

Stock Market Fluctuations and Retiree Incomes: An Update

by

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THE BROOKINGS INSTITUTION

SOCIAL SECURITY WAS CREATED in the middle of the Great Depression. The recent dive in stock prices and home values offers a painful reminder of why government-guaranteed pensions seemed like a good idea in the 1930s. President Franklin Roosevelt proposed creation of the Social Security program in 1935, a bit more than five years after the stock market crash of October 1929. The collapse of stock prices and the bankruptcy of thousands of farms, businesses, and banks wiped out the lifetime savings of millions of retirees and aging workers. Many industrial and trade union pension plans became insolvent, leaving former pensioners with no dependable source of income in old age. In view of the precariousness of private savings, it is not surprising that the President, Congress, and most American voters thought a public pension plan, backed by the taxing power of the federal government, was preferable to sole reliance on private retirement savings.

Today's Social Security system covers a much bigger fraction of the workforce and offers better income protection than the program established by President Roosevelt in the Great Depression. Like the original system, however, the current program provides workers with a dependable source of retirement income largely insulated against the risks of company bankruptcy and financial market turbulence. For Americans past age 65 Social Security accounts for about 40% of total income, though the share is even larger for the elderly in middle- and low-income families (see box).

Recent market gyrations give a vivid demonstration of the impact of lower asset prices on retirement incomes. Between October 2007 and the close of trading on October 24, 2008, stock market prices in the United States fell 43%. Newly retired workers who invested all their savings in the American stock market have seen the value of their nest

eggs fall more than 40%. In contrast, the purchasing power of their Social Security benefits has been unaffected by the stock market slump.

Social Security pensions are not totally secure, of course. If Congress does not raise the contribution rate or trim benefits in the next three decades, the reserves of the system will be depleted shortly after 2040. At that point Social Security pensions will have to be cut or contributions into the system increased. If all of the adjustment takes the form of a benefit cut, monthly pensions will have to be trimmed about 25% around the time the Social Security reserve fund is exhausted.

Social Security's long-run funding problem is one reason critics of the program argue for full or partial privatization of the program. As recently as 2005 President Bush urged Congress to adopt a reform plan that would have allowed workers to divert some of their Social Security contributions into private retirement accounts. The reform would have undermined Social Security funding over the next few decades because workers who opted into the new accounts would have sent smaller contributions to the existing system.

Individual account plans like the one proposed by President Bush differ from traditional Social Security in an important way. Each worker's private retirement benefit depends solely on the size of the worker's contributions and the success of the worker's investment strategy. Workers who make bigger contributions and earn better returns on their savings get larger pensions than workers who contribute less and earn lower returns. In contrast, workers' Social Security benefits depend on their average lifetime wages, their eligible dependents when they claim a pension, and the age at which a benefit is claimed. Workers who retire at the same age and with the same earnings records generally receive very similar benefits, regardless of the year in which they claim benefits or the ups and downs in financial markets.

A supposed advantage of individual retirement accounts is that they permit workers to earn a much better rate of return than they can obtain on their contributions to traditional Social Security. I have heard it claimed, for example, that workers will earn negative rates of return on their contributions to Social Security, while they can earn 7% or more on their contributions to a private retirement account. The comparison is incorrect and seriously misleading.¹ Most workers can expect to obtain positive real

returns on their contributions to Social Security. Over the next few decades only a few of them could obtain significantly higher returns if the system were partly or fully privatized.

