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# WHAT ARE THE COSTS AND BENEFITS OF SOCIAL SECURITY INVESTING IN EQUITIES?

BY GARY BURTLESS, ANQI CHEN, WENLIANG HOU, AND ALICIA H. MUNNELL\*

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## Introduction

Policymakers have long known that the retirement of the baby boom generation would produce significant deficits for the Social Security program. Restoring balance will require raising taxes, reducing benefits, or both. Some observers argue that shifting a portion of the Social Security trust fund from bonds to stocks, as part of a comprehensive reform package, could reduce the size of the required tax increases or benefit cuts. Other countries, such as Canada and Japan, invest a portion of their social security assets in equities, so precedents exist. Equity investments, however, would expose the program to greater financial risk and, potentially, greater political risk. This *brief*, based on a recent paper, assesses the costs and benefits of investing in equities.<sup>1</sup>

The discussion proceeds as follows. The first section provides background on the debate over investing trust fund reserves in equities. The second section investigates how investing in equities would have affected the finances of Social Security if the policy had been adopted in the past and if the policy

were adopted today as part of a package to restore solvency over the next 75 years. It also includes a welfare analysis to address the contention that people will not value lower taxes in good times as much as they will dislike tax hikes in bad times. The third section addresses the non-financial issues associated with equity investing, such as the impact on capital markets and corporate governance and how to account for the possibility of higher expected returns without giving the impression that the government could solve all its problems simply by selling bonds and buying stocks.

The final section concludes that both retrospective and prospective analyses suggest that investing a portion of the Social Security trust fund in equities would improve its finances; little evidence exists that trust fund equity investments would disrupt the stock market; equity investments could be structured to avoid government interference with capital markets or corporate decision making; and accounting for returns on a risk-adjusted basis would avoid the appearance of a free lunch.

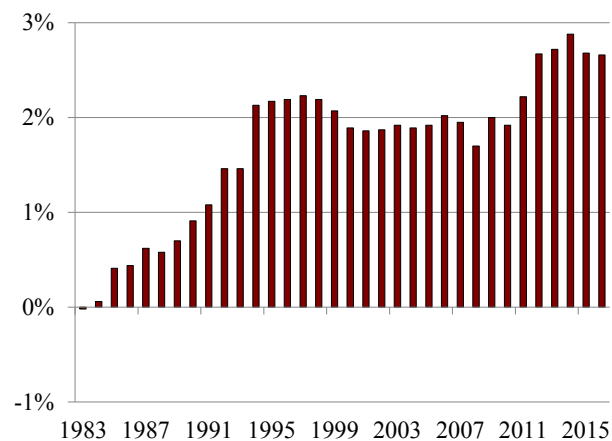
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## The Origins of Equity Proposals

Serious discussion of equity investments for Social Security arose as 75-year deficits re-emerged in the wake of the 1983 amendments (see Figure 1). President Clinton asked the 1994-96 Social Security Advisory Council to consider options to achieve long-term solvency. The Council could not agree on a single plan, so its members advanced three different proposals to close the funding gap.<sup>2</sup> All three included some form of investment in equities to boost returns on Social Security contributions. Two of the three plans proposed that equity investment take place in individually held private accounts. The third plan recommended that a fraction of the trust fund reserves be invested directly in equities, which is the subject of this analysis.<sup>3</sup>

FIGURE 1. SOCIAL SECURITY'S 75-YEAR DEFICIT AS A PERCENTAGE OF TAXABLE PAYROLL, 1983-2016



Source: U.S. Social Security Administration (2016a).

The attraction of equity investment is that it has a higher expected rate of return relative to safer assets, such as Treasury bills or bonds (see Table 1). However, in exchange for higher returns, equities carry greater risk, as evident by the higher standard deviation in returns historically.<sup>4</sup>

A second potential advantage is theoretical. Economists argue that efficient risk-sharing across a life-cycle requires individuals to bear more financial risk when young and less when old. Because the young have yet to accumulate much financial wealth,

TABLE 1. AVERAGE RETURNS AND STANDARD DEVIATION OF DIFFERENT ASSETS, 1928-2016

	Average geometric returns	Standard deviation
S&P 500	9.5%	19.7
3-month Treasury bill	3.4	3.0
10-year Treasury bond	4.9	7.7

Source: Authors' calculations from Damodaran (2016).

