CENTER for RETIREMENT RESEARCH at BOSTON COLLEGE

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NRRI UPDATE SHOWS HALF STILL FALLING SHORT

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Introduction

The release of the Federal Reserve's 2013 *Survey of Consumer Finances* (SCF) is a great opportunity to reassess Americans' retirement preparedness as measured by the National Retirement Risk Index (NRRI). The NRRI shows the share of working-age households who are "at risk" of being unable to maintain their pre-retirement standard of living in retirement. The Index is constructed using the SCF, a triennial survey of a nationally representative sample of U.S. households that collects detailed information on their assets, liabilities, and demographic characteristics. For SCF households, the NRRI compares projected replacement rates – retirement income as a percentage of pre-retirement income – with target rates that would allow them to maintain their living standard and calculates the percentage at risk of falling short. The NRRI was originally created using the 2004 SCF and has been updated with the release of each subsequent survey.

The discussion proceeds as follows. The first section describes the nuts and bolts of constructing the NRRI. The second section presents the NRRI in 2013, showing that 52 percent of households were at risk. The third section highlights the key levers, and presents the results by age, income, and the nature of pension coverage. The fourth section discusses the stability of the NRRI despite numerous revisions and then identifies why it provides a more dire outlook than that of the optimal savings literature. The final section concludes that the NRRI confirms what we already know – today's workers face a major retirement income challenge. Even if households work to age 65 and annuitize all their financial assets, including the receipts from reverse mortgages on their homes, more than half are at risk in retirement.

The Nuts and Bolts of the National Retirement Risk Index

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."

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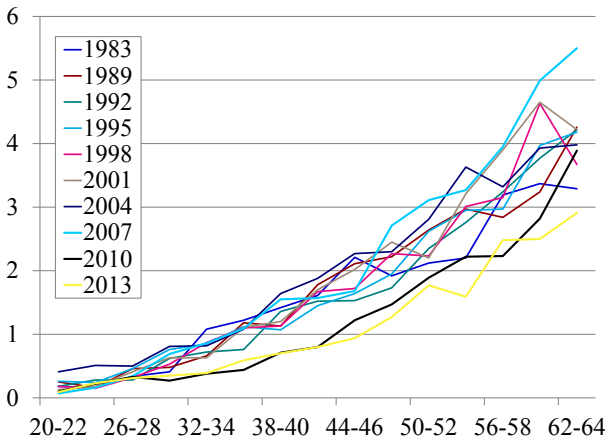
Projecting Household Replacement Rates

The exercise starts with projecting how much retirement income each household 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 1983-2013 SCFs. As shown in Figure 1, wealth-to-income lines from each survey rest virtually on top of one another, bracketed by 2007 values on the high side and 2010 and 2013 values on the low side. The fact that 2013 looks very much like 2010 suggests that the percentage at risk may not have improved as much as we expected.

FIGURE 1. RATIO OF WEALTH TO INCOME BY AGE FROM THE *SURVEY OF CONSUMER FINANCES*, 1983-2013



Sources: Authors' calculations based on U.S. Board of Governors of the Federal Reserve System, *Survey of Consumer Finances* (1983-2013).

Using this relationship between wealth and income, financial assets and housing are estimated separately.[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 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 need to be estimated directly. For defined benefit pension income, the projections are based on the amounts reported by survey respondents. For Social Security, benefits are calculated directly based on estimated earnings histories for each member of the household. Earnings prior to retirement are calculated by creating a wage-indexed earnings history and averaging each individual's annual indexed wages over his lifetime. Once estimated, the components are added together to get total projected retirement income at age 65.

To calculate projected replacement rates, we also need income *prior to* retirement. The items that comprise pre-retirement income include earnings, the return on taxable 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 the population that will be at risk requires comparing projected replacement rates with a benchmark rate. A commonly used benchmark is the replacement rate needed to allow households to maintain their pre-retirement standard of living in retirement. People typically need less than their full pre-retirement income to maintain this standard once they stop working since they generally pay less in taxes, no longer need to save for retirement, and often have paid off their mortgage. Thus, a greater share of their income is available for spending. Target replacement rates are estimated for different types of households[5] assuming that households spread their income in order to have the same level of consumption in retirement as they had before they retired.[6]

