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WHAT MOVES THE NATIONAL RETIREMENT RISK INDEX? A LOOK BACK AND AN UPDATE

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Introduction

In June 2006, the Center for Retirement Research released the National Retirement Risk Index (NRRI). The results showed that even if households work to age 65 and annuitize all their financial assets, including the receipts from reverse mortgages on their homes, 43 percent will be 'at risk' of being unable to maintain their standard of living in retirement. Households are more likely to be 'at risk' if they are young, have low incomes, or lack pension coverage.

This *brief* looks at the three major factors that have caused the Index to increase since the early 1980s. These factors are: 1) a decline in Social Security replacement rates due to the decline in one-earner couples and the increase in Social Security's Normal Retirement Age; 2) lower pension replacement rates as a result of the shift from defined benefit to defined contribution plans; and 3) lower annuity payments due to the dramatic decline in real interest rates. These negative factors have been only partially offset by a modest increase in financial assets, and an increase in the retirement income that homeowners could potentially obtain through reverse mortgages.

Having identified the key movers, this *brief* also updates the Index from 2004 to 2006. During this period, the run-up in housing prices was cancelled out by a corresponding surge in mortgage debt, which resulted in no change in the 'at risk' status of any of the Index's age cohorts. However, compared to the 2004 Index, the 2006 Index has more Generation Xers and fewer Baby Boomers. Since Generation Xers are more likely to be 'at risk,' this change increased the Index slightly to 44 percent.

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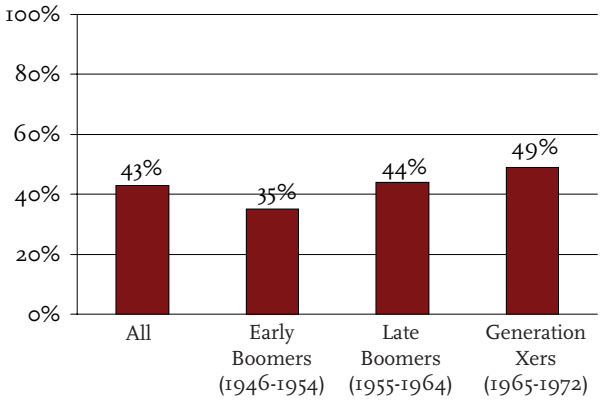
A Recap of the NRRI

The retirement income landscape is becoming more treacherous. The length of retirement is increasing as the average retirement age hovers at 63 for men and 62 for women while life expectancy continues to rise. At the same time, replacement rates are falling for a number of reasons. First, at any given retirement age, Social Security benefits will replace a smaller fraction of pre-retirement earnings as the Normal Retirement Age (NRA) rises from 65 to 67. Second, while the share of the workforce covered by a pension has not changed over the last quarter of a century, the type of coverage has shifted from defined benefit plans, where workers receive lifetime payments based on years of service and final salary, to 401(k) plans, where individuals are responsible for their own saving. In theory, 401(k) plans could provide adequate retirement income, but individuals make mistakes at every step along the way and balances are low.[1] Finally, most households save virtually nothing outside of their employer-sponsored pension plan.

To quantify the effects of the changing landscape, the NRRI provides a measure of the percent of working-age American households that are at risk of being financially unprepared for retirement. The 2004 Index calculates for each household in the 2004 *Survey of Consumer Finances* a replacement rate — projected retirement income as a percent of pre-retirement earnings — and compares that replacement rate with a benchmark that it defined as adequate. Those who fail to come within 10 percent of the benchmark are defined as 'at risk,' and the Index reports the percent of households 'at risk.'

The results as presented in the original release show that, overall, 43 percent of households sampled in 2004 will be unable to maintain their standard of living in retirement even if they retire at age 65, which is above the current average. An analysis by age group indicates that the situation gets more serious over time. As shown in Figure 1, about 35 percent of the Early Boomers (those born between 1946 and 1954) will not have an adequate retirement income. This share increases to 44 percent for the Late Boomers (those born between 1955 and 1964), and then rises to 49 percent for the Generation Xers (those born between 1965 and 1972).[2] This pattern of increasing risk reflects the longevity and retirement income issues discussed above.

