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NATIONAL RETIREMENT RISK INDEX SHOWS MODEST IMPROVEMENT IN 2016

BY ALICIA H. MUNNELL, WENLIANG HOU, AND GEOFFREY T. SANZENBACHER*

Introduction

The release of the Federal Reserve's 2016 *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. This Index is constructed using the SCF, a triennial nationally representative survey of household finances.

Since the last SCF was conducted in 2013, the U.S. economy enjoyed a period of low unemployment, rising wages, strong stock market growth, and rising house prices. These factors should have improved households' preparedness for retirement. At the same time, longer-term trends – such as the gradual rise in Social Security's Full Retirement Age and low interest rates – served as headwinds that made it more difficult to achieve retirement readiness. The question is what is the net impact of these disparate factors.

The discussion proceeds as follows. The first section describes the nuts and bolts of the NRRI. The second section updates the NRRI using 2016 SCF data and shows that the share of households at risk dropped from 52 percent to 50 percent, largely due to rising home values. The third section presents results by age, income, and pension coverage. The fourth section takes a step back and assesses the overall reasonableness of the NRRI's findings. The fifth section concludes that retirement readiness remains a major challenge for many of today's workers; they need to save more and/or work longer to improve their prospects for a secure retirement.

The Nuts & Bolts of the NRRI

The NRRI is constructed using data from the SCF, which collects detailed information on household 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 households 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.

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."

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 1983-2016 SCFs. As shown in Figure 1, wealth-to-income lines from each survey rest roughly on top of one another, bracketed by 2007 values on the high side and 2013 values on the low side. The fact that 2016 (the red line) looks somewhat better than 2010 and 2013 but still falls into the bottom half suggests that the percentage at risk may have improved only slightly.

FIGURE 1. RATIO OF WEALTH TO INCOME BY AGE FROM THE *SURVEY OF CONSUMER FINANCES*, 1983-2016
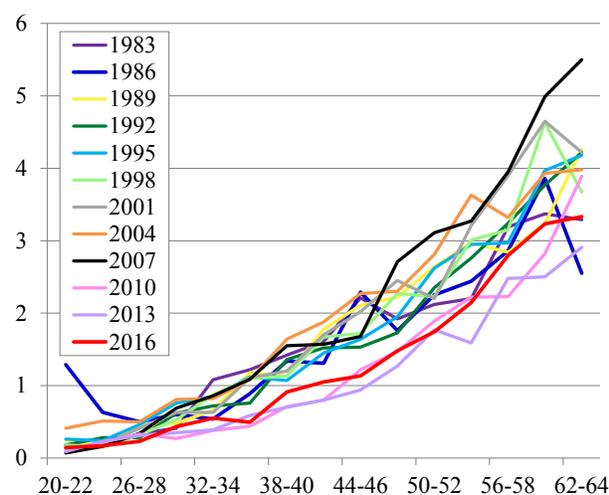
Sources: Authors' calculations based on U.S. Board of Governors of the Federal Reserve System, *Survey of Consumer Finances* (1983-2016).

Using this relationship between wealth and income, financial assets and housing at age 65 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 401(k) plans and 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 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 NRRI 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 NRRI is simply the percentage of *all* households that fall more than 10 percent short of their target.

The NRRI in 2013 and 2016

The NRRI hit a peak of 53 percent in 2010 and dropped slightly to 52 percent in 2013. For 2016, higher stock and house prices should have served to bring the NRRI down through growth in household wealth.[7] On the other hand, other factors – a higher Social Security Full Retirement Age, lower interest rates, and a reduction in the amounts that can be borrowed through a reverse mortgage – should have pushed up the NRRI.

The net effect of these positive and negative developments was to reduce the NRRI in 2016 to 50 percent (see Figure 2), a modest improvement from the 2013 level. The following discussion describes why the NRRI declined by first examining the factors that reduced it and then examining the factors that moved it in the other direction.