they typically hold few risky, high-yielding financial assets. One important asset that they do hold is a growing claim on future Social Security benefits. Because of the current trust fund investment policy, however, this asset is invested solely in safe, low-expected return Treasury bonds. Shifting Social Security assets from low-risk, low-return bonds to higher-risk, higher-expected-return equities would shift some financial market risk from the old to the young.<sup>5</sup>

The third set of arguments about equity investment is more political than economic. On the one hand – if the trust fund actually earns higher real returns – Social Security benefits will be less expensive, thereby reducing political risk to the program. On the other hand, equity investments also raise concerns of government interference with the allocation of capital in the economy and with corporate decision making, as well as concerns that improper accounting could give the impression that the government could get rich simply by selling bonds and buying equities.

The following sections look first at the likely financial implications of equity investments both historically and prospectively and then address the policy issues associated with a shift from bonds to equities in Social Security.

## Equity Investment and Social Security Finances

The analysis takes two approaches to examining the impact of equity investments on Social Security finances. The first is documenting retrospectively what the trust fund would look like today if equity investment had been introduced in the past. The second approach is forward-looking and projects a probabilistic range of trust fund outcomes if equities

were introduced today as part of a reform package to close the 75-year funding gap.<sup>6</sup> The third approach uses welfare analysis to reflect the value of strong or poor equity returns in different states of the world.

## Data and Methodology

Modeling Social Security finances requires data on the income and cost components of the trust fund, as well as data on equity returns and intermediate-term U.S. Treasury securities. The income and cost components of the combined Old-Age, Survivors, and Disability Insurance (OASDI) trust fund, both historically and for the 75-year projection horizon, are reported in the 2016 *Social Security Trustees Report*.<sup>7</sup> Historical equity returns are based on reported returns of the Wilshire 5000 and the Ibbotson Large Cap Index.<sup>8</sup> Going forward, for a number of reasons, equity returns are assumed to be lower than in the past – 6.6 percent versus 9.5 percent.<sup>9</sup>

The proportion of trust fund assets invested in equities depends on the phase-in scheme adopted and the assumed ceiling on equity holdings. The central assumption, following the “Maintenance-of-Benefits” proposal outlined in the 1994-96 Advisory Council report, increases the percentage of trust fund reserves invested in equities by 2.67 percentage points each year up to a ceiling equity allocation of 40 percent.<sup>10</sup>

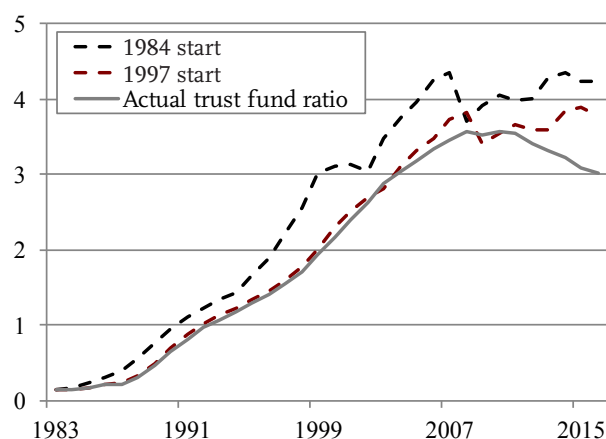
## Equity Investing in Hindsight

Actual returns determine whether, with the benefit of hindsight, investing the trust fund in equities would have improved its solvency in 2016. The results are expressed in terms of the trust fund ratio – the ratio of assets to benefits. A trust fund ratio of 1.0 is the benchmark used for the Trustees’ short-term test of financial adequacy. If equity investment had started in 1984, the trust fund ratio in 2016 would have been 4.2 compared to an actual ratio of 3.0 (see Figure 2). If equity investment had started in 1997, the ratio would have been 3.8. In short, despite two stock market slumps and a financial crisis, strong historical average equity returns would have increased trust fund balances whether investments began in 1984 or 1997.

