

## Using a bond tent to navigate the retirement danger zone

Michael Kitces | Pinnacle Advisory Group | 07 October 2016

### EXECUTIVE SUMMARY

The final decade leading up to retirement, and the first decade of retirement itself, form a retirement danger zone whereby the size of ongoing contributions and the benefits of continuing to work are dwarfed by the returns of the portfolio itself. As a result of this "portfolio size effect", the portfolio becomes almost entirely dependent on getting a favorable sequence of returns to carry through.

And because the consequences of a bear market can be so severe when the portfolio's value is at its peak, it becomes necessary to dampen down the volatility of the portfolio to navigate the danger – a strategy commonly implemented by many lifecycle and target date funds, which use a decreasing equity glidepath that drifts equity exposure lower each year.

Yet the reality is that the retirement danger zone is still limited. After the first decade, good returns will have already carried the retiree past the point of danger, and bad returns at least mean that good returns are likely coming soon, as valuation normalises and the market cycle takes over. This means that while it's necessary to be conservative to defend against the portfolio size effect, it's not necessary to reduce equity exposure indefinitely.

Instead, the optimal glidepath for asset allocation appears to be a V-shaped equity exposure, that starts out high in the early working years, gets lower as retirement approaches, and then rebuilds again through the first half of retirement. Or, viewed another way, the prospective retiree builds a reserve of bonds in the final decade leading up to retirement and then spends down that bond reserve in the early years of retirement itself (allowing equity exposure to return to normal).

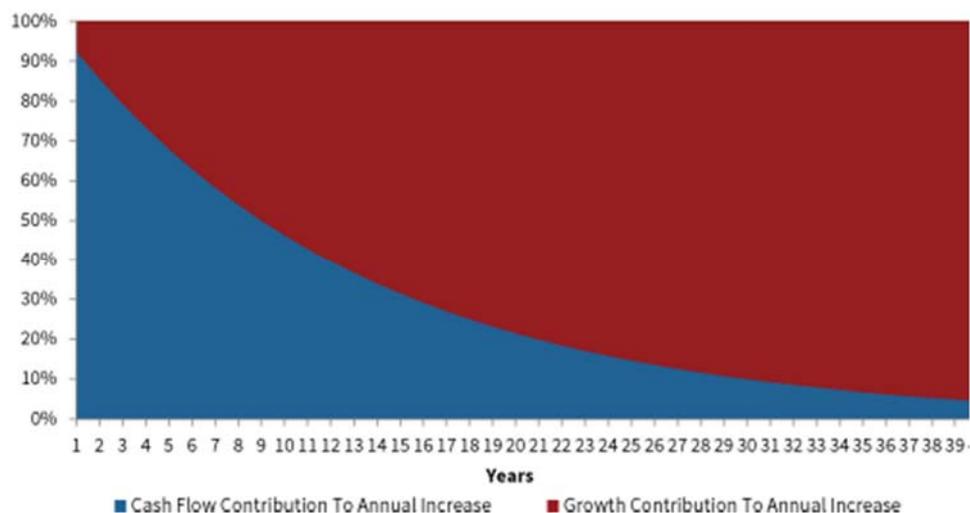
Ultimately, further research is necessary to determine the exact ideal shape of this "bond tent" (named for the shape of the bond allocation as it rises leading up to retirement and then falls thereafter). But the point remains that perhaps the best way to manage sequence of return risk in the years leading up to retirement and thereafter is simply to build up and then use a reserve of bonds to weather the storm.

## THE PORTFOLIO SIZE EFFECT AND THE RETIREMENT RED ZONE

Saving for retirement is often framed as a long-term effort of systematic saving and years of compounding growth. But the reality is that in the early years, whether you save is more important than the growth you earn, because the portfolio isn't large enough for the earnings to have a material impact. It's only after a decade or more of saving that eventually the annual return of the portfolio begins to trump the impact of the direct contributions to it (Figure 1).

For instance, saving \$300 a month allows an account balance to grow to \$3,600 by the end of the first year. In the second year, the account may grow slightly, but the increase in the account balance will again be driven primarily by the contributions (as a year's worth of growth may still be less than a single month's worth of contributions). After 10 years of the same behavior, though, suddenly only half of the annual increase in the account balance is driven by new contributions, while the remainder is driven by growth on the existing balance. After 20 years, growth will drive 75% of the annual increases in the account balance. After 30 years, it's almost 90%.