Figure 2. The National Retirement Risk Index, 1983-2016
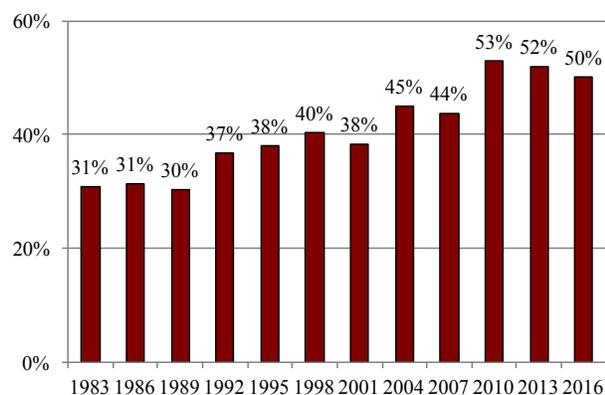
Source: Authors' calculations.

Factors That Reduced the NRRI

Between 2013 and 2016, both equity and house prices increased sharply, serving to reduce the NRRI.

Equities. Despite a short pullback from late 2015 to early 2016, equity prices increased by more than 20 percent after adjusting for inflation between the third quarter of 2013 (which marks the previous NRRI baseline) and the third quarter of 2016 (see Figure 3). However, these gains have been concentrated in the top third of the income distribution, which holds about 87 percent of all equities. That pattern means that much of the gains went to households that were already not at risk.

Figure 3. Dow Jones Wilshire 5000 (Real), 1990 (January) to 2017 (September)
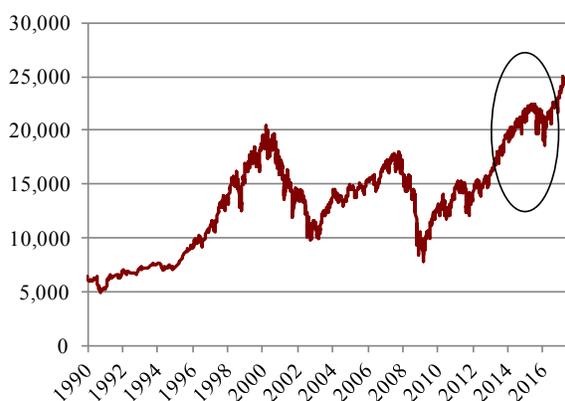
Sources: Wilshire Associates (2017); and U.S. Bureau of Labor Statistics (2017).

House Prices. In contrast to equities, a substantial percentage of households in all income groups own a home and enjoyed the benefits of rising prices. Between 2013 and 2016, U.S. home prices increased about 14 percent in real terms, according to the S&P CoreLogic Case-Shiller U.S. National Home Price NSA Index (see Figure 4 on the next page). In the NRRI, home ownership and home prices have a significant impact because households are assumed to access their home equity at retirement by taking out a reverse mortgage. The higher the home value, the more households can extract in cash and turn into an income stream through annuitization.
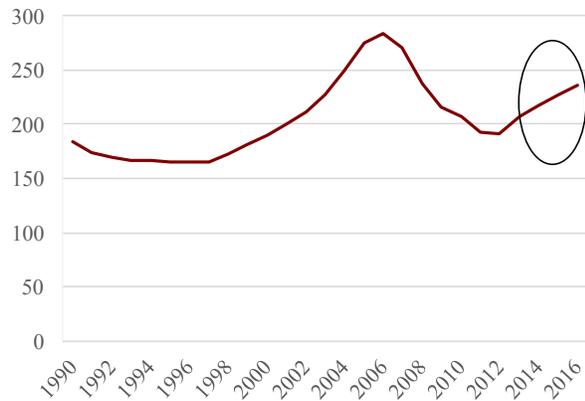
Source: S&P CoreLogic Case-Shiller U.S. National Home Price NSA Index, 2017.

Factors That Increased the NRRI

The three main factors increasing the share at risk were the ongoing 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). The transition of the FRA from 65 to 67 has been increasing the NRRI for many years. Under legislation enacted in 1983, the rise 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 two-thirds of working households could claim full benefits at 65, the rest had to wait until 66; none had to wait until 67. Since then, the share of households with an FRA of 66 and 67 has increased steadily. By 2016, almost all workers had an FRA of 67 (see Figure 5). Because benefits are actuarially reduced for early claiming, an increase in the FRA causes benefits claimed at 65 – the assumed retirement age in the NRRI – to 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.