## Equity Investment Starting in 2017

The second exercise assumes that Congress introduces equities in 2017 as part of a package of tax increases to restore balance to the system. A Monte-Carlo analysis with 10,000 iterations is used to project

FIGURE 2. OASDI TRUST FUND RATIO WITH EQUITY INVESTMENT BY STARTING YEAR, 1983-2016



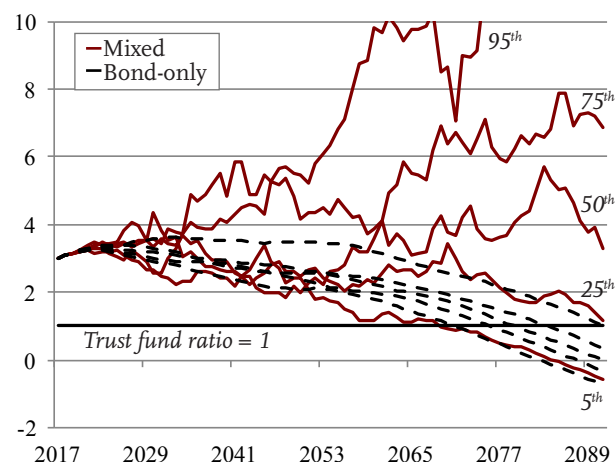
Note: Both scenarios assume that the percentage in equities is phased in at 2.67 percentage points per year.

Source: Authors’ calculations.

the range of outcomes for future equity returns. As noted, equity returns are assumed to be lower in the future than in the past.<sup>11</sup>

The key result of the Monte-Carlo simulations is that the 50<sup>th</sup> percentile of outcomes for the mixed portfolio projects a trust fund ratio of 3.3 at the end of the 75-year period, well above the short-term benchmark ratio of 1.0 (see Figure 3). In other

FIGURE 3. PROJECTED OASDI TRUST FUND RATIOS UNDER DIFFERENT PORTFOLIOS, 2017-2091



Note: The percentiles are determined by the rank of outcomes in 2091. The paths follow the simulations along the 75-year horizon.

Source: Authors’ calculations.

words, with equity investing, a 75-year solution could turn out to be a permanent fix for the program. Interestingly, even the 25<sup>th</sup> percentile of the mixed portfolio remains above the short-term benchmark and shows a much better outcome than *any* of the bond-only simulations depicted.

### *Welfare Consequences*

Overall, 97 percent of the simulations of diversifying investments into equities show that the financial status of the trust fund is strengthened. In 3 percent of the simulations, however, equity investment produces worse outcomes. Critics raise the concern that these very bad outcomes will occur when the economy is in terrible shape and that workers will not value the strong equity performances and lower required taxes from the frequent good outcomes as much as they will dislike the poor equity returns and higher taxes from the few awful outcomes. Addressing such a concern requires a welfare analysis, which is presented in the appendix. This analysis shows that even if the average wage were halved and the trust fund faced equity returns in the first percentile (an extremely poor outcome), the benefits of equity investments would still outweigh the losses.

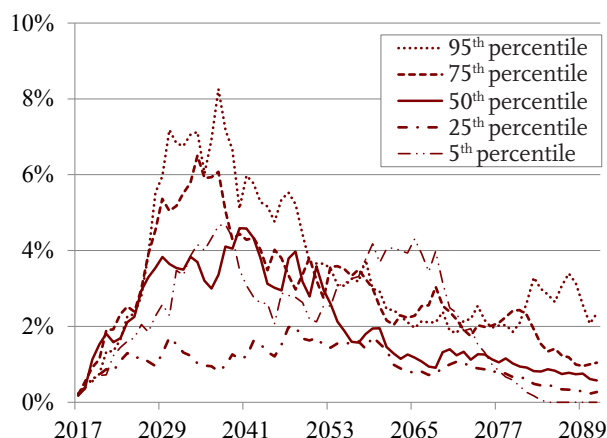
## Addressing Critics' Concerns

Critics question whether Social Security equity investments could be structured in a way to avoid adverse effects on the stock market and corporate decision making and reported in a way that does not imply trading bonds for stocks provides magic money.

### *Impact on the Stock Market*

Critics are concerned that Social Security holdings will disrupt the stock market. However, if Social Security had begun investing in the stock market in 1984 or 1997, it would own less than 4 percent of the market today. As a point of comparison, state and local pension plans currently hold about 6 percent of total equities, and no one expresses concern that those plans are disrupting market activity. Going forward, the trust fund percentages are projected to

FIGURE 4. PERCENTAGE OF TOTAL EQUITIES HELD BY OASDI TRUST FUND, 2017-2091



Note: The percentiles are ranked based on the percentage of total equities held by the trust fund at the end of the projection horizon.

