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Integrating Home Equity and Retirement Savings Through the "Rule of 30"

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In a recent SOA White Paper[1], Wade Pfau, Joe Tomlinson and Steve Vernon presented a wide-ranging review of the many retirement income generators (RIGs) presently available to retirees. Included among the RIGs considered were the obvious and most prevalent ones, i.e., defined contribution plans (most commonly the 401(k) account and rollover IRA), and the less obvious (but equally prevalent) one, home equity. Because 401(k) accounts and IRAs are generally invested in portfolios of securities, they will simply be referred to as "portfolios."

In a recently published paper in the *Journal of Financial Planning*[2], we presented the results of some research expanding upon earlier work that takes advantage of a symbiotic relationship between those two RIGs. The symbiosis is that home equity, accessed by means of a reverse mortgage credit line, can be used to offset the adverse sequence of investment returns incurred by portfolios that are being drawn upon. This use of home equity, referred to as a "coordinated strategy," results in greater inflation-adjusted cash flow to the retiree throughout a 30-year retirement than that provided by the conventional strategy. The conventional strategy is to draw from the portfolio alone, and then to establish and draw upon the reverse mortgage as a "last resort" only if and when the portfolio is exhausted or close to exhaustion.

THE RETIREES CONSIDERED

The use of home equity to enhance retirement income is an emerging topic in the financial planning arena. The concept was first formally introduced in the *Journal of Financial Planning* in 2012.[3] That paper, as well as a number of other papers presented since that time, examined model retirees whose ratios of home values to the value of their portfolios were, with surprising consistency, equal to 1:2 (i.e., 0.5). A couple of them suggested expanding the research to retirees with different ratios, but did not include any analysis of such expansion. We picked up that suggestion, and our paper summarized the analysis on an expansion of the range of retirees.

Drawing on the table of median amounts of home equity and retirement savings for various categories of retirees (or near-retirees) described in the SOA white paper, we considered four representative retirees; these retirees had ratios of home value to portfolio value at the endpoints of a range of ratios between 0.5 and 2.0. The values of their respective retirement income resources (meaning home value plus initial portfolio value) are set out in Table 1.

CASH FLOW SURVIVAL

Consistent with much of the recent literature, the primary economic concern we considered is cash flow survival throughout a 30-year retirement. Accordingly, the analysis focused on this concern. In this context, cash flow survival was defined as a 90 percent or greater probability of inflation-adjusted (constant purchasing power) cash flow throughout a 30-year retirement.

SUMMARY OF KEY FINDINGS

1. **Dollar amount of annual distribution resulting in cash flow survival constant for a wide range of ratios.** For any given amount of total retirement income resources, the *dollar amount* of initial withdrawal that resulted in cash flow survival was *constant* across a wide range of ratios of initial home value to initial portfolio value. That dollar amount was determined

Table 1
Table of Retirees: Their RIGs and Draw Amounts

	Home/Portfolio/Total	Draw under 3.2 Percent Rule	Draw under "Rule of 38"	Draw as Percent of Portfolio	Approximate Probability of 30-Year Cash Flow Survival
Retiree No. 1	$400k/$800k/$1200k	$25,600	$31,600	3.95 percent	90 percent
Retiree No. 2	$800k/$400k/$1200k	$12,800	$28,400	7.10 percent	90 percent
Retiree No. 3	$150k/$300k/$450k	$9,600	$11,850	3.95 percent	90 percent
Retiree No. 4	$300k/$150k/$450k	$4,800	$11,850	7.89 percent	90 percent

Note: Initial draw amounts that result in an approximately 90 percent probability of 30-year constant purchasing power cash flow survival when the Coordinated Strategy is used, with current investment return projections (as set out in Appendix B). (For Retiree No. 2, the rule of 38 only takes account of home value up to the HECM limit of $679,650.)

as a fraction of the retirees' total retirement income resources. The fraction is described in Key Finding 3. This finding resulted when the coordinated strategy was used for the withdrawals, but not when the last resort strategy was used.

2. **Initial distribution as a fraction of total retirement income resources resulting in cash flow survival constant for wide range of total resources**. Across a broad range of amounts of total retirement income resources, the applicable fraction was constant. In other words, in addition to the **range of ratios** described above, the fraction described below applies to a broad **range of amounts** of total retirement income resources.

3. **The specific value of the fraction referred to in Key Finding 1 and 2 is a function of investment return projections and HUD rules on mortgage insurance premiums (MIPs) and principal limit factors (PLFs)**. The relevant fraction is a function of the projected investment returns used in the Monte Carlo simulation as well as the MIPs charged by HUD and the PLFs prescribed by HUD. If the investment return projection figures used are consistent with historical averages and the reverse mortgage parameters are those in effect through Sept. 2017, the fraction turns out to be 1/30. Accordingly, the finding is termed the "Rule of 30." If more recent (and more conservative) projections of investment returns are used and current MIPs and PLFs are used (HUD changed these rates effective Oct. 2, 2017), the fraction turns out to be 1/38. However, it is important to note that investment return assumptions are also reflected in the more traditional measure of the "safe withdrawal rate" (e.g., with the more conservative investment assumptions noted above, the so-called "4% Rule" becomes a "3.2% Rule").

Graphic representations of these results are shown in the recent *JFP* paper.

