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HOW MUCH SHOULD PEOPLE SAVE?

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Introduction

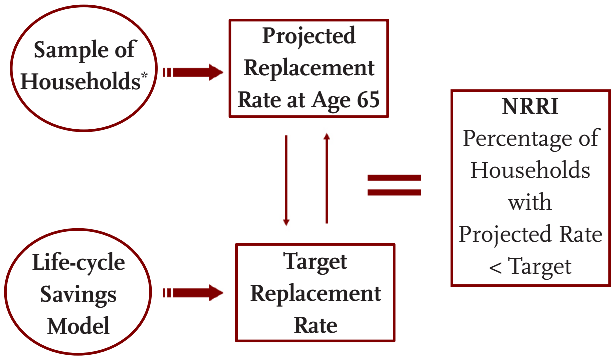
The National Retirement Risk Index (NRRI) shows that half of today's working families are "at risk" of not being able to maintain their standard of living once they retire. This result is not surprising given that half of private sector workers do not have an employer–sponsored retirement plan and that many who do have a plan save relatively little. The question is how much households would have to save in order to maintain their pre-retirement living standards. This analysis employs the NRRI infrastructure in a slightly different way to answer this question in three steps. What is the average amount of saving that will come from retirement savings plans? What is the average required saving rate to produce adequate retirement income? Given current saving patterns, how much more would households have to save?

The discussion proceeds as follows. The first section recaps the nuts and bolts of the NRRI and describes the target calculations that serve as the basis for this analysis. The second section describes the methodology for answering each of the three questions. The third section discusses the benefits of starting to save early and retiring late. The final section concludes that a saving rate of about 15 percent of income would be sufficient to achieve retirement income targets. Among those households currently falling short, attaining the necessary saving rate is a much more feasible goal for younger households than for older households.

Nuts and Bolts of the NRRI

Constructing the NRRI involves three steps: 1) projecting a replacement rate – retirement income as a share of pre-retirement income – for each member of a nationally representative sample of U.S. households; 2) constructing a target replacement rate that would allow each household to maintain its pre-retirement standard of living in retirement; and 3) comparing the projected and target replacement rates to find the percentage of households at risk. Although the analysis in this *brief* relies on the model used to generate the targets, it is useful to recap how the target model fits into the NRRI structure (see Figure 1).

Figure 1. Overview of the NRRI


Sample of Households*
Projected Replacement Rate at Age 65
NRRI
Percentage of Households with Projected Rate < Target
Life-cycle Savings Model
Target Replacement Rate

* The sample is from the U.S. Board of Governors of the Federal Reserve System's 2010 *Survey of Consumer Finances*.
Source: Authors' illustration.

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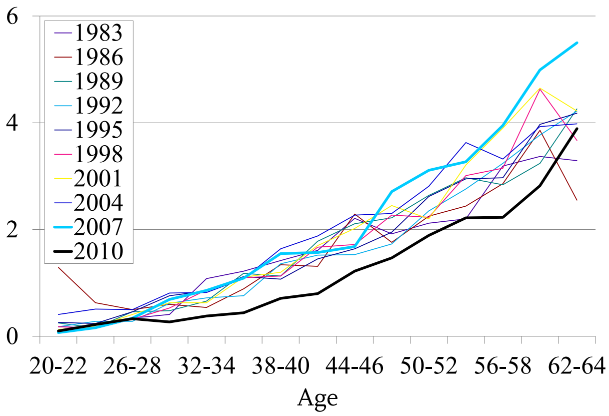
Projecting Household Replacement Rates

The exercise starts with projecting how much retirement income each of today's working households will have at age 65. Retirement income is defined broadly to include all of the usual suspects plus housing.[1] Retirement income from financial assets and housing is derived by projecting assets that households will hold at retirement, based on the stable relationship between wealth-to-income ratios and age evident in the Federal Reserve's *Survey of Consumer Finances* (SCF) during the 1983-2010 period (see Figure 2).[2] In the case of housing, the projections are used to calculate two distinct sources of income: the rental value that homeowners receive from living in their home rent free – "imputed rent" – and the amount of equity they could borrow from their housing wealth through a reverse mortgage.[3] Sources of retirement income that are not derived from SCF reported wealth – namely, income from defined benefit pensions and Social Security – are estimated directly. Once estimated, the components are added together to get total projected retirement income at age 65.