Source: Authors' calculations.

be even smaller (see Figure 4). The trust fund's share of the total stock market would increase as equity holdings climb toward 40 percent of assets. In most outcomes, once the fund reached its 40-percent limit, Social Security's share of total equities would start to decline. Thus, it appears that equity markets would grow fast enough to absorb the equity investment envisioned in this analysis.

### *Impact on Corporate Governance*

A second issue is how government officials would choose the investments and vote their shares. Proponents of trust fund equity investment on the 1994-96 Advisory Board assumed that the government would take a very passive role. They suggested that investments be indexed to a broad market average and that the goal of investment neutrality be established in law. To achieve these objectives, the government would establish an expert investment board similar to the Federal Retirement Thrift Investment Board, which administers the Thrift Savings Plan (TSP) for federal employees. This board would be responsible for selecting an appropriate broad market index, such as the Russell 3000 or Wilshire 5000; for

choosing – through competitive bidding – several portfolio managers to handle the accounts; and for monitoring the performance of these managers. In response to concerns about corporate governance, the government shares could either not be voted or voted in a pattern that reflected other common shareholders. An alternative strategy would delegate proxy decisions to the individual portfolio managers as is done in the case of the TSP. Following these procedures, investing the Social Security trust fund in equities would have virtually no impact on the operations of corporations.

### *The Accounting Issue*

Another issue in the debate over the introduction of equities is the question of how to treat the risk in such investments when evaluating Social Security's finances. Currently, the program's actuaries credit equities with their expected rate of return. But other government agencies, like the Congressional Budget Office and the Office of Management and Budget, ignore the higher expected return and credit equities as yielding the long-term Treasury rate. These agencies, in effect, view the cost of the additional risk of stocks as precisely offsetting their additional return.

Adjusting for risk would avoid the criticism that the government could mint money simply by selling bonds and buying stocks. This approach would mean that introducing equity investment would not contribute to solving the Social Security deficit problem *at the time of adoption*. Only as returns were realized over time would it become evident whether stock market investment helped the system's financing through increasing trust fund assets.

## Conclusion

This analysis suggests that investing a portion (a maximum of 40 percent) of Social Security trust fund assets in equities would reduce the need for greater payroll tax contributions or benefit reductions. If equity investment had begun in 1984 or 1997, trust fund assets would be higher than they are currently, despite two major stock market slumps and a financial crisis. Going forward, the simulation results show that equity investment would likely help maintain a healthy trust fund balance over the next 75 years.

In terms of critics' concerns, little evidence exists that trust fund equity investments would disrupt the stock market; the experience with the Thrift Savings Plan provides a road map for separating the government from actual investment decisions; and accounting for returns on a risk-adjusted basis would avoid the appearance of easy money.

In short, both ex-post and prospective analyses suggest that equities would improve Social Security finances and that much of the concerns about interfering in private sector decisions could be addressed.

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# APPENDIX

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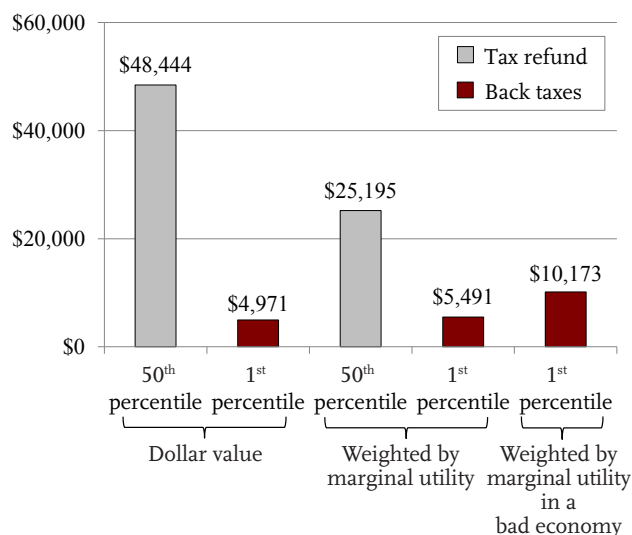
## Equity Investment and Welfare

A concern with the Monte-Carlo analysis is that workers will not value strong equity performances and the resulting lower required taxes as much as they will dislike poor equity returns and higher taxes. Addressing such a concern requires a welfare analysis.

