Southern Business Review

Volume 31 | Issue 2 Article 3

March 2006

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Proposals to allow individuals to establish "private accounts" with a portion of their Social Security withholding have generated intense debate. Whether such accounts are proposed as an alternative to, or an integral part of Social Security, the arguments for and against private accounts have been numerous and heated. One of the most prominent arguments against private accounts is that allowing individuals to invest a portion of their Social Security withholding in equity securities is "too risky."

Opponents of private accounts give examples of corporate abuses such as those that occurred at Enron and WorldCom, as evidence that equity investments are an unsuitable replacement for government-guaranteed benefits. Clearly, these cases represent extreme examples of equity investments gone bad; however, the issue of risk is an appropriate consideration for policymakers charged with ensuring the viability of the Social Security system. The purpose of this article is to address this single, specific issue: Does the risk associated with investing in common stocks make "private accounts" an unreasonable alternative to the current Social Security system?

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The general risk associated with investing in equities, the variability of annual returns, is well known and understood; however, the specifics of investment risk in connection with private Social Security accounts are not as apparent. One key issue in connection with this debate is selecting an appropriate time period over which to assess investment risk. A strong case can be made that the variability of *annual* returns is not an appropriate measure of the risk in private Social Security accounts. In a retirement planning setting, the critical issue is whether the amount of funds generated over an employee's period of active employment is likely to be greater under the current system or a system that allows private investment in equity securities. From this perspective, the annual variability of portfolio returns during the investment period is by no means the obvious measure.

Regardless of whether individuals are permitted to invest a portion of their Social Security taxes through private accounts, the most important policy issue is whether they will have adequate income upon retirement. The specifics of a Social Security system that allows private accounts have not yet been determined; however, it seems unlikely that such a system would permit participants to invest in individual stocks. Therefore, the findings presented in this article are based on the assumption that individuals choosing to direct a portion of their Social Security withholding to private accounts would be limited to investments in index funds, such as the S&P 500 index.

The remainder of this article relies on historical data to illustrate how the owners of private accounts might have fared since the beginning of the Social Security system in 1937.

The Study

This article addresses the issue of risk in private Social Security accounts by reviewing the historical performance of portfolios of equity securities over various time periods, beginning with the inception of Social Security in 1937. The balances that would have been accumulated by investing in diversified portfolios of stocks are then compared to those that would have resulted from investing in long-term government bonds over the same periods. Under the current system, most workers will qualify for full Social Security benefits between the ages 66 and 67, and reduced benefits at age 62. Thus, an assumed investment period of 40 years would be reasonable for most individuals beginning their working careers in their early twenties. This article reports results for investment periods of 20, 30 and 40 years.

The proxies for risk are drawn from the *Stocks, Bonds, Bills and Inflation Year Book* (SBBI) published annually by Ibbotson and Associates. SBBI reports annual rates of return for different types of portfolios of securities, including large stocks, small stocks, corporate bonds, intermediate-term government bonds, long-term government bonds, and treasury bills. The analyses in this article are limited to small company stocks (most perceived risk); large company stocks (S&P 500); and long-term government bonds (least perceived risk).

Data

Portfolio contributions for this study were based upon the maximum Social Security taxes that an individual might pay in a year. Table 1 presents the maximum taxable earnings subject to Social Security taxes, the applicable tax rates, and the subsequent taxes paid by an individual subject to the maximum tax for each year, for the years 1937 through 2005. Table 1 shows that both the maximum earnings subject to taxes and the Social Security tax rate were quite small in the early years; however, both have grown substantially in the 68 years since the program began. Therefore, the maximum amount of taxes (the value in the last column) has grown substantially, from $30 per year in 1937 to $5,580 in 2005. The overall annually compounded rate of increase in Social Security taxes has been approximately 8.0 percent, but growth in individual years have varied widely over the 68-year period. Table 2 and Figure 1 track the annual growth in the maximum social security taxes by year. Note that *these statistics include only the taxes that would have been paid by the individual wage earner*. The matching amount paid by employers is not considered in this study.

Obviously, annual contributions over a 20-year period are not all invested for 20 years. For example, under the 20-year investment period assumption, the 1937 contribution of $30 would be invested for 20 years. The 1938 contribution (also $30), however, would be invested for only 19 years, and the 1956 contribution of $84 for one year.

