



Social Security versus Private Retirement Accounts: A Historical Analysis

Thomas A. Garrett and Russell M. Rhine

This paper compares Social Security benefits relative to those paid from private investments: specifically, whether 2003 retirees would gain more retirement income if they had invested their payroll taxes in private accounts during their working years. Three different retirement ages and four possible earnings levels are considered for two private investments—6-month CDs or the S&P 500. On average, the results suggest less than 5 percent of current retirees would receive a higher monthly benefit with Social Security. Several Social Security reform proposals are described.

Federal Reserve Bank of St. Louis *Review*, March/April 2005, 87(2, Part 1), pp. 103-21.

INTRODUCTION

The Social Security Act of 1935 remains one of the largest and most enduring mandates of federal government activity.¹ Although the term Social Security is commonly used to refer to retirement benefits, the Social Security system has evolved over time to include other social welfare programs as well. Initially, the Act provided for only old-age retirement benefits (also called Old Age Insurance, or OAI). Benefits for survivors were added in 1939, and the system became known as OASI. Disability benefits were added in 1954 (OASDI). The final addition came in 1965, when Medicare was enacted, giving the present-day program the name OASDHI. As seen in Figure 1, Social Security, disability, and Medicare benefits are the largest expenditures of the federal government, with nearly \$725 billion (7 percent of gross domestic product, 34 percent of total federal spending) spent on OASDHI in 2003.² We focus specifically on OASDI and sim-

ply refer to this as Social Security throughout the remainder of the paper, unless noted otherwise.

Social Security (OASDI) is commonly referred to as a pay-as-you-go pension system.³ Rather than paying an individual benefits from a fund that they have built up over time (called a fully funded pension system), a pay-as-you-go system relies on tax revenue from current workers to fund the benefits of current recipients. Over 47 million Americans received benefits through the OASDI system in 2003 (roughly 16 percent of the U.S. population).⁴ Considering only retirees and their dependents, nearly 33 million Americans received OASDI benefits in 2003 (roughly 11 percent of the U.S. population and 91 percent of the U.S. population over age 65). The system is funded by payroll taxes levied equally on employees and their employer up to a maximum income level (\$90,000 in 2005).⁵ The current tax rate for each employee and his employer is 6.2 percent (for a total rate

¹ Extensive academic research has addressed the economics of Social Security. For a discussion of Social Security's rate of return relative to private investments and the impact of Social Security on private savings, see Feldstein, Poterba, and Dicks-Mireaux (1981), Boskin (1977, 1978), Campbell and Campbell (1976), and Boskin and Hurd (1978).

² Transfer payments are not included in gross domestic product.

³ A true pay-as-you-go system takes in revenues only in the amount it disperses them to recipients. Social Security, however, has run surpluses and deficits over its history.

⁴ Based on Social Security data.

⁵ Income subject to OASDI payroll taxes was capped at \$3,000 in 1950, \$25,900 in 1980, and \$51,300 in 1990. See www.ssa.gov/OACT/COLA/cbb.html#Series for a complete history of all income limits.

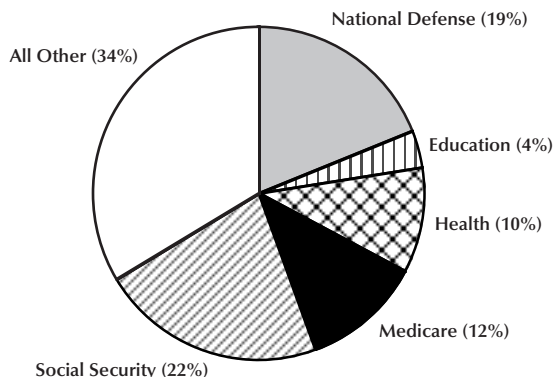
Thomas A. Garrett is a senior economist at the Federal Reserve Bank of St. Louis. Russell M. Rhine is an assistant professor at St. Mary's College of Maryland. Molly Dunn-Castelazo provided research assistance.

© 2005, The Federal Reserve Bank of St. Louis.

Figure 1

Major Federal Outlays

Percentage of Total Expenditures, 2003



SOURCE: Office of Management and Budget.

of 12.4 percent). Payroll tax rates have increased since the 1930s, as seen in Table 1.⁶

Since the inception of Social Security in 1937, for most years revenues coming in have been greater than expenditures going out. In 2003, for example, OASI trust fund revenues from payroll taxes totaled \$544 billion, while benefits summed to \$406 billion.⁷ By law, any surplus revenue must be credited to the Social Security trust fund. Trust fund monies are invested in federal government securities (Treasury securities) to earn a rate of return. There are no actual funds held in the trust fund; the federal government regularly uses these monies for both mandatory and discretionary purposes. The size of the Social Security trust fund was roughly \$1.4 trillion at the end of 2003.

⁶ Statistics on the Social Security system can be found at www.ssa.gov/OACT/STATS/index.html.

⁷ In addition to the direct contributions obtained from the payroll tax, there is an additional payment into the system. This payment is interest paid on Treasury securities that are held by the Social Security trust fund. The portfolio of Treasury securities earns interest income that is an expense to the federal government and subsequently to the taxpayer. This is a relatively small indirect Social Security income tax, less than 1 percent, but it is worth mentioning to accurately explain the source of funds to the system. The indirect Social Security tax rate is generated by finding the product of the percent of worker's income paid in federal income taxes and the percent of federal government expenditures paid as interest on the federal government debt held by the Social Security trust fund.

Table 1

Payroll Tax Rates

Calendar year	OASDI tax rate for employees and employers (each)
1937-49	1.000
1950	1.500
1951-53	1.500
1954-56	2.000
1957-58	2.250
1959	2.500
1960-61	3.000
1962	3.125
1963-65	3.625
1966	3.850
1967	3.900
1968	3.800
1969-70	4.200
1971-72	4.600
1973	4.850
1974-77	4.950
1978	5.050
1979-80	5.080
1981	5.350
1982-83	5.400
1984	5.700
1985	5.700
1986-87	5.700
1988-89	6.060
1990 and later	6.200

SOURCE: Social Security Administration: www.ssa.gov/OACT/ProgData/taxRates.html.

Revenues, expenditures, and the trust fund balances for selected years are shown in Table 2.

Prelude to a Crisis

The Social Security system remains quite solvent today, despite an increase in the number of benefit recipients and increasing expenditures as a percentage of total federal spending. As seen in Figure 2, the number of OASDI beneficiaries has increased from nearly 26 million in 1970 to over 47 million in 2003, which is an average

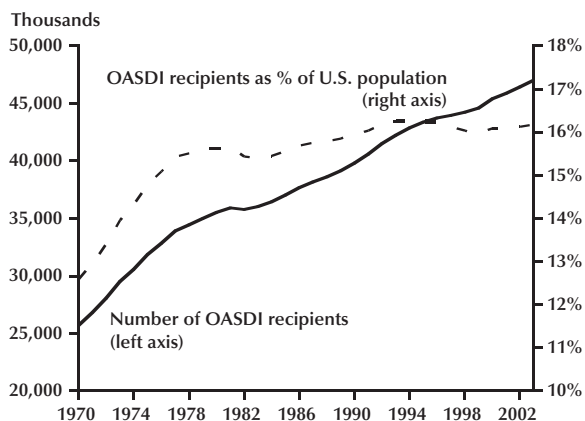
Table 2**OASI Trust Fund Data**

Calendar year	Total receipts (\$ thousands)	Total expenditures (\$ thousands)	Trust fund (\$ thousands)
1937	\$767,000	\$1,000	\$766
1940	368,000	62,000	2,031,000
1950	2,928,000	1,022,000	13,721,000
1960	11,382,000	11,198,000	20,324,000
1970	32,220,000	29,848,000	32,454,000
1980	105,841,000	107,678,000	22,823,000
1990	286,653,000	227,519,000	214,197,000
2000	490,513,000	358,339,000	930,836,000
2003	543,811,000	405,978,000	1,355,330,000

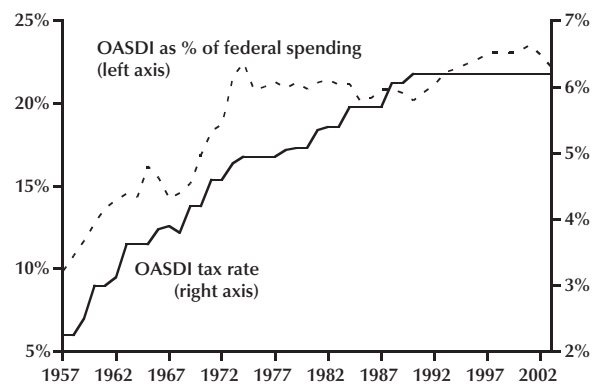
NOTE: The trust fund is the cumulating surpluses from all prior years. Trust funds for Medicare (HI) and Disability (DI) are not included.
SOURCE: Social Security Administration: www.ssa.gov/OACT/STATS/table4a1.html.

