National Savings Rate Guidelines for Individuals

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Executive Summary

- This study creates savings guidelines for typical individuals with different ages, income levels, and initial accumulated wealth so the public can more easily determine how much to save for retirement. It also creates benchmarks for how much capital an individual would have accumulated based on their income and age, with the presumption that they started saving at age 35. Additionally, it shows targets for how much an individual should have accumulated at age 65, prior to retiring. The authors recommend that their findings be adopted as national savings guidelines.
- The study differs from previous savings studies in several important ways. Perhaps most key is that the savings guidelines and capital needs are calculated on retirement income as a percent of *net* pre-retirement income—gross income minus annual retirement savings in pre-retirement. The study also uses Monte Carlo simulations and Ibbotson Associates' forecasted returns to calculate capital required for retirement.
- The article calculates retirement cash flow using an 80 percent replacement ratio of pre-tax pre-retirement net income for a single person, along with other assumptions. As a comparison, it shows the difference in savings require for 60 and 80 percent replacement ratios without the pre-retirement net income approach. The study takes into account Social Security benefits, and shows that higher-income individuals need to save at substantially higher rates in order to offset the impact of Social Security benefits being skewed t lower-income individuals.
- The study shows the urgency of startin to save no later than age 35. It also sug gests that those whose income increas faster than inflation will have to save an increasing amount to "catch up" so as t be able to provide for the higher assumed standard of living in retiremen

In recent years there has been a significant shift in retirement practices in the United States from reliance on defined-benefit pension plans to self-directed defined-contribution plans such as 401(k) plans. Retirees increasingly must rely on cash flow from their own resources (including defined-contribution and IRA plans) to help pay for their retirement.

To achieve this, future retirees must acquire sufficient wealth to generate this cash flow. "Accumulation" is a function of both savings and investment performance. The market is variable and retirees cannot control their investment returns. Therefore, this paper focuses on savings, which is within their control.

Few workers appear to have the discipline to save adequately (Helman and Paladino 2004, Thaler and Bernatzi 2004). According to the 14th Retirement Confidence Survey in 2004, many American workers have saved some money for retirement, but many of them cite low levels of savings and investments, and 40 percent o workers say they are not *currently* saving for retirement (Helman and Paladino 2004). A large proportion of employees at

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firms that offer only defined-contribution plans contribute nothing, or little, or do not fund their 401(k) plans sufficiently to receive the full match that their employers provide.

There are a large number of variables involved in every unique retirement planning situation. This study does not attempt to address every variable, but provides general guidelines for individuals and planners. The study incorporates commonly accepted figures to simplify wherever possible. The study demonstrates that achieving sufficient retirement income is possible with reasonable savings rates. Not surprisingly, there is a premium on starting early. Those who do save early can save without a significant drop in lifestyle. A critical inflection point occurs at age 35 to 40. Those individuals starting their retirement savings after that age face the challenge of an increasingly higher savings rate needed to accumulate sufficient capital.

Other studies have developed savings guidelines. Thomas Walsh in 2003 used a deterministic method in which a single number (8 percent) was assumed for investment returns to estimate how much a person should save for retirement. In our study, we use a similar approach but improve on the methodology in two ways:

1. To calculate the savings rates, we calculate income needed in retirement based on retirement income as a percent of *net* pre-retirement income, which we define as gross income less the amount saved for retirement each year during pre-retirement. Basing retirement costs on pre-retirement net income rather than gross income, as done with other studies, significantly reduces the amount that must be saved.
2. For estimating the savings rate needed to build the capital to sustain retirement, we used Monte Carlo simulations and Ibbotson Associates' forecasted long-term capital market returns.

Like Walsh, we developed a general savings rate guideline for individuals with different ages, income levels, and initial capital saved.