Table 3 shows the actual weighted average period of investment for 20-year, 30-year, and 40-year periods beginning in 1937 to date. The calculated value is the amount invested in each year multiplied by the length of that investment period, summed over the period and divided by the total amount of the investment over the period. For example, the 8.4 years for the 20-year investment for the initial investment beginning in 1937 is determined by multiplying the 1937 investment of $30 by the 20 years of investment, the 1938 investment of $30 by 19 years of investment ... and the 1956 investment of $84 by 1 year of investment and dividing the summed value by the $837 total investment over the 20-year period. The remaining table values were calculated using

Table 1
Maximum Taxable Earnings, Applicable Rates & Subsequent Taxes For Employees and Employers (Each) Old-Age Survivors & Disability Insurance (OASDI)

Year	Maximum Taxable Earnings (in dollars)	Tax Rate (Percent)	Annual Taxes (in dollars)	Year	Maximum Taxable Earnings (in dollars)	Tax Rate (Percent)	Annual Taxes (in dollars)
1937-49	3,000	1.000	30.00	1982	32,400	5.400	1,749.60
1950	3,000	1.500	45.00	1983	35,700	5.400	1,927.80
1951-53	3,600	1.500	54.00	1984	37,800	5.700	2,154.60
1954	3,600	2.000	72.00	1985	39,600	5.700	2,257.20
1955-56	4,200	2.000	84.00	1986	42,000	5.700	2,394.00
1957-58	4,200	2.250	94.50	1987	43,800	5.700	2,496.60
1959	4,800	2.500	120.00	1988	45,000	6.060	2,727.00
1960-61	4,800	3.000	144.00	1989	48,000	6.060	2,908.80
1962	4,800	3.125	150.00	1990	51,300	6.200	3,180.60
1963-65	4,800	3.625	174.00	1991	53,400	6.200	3,310.80
1966	6,600	3.850	254.10	1992	55,500	6.200	3,441.00
1967	6,600	3.900	257.40	1993	57,600	6.200	3,571.20
1968	7,800	3.800	296.40	1994	60,600	6.200	3,757.20
1969-70	7,800	4.200	327.60	1995	61,200	6.200	3,794.40
1971	7,800	4.600	358.80	1996	62,700	6.200	3,887.40
1972	9,000	4.600	414.00	1997	64,400	6.200	3,992.80
1973	10,800	4.850	523.80	1998	68,400	6.200	4,240.80
1974	13,200	4.950	653.40	1999	72,600	6.200	4,501.20
1975	14,100	4.950	697.95	2000	76,200	6.200	4,724.40
1976	15,300	4.950	757.35	2001	80,400	6.200	4984.80
1977	16,500	4.950	816.75	2002	84,900	6.200	5,263.80
1978	17,700	5.050	893.85	2003	87,000	6.200	5,394.00
1979	22,900	5.080	1,163.32	2004	87,900	6.200	5,449.80
1980	25,900	5.080	1,315.72	2005	90,000	6.200	5,580.00
1981	29,700	5.350	1,588.95				

Table 2
Growth Rate in Maximum Social Security Taxes

Year	Rate (%)	Year	Rate(%)
1937-49	0.00	1979	30.15
1950	50.00	1980	13.10
1951	20.00	1981	20.77
1952-53	0.00	1982	10.11
1954	33.33	1983	10.19
1955	16.67	1984	5.88
1956	0.00	1985	10.58
1957	12.50	1986	6.06
1958	0.00	1987	4.29
1959	26.98	1988	9.23
1960	20.00	1989	6.67
1961	0.00	1990	9.34
1962	4.17	1991	4.09
1963	16.00	1992	3.93
1964-65	0.00	1993	3.78
1966	46.03	1994	5.21
1967	1.30	1995	0.99
1968	15.15	1996	2.45
1969	10.53	1997	4.31
1970	0.00	1998	4.59
1971	9.52	1999	6.14
1972	15.38	2000	4.96
1973	26.52	2001	5.51
1974	24.74	2002	5.60
1975	6.82	2003	2.47
1976	8.51	2004	1.03
1977	7.84	2005	2.39
1978	9.44		