Figure 2. Ratio of Wealth to Income from the Surveys of Consumer Finances, 1983-2010



Source: Authors' calculations based on U.S. Board of Governors of the Federal Reserve System, *Survey of Consumer Finances* (SCF), 1983-2010.

To calculate projected replacement rates, we also need income prior to retirement. Earnings are calculated by creating a wage-indexed earnings history and averaging each individual's annual indexed wages over his lifetime. Other items that comprise pre-retirement income include the return on 401(k) plans, other financial assets, and imputed rent from housing.[4] Average lifetime income then serves as the denominator for each household's replacement rate.

Estimating Target Replacement Rates

To determine the share of households that will be at risk requires comparing projected replacement rates with target replacement rates. The NRRI target assumes that the household's goal is to accumulate sufficient wealth to generate a level of post-retirement consumption that equals consumption immediately before retirement. The household achieves this goal by choosing an age-varying saving rate. The target replacement rate is the ratio of post-retirement income to pre-retirement income associated with the optimal saving strategy. Pre-retirement income equals labor market earnings, imputed rent, and investment returns, minus mortgage and loan interest paid, all averaged over ages 20-65.[5] Post-retirement income equals income from Social Security, employer pensions, and an inflation-indexed annuity, plus imputed rent. The household is assumed to purchase an inflation-indexed annuity with its financial assets plus the proceeds of a reverse mortgage. The calculations include federal, state (Massachusetts), and Social Security taxes, including the Earned Income Tax Credit and the favorable tax treatment accorded to income from Social Security.[6]

Targets are calculated for 48 types of households – those in the bottom, middle, and top tercile of the income distribution who are single men, single women, or one- or two-earner couples, with or without defined benefit pensions, and who are homeowners or renters. Weighted averages are calculated to yield targets for three income terciles for single men, single women, and one- and two-earner couples. Overall the replacement rates that emerge from the target model are consistent with those from other approaches (see Table 1).[7]

Table 1. NRRI Target Replacement Rates

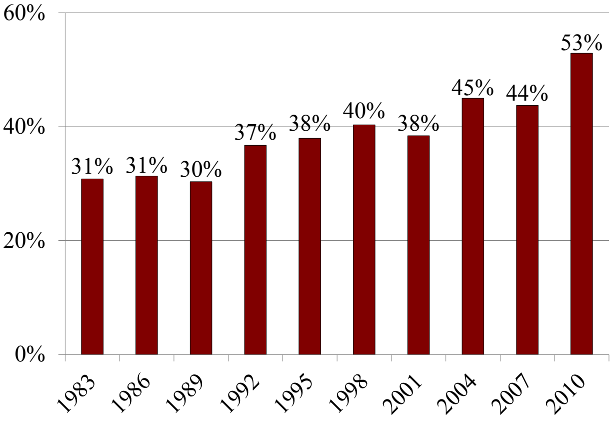
Income group	Target replacement rate
All	73%
Low income	80
Middle income	71
High income	67

Source: Authors' calculations.

Calculating the Index

The final step in creating the NRRI is to compare each household's projected replacement rate with its target. Households whose projected replacement rates fall more than 10 percent below their targets are deemed to be at risk of having insufficient income to maintain their pre-retirement standard of living. The NRRI is simply the percentage of *all* households that fall more than 10 percent short of their target. Figure 3 shows the Index from 1983 to 2010. The NRRI will be updated in early 2015 with the release of data from the Federal Reserve's 2013 SCF.

Figure 3. The National Retirement Risk Index, 1983-2010



Source: Munnell, Webb, and Golub-Sass (2012).

Using the Target Model to Calculate Needed Saving Rates

The target model can be queried to answer the questions about required saving through employer plans. Employer plans include both traditional defined benefit plans and defined contribution – primarily 401(k) – plans.[8] Private sector defined benefit plans generally do not require any direct employee contributions; however, these benefits – just like employer contributions to a 401(k) – are not "free" in that they are part of a worker's total compensation and a form of workers' retirement saving. In the following analysis, saving in defined benefit plans is calculated based on reported defined benefit income and is combined with saving in defined contribution plans.[9] Since defined contribution plans are rapidly replacing defined benefit plans in the private sector, the results below can be thought of as 401(k) saving rates.

The simplest question is what portion of retirement income needs to come from retirement savings plans. This percentage will vary by household income, since Social Security's progressive benefits replace a higher portion of pre-retirement income for lower-income households than for those with higher incomes. Table 2 shows the percentage of income that households must generate through savings in employer retirement plans to produce their target replacement rates.

