Quantitative Approaches for the Student-Managed Investment Fund

A STUDY OF SMART BETA STRATEGIES

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INTRODUCTION
We examined the performance of a total of six quantitative strategies over three, five, and ten years horizons. In this presentation, we are presenting the two strategies with the best results.

BACKGROUND INFORMATION
To begin, we first define what is a Student Managed Investment Fund, and a Smart Beta investment strategy and why they are important.

A survey by Walter P. Neely and Philip L. Cooley defines a student managed fund as a fund that offers students the opportunity to invest real money, which tends to focus the mind more than simulated investments can ever do.

Though there is no universally accepted definition, a Smart Beta strategy (as defined by Burton Malkiel in *A Random Walk Down Wall Street*) is a strategy that claims to be able to gain excess (greater than market) returns by using a variety of relatively passive investment strategies that involve no more risk than would be assumed by investing in a low-cost Total Stock Market index fund. Not all Smart Beta strategies involve using betas.

We hypothesized that it would be possible to implement Smart Beta strategies for our Student Managed Investment Fund for the purpose of gaining a better than market return on our investment and give students the opportunity to learn and invest outside of the academic field.

OUR PROCESS: HOW WE APPROACHED OUR RESEARCH

Both researchers were each given three Smart Beta strategies and used them to create six well diversified portfolios. The strategies were: High Value, High Growth, Momentum, High EPS, Low Volatility and High Beta. The benchmarks for the first three strategies was the S&P 500 index, and the Russell 1000 index for the final three. All strategies were backtested on Bloomberg Terminal for 3, 5, and 10 year investment horizons.

RESULT ANALYSIS

From the overall results above, it is apparent that among the three popular ratios, P/B ratio creates the best performance-- 301.92% return over the investment horizon, which outperforms the market by 194.79%, while P/E outperforms by only 83.48% and P/FCF underperforms by -48.13%. At the meanwhile, P/B also carry the least risk among the three, resulting a Sharpe ratio nearly twice as much as the market. Therefore, we conclude that P/B is the best ratio to use to find growth stocks.

SMART BETAS VS. RUSSELL 1000

OPENING

Three strategies: High Quality, Low Volatility, and High Beta, were used to create three diversified portfolios to be backtested against the Russell 1000 as a benchmark.

STRATEGY DEFINITIONS

High EPS: This strategy involved choosing the stocks that had the highest Basic Earnings Per Share. Low Volatility: This strategy involved choosing stocks that had the lowest total volatility (standard deviation) High Beta: This strategy involved choosing stocks which had the highest betas with the market.

A beta is the extent to which the value of an investment is affected by a change in market

PORTFOLIO MEASURES

Portfolio performance was measured by Total Return, Volatility and Sharpe Ratio.

The Table below shows each portfolio’s performance from 12/31/2005-12/31/2015 and compares them with the Russell 1000 index.

<table>
<thead>
<tr>
<th>Measure</th>
<th>P/B</th>
<th>P/E</th>
<th>P/FCF</th>
<th>S&amp;P 500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ten-Year Total Return</td>
<td>301.92</td>
<td>167.92</td>
<td>53.13</td>
<td>102.42</td>
</tr>
<tr>
<td>Volatility</td>
<td>18.88</td>
<td>18.88</td>
<td>20.06</td>
<td>17.46</td>
</tr>
<tr>
<td>Sharpe Ratio</td>
<td>0.67</td>
<td>0.46</td>
<td>0.23</td>
<td>0.35</td>
</tr>
</tbody>
</table>

From the overall results above, it is apparent that among the three popular ratios, P/B ratio creates the best performance-- 301.92% return over the investment horizon, which outperforms the market by 194.79%, while P/E outperforms by only 83.48% and P/FCF underperforms by -48.13%. At the meanwhile, P/B also carry the least risk among the three, resulting a Sharpe ratio nearly twice as much as the market. Therefore, we conclude that P/B is the best ratio to use to find growth stocks.

HIGH EPS VS. RUSSELL 1000: RETURNS/SPREAD

The portfolio using the High EPS strategy is displayed because it represents a higher total return, lower volatility and comparable Sharpe ratio to the Russell 1000.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Benchmark Russell 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Return</td>
<td>124.64%</td>
</tr>
<tr>
<td>Volatility</td>
<td>18.38%</td>
</tr>
<tr>
<td>Sharpe Ratio</td>
<td>0.37</td>
</tr>
</tbody>
</table>

CONCLUSIONS

The largest limitation to Smart Beta strategies is that they rely on past/current market valuations. Because markets trends can shift rapidly and unpredictably, current valuations are no guarantee that a stock scoring high in the smart beta criteria will generate better than market returns.

A second limitation is the transaction costs and brokerage fees attached to active portfolio management, as mentioned in the previous section. A quick internet search will reveal that brokerage firms like Scottrade, TD Ameritrade and Fidelity all have stock trading fees between $7.00-$10.00, as well as a slew of service and other brokerage fees.

FINALE CONCLUSIONS

As a tool purely for investment with a student managed investment fund, when fees and taxes are taken into consideration, Smart Beta strategies do not produce excess returns that would justify not simply utilizing a buy and hold strategy with a broad based index fund. However, when taken into account the practical skills learned when using a tool such as Bloomberg Terminal, and the exposure to real world conditions, portfolio creation using Smart Beta strategies can be useful for teaching students.