Figure 1
Growth Rates in Social Security Taxes

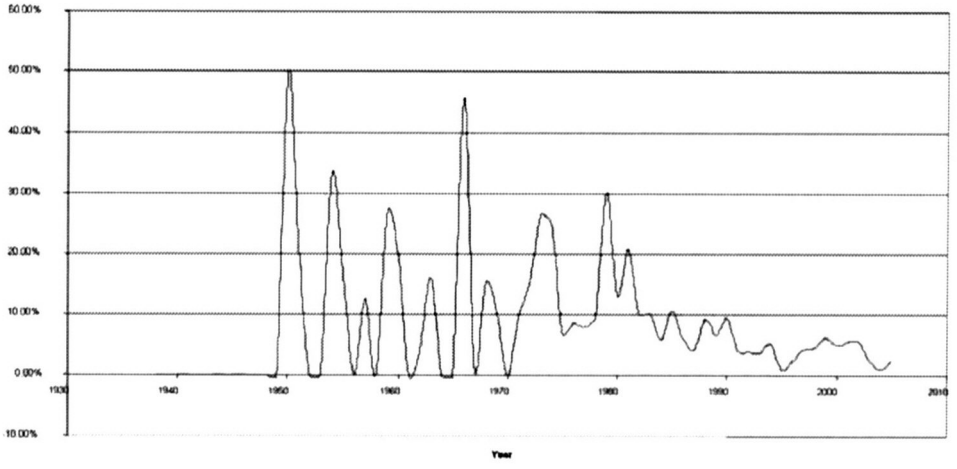

Table 3
Weighted Average Period of Investment

Initial Year	20-Years	30-Years	40-Years
1937	8.4	9.6	9.6
1942	8.3	9.0	8.8
1947	7.3	8.4	8.6
1952	7.4	8.1	9.2
1957	7.0	8.0	10.3
1962	6.7	8.6	11.5
1967	6.8	9.6	
1972	7.4	10.7	
1977	8.2		
1982	8.9		

Note that the average period of investment has been lengthening for the later investment periods. This is due to the fact that Social Security payments have been increasing at a *lower rate*. As long as the *rate of growth* in the maximum taxes declines, the average length of the investment will increase. If the rate of growth were zero, the 20-year weighted average time period would be 10.5, the 30-year weighted average time period would be 15.5, and the 40-year weighted average time period would be 20.5.

the same process with appropriate inputs. In the early years, the percentage increase in taxes was quite large because the base level of taxes was so low. As the system matured, the percentage increase in taxes decreased. This slowdown in the percentage increase in taxes results in longer average time periods invested in more recent years. Social Security investments in private accounts are likely to remain long-term investments.

Results

Tables 4, 5, and 6 report the accumulation results for 20-year, 30-year, and 40-year investment periods, respectively. Table 4 shows the amounts accumulated by investing the individual's portion of Social Security taxes in each of the three portfolios at the end forty-seven 20-year overlapping calendar periods beginning with investment of tax payments in 1937 and ending 20-years later. For example, the values $4,435, $3,520, and $991 for beginning-year 1937 were determined by investing the $30 in taxes paid by the individual in 1937 (from Table 1, last column) for 20 years, the $30 in taxes paid in 1938 for 19 years, etc., at the rates actually earned over the 20-year period for small stocks, large stocks, and long-term government bonds, respectively. Each subsequent-year set of values was determined in the same manner. Tables 5 and 6 show the corresponding amounts accumulated for the thirty-seven 30-year, and twenty-seven 40-year periods, respectively.

As expected, the amounts accumulated in the small stock portfolio were generally higher than those in the large stock portfolio and those in the large stock portfolio were higher than those in the long-term government bond portfolio. This result is consistent with the fact that investors view stocks as being more risky than bonds and, thus, require higher returns. Likewise, the long-term rates of return on smaller (riskier) stocks should be higher than those on larger (less risky) stocks, which, in turn, would be higher than returns on bonds.

Focusing on shorter time periods would undoubtedly reveal numerous occasions that differ from these expectations. If, however, the investment period is sufficiently long, the results should match with long-term averages. What may not be so apparent is what constitutes sufficiently long. The summary of exceptions presented in the next section offers some insight into the investment period necessary to achieve long-term expectations.

Exceptions

Italicized and ***bolded*** areas in Tables 4, 5, 6 & 7 indicate exceptions to the expected results. Table 7 summarizes the exceptions.

For the 20-year accumulations (Table 4), the amounts accumulated in large company portfolios were more than the small company accumulations in 10 of the 47 periods, specifically for periods beginning in 1942 through 1944, 1970, and 1976 through 1981. Even more interesting is the fact that accumulations in the long-term government bond portfolio exceed those in the large company stocks portfolio twice in the 47 periods, specifically the 1954-74 and 1982-2002 periods.

The differences, however, are relatively small. In the 20-year period beginning in 1954 and ending in 1974, the amounts accumulated in the long-term government bond and large stock portfolios were $5,346 and $5,012, respectively. The difference of $334 is 6.664 percent of the $5,012. For the beginning-year 1982 portfolios, the difference in amounts accumulated is only $229 ($187,593 verses $187,364) and only .122 percent of the amount accumulated in the large stock portfolio. For the 20-year investment period, the small stock portfolio outperformed the long-term government portfolio in every case.

