




BNP PARIBAS
INVESTMENT PARTNERS



Paddling in Smoother Waters

Low volatility investing for Canadians

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Institutional Newsletter

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In February 2012, Raul Jorge F. Leote de Carvalho, Ph.D., Head of Quantitative Strategies and Research with BNP Paribas Investment Partners in Paris spoke at informational seminars in Montreal and Toronto on the topic of low volatility investing. This newsletter summarizes a portion of his presentation.

Until recently, established investment theory held that investments having higher volatility should offer higher potential rewards over time. While some researchers have disagreed since the 1960s, it is only recently that the investment community at large has come to accept that lower volatility equities have actually outperformed their higher volatility counterparts. Low volatility investing involves using strategies designed to take advantage of this fact.

In this newsletter, we describe the so-called “low volatility anomaly”, show some of the extensive empirical evidence for it, discuss possible reasons for the “anomaly” in order to understand its origin and likely persistence, and then discuss how to benefit from it in practical terms.

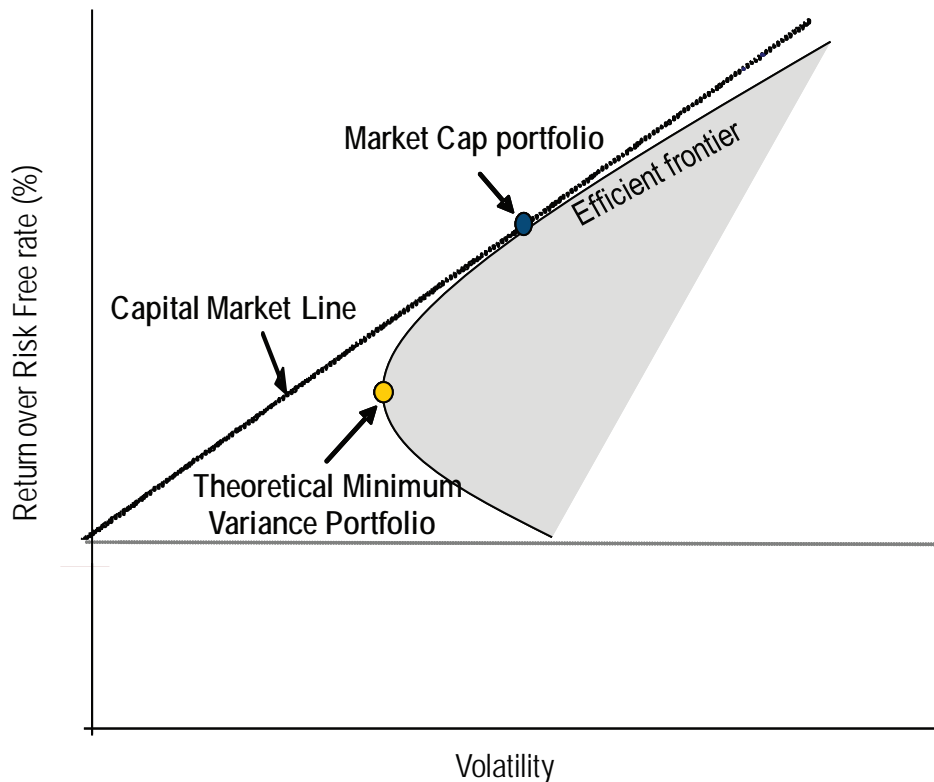


The Low Volatility “Anomaly”

It’s a wry comment on our culture that when empirical facts don’t fit academic theory, it’s the facts that are labeled the anomaly. This is exactly what has happened in the field of investing.

In the Capital Asset Pricing Model (CAPM), the return of a stock is proportional to its beta, that is, its statistically-measured sensitivity to market fluctuations. Under this theory, the market cap portfolio constructed by holding every stock in the market in proportion to its market capitalization is the most diversified possible portfolio and has the highest Sharpe ratio, or risk-adjusted return.