Figure 5. Full Retirement Age for Different NRRI Cohorts, 1983-2016
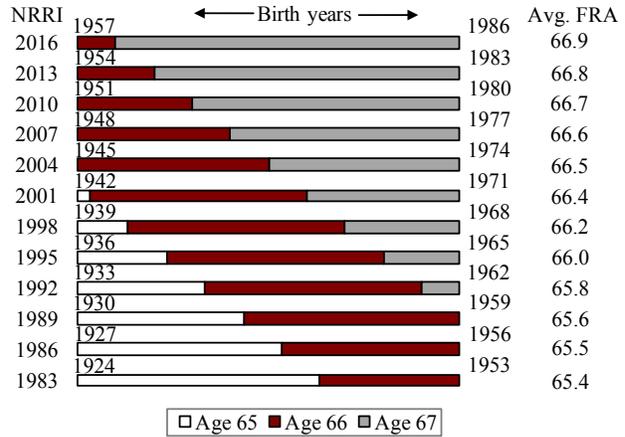
Source: Authors' calculations from U.S. Social Security Administration (2017).

Decline in Interest Rates. Lower interest rates mean that households get less income from annuitizing their assets.[8] As shown in Figure 6, interest rates were lower in 2016 than 2013, so households will receive less when they annuitize their 401(k)/IRA

Figure 6. Real 10-Year Interest Rate, 1990-2017

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 TIPS.
Sources: Authors' calculations based on U.S. Board of Governors of the Federal Reserve System (2017); and Federal Reserve Bank of Philadelphia (2009).

balances, their other financial assets, and the money they receive from a reverse mortgage. 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 2013-2016 is small (from 0.61 percent to 0.55 percent) and that it affects only those close to retirement, its impact on the NRRI is modest.

Reverse Mortgage Reform. In 2017, the government announced tougher rules for the Home Equity Conversion Mortgage (HECM) program – raising up-front premiums and placing tighter limits on loans. 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 of home equity that can be borrowed.[9] The net impact on the NRRI from these changes is small.

The Net Effect on the NRRI

How much does each of these individual factors contribute to the change in the overall NRRI from 2013 to 2016? Figure 7 decomposes the total change into the effects of: 1) the increase in the stock market; 2) the increase in the housing market; 3) the rise in the FRA; 4) the decline in annuity rates; and 5) the new rules for reverse mortgages. The increase in housing prices had the largest effect; it reduced the NRRI by

FIGURE 7. DECEASE IN PERCENTAGE "AT RISK" FROM 2013 TO 2016, BY CONTRIBUTING COMPONENT

0.3% ↑	Rising FRA
0.1% ↑	New HECM rules
0.1% ↑	Annuity rates decline
-0.6% ↓	Stock market increase
-1.4% ↓	Housing market increase

Source: Authors' calculations.

1.4 percentage points, reflecting the fact that housing is most households' largest asset. All of the other effects essentially offset each other.

Patterns in the 2016 NRRI

It is interesting to examine different patterns in the NRRI by pension coverage, age group, and income level.

Compared to no employer retirement plan, having a plan certainly reduces the percentage of households at risk (see Table 1). But the difference between 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 of these plans are in the public sector, where pensions account for a much larger share of total compensation than in the private sector.

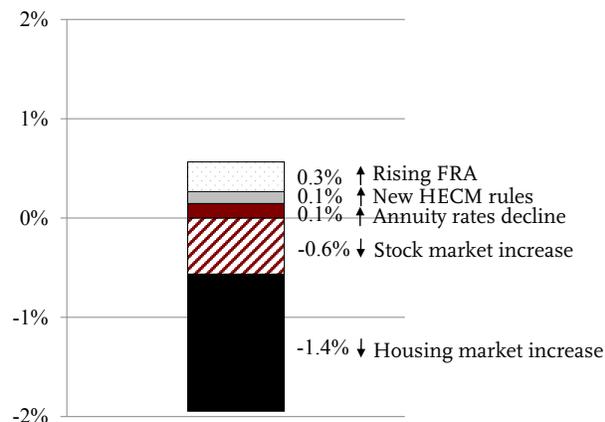TABLE 1. PERCENTAGE OF HOUSEHOLDS "AT RISK" AT AGE 65 BY PENSION COVERAGE, 2013 AND 2016