The analysis was performed in three steps, explained in more detail below. We calculated

1. The annual cash flow needed in retirement
2. The capital needed to generate this lifetime retirement cash flow
3. The annual savings needed to build the capital that will provide the retirement cash flow

This improved methodology, along with the three-step analysis, results in savings guidelines that individuals of different ages, incomes, and accumulated wealth can easily apply in determining how much to save for an adequate retirement. Second, by taking into account the impact of Social Security benefits, the study reveals the need for higher-income workers to save at substantially higher rates. Third, the study illustrates the need for workers to periodically return to these guidelines in order to determine if their savings rates are sufficient to maintain a desired standard of living for retirement. Finally, the study reinforces the importance of starting to save early. The recommended savings rate for a person starting to save at age 25 typically more than doubles if they wait until age 45 to start saving, and triples if they wait until age 55 to start.

Retirement Cash Flow

We calculated retirement cash flow in three ways. First, we assumed retirement would be at age 65 and that retirement cash flow would be equal to 80 percent (replacement ratio) of pre-tax pre-retirement gross income at age 64. The age 65 retirement date is based on the popular use of that age in planning. The 80 percent is based on the AON Consulting/Georgia State University 2004 Retirement Income Replacement Ratio Study. (The study reported very low savings rates in estimating the 80 percent replacement ratio.) Individuals desiring different replacement ratios will need to adjust their savings up or down to meet their objectives. It should be noted that nothing has been included in these numbers for late-in-life medical costs.

We assumed post-retirement cash-flow needs would increase with inflation (2.5 percent as assumed by Ibbotson Associates, December 2005). To determine pre-retirement income we assumed individual income would grow at the rate of inflation (2.5 percent) from current age to retirement age.

In our second scenario, we repeated the above analysis using a 60 percent replacement ratio. There are many individuals who will not need the full 80 percent replacement of income in retirement, either because they plan to reduce their standard of living more in retirement or they have expenses that will disappear or reduce dramatically in retirement (for example, mortgage paid off, college expenses completed, and savings programs funded).

Third, we used a more sophisticated approach by using the retirement ratio of 80 percent based on *pre-retirement net income as defined as gross income less retirement savings*. We used net income because someone who saves for retirement has reduced their pre-retirement living expenses and, for most, it typically follows that they also reduce their post-retirement expenses. For individuals who are saving a lot, this can be significant. Lower retirement expenses means less needed capital. You could say the more one saves, the less one needs to save. The mathematics for calculating this can be relatively complicated. Appendix A explains how these calculations were done.

Using net income is a realistic approach for both retirees and planners. Workers can make small adjustments to current lifestyle (spending) in order to continue that adjusted lifestyle (income) in retirement, thus avoiding radical changes in their lifestyle. Using gross income as the retirement income target forces an individual to save more and to make a more radical reduction in current lifestyle, resulting in excess capital that can generate an increase in lifestyle upon retirement. In short, the amount saved could theoretically be too much and provide a higher standard of

Table 1: Savings Rate for Different Income Levels with 80% or 60% Replacement of Gross Income and No Past Savings

Age	Income	Savings Rate for 80% Income Replacement	Savings Rate for 60% Income Replacement
25	$20,000	6.8%	1.4%
25	$40,000	10.0%	4.6%
25	$60,000	12.0%	6.4%
25	$80,000	13.8%	8.0%
30	$20,000	8.8%	2.0%
30	$40,000	12.8%	5.8%
30	$60,000	15.6%	8.4%
30	$80,000	17.2%	10.4%
35	$20,000	11.4%	2.4%
35	$40,000	16.4%	7.4%
35	$60,000	19.6%	10.6%
35	$80,000	22.0%	13.2%
35	$100,000	23.8%	14.8%
40	$20,000	14.8%	3.2%
40	$40,000	21.6%	9.8%
40	$60,000	25.8%	14.2%
40	$80,000	29.0%	17.4%
40	$100,000	31.0%	19.8%
45	$20,000	20.0%	4.2%
45	$40,000	29.4%	13.4%
45	$60,000	35.0%	19.4%
45	$80,000	39.4%	23.6%
45	$100,000	42.8%	26.8%
45	$120,000	46.2%	30.2%
50	$20,000	28.8%	6.0%
50	$40,000	42.4%	19.0%
50	$60,000	50.0%	27.2%
50	$80,000	56.8%	33.4%
50	$100,000	61.0%	39.0%
50	$120,000	66.6%	43.8%
55	$20,000	45.6%	9.6%
55	$40,000	66.6%	30.2%
55	$60,000	79.8%	43.8%
55	$80,000	89.6%	53.2%
55	$100,000	97.0%	62.0%
55	$120,000	105.6%	70.0%
60	$20,000	94.6%	19.6%
60	$40,000	138.2%	62.4%
60	$60,000	>150%	89.8%
60	$80,000	>150%	111.2%
60	$100,000	>150%	130.2%
60	$120,000	>150%	146.0%