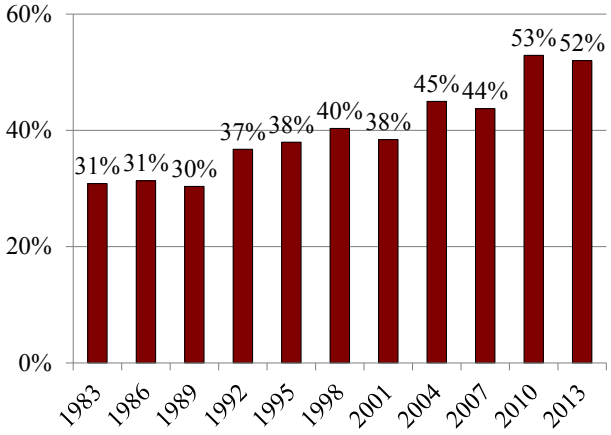
Calculating the Index

The final step in creating the Index is to compare each household's projected replacement rate with the appropriate target. Households whose projected replacement rates fall more than 10 percent below the target are deemed to be at risk of having insufficient income to maintain their pre-retirement standard of living. The Index is simply the percentage of *all* households that fall more than 10 percent short of their target.

The NRRI in 2013

Our expectation was that the NRRI would improve sharply in 2013; it certainly felt like a better year than 2010. The stock market was up, and housing values were beginning to recover. But the ratio of wealth to income had not bounced back from the financial crisis (as noted earlier), more households faced a higher Social Security Full Retirement Age, and the government had tightened up on the percentage of housing equity that borrowers could extract through a reverse mortgage. On balance, then, the Index level for 2013 was 52 percent, only slightly better than the 53 percent reported for 2010 (see Figure 2). This small change was the net result of several factors, some that reduced the NRRI and some that increased it.

Figure 2. The National Retirement Risk Index, 1983-2013



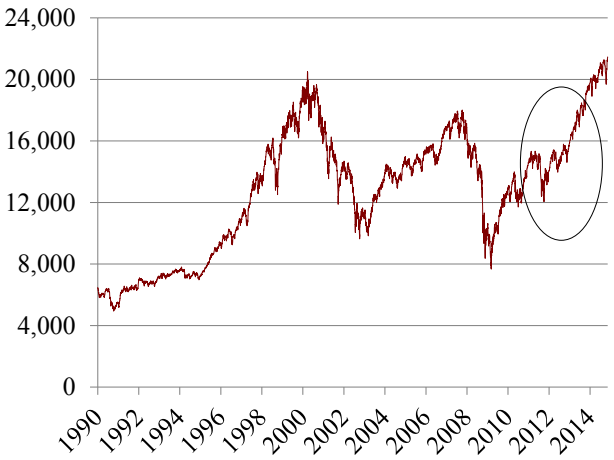
Source: Authors' calculations.

Factors That Reduced the NRRI

Since 2010, both equity and house prices have increased. The increase in the prices of equities, which are held primarily by the wealthy, has been dramatic. The increase in the value of housing, which is much more widely held, has been modest.

Equities. Between the third quarter of 2010 (which marks the previous NRRI baseline) and the third quarter of 2013, equity prices increased by about 40 percent after adjusting for inflation (see Figure 3). These gains have been concentrated in the top third of the income distribution, which holds about 90 percent of all equities.

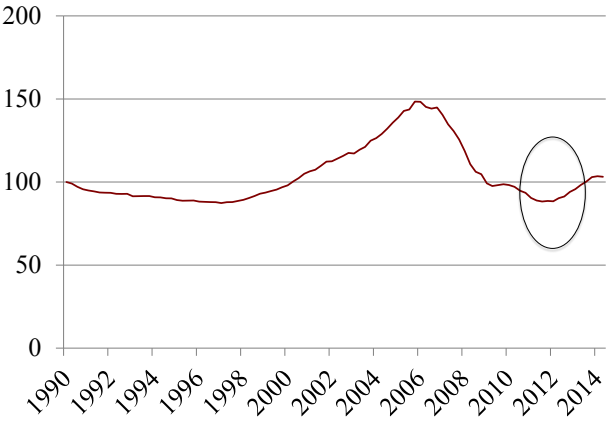
Figure 3. Dow Jones Wilshire 5000 (Real), 1990 (January)-2014 (November)



Sources: Wilshire Associates (2014); and U.S. Bureau of Labor Statistics (2014).

