by JAVIER ESTRADA

The Retirement Glidepath: A Vote for Static Asset Allocations

Saving for retirement and spending during retirement require individuals to focus on three critical variables: their savings rate during the accumulation period, their withdrawal rate during the retirement (or distribution) period, and their asset allocation during both periods. This article focuses on how a portfolio's asset allocation should evolve during the retirement period.

The withdrawal rate during the retirement period has been the subject of considerable attention. Bengen (1994) pioneered two critical ideas: First, the "4% rule" to determine annual withdrawals and, second, the sustainability of that (or any other) withdrawal rule. Regarding the rule, he proposed to take an initial 4% of the nest egg in the first year of retirement and then adjust that initial withdrawal by inflation every subsequent year. Regarding sustainability of the rule, he found that a 50/50 stock/bond portfolio subject to this rule would have (historically) never been exhausted before 30 years of retirement, which led him to view the 4% rule as safe.

The literature spanned by Bengen (1994) is vast and considers, to name but a few topics, various methodologies, time periods, assets, asset allocations, acceptable failure rates, and retirement periods. Therefore, many different views exist regarding both the sustainability of the 4% withdrawal rate and the specific withdrawal rule recommended to retirees.

The focus of this article is on neither the optimal withdrawal rate nor the sustainability of any withdrawal rule; rather, the article addresses how a portfolio's asset allocation should evolve during the retirement period. Interestingly, some articles in the vast literature on retirement recommend a declining-equity glidepath (that is, an asset allocation whose proportion of equity decreases over time); others suggest an increasing-equity glidepath, a constant-equity glidepath, or a valuation-based glidepath (that is, an asset allocation in which the proportion of equity depends on whether the stock market is considered to be overvalued, undervalued, or fairly valued).

Ultimately, the recommendation of this article is to implement a static asset allocation, either (1) fully invested in stocks or (2) split 60% in stocks and 40% in bonds, which may be psychologically the easier allocation for most retirees to accept. These two strategies, in addition to being simple and easy to implement, have generally displayed good historical behavior. Relative to many other strategies, failure rates have been lower, bequests have been higher, and downside protection when tail risks strike has been better. The evidence leads to this conclusion.

RESEARCH METHOD AND RESULTS

The sample considered in Estrada (Forthcoming 2015) is the Dimson–Marsh–Staunton dataset for stocks and government bonds over the 1900–2009 period for 19 countries.[1] Annual returns for individual countries are real (adjusted by local inflation), in local currency, and account for both capital gains/losses and cash flows. In this article, only the US results are discussed. Stocks and bonds had annual (compound) returns of 6.2% and 1.9%, with volatility of 20.3% and 10.1%.

The analysis is based on a $1,000 nest egg at the beginning of retirement, an initial withdrawal rate of 4%, and a 30-year retirement period. At the beginning of each year, $40 (in real terms) is withdrawn, the portfolio is rebalanced right after to the target allocation for the year, and then it compounds at the observed return of stocks

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and bonds. This process is repeated at the beginning of each year during the 30-year retirement period. At the end of the retirement period, the portfolio has a terminal wealth or bequest that may be positive or zero.

The analysis focuses on each strategy's failure rate, defined as the proportion of the 81 retirement periods in which the portfolio is depleted before 30 years. (The 81 overlapping retirement periods considered are 1900–1929, 1901–1930,…, 1979–2008, and 1980–2009.) Also analyzed is the distribution of terminal wealth or bequest, which results from aggregating the 81 wealth levels at the end of each of the 81 retirement periods.