THE ANALYSIS

The analytic technique was similar to that described by Sacks and Sacks: A spreadsheet model, using Monte Carlo simulation for the investment returns and inflation, was run for each of the four representative retirees. For each retiree, two worksheets were run simultaneously. The two worksheets were identical in all respects (including the investment performance of the portfolio, the rate of inflation, and the amount drawn by the retiree) *except* for the strategy used to determine whether the retirement income was withdrawn from the portfolio and/or from the reverse mortgage credit line. In other words, in one of the two worksheets the coordinated strategy was used, and in the other one the last resort strategy was used.

The spreadsheet model used the following input parameters: (1) initial value of the portfolio; (2) initial value of the retiree's home; and (3) initial withdrawal rate. The output was a graph of cash flow survival probabilities as a function of number of years in retirement.

> The dollar amount of annual distribution resulting in cash flow survival is constant for a wide range of ratios.

The portfolio in all cases was a 60/40 portfolio comprised of the indices of each asset class comprising the equity portion and the fixed income portion of the portfolio. The proportion of each asset class in the portfolio is specified in Appendix A. Each index is assumed to have a normal distribution. The assumed means and standard deviations of the returns of those indices are also specified in Appendix A.

For each set of initial portfolio value and initial home value, initial withdrawal rates were tried, until a rate was found that yielded a 90 percent probability of inflation-adjusted cash flow survival throughout a 30-year retirement. That initial withdrawal rate, as a fraction of the retiree's total retirement income resources, turned out to be equal to 1/38, across a range of ratios of initial home values to initial portfolio values (from 0.5 to 2.0) and across a range to total values of retirement income resources (from $450,000 to $1,200,000).

LIMITATIONS AND CAVEATS

The key findings described earlier are empirical observations; they are not mathematically determinable in closed form. Although these findings have been tested and validated for ratios of home value to initial portfolio value ranging from 0.5 to 2.0, it is not clear what the results would be for lower or higher ratios; that is, where there is little or no retirement savings portfolio or accumulated home equity. The findings presented are unlikely to have any application to a retiree whose total retirement income resources substantially exceed the HECM limit of $679,650 (e.g., by a factor of 5 or more).

The Monte Carlo simulations employed in the analyses presented are by nature stochastic. That is, each year's investment performance and inflation amount are treated as entirely independent of the previous year's parameters. Other approaches exist that suggest that financial processes are subject to homeostasis, a reversion to the mean, often resulting from government intervention—such as the Federal Reserve changing interest rates to bring down inflation.

The analyses and results reported assumed that the expected interest rates, and therefore the PLFs of the HECM credit

lines would remain constant. The expected rates are currently near the low ends of their ranges, so the PLFs, and therefore the amounts available from reverse mortgage credit lines, are near the high ends of their ranges. If the expected rates increase, the amounts available will decrease, and the effectiveness of the strategies considered will also decrease.

Finally, there has been no consideration in this paper of possible changes in the law or regulations governing reverse mortgages.

IMPLICATIONS FOR PLANNERS

The results presented have great significance for baby boomer retirees who have limited total resources and/or have a disproportionate amount of their wealth in the value of their home.

A simple Rule of 30 (currently a Rule of 38) can be used by a broad range of retirees to help determine how much retirement income their total retirement income resources can provide, with a small probability of outliving those resources. The availability of this rule can potentially make retirement income planning more straightforward for a large number of individuals currently considering their future retirement income needs.

In addition, the non-recourse feature of the HECM is significant over the long term (20-plus years into retirement). As a result, establishing a HECM line of credit as early as possible can provide many retirees—particularly those who are house-rich and cash-poor—with a significantly higher retirement income than a later establishment of the credit line, while reducing the probability of exhausting his or her assets. ■

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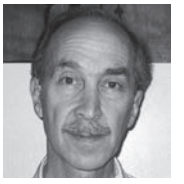

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ENDNOTES

1 "Optimizing Retirement Income Solutions in Defined Contribution Retirement Plans" (subtitled "A Framework for Building Retirement Income Portfolios.") Online at: *https://www.soa.org/.../research-2016-optimizing-retirement-income-framework-building-retiremen-income-portfolios.* May 1, 2016.

2 Neuwirth, Peter, Barry H. Sacks and Stephen R. Sacks. "Integrating Home Equity and Retirement Savings through the Rule of 30." *Journal of Financial Planning* 30 (10): 52-62.

3 Sacks, Barry H., and Stephen R. Sacks. 2012. "Reversing the Conventional Wisdom: Using Home Equity to Supplement Retirement Income." *Journal of Financial Planning* 25 (2): 43-52.

APPENDIX A

Composition of Portfolio and Projected Values of Geometric Means and standard deviations of the rates of return of each asset class (based on current conservative estimates) used in the Monte Carlo simulations.

Asset Class	Percentage in Portfolio	Geometric Mean	Standard Deviation
S&P 500	40%	7.00%	20.00%
U.S. Small Stock (Ibbotson)	10%	7.70%	22.00%
MSCI EAFE	10%	8.65%	22.50%
Lehman Bros. Long Term Govt./Cred Bond	10%	3.30%	12.00%
Lehman Bros. Int. Term Govt./Cred Bond	15%	3.50%	6.50%
U.S. 1-yr. Treasury	15%	3.30%	2.00%
Interest (incl. 1.8% LIBOR, plus 2.50% margin plus .5% MIP)		3.8%	1.0%
U.S. Inflation		2.0%	1.5%
Home value appreciation		2.0%	(assumed constant)