House Prices. In contrast, housing is important for all income groups. But, despite all the favorable press reports, Federal Reserve data show that – on a national basis – house prices increased only about 6 percent in real terms between the third quarter of 2010 and the third quarter of 2013 (see Figure 4). Moreover, the 2013 SCF reported a noticeable decline, among all age groups, in the percentage of households owning a primary residence.[7] In the NRRI, home ownership and home prices have a significant impact because

Figure 4. Index of Average U.S. House Prices (Real), 2000(Q1)-2014(Q2)



Sources: Authors' calculations based on U.S. Board of Governors of the Federal Reserve System, *Flow of Funds Accounts* (2009-2014); and U.S. Department of Commerce (2002).

households are assumed to access their home equity at retirement by taking out a reverse mortgage. The higher the home value, the more a household can extract in cash and turn into an income stream through annuitization.

Factors That Increased the NRRI

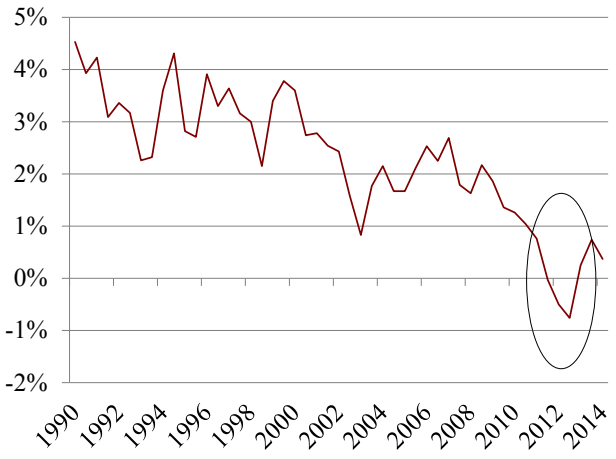
The three main factors increasing the NRRI were the rise in Social Security's Full Retirement Age, the decline in interest rates, and new reverse mortgage rules that lowered the percentage of home equity that could be accessed at any given interest rate.

Increase in the Full Retirement Age (FRA). Until it is fully phased in, the transition of the FRA from 65 to 67 will continue to increase the NRRI. Under legislation enacted in 1983, the increase in the FRA began with those born in 1938 (who turned 62 in 2000) and will be fully phased in for those born in 1960 (turning 62 in 2022). In 1983, about half of working households could claim full benefits at 65. By 2001, almost all working households were required to wait until at least 66 and many until 67 to receive full benefits. Since then, the share of households required to wait until 67 has continued to increase. As the FRA goes up, benefits at 65 – the assumed retirement age in the NRRI – decline. This decline affects all households but has a particularly large impact on low-income households who depend almost entirely on Social Security for retirement income.

Decline in Interest Rates. Lower interest rates (as shown in Figure 5) mean that households get less income from annuitizing their assets, which include financial assets, 401(k)/IRA balances, and money received from a reverse mortgage on the household's primary residence; this reduction in income increases the NRRI. However, the NRRI "tapers" the impact of the interest rate decline by including all or part of the change for households approaching retirement and none of the change for those under age 50. Given that the decline in the real interest rate from 2010-2013 is small (0.9 percent to 0.6 percent) and that it affects only those close to retirement, its impact on the NRRI is modest.

Reverse Mortgage Reform. In 2013, the government simplified the Home Equity Conversion Mortgage (HECM) rules and lowered the percentage of the house value that borrowers could receive in the form of a reverse mortgage at any given interest rate. This effect increased the percentage of households at risk, but its impact was slightly offset by the decline in interest rates, which raised the amount that can be borrowed.[8] The net impact on the NRRI is small, because both the borrowing limitations and the decline in interest rates are included in the calculation of the target replacement rates as well as the projected replacement rates.

Figure 5. Real 10-Year Interest Rate, 1990-2014



Note: Real interest rates equal the 10-year Treasury bond interest rate minus anticipated 10-year inflation for 1990-2003 and, thereafter, the 10-year rate for Treasury Inflation Protected Securities (TIPS).
Sources: Authors' calculations based on U.S. Board of Governors of the Federal Reserve System (2014); and Federal Reserve Bank of Philadelphia (2009).

Patterns in the 2013 NRRI

Identifying the primary levers affecting the NRRI makes it possible to understand the pattern of change in the NRRI by age group, income level, and pension coverage.

When viewed by age, the most noticeable fact is the lack of any improvement for households age 50-59 (see Table 1 on the next page). This pattern reflects two developments. First, households age 59 are exposed to the full impact of today's low interest rates; rates are then tapered over a 10-year period so that households under age 50 are not affected. Second, the retirement assets of households age 50-59 declined slightly – to about $110,000 – between 2010 and 2013. In contrast, households age 40-49 showed a big gain in 401(k)/IRA assets and were not affected by the interest rate decline, so they experienced a significant drop in the percentage at risk.