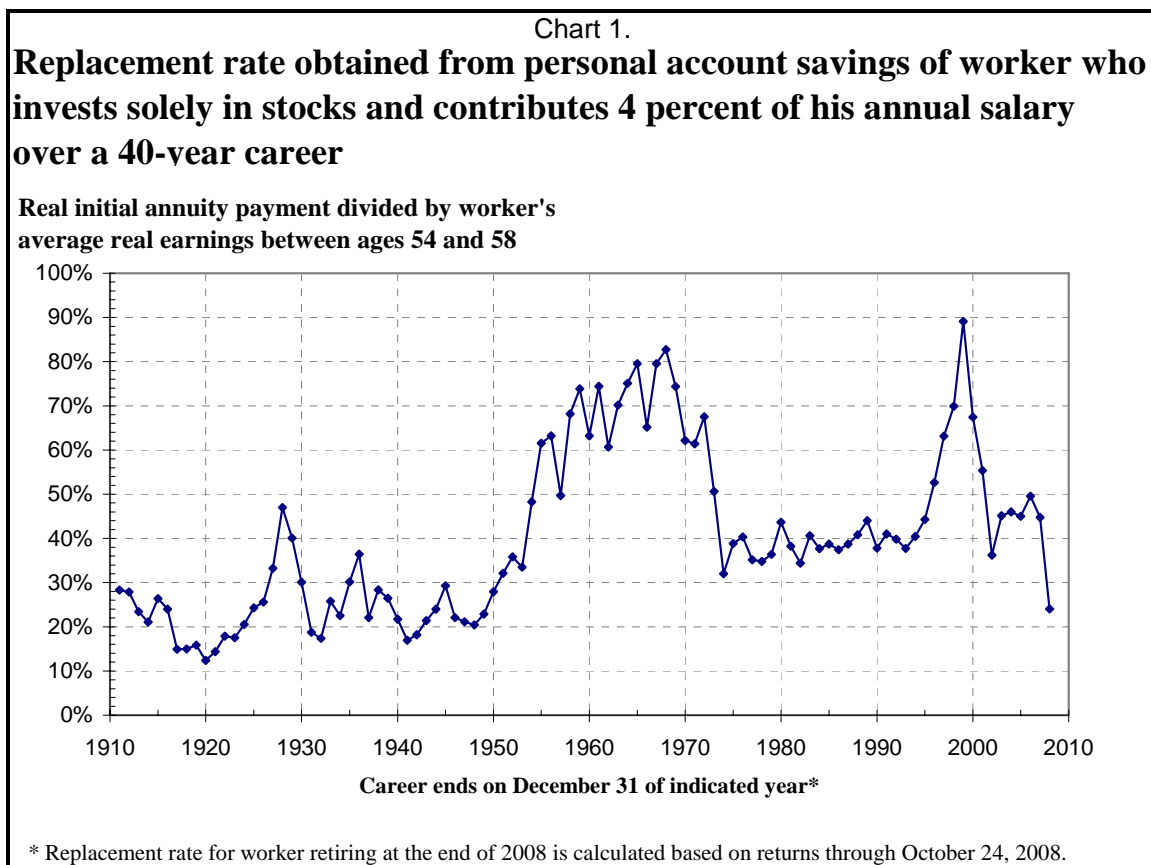
Investment risk

There is a more basic problem with individual retirement accounts, however, one highlighted by the recent market turmoil. It is hard to predict how much retirement income will be produced by a private savings plan. Advocates of individual accounts often overlook the investment risk inherent in private savings. All private investments are subject to risk. Their returns, measured in constant, inflation-adjusted dollars, are not guaranteed. Over long periods of time, investments in the U.S. stock market have outperformed other types of financial investments, including U.S. Treasury securities and corporate bonds. This explains why financial advisors recommend that young and middle-age workers invest most of their retirement savings in the stock market. But stock returns are highly variable from one year to the next. They are substantially more variable over short periods of time than are the returns on safer assets, like short-term Treasury securities.

Some people mistakenly believe the annual ups and downs in the stock market average out over time, assuring even the unluckiest investor a good return if she invests steadily over a full career. A moment's reflection shows that this cannot be true. From the end of October 2007 to October 24, 2008, the Standard and Poor's composite stock index fell 46% after adjusting for changes in the U.S. price level. Shares purchased before November 2007 lost almost half their value in less than 12 months. For a worker who planned on retiring at the end of 2008, the drop in stock market prices would require a drastic downsizing of consumption plans if the worker's sole source of retirement income is derived from stock investments.