Figure 2**OASDI Recipients**

Total as a Percentage of the U.S. Population



SOURCE: www.ssa.gov/OACT/STATS/OASDIbenies.html and U.S. Bureau of the Census.

Figure 3**OASDI Expenditures as Percent of Federal Spending and OASDI Payroll Tax Rate**

SOURCE: www.ssa.gov/OACT/ProgData/taxRates.html, www.ssa.gov/OACT/STATS/table4a3.html, and Office of Management and Budget.

annual increase of 1.86 percent. In terms of the entire U.S. population, 12.6 percent received some OASDI benefit in 1970, compared with 16.2 percent in 2003. OASDI expenditures as a percentage of total federal spending rose from roughly 10 percent in 1957 to 22 percent in 2003, as seen in Figure 3.

Reasons for the rapid rise in Social Security expenditures include increases in the payroll tax rate (see Figure 3), an increase in the scope of coverage, the increasing longevity of the U.S. population, and an increase in the share of the elderly relative to the overall population. In 1950, there were 16.5 workers paying Social Security taxes for every retired person receiving benefits.

Table 3

Important Trust Fund Dates

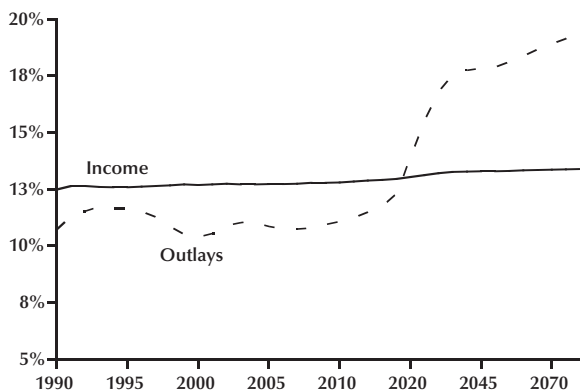
	OASI	DI	OASDI
First year outgo exceeds income, excluding interest	2018	2008	2018
First year outgo exceeds income, including interest	2029	2017	2028
Year trust fund assets are exhausted	2044	2029	2042

SOURCE: Board of Trustees, Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds (2004, Tables IV.B1, IV.B3, and VI.F1).

Figure 4

OASDI Income and Outlays

Percentage of Taxable Payroll



SOURCE: www.ssa.gov/OACT/TR/TR04/IV_LRest.html#wp257923.

Today the number is 3.31, and by 2030 there will be 2.17 workers paying taxes for every recipient.⁸ By 2030, there will be 70 million Americans of retirement age, compared with about 35 million today.⁹ Preserving the current Social Security system for the next 75 years would require an immediate increase in the payroll tax to 14.3 percent (from its current level of 12.4 percent) or a 13 percent reduction in all current and future benefits.¹⁰

⁸ Board of Trustees, Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds (2004, pp. 47-48).

⁹ Social Security Administration: www.ssa.gov.

¹⁰ Board of Trustees, Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds (2004, p. 56).

Forecasts for the continued solvency of the Social Security system are quite bleak. The Social Security and Medicare Boards of Trustees (2004) estimates that OASI inflows from payroll taxes will be less than projected benefits by 2018, and by 2044 the trust fund (which is currently \$1.4 trillion) will be exhausted (see Table 3). If disability insurance is also considered, the trust fund will be depleted in 2042. These projections assume no increase in the payroll tax. As seen in Figure 4, Social Security costs (expenditures to recipients) are expected to exceed payroll tax revenues by 2020, and deficit financing of Social Security will continue until the trust fund is “exhausted” around 2040.

Various solutions to preserving Social Security for America’s retirees have been proposed, such as raising payroll tax rates and cutting benefits. These are steps that would more or less preserve the current system and improve its solvency into the future. Another option would allow individuals to invest some of their payroll taxes in private retirement accounts. Unlike cutting benefits or raising payroll taxes, a move in this direction would produce a social retirement system quite different from the current Social Security system.

Our Objective

Social Security reform proposals range from maintaining the current system to a complete revamping of social insurance in the United States by allowing individuals to invest their payroll tax contributions in private retirement accounts.¹¹

¹¹ Many of these proposals will be discussed later in the paper.

Table 4

Summary of Assumptions

- All contributions (both employee and employer) to the Social Security system are invested into the private investment.
- The investments increase at the actual rate of return for each year.
- Investments are tax deferred—taxed at the time of distribution at the rate of 15 percent.
- The balance of the private investments continues to grow at the average real rate of return (average nominal rate of return minus the average inflation rate) after retirement in 2003.
- Individuals remain in their same earnings level their entire life.
- An individual is considered to be better off during retirement by privately investing as opposed to participating in Social Security if the amortized private investment balance at retirement is greater than the Social Security benefit payment.

NOTE: Our data and programs are available on the web site of the Research Division of the Federal Reserve Bank of St. Louis: research.stlouisfed.org/. The above assumptions can be altered within the programs to accommodate alternative analyses.

We argue that a crucial factor of any Social Security reform proposal is an analysis of the actual benefits received from Social Security compared with the benefits that would have been gained with a system of private retirement accounts during retirees' working years. Assessing the benefits of Social Security, in its current form, is an important policy question because it can guide the direction of Social Security reform. If a large percentage of the population has received a rate of return from Social Security that is greater than that which could have been obtained by investing in financial markets, then proposals that maintain or build on the current system would be preferable to a private investment approach to providing retirement benefits.

This paper provides a historical look at the benefits of Social Security relative to private investments. We conduct an analysis—according to various factors, such as income level and age at retirement—to determine who has benefited from the current system and who would have been better off had they been allowed to invest their Social Security contributions (payroll taxes) in a private retirement account throughout their working years. We ask, for people retiring in 2003, if their lifetime Social Security contributions were alternatively fully invested in a private account, would they have had a higher monthly income during retirement than they are receiving from Social Security.

WHO HAS BENEFITED?

Assumptions

We make several assumptions to easily compare individuals at a more aggregate level. The assumptions are four average levels of annual income, years of contributions to the Social Security system, the opportunity cost of Social Security contributions, and retirement age. The analysis also considers two different private investments. These assumptions will allow us to focus on a few age and income groups to investigate who has borne the costs of the current system and whether the benefits of the current system would have been exceeded by the use of private retirement accounts. Other assumptions used in our analysis are listed in Table 4.

Methods and Stipulations

To analyze the impact of the Social Security system on different types of individuals, it is necessary to determine the opportunity cost of the contribution (to what amount those contributions would have accumulated if they had been privately invested) and the disbursements from both Social Security and the alternative private investment. We calculate the exact amount of the contributions to the Social Security system and apply them to a market rate of return to obtain the opportunity cost of Social Security. Thus, we get the value of

Table 5**Private Portfolio Balance at Retirement in 2003 Based on an Alternative Investment in the S&P 500**

Retirement age/years working	Earnings level			
	Low	Average	High	Maximum
62/40 years	\$130,642	\$290,315	\$447,032	\$591,113
65/43 years	\$136,517	\$303,371	\$461,740	\$605,821
70/48 years	\$144,796	\$321,768	\$483,589	\$627,670

NOTE: Actual employee and employer contributions to the Social Security system are increased annually by the actual return of the S&P 500 Composite Index. See text for a description of earnings levels.

Table 6**Private Portfolio Balance at Retirement in 2003 Based on an Alternative Investment in 6-Month CDs**

Retirement age/years working	Earnings level			
	Low	Average	High	Maximum
62/40 years	\$94,775	\$210,611	\$319,148	\$416,787
65/43 years	\$100,771	\$223,934	\$334,159	\$431,798
70/48 years	\$109,201	\$242,668	\$356,394	\$454,033

NOTE: Actual employee and employer contributions to the Social Security system are increased annually by the 6-month CD rate. For the years 1961-63 and 1956-63 for those retiring at age 65 and 70, respectively, the 40-year average of 6-month CD rates is used. See text for a description of earnings levels.

the contributions to the Social Security system had the individual used those funds to make an alternative private investment.

