

# Should you carry a mortgage into retirement?

Author: Anthony Webb

Persistent link: <http://hdl.handle.net/2345/bc-ir:104273>

This work is posted on [eScholarship@BC](#),  
Boston College University Libraries.

---

Chestnut Hill, Mass.: Center for Retirement Research at Boston College, July 2009

These materials are made available for use in research, teaching and private study, pursuant to U.S. Copyright Law. The user must assume full responsibility for any use of the materials, including but not limited to, infringement of copyright and publication rights of reproduced materials. Any materials used for academic research or otherwise should be fully credited with the source. The publisher or original authors may retain copyright to the materials.

# SHOULD YOU CARRY A MORTGAGE INTO RETIREMENT?

BY ANTHONY WEBB\*

---

## Introduction

Although it remains the goal of many households to repay their mortgage by retirement, an increasing proportion now enters retirement with a mortgage. At the same time, households are increasingly likely to hold substantial amounts of financial assets, as a result of the growth of 401(k) and similar plans. Among households aged 60 to 69 in 2007, 41 percent had a mortgage.<sup>1</sup> Of these, 51 percent had sufficient assets to repay their mortgage.<sup>2</sup> These households could, if they wanted, be mortgage-free simply by selling some of their investments and mailing a check to the lender.

This *Issue in Brief* considers whether households should use retirement or non-retirement wealth to pay down their mortgage. It first shows that it is unlikely that many retired households will be able to earn a return on risk-free investments such as bank certificates of deposit, Treasury bills, and Treasury bonds that will exceed the cost of their mortgage.<sup>3</sup> Liquidity considerations aside, households holding such assets will generally be better off using them to pay down their mortgage. It then considers and (for most households) rejects the argument that households should retain their mortgage because they can

earn a higher expected return in stocks and other risky assets. It concludes with practical advice for most households.

## The Risk-Free Case

A household that chooses not to repay a mortgage is, in effect, choosing to finance the ownership of its financial assets with borrowed money. If the after-tax return on the household's risk-free assets, such as bank certificates of deposit, Treasury bills, and Treasury bonds, exceeds the after-tax interest cost of the mortgage, the household has an opportunity to make a risk-free profit. As discussed below, this situation is rare and, liquidity considerations aside, the household will generally be better off using such assets to pay down its mortgage.

Consider first a single period choice in which the household must decide whether to withdraw some short-term deposits to repay its mortgage now, or delay one year. It is optimal to delay repaying the mortgage for one year if the after-tax interest rate on the household's short-term deposits exceeds the after-tax cost of the mortgage.

---

\* Anthony Webb is a research economist at the Center for Retirement Research at Boston College. The Center gratefully acknowledges AARP for its exclusive financial support of this *Issue in Brief*. This *brief* provides general guidance that may be useful in many circumstances. However, for any specific household, an investment or financial planning strategy should be based on the particular household's personal and financial circumstances. The authors strongly recommend that households seek appropriate financial advice prior to making any financial decisions.

If the household holds financial assets in both taxable and tax-advantaged accounts (e.g., IRAs and 401(k)s), it will generally make sense to first use lower return taxable accounts to repay the mortgage and only then use money in tax-advantaged accounts. If  $r$  equals the pre-tax interest rate on risk-free assets and  $t$  is the household's marginal tax rate, the relevant interest rate on the household's short-term deposits will be  $r(1-t)$  up to mortgage prepayments equaling the amount in taxable accounts, and  $r$  thereafter for the tax-advantaged accounts.<sup>4</sup> If the household only has money in tax-advantaged accounts, the relevant interest rate is simply  $r$ .<sup>5</sup> The after-tax mortgage cost will equal  $i$ , the mortgage interest rate when the household does not itemize its tax deductions, and  $i(1-t)$ , when it does.