Figure 1. Percent of Households 'At Risk' by Birth Cohort

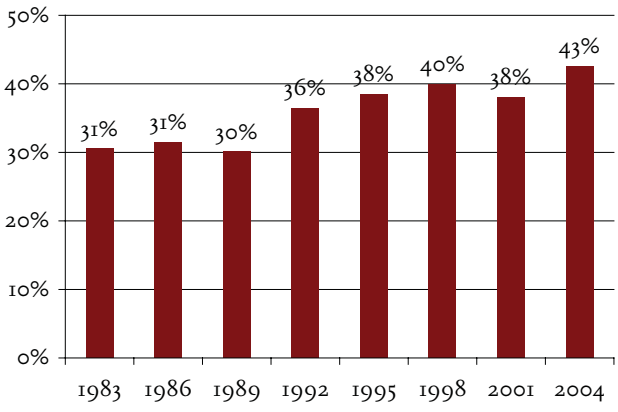


Source: Center for Retirement Research at Boston College (2006).

The NRRI: 1983-2004

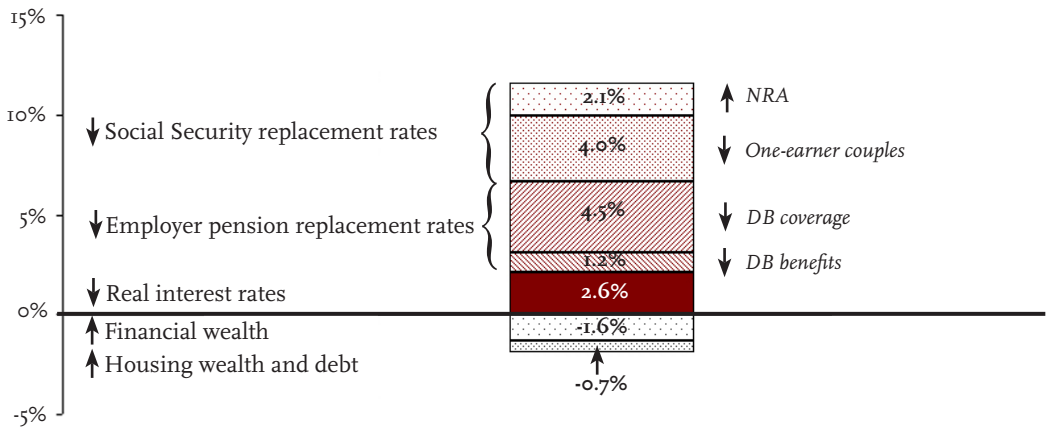
The original report also presented the NRRI over the 1983-2004 period (see Figure 2). The earlier values of the Index were derived by projecting replacement rates for the population in, say, the 1983 *Survey of Consumer Finances* and comparing those replacement rates to the relevant targets. As shown in Figure 2, the NRRI has increased by 12 percentage points between 1983 and 2004.

Figure 2. The National Retirement Risk Index, 1983-2004



Source: Center for Retirement Research at Boston College (2006).

Figure 3. Increase in Percentage 'at Risk' from 1983 to 2004 by Contributing Component



Source: Authors' calculations based on Center for Retirement Research at Boston College (2006).

Figure 3 breaks down the 1983-2004 change in the NRRI into the contributing components. The top part of the figure shows the factors that have increased the NRRI: 1) a decrease in Social Security replacement rates due to the decline in one-earner couples and the increase in the NRA from 65 to 67; 2) the reduction in private pension replacement rates due to the shift from traditional defined benefit plans to 401(k) plans, which have modest balances; and 3) the reduction in the stream of income from various asset accumulations due to the decline in real interest rates. Offsetting these negative factors are two positive developments: an increase in financial assets most likely due to the run-up of the stock market; and an increase in the percentage of home equity potentially accessible through reverse mortgages. The remainder of this section describes each development in more detail.

