Low Volatility Investing from a Fundamental Perspective

Mark Ingham
31 May 2012
Introduction

Outline

- Risk seems to be backwards
  - behavioural factors are big drivers of this
  - but not the only drivers...

- Fundamental risk and quality characteristics also work backwards

- On some dimensions low fundamental risk is more attractive than low trailing return risk:
  - payoff structure
  - liquidity
  - valuation
Low Volatility – What a Backtest!

Note: High Beta = Top 25% of Beta by Market Cap in Top 1000 U.S. Equities and Low Beta = Bottom 25% of Beta by Market Cap in Top 1000 U.S. Equities.
This Isn’t a New Phenomenon

Note: High Beta = Top 25% of Beta by Market Cap in Top 1000 U.S. Equities and Low Beta = Bottom 25% of Beta by Market Cap in Top 1000 U.S. Equities.
This Isn’t a U.S. Phenomenon

Source: GMO  As of 7/31/11


Source: GMO  As of 7/31/11
This Isn’t an Equity Phenomenon

Note: Results here are taken from Frazzini and Pederson “Betting against Beta.” To construct the BAB factor, all instruments are assigned to one of two portfolios: low beta and high beta. Instruments are weighted by the ranked betas and the portfolios are rebalanced every calendar month. Both portfolios are rescaled to have a beta of 1 at portfolio formation. The BAB factor is a zero-cost portfolio that is long the low-beta portfolio and shorts the high-beta portfolio.
And Pretty Much the Same Phenomenon as MVP

Source: GMO     As of 7/31/11

Note: MVP = Minimum volatility portfolio, High Beta = Top 25% of Beta by Market Cap in Top 1000, Low Beta = Bottom 25% of Beta by Market Cap in Top 1000.
Why Risk Is Backwards

Behavioural or People are weak and stupid!

- **Career Risk**
  - Benchmark huggers run the risk of picking high volatility, low return stocks in order to keep tracking error down.

- **Glamour Stocks**
  - High volatility tends to be associated with exciting growth stories. The chance of this growth not materialising is generally underappreciated.

- **Lottery Love**
  - Investors like positive skew, just as they overpay for lottery tickets.
Lottery Love

The favourite long-shot bias

Source: Snowberg and Wolfers (2010)
Why Risk Is Backwards

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**Implicit leverage**

- High beta can give additional exposure to investors who want to go extra-long but can’t (or won’t) take on leverage
Not All Leverage Is Created Equal

Beta is leverage, but beta’s leverage is “zero recourse”
Not All Leverage Is Created Equal

It’s not just about leverage, it’s about convexity

**Note:** Return = 20-Day Rolling Compound Return; Market = Top 1000 U.S. Equity Stocks by Market Capitalization; High Beta = Top 25% of Beta by Market Cap in Top 1000 U.S. Equities and Low Beta = Bottom 25% of Beta by Market Cap in Top 1000 U.S. Equities.
Not All Leverage Is Created Equal

In down markets, correlations go to 1

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Leverage  Convexity / Concavity

- High beta has a convex payoff.
  - The bigger the market return, the higher the “beta.”
  - Looks like a call option (or, at least, a stock plus a call).

- Conversely, low beta has a concave payoff with a greater sensitivity to down markets than up

- Convex payoffs are good, and good things are rarely free

- Concave payoffs are bad, and you should be paid to take them
Mitigating Concavity

- Can one maximise the behavioural aspects of low volatility investing whilst minimising concavity (or have your cake and eat it?)

- YES!
  - Reassess risk
Real Risk Is Losing Your Money!

Three routes to the permanent impairment of capital:

- **Fundamental risk**
  - “Real risk is measured not by the percent that a stock may decline in price in relation to the general market in a given period, but by the danger of a loss of quality and earnings power through economic change or deterioration in management.”  — Ben Graham

- **Financing risk**
  - Leverage — “An investor who proposes to ignore near-term market fluctuations needs greater resources for safety and must not operate on so large a scale, if at all, with borrowed money.”  — Maynard Keynes

- **Price risk**
  - Buying overvalued assets dooms you to low long run returns
Fundamental Risk

...also seems backwards – high quality seems to pay!

### U.S. Small Cap

<table>
<thead>
<tr>
<th></th>
<th>Small Leverage</th>
<th>Small Profitability</th>
<th>Small Profit Volatility</th>
<th>Small Combined Quality*</th>
<th>Small Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Risk Stocks</td>
<td>Low 1.6%</td>
<td>High 2.1%</td>
<td>Low 1.8%</td>
<td>High 2.9%</td>
<td>Low 1.7%</td>
</tr>
<tr>
<td>Small Cap</td>
<td>-3.7% High</td>
<td>-4.7% Low</td>
<td>-3.7% High</td>
<td>-5.5% Low</td>
<td>-4.3% High</td>
</tr>
<tr>
<td>High Risk Stocks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: GMO annualized data from 1/79 – 12/11

### EAFE

<table>
<thead>
<tr>
<th></th>
<th>Leverage</th>
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</tr>
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</tr>
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* Leverage, profitability and profit volatility

Note: GMO defines quality companies as those with high profitability, low profit volatility, and minimal use of leverage. Simulated relative returns of a hypothetical portfolio.