I have made calculations of the pensions that workers could expect under an individual account plan using information about annual stock and bond returns, interest rates, and inflation dating back to 1872. I start with the assumption that workers enter the workforce at age 22 and work for 40 years until reaching their 62nd birthdays. I also assume they contribute 4% of their wages each year to their individual retirement accounts. Wages typically rise through workers' careers until they reach their early or

mid-50s, and then earnings begin to fall. When workers reach their 62nd birthdays I assume they use their retirement savings to purchase a single-life annuity. A standard measure of the value of an annuity is the replacement rate, which is simply the amount of the monthly annuity expressed as a percentage of the worker's final wage. Many financial planners suggest that workers should plan on replacing about 75% to 85% of their pre-retirement earnings in order to ensure a comfortable income in old age. (The details and assumptions behind my calculations are spelled out in a note at the end of this essay.²)



For a full explanation of the calculations, see Gary Burtless, "What Do We Know about the Risk of Individual Account Pensions? Evidence from Industrial Countries." *American Economic Review, Papers and Proceedings* (May 2003).

Chart 1 shows replacement rates for workers who invest all their retirement savings in stocks. I show replacement rates for workers retiring at the end of successive years from 1911 through 2008. (To calculate the pension value for someone retiring in 2008, I use information on stock prices, bond yields, and inflation available on October

24, 2008.) The hypothetical experiences of 98 workers are shown in the chart. The worker who entered the workforce in 1872 and retired at the end of 1911, for example, would have accumulated enough savings in his individual retirement account to buy an annuity that replaced 28% of his peak lifetime earnings (that is, his average earnings between ages 54 and 58). The worker who entered the workforce in 1967 and retired at the end of 2006 could have purchased an annuity that replaced 50% of his peak earnings. The highest replacement rate (89%) was obtained by a worker who entered the workforce at the start of 1960 and retired at the end of 1999. The lowest (12%) was obtained by a worker who began to work in 1881 and retired in 1920. Nine-tenths of the replacement rates shown in the chart fall in the range between 16% and 75%. The average replacement rate is 40%. For workers retiring after 1945 the replacement rate has averaged 49%.

The main lesson to be drawn from the chart is that individual retirement accounts invested solely in the stock market offer a very shaky cornerstone for retirement income. Workers fortunate enough to retire when stock prices are high obtain big pensions, while workers with the bad luck to retire after markets plunge can be left with little money to live on in retirement. The largest pension shown in the chart is more than 7 times bigger than the smallest one. Even in the years since 1960, the experiences of retiring workers have differed dramatically. The biggest pension was almost 4 times the size of the smallest one. In the six years from 1968 to 1974 the replacement rate fell 51 percentage points, plunging from 83% to 32% (see table below). In the six years from 1993 to 1999 it jumped 51 percentage points, rising from 38% to 89%. In the past 10 months the predicted replacement rate has dropped 21 percentage points, falling from 45% to 24%, or a little less than half of the average replacement rate of workers retiring after 1945.

Social Security pensions have been far more predictable and have varied within a much narrower range. For that reason, traditional Social Security provides a more predictable basis for retirement planning and a much more reliable foundation for basic retirement income.

Table. Replacement rates under alternative investment strategies for workers who retire at the end of selected years, 1968 - 2008

	Percent*		
	100% stock portfolio	50% stock / 50% bond portfolio	100% bond portfolio
1968	83	30	11
1974	32	18	11
1993	38	30	23
1999	89	50	25
2002	36	32	25
2007	45	34	23
2008	24	25	21

* The replacement rate is the worker's estimated real annuity payment divided by his average real earnings between ages 54 and 58.