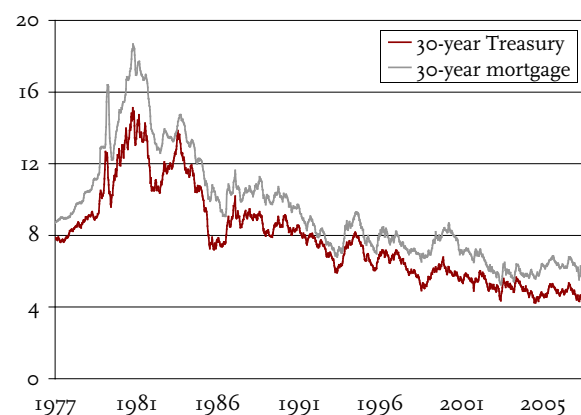
To make the example concrete, assume that the mortgage interest rate,  $i$ , equals five percent, about the average for newly-originated 30-year mortgages (a historically low rate). If the household does not itemize, this is both the before and after-tax interest rate. If the household itemizes and faces a tax rate of 0.25 (25 percent), the after-tax cost would be 3.75 percent.<sup>6</sup>

Assume that the interest rate on short-term deposits,  $r$ , is 3.0 percent, significantly above the interest rate at the time of writing.<sup>7</sup> At our assumed 25 percent tax rate, the household earns a net return of only 2.25 percent on money invested in a taxable account, and the household would be better off repaying its mortgage whether or not it itemizes. Table 1 presents the above example as a general rule.

An alternative to investing in short-term deposits is to invest in Treasury bonds of longer durations. This strategy is not risk-free over one year (because the price at which the bond could be sold at one year hence is unknown), but is risk-free if the household holds the bond to maturity.<sup>8</sup> As longer maturity investments usually pay higher returns, a household has a better chance of making a risk-free profit following this strategy.

Figure 1 compares the 30-year Treasury bond interest rate with the 30-year mortgage rate over the last 30 years.<sup>9</sup> The mortgage interest exceeded the Treasury rate throughout this period, sometimes by substantial amounts, so households could only have been better off retaining their mortgage if they were itemizing, facing a significant marginal tax rate, and unable to repay their mortgage by drawing on non tax-deferred assets. Our analyses of the Federal Reserve's *Survey of Consumer Finances* indicate that this combination of circumstances is quite unusual. For most households, there are no risk-free profits to be earned by retaining a mortgage.

FIGURE 1. INTEREST RATE ON 30-YEAR TREASURIES AND ON NEWLY-ORIGINATED 30-YEAR MORTGAGES, 1977-2008



Source: Federal Reserve Bank of St. Louis (2008).

## The Risky Case

So far, we have restricted our analysis to strategies that are guaranteed to leave the household no worse off. But an alternative for households that choose not to repay their mortgage is to invest in stocks. Stocks

TABLE 1. RULES-OF-THUMB FOR DECIDING WHETHER TO REPAY A MORTGAGE

Investments held in:	If household itemizes, repay if:	If household does not itemize, repay if:
Taxable account	Return on risk-free assets less than mortgage interest rate	$(1-t)$ times return on risk-free assets less than mortgage interest rate
Tax-advantaged account	Return on risk-free assets less than $(1-t)$ times mortgage interest rate	Pre-tax return on risk-free assets less than pre-tax mortgage interest rate

Note:  $t$  is the household's marginal tax rate.

Source: Author's analysis.

offer a higher expected return than the interest cost of the mortgage, but also carry the risk of loss. Over the period 1925-2006, stocks yielded an average real return of 7.1 percent.<sup>10</sup>

Although many financial advisers recommend that retired households invest their financial assets in a mixture of stocks and bonds, only a very small minority of retired households has all, or almost all, of their financial assets invested in stocks. As discussed below, all except this small minority will be better off repaying their mortgage.