To calculate the contributions into the Social Security system, we use four different levels of earnings and multiply those earnings by the corresponding OASDI tax rate for each year (see Table 1). We then multiply the contribution by 2 so that we capture both the employee and the employer contribution. A breakdown of the contributions is shown in the appendix. The earning groups we use are low earners (45 percent of the national average wage), average earners (national average wage), high earners (160 percent of the national average wage), and maximum earners (maximum wage subject to payroll tax).¹² In addition

¹² The national average wage is a time series of annual wage data that is generated by the Social Security Administration. See www.ssa.gov.

to considering different earnings, we also consider three different retirement ages: 62 years, 65 years, and 70 years.

The two market rates of return that we use in the analysis are the average monthly Standard and Poor's 500 Composite Index and the interest rate on 6-month certificates of deposits (CDs).¹³ These were chosen to account for different risk preferences of individual investors, realizing that some people would prefer to have their retirement investments in a relatively safe investment, such as CDs, rather than the stock market. We assume that CDs are rolled-over when they mature. The

¹³ The S&P 500 data is from the *Wall Street Journal* and the 6-month CD rate of return is from the Board of Governors of the Federal Reserve System. The composite index consists of 500 widely held common stocks of leading companies. Unlike the total return index, the composite index is the more conservative measure of market performance, in that it does not assume the reinvestment of dividends.

Table 7**Social Security Monthly Benefits in 2003**

Retirement age/years working	Earnings level			
	Low	Average	High	Maximum
62/40 years	\$575	\$947	\$1,242	\$1,412
65/43 years	\$701	\$1,157	\$1,512	\$1,721
70/48 years	\$832	\$1,386	\$1,785	\$2,045

NOTE: Monthly benefit payments are based on the 35 highest income years of work (income not to exceed the maximum level of taxable income) and are adjusted based on age at retirement. See text for a description of earnings levels.

SOURCE: Social Security Administration: www.ssa.gov/OACT/COLA/examples.html.

S&P 500 has an average annual return of about 8.5 percent over the past 56 years. The rate of return on 6-month CDs is lower than the S&P 500, at an average of about 6.9 percent over 40 years, and is much less volatile. Since CDs did not exist prior to 1964, the 40-year average is used for the earlier years.

The balance of an individual's investment at the time of retirement can be calculated by combining employee and employer contributions to the Social Security system and applying the market rate of return for each of the two private investments. A nominal rate of return is used because wages, and the corresponding contribution to the private investments, are in nominal terms.

There is no comparable rate of return for Social Security because the majority of contributions into the system are immediately paid out to beneficiaries. However, the trust fund rate of return is the interest earned on Treasury securities. This interest rate is lower than both the S&P 500 and the 6-month CD rate, about 5.9 percent, and applies only to a small portion of the payments into the system.¹⁴ Tables 5 and 6 show the balance of the two private portfolios, assuming retirement in the year 2003.¹⁵

¹⁴ This figure, 5.9 percent, is the 44-year average (1960-2003) for 6-month Treasury securities sold on the secondary market. Source: Board of Governors of the Federal Reserve System.

¹⁵ We assume that all four groups have the same labor productivity growth over time and that each group's factor endowments remain unchanged.

Calculation of Benefits

The Social Security Administration adjusts the level of monthly benefit payments depending on an individual's age at retirement. For individuals that choose early retirement, their monthly Social Security benefits are reduced, whereas benefits are increased for individuals that choose to delay retirement. The Social Security Administration considers normal retirement age to be 65 to 67 years old, early retirement to be 62 to 64 years old, and delayed retirement age to be greater than 67 years old. Table 7 shows the monthly Social Security benefits that an individual will receive in 2003 based on various retirement ages and earning levels. We assume that individuals do not change their level of earnings throughout their life.¹⁶

The private investment balance at the time of retirement is amortized over a range of 1 to 30 years to determine the level of monthly benefit payments. That is, assuming a constant real growth rate of the portfolio during retirement and a given number of life years, a fixed monthly payment is calculated.¹⁷ The portion of the S&P 500 portfolio that is not distributed continues to grow at a real rate of 4.61 percent during retirement. This real growth rate is the difference in the average rate of return of the S&P 500 and the average inflation rate

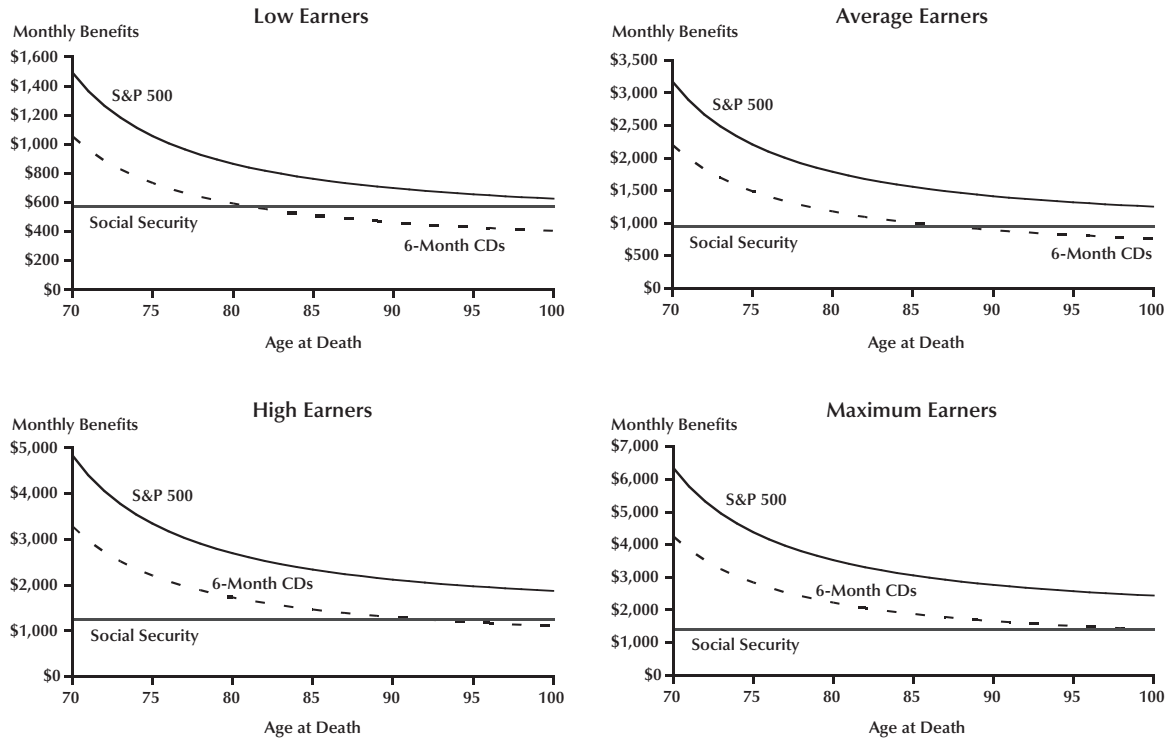
¹⁶ Earning estimates and monthly benefits are from the Social Security Administration, "Retirement Benefit Examples." See www.ssa.gov/OACT/COLA/examples.html.

¹⁷ The Excel PMT function is used to generate the monthly payment amount.

Figure 5

Monthly Benefits from Social Security, S&P 500, and 6-Month CDs

Retirement Age: 62



SOURCE: See the appendix for source information.

for the years 1948-2003 (8.49 percent – 3.88 percent). Similarly, the portion of the 6-month CD portfolio that is not distributed continues to grow at a real rate of 3.0 percent. This real growth rate is the difference in the average rate of return of the 6-month CDs (1964-2003) and the average inflation rate for the years 1948-2003 (6.88 percent – 3.88 percent). The Social Security benefit is constant because the annual increase in the Social Security benefit is simply a cost of living adjustment and does not increase in real terms. The private benefit decreases as the age at death increases because the portfolio balance is amortized over a longer period.