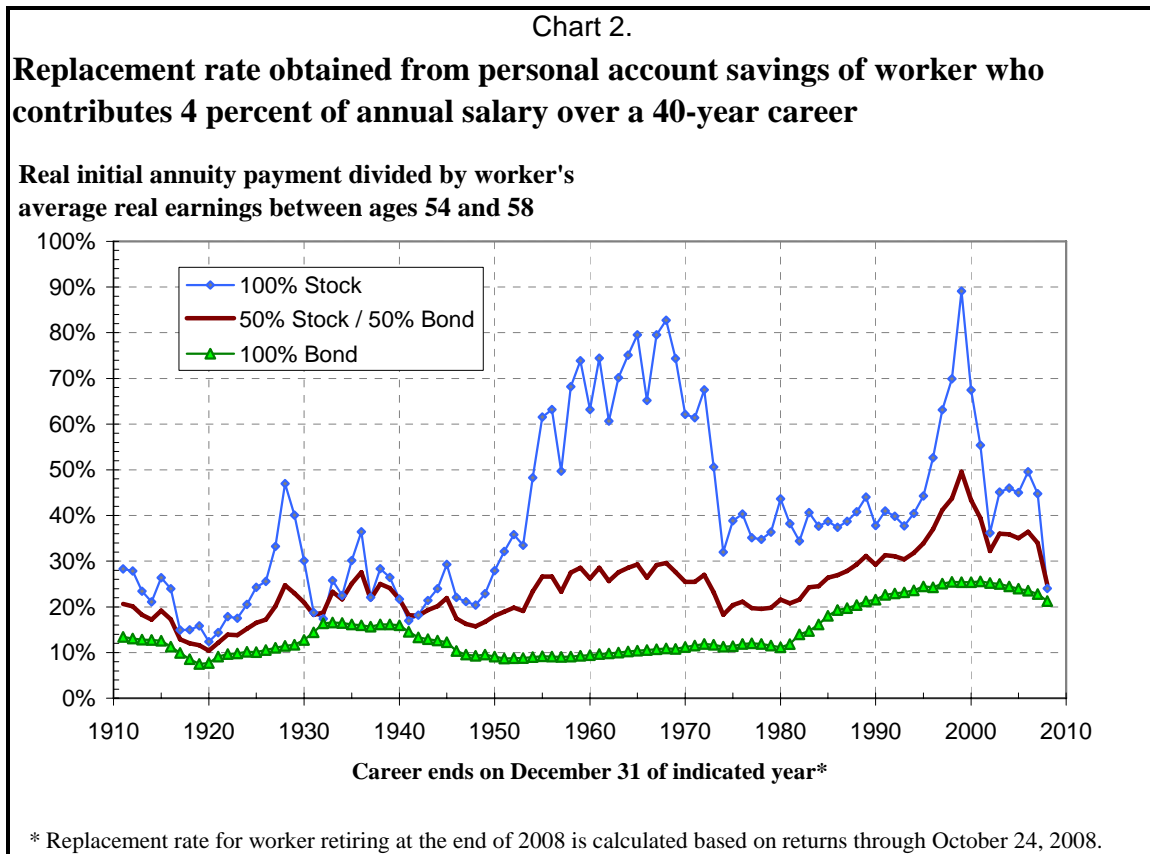
Source: Author's calculations based on stock and bond return data and inflation statistics for the period 1930-2008. Estimates of 2008 returns and inflation are based on data through October 24, 2008.

Alternative investment strategies

The calculations shown in Chart 1 refer to the experiences of workers who consistently invest 4% of their wages in U.S. equities. This investment strategy has on average yielded the best pension available to most U.S. workers. Workers who do not want to accept the risk associated with equity investment can put some or all of their savings in less risky assets, such as corporate or U.S. Treasury bonds. Chart 2 shows replacement rates when workers invest part or all of their retirement savings in U.S. government bonds. Under one of the alternative investment strategies, workers place one-half their savings in long-term government bonds and the other half in stocks. Under the less risky strategy, they invest all of their savings in government bonds.

As can be seen in the chart, workers who choose a less risky investment strategy will experience less variability in replacement rates. Between 1999 and 2002, workers who invested everything in stocks saw replacement rates fall 53 percentage points, while workers who invested half their savings in bonds saw replacement rates fall 18 percentage points and those who invested all their savings in bonds saw the replacement rate fall just 0.1 percentage point (see the table above). Of course, workers who opt for a

low-risk investment strategy will also receive a lower replacement rate on average than they would obtain if they invest all of their savings in equities. Whereas the average replacement rate under a 100%-stock investment strategy is 40%, the average under the 50%-stock / 50%-bond strategy is only 24%. Under the 100%-government-bond strategy, the average is just 14%. Chart 2 emphasizes the trade-off workers face between expected returns on retirement savings and the risk of their investment strategy. A worker's retirement income is more secure and less risky if he invests solely or mainly in very safe assets, but his retirement income is likely to be considerably lower. In many years, workers who adopted the low-risk investment strategy obtained a much lower rate of return on their individual account savings than they did on their Social Security contributions.