Eight dynamic strategies are considered—four featuring declining-equity (DE) glidepaths and four featuring rising-equity (RE) glidepaths. The four DE strategies start with allocations to stocks of 100%, 90%, 80%, and 70% at the beginning of the retirement period (with the rest of the portfolio invested in bonds) and end 30 years later with, respectively, 0%, 10%, 20%, and 30% in stocks. The four RE strategies considered are mirrors of the DE strategies and thus start with 0%, 10%, 20%, and 30% in stocks and end with 100%, 90%, 80%, and 70% in stocks. In all cases, the asset allocation between the beginning and the end of each 30-year retirement period changes annually and linearly over time. Results for these eight dynamic strategies for the United States are presented in **Table 1**, which shows failure rates and some characteristics of the distribution of terminal wealth or bequest across the 81 retirement periods.

As Table 1 shows, the failure rates for the DE strategies (8.6%, 6.2%, 4.9%, and 4.9%) are in all cases substantially lower than those for their RE mirrors (21.0%, 17.3%, 11.1%, and 8.6%). In other words, DE strategies during retirement lead to much lower expected probabilities of portfolio failure. These strategies also accumulate more (mean and median) wealth by the end of the retirement period than do RE strategies, and they also do so in particularly good periods (those occurring less than 1%, 5%, or 10% of the time and quantified by P99, P95, and P90 in Table 1). In short, DE strategies expose retirees to a much lower failure rate and a much higher upside potential than do RE strategies.

DE strategies keep retirees more uncertain about their terminal wealth or bequest, however, than do RE strategies, as indicated by their larger standard deviations, which measure the dispersion of the distribution of terminal wealth across the 81 retirement periods. Consider, however, the P1, P5, and P10 figures for bad retirement periods, defined as those that occur less than 1%, 5%, or 10% of the time. These data are what Estrada (2014b, 2014c) defined as "lower-tail terminal wealth," a measure of long-term risk that focuses on extreme and unlikely adverse scenarios. In this case, these data show that DE strategies provide the same as (or better than) downside protection—in the form of a higher terminal wealth or bequest—as RE strategies when tail risks strike. Put differently, to consider DE strategies as riskier than RE strategies is problematic if DE strategies

Table 1. Dynamic Strategies

	Proportion of Stocks in Portfolio at Beginning/End of Retirement Period							
Measure	**100/0**	**0/100**	**90/10**	**10/90**	**80/20**	**20/80**	**70/30**	**30/70**
Failure rate (%)	8.6	21.0	6.2	17.3	4.9	11.1	4.9	8.6
Terminal wealth ($)								
Mean	1,388	851	1,336	901	1,283	954	1,230	1,009
Median	947	171	873	293	908	424	951	527
P99	7,017	4,102	6,304	3,958	5,613	4,006	4,950	4,029
P95	5,913	3,824	5,493	3,553	5,063	3,468	4,627	3,476
P90	4,781	3,579	4,490	3,323	4,233	3,234	3,967	3,185
Std. dev.	1,412	1,178	1,314	1,108	1,224	1,056	1,146	1,027
P1	0	0	0	0	0	0	0	0
P5	0	0	0	0	0	0	0	0
P10	9	0	14	0	45	0	67	2

Notes: The proportion of the portfolio not invested in stocks is invested in bonds. Std. dev. = standard deviation. P99, P95, and P90 data represent the average terminal wealth for particularly good periods, as defined in the text. P1, P5, and P10 data represent the average terminal wealth during particularly bad periods, as defined in the text.

expose retirees to both a higher upside potential and better downside protection when tail risks strike. In such cases, a larger standard deviation indicates only higher uncertainty about how much *better* off, not worse off, a retiree will be after 30 years. This type of uncertainty is often referred to as "upside risk."

Table 2 shows in the first column results for a strategy that remains fully invested in stocks (100%) during the 30 years of retirement (100 × 30). The second column shows results for the best of the eight dynamic strategies reported in Table 1, defined as the one with the lowest failure rate. (The 80/20 and 70/30 strategies have the same failure rate, but the 80/20 strategy was selected because of its higher mean bequest.) The third column shows results for the best of 10 static strategies considered; these strategies are 90%, 80%,…, 10%, and 0% invested in stocks, with the rest invested in bonds). The best is the 90%. Finally, the last column shows results for a strategy that remains invested 60% in stocks and 40% in bonds for 30 years.