Table 1. Percentage of Households "At Risk" at Age 65 by Age Group, 2010 and 2013

Age group	2010	2013
All	53%	52%
30-39	62	59
40-49	55	52
50-59	44	45

Source: Authors' calculations.

When viewed by income, all of the groups experienced only a modest improvement (see Table 2). For low-income households, the gain they experienced from rising house prices was offset primarily by the increase in Social Security's FRA. For middle-income households, gains from rising house and equity prices were dampened by both the higher FRA and the decline in annuity rates. For upper-income households, who are most reliant on equities and least reliant on Social Security, gains from equities were offset mainly by the lower annuity rates.

Table 2. Percentage of Households "At Risk" at Age 65 by Income Group, 2010 and 2013

Income group	2010	2013
All	53%	52%
Low income	61	60
Middle income	54	52
High income	44	43

Source: Authors' calculations.

Finally, it is interesting to look at the effect of pension coverage (see Table 3). Compared to no plan, having an employer sponsored plan certainly reduces the percentage of households at risk. But the difference between the effects of defined benefit and 401(k) coverage remains large. Part of this discrepancy may be due to the differences in plan design from one in which all risks and responsibilities are borne by the employer to one in which the individual makes all the decisions and bears all the risk. But it is more likely that the very low NRRI for households with defined benefit plans reflects the fact that many defined benefit plans are found in the public sector, where pensions account for a much larger share of total compensation than they do in the private sector.

Table 3. Percentage of Households "At Risk" at Age 65 by Pension Coverage, 2010 and 2013

Pension coverage	2010	2013
All	53%	52%
Defined benefit[a]	19	20
Defined contribution only	58	53
None	69	68

[a] This category also includes households with both a defined benefit and a defined contribution plan.
Source: Authors' calculations.

Overall NRRI Assessment

This year's update involved a major overhaul of the NRRI. As always, households from the new SCF replaced households from the previous SCF, and 2013 data were incorporated in the equations used to predict financial and housing wealth at age 65. In addition, the new population was subjected to a higher Social Security Full Retirement Age, which substantially increased the percentage at risk. And, on the target side, the thresholds at which Social Security benefits are taxable were increased to reflect the fact that these thresholds are fixed in nominal terms so more households are subject to tax over time; this adjustment also increases the percentage at risk. Several other changes had smaller effects; these included lower annuity rates, lower HECM limits, and a reduction in the assumed real return on investments from 4.6 percent to 4 percent in order to account for investment fees. A number of anomalies that had crept in over the years were also eliminated. Despite all these revisions, the NRRI continues to tell the same story – roughly half of today's working households will not be able to maintain their standard of living in retirement.

While the stability of the NRRI suggests retirement shortfalls are a major problem, the question is not fully settled yet among academic researchers. For example, studies by well-respected scholars conclude that most Americans are saving optimally to meet their consumption needs in retirement, with less than 10 percent of households falling short.[9] The question is why this optimal savings approach yields such comforting results. The answer hinges on two key assumptions: 1) how children affect replacement rate targets; and 2) how households consume their accumulated wealth in retirement.[10]

What happens to household consumption once the children leave home? One hypothesis is that the adults keep household consumption steady by spending more on themselves, particularly on discretionary items such as travel, entertainment, and restaurants. Under the optimal savings approach, though, the adults do not increase their spending; instead, they save the extra money that used to be devoted to their children. As a result, they have a lower replacement rate target and need to save less for retirement than households where consumption remains steady.

The second key assumption is how households consume their accumulated wealth in retirement. The NRRI has retirees buying an annuity so that they spend a steady inflation-adjusted amount. In contrast, the optimization model assumes that households draw down their wealth on their own. In this framework, households optimally choose higher consumption in their 60s, and significantly lower consumption by age 85. Households accept declining consumption in retirement because they are less willing to save during their working years for consumption at ages when they are less likely to be alive. With a declining consumption path, the typical household will need to accumulate much less wealth to meet any target replacement rate at retirement.

The question then becomes which set of assumptions is most plausible. Total spending does decline as people age, but it is unclear the extent to which the pattern reflects declining income; people cannot spend what they do not have. In contrast, financial planning tools typically assume that households require a level amount throughout retirement. The one study looking at how households react when the kids leave home finds that household consumption does not decline and per-capita consumption increases.[11] But the sample size is small, so the issue is unresolved. The key point is that specific assumptions, with precise behavioral implications, are required to conclude that households are saving optimally.

