Do Small Cap-Value Stocks add Value in Retirement Portfolios?  

By Joe Tomlinson  
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Research going back to Eugene Fama and Kenneth French in the early 1990s has shown that small-value stocks have produced superior returns. Subsequent debate has centered on whether this superior performance will continue and if investors should tilt portfolios to capture those returns. I'll examine the historical evidence, incorporate it in retirement examples and discuss the future prospects for small-cap value.

**Historical performance**

The chart below compares real (after-inflation) performance of small-value stocks, large-capitalization stocks and intermediate-term government bonds in the period 1927-2013. The small-value category was based on the Fama/French U.S. Small Value Research Index data obtained from the Dimensional Fund Advisors Matrix Book. The large-capitalization and government bonds returns data came from the Ibbotson® yearbook.

**Historical performance, real returns 1927 – 2013**

<table>
<thead>
<tr>
<th></th>
<th>Small Value Stocks</th>
<th>Large Capitalization Stocks</th>
<th>Inter-term Gov't Bonds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arithmetic Average Return</td>
<td>16.2%</td>
<td>9.0%</td>
<td>2.4%</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>31.5%</td>
<td>20.7%</td>
<td>7.0%</td>
</tr>
<tr>
<td>Sharpe Ratio</td>
<td>0.430</td>
<td>0.310</td>
<td></td>
</tr>
</tbody>
</table>

*Sources: Fama/French, Ibbotson®*

The chart clearly shows the performance gain for small-cap value, with a 7.2% average return advantage over large-capitalization stocks. However, the volatility of performance, as measured by the standard deviation, is higher. Examination of the data also illustrates the volatility difference – the range of annual returns for small-cap value was -53% to 125%, versus -39% to 54% for large-capitalization stocks. The Sharpe ratio provides a measure of risk-adjusted return by dividing the return (in excess of the risk-free rate, for which I have used the government bond return) by the standard deviation. On this risk-adjusted basis, small-cap value still outperforms large-cap significantly.

**Financial planning research**

Given the superior risk-adjusted performance of the small-cap value category, clients might disregard the various style-box categories and concentrate all investing in small-cap value – at least for domestic stocks. However, such a strategy might give up too much diversification benefit.
Financial planners have researched the role of the small cap in asset allocation, beginning with a 1997 article by Bill Bengen. His original research on the 4% rule used only large-cap stocks and intermediate-term government bonds, and he later determined that he could improve safe withdrawal rates (SWRs) by adding small-cap stocks to the mix. He used a small-cap category that included both value and growth and, based on historical data from Ibbotson®, showed that SWRs increased from 4.1% to 4.3% by including small-cap stocks. He determined that including 30% small cap in the mix was enough to achieve the 4.3% SWR. Further increases did little to increase the SWR, so he settled on recommending a stock mix that included 30% small cap.

In 2011, planner Rick Ferri focused on the small-cap value category as a part of a total stock allocation and used data from 1981 to 2010. He did an efficient-frontier analysis with returns on the y-axis and standard deviations on the x-axis, which showed that stock portfolios with at least 30% small-cap value produced both higher returns and lower standard deviations than portfolios with less than 30% small-cap value. Above 30% small-cap value there was a tradeoff, as increased small-cap value allocations produced higher returns, but with more volatility as measured by standard deviation.

**Updated analysis**

I used the 1927-2013 data to do a different type of small-cap value analysis, combining the Rick Ferri efficient-frontier view with Bengen-like retirement outcomes. I modeled a 4% inflation-adjusted withdrawal rate over a 30-year retirement and used 30-year blocks of historical returns for small-cap-value, large-cap stocks and intermediate-term government bonds. The number of years of available data gave me 58 separate, but overlapping, blocks of returns to test. The use of historical returns rather than Monte Carlo simulations limited the amount of data available but had the advantage of capturing any year-to-year correlation of returns.

I tested different stock/bond mixes in 20% increments. Within the stock mixes, I varied the small-cap value versus large-cap mix in 20% increments. For a "return" measure on the y-axis, I used the median bequest from the 58 separate runs. For a "risk" measure, I used the 5th percentile bequest outcome. (A positive 5th percentile bequest would indicate a probability of less than 5% of running out of money in 30 years.)

In the chart below, the points on the efficient frontier are marked as red triangles, and the legend below provides details about the two points on the efficient frontier.
This analysis shows a strong dominance of small-cap value stocks in the total stock mix. Both efficient-frontier portfolios have less than a 5% chance of running out of money. This approach, based purely on historical data, calls for 80-100% allocations to small-cap value, which is likely not practical for most financial-planning recommendations, and is far greater than either the Bengen or Ferri analysis would recommend.