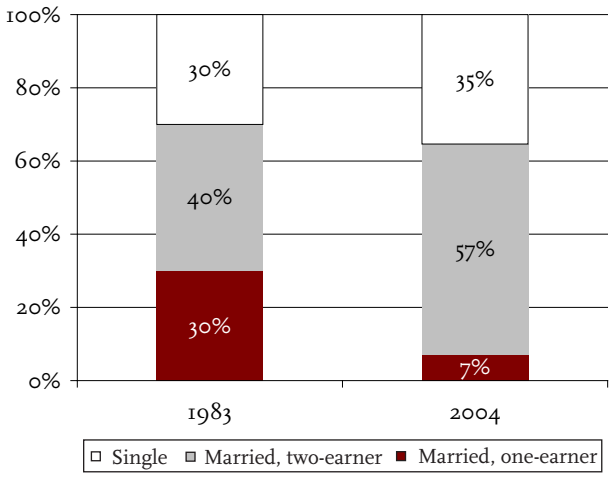
Reduction in Social Security Replacement Rates

The most important reasons for the increase in the NRRI relate to changes in Social Security replacement rates. First, as shown in Figure 4, the percentage of one-earner couples has fallen significantly, and one-earner couples have higher replacement rates than two-earner couples or single households.[3]

Higher benefits for one-earner couples are virtually inevitable in a system that provides a 50-percent spouse's benefit. As women go to work, they increase the family's pre-retirement earnings but often fail to increase the couple's Social Security benefit in retirement. Thus, the average Social Security replacement rate for one-earner couples in 2004 was 56 percent compared to 32 percent for two-earner couples. The increase in the percent of households receiving the lower rate relative to 1983 reduces Social Security replacement rates and increases the NRRI.

The second factor leading to a decline in Social Security replacement rates is the increase in Social Security's NRA — the age at which participants are entitled to full benefits — from 65 to 67. The increase, which was legislated in 1983, is being phased in gradually, as shown in Table 1.

Figure 4. Household Composition by Marital Status, 1983 and 2004



Source: Authors' calculations based on U.S. Board of Governors of the Federal Reserve System (1985 and 2006).

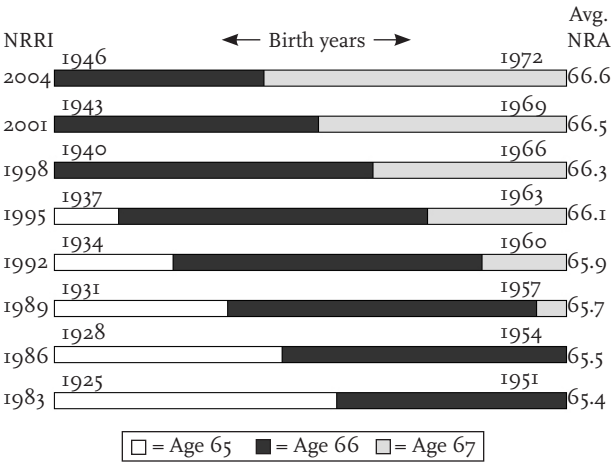
Table 1. Social Security's Normal Retirement Age

Birth year	Normal Retirement Age
1938	65 and 2 months
1939	65 and 4 months
1940	65 and 6 months
1941	65 and 8 months
1942	65 and 10 months
1943-1954	66
1955	66 and 2 months
1956	66 and 4 months
1957	66 and 6 months
1958	66 and 8 months
1959	66 and 10 months
1960 and later	67

Source: U.S. Social Security Administration (2006).

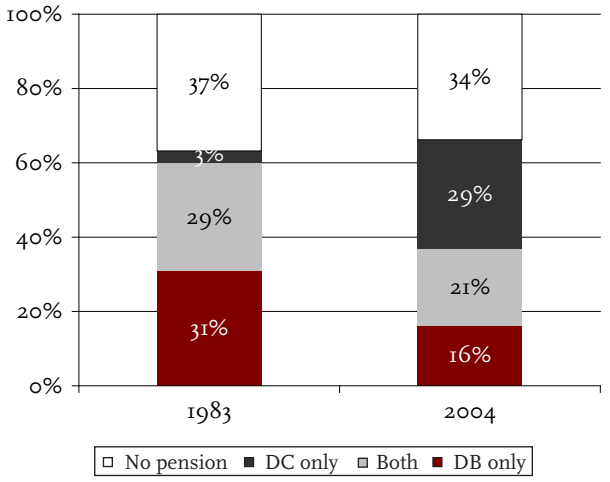
Figure 5 shows how the increase in the NRA affects working-age households in the various *Surveys of Consumer Finances*, which constitute the basis for the earlier NRRI estimates. For example, in 1983 about half the households in the age range considered by the NRRI were born before 1938, so they could claim full benefits at 65. The remainder of the 1983 population, born in 1938 or later, faced a NRA greater than 65 but no more than 66. By the time of the 1989 *Survey of Consumer Finances*, a small portion of households, born after 1954, faced a NRA greater than 66 and less than 67. Finally, by 2004, all households were required to wait until at least 66 and many until 67 to receive full benefits. A one-year increase in the NRA reduces replacement rates by about 2.8 percentage points, so as the age rises, the NRRI increases.