Relative to the best dynamic and static strategies considered here, the strategy that fully invests in stocks has the lowest failure rate (tied with the best static strategy at 3.7%). It provides the same or better downside protection when tail risks strike (measured by P1, P5, and P10), and it provides much higher upside potential (measured by the mean, median, P90, P95, and P99). Therefore, as discussed previously, the higher standard deviation of this strategy indicates only uncertainty about how much better off (not worse off) a retiree will be after 30 years.

So, although a strategy that fully invests a retirement portfolio in stocks can be *perceived* as riskier than most alternatives, is it? Is a strategy that has the lowest probability of failure and provides the same or better downside protection and higher upside potential as other strategies really riskier than other strategies simply because a retiree is more uncertain about how much *higher* his bequest will be? If not, then having a retirement portfolio fully invested in stocks is a strategy that retirees should seriously consider.

Finally, consider the 60 × 30 strategy. It performs just as well or better than the best of all dynamic strategies considered here in terms of the probability of failure, expected (mean and median) bequest, and downside protection when tail risks strike. Although it underperforms the all-equity strategy (and those heavily invested in stocks), nevertheless, it may be psychologically easier for many retirees to implement than a higher-equity strategy; not everybody is able to take the long view during retirement and ignore the short-term fluctuations that inevitably occur in the value of a portfolio. For such retirees, a 60 × 30 strategy is a plausible middle-of-the-road alternative.

FINAL THOUGHTS ON OPTIMAL RETIREMENT ASSET ALLOCATION

The US evidence analyzed here suggests that, relative to dynamic asset allocation strategies, a 60/40 stock/bond portfolio would provide retirees lower probabilities of portfolio failure, higher bequests, and better downside protection when tail risks strike. In fact, both evidence and simplicity support this static strategy, which is particularly relevant for those retirees who may fail to periodically adjust their portfolios in the methodical way required by rising-equity or declining-equity glidepaths. Furthermore, the combined results in Estrada (2014a) and Estrada

Table 2. Static Strategies

	Strategy			
Measure	100 × 30	Best Dynamic (80/20)	Best Static (90)	60 × 30
Failure rate (%)	3.7	4.9	3.7	4.9
Terminal wealth ($)				
Mean	3,077	1,283	2,607	1,437
Median	2,505	908	2,085	1,155
P99	11,858	5,613	9,360	4,615
P95	10,851	5,063	8,250	4,428
P90	9,263	4,233	7,260	4,079
Std. dev.	2,764	1,224	2,171	1,202
P1	0	0	0	0
P5	20	0	7	0
P10	149	45	149	86

(Forthcoming 2015) support the implementation of this simple strategy during both the accumulation *and* the retirement periods.

Nevertheless, although many retirees would be reluctant to hold portfolios fully invested in stocks, the evidence does support such a strategy. In fact, during both the accumulation period and the retirement periods, an all-equity strategy generally outperforms all others, including the 60/40 stock/bond allocation, in terms of the probability of failure, upside potential, and downside protection when tail risks strike.

In conclusion, note three final points. First, performance and simplicity seem to side with static glidepaths rather than dynamic ones. Second, downside protection when tail risks strike seems to be a better way to assess risk than uncertainty about terminal wealth, particularly when the tail risk is mostly upside risk. Third, exposure to stocks and bonds is, of course, not the only important financial decision retirees need to make, but implementing a simple and effective asset allocation certainly is a good starting point.

NOTES

1. The data are from Morningstar (http://datalab.morningstar.com/knowledgebase/aspx/Article.aspx?ID=409&Country=us).

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Author's Note: This article is based on my comprehensive study of asset allocation during retirement (Estrada Forthcoming 2015), which is a follow-up of a study that focused on asset allocation during the accumulation period (Estrada 2014a). Javier Zazurca provided valuable research assistance. The views expressed here and any errors that may remain are entirely my own.

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