The 30- and 40-year accumulation results are even more consistent with expectations. For the 30-year accumulations (Table 5), the

Table 4
20-Year Accumulations*
Employee Contributions Only

Beginning Year	Small Stock Portfolio (in dollars)	Large Stock Portfolio (in dollars)	Long-term Government Portfolio (in dollars)
1937	4,435	3,520	991
1938	6,396	4,688	973
1939	6,615	4,933	1,000
1940	5,607	4,651	1,228
1941	6,334	5,487	1,340
1942	***4,484***	***4,522***	***1,540***
1943	***4,682***	***5,108***	***1,664***
1944	***5,313***	***5,569***	***1,856***
1945	7,146	5,911	1,998
1946	6,468	5,112	2,209
. . .	. . .	. . .	. . .
1953	6,748	6,716	4,681
1954	***5,401***	***5,012***	***5,346***
1955	8,719	7,400	6,436
. . .	. . .	. . .	. . .
1969	109,943	90,410	61,718
1970	85,205	87,581	66,666
1971	122,028	114,946	81,251
1972	147,870	123,672	89,200
1973	174,052	135,913	106,737
1974	166,152	135,455	98,429
1975	192,852	177,666	129,341
1976	***202,019***	***210,242***	***126,851***
1977	***228,028***	***270,277***	***146,028***
1978	***195,359***	***329,899***	***163,172***
1979	***236,327***	***376,055***	***145,688***
1980	***212,300***	***317,535***	***171,686***
1981	***246,703***	***262,635***	***169,792***
1982	***200,112***	***187,364***	***187,593***
1983	304,947	223,270	181,039

* Beginning years 1947 through 1952 and 1956 through 1968 were omitted for space considerations. Omitted years show no unusual patterns.

Table 5
30-Year Accumulations*
Employee Contributions Only

Beginning Year	Small Stock Portfolio (in dollars)	Large Stock Portfolio (in dollars)	Long-term Government Portfolio (in dollars)
1937	40,434	14,362	2,661
1942	20,855	15,537	4,974
1947	28,772	14,385	10,010
1952	95,079	30,450	20,561
1957	130,208	72,266	51,300
1962	217,983	156,886	106,563
1967	460,381	392,337	190,265
1968	***419,853***	***499,443***	***216,209***
1969	***538,744***	***596,811***	***197,030***
1970	***507,126***	***532,657***	***239,634***
1971	603,692	461,588	248,603
1972	507,702	354,540	293,359
1973	788,572	451,933	296,896

*All unusual results are shown.

Table 6
40-Year Accumulations
Employee Contributions Only

Beginning Year	Small Stock Portfolio (in dollars)	Large Stock Portfolio (in dollars)	Long-term Government Portfolio (in dollars)
1937	77,932	25,911	10,795
1942	160,057	44,690	21,555
1947	194,076	95,546	53,950
1952	328,342	190,426	114,422
1953	385,940	208,605	138,785
1954	384,592	210,221	130,781
1955	503,288	288,385	176,303
1956	574,764	353,381	177,435
1957	684,957	468,689	208,851
1958	607,508	595,264	239,277
1959	769,478	715,012	220,309
1960	720,415	643,008	270,906
1961	850,982	559,249	283,430
1962	716,512	432,457	337,067
1963	1,110,902	552,947	344,526

Table 7
Exceptions to Expectations
Portfolio with Greater Accumulation

	Small Stock Portfolio	Large Stock Portfolio
20-Year Investment Period	37	10
30-Year Investment Period	34	3
40-Year Investment Period	27	0
	Small Stock Portfolio	**Long-term Government Portfolio**
20-Year Investment Period	47	0
30-Year Investment Period	37	0
40-Year Investment Period	27	0
	Large Stock Portfolio	**Long-term Government Portfolio**
20-Year Investment Period	45	2
30-Year Investment Period	37	0
40-Year Investment Period	27	0

amounts accumulated from investment in large company stocks were greater than the amounts accumulated in small company stocks in only three periods, those with investment beginning in 1968, 1969, and 1970. In no cases among the 30-year periods did the long-term government bond portfolio accumulate more than either the small stock or large stock portfolios. Among the 40-year periods (Table 6), no exceptions to the normal expectations occurred. Apparently, the 40-year investment period was sufficiently long enough in order for the higher long-term rates to dominate the variability in the rates.