Conclusion

Today's working households will be retiring in a substantially different environment than their parents did. The length of retirement is increasing as the average retirement age hovers around 63 and life expectancy continues to rise. At the same time, replacement rates are falling because of the extension of Social Security's Full Retirement Age and modest 401(k)/IRA balances. According to the 2013 SCF, median 401(k)/IRA balances for households approaching retirement were only about $110,000. Yes, the stock market was up and housing prices had begun to rebound, but these positive developments were not enough to return the Index to pre-crisis levels.

The NRRI shows that, as of 2013, more than half of today's households will not have enough retirement income to maintain their pre-retirement standard of living, even if they work to age 65 – which is above the current average retirement age – and annuitize all their financial assets, including the receipts from a reverse mortgage on their homes. The NRRI clearly indicates that many Americans need to save more and/or work longer.[12]

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 Interest on both mortgage and non-mortgage debt is subtracted from the appropriate components of pre-retirement income.

5 Specifically, the targets are calculated for one-earner and two-earner couples, single men, and single women with low-, middle-, and high-income, weighted to reflect the prevalence of home ownership and defined benefit pension coverage.

6 We recognize that smoothing consumption is not the same as smoothing the unobserved marginal utility of consumption that theory suggests, but our method likely provides a reasonable approximation.

7 Bricker et al. (2014).

8 The HECM formula uses the yield on 10-year Treasury bonds as a proxy for anticipated interest rates.

9 Scholz and Seshadri (2008). Other researchers also suggest that retirees are likely to have adequate saving. For example, Hurd and Rohwedder (2013) find only modest declines in total spending after retirement. It appears though, that the households they study cannot sustain their initial level of consumption throughout the retirement period.

10 See Munnell, Rutledge, and Webb (2014) for a thorough discussion of the conflicting studies.

11 Coe and Webb (2010).

12 See Munnell, Hou, and Webb (2014) for an analysis of how much households need to save for retirement.

References

Bricker, Jesse, Lisa J. Dettling, Alice Henriques, Joanne W. Hsu, Kevin B. Moore, John Sabelhaus, Jeffrey Thompson, and Richard A. Windle. 2014. "Changes in U.S. Family Finances from 2010 to 2013: Evidence from the Survey of Consumer Finances." *Federal Reserve Bulletin* 100(4): 1-41.

Coe, Norma and Anthony Webb. 2010. "Children and Household Utility: Evidence from Kids Flying the Coop." Working Paper 2010-16. Chestnut Hill, MA: Center for Retirement Research at Boston College.

Federal Reserve Bank of Philadelphia. 2009. *Short-Term and Long-Term Inflation Forecasts: Survey of Professional Forecasters*. Philadelphia, PA.

Hurd, Michael D. and Susann Rohwedder. 2013. "Heterogeneity in Spending Change at Retirement." *Journal of the Economics of Ageing* 1(2): 60-71.

Munnell, Alicia H., Anthony Webb, and Wenliang Hou. 2014. "How Much Should People Save? *Issue in Brief* 14-11. Chestnut Hill, MA: Center for Retirement Research at Boston College.

Munnell, Alicia H., Matthew Rutledge, and Anthony Webb. 2014. "Are Retirees Falling Short? Reconciling the Conflicting Evidence." Working Paper 2014-16. Chestnut Hill, MA: Center for Retirement Research at Boston College.

Scholz, John Karl and Ananth Seshadri. 2008. "Are All Americans Saving 'Optimally' for Retirement?" Presented at the 10th Annual Joint Conference of the Retirement Research Consortium in Washington, DC, August 7-8.

U.S. Board of Governors of the Federal Reserve System. *Flow of Funds Accounts of the United States,* 2009-2014. Washington, DC.

U.S. Board of Governors of the Federal Reserve System. *Survey of Consumer Finances,* 1983-2013. Washington, DC.

U.S. Board of Governors of the Federal Reserve System. 2014. "Selected Interest Rates: Historical Data." Washington, DC.

U.S. Bureau of Labor Statistics. 2014. *Consumer Price Index*. Washington, DC.

U.S. Department of Commerce. 2002. "Table 5.64 Historical-Cost Depreciation of Residential Fixed Assets by Type of Owner, Legal Form of Organization, Industry, and Tenure Group." Washington, DC: Bureau of Economic Analysis, National Economic Accounts.

Wilshire Associates. 2014. *Dow Jones Wilshire 5000 (Full Cap) Price Levels Since Inception*. Data for nominal dollar levels available at: http://www.wilshire.com/Indexes/calculator/csv/w5kppidd.csv.

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