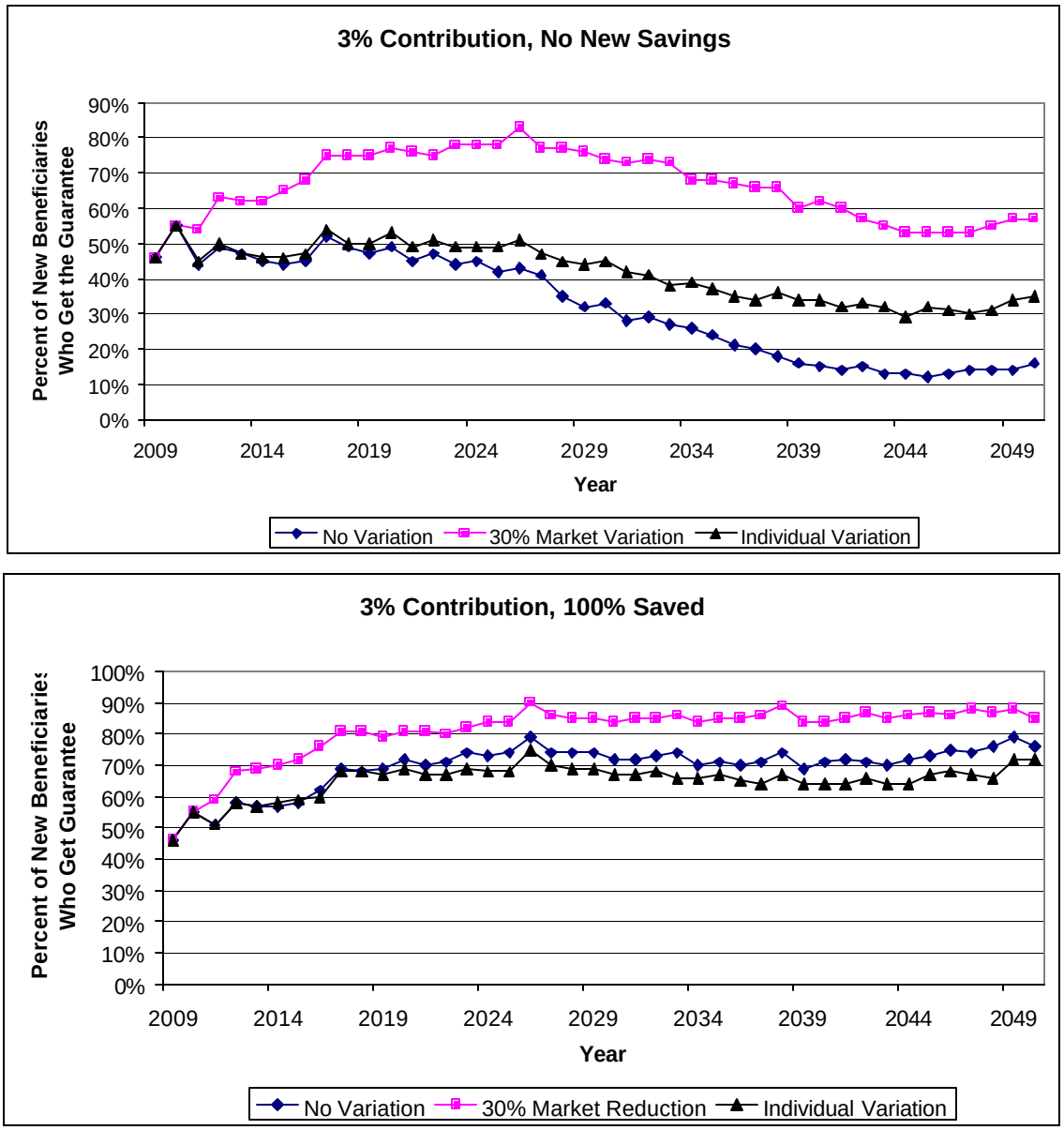
Source: DYNASIM3 (Favreault and Smith 2004) and Brookings Macro Model (Burtless and Bosworth 2000).

Figure 8
Net Social Security Income/Loss With and Without Guarantees
(in 2050 billions $2004)



Source: DYNASIM3 (Favreault and Smith 2004) and Brookings Macro Model (Burtless and Bosworth 2000).

Figure 9
Percent of New Beneficiaries Who Get the Guarantee
by Year and Market Return



Source: DYNASIM3 (Favreault and Smith 2004) and Brookings Macro Model (Burtless and Bosworth 2000).

Table 1
Percent of New Beneficiaries that Get the Guarantee, Total Social Security Revenue and Expenses in 2050 under Alternate IA Options
Balanced Portfolio with No Annual Market Fluctuation

	Current Law	Option 1 1% contribution 0% saved	Option 2 2% contribution 0% saved	Option 3 3% contribution 0% saved	Option 4 1% contribution 50% saved	Option 5 2% contribution 50% saved	Option 6 3% contribution 50% saved	Option 7 1% contribution 100% saved	Option 8 2% contribution 100% saved	Option 9 3% contribution 100% saved
Percent of New Beneficiaries that Get Guarantee	0%	87%	57%	16%	87%	77%	51%	87%	84%	76%
Current Law Promised Benefits (billions $2004)	1893	1893	1893	1893	1924	1954	1983	1957	2017	2073
Cost of Guarantee (billions $2004)	0	299	160	120	337	226	167	376	303	253
Total DB Expenses (billions $2004)	1893	1420	1420	1420	1420	1420	1420	1420	1420	1421
Total Social Security Expenses (billions $2004) (DB+guarantee)	1893	1719	1580	1540	1757	1646	1587	1796	1723	1675
Total Annuity Payment (billions $2004)	0	180	361	541	173	333	483	166	310	438
Total Social Security Benefits (billions $2004) (DB+Annuity+Guarantee)	1893	1900	1941	2081	1930	1979	2071	1962	2033	2113
Amount Total Guaranteed Benefit Above Current Law (billions $2004)	0	7	48	188	6	25	87	6	16	40
Total Payroll Tax before IA Deduction (billions $2004)	1361	1361	1361	1361	1398	1435	1469	1438	1508	1572
Total Lost Revenue from IA Contributions (billions $2004)	0	-110	-220	-329	-113	-231	-355	-116	-243	-380
Total Social Security Revenue (billions $2004) (payroll tax - IA contribution)	1361	1252	1142	1032	1285	1204	1114	1322	1265	1192
Net Social Security Income/Loss with Guarantees (billions $2004) (revenue - expenses)	-532	-468	-438	-508	-471	-442	-474	-474	-458	-483
Net Social Security Income/Loss Without Guarantees (billions $2004) (revenue - expenses)	-532	-169	-278	-388	-135	-216	-307	-98	-155	-230

Notes: Sixty percent of IA balances are invested in stocks and 40 percent in bonds. Portfolio is subject to no individual annual market fluctuation. We assume annual portfolio rebalancing.

Source: DYNASIM3 (Favreault and Smith 2004) and Brookings Macro Model (Burtless and Bosworth 2000).

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