The uncertainty of individual account pensions is understated in the charts for two reasons. First, my calculations do not take account of the effects of inflation in years after a worker retires. In periods of low inflation, such as the 1950s and the late 1990s,

consumer prices edged up slowly. In other periods, such as the 1940s, the 1970s, and the early 1980s, inflation was high and erratic. Social Security benefits are adjusted upward to reflect changes in prices, sparing pensioners from the adverse effects of unexpected inflation. Workers with private pensions or annuities do not receive this kind of inflation protection. As a result, private pensioners experience big drops in the purchasing power of their annuities when prices rise unexpectedly.

Investor psychology poses a second kind of risk that is not reflected in the charts. All of the calculations are based on the assumption that workers follow a disciplined and consistent investment strategy throughout their careers. Research studies show that many of us are neither consistent nor disciplined in our portfolio choices. We over-invest in assets that have performed strongly in the recent past, and we sell assets after a persistent or sharp fall in prices. This tendency means that many of us tend to buy assets when their price is high and sell them after their price has declined. Workers who make this kind of investment error will earn lower returns than the returns shown in the charts. The risk that workers might choose a bad investment strategy does not arise in the current Social Security system. Social Security provides a minimally adequate pension for nearly all workers who make contributions over a full career, regardless of the worker's investment expertise.

The bottom line

Workers can improve their living standards in old age if they set aside part of their wages in a retirement plan. The question is, what kind of basic retirement plan offers the best guarantee that workers will receive a predictable and comfortable income when they retire? For most Americans, the cornerstone of retirement income is their Social Security pension. It replaces a predictable percentage of the wages they earn while working, and it is adjusted every year to protect retirees against the risk of inflation.

The debate over Social Security reform has focused on Social Security's funding problems and the supposed advantages of personal savings accounts in generating high rates of return. Often overlooked is the issue of financial market risk. The attractions of a personal saving account seem compelling when investment returns are consistently

high, as was the case in 1990s. However, the advantages of a government-guaranteed pension seem much more persuasive after asset prices tumble.

The Social Security program's only genuine financial crisis occurred in the early 1980s, when the Old-Age and Survivors Insurance Trust Fund was nearly depleted. Congress and the President had to agree on a plan to fix Social Security in order to keep benefits flowing. Few people at the time thought the system should be scrapped or downsized. Almost no one argued that it should be replaced with a system of private retirement accounts. The reason is simple. In 1983 both voters and policymakers were acutely aware that the value of stocks and bonds could fall—and fall sharply—without warning. Retirees and aged workers who relied solely on personal savings to fund their retirement could face a very bleak future. The numbers in Charts 1 and 2 show that after 1973 workers who invested their retirement savings in either stocks or bonds saw a dramatic fall in their expected retirement incomes compared with the incomes that were available to workers who retired before 1973.