Source: GMO annualized data from 1/85 – 12/11

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Quality Characteristics Persist

Contrary to economic theory, quality exhibits a sustainable competitive advantage

After 30 years the high quality quartile is almost twice as profitable.

Note: Profitability = Return On Equity  
Source: GMO, U.S. 1965-2010; Realized GMO 2004-31/10/11

The securities identified above represent a selection of securities identified by the GMO quantitative model. These specific securities are selected for presentation by GMO based on their underlying characteristics and are not selected on the basis of their investment performance. These securities are not necessarily representative of the securities purchased, sold or recommended for advisory clients, and it should not be assumed that the investment in the securities identified will be profitable.
### Quality, the Market and Low Volatility during Historic Downturns

<table>
<thead>
<tr>
<th>Market</th>
<th>Quality</th>
<th>Min vol</th>
<th>Dates</th>
<th>Name</th>
<th>Duration (months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-71%</td>
<td>N/A</td>
<td>-68%</td>
<td>Jan-29 to Jan-32</td>
<td>Great Depression</td>
<td>36</td>
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<tr>
<td>-48%</td>
<td>N/A</td>
<td>-45%</td>
<td>Feb-37 to Mar-38</td>
<td>Echo of above</td>
<td>13</td>
</tr>
<tr>
<td>-22%</td>
<td>N/A</td>
<td>-20%</td>
<td>May-46 to Nov-46</td>
<td>Post-WWII</td>
<td>6</td>
</tr>
<tr>
<td>-23%</td>
<td>N/A</td>
<td>-20%</td>
<td>Dec-61 to Jun-62</td>
<td>Kennedy Break</td>
<td>6</td>
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<tr>
<td>-29%</td>
<td>-19%</td>
<td>-30%</td>
<td>Dec-68 to Jun-70</td>
<td>GGM meltdown*</td>
<td>18</td>
</tr>
<tr>
<td>-44%</td>
<td>-46%</td>
<td>-37%</td>
<td>Jan-73 to Sep-74</td>
<td>First Oil Shock</td>
<td>20</td>
</tr>
<tr>
<td>-19%</td>
<td>11%</td>
<td>13%</td>
<td>Nov-80 to Jul-82</td>
<td>Second Oil Shock</td>
<td>20</td>
</tr>
<tr>
<td>-28%</td>
<td>-27%</td>
<td>-22%</td>
<td>Sep-87 to Nov-87</td>
<td>Black Monday</td>
<td>2</td>
</tr>
<tr>
<td>-15%</td>
<td>-10%</td>
<td>-13%</td>
<td>May-90 to Oct-90</td>
<td>S &amp; L crisis</td>
<td>5</td>
</tr>
<tr>
<td>-16%</td>
<td>-12%</td>
<td>-11%</td>
<td>Jun-98 to Aug-98</td>
<td>LTCM</td>
<td>2</td>
</tr>
<tr>
<td>-46%</td>
<td>-39%</td>
<td>7%</td>
<td>Mar-00 to Sep-02</td>
<td>TMT meltdown</td>
<td>30</td>
</tr>
<tr>
<td>-50%</td>
<td>-37%</td>
<td>-34%</td>
<td>Oct-07 to Feb-09</td>
<td>Financial crisis</td>
<td>16</td>
</tr>
</tbody>
</table>

*Great Garbage Market*
Concavity / Convexity of Low Beta and Quality

Flight to Quality NOT flight to Low Beta!

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Concavity / Convexity of Low Beta, Quality and MVP

...and, on average, low beta

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Mitigating Concavity

- Can one maximise the behavioural aspects of low volatility investing whilst minimising concavity (or have your cake and eat it?)

- YES!
  - Reassess risk
  - Extend investment horizon
Convexity Is a Shorter-Term Phenomenon

Convexity over different return horizons

Notes: High Beta = Top 25% of Beta by Market Cap in Top 1000 U.S. Equities and Low Beta = Bottom 25% of Beta by Market Cap in Top 1000 U.S. Equities. Convexity is the coefficient of the quadratic term from a quadratic fit of high beta and low beta returns against the market for different return horizons. Data is from 01-Jan-1966 to 30-Apr-2012
Real Risk Is Losing Your Money!