living in retirement than while working. Table 1 shows the savings rates for the first two scenarios. Table 2 (p. 54) shows the third scenario. The national savings guidelines that we suggest adopting are based on Table 2 and base the replacement ratio on net income. These two tables will be discussed later under "Results."

Capital Needed to Generate Retirement Cash Flow

We assumed retirement cash flow would come from both Social Security and distributions from personal capital.

The Social Security benefits are based, with some simplifications, on program code that the Social Security Administration posts on its Web site (http://www.socialsecurity.gov/OACT/ANYPIA/anypia.html). One of the simplifications was to assume full Social Security benefits were available at age 65 instead of age 67 to match the commonly accepted retirement age. But individuals should strongly consider delaying taking Social Security until they receive the full benefit. At each income level, the corresponding Social Security benefits are assumed to increase at the same rate of inflation as the income level.

To estimate the capital needed to provide the cash flow not covered by Social Security, we assumed the capital would be invested in inflation-indexed lifetime fixed-payout annuities and calculated how much to buy to provide the desired cash flow. These create inflation-adjusted lifetime income, regardless of how long the retiree lives. The amount purchased is that which will provide the needed annual retirement cash flow from step 1. We used the industry averages for the fees and expenses, estimated as 0.8 percent. The total required amount for retirement is calculated as the discounted value of expected annuities for the entire retired life weighted by surviving probabilities with a discount rate of 4 percent. Annual annuity payment is set to provide the retirement goal, 80 percent of final salary net of savings.

Retirement income is needed for one's life, and the length of a person's life is subject to uncertainty. Therefore, we used a probabilistic mortality rate model to address the uncertainty. The savings rate guideline in this study is for an individual person, and we calculate this individual's mortality rate as the average of male and female mortality rates. Mortality rates are from the Society of Actuaries' 2000 mortality rate table. From this table, for example, an individual at age 64 will have a 0.81 percent probability of dying in the next year.

The capital needed to fund retirement at age 65 at various income levels is shown in Table 3 (p. 54). For example, if a person is at age 65 and just retired with a final salary of $100,000, his or her expected inflation-adjusted annual retirement income is $65,920 to provide the same lifestyle as their pre-retirement. Estimated Social Security benefits are $27,343 and the balance of $38,577 is distributed from savings. The last row in Table 3 is also the amount needed to buy the inflation-indexed lifetime fixed-payout annuities mentioned earlier.

Our calculations are for a single individual. The savings rate we have calculated will be different, however, for a couple because the couple has a longer joint life expectancy than a single individual and the retirement income for a couple must last longer than for a single person. This is somewhat offset by the positive effect of spousal Social Security benefits, which decreases the need for accumulated capital. We suspect the spousal benefit more than offsets the costs of longer life expectancy but this will require additional research to verify.

Savings Required to Build Capital to Provide Retirement Cash Flow

Building capital consists of two components: savings and investment returns. The analysis solved for the savings rate. To estimate investment returns, the study used a Monte Carlo simulation (see the sidebar, "Why Use Monte Carlo Simulations?"). This approximates the uncertainty experienced by investors and therefore their chance of achieving their desired retirement outcome.