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PIONEERS IN FACTOR INVESTING

Guide to low volatility investing

FROM THEORY TO PORTFOLIO

‘Robeco Conservative Equity strategies are based on the revolutionary idea that risk and return do not go hand in hand. This anomaly forms the basis of our philosophy’

Portfolio Manager Pim van Vliet

Guide to low volatility investing

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Foreword

It gives us great pleasure to present you with this 'Guide to low volatility investing'. It describes the basics of low volatility investing, provides insight into the volatility effect and shows how the Robeco Conservative Equities strategies work. This guide introduces the key features of Robeco's Conservative Equities and explains how the strategy can be used in a portfolio.

The objective of Robeco's Conservative Equities strategies is to achieve a long-term full-cycle performance equal to or greater than the equity market with substantial lower downside risk.

According to the Capital Asset Pricing Model (CAPM) theory, risk and return should go hand in hand. However, over 40 years of empirical studies have proved that the relationship between risk and return is flat or even negative. Strategies based on this phenomenon are therefore a promising investment approach for investors.

Robeco was one of the first companies to make research contributions to the academic debate on low volatility investing. And we have been a leader in successfully putting the concept into practice. We launched our first Conservative Equity strategy for developed markets in 2006 and an emerging markets strategy in 2011.

As of March 2019, Robeco manages over AUD 106.6 billion in quantitative strategies. A significant proportion of this sum is invested in low volatility equity strategies: with over AUD 34.2 billion in assets under management, Robeco can be considered one of the world's largest active low volatility equity managers.

We hope this guide will give you an insight into how to achieve your long-term investment goals and convince you of the benefits of our low volatility approach.

Portfolio Managers Robeco Conservative Equities



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Past and present

- Lower-risk stocks actually generate higher returns, which contradicts the CAPM theory
- Low volatility investing works because investors are biased towards high-risk stocks and are willing to overpay for these
- Despite the growing interest in low volatility investing, total assets under management for these strategies are estimated to be relatively low

The history and basics of low volatility investing

Already in the early 1970s, academic research reported that the risk-return relationship is flat for the US equity market.

Discovery of the volatility effect

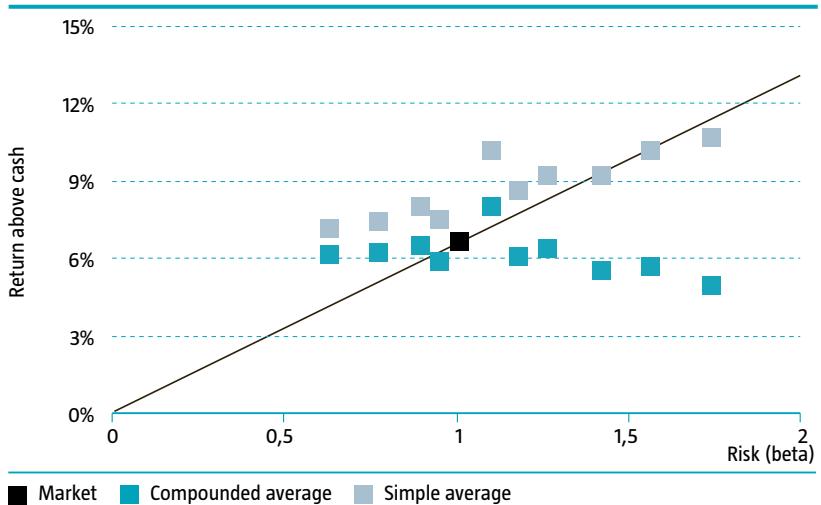
The CAPM (Capital Asset Pricing Model) predicts a positive relationship between risk and return. In other words, taking a higher degree of risk should, on average, be rewarded with a higher level of return. However, the first empirical tests carried out on the CAPM documented that the risk-return relationship is flatter than the theory predicts. In fact, a study by Haugen and Heins (1972) showed that low-beta stocks in the United States outperformed in the period 1929-1971.

Award-winning research by Robeco confirmed this 'beta effect' for other equity markets, such as Europe and Japan, and documented a related 'volatility effect': stocks with lower risk (as measured by beta or volatility) actually generate higher returns, which contradicts the CAPM theory¹. Figure 1 shows that stocks with a beta lower than 1 have similar returns as the market. As this phenomenon cannot be explained by standard theories like the CAPM, it is defined as an anomaly. In addition, this academic research shows that the volatility effect is growing stronger over time. Later, Robeco research was the first to publish the volatility effect in emerging markets as well.

A generic low volatility strategy selects stocks based on the volatility of past returns. From an investor's point of view, such a quantitative strategy offers higher risk-adjusted returns as measured by the Sharpe Ratio. This ratio indicates the extent to which investors are rewarded for the (absolute) risk they take. In other words, how much return they receive per unit of risk they take.