Results

Figures 5 through 7 show the real monthly benefit paid by Social Security and the real

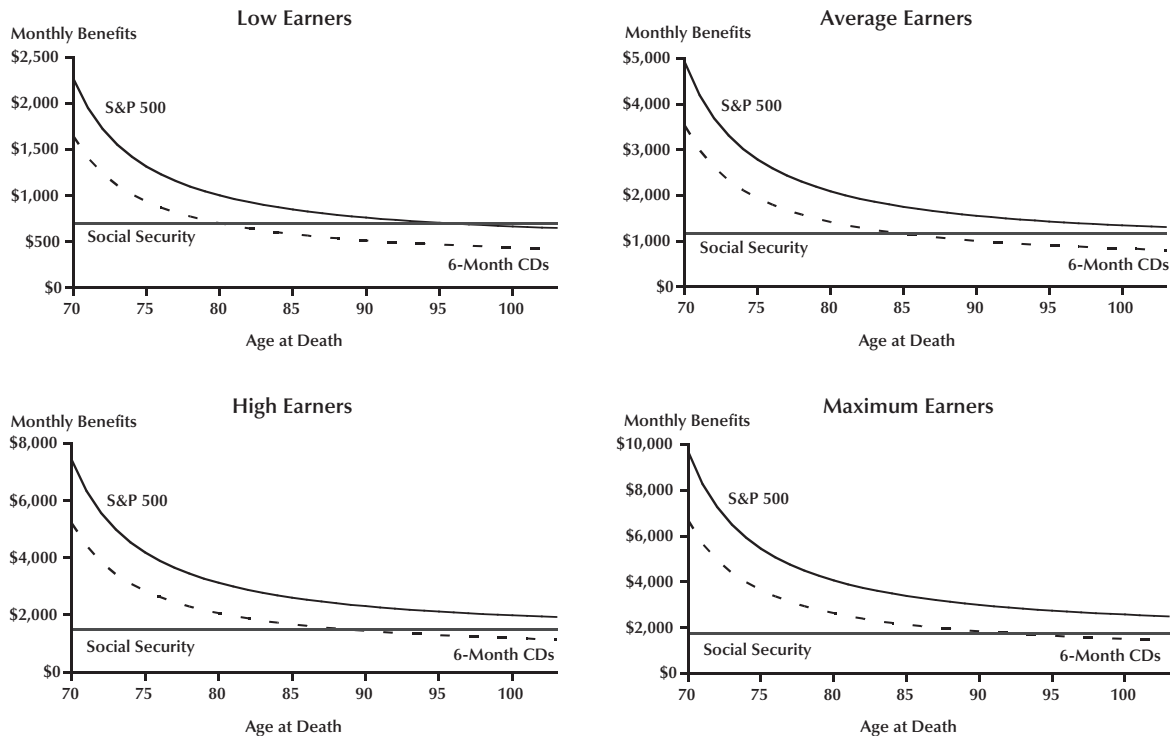
monthly benefit from the two amortized private portfolios for each of three different retirement ages. In reality, people do not know when they are going to die. However, it is clear that in most cases it does not matter how long people choose to amortize their savings—they will still receive a higher monthly payment from the private portfolio than the Social Security benefit. If people die early in retirement, or prior to retirement, their families receive a small death benefit (\$255) and survivor benefits (up to 100 percent) of the deceased spouse’s benefits. As long as a widowed spouse does not live beyond the age shown in Tables 8 and 9, he or she will receive a private investment benefit that is greater than the Social Security benefit.

Regarding taxes, we assume that the private investment accounts were tax deferred—that is, taxes are only paid on distributions during retire-

Figure 6

Monthly Benefits from Social Security, S&P 500, and 6-Month CDs

Retirement Age: 65



SOURCE: See the appendix for source information.

ment years. We assume a tax rate of 15 percent on distributions from private investment accounts.¹⁸ Tax law treats Social Security payments and disbursements from private accounts differently in terms of tax liability—100 percent of private account disbursements is considered as income, whereas only a portion of Social Security benefits is considered income.¹⁹ We assume no taxes are paid on Social Security benefits because annual Social Security disbursements fall below the minimum level of taxable income.

¹⁸ For 2003, the 15 percent tax bracket applied to a taxable income (total income less deductions and exemptions) of \$14,000 to \$56,800 (married filing jointly). We use a 15 percent tax bracket because most annual incomes at the time of death are within this range.

¹⁹ See <http://taxguide2002.completetax.com/text/c60s10d573.asp?style=8> or the instruction booklet for the 2003 Form 1040 at www.irs.gov for a discussion on the taxation of Social Security benefits.

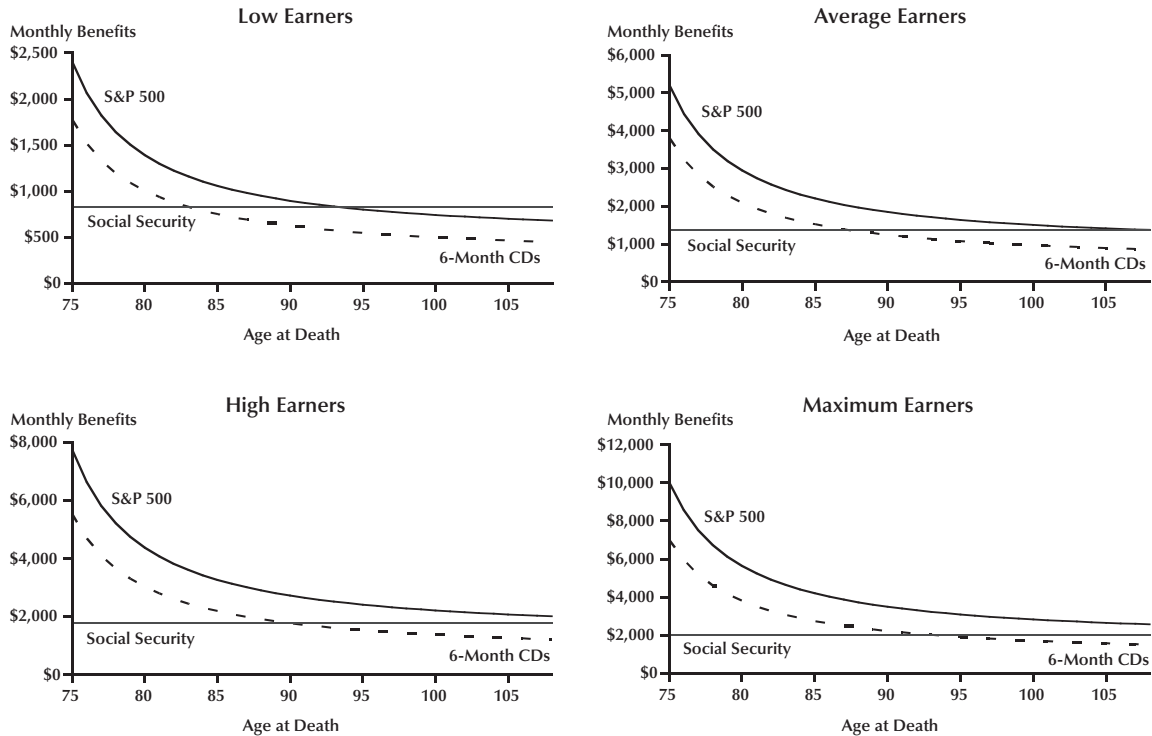
A comparison of the monthly private investment benefit with the Social Security benefit, for a given age at death, provides evidence on whether various age and income groups received a greater retirement benefit from Social Security than they would have from private investments. Using Figures 5 through 7, if either of the private investment benefits is greater than the Social Security benefit, then individuals in the specific age and income cohort received a lower monthly benefit from Social Security than if they had invested in a private retirement account during their working years.

Figures 5 through 7 provide the following conclusions: For those people retiring at age 62, none would benefit more from the current Social Security system relative to private investments in the S&P 500 (Figure 5). A person retiring at age 65

Figure 7

Monthly Benefits from Social Security, S&P 500, and 6-Month CDs

Retirement Age: 70



SOURCE: See the appendix for source information.

will only benefit more from Social Security relative to a private investment in the S&P 500 if he is a low earner and lives to be at least 96 years old (Figure 6). Finally, for those retiring at age 70, the only individuals that benefit more from Social Security are low earners who live to be at least 94 years old and average earners who live to be at least 108 years old, assuming an investment in the S&P 500 (Figure 7). Tables 8 and 9 provide a summary of which age and income groups benefit more from the Social Security system relative to the S&P 500 (Table 8) and the 6-month CDs (Table 9).²⁰

²⁰ We ignore the role of spousal benefits. Under current law, a spouse is guaranteed a benefit equal to half the monthly benefit of the higher earning spouse. As long as the monthly benefit from a private retirement account is less than 50 percent higher than the monthly Social Security benefits, the latter is preferred by single-earner couples.

We can now address the question of who has benefited more from the current Social Security system relative to a situation in which they had been allowed to invest their Social Security contributions in private retirement accounts throughout their working years.

First consider the S&P 500 (Table 8). The U.S. Census estimates that there are 415,000 people in the U.S. over the age of 94 and that the total U.S. population is 290,809,777 (as of 2003). Thus, the percentage of the population that is 95 years old or older is 0.14 percent of the U.S. population. If we assume that this age group is evenly distributed over the four income groups, then roughly 0.04 percent (4 of every 10,000) of the current total U.S. population would benefit more from Social Security than from a retirement investment in the S&P 500.