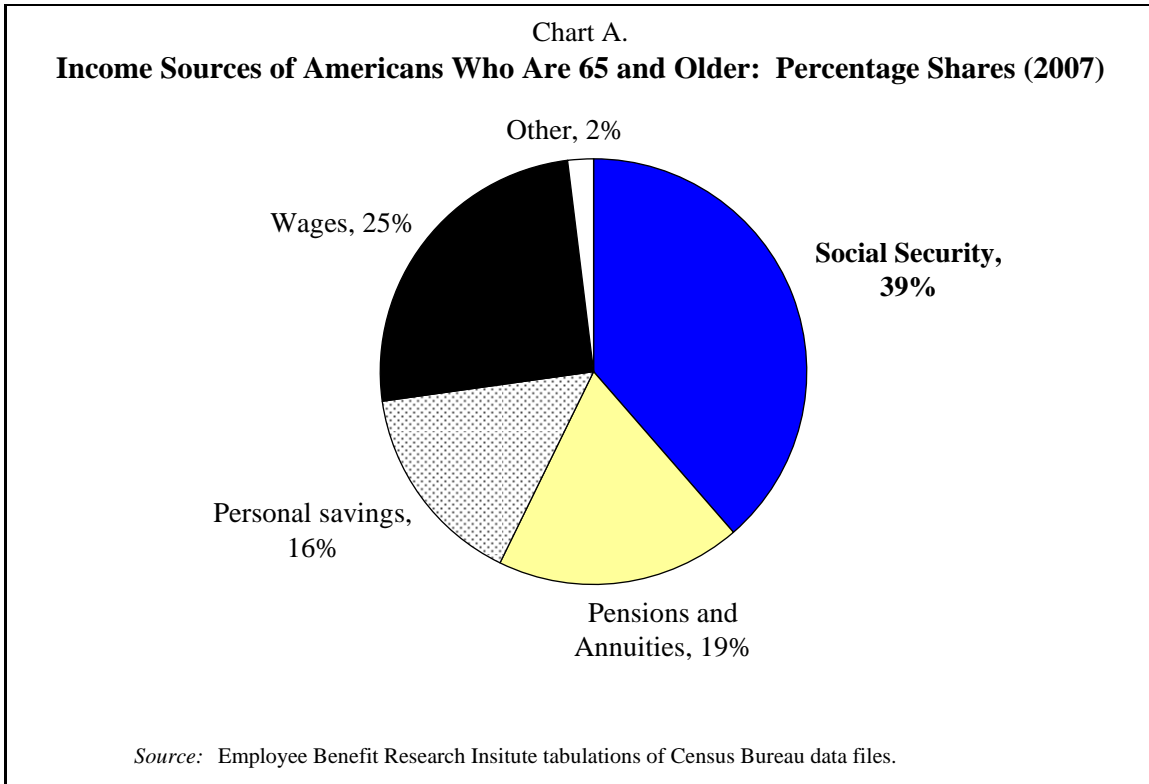
Few people in 1935 or 1983 suffered under the illusion that a private savings account offers a secure foundation for a comfortable retirement. Big selloffs in stock and bond markets had convinced most observers that Social Security was valuable and worth preserving. The recent market selloff may have the same salutary effect on popular opinion. Social Security's problems still need to be fixed. But it is hard to argue that the most sensible fix will involve scaling back Social Security's basic promises in order to make room for a bigger private savings system.

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Box: The income sources of Americans over 65

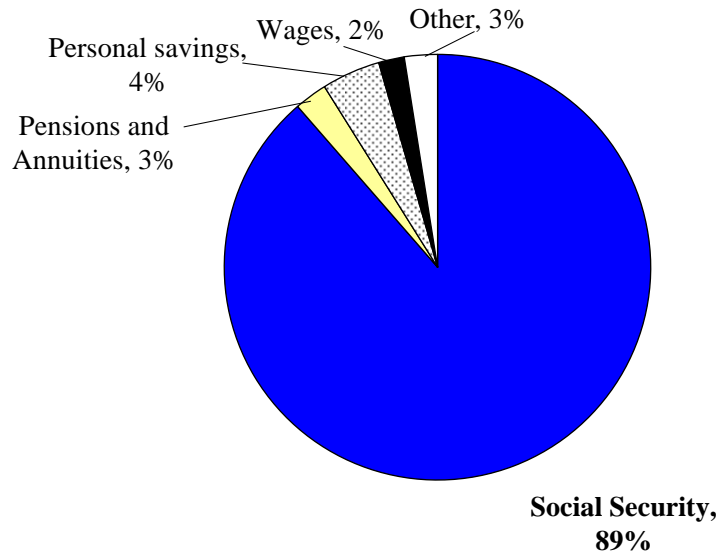
Income from Social Security is currently the most important source of income for America's aged population. In 2007 it accounted for 39% of the total income received by the elderly (see Chart A below). Income from pensions other than Social Security is the second most important source of income, accounting for almost one-fifth of the income of the aged. Interest and dividend income provides 16% of total income.