1. David Blitz and Pim van Vliet (2007), 'The Volatility Effect: Lower Risk Without Lower Return', Journal of Portfolio Management, pp. 102-113, Fall 2007

Figure 1: Risk-return relationship US, 1931-2002



Source: Van Vliet, Pim (2004), "Downside Risk and Empirical Asset Pricing", PhD thesis Erasmus School of Economics.

Why does low volatility investing work?

Because empirical evidence documents a flat or even a negative relationship between risk and return, the volatility effect in essence challenges the well-known CAPM model. This model assumes a positive and linear relationship between risk and return.

Explanations for this so-called low-risk anomaly² come from both rational professional investor behavior (market structure and regulation) and behavioral finance (irrational behavior by market participants). These are explained in more detail below.

- The first explanation has to do with the rational behavior of asset managers, whose performance is generally evaluated against a benchmark. This is why asset managers tend to focus on being able to deliver outperformance and on minimizing relative risk. As a result, they tend to overlook low-risk stocks.
- The goals and incentives of investors, asset managers, analysts and asset management firms can lead to investors overpaying for high-beta stocks. This is due to the fact that in the investment industry 'the winner often takes it all'. This means that based on performance only the best investors receive inflow. That is why some are even willing to take unrewarded risks to become the winner. As a result, they overpay for high-risk stocks with 'option-like' payoffs. This behavior is confirmed by empirical evidence that shows that mutual funds hold a disproportionately large amount of high-beta stocks.
- From a behavioral perspective market participants are known not to behave completely rationally. Usually they act on only a fraction of all the available relevant information. A well-known example is that high-risk stocks receive a lot of attention from investors, for example by making headlines in the news, whereas more boring low-risk stocks don't.
- Whenever an asset does not yield the return that corresponds with its risk profile, it is considered too expensive. A rational investor will try to sell this expensive asset to lock in a profit. There is still an incentive to sell, even if the investor does not hold the asset itself. All he needs to do is to borrow the assets and sell them short. However, this is not always possible because of the market structure (the ability to borrow and sell short) or regulatory requirements. These constraints prevent so-called arbitrageurs (and short-sellers) from re-establishing the fair risk-return relationship when high-beta stocks become overpriced.
- A similar situation occurs when an investor cannot switch between the following two types of portfolio: a portfolio of high-risk stocks and a portfolio of low-risk stocks where leverage is used to increase the risk level to that of the high-risk stock portfolio. The application of leverage is often not permitted by regulators or is against client wishes.

These factors will persist unless fundamental changes in law, regulations or industry structure occur or the behavior of market participants changes. Therefore, investors are likely to remain biased towards high-risk stocks, and willing to overpay for them. This disturbs the system of a fair reward for risk and gives low volatility investors the opportunity to exploit this.

'Investors are likely to remain biased towards high-risk stocks, and willing to overpay for them'

2. Blitz, David, Falkenstein, Eric and Van Vliet, Pim (2013), "Explanations for the Volatility Effect: An Overview Based on the CAPM Assumptions"

Low volatility investing today

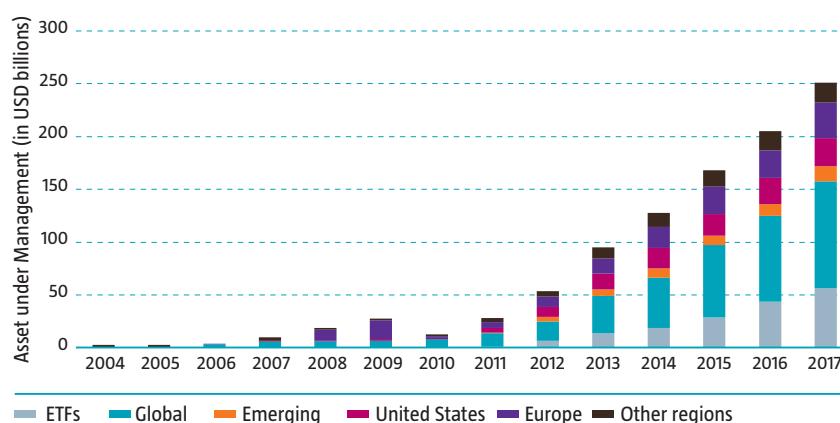
Whereas only ten years ago hardly anyone had heard about low volatility investing, nowadays many professional investors allocate to low volatility stocks and many asset managers offer a variety of related products.

Following the success of active managers, index providers and passive managers have also jumped on the bandwagon by introducing low volatility indices and ETFs. The names might vary from minimum variance to managed volatility. They all try to exploit the low volatility effect in one way or another.

In response to the popularity of these new products, some investors have become concerned that low volatility is starting to become an overcrowded trade and that the anomaly might disappear. However, there is no empirical evidence to support these concerns. Like other well-known effects, such as value, which even is exploited by a larger investment community, the volatility effect can be considered persistent as well. In addition, the reasons why low volatility investing works as described in the previous chapter are still in place for the majority of global equity investors.