Table 8**Those Who Would Benefit More from the Social Security System (by Age) Compared with an Alternative Investment in the S&P 500**

Retirement age/years working	Earnings level			
	Low	Average	High	Maximum
62/40 years	None	None	None	None
65/43 years	96 or older	None	None	None
70/48 years	94 or older	108 or older	None	None

NOTE: These beneficiaries are based on Figures 5 through 7 and the corresponding tables. See text for a description of earnings levels.

Table 9**Those Who Would Benefit More from the Social Security System (by Age) Compared with an Alternative Investment in 6-Month CDs**

Retirement age/years working	Earnings level			
	Low	Average	High	Maximum
62/40 years	81 or older	88 or older	93 or older	100 or older
65/43 years	81 or older	86 or older	89 or older	94 or older
70/48 years	83 or older	88 or older	91 or older	93 or older

NOTE: These beneficiaries are based on Figures 5 through 7 and the corresponding tables. See text for a description of earnings levels.

A similar analysis can be done for an investment in 6-month CDs (Table 9). The number of people in the U.S. that are 80 years old or older is 10,130,000, or 3.5 percent of the total U.S. population. Because certain age and income groups would benefit more from Social Security relative to 6-month CD investments if they lived long enough, 3.5 percent is an upper bound on the percentage of the U.S. population that would benefit more from Social Security relative to a retirement investment in 6-month CDs.

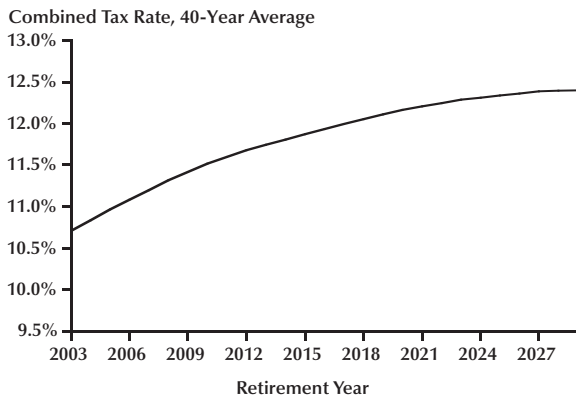
It is also interesting that the number of people who benefit overall from the current system will decrease in the future as the average annual tax rate increases and benefit calculations remain unchanged. Since those people retiring in 2003 have not always paid into the system at the current high rate of 12.4 percent, their average tax rate is only 10.7 percent, assuming 40 years of work. This average tax rate will increase in later years as

future retirees have fewer years paid in at lower tax rates and more years paid in at a higher rate (assuming 40 years of work). Figure 8 illustrates how future retirees will be paying a higher average tax rate over their working life, even if the current tax rate is unchanged. This will further reduce the number of people that benefit from the current Social Security system.

It can be argued that some individuals will not realize the importance of investing for retirement and, therefore, the government should provide a means of income for retirees. While this is an interesting argument, it is a debatable question that we are leaving for the politicians and voters. From our numerical analysis, we find that over 99 percent of the U.S. population would have earned a greater return by investing in the S&P 500, and over 95 percent would have earned a greater return by investing in 6-month CDs relative to the current Social Security system. Although a common criti-

Figure 8

Average Annual Combined Employee and Employer Social Security Tax Rate



NOTE: Average tax rate paid over 40 years of work assuming no payroll tax increase from the current rate of 12.4 percent.
SOURCE: www.ssa.gov/OACT/ProgData/taxRates.html.

cism of investing future retirement funds in the stock market is the risk of a significant downturn in the market at the time of retirement, our analysis considered the recent market downturn and all other downturns over the past 56 years. Despite these market fluctuations, a long-term investment in the S&P 500 for a 2003 retiree would have yielded a greater monthly income than is provided under the current Social Security system.²¹

THE FUTURE OF SOCIAL SECURITY

There is overwhelming evidence that the current Social Security system will become insolvent within the next several decades. As such, there is an extensive academic literature on the subject.²² Policymakers are becoming more aware of the problem, and numerous proposals to improve the solvency of Social Security have been raised.

²¹ For the years 2001, 2002, and 2003, the S&P 500 index had returns of -16.45 percent, -16.48 percent, and -3.20 percent, respectively.

²² See Geanakoplos, Mitchell, and Zeldes (1998a,b), Kotlikoff, Smetter, and Walliser (1999), Fuster (1999), and Cooley and Soares (1999).

These proposals consist of one or more of four basic elements: (i) increasing payroll taxes, (ii) decreasing benefits, (iii) using revenues from the general fund, and (iv) allowing individuals or the government to invest some or all of an individual's payroll tax in financial markets, which typically have a higher rate of return than Social Security.²³

Several proposals to reform Social Security are overviewed below, each containing one or more of the four elements described above²⁴:

- **Social Security Guarantee Plan.** This plan relies on revenues from the general fund to finance private accounts for individuals. These private accounts have a rate of return higher than that of government securities. The government's contribution to a private account would be equal to 2 percent of the individual's wage (up to the Social Security wage cap). An individual's total benefit (Social Security + market return) would be guaranteed to never fall below the Social Security defined benefit obtained without market investment. Payroll taxes would be reduced under this plan, and Social Security benefits would not be reduced.
- **Trust Fund Investment Plans.** Up to 15 percent of the Social Security trust fund would be invested in equities, and additional monies would be transferred from the general fund to the Social Security trust fund. Unlike the Social Security Guarantee Plan, which invests payroll taxes in private accounts, this plan directly invests a portion of the trust fund in equities. No change in payroll taxes would be required under this plan, but a reduction in Social Security benefits would occur.
- **Social Security Solvency Act of 1999.** This plan would initially cut payroll taxes by 2 percentage points and allow voluntary contributions in private accounts in the

²³ Numerous Social Security reform proposals are discussed in Lyon and Stell (2000), Pecchenino and Pollard (1998), Auerbach and Kotlikoff (1985), Feldstein (1975), Gramlich (1996), Diamond and Orszag (2003), and the Concord Coalition at www.concordcoalition.org/entitlements/ss_summaries.html, and the Social Security Reform Center at www.socialsecurityreform.org.

²⁴ See Lyon and Stell (2000) for a detailed discussion of each plan.

amount of 1 percent of wages (1 percent also matched by employer). Social Security benefits would be cut, and the payroll tax would be increased 3.3 percentage points in 2029.

- **Bipartisan Social Security Reform Plan.**

Two percentage points of the payroll tax would be transferred into private accounts. The reduction in payroll tax revenue would be replaced with monies from the general fund. No payroll tax changes would occur under this plan, and Social Security benefits would be reduced depending upon the return from private accounts.

Currently, no plan for Social Security reform has moved beyond the proposal stage because of the highly political nature of each of the reform elements. Certainly, current retirees and those individuals approaching retirement would not favor a cut in benefits. However, current workers would probably not favor an increase in payroll taxes. These workers, however, are likely to be more amenable to private investment accounts than current retirees. Different age cohorts will favor different alternatives. When (or if) a Social Security reform plan is passed, it is likely to be the one favored by the age cohort wielding the greatest political influence.

Given the political nature of Social Security reform, it is unlikely that any initial reform would allow individuals to invest all of their payroll tax contributions in private retirement accounts. Our findings suggest that an initial Social Security reform plan could include at least some investment in private retirement accounts. However, cost and subsequent coverage may be an obstacle in the transition toward private investment retirement accounts. Over time, if some or all of payroll tax revenue was diverted to private funds, the federal government would have to increase debt issuance, raise taxes, or reduce benefits to continue providing traditional Social Security for America's seniors. Higher payroll taxes may restore the solvency of the system, but large increases in this tax are likely to have distortionary effects on labor supply and productivity. Decreased benefits, too, may continue the solvency of Social Security, but this reduction could be detrimental to individuals

relying solely on Social Security as their means of income. Furthermore, transferring revenues from the general fund to the trust fund may require an increase in other taxes in order to maintain the size of the general fund. In short, the general equilibrium effects of any Social Security reform plan should be fully understood when evaluating any change to the system.

The three plans discussed earlier that provide for private investment accounts would have significant costs, as measured by transfers from the general fund or other nonpayroll sources for the period 2000-73: Social Security Guarantee Plan, \$41 trillion; Social Security Solvency Act, \$2 trillion; and the Bipartisan Plan, \$31 trillion. Although a move to private investments is costly, both the public and elected officials must decide whether the cost of doing nothing to the current Social Security system is more than the cost of fixing it.

As mentioned, another concern over private retirement accounts is volatility. Relative to Social Security, investment in private accounts will generate a higher return at the expense of greater volatility. The fear of many opponents of private retirement accounts is that a large drop in the stock market occurring months before an individual's planned retirement would significantly reduce their retirement income. However, our analysis considered the most recent market downturn, as well as all other downturns occurring in the past 56 years, and revealed that investment in private retirement accounts would have yielded a monthly retirement benefit greater than that received from the current Social Security system.