Figure 5. Normal Retirement Age for Different NRRI Cohorts, 1983-2004



Note: The Normal Retirement Age is rounded to 65, 66, and 67 for clarity, even though for many birth cohorts the retirement age will include fractions of a year.
Source: U.S. Social Security Administration (2006).

Figure 6. Households by Type of Pension Coverage, 1983 and 2004



Source: Authors' calculations based on U.S. Board of Governors of the Federal Reserve System (1985 and 2006).

Shift in Pension Coverage

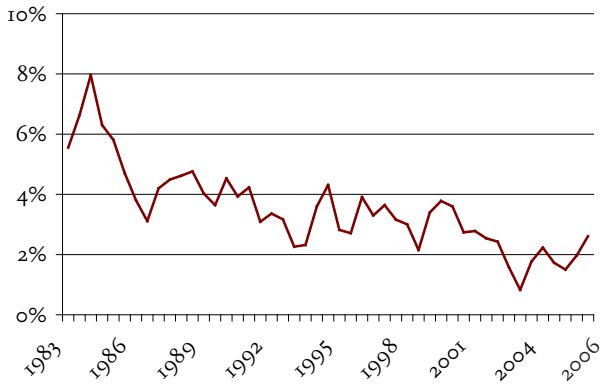
The second largest reason for the increase in the NRRI is the shift in the composition of pension coverage from defined benefit to defined contribution plans — primarily 401(k) plans. As shown in Figure 6, in 1983 most households with a pension were covered by a defined benefit plan, either solely or with a supplemental defined contribution plan; virtually none relied only on a defined contribution plan. By 2004, the picture had changed dramatically; most households with pension coverage were covered by a defined contribution plan, either solely or with a supplemental defined benefit plan. Since overall coverage remained virtually the same, the impact of the shift in pension coverage arises from the fact that benefits projected from 401(k)s are smaller than those projected from defined benefit plans.[4]

As noted above, it was not inevitable that the shift in pension coverage would produce lower benefits. In theory, workers could do equally well under either arrangement. But 401(k) plans place all the risk and responsibility on the individual, and individuals make numerous mistakes. More than one-fifth of those eligible to participate choose not to do so. Over half fail to diversify their investments. Many over-invest in company stock. Most importantly, many cash out when they change jobs. As a result, in 2004 the median 401(k)/IRA balance for a head of household aged 55 to 64 was only $60,000.[5] This amount would purchase an inflation-indexed annuity of only $250 a month at current annuity rates.

Decline in Real Interest Rates

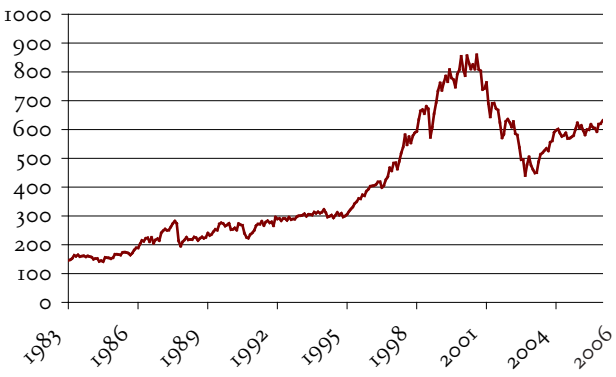
The final factor leading to the increase in the NRRI between 1983 and 2004 is the decline in real interest rates, as measured by the ten-year Treasury bond interest rate minus anticipated inflation over the same ten-year period (see Figure 7). Lower interest rates mean that households get less income from annuitizing their wealth. A retiree with $100,000 will receive $605 per month from an inflation-indexed annuity when the real interest rate is 5 percent compared to $419 per month when it is 2.5 percent.[6] The NRRI assumes that three types of wealth are annuitized at retirement: financial assets, 401(k) balances, and money received from a reverse mortgage on the household's primary residence. Lower interest rates reduced the annuity income from all three sources. However, with respect to housing, the decline in interest rates also resulted in increases in the percentage of the value of the house that could be borrowed through a reverse mortgage — an issue that will be discussed below.