Social Security benefits are a much more important source of income for aged Americans with limited means (see Chart B). In the bottom one-fifth of the income distribution of the elderly, Social Security accounts for almost 90% of total household income. Pensions and income from private savings account for a total of 7% of their incomes.

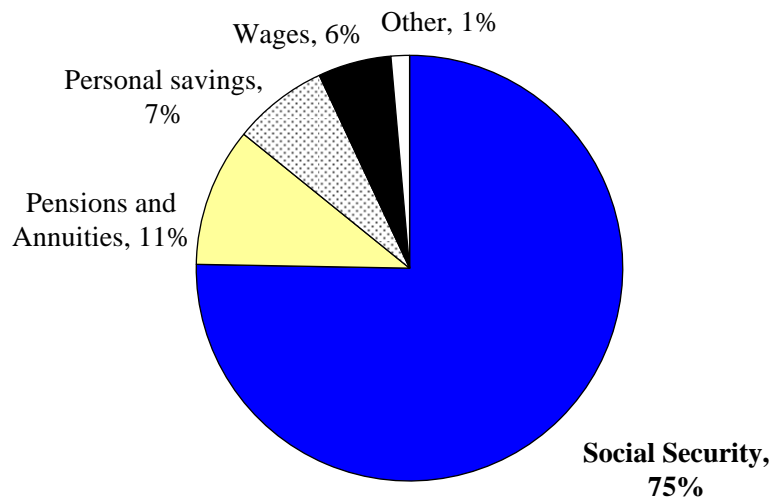
Even in the middle of the income distribution, however, Social Security benefits provide a large fraction of the incomes received by aged Americans (see Chart C). Three-quarters of the total income received by the aged in the middle one-fifth of the elderly income distribution comes from a Social Security check. About 18% is derived from an employer pension or personal savings.

Chart B.
Income Sources of Aged Americans in the Bottom One-fifth of the Income Distribution (2007)



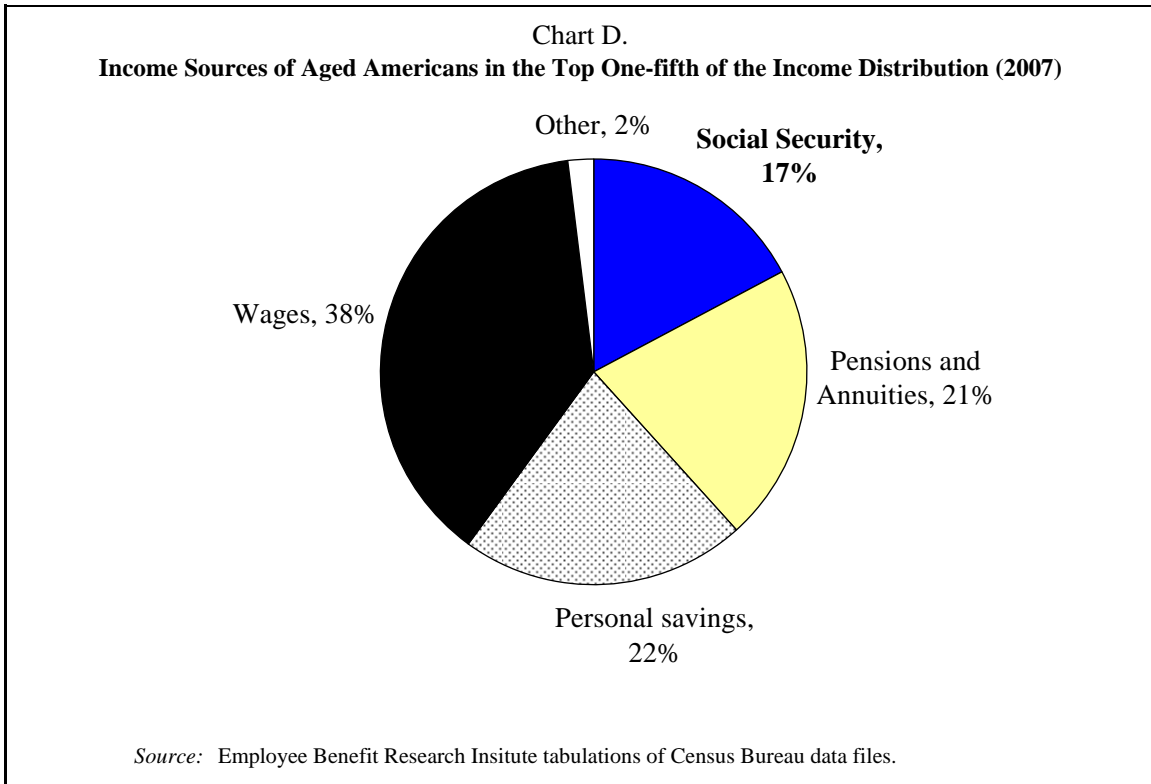
Source: Employee Benefit Research Institute tabulations of Census Bureau data files.