What the future Social Security system may look like is unclear, but it is clear that the future solvency of the current system is in jeopardy. Policymakers and the public are slowly realizing the impending crisis, and numerous plans to restore the solvency of Social Security or provide adequate benefits to retirees have been proposed. However, the highly political nature of Social Security means that final adoption of any proposal will be the result of a tough fight among competing political interest groups. Hopefully, this paper can provide a direction for discussion on Social Security reform through its analysis of rates of

Garrett and Rhine

return under Social Security versus private retirement accounts. While we are not advocating for one system over another, our evidence suggests that a great majority of current retirees would have had a higher retirement income under private accounts than they do now with the current Social Security system.

REFERENCES

- Auerbach, Alan J. and Kotlikoff, Laurence J. "Simulating Alternative Social Security Responses to the Demographic Transition." *National Tax Journal*, June 1985, 38(2), pp. 153-68.
- Board of Trustees, Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds. "The 2004 Annual Report of the Board of Trustees of the Federal Old-Age and Survivors Insurance and Disability Insurance Trust Funds." March 23, 2004. Available at www.socialsecurity.gov/OACT/TR/TR04/index.html.
- Boskin, Michael J. "Social Security and Retirement Decisions." *Economic Inquiry*, January 1977, 15(1), pp. 1-25.
- Boskin, Michael J. "Taxation, Saving, and the Rate of Interest." *Journal of Political Economy*, April 1978, 86(2, Part 2), pp. S3-27.
- Boskin, Michael J. and Hurd, Michael D. "The Effect of Social Security on Early Retirement." *Journal of Public Economics*, December 1978, 10(3), pp. 361-77.
- Campbell, Colin D. and Campbell, Rosemary G. "Conflicting Views on the Effect of Old-Age and Survivors Insurance on Retirement." *Economic Inquiry*, September 1976, 14(3), pp. 369-88.
- Cooley, Thomas F. and Soares, Jorge. "Privatizing Social Security." *Review of Economic Dynamics*, July 1999, 2(3), pp. 731-55.
- Diamond, Peter A. and Orszag, Peter R. *Saving Social Security*. Washington, DC: Brookings Institution Press, 2003.
- Feldstein, Martin. "Toward a Reform of Social Security." *Public Interest*, Summer 1975, No. 40, pp. 75-95.
- Feldstein, Martin; Poterba, James M. and Dicks-Mireaux, Louis. "The Effective Tax Rate and the Pretax Rate of Return." NBER Working Paper No. 740, National Bureau of Economic Research, September 1981.
- Fuster, Luisa. "Is Altruism Important for Understanding the Long-Run Effects of Social Security?" *Review of Economic Dynamics*, July 1999, 2(3), pp. 616-37.
- Geanakoplos, John; Mitchell, Olivia S. and Zeldes, Stephen P. "Would a Privatized Social Security System Really Pay a Higher Rate of Return?" NBER Working Paper No. 6713, National Bureau of Economic Research, August 1998a.
- Geanakoplos, John; Mitchell, Olivia S. and Zeldes, Stephen P. "Social Security Money's Worth." NBER Working Paper No. 6722, National Bureau of Economic Research, September 1998b.
- Gramlich, Edward M. "Different Approaches for Dealing with Social Security." *Journal of Economic Perspectives*, Summer 1996, 10(3), pp. 55-66.
- Kotlikoff, Laurence J.; Smetters, Kent and Walliser, Jan. "Privatizing Social Security in the United States—Comparing the Options." *Review of Economic Dynamics*, July 1999, 2(3), pp. 532-74.
- Lyon, Andrew B. and Stell, John L. "Analysis of Current Social Security Reform Proposals." *National Tax Journal*, September 2000, 53(3, Part 1), pp. 473-514.
- Pecchenino, Rowena A. and Pollard, Patricia S. "Reforming Social Security: A Welfare Analysis." Federal Reserve Bank of St. Louis *Review*, March/April 1998, 80(2), pp. 19-30.

Appendix Table A1

Low Earners

Year	Low earnings (45% of AWI)*	Tax rate (employer and employee)	6-Month CD rate of return	S&P 500 rate of return	Low contribution [†]	Low fund balance (6- month CD) [‡]	Low fund balance (S&P 500 account) [‡]
1956	\$1,590	4.00%	6.88%**	15.14%	\$64	\$68	\$73
1957	\$1,639	4.50%	6.88%**	-4.81%	\$74	\$151	\$140
1958	\$1,653	4.50%	6.88%**	4.19%	\$74	\$241	\$223
1959	\$1,735	5.00%	6.88%**	24.09%	\$87	\$351	\$385
1960	\$1,803	6.00%	6.88%**	-2.66%	\$108	\$490	\$480
1961	\$1,839	6.00%	6.88%**	18.66%	\$110	\$642	\$700
1962	\$1,931	6.25%	6.88%**	-5.87%	\$121	\$815	\$773
1963	\$1,978	7.25%	6.88%**	11.99%	\$143	\$1,025	\$1,026
1964	\$2,059	7.25%	3.82%	16.47%	\$149	\$1,219	\$1,369
1965	\$2,096	7.25%	4.43%	8.36%	\$152	\$1,432	\$1,648
1966	\$2,222	7.70%	5.63%	-3.30%	\$171	\$1,693	\$1,759
1967	\$2,346	7.80%	5.21%	7.83%	\$183	\$1,974	\$2,094
1968	\$2,507	7.60%	6.00%	7.36%	\$191	\$2,294	\$2,453
1969	\$2,652	8.40%	7.89%	-0.87%	\$223	\$2,716	\$2,652
1970	\$2,784	8.40%	7.66%	-14.94%	\$234	\$3,175	\$2,455
1971	\$2,924	9.20%	5.22%	18.11%	\$269	\$3,624	\$3,217
1972	\$3,210	9.20%	5.02%	11.10%	\$295	\$4,116	\$3,902
1973	\$3,411	9.70%	8.31%	-1.62%	\$331	\$4,816	\$4,164
1974	\$3,614	9.90%	9.98%	-22.88%	\$358	\$5,690	\$3,487
1975	\$3,884	9.90%	6.89%	4.00%	\$385	\$6,493	\$4,027
1976	\$4,152	9.90%	5.62%	18.40%	\$411	\$7,292	\$5,254
1977	\$4,401	9.90%	5.92%	-3.73%	\$436	\$8,185	\$5,478
1978	\$4,750	10.10%	8.61%	-2.23%	\$480	\$9,412	\$5,825
1979	\$5,166	10.16%	11.44%	7.29%	\$525	\$11,073	\$6,812
1980	\$5,631	10.16%	12.99%	15.30%	\$572	\$13,158	\$8,514
1981	\$6,198	10.70%	15.77%	7.80%	\$663	\$16,001	\$9,894
1982	\$6,539	10.80%	12.57%	-6.51%	\$706	\$18,808	\$9,910
1983	\$6,858	10.80%	9.27%	33.99%	\$741	\$21,361	\$14,272
1984	\$7,261	11.40%	10.68%	0.03%	\$828	\$24,558	\$15,104
1985	\$7,570	11.40%	8.25%	16.44%	\$863	\$27,517	\$18,592
1986	\$7,795	11.40%	6.51%	26.49%	\$889	\$30,254	\$24,642
1987	\$8,292	11.40%	7.00%	21.36%	\$945	\$33,382	\$31,053
1988	\$8,700	12.12%	7.90%	-7.34%	\$1,054	\$37,158	\$29,752
1989	\$9,045	12.12%	9.08%	21.48%	\$1,096	\$41,728	\$37,474
1990	\$9,463	12.40%	8.17%	3.63%	\$1,173	\$46,407	\$40,051
1991	\$9,815	12.40%	5.91%	12.44%	\$1,217	\$50,438	\$46,403
1992	\$10,321	12.40%	3.76%	10.50%	\$1,280	\$53,665	\$52,690
1993	\$10,410	12.40%	3.28%	8.58%	\$1,291	\$56,758	\$58,612
1994	\$10,689	12.40%	4.96%	1.98%	\$1,325	\$60,962	\$61,122
1995	\$11,118	12.40%	5.98%	17.66%	\$1,379	\$66,069	\$73,540
1996	\$11,661	12.40%	5.47%	23.85%	\$1,446	\$71,205	\$92,871
1997	\$12,342	12.40%	5.72%	30.10%	\$1,530	\$76,899	\$122,812
1998	\$12,988	12.40%	5.44%	24.25%	\$1,610	\$82,784	\$154,590
1999	\$13,711	12.40%	5.46%	22.30%	\$1,700	\$89,095	\$191,135
2000	\$14,470	12.40%	6.58%	7.59%	\$1,794	\$96,872	\$207,580
2001	\$14,815	12.40%	3.64%	-16.45%	\$1,837	\$102,303	\$174,971
2002	\$14,963	12.40%	1.81%	-16.48%	\$1,855	\$106,040	\$147,688
2003	\$15,329	12.40%	1.17%	-3.20%	\$1,901	\$109,201	\$144,796