Figure 7. Real Ten-Year Interest Rate, 1983-2006



Sources: Authors' calculations based on U.S. Board of Governors of the Federal Reserve System (2006) and Federal Reserve Bank of Philadelphia (2006).

Figure 8. Standard and Poor's 500 Index, 1983-2006 (1983 dollars)



Sources: Yahoo Finance! (2006) and U.S. Bureau of Labor Statistics (2006).

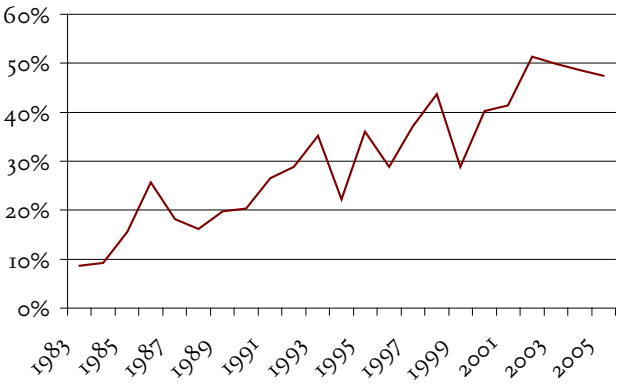
Offsetting Developments

Two developments — an increase in financial wealth and an increase in the potential proceeds from reverse mortgages — mitigated the increase in the NRRI. The first is straightforward; the second extremely complicated.

Increase in financial wealth. Between 1983 and 2004, projected financial wealth at retirement rose by one-third relative to income. This increase most likely reflected the dramatic rise in the stock market, which, despite the decline in 2000, more than tripled in real terms over the period (see Figure 8). All else equal — that is, abstracting from the decline in interest rates that occurred — the increase in financial wealth partially offset the negative factors discussed above.

Change in housing wealth and mortgage debt. Changes in housing wealth and mortgage debt affect the NRRI in a couple of ways, one of which interacts with interest rates. First, the amount that can be borrowed through a reverse mortgage crucially depends on interest rates. Interest payments are added to the loan principal over the life of the loan. The higher the interest rate, the more rapidly the outstanding balance will increase. Accordingly, at higher interest rates lenders will offer a smaller proportion of the

Figure 9. Percentage of House Value that Could Be Borrowed at Age 65, 1983-2005

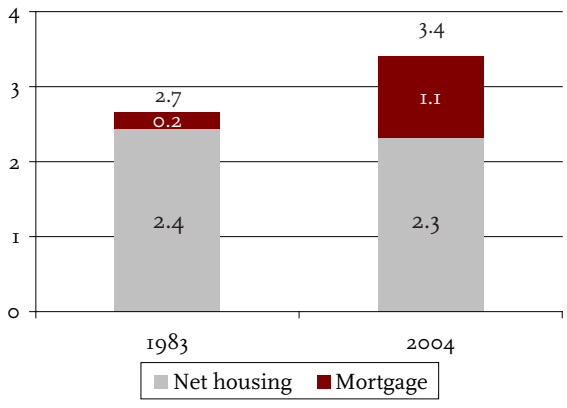


Note: 1) This figure assumes a $200,000 house, a 1.5 percent lender's margin and the closing cost estimates used in AARP's online reverse mortgage loan calculator. 2) HECM loans have only been available since 1990, so amounts for 1983 to 1989 represent the percentages that could have been borrowed had they been available.
Source: Eschtruth, Sun, and Webb (2006).

value of the house. As shown in Figure 9, a 65-year-old household could borrow 10 percent of the value of their house in 1983, compared to almost 50 percent in 2004.

The second factor affecting the amount of money that a household can extract is the value of the house. As shown in Figure 10, gross housing wealth increased from 2.7 times income in 1983 to 3.4 times income in 2004, reflecting the strong housing market of the last few years. Thus, the increase in the value of gross housing reinforces the effect of interest rates and further increases the dollar amount that households can potentially withdraw from their houses in retirement.