The analysis starts with calculating the higher “tax refunds” and the higher “back-tax payments” associated with moving from a bond-only portfolio to a mixed portfolio. The tax refunds and back taxes are calculated at the end of each of the 10,000 simulations relative to the trust fund’s short-term benchmark ratio of 1. As shown in Figure A1, workers would gain \$48,444 in tax refunds at the 50<sup>th</sup> percentile outcome in Figure 3, but would have to pay \$4,971 more in back taxes at the 1<sup>st</sup> percentile (one of the worst outcomes).

Workers with a diminishing marginal utility of consumption, however, do not value tax refunds as much as they dislike paying back taxes. To account for this effect, the dollar amounts are weighted by the marginal utility derived from a typical utility function with risk-aversion.<sup>12</sup> This weighting narrows the gap between the gains and losses, as shown by the second cluster of bars. Since back taxes are more likely to occur when the economy is bad, the amount is then re-weighted assuming that the average wage is halved. Even this dramatic assumption shows tax refunds at the median will still outweigh losses when poor returns occur during a bad economy.

FIGURE A1. INCREASES IN “TAX REFUNDS” AND “BACK TAXES” DUE TO SHIFT FROM BOND-ONLY TO MIXED PORTFOLIO



Source: Authors' calculations.



## Endnotes

1 Burtless et al. (2016).

2 Advisory Council on Social Security (1997).

3 President Clinton later proposed that a modest portion of reserves could be invested in equities, but Congress did not act on this proposal.

4 For a more in-depth discussion, see Burtless et al. (2016).

5 See Burtless et al (2016) for a discussion of Trust Fund investments and intergenerational risk sharing.

6 This policy will produce large and growing trust fund accumulations during the first decades of the projection period, even if 100 percent of the reserve is held as Treasury securities. See U.S. Social Security Administration (2016b) for estimates on the effect of investing 40 percent of the trust fund in equities without any accompanying tax or benefit changes.

7 See Tables VI.A1, VI.A3, and VI.G8 in U.S. Social Security Administration (2016a). Since the Disability Insurance trust fund was not established until 1958, the data for 1937-58 refer to the Old-Age and Survivors Insurance trust fund.

8 While the Wilshire 5000 stock index is a better measure of total market returns than the S&P 500 or Ibbotson Large Cap Index, it only goes back to 1971. To infer annual Wilshire 5000 returns before 1971, the statistical relationship between the Wilshire 5000 and the Ibbotson Large Cap index – during the period in which they were both available, 1971-2015 – is estimated. Small-cap stocks tend to outperform large-cap stocks over long time horizons. As a result, the Wilshire 5000, which includes both small- and large-cap stocks, out-performed the Ibbotson Large Cap Index. This out-performance is assumed to be constant and applied to the Ibbotson Large Cap Index for the period 1929-1971 to create a *hypothetical* sequence of Wilshire 5000 returns in those years.

9 To get some idea of future real returns, three approaches are considered. The first is simply to look at the inverse of the price/earnings (P/E) ratio to gauge future returns, which at 25.8 (as of December 2016) suggests future real returns of 3.9 percent. Short-term earnings yields, however, can be misleading. Campbell and Shiller (1988) argue that the 10-year earnings yield is a much better predictor of stock returns. The current cyclically adjusted PE (CAPE) ratio is 28.7 (as of February 2017), suggesting a future long-term return of 3.5 percent. The third approach turns to a formula from the Gordon growth model, which establishes a steady state relationship between market value, stock returns, and GDP. In a steady state, the growth rate of stock prices can be assumed to equal the growth rate of GDP. The stock return implied by the Gordon equation is 4.3 percent. For simplicity, future real equity returns at the 50<sup>th</sup> percentile are assumed to equal 3.9 percent real, the mid-point of the range, and 6.6 percent nominal.

10 Alternative equity accumulation rates of 2.0 and 5.0 percentage points per year, as well as equity allocation caps of 20 percent and 60 percent of total assets, were also modeled. See Burtless et al. (2016) for more detail.

11 Equity returns are also assumed to follow a lognormal distribution, and the covariance between bond returns and equity returns is assumed to be zero. For simplicity, mean-reversion is not built into the model.

12 The analysis assumes a risk-aversion coefficient, gamma, equal to two. Sensitivity tests show that once gamma approaches five, individuals are indifferent between the two investment policies. Chetty (2006) however, shows that the wage elasticity of labor supply implies that gamma is bound by an upper limit of two.

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