Low Volatility Investing: Theory and Empirical Evidence
Fiera Systematic Investment Strategy Team (SIS Team)

The last decade has seen a proliferation of low volatility equity strategies, with nearly $10B invested in these strategies in Canada alone as of December 2016. For the most part, these strategies are based on the premise that allocating to a sub-group of low volatility stocks can generate excess returns above the market cap index, at least on a risk-adjusted basis.

While acknowledging the merits of the strategic case for LowVol investing, the jury is still very much out as to why these strategies have posted such surprisingly strong track records since the financial crisis and whether or not the past is prologue. The question of valuation has arisen because asset flows into low-volatility stocks have arguably led to crowding. A further concern is the potential impact of rising interest rates on low-volatility strategies. The quest for yield since the Financial crisis has amplified the demand for some of these strategies as LowVol stocks are often synonymous with higher dividends. To better appreciate the LowVol phenomenon, let’s start by considering what financial theory and empirical research has to say on the matter.

At first glance, LowVol investing finds itself at odds with the two most fundamental financial theories: the Efficient Market Hypothesis and the Capital Asset Pricing Model. However, let’s keep in mind that these theories have struggled to explain a number of market anomalies. The empirical success of CAPM has been somewhat limited and a number of factors (beyond market beta) have been shown to explain the cross-section of stock returns. Factors such as market capitalization (Banz, 1981), book-to-market (Fama and French, 1992), liquidity (Pastor and Stambaugh, 2003), profitability (Novy-Marx, 2013), and previous year’s returns (Jegadeesh and Titman, 1993) all provide some additional information that can help explain stock performance. Many of these factors have been at the core of investment strategies over the last 40 years, with value and growth being the most widely marketed by investment firms. So where does the low volatility anomaly fit into this landscape? And why has it only been a focus for investment firms over the last decade?

Academics have in fact been studying this empirical incongruity for many years and there are still many unanswered questions. One thing that is clear, is the significant empirical evidence supporting not only the existence of a low volatility anomaly, but pointing at the fact that we might be dealing with a very persistent risk premia. Recently, the low risk anomaly has been branded by Baker, Bradley, and Wurgler (2011) as “the greatest anomaly in finance”. With the noted exception of the Equity Risk Premia puzzle that has confounded researchers for half a century, it is hard to think of any other anomaly questioning the risk-return paradigm in finance as much as the proposition that the most widely used risk measure (volatility) is not related to returns. Empirical support of a low risk anomaly essentially implies that either prices are not right or that risk measures are flawed.

Interestingly, the empirical support for the low risk anomaly goes back almost 50 years. Black (1972) found that the expected excess return on a stock is not strictly proportional to its beta. He found that the empirical security market line was too flat relative to the one implied by CAPM, suggesting that low-beta stocks produce higher than expected returns whereas the opposite is true for high-beta stocks. (Figure 1)
More recently, a number of papers have shown that total volatility and beta have negative relationship with stock returns and that higher volatile stock portfolios underperform in terms of both Sharpe and alpha (Baker et al. (2011), Blitz and van Vliet (2007) and Bali et al. (2014)). Frazzini and Pedersen (2014) perform an extensive study and find that overall low-beta stocks offer superior performance on risk-adjusted basis. They formalize this notion by constructing a betting against beta factor (BAB), going long a levered portfolio of low-beta stocks while shorting high-beta stocks. The BAB factor realizes positive and statistically significant returns in both excess return and risk-adjusted terms. In examining the performance of the US and Canada BAB factor (table 1 below) there are a number of interesting takeaways. Most notably, the BAB factor has persistently generated an excess return over the last 30 years. From 1985 to 2000 the factor demonstrated similar risk returns characteristics in Canada and the US, however over the last 15 year BAB Canada has produced particularly compelling results. It is important to note that the best period for BAB factor in the US and Canada was actually the 2000 - 2005. This should help quell any argument that LowVol strategies are simply a post crisis low rate anomaly!