Chart C.
Income Sources of Aged Americans in the Middle One-fifth of the Income Distribution (2007)



Source: Employee Benefit Research Institute tabulations of Census Bureau data files.

In the top one-fifth of the income distribution, Social Security benefits are a much less important source of income for the aged (see Chart D). Only about one dollar in six comes from a Social Security check. More than 40% of their income is derived from an employer pension or from household investments in stocks, bonds, bank accounts, and real estate. Many high-income elderly are not yet retired, however. Almost four-tenths of the incomes of the high-income aged comes from wages and self-employment earnings. When the working elderly withdraw altogether from the labor force, a larger percentage of their incomes will come from Social Security. Indeed, Social Security is a more important source of income for the very old, who are very unlikely to work, than it is for the elderly who have just passed age 65.



End of box

NOTES

¹ There are two problems that make the comparison misleading. First, the claimed return on Social Security contributions is too low. Some contributors will earn negative returns on their Social Security contributions, but on average future returns are expected to be between 1% and 1½%, even if contributions must be raised or benefits reduced in order to eliminate the program's funding shortfall. Second, workers will not have an opportunity to earn the stock market rate of return on all of their retirement contributions, even if Congress established an individual account system. Workers' overall rate of return on their contributions to the retirement system will be an average of the return obtained on their contributions to individual accounts and the return earned on their contributions to whatever remains of the traditional Social Security system. For most people who are currently at work or who will join the workforce in the next three decades, the combined rate of return will be much closer to the current return on Social Security contributions than it is to 7%.

² I assume that the age profile of earnings in a given year matches the age profile of earnings for American men in 1995 as reported by the Census Bureau. In addition, I assume that average earnings in the economy as a whole grow 1½ % a year. While it would be interesting to see how workers' pensions would vary if we altered the percentage of contributions invested in exotic assets, in my calculations I assume that all contributions are invested in a combination of U.S. stocks and long-term U.S. government bonds. The total return calculation for stocks is based on the return for the Standard and Poor's composite stock index; the total return calculation for bonds reflects the return on U.S. government debt with a maturity of at least 10 years. Interest and dividend payments from the worker's investment portfolio are immediately reinvested, and the worker's portfolio is rebalanced at the end of every year to maintain a constant ratio of stock and bond investments. Optimistically, I assume that workers incur no expenses buying, selling, or holding stocks and bonds. When workers reach their 62nd birthdays they use their stock accumulations to purchase a single-life annuity for males. (Joint survivor annuities for a worker and a spouse would be about one-fifth lower than the ones shown in the charts.) To determine the annuity company's charge for the annuity, I use the Social Security Actuary's projected life table for males reaching age 65 in 1995. The annuity company is assumed to invest solely in long-term U.S. government bonds, so when it determines the price of an annuity it uses the current yield on long-term government bonds. I assume that the annuity company sells a fair annuity. It does not earn a profit, incur administrative or selling costs, or impose extra charges to protect itself against the risk of adverse selection in its customer pool. These assumptions are unrealistic. Annuity companies typically charge an amount that is between 10% and 15% of the selling price of annuities to cover these items. My assumptions therefore yield an overly optimistic estimate of the pension that each worker would receive. For a full explanation of the calculations, see Gary Burtless, "What Do We Know about the Risk of Individual Account Pensions? Evidence from Industrial Countries," *American Economic Review* (May 2003), pp. 354-59.