Figure 1: The Capital Asset Pricing Model



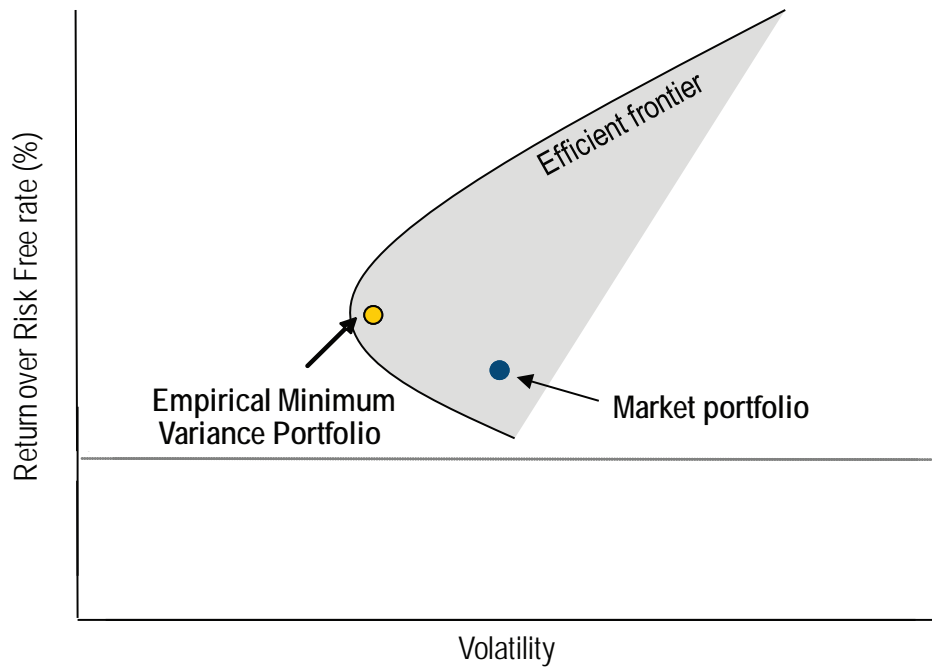
The general acceptance of CAPM led to the market cap portfolio becoming the accepted benchmark for portfolio performance. Well-known indices such as the S&P/TSX Composite and the MSCI World are examples of market cap benchmarks.

From the specific universe of stocks being considered, such as Canadian equities or global equities, it is also possible to construct a portfolio that has the lowest ex ante volatility. This is known as the minimum variance portfolio and under CAPM it should underperform the market cap portfolio, as shown in Figure 1, above.



However, when one measures historical returns and volatilities, it turns out that the actual minimum variance portfolio has in fact tended to outperform the market cap portfolio, as illustrated in Figure 2 below.

Figure 2: The low volatility “anomaly”



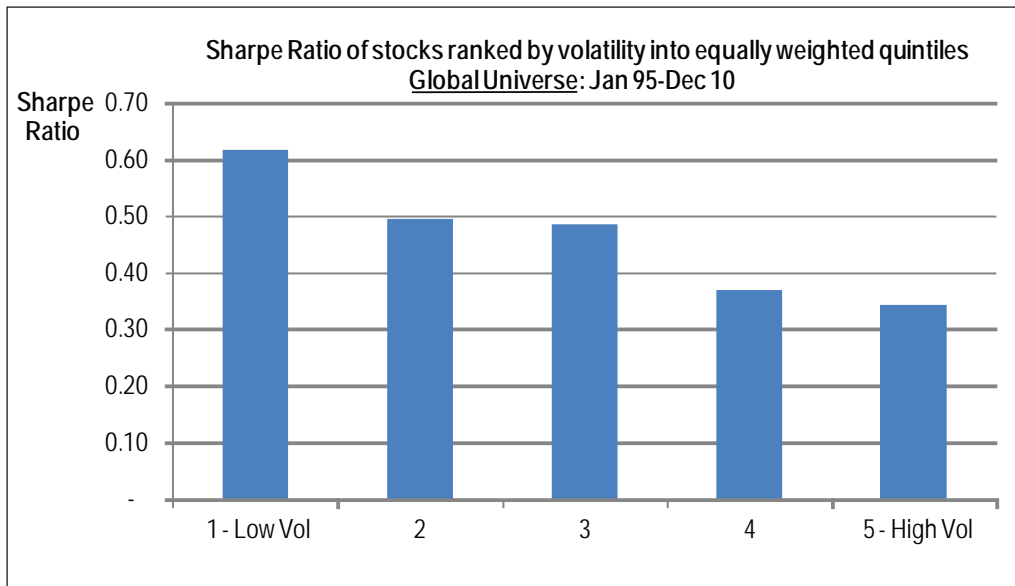
This fact was first discovered by Robert Haugen and James Heins in 1969¹. Numerous other studies have confirmed their finding since then: in actuality, lower risk portfolios have provided superior returns to the supposedly efficient market cap portfolio. The low volatility “anomaly” has been observed over different time periods and across markets globally.