While both pre-retirement and retirement income include imputed rent, this number is not included in the percentage calculation. For example, the middle household will require 71 percent of pre-retirement income to maintain pre-retirement living standards. This amount breaks down as follows: 41 percent of pre-retirement income from Social Security, 4 percent from the reverse mortgage, and 6 percent from imputed rent, which means that the rest – 21 percent – needs to come from retirement savings plans.[10] The 32 percent reported in the table is simply the ratio of 21/(41+21+4), so it excludes imputed rent. The takeaway here is that a quarter of retirement income must come from retirement savings plans for low-income households, one third for the middle income, and half for the high income.

Table 2. Percentage of Retirement Income Required from Retirement Savings Plans

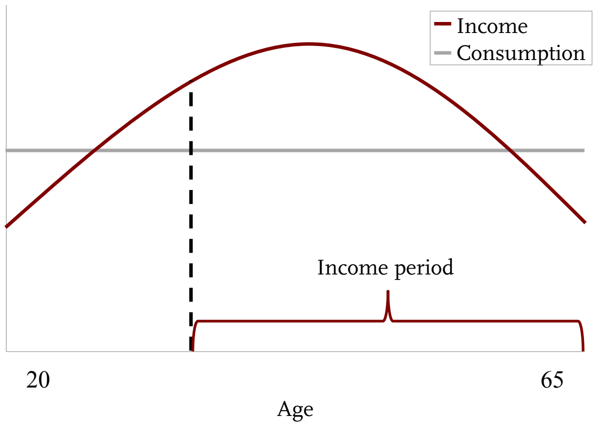
Income group	Percentage of retirement income
All	35%
Low income	25
Middle income	32
High income	47

Note: Retirement savings plans include defined benefit plans, defined contribution plans, and IRAs.
Source: Authors' calculations.

The second question is how much households must save over their worklives to generate the required amount of income. This number falls out of the target calculation, since the target saving rate is the rate that allows households to maintain their pre-retirement consumption once they stop working.

Again, nothing is simple. Saving can be measured in any number of ways, given the pattern of income and consumption in the target model. The concept reported here measures net saving – positive saving less amounts required to pay off debts – divided by income from the age at which debt is repaid to age 65 (see Figure 4).

Figure 4. Calculation of Saving Rates from the Target Model



Source: Authors' illustration.

The required saving rate produced by these calculations is 15 percent for the middle income household (see Table 3). These saving rates represent total saving in retirement plans, which includes both employee and employer contributions.[11]

Table 3. Required Saving Rates from Retirement Savings Plans

Income group	Required saving rate
All	14%
Low income	11
Middle income	15
High income	16

Source: Authors' calculations.

The final question is how much more households would need to save to hit their target replacement rates. This analysis proceeds in three steps. First, for each household in the NRRI, we compare its projected replacement rate to its target in order to identify the half of households falling short and the magnitude of the shortfall. Second, we calculate the percentage of income that the household needs to save each year so that the accumulated additional savings, when annuitized at age 65, will bring the household's total income up to the target. Third, we divide the shortfall in replacement rate by the additional replacement income from a 1-percent increase in saving to calculate the required additional saving.

The median required increases in the saving rate are shown in Table 4. The most sensible way to look at these numbers is by age group. A feasible increase in saving rates at younger ages can have a large effect on wealth at age 65. In contrast, people in their 50s have so little time before retirement that middle-income households would have to increase their saving by an unrealistic 29 percentage points of income to reach their target. A better strategy for these households would be to work longer and cut current and future consumption in order to reduce the required saving rate to a more feasible level.

Table 4. Required Increase in Saving Rates for Households Falling Short (Percentage Points)

Age	Household income (tercile)		
	Low	Middle	High
30-39	8	7	7
40-49	16	13	13
50-59	35	29	30

Source: Authors' calculations.

Importance of Starting Early and Retiring Late

The NRRI target calculations effectively have households beginning retirement saving in their mid-30s and retiring at 65, which produces high required saving rates. The required saving rates, however, are very sensitive to assumptions about starting and ending dates. Consider a simple Excel spreadsheet example of individuals earning the average wage and planning to retire at 65 in 2040. Under current law, Social Security will replace 36 percent of their final inflation-adjusted earnings, so they have to save enough on their own to replace 34 percent (70 percent minus 36 percent). Assuming individuals purchase an annuity at retirement that produces steady inflation-adjusted consumption, average workers need to accumulate investments of $538,000. If they start saving at 35 and earn a real return of 4 percent, they will need to save 15 percent of earnings each and every year to be able to retire at 65 with financial security (see Table 5). However, if they delay retirement to 70, that figure drops from 15 percent to 6 percent. Starting to save earlier would bring the rate even lower.