**Figure 1: Contributions to annual increases in account value**  
Investment growth vs new cash flow contributions



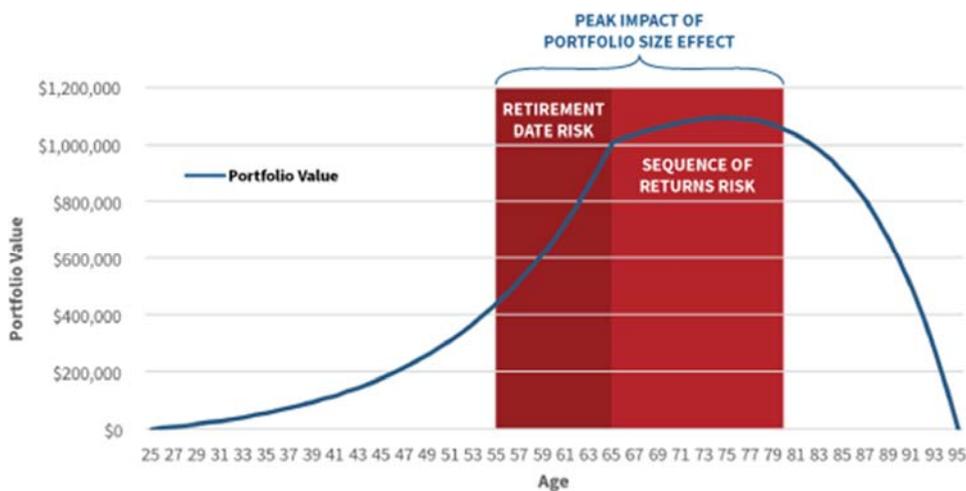
Source: Michael Kitces, [www.kitces.com](http://www.kitces.com).

This phenomenon is known as the "portfolio size effect" – the mathematical recognition that in dollar terms, the impact of a portfolio's returns is dependent on the portfolio's size. And while this mathematical truth may seem self-evident, it has significant implications for the accumulation and decumulation of retirement portfolios. The portfolio size effect means that not only does growth produce a greater dollar amount of gains on a larger portfolio, but a market decline also produces a larger dollar amount of losses.

In fact, this is one of the primary reasons why retirees face sequence of return risk in their first decade of retirement – because the portfolio is the largest in the first decade of retirement (even retirees who are “spending down” don’t normally spend more than their growth until at least the second decade of retirement). This means an ill-timed bear market takes its biggest financial slice when the portfolio's size is at its peak, potentially leaving the portfolio with too little in dollar terms to sustain the retiree's current standard of living. After all, a "mere" 20% decline on a portfolio in a bear market evaporates five years' worth of spending at a 4% withdrawal rate.

Similarly, prospective retirees in the final decade leading up to their retirement also face a problem with the portfolio size effect. The good news of a growing retirement portfolio is that it’s possible to bridge a significant shortfall in the retirement nest egg in just the last few years before retirement (because the growth is so significant in dollar terms as the account balance rises). The bad news, however, is that a bear market in the final years before retirement can set the retiree so far back that later years' ongoing contributions can't possibly make it up, forcing a substantial delay in retirement. In other words, the portfolio size effect leaves the prospective retiree increasingly exposed to substantial retirement date risk as the portfolio becomes almost entirely reliant on a few years' worth of growth to bridge the final gap.

Figure 2: The portfolio size effect and the retirement red zone



Source: Michael Kitces, www.kitces.com.

Simply put, the portfolio size effect leads to a substantial "retirement red zone" of danger that covers the final decade leading up to retirement, and the first half of retirement itself, where the portfolio's value is so large that a potential market decline can have a catastrophic impact (given a fixed standard of living that the portfolio is intended to support).

## MANAGING THE PORTFOLIO SIZE EFFECT WITH A V-SHAPED ASSET ALLOCATION GLIDEPATH

The double-edged sword nature of the portfolio size effect – that it makes good returns even better (in dollar terms), but market declines more adversely impactful – raises challenging questions about the optimal asset allocation glidepath through the accumulation and decumulation phase.

On the one hand, the fact that positive returns just do even more to get the prospective retiree to their nest egg goal suggests that portfolios should just continue to be aggressive, or even get more aggressive, as the retirement date approaches. After all, [Shiller](#) has noted it's rather ironic that savers would be more aggressive in the early years (when the growth has little positive financial impact) and conservative just as they approach retirement and the portfolio's size would make it easiest to catch up on any retirement shortfall. Similarly, [Basu and Drew](#) find that the amount of money a prospective retiree has on the retirement date is driven almost entirely by their asset allocation in the later years, and not the early years, given the portfolio size effect. And [Arnott](#) has called the presumed benefit of the conventional target date fund glidepath (decreasing equity exposure as retirement approaches) an illusion.