Consider a retired household under two scenarios – in each scenario, it starts with \$200,000 in financial assets and a \$100,000 mortgage. In Scenario 1, it chooses to repay its \$100,000 mortgage. It can allocate its remaining \$100,000 in financial assets between stocks and bonds. Stocks offer a higher expected return, but at the cost of additional risk. After taking appropriate advice, it decides to allocate its \$100,000 wealth 50:50 between stocks and bonds, investing \$50,000 in each category.

In Scenario 2, the household decides not to repay its mortgage. It now has \$200,000 to invest and has to decide whether to invest more than \$50,000 in stocks. Leaving aside the mortgage prepayment option, mortgages and bonds are mirror images of each other.<sup>11</sup> A household investing in a bond is purchasing an obligation entered into by a borrower, usually a company, or some government body, to make periodic interest payments on a loan, and to repay the amount borrowed at some future date. A home mortgage is a loan made to a borrower household, typically at a fixed interest rate, and with a fixed repayment schedule.

Assume for ease of illustration that the after-tax return that the household can earn on risk-free bonds exactly equals the after-tax interest cost of the mortgage. Then, in Scenario 2, the household could simply invest the additional \$100,000 in risk-free bonds, with the result that its new portfolio produced the same return for the same risk as in Scenario 1 (see Figure 2).

But might the household in Scenario 2 instead prefer a different portfolio, say \$60,000 invested in stocks and \$140,000 in bonds. The answer is “no!” In Scenario 1, the household could have achieved the balance of risk and reward that goes with a \$60,000/\$140,000 portfolio and a \$100,000 mortgage by choosing a \$60,000/\$40,000 portfolio and \$0 mortgage, but chose not to. In short, the household doesn’t need to retain its mortgage to attain its preferred combination of investment risk and return.

FIGURE 2. ALTERNATIVE INVESTMENT SCENARIOS THAT PRODUCE THE SAME RISK-RETURN PORTFOLIO

Scenario 1: Repay Mortgage	
Assets	Liabilities/net worth
Stocks \$50,000	Net worth \$100,000
Bonds \$50,000	

Scenario 2: Retain Mortgage	
Assets	Liabilities/net worth
Stocks \$50,000	Net worth \$100,000
\$50,000	
Bonds \$150,000	Mortgage \$100,000
\$100,000	

Source: Author’s illustration.

The sole exception to the above rule is the rare case where the household’s optimal investment in stocks exceeds the size of the portfolio it would retain were it to repay its mortgage – the \$100,000 in the above example. That is, the household is so risk tolerant that it wants to play the stock market with borrowed money. Very few retired households appear to want to adopt such a strategy, and with good reason,

given its inherent risks. The remainder of the population can get all the exposure to the stock market they want without keeping a mortgage in retirement.

## Conclusion

The above analysis indicates that retired households are, in theory, better off repaying their mortgage. In addition to this theoretical conclusion, there is also a very practical argument against borrowing to invest. If a household with a mortgage mismanages its investments, or over-estimates the rate at which it can decumulate those investments, it risks losing the house, its only remaining asset.

One argument that is sometimes cited in favor of not repaying the mortgage is that retaining a mortgage increases the household's liquidity, and enables it to better cope with sudden unexpected expenses. But households that retain a mortgage need to consider what they would do if the bad event actually happened – i.e., how they would maintain their mortgage payments once their financial assets had been spent.

## Endnotes

1 Authors' calculations based on the 2007 *Survey of Consumer Finances*.

2 Twenty-nine percent of households had sufficient non-retirement financial assets to repay their mortgage, while an additional 22 percent could repay their mortgage by tapping both retirement and non-retirement assets.

3 Bank deposits are insured by the Federal Deposit Insurance Corporation up to a limit of \$250,000 per depositor, per insured bank.

4 Amromin, Huang, and Sialm (2008) argue that many working-age households can perform tax arbitrage by cutting back on mortgage prepayments and increasing their contributions to tax-deferred accounts. Their analysis is less applicable to retired households who generally face lower marginal tax rates. In contrast to working-age households who may wish to retain non tax-deferred assets for liquidity reasons, retired households over age 59 ½ are free to draw on tax-deferred assets without penalty. For these households, the appropriate margin of substitution is first between mortgage prepayments and lower yielding taxable accounts.