Our own research has also confirmed the superior risk-adjusted returns delivered historically by low volatility stocks. For example, using data from January 1, 1995 to December 31, 2010 we ranked all the stocks in the MSCI World Index into quintiles based on their volatility and then calculated the Sharpe ratios of those stocks over the period. The results are shown in Figure 3 on the following page.

¹ Haugen, Robert A. and Heins, A. James, On the Evidence Supporting the Existence of Risk Premiums in the Capital Market (December 1, 1972). Available at SSRN: <http://ssrn.com/abstract=1783797> or <http://dx.doi.org/10.2139/ssrn.1783797>.



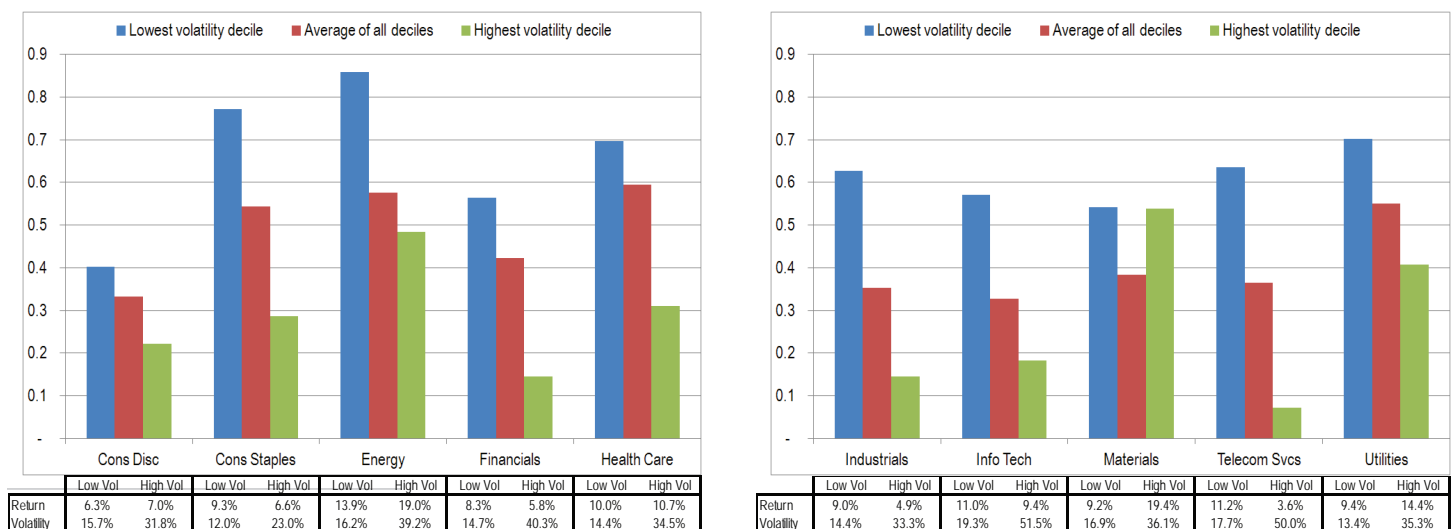
Figure 3: Lower volatility global equities generated higher Sharpe ratios



We have repeated this analysis for different regions and countries and have found the same result: the lowest volatility stocks have historically had the highest Sharpe ratios in Europe, the United States, Canada, Japan and in emerging markets, among other stock universes.

One might be tempted to argue that this could be an industry sector effect: perhaps the lowest volatility stocks happen to lie in the highest returning sectors for some reason? In fact, this is not the case. Our research has shown that the low volatility “anomaly” occurs within each sector as well. Figure 4 sets out our findings for global sectors during the same period.