Recall that the purpose of this article is to determine whether it is too risky to allow individuals to invest a portion of their Social Security taxes in private accounts. Regardless of the variability of the accumulated amounts, if one plan is better in *all* cases, then that plan has less risk than the alternative plan. In all cases for the 30-year and 40-year investment periods evaluated in this study, investing in diversified portfolios of equity securities provided larger balances than investing in a portfolio of long-term government securities. The fact that the variability in the amounts accumulated in the stock portfolios was greater demonstrates that the net advantage of investing in equity securities rather than long-term government securities was very large in some cases. The bottom line conclusion suggested by these findings is that, although there are undoubtedly valid objections to allowing investments in equity securities through private accounts, too much risk does not appear to be one of them.

Nature of the Amounts Accumulated

The primary purpose of this article is to evaluate the relative riskiness of investing Social Security taxes in equities securities. The results, however, also provide some insight (not proof) into the larger issue of using private accounts at all. The major question is, of course, whether the amounts accumulated in private accounts would be sufficient to generate retirement income comparable to that expected from Social Security. In other words, would the accumulations in private accounts (and the resulting retirement earnings) be sufficient to justify the individuals agreeing to give up government-guaranteed payments? Remember that the data generated for this study consider only the individual's portion of the Social Security

taxes. Employers' matching contributions have not been considered.

One way to evaluate this question is to estimate the amount of the monthly payment that the accumulated investment balances would generate. The monthly payment would depend on both the number of months of income the balance would need to support and the assumed rate at which the funds are invested. The Social Security Online Statistical Tables indicate that the life expectancy of a 66-year old male is 15.36 years (185 months), and that of a 66-year old female is 18.3 years (220 months). In order to be conservative, the estimates presented below are based upon a 5 percent annual rate of return.

For each $100,000 accumulated and invested at an annual rate of only 5 percent, a monthly payment of $773.23 for males and $692.27 for females can be generated for the expected life of the individual. Based upon the most current data in Table 6, males could expect a monthly payment of approximately $8,590, $4,276 and $2,664 if investments had been made in small company stocks, large company stocks, and government bonds, respectively. Currently, the maximum payment from Social Security is approximately $2,000 per month.

Based upon the amounts accumulated for the 40-year investment period (Table 6), it seems apparent that investing in equity securities would have been a superior alternative (for the most recent periods) to the guaranteed Social Security payments. This is so even though Social Security payments increase over time, and the annuity amounts would not; however, the monthly annuity amounts would likely be even larger because 5 percent is a conservative assumed investment rate.

For earlier periods the advantage would not have been as obviously superior because the annual amounts of Social Security taxes, and thus funds available for investment, in early years were so small. This is not likely to be an issue for future participants.

Conclusions

This article attempts to address the issue of the risk associated with allowing individuals to invest in equity securities in private accounts as an alternative to participating fully in Social Security. Actual tax payments made by those paying the maximum tax each year were used to determine the amounts those taxes would have provided had taxpayers been permitted to invest in three different portfolios rather than pay into Social Security. Monthly incomes from those accumulations were then computed based upon life expectancy and a 5 percent annual rate of interest. Results were generated using historical data and assuming individuals had been permitted to invest their Social Security taxes in portfolios of varying risk securities.

Although this article reports results for 20-year, 30-year, and 40-year periods of investment, the 40-year investment period most closely approximates the time period over which individuals will pay into the Social Security system in the future. In fact, as individuals live longer, the beginning age for receiving benefits may well be delayed beyond the current age of 67 for those born after 1959. Thus, the length of the investment is much more likely to increase than decrease.

The past does not always indicate the future; however, investors' risk aversion, combined with the majority perception that equity instruments are riskier than fixed income investments, suggest that equity securities should continue to generate higher average long-term returns than fixed income securities in the future. The size of this risk premium and the length of time necessary for higher rates to offset higher variability are less certain.

In spite of all of the uncertainties, findings reported in this article demonstrate that investments in "higher risk portfolios" would have accumulated

substantially more funds than investments in less risky portfolios, offsetting the "additional risk" in almost all cases considered. Moreover, lengthening the investment period (especially to the 40-year period that most taxpayers can expect to be paying into the system), increases the likelihood that investing in "riskier" equity securities would provide a far superior outcome. In conclusion, while the reasons to oppose private accounts as an alternative to the current social security system may be valid, the relative risk of investing in equity securities does not appear to be one of them.

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