Appendix Table A2

Average Earners

Year	Average earnings (AWI)*	Tax rate (employer and employee)	6-Month CD rate of return	S&P 500 rate of return	Average contribution†	Average fund balance (6-month CD)‡	Average fund balance (S&P 500 account)‡
1956	\$3,532	4.00%	6.88%**	15.14%	\$141	\$151	\$163
1957	\$3,642	4.50%	6.88%**	-4.81%	\$164	\$337	\$311
1958	\$3,674	4.50%	6.88%**	4.19%	\$165	\$536	\$496
1959	\$3,856	5.00%	6.88%**	24.09%	\$193	\$779	\$855
1960	\$4,007	6.00%	6.88%**	-2.66%	\$240	\$1,090	\$1,066
1961	\$4,087	6.00%	6.88%**	18.66%	\$245	\$1,427	\$1,556
1962	\$4,291	6.25%	6.88%**	-5.87%	\$268	\$1,812	\$1,717
1963	\$4,397	7.25%	6.88%**	11.99%	\$319	\$2,277	\$2,280
1964	\$4,576	7.25%	3.82%	16.47%	\$332	\$2,709	\$3,042
1965	\$4,659	7.25%	4.43%	8.36%	\$338	\$3,181	\$3,662
1966	\$4,938	7.70%	5.63%	-3.30%	\$380	\$3,762	\$3,909
1967	\$5,213	7.80%	5.21%	7.83%	\$407	\$4,386	\$4,653
1968	\$5,572	7.60%	6.00%	7.36%	\$423	\$5,098	\$5,450
1969	\$5,894	8.40%	7.89%	-0.87%	\$495	\$6,034	\$5,894
1970	\$6,186	8.40%	7.66%	-14.94%	\$520	\$7,056	\$5,455
1971	\$6,497	9.20%	5.22%	18.11%	\$598	\$8,053	\$7,149
1972	\$7,134	9.20%	5.02%	11.10%	\$656	\$9,146	\$8,672
1973	\$7,580	9.70%	8.31%	-1.62%	\$735	\$10,703	\$9,254
1974	\$8,031	9.90%	9.98%	-22.88%	\$795	\$12,645	\$7,750
1975	\$8,631	9.90%	6.89%	4.00%	\$854	\$14,429	\$8,948
1976	\$9,226	9.90%	5.62%	18.40%	\$913	\$16,205	\$11,676
1977	\$9,779	9.90%	5.92%	-3.73%	\$968	\$18,190	\$12,173
1978	\$10,556	10.10%	8.61%	-2.23%	\$1,066	\$20,915	\$12,944
1979	\$11,479	10.16%	11.44%	7.29%	\$1,166	\$24,607	\$15,138
1980	\$12,513	10.16%	12.99%	15.30%	\$1,271	\$29,240	\$18,921
1981	\$13,773	10.70%	15.77%	7.80%	\$1,474	\$35,559	\$21,986
1982	\$14,531	10.80%	12.57%	-6.51%	\$1,569	\$41,796	\$22,023
1983	\$15,239	10.80%	9.27%	33.99%	\$1,646	\$47,469	\$31,715
1984	\$16,135	11.40%	10.68%	0.03%	\$1,839	\$54,572	\$33,565
1985	\$16,823	11.40%	8.25%	16.44%	\$1,918	\$61,148	\$41,317
1986	\$17,322	11.40%	6.51%	26.49%	\$1,975	\$67,230	\$54,761
1987	\$18,427	11.40%	7.00%	21.36%	\$2,101	\$74,183	\$69,007
1988	\$19,334	12.12%	7.90%	-7.34%	\$2,343	\$82,573	\$66,116
1989	\$20,100	12.12%	9.08%	21.48%	\$2,436	\$92,729	\$83,275
1990	\$21,028	12.40%	8.17%	3.63%	\$2,607	\$103,126	\$89,003
1991	\$21,812	12.40%	5.91%	12.44%	\$2,705	\$112,085	\$103,119
1992	\$22,935	12.40%	3.76%	10.50%	\$2,844	\$119,256	\$117,090
1993	\$23,133	12.40%	3.28%	8.58%	\$2,868	\$126,130	\$130,248
1994	\$23,754	12.40%	4.96%	1.98%	\$2,945	\$135,472	\$135,826
1995	\$24,706	12.40%	5.98%	17.66%	\$3,064	\$146,821	\$163,422
1996	\$25,914	12.40%	5.47%	23.85%	\$3,213	\$158,234	\$206,381
1997	\$27,426	12.40%	5.72%	30.10%	\$3,401	\$170,887	\$272,916
1998	\$28,861	12.40%	5.44%	24.25%	\$3,579	\$183,964	\$343,533
1999	\$30,470	12.40%	5.46%	22.30%	\$3,778	\$197,988	\$424,745
2000	\$32,155	12.40%	6.58%	7.59%	\$3,987	\$215,272	\$461,289
2001	\$32,922	12.40%	3.64%	-16.45%	\$4,082	\$227,340	\$388,825
2002	\$33,252	12.40%	1.81%	-16.48%	\$4,123	\$235,644	\$328,197
2003	\$34,065	12.40%	1.17%	-3.20%	\$4,224	\$242,668	\$321,768

Appendix Table A3

High Earners

Year	High earnings (160% of AWI)*	Tax rate (employer and employee)	6-Month CD rate of return	S&P 500 rate of return	High contribution [†]	High fund balance (6-month CD) [‡]	High fund balance (S&P 500 account) [‡]
1956	\$5,652	4.00%	6.88%**	15.14%	\$168 ^{††}	\$180	\$193
1957	\$5,827	4.50%	6.88%**	-4.81%	\$189 ^{††}	\$394	\$364
1958	\$5,878	4.50%	6.88%**	4.19%	\$189 ^{††}	\$623	\$576
1959	\$6,169	5.00%	6.88%**	24.09%	\$240 ^{††}	\$922	\$1,013
1960	\$6,411	6.00%	6.88%**	-2.66%	\$288 ^{††}	\$1,294	\$1,266
1961	\$6,539	6.00%	6.88%**	18.66%	\$288 ^{††}	\$1,690	\$1,844
1962	\$6,866	6.25%	6.88%**	-5.87%	\$300 ^{††}	\$2,127	\$2,018
1963	\$7,035	7.25%	6.88%**	11.99%	\$348 ^{††}	\$2,646	\$2,650
1964	\$7,322	7.25%	3.82%	16.47%	\$348 ^{††}	\$3,108	\$3,492
1965	\$7,454	7.25%	4.43%	8.36%	\$348 ^{††}	\$3,609	\$4,161
1966	\$7,901	7.70%	5.63%	-3.30%	\$508 ^{††}	\$4,349	\$4,515
1967	\$8,342	7.80%	5.21%	7.83%	\$515 ^{††}	\$5,117	\$5,423
1968	\$8,915	7.60%	6.00%	7.36%	\$593 ^{††}	\$6,053	\$6,459
1969	\$9,430	8.40%	7.89%	-0.87%	\$655 ^{††}	\$7,237	\$7,052
1970	\$9,898	8.40%	7.66%	-14.94%	\$655 ^{††}	\$8,497	\$6,556
1971	\$10,395	9.20%	5.22%	18.11%	\$718 ^{††}	\$9,695	\$8,591
1972	\$11,414	9.20%	5.02%	11.10%	\$828 ^{††}	\$11,051	\$10,464
1973	\$12,128	9.70%	8.31%	-1.62%	\$1,048 ^{††}	\$13,104	\$11,325
1974	\$12,849	9.90%	9.98%	-22.88%	\$1,272	\$15,810	\$9,714
1975	\$13,809	9.90%	6.89%	4.00%	\$1,367	\$18,361	\$11,524
1976	\$14,762	9.90%	5.62%	18.40%	\$1,461	\$20,937	\$15,375
1977	\$15,647	9.90%	5.92%	-3.73%	\$1,549	\$23,817	\$16,293
1978	\$16,890	10.10%	8.61%	-2.23%	\$1,706	\$27,722	\$17,598
1979	\$18,367	10.16%	11.44%	7.29%	\$1,866	\$32,972	\$20,882
1980	\$20,022	10.16%	12.99%	15.30%	\$2,034	\$39,554	\$26,423
1981	\$22,037	10.70%	15.77%	7.80%	\$2,358	\$48,523	\$31,027
1982	\$23,250	10.80%	12.57%	-6.51%	\$2,511	\$57,450	\$31,356
1983	\$24,383	10.80%	9.27%	33.99%	\$2,633	\$65,653	\$45,544
1984	\$25,816	11.40%	10.68%	0.03%	\$2,943	\$75,920	\$48,502
1985	\$26,916	11.40%	8.25%	16.44%	\$3,068	\$85,501	\$60,050
1986	\$27,715	11.40%	6.51%	26.49%	\$3,159	\$94,430	\$79,956
1987	\$29,482	11.40%	7.00%	21.36%	\$3,361	\$104,634	\$101,114
1988	\$30,934	12.12%	7.90%	-7.34%	\$3,749	\$116,949	\$97,170
1989	\$32,159	12.12%	9.08%	21.48%	\$3,898	\$131,820	\$122,773
1990	\$33,645	12.40%	8.17%	3.63%	\$4,172	\$147,104	\$131,559
1991	\$34,899	12.40%	5.91%	12.44%	\$4,327	\$160,381	\$152,794
1992	\$36,697	12.40%	3.76%	10.50%	\$4,550	\$171,140	\$173,867
1993	\$37,012	12.40%	3.28%	8.58%	\$4,590	\$181,493	\$193,764
1994	\$38,006	12.40%	4.96%	1.98%	\$4,713	\$195,434	\$202,400
1995	\$39,529	12.40%	5.98%	17.66%	\$4,902	\$212,317	\$243,918
1996	\$41,462	12.40%	5.47%	23.85%	\$5,141	\$229,343	\$308,464
1997	\$43,882	12.40%	5.72%	30.10%	\$5,441	\$248,223	\$408,376
1998	\$46,178	12.40%	5.44%	24.25%	\$5,726	\$267,775	\$514,504
1999	\$48,752	12.40%	5.46%	22.30%	\$6,045	\$288,764	\$636,607
2000	\$51,448	12.40%	6.58%	7.59%	\$6,380	\$314,573	\$691,813
2001	\$52,675	12.40%	3.64%	-16.45%	\$6,532	\$332,796	\$583,478
2002	\$53,203	12.40%	1.81%	-16.48%	\$6,597	\$345,522	\$492,840
2003	\$54,504	12.40%	1.17%	-3.20%	\$6,758	\$356,394	\$483,589