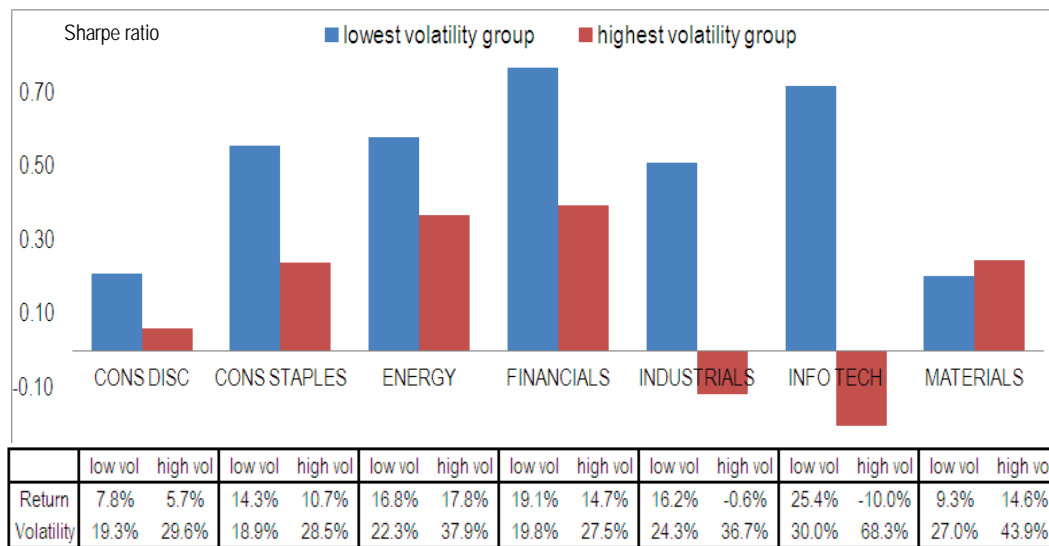
Figure 4: The low volatility “anomaly” can be found within global sectors





As Figure 4 shows, even within cyclical sectors such as energy, high volatility sectors such as information technology, and low volatility sectors such as consumer staples, the lowest volatility decile has generated higher Sharpe ratios than the highest volatility decile. Again, this is true across geographies and time periods. For instance, it has been true in Canada with the exception (for the period January 1, 1995 to September 30, 2011) of the materials sector as shown in Figure 5.

Figure 5: The lowest volatility Canadian stocks have higher Sharpe ratios in almost all sectors



Causes of the Low Volatility “Anomaly”

Before trying to develop ways to take advantage of the low volatility “anomaly”, it makes sense to try to understand what factors give rise to it that the Capital Asset Pricing Model overlooks. In particular, it makes sense to ask if the “anomaly” is likely to persist (although it has already persisted for decades).

Researchers have suggested a number of factors that could cause low volatility stocks to outperform:

- Stocks that are in the news a lot tend to be overbought, and it is high volatility stocks that tend to make headlines. As the price of overbought stocks has, by definition, been bid up by demand, their future returns have been depressed. By contrast, low volatility stocks will tend to be ignored and thus underbought; their prices will be lowered by this lack of demand, causing their future returns to be enhanced.
- Many investors are in the market to seek risk in the hope of hitting a big winner, so they gravitate towards high volatility stocks, bidding up their prices and thus lowering their future returns.
- Due to the behavioural factor known as representativeness bias, investors overemphasize big successes and are thus led to overpay for small and speculative investments.
- So-called agency issues affect the stock selections made by professional analysts and fund managers, who are attracted to exciting volatile stocks with powerful “stories” in order to make sure they are not left behind when some of these stocks outperform in the future.



- Under the influence of the CAPM and its adherents in the academic, consulting and investing communities, most active money is now managed against the market cap benchmarks. A fund manager deliberately selecting low beta stocks would have high tracking error against the market cap benchmark, would be criticized for doing so, and could even lose business as a result. This is exacerbated by the fact that although low beta stocks may have higher Sharpe ratios than high beta stocks, this does not automatically mean they will “beat the benchmark” in performance terms alone – for this to happen, the alpha from the low volatility “anomaly” must exceed the drag of lower beta.

It is quite likely that some combination of these factors is at work, resulting in the low volatility effect. And to the extent this is so, the low volatility “anomaly” is likely to persist. Indeed, we would expect that the next strong bull market will “erase” many investors’ memories of the low volatility effect as nearly everyone joins the chase for hot returns, thus improving the future potential for low volatility stocks to outperform!

Benefiting from the Low Volatility Effect

Given that the low volatility effect is well-established and is likely to persist, can investors take advantage of it? While at first glance it might seem that the way to benefit from the “anomaly” is to use the minimum variance portfolio, this may not actually be the case because of the needs and constraints of investors in real life:

- Defined benefit pension funds are long-term investors for which higher Sharpe ratios are attractive, and which favor asymmetric return profiles that offer a degree of downside protection in order to protect their funded ratios. However, pension funds often also impose constraints on tracking error relative to the market in order to meet their conceptual asset/liability models.
- Defined contribution pension plans and individual investors generally also prefer downside protection while still seeking to share in bull market growth.
- Asset allocation managers and fund-of-funds managers would generally prefer to outperform the market for the same degree of risk, and might also impose tracking error constraints due to peer comparison effects.