Figure 10. Net Housing Wealth and Mortgage Debt as a Ratio to Income at Age 62, 1983 and 2004



Source: Authors' calculations based on U.S. Board of Governors of the Federal Reserve System (1985 and 2006).

Unfortunately, that is not the end of the story. At the same time that gross housing values increased, mortgage debt also rose substantially. The rise in mortgage debt means that some households will not only be ineligible to take out a reverse mortgage, but will also face substantial mortgage payments during retirement. This mortgage effect dampens the favorable impact of the growth in gross housing wealth and the ability to borrow a larger percentage of the value of the house, so that on balance housing has only a modest positive impact on the NRRI between 1983 and 2004.

The NRRI 2004-2006

Having identified the key levers that moved the NRRI between 1983 and 2004, it is possible to update it. The original Index was based on the world at the time of the 2004 *Survey of Consumer Finances*, and therefore should be viewed as the June 2004 NRRI. More than two years have passed, so it is useful to update the NRRI to June 2006.

In updating the Index, decisions are required as to when to reflect the change in the Index and the extent to which it should affect different age groups. The rules adopted for updating the Index are as follows: 1) Disregard small fluctuations in asset prices, with "small" defined as any change that is less than one standard deviation from the long-term trend. 2) Taper the impact of asset price fluctuations and interest rate changes so that the Index incorporates all of the change for households approaching retirement, part of the change for younger households, and none of the change for the youngest.

Several factors that were influential in the 1983-2004 NRRI changes — stock prices, pensions, and Social Security — had no effect on the update from 2004 to 2006. The movement in stock prices between 2004 and 2006 was disregarded, as it was below the above standard for determining whether to incorporate changes into the Index. No new data were available on the coverage and generosity of employer pensions, so the impact of these factors remained unchanged. Any changes will be incorporated when the 2007 *Survey of Consumer Finances* becomes available. Finally, Social Security's NRA did not change

for any of the age cohorts. While, as discussed below, the 2006 sample included fewer Early Boomers and more Generation Xers, the NRA for each group is the same for all birth years — 66 for the Early Boomers and 67 for the Generation Xers.[7]

The key factors affecting the Index over the two-year period are a rapid increase in both house prices and mortgage debt and a modest increase in interest rates.

Increase in Housing Wealth and Mortgage Debt

The most dramatic change over the two-year period was the run-up in gross housing wealth and mortgage debt. Since the changes in these components were both well above long-run trends (10 and 11 percent, respectively), they were reflected in the Index with the impact tapered by the household's age as described above.

The increase in real house prices, by itself, clearly helps households approaching retirement by allowing them to borrow more on reverse mortgages than previous age groups, even after accounting for the increase in interest rates. However, the favorable impact of rising house prices was offset by a surge in mortgage debt. Households taking a reverse mortgage must first use the proceeds to repay their existing mortgage. So only the amount of the reverse mortgage in excess of the first mortgage is available to purchase an annuity. On balance, the higher mortgage debt almost completely cancelled out the positive impact of higher home prices, leading to no change in the 'at risk' status of Early Boomers, Late Boomers, or Generation Xers.

Increase in Real Interest Rates

Between June 2004 and June 2006, the real interest rate used in the NRRI rose from 2.2 to 2.6 percent.[8] The analysis assumes that 2004 interest rates are the best available estimate of interest rates over the long term but that current interest rates give some indication of likely levels over the short term.[9] Overall, this treatment results in a modest increase in annuity rates that is only slightly offset by continuing improvements in longevity.[10] The changes in annuity rates resulted in a 0.1 percentage point decrease in the Index for Early Boomers and little change for later cohorts.

Overall Effect

Although the changes described above had virtually no net impact on the 'at risk' status of any of the age cohorts, the NRRI rose slightly — to 44 percent. How can that be? The answer is that the composition of the sample changed in order to maintain the same age range as the original Index (households aged 32 to 58). Keeping the age range constant means that two years of lower risk Early Boomers (those born in 1946 and 1947) were replaced by two years of higher risk Generation Xers (those born in 1973 and 1974). Thus, as shown in Table 2, the weight applied to the updated Index for the Early Boomers declined from the original sample, while the weight applied to the higher risk Generation Xers increased, so that the overall Index increased modestly.