On the other hand, while growth can help more when the portfolio's size is larger, and markets do go up on average (and go up more often than they go down), it's important not to understate the consequences of how an ill-timed bear market can set back a retiree's goals. Especially when recognizing that compounding wealth beyond a certain point has diminishing marginal utility (i.e., extra growth from the portfolio size effect is nice, but the second million isn't nearly as rewarding as the first). And the research going all the way back to Kahneman and Tversky's Prospect Theory shows that we are risk averse in that we experience the pain of losses more than the upside benefit of gains. Accordingly, even though the portfolio size effect will arguably be positive more often than negative, [Wade Pfau](#) has shown that once a glidepath analysis incorporates these utility impacts, the conventional wisdom of decreasing equities in the years leading up to retirement makes sense after all.

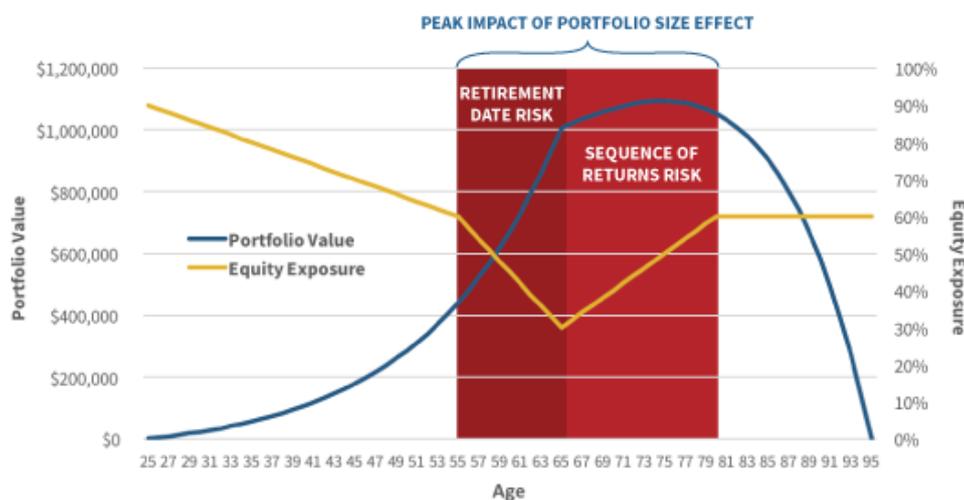
And, notably (as shown earlier), the potential adverse impact of the portfolio size effect applies in retirement as well. This in turn means getting more conservative with the portfolio as its value peaks is not just about reducing equity exposure in the years leading up to retirement, but also in the first decade of retirement, too. Accordingly, [our prior research for retirees found that a rising equity glidepath \(which is more conservative in early retirement and gets more aggressive later\) can also improve retiree outcomes](#), by limiting their exposure to potentially adverse market volatility when the portfolio size effect is greatest.

All of this means the optimal equity exposure to manage the risks associated with the portfolio size effect over an individual's full lifecycle would take on a V-shaped glidepath, getting more conservative in the decade leading up to retirement, remaining conservative in

early retirement, and then drifting at least somewhat higher again in the later years (Figure 3).

Or, viewed another way, if the portfolio size effect reflects when the portfolio (and the goals it is intended to support) is at the greatest risk for a catastrophe, the way to manage the danger is simply to take the least risk with the portfolio when it is the largest.

**Figure 3: Managing the portfolio size effect with a V-shaped equity glidepath**



Source: Michael Kitces, [www.kitces.com](http://www.kitces.com).