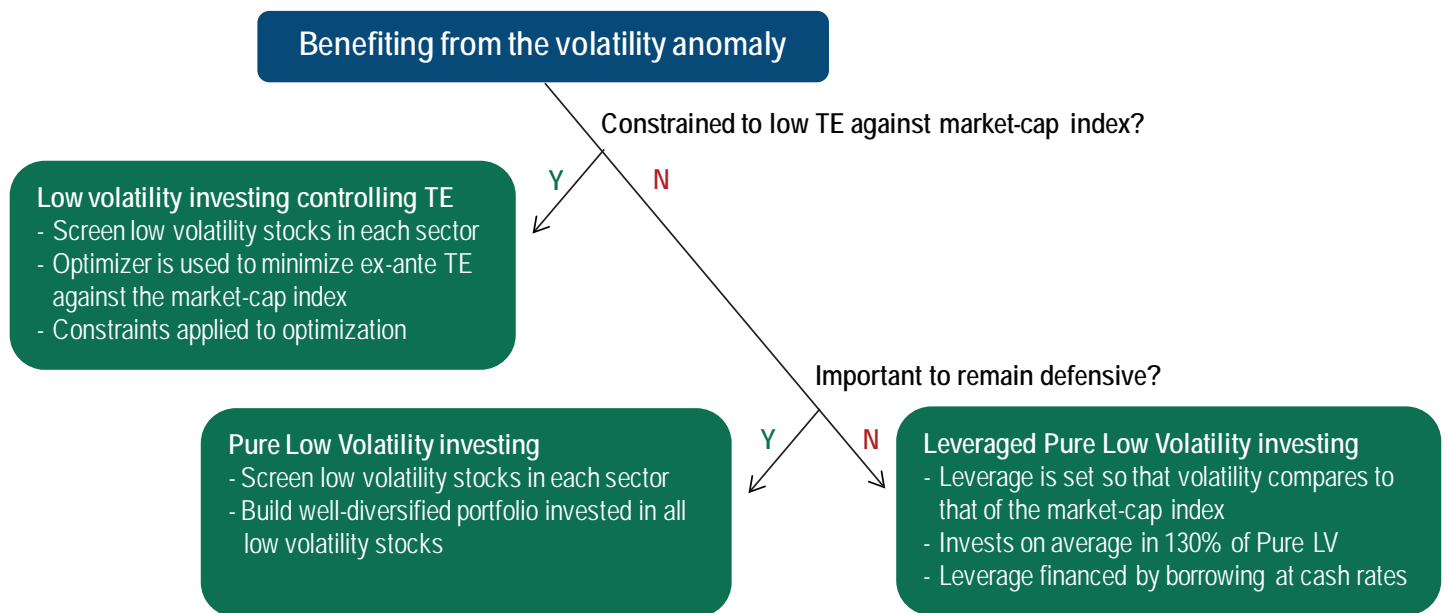
Unfortunately, the minimum variance portfolio is not in line with many of these requirements:

- The true unconstrained minimum variance portfolio is actually a long/short portfolio.
- Even if the minimum variance portfolio is constrained to be long only, its turnover tends to be high and sensitive to “noise” in the risk model chosen.
- The minimum variance portfolio tends to be under-diversified as the typical optimization tends to avoid such cyclical sectors as energy and materials. Indeed, it tends to avoid even the low volatility stocks in such sectors despite their attractive Sharpe ratios (Figs. 4 & 5).
- Perhaps most significantly, tracking error against the market cap benchmark tends to be very high (8% to 12% per annum, for example) and variable as well.



Fortunately, there are other ways to build a low volatility portfolio. At BNP Paribas Investment Partners we have developed low volatility portfolios that are better diversified than the minimum variance portfolio and, if desired, that limit tracking error as well. In actual live portfolios as well as extensive back-tests, our proprietary low volatility approach has demonstrated significantly reduced volatility, dramatically improved Sharpe ratios and appealing information ratios relative to the market cap benchmark — and where desired, carefully controlled tracking error as well. This approach allows us to tailor solutions to provide the benefits of low volatility investing to a wide range of clients based on their specific circumstances as shown in Figure 6 below:

Figure 6: Client decision tree for implementing a low volatility solution



To learn more about our research into the low volatility “anomaly” or to discuss how BNP Paribas Investment Partners’ proprietary approach to low volatility investing could be implemented to meet your needs or those of your clients, please contact Simon Segall at 416-365-3983 or Phil Gelsheimer at 416-365-3981.

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