Appendix Table A4

Maximum Earners

Year	Maximum earnings ^{##}	Tax rate (employer and employee)	6-Month CD rate of return	S&P 500 rate of return	Maximum contribution [†]	Maximum fund balance (6-month CD) [‡]	Maximum fund balance (S&P 500 account) [‡]
1956	\$4,200	4.00%	6.88%**	15.14%	\$168	\$180	\$193
1957	\$4,200	4.50%	6.88%**	-4.81%	\$189	\$394	\$364
1958	\$4,200	4.50%	6.88%**	4.19%	\$189	\$623	\$576
1959	\$4,800	5.00%	6.88%**	24.09%	\$240	\$922	\$1,013
1960	\$4,800	6.00%	6.88%**	-2.66%	\$288	\$1,294	\$1,266
1961	\$4,800	6.00%	6.88%**	18.66%	\$288	\$1,690	\$1,844
1962	\$4,800	6.25%	6.88%**	-5.87%	\$300	\$2,127	\$2,018
1963	\$4,800	7.25%	6.88%**	11.99%	\$348	\$2,646	\$2,650
1964	\$4,800	7.25%	3.82%	16.47%	\$348	\$3,108	\$3,492
1965	\$4,800	7.25%	4.43%	8.36%	\$348	\$3,609	\$4,161
1966	\$6,600	7.70%	5.63%	-3.30%	\$508	\$4,349	\$4,515
1967	\$6,600	7.80%	5.21%	7.83%	\$515	\$5,117	\$5,423
1968	\$7,800	7.60%	6.00%	7.36%	\$593	\$6,053	\$6,459
1969	\$7,800	8.40%	7.89%	-0.87%	\$655	\$7,237	\$7,052
1970	\$7,800	8.40%	7.66%	-14.94%	\$655	\$8,497	\$6,556
1971	\$7,800	9.20%	5.22%	18.11%	\$718	\$9,695	\$8,591
1972	\$9,000	9.20%	5.02%	11.10%	\$828	\$11,051	\$10,464
1973	\$10,800	9.70%	8.31%	-1.62%	\$1,048	\$13,104	\$11,325
1974	\$13,200	9.90%	9.98%	-22.88%	\$1,307	\$15,848	\$9,741
1975	\$14,100	9.90%	6.89%	4.00%	\$1,396	\$18,432	\$11,582
1976	\$15,300	9.90%	5.62%	18.40%	\$1,515	\$21,069	\$15,507
1977	\$16,500	9.90%	5.92%	-3.73%	\$1,634	\$24,046	\$16,501
1978	\$17,700	10.10%	8.61%	-2.23%	\$1,788	\$28,059	\$17,881
1979	\$22,900	10.16%	11.44%	7.29%	\$2,327	\$33,862	\$21,680
1980	\$25,900	10.16%	12.99%	15.30%	\$2,631	\$41,234	\$28,032
1981	\$29,700	10.70%	15.77%	7.80%	\$3,178	\$51,417	\$33,645
1982	\$32,400	10.80%	12.57%	-6.51%	\$3,499	\$61,820	\$34,728
1983	\$35,700	10.80%	9.27%	33.99%	\$3,856	\$71,765	\$51,700
1984	\$37,800	11.40%	10.68%	0.03%	\$4,309	\$84,195	\$56,026
1985	\$39,600	11.40%	8.25%	16.44%	\$4,514	\$96,025	\$70,495
1986	\$42,000	11.40%	6.51%	26.49%	\$4,788	\$107,373	\$95,229
1987	\$43,800	11.40%	7.00%	21.36%	\$4,993	\$120,229	\$121,629
1988	\$45,000	12.12%	7.90%	-7.34%	\$5,454	\$135,615	\$117,760
1989	\$48,000	12.12%	9.08%	21.48%	\$5,818	\$154,276	\$150,118
1990	\$51,300	12.40%	8.17%	3.63%	\$6,361	\$173,763	\$162,165
1991	\$53,400	12.40%	5.91%	12.44%	\$6,622	\$191,045	\$189,788
1992	\$55,500	12.40%	3.76%	10.50%	\$6,882	\$205,377	\$217,323
1993	\$57,600	12.40%	3.28%	8.58%	\$7,142	\$219,490	\$243,720
1994	\$60,600	12.40%	4.96%	1.98%	\$7,514	\$238,255	\$256,200
1995	\$61,200	12.40%	5.98%	17.66%	\$7,589	\$260,547	\$310,383
1996	\$62,700	12.40%	5.47%	23.85%	\$7,775	\$282,985	\$394,043
1997	\$65,400	12.40%	5.72%	30.10%	\$8,110	\$307,758	\$523,181
1998	\$68,400	12.40%	5.44%	24.25%	\$8,482	\$333,456	\$660,568
1999	\$72,600	12.40%	5.46%	22.30%	\$9,002	\$361,148	\$818,853
2000	\$76,200	12.40%	6.58%	7.59%	\$9,449	\$394,994	\$891,201
2001	\$80,400	12.40%	3.64%	-16.45%	\$9,970	\$419,708	\$752,942
2002	\$84,900	12.40%	1.81%	-16.48%	\$10,528	\$438,005	\$637,662
2003	\$87,000	12.40%	1.17%	-3.20%	\$10,788	\$454,033	\$627,670

NOTE: *Average wage (AWI) is the national average wage index for individuals.

†Contribution equals the earnings multiplied by the tax rate of the employee and employer.

‡Fund balance = (current year's contributions + previous year's fund balance) \times (1 + rate of return).

**Average 6-month CD rate (1964-2003).

††For the years prior to 1974, the high earnings are greater than the maximum earnings, so the contribution will be equal to the contribution for the maximum earnings.

‡‡Maximum earnings represents the maximum amount of wages subject to Social Security taxes.

SOURCE: AWI: www.ssa.gov/OACT/COLA/awiseries.html.

Social Security tax rates: www.ssa.gov/OACT/ProgData/taxRates.html.

S&P 500 rates of return: *Wall Street Journal*.

6-Month CD rates of return: Federal Reserve Board.

Maximum earnings: www.ssa.gov/OACT/COLA/cbb.html#Series.