<table>
<thead>
<tr>
<th>PERIOD</th>
<th>US</th>
<th>CANADA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AVERAGE MONTHLY RETURN</td>
<td>% POSITIVE MONTHS</td>
</tr>
<tr>
<td>1985 - 1990</td>
<td>0.87%</td>
<td>69.49%</td>
</tr>
<tr>
<td>1990 - 1995</td>
<td>0.82%</td>
<td>63.33%</td>
</tr>
<tr>
<td>1995 - 2000</td>
<td>0.58%</td>
<td>63.33%</td>
</tr>
<tr>
<td>2000 - 2005</td>
<td>1.69%</td>
<td>73.33%</td>
</tr>
<tr>
<td>2005 - 2010</td>
<td>-0.22%</td>
<td>53.33%</td>
</tr>
<tr>
<td>2010 - 2015</td>
<td>0.97%</td>
<td>76.67%</td>
</tr>
<tr>
<td>Entire period</td>
<td>0.79%</td>
<td>66.57%</td>
</tr>
</tbody>
</table>

Note: BAB factor returns obtained from Andrea Franzini’s homepage. All pricing and accounting data are from the union of the CRSP tape and the Compustat/Xpressfeed Global database.
Given the clear empirical evidence of a low risk anomaly, the next step is to find a coherent theory as to why this anomaly exists in the first place, and why it has not been arbitraged away. A number of behavioral finance theories have been put forth, the most compelling of which is the Lottery Demand Theory. This Lottery demand seems to be an important driving force for the lower-than-expected returns for the high-beta stocks. Baker, Bradley and Wurgler (2011) stipulate that individuals seek “a shot at riches” and they believe that higher volatility provides the possibility of higher returns. The high concentration of retail ownership among the highest beta stocks provides a great story with empirical backing (Bali et al., 2014). However, once most anomalies have been identified, they tend to be rather swiftly arbitraged away, so it is fundamental to contemplate whether there are Limits to Arbitrage that might lead us to believe the low risk anomaly will persist. In other words, there must be regulatory, market micro-structure or behavioral barriers in place to ensure that the anomaly persists over time and is not fully arbitraged.

Leverage constraints and benchmarking are two such Limits to Arbitrage that should help ensure the persistence of the LowVol anomaly. Given the lower absolute but higher risk-adjusted return of low beta stocks, leverage is required in order to arbitrage the anomaly. Borrowing restrictions will limit this arbitrage and ultimately investors who seek higher returns will continue to overweighting high-beta assets. Benchmarking is also integral to the persistence of the low volatility anomaly. Typically institutional equity managers have a mandate to maximize information ratio (excess return per unit of tracking error relative to their benchmark), and this objective leads managers to neglect considerable profit opportunities among low-beta stocks and prefer high-beta stocks that tend to exhibit lower tracking error. The continued existence of borrowing constraints and the huge importance placed on benchmarks and tracking error in the mutual fund industry should ensure the sustained outperformance of low equity stocks on a risk-adjusted basis.

In a series of future publications by the Fiera SIS team we will have a closer look at some of the issues relating to low volatility investing. These will include a closer look at the dynamics of the volatility anomaly over time, how to construct a low volatility portfolio (low beta versus low volatility) and the impact of interest rates on the performance of LowVol strategies.

References

Nicolas Papageorgiou, Ph.D.
Vice President, Research and Development, Systematic Investment Strategies

Axelroed Hocquard, Ph.D.
Vice President, Senior Portfolio Manager, Systematic Investment Strategies

The information and opinion herein are provided for informational purposes only and are subject to change. The information provided herein does not constitute investment advice and it should not be relied on as such. It should not be considered a solicitation to buy or an offer to sell a security. It does not take into account any investor’s particular investment objectives, strategies, tax status or investment horizon. There is no representation or warranty as to the current accuracy of, nor liability for, decisions based on such information. Past performance is no guarantee of future results. Views expressed regarding a particular company, security, industry or market sector should not be considered an indication of trading intent of any funds managed by Fiera Capital Corporation.