5 In the case of Roth IRAs, the intuition for using the pre-tax interest rate is clear – taxes are paid up front and no taxes are due upon withdrawal. The intuition for using a pre-tax rate for 401(k)s is more complicated, since 401(k) assets *are* taxed upon withdrawal. The following example may help. Consider a household with a constant marginal tax rate of 30 percent and \$100 invested in a Roth IRA and \$100 in a 401(k), each earning a 10% rate of interest. During the year, it earns \$10. In the Roth IRA, the household would now have \$110 at year end ( $100 \times 1.10 = \$110$ ). In the 401(k), however, the \$100 at the beginning of the year is really only \$70, because the household would have owed \$30 in taxes if it withdrew the money at the start of the year. In other words, unlike the Roth IRA, some of the balance in the 401(k) account is 'borrowed' from the government. Thus, if the household waited until year end, it would have \$77 in its 401(k) (\$110 less \$33 in taxes payable on withdrawal), and would have again earned a 10% return ( $\$70 \times 1.10 = \$77$ ).

6 The 25 percent is purely for illustrative purposes. There is considerable heterogeneity in marginal tax rates, depending on income and state of residence, among other factors. The taxation of Social Security benefits depends on modified adjusted gross income (MAGI). A household that retains its mortgage and retains investments in taxable accounts will increase its MAGI, potentially increasing both the proportion of Social Security benefits subject to taxation and its effective marginal tax rate. Our analyses of the *Survey of Consumer Finances* show that over 70 percent of 60-69 year old households with mortgages and with sufficient non-retirement or total financial assets to repay their mortgage do in fact itemize.

7 Longer-term averages, however, are closer to the 3.0 percent figure. For example, the one-year Treasury bill averaged 3.25 percent over the ten years ending July 10, 2008.

8 Amromin, Huang, and Sialm (2006) propose that households invest in higher return mortgage-backed securities, but these are not risk-free.

9 The data are published by the Federal Reserve Bank of St. Louis. There is a four-year gap between 2002 and 2006 when 30-year Treasuries were not issued. In theory, some households could be better off not repaying their mortgage if interest rates had increased between the time it was taken out and the current date.

10 Academic economists disagree about whether there has been a narrowing of the so-called “equity premium” – the amount by which the expected return on equities exceeds the return on safe investments. A recent survey of professional forecasters yielded an average estimate of a 4.6 percent real return on stocks over the next 44 years. In another survey, economists forecast 2.5 percent inflation over the next ten years, implying an average 7 percent nominal return before taking account of the effects of inflation.

11 This statement ignores the risk of default.

## References

- Amromin, Gene, Jennifer Huang, and Clemens Sialm. 2006. “The Tradeoff Between Mortgage Prepayments and Tax-Deferred Retirement Savings.” Working Paper No. 12502. Cambridge, MA: National Bureau of Economic Research.
- Federal Reserve Bank of St. Louis. 2008. *Interest Rates on Federal Treasury Bonds and on Newly-Originated Mortgages, 1977-2008*. St. Louis, MO.
- U.S. Board of Governors of the Federal Reserve System. 2007. *Survey of Consumer Finances*. Washington, DC.

CENTER FOR  
RETIREMENT  
RESEARCH  
AT BOSTON COLLEGE

---

## 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.

## Affiliated Institutions

The Brookings Institution  
Massachusetts Institute of Technology  
Syracuse University  
Urban Institute

## Contact Information

Center for Retirement Research  
Boston College  
Hovey House  
140 Commonwealth Avenue  
Chestnut Hill, MA 02467-3808  
Phone: (617) 552-1762  
Fax: (617) 552-0191  
E-mail: [crr@bc.edu](mailto:crr@bc.edu)  
Website: <http://www.bc.edu/crr>