**Lower returns**

I wanted to test the sensitivity of this result to both the overall level of returns and the small-cap value premium. For the chart below, I reduced returns on bonds from 2.4% to 0.4%, large company stocks from 9.0% to 5.0% and small-cap value from 16.2% to 8.6% (a 4.0% reduction for stocks in general and a further 3.6% reduction to cut the 7.2% small value premium in half).
Efficient frontier points

<table>
<thead>
<tr>
<th>WD rate</th>
<th>Small Value</th>
<th>Large Capitalization Stocks</th>
<th>Govt Bond</th>
<th>Average Bequest</th>
<th>Median Bequest</th>
<th>5th Percentile Bequest</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.0%</td>
<td>40%</td>
<td>0%</td>
<td>60%</td>
<td>$39,435</td>
<td>$15,879</td>
<td>-$27,050</td>
</tr>
<tr>
<td>4.0%</td>
<td>60%</td>
<td>0%</td>
<td>40%</td>
<td>$89,035</td>
<td>$55,809</td>
<td>-$29,624</td>
</tr>
<tr>
<td>4.0%</td>
<td>60%</td>
<td>20%</td>
<td>20%</td>
<td>$115,785</td>
<td>$80,965</td>
<td>-$43,136</td>
</tr>
<tr>
<td>4.0%</td>
<td>80%</td>
<td>0%</td>
<td>20%</td>
<td>$147,032</td>
<td>$102,528</td>
<td>-$50,528</td>
</tr>
<tr>
<td>4.0%</td>
<td>60%</td>
<td>40%</td>
<td>0%</td>
<td>$142,029</td>
<td>$105,490</td>
<td>-$58,347</td>
</tr>
</tbody>
</table>

Source: Author's calculations

We now see all 5th percentile bequests falling in negative territory, reflecting the lower returns. We also see an efficient frontier that begins to take a more traditional shape. However, despite the lower returns overall and the significant reduction in the small-value premium, the small-value asset class plays a more prominent role in the optimal allocations than do large-company stocks.

Other withdrawal rates

I also ran sensitivity tests for 3% and 5% withdrawal rates using both historical returns and lower returns. The chart below shows the range of resulting optimal allocations to small-cap value stocks.
Small value stocks optimal allocation percentages

<table>
<thead>
<tr>
<th>Withdrawal rate</th>
<th>Historical returns</th>
<th>Lower returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>3%</td>
<td>100%</td>
<td>40% to 100%</td>
</tr>
<tr>
<td>5%</td>
<td>60% to 100%</td>
<td>40% to 80%</td>
</tr>
</tbody>
</table>

*Source: Author’s calculations*

For a 3% withdrawal rate with historical returns, the efficient frontier consists of a single point associated with a 100% allocation to small-value stocks. This allocation produces both the highest median bequest and 5th percentile bequest. When I lowered the returns for the 3% withdrawal rate, the efficient frontier includes allocations to large-cap stocks and/or bonds. However, in no case is the optimal large-cap stock allocation greater than the small-value allocation.

At the 5% withdrawal rate, there is a wider range of efficient-frontier points, but in all cases, the 5th percentile bequests are negative. There is one efficient-frontier point where the small-value and large-cap allocations are equal at 40%, but for all other points the small-value allocations dominate the total stock allocations.

**Planning implications**

Based on the modeling approach I have used and the historical evidence, there is no justification for holding small-cap value allocations below 30%. Lower-than-30% allocations would be justified if short-term volatility is too much to bear or if there are good reasons to expect a substantially lower small-value premium in the future.

The chart below shows the trend in the small-value premium (excess return over large-cap stocks) based on a 15-year rolling average.
What is most striking about this chart is the wide variation in the small-value premium, even with the smoothing of 15-year averaging. If there were a way to predict this premium in advance, it would certainly be a moneymaker, but there are no obvious predictors – certainly a candidate for future research. The small-value premium, which has averaged 7.2%, may be becoming less volatile, but there are not enough years of data to provide solid evidence. There is no indication that the average premium is decreasing.

Looking ahead

Based on history, there is a solid case for overweighting small-cap value stocks in retirement portfolios, even if there are future reductions in the premiums earned over large-company stocks. However, there is still considerable debate about whether small-cap value stocks truly provide excess returns when risks are appropriately recognized (see here, for example).

It's important to distinguish between assertions made about small cap in general versus small-cap value, since the value category has performed better historically than growth on an absolute and risk-adjusted basis. There are indications that the small-cap category has performed about in line with stocks in general when adjusted for risk. Larry Swedroe, in this blog post, showed that between 1927 and 2012, small cap outperformed large cap by about 3%, but with virtually identical Sharpe ratios. However, this Vanguard study that split out growth and value in the period 1927-2004 showed small-cap value earning an average annual return of 15.1% versus 9.9% for growth, with similar standard deviations.

There is something special about small-cap value, and the question is whether its superior performance is likely to continue. Behavioral economists argue that that there is a bias against value stocks that gives rise to the return premium. Small companies with low market-to-book ratios generally do not generate much excitement, and often they have faced problems. This type of behavioral bias supports the small-value premium continuing into the future. But as more investors acknowledge small-value performance, there
may be more demand for this asset class and downward pressure on returns, particularly with index exchange-traded funds available to provide low-cost investing.

My personal assessment is that it is and will be worthwhile to tilt retirement portfolios toward small-cap value stocks. However, this is not an asset class for those who cannot tolerate volatility or have a short-term focus.

Joe Tomlinson, an actuary and financial planner, is managing director of Tomlinson Financial Planning, LLC in Greenville, Maine. His practice focuses on retirement planning. He also does research and writing on financial planning and investment topics.

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