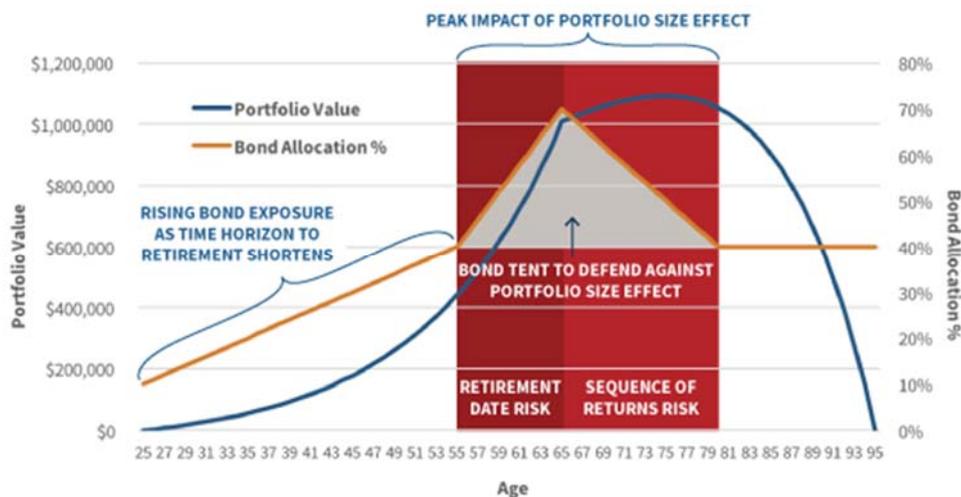
### USING A BOND TENT TO DAMPEN THE VOLATILITY OF THE PORTFOLIO SIZE EFFECT

From the traditional equity-centric perspective of portfolio management, using a V-shaped asset allocation glidepath may seem counterintuitive, particularly when it comes to having a more conservative portfolio in the early retirement stage and then allowing it to become more aggressive again later. However, when viewed from the perspective of the portfolio's bond allocation, the strategy appears far more logical.

After all, the fundamental purpose of bonds in a traditional portfolio is to reduce the portfolio's volatility, which means a larger portfolio would be at less risk for a substantial financial loss. Bonds can achieve this outcome both by being an outright volatility dampener (since bonds are less volatile than stocks, swapping stocks for bonds reduces the portfolio's overall volatility), and also as a diversifier (since stocks and bonds are not correlated, total portfolio volatility may decrease even further). Notably, in this context, the point of the bonds is not to drive returns, but to manage retirement risks (which is why they're appropriate to own, even in a low-yield environment).

Accordingly, from the bond perspective, the V-shaped glidepath turns upside down and the prospective retiree actually accumulates extra bonds in the years leading up to retirement, and then spends down that volatility-dampening bond reserve in the first half of retirement (Figure 4). By the end, the retiree will finish with a bond allocation that is higher than it was in the early accumulation years, but less than it was when the portfolio was at its peak value (and therefore peak portfolio size effect risk).

**Figure 4: Dampening the volatility of the portfolio size effect using a bond tent**



Source: Michael Kitces, [www.kitces.com](http://www.kitces.com)

In essence, the strategy to protect against the retirement danger zone and the risks that come with the portfolio size effect is to build a "bond tent" – an upside-down, V-shaped extra allocation to bonds that gets built up in the final years before retirement and is spent down in the early years of retirement. This allows the portfolio to take shelter in the tent during the riskiest years of being exposed to the portfolio size effect – not because bonds have an appealing return, but simply because they reduce the volatility risk that becomes so severe at the portfolio's maximum size.

Notably, there's still far more research to be done to optimise the exact shape and the slope of the V-shaped equity glidepath and the bond tent. It's not entirely clear how quickly during the pre-retirement red zone the bond allocation should build (i.e., the preretirement glidepath), nor how quickly it should be liquidated in the early retirement years. It may be that the equity exposure should be shaped more like the letter U than a V, such that the bond tent would have a wider roof – an extended period of time where greater bond allocations are held as a reserve. And the exact height of the bond tent – how high the bond allocation should reach – may be further optimised as well, especially given today's low-yield environment (where bonds are less appealing to hold relative to historical standards, but still

better than holding equities with even greater volatility and sequence risk). And, of course, there are other fixed income alternatives besides traditional bonds that might be considered as volatility dampeners and diversifiers as well.

Nonetheless, a wide base of research suggests that SOME preretirement decreasing glidepath in equities (and building of the bond position) is appropriate, and [even our original rising equity glidepath over the entire 30-year retirement time horizon](#) helped defend against a subset of the most adverse scenarios (and an accelerated glidepath over just the first half of retirement helped slightly more). Which means SOME kind of V-shaped equity glidepath – or building a bond tent in which the retiree can take shelter during the retirement red zone when the risk of the portfolio size effect is greatest – appears to be more effective than the "traditional" lifecycle or target date fund asset allocation glidepath, that just gets lower and lower throughout retirement, and may actually be amplifying the risk of a bad sequence of market returns!

***So what do you think? Would you consider a V-shaped equity glidepath in the years immediately before and after retirement? Does the idea of a bond tent – building a reserve of bonds during the years of greatest risk – make sense as a retirement strategy? Please share your thoughts in the comments area below!***

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