Deleveraging can drive correlations to 1

- **Fundamental risk**
  
  “Real risk is measured not by the percent that a stock may decline in price in relation to the general market in a given period, but by the danger of a loss of quality and earnings power through economic change or deterioration in management.”  — Ben Graham

- **Financing risk**
  
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- **Price risk**
  
  Buying overvalued assets dooms you to low long run returns
August 2007 – Correlations Going to 1

USD value of coincident holdings of 8 prominent quants

Source: GMO As of 30/9/07
3 Years of Returns Were Wiped Out in 3 Days

Quant became the risk factor

The above illustrate a hypothetical strategy that GMO does not manage. Hypothetical returns are not predictive of future allocations. The results reflect returns an investor would have obtained had they invested in this hypothetical strategy during the time periods shown and do not represent actual returns. Hypothetical returns are calculated by the retroactive application of a model constructed on the basis of historical data and based on assumptions integral to the model which may or may not be testable. In the above, we aggregated reported holdings from eight quantitative managers identified by GMO to come up with a long/short portfolio. Changes in these assumptions may have a material impact on the hypothetical returns presented. Certain assumptions have been made for modeling purposes and are unlikely to be realized. No representations and warranties are made as to the reasonableness of the assumptions. Hypothetical returns are developed with the benefit of hindsight and have inherent limitations. Specifically, hypothetical returns do not reflect actual trading or the effect of material economic and market factors on the decision-making process. Because trades have not actually been executed, results may have under- or over-compensated for the impact, if any, of certain market factors, such as lack of liquidity, and may not reflect the impact that certain economic or market factors may have had on the decision-making process. Actual returns may differ significantly from the hypothetical returns.

Source: GMO, LionShare As of 31/8/07
Illiquidity Was the Real Risk

Performance was determined by where the crowding took place

Estimated number of days to liquidate securities that were held by six or more of the eight prominent quantitative managers as determined by GMO while seeking to minimize market impacts.

Source: GMO As of 30/9/07
Low Volatility Looking Forward

Liquidity of Low Volatility and Quality

Low Volatility - $10 billion

Mega Quality - $10 billion

Note: Mega Quality represents Quality companies with the largest 100 companies by market cap.
**Real Risk Is Losing Your Money!**

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Low Volatility Looking Forward

Valuation of trailing low volatility

Note: Valuations = Price to Normalized Earnings

Source: GMO  As of 29/2/12
Price Also Matters

Quality MEGA cap stocks have won over the long term

Stocks’ Historical Premium

GMO Launches Quality Strategy

Valuation of MEGA Cap Quality Stocks Relative to the Market

Cumulative Return of MEGA Cap Quality Stocks Relative to the Market

GMO defines quality companies as those with high profitability, low profit volatility, and minimal use of leverage. The historical valuation is determined by our proprietary intrinsic valuation measure. MEGA Cap Quality represents Quality companies within the largest 100 companies by market cap.

Source: GMO As of 29/2/12

* Stocks’ historical premium valuation since 1980.

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Conclusion

- Low volatility investing has done well because of:
  - Behavioural drivers
  - Marketplace structure
  - Concave payoffs

- Considering fundamental risk can reduce concavity and is a good indicator of future fundamental risk

- It can also reduce liquidity risk

- Low trailing return volatility is expensive today and therefore at risk of disappointing
Appendix
Implicit Leverage

Average bet on beta quintiles by U.S. mutual funds

Note: Data is taken from Karceski 2002 “Returns-Chasing Behaviour, Mutual Funds and Beta’s Death” and is based on U.S. domestic mutual fund holdings in Morningstar’s “Mutual Fundsondisc” reported from 1984-1996.

Source: Karceksi 2002 “Returns-Chasing Behaviour, Mutual Funds and Beta’s death”
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Getting Convexity Is Easy

Systematically buying call options gives a nice convex result

Note: Market = S&P 500. No commissions, options priced at mid-point.

Source: Ivy DB, GMO
Monetizing the Option Brings Back the Return

Beta + Call option = Market

Note: High Beta = Top 25% of Beta by Market Cap within Top 200 U.S. Equities; Low Beta Quartile = Bottom 25% of Beta by Market Cap within Top 200 U.S. Equities; High Beta Covered Call = Top 25% of Beta by Market Cap with Top 200 U.S. Equities Paired with a Written 1 Month at the Money Call Option; Low Beta Covered Call = Bottom 25% of Beta by Market Cap with Top 200 U.S. Equities Paired with a Written 1 Month at the Money Call Option; Market = Top 200 U.S. Equities. All option trades assume crossing the spread and paying commission.

Source: Ivy DB, GMO As of 9/1/11
Performance data quoted represents past performance and is not predictive of future performance. The foregoing does not constitute an offer of any securities for sale. Returns are presented gross of management fees, net of transaction costs and include the reinvestment of dividends and other income. If these expenses were deducted performance would be lower. For example, if the strategy were to achieve a 10% annual rate of return each year for ten years and an annual advisory fee of 0.75% were charged during that period, the resulting average annual net return (after the deduction of advisory fees) would be 9.25%. A GIPS compliant presentation of composite performance has preceded this report in the past 12 months or accompanies this presentation, or is also available at www.gmo.com. Actual fees are disclosed in the Prospectus for each fund and are also available in each strategies compliant presentation.

Performance is shown compared to broad-based securities market indices. Broad-based indices are unmanaged and are not subject to fees and expenses typically associated with managed accounts or investment funds. Investments cannot be made directly into an index.