TABLE 5. SAVING RATE REQUIRED FOR A MEDIUM EARNER TO ATTAIN A 70-PERCENT REPLACEMENT RATE

Retire at:	Start saving at:		
	25	35	45
62	15%	24%	44%
65	10	15	27
67	7	12	20
70	4	6	10

Note: The calculations assume a real rate of return of 4 percent and the purchase of an inflation-indexed annuity with the same rate as in the National Retirement Risk Index.
Source: Authors' calculations.

Conclusion

Currently, about half of working-age households are not saving enough to maintain their pre-retirement standard of living in retirement. To supplement Social Security, depending on their income level, households should plan to get between one-quarter to one-half of their retirement income from retirement savings plans, such as 401(k)s. To produce this income, the typical household needs to save about 15 percent of earnings, well above today's actual saving rates. Low-income households need to save less and high-income households more. For those households currently identified as having a savings shortfall in the National Retirement Risk Index, the necessary increase in saving depends crucially on their age; younger households need to boost their saving by a feasible amount while older households would need to work longer to moderate the need for additional saving.

Endnotes

1 The Index does not include income from work, since labor force participation declines rapidly as people age.

2 Both mortgage debt and non-mortgage debt are subtracted from the appropriate components of projected wealth.

3 For 401(k) assets, other financial wealth, and housing wealth, the assumption is that households convert the wealth into a stream of income by purchasing an inflation-indexed annuity – that is, an annuity that will provide them with a payment linked to the Consumer Price Index for the rest of their lives. For couples, the annuity provides the surviving spouse two-thirds of the base amount. While inflation-indexed annuities are not widely used by consumers, they provide a convenient metric for calculating the lifetime income that can be obtained from a lump sum. And while inflation-indexed annuities provide a smaller initial benefit than nominal annuities, over time they protect a household's purchasing power against the erosive effects of inflation.

4 As with the components of retirement income, both mortgage debt and non-mortgage debt are subtracted from the appropriate components of pre-retirement income.

5 Low, middle, and high earners experience wage increases derived from Clingman and Nichols (2004). The calculations assume that young households are able to borrow if their desired consumption exceeds their net income. They also assume that, during their working lives, households optimally choose a level of consumption that increases at the rate of 1 percent a year.

6 The calculations assume that both housing and financial assets yield a historical real return. The secondary earner joins the household at age 25 with zero assets. Married couples, single men, and single women face annuity rates corresponding to the income payable on inflation-indexed annuities for members of the 1956 birth cohort at 2004 interest rates and expense loads. At age 30, homeowners purchase a house valued at twice their age-50 earnings with the aid of a 30-year mortgage at a real interest rate of 2.23 percent. At retirement, homeowners can borrow a portion of the value of the house on a reverse mortgage.

7 See Palmer (2008). Lower-income households require higher replacement rates, because they pay little in taxes and need to save little for retirement and therefore do not experience much relief from these payments upon retirement.

8 IRA assets are also included in employer plans because the large majority of these assets are simply rolled over from 401(k)s. In addition, for the sake of simplicity, savings outside of employer plans – which are very small for most households – are also included.

9 A simpler alternative calculation would be to exclude households with defined benefit plans from the analysis, but this approach unnecessarily discards too much information that is relevant to determining average saving rates.

10 The imputed rent assumption is broadly consistent with estimates by Poterba and Sinai (2008) of homeowner user costs – which, in addition to imputed rent, include property taxes and maintenance.

11 One question is whether people can achieve these saving rates under the current system, given that 401(k) contributions are limited to specified dollar amounts (currently $17,500 for those under age 50 and $22,000 for those age 50 and over). The answer is yes. Currently only about 5 percent of workers (both those under and over age 50) have incomes so high that they would be constrained by the 401(k) contribution limits. And, even for these individuals, widespread acceptance of the need for more retirement saving could persuade employers to raise their matching contributions. If so, plenty of room exists for additional employer contributions because the combined employer-employee contribution limit is $52,000. Alternatively, individuals could always choose to save outside of tax-deferred retirement accounts.

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