Pension coverage	2013	2016
All	52%	50%
Defined benefit[a]	20	20
Defined contribution only	53	51
None	68	67

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

When viewed by age and income, all groups of households experienced an improvement, except middle-age and middle-income households (see Tables 2 and 3 on the next page). One reason for the lack of improvement for the middle-age group is more non-mortgage borrowing, particularly for education expenses. For example, for households ages 45-50, their average non-mortgage debt-to-income ratio almost doubled from 14 percent in 2013 to 27 percent in 2016.[10] Increased borrowing was also an issue for the middle-income group, aggravated by a downturn in reported defined benefit coverage.

TABLE 2. PERCENTAGE OF HOUSEHOLDS "AT RISK" AT
AGE 65 BY AGE GROUP, 2013 AND 2016

Age group	2013	2016
All	52%	50%
30-39	59	56
40-49	52	52
50-59	45	44

Source: Authors' calculations.

TABLE 3. PERCENTAGE OF HOUSEHOLDS "AT RISK" AT
AGE 65 BY INCOME GROUP, 2013 AND 2016

Income group	2013	2016
All	52%	50%
Low income	60	56
Middle income	52	54
High income	43	41

Source: Authors' calculations.

Overall Assessment of NRRI

The Center first developed the NRRI over a dozen years ago and has been making regular updates and improvements ever since. The overall finding that roughly half of the nation's working-age households are at risk of falling short in retirement has been very stable throughout this period, with some ups and downs reflecting fluctuations in the economy. The stability underscores that the broad underlying economic, policy, and demographic factors have remained largely unchanged. In addition, the NRRI methodology incorporates conservative assumptions, such as having households annuitize their financial assets and the proceeds of a reverse mortgage, when few actually do so.

While both the stability and conservative assumptions of the NRRI suggest that 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.[11] 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.[12]

What happens to household consumption once the children are grown and leave home? One hypothesis is that the parents 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 when their children leave the nest; instead, they simply save the extra cash. As a result, in addition to accumulating more retirement saving, they have a lower replacement rate target, which means they need to save less than households whose 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 optimal framework, households 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 to support 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. 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. And a growing body of research on how households behave when the kids leave home supports the notion of little change in the household's consumption and saving levels. One study shows that the household consumption of empty nesters does not decline and their per-capita consumption increases, while another finds that they save only a little bit more in their 401(k)s.[13] Given the accumulating evidence, the assumptions underlying the NRRI seem more plausible than those of the optimal savings approach.

Conclusion

Between 2013 and 2016, the NRRI dropped modestly – from 52 to 50 percent. The improvement reflected solid gains in the stock and housing markets. The modest nature of the improvement, though, indicates that underlying structural factors – such as the gradual rise in Social Security's Full Retirement Age and low interest rates – continued to serve as headwinds against more substantial progress.

The bottom line is that 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 and annuitize all their financial assets, including the receipts from a reverse mortgage on their homes. This analysis clearly confirms that many of today's workers need to save more and/or work longer to achieve a secure retirement.[14]

Endnotes

1 The NRRI 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 this 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 with 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, they protect a household's purchasing power over time 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 incomes, 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 Between 2013 and 2016, median family income grew 10 percent, and median household net worth grew 16 percent. See Bricker et al. (2017).

8 This relationship assumes no significant change in mortality rates.

9 The percentage of the Maximum Claim Amount allowable in total cash draws, given the age of the bor-

rower, increases with a lower "expected" interest rate of the loan. The latest version of the HECM Principal Limit Factors table went into effect on October 2, 2017.

10 The non-mortgage-debt-to-income ratio is the balance of borrowing excluding mortgage debt divided by household income.

11 Scholz and Seshadri (2008). Other researchers also suggest that retirees are likely to have adequate saving. 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 whole retirement period.

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

13 Coe and Webb (2010) and Dushi et al. (2015). Not surprisingly, given these findings, a recent NRRI study suggests that having children moderately increases a household's prospects of being at risk (Munnell, Hou, and Sanzenbacher, 2017).

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

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