Table 2. Percent of Households 'At Risk' at Age 65 by Birth Cohort, 2004 and 2006

	2004			2006		
	Birth years	'At risk'	Percent of sample	Birth years	'At risk'	Percent of sample
Early Boomers	(1946-1954)	35.3 %	31.9 %	(1948-1954)	35.4 %	24.9 %
Late Boomers	(1955-1964)	44.4	41.5	(1955-1964)	44.3	40.7
Generation Xers	(1965-1972)	48.6	26.6	(1965-1974)	48.4	34.4
All		42.6	100.0		43.5	100.0

Source: Authors' calculations based on Center for Retirement Research at Boston College (2006) and updates.

Conclusion

From 1983 to 2004, the percent of households 'at risk' of being unable to maintain their living standard in retirement rose substantially from 31 percent to 43 percent. This change was driven by declining Social Security replacement rates, the shift to 401(k) plans, and declining interest rates.

Using the levers that moved the NRRI between 1983 and 2004 to update the NRRI to 2006 had virtually no effect on the 'at risk' status of Baby Boomers or Generation Xers. But because of the increasing weight on the high-risk Generation Xers, the update produced a slight change in the overall NRRI to 44 percent. This high level continues to raise serious concerns for future retirement security.

The situation is not hopeless, however. Sensitivity analyses of the Index results show that changing retirement and savings behavior can have a major impact. For example, if people were to retire at age 67 rather than the assumed base case of 65, the share of households 'at risk' would drop by 11 percentage points. Similarly, if people could save 3 percent more of their earnings each year, the percent 'at risk' would decline eventually by 11 percentage points. The purpose of the NRRI is to provide today's workers with the information they need to change their behavior so that they and their families can enjoy a secure retirement.

Endnotes

1 For further details on 401(k) missteps, see Munnell and Sundén (2006).

2 This sample does not include Generation Xers born after 1972.

3 One-earner households, as defined here, are those households in which the non-working spouse has less than 40 quarters of covered earnings for Social Security purposes.

4 An additional factor is a decline between 1983 and 2004 in the projected generosity of benefits payable under defined benefit plans.

5 Munnell and Sundén (2006). This amount includes Individual Retirement Account (IRA) balances, because most of the money in IRAs is rolled over from 401(k) plans.

6 This calculation is made by determining the expected present value of an annuity using the current ten-year Treasury bond interest rate and then calculating annuity rates at other interest rates, using the same expected present value. In practice, insurance companies offering inflation-linked annuities do not hedge their liabilities by investing in Treasury bonds or indeed in Treasury Inflation Protected Securities (TIPS), and the duration of annuities exceeds ten years. But calculations based on an assumption that insurers price annuities by reference to the yield on ten-year Treasury bonds provide reasonable estimates of the effect of *changes* in interest rates and anticipated inflation on annuity rates.

7 The updated results do not reflect any potential change in the composition of households — the other major factor affecting changes in Social Security replacement rates. No new data on household composition were available; any changes will be incorporated when the 2007 *Survey of Consumer Finances* becomes available.

8 This rate equals the yield on the ten-year Treasury bond, which increased from 4.7 to 5.1 percent, minus consensus inflation expectations, which remained unchanged at 2.5 percent.

9 Annuity rates are further adjusted to reflect the deletion from the sample of those born in 1946 and 1947 and the addition of those born in 1973 and 1974. Social Security Administration cohort mortality tables forecast that the younger households will enjoy substantially lower mortality than the older households. The projections of annuity rates used in the Index assume that trends in annuitant mortality will track the Social Security Administration's forecasts of trends in population mortality.

10 The Index numbers for 1983 to 2004 were constructed in June 2006. Lacking a complete historical series of annuity rates, Index calculations used an annuity expense load based on 2006 interest and cohort mortality rates, with annuity rates for earlier years based on the assumption that insurance companies applied the same expense loads to calculations based on prevailing interest rates and mortality projections.

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About the Center

The Center for Retirement Research at Boston College was established in 1998 through a grant from the Social Security Administration. The Center's mission is to produce first-class research and forge a strong link between the academic community and decision makers in the public and private sectors around an issue of critical importance to the nation's future. To achieve this mission, the Center sponsors a wide variety of research projects, transmits new findings to a broad audience, trains new scholars, and broadens access to valuable data sources. Since its inception, the Center has established a reputation as an authoritative source of information on all major aspects of the retirement income debate.

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