Despite the growing interest, total assets under management in low volatility strategies were at around USD 250 billion at the end of 2017, according to Mercer Insight and Morningstar. Total assets under management in active low volatility products amounted to around USD 195 billion (Figure 2). These figures remain relatively small compared to the size of global equity markets. Therefore low volatility is far from overcrowded and still has considerable growth potential.

Figure 2: AuM of low volatility products



Source: Robeco calculations based on data by Mercer Insight and Morningstar.

2

Strategy

- Investors should be aware of the potential pitfalls of low volatility investing
- The Robeco approach successfully avoids these pitfalls
- Significant reduction of losses in down markets ensures capital preservation

How to avoid the pitfalls of a generic low volatility approach

In their bid to benefit from the low volatility anomaly, investors might be tempted to opt for cheap generic solutions, typically based on so-called 'smart beta' indices. But before they start investing in low volatility stocks, they should be aware of the potential pitfalls of a generic strategy. The five most common pitfalls are summarised below.

For each of the pitfalls, Robeco offers a solution and identifies the most attractive low volatility stocks. These are stocks with low absolute risk, low distress risk and attractive upside potential. Our prudent and systematic process for selecting stocks and constructing the portfolio leads to a low turnover and enhanced long-term returns.

Pitfalls and solutions

Pitfalls of generic approach	Robeco approach
1 One-dimensional view of risk	Multi-dimensional risk approach
2 Limited up-capture	Valuation and momentum factors in the stock-selection model
3 High trading costs	Robust portfolio-construction process
4 Concentration risk	Strict concentration limits for region, country, (sub)sector and single stock weights
5 Arbitrage risk	Keep strategies transparent for clients only

Source: Robeco

Pitfall 1 of a generic approach

1

1 One-dimensional view of risk

First, a low volatility portfolio focusing only on past volatility has a one-dimensional view of risk. An important risk dimension, future expectations, is excluded if the analysis relies solely on historical statistical risk factors.

Robeco approach

Robeco adopts a multi-dimensional risk approach, which also includes forward looking risk measures. The Robeco distress-risk model takes into account how balance sheet leverage of a company might translate into future distress (e.g. credit rating downgrade or insolvency). The Robeco risk approach also incorporates other forward-looking financial information about the firm's corporate structure.

Based on extensive testing over the period 1991-2009, Robeco has found that the distress-risk model has strong predictive power and is an effective indicator of future financial distress. This predictive power is especially important to a low volatility strategy, because one of its main goals is to preserve equity capital by minimizing losses in down markets and realizing positive excess returns in such a bearish environment.

Pitfall 2 of a generic approach

2

2 Limited up-capture

Due to its focus only on low volatility, a generic strategy tends to lag during an up market: this is called limited up-capture. Valuation risk is the risk of overpaying for low volatility stocks because the actual valuation (price relative to fundamentals) is ignored.

Most generic low volatility strategies do not take valuation into account. This can be a risk as during some periods, low volatility stocks can be more expensive. This was for example the case in the 1940s and 1950s, when people were willing to pay for stability, which resulted in relatively low returns in the following years. Also, in the years after the financial crisis (2008) low volatility stocks became relatively expensive.

Robeco approach

In order to enhance the risk-return profile and to mitigate the valuation risk, Robeco Conservative Equities has added return factors to its stock-selection model. Adding the momentum factor, for example via earnings revisions, helps to improve up-capture. Adding the valuation factor mitigates valuation risk. Incorporating these two factors into a low volatility strategy enables us to realise our objective of maximizing the return per unit of risk (Sharpe-ratio).

3 High trading costs

Pitfall 3 of a generic approach

Second, a low volatility strategy can lead to high trading costs, because of high turnover. Generic low volatility managers typically have a turnover rate of more than 50% and some in excess of 100%. This high turnover is often the result of the optimisation method used to construct portfolios. The optimisation method is very sensitive to assumptions on parameters, especially the correlations between individual stocks in the investment universe and in the portfolio. At first glance, portfolio turnover might look like a relatively minor issue. After all, the impact of a single transaction on net performance is minimal for most stocks. This is not always the case in emerging markets where these costs are relatively high compared to those in developed markets. But when all the individually modest costs are bundled together, they can take a big bite out of net performance. Transaction costs are the silent killer of performance, making them a major consideration.

Robeco approach

In order to prevent unnecessary trading costs and enhance returns in the long run, Robeco's Conservative Equities strategy has a robust portfolio-construction process which is different from most other asset managers. The portfolio-construction process uses a ranking method. A ranking method is less sensitive to changing inputs and avoids high turnover. Furthermore, the portfolio-construction process incorporates a sell-driven investment discipline. This means that stocks are only sold when they end up in the bottom 40% of the ranking, or if another stock with a much higher ranking can be bought instead. This results in an expected annual one-way turnover of only around 25%. In other words, on average a stock is held in the portfolio for four years.

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4 Concentration risk

Pitfall 4 of a generic approach

Low volatility indices and portfolios constructed using the optimisation method can heighten the concentration risk. The S&P 500 Low volatility Index is a good example. It does not constrain sector weights, which can result in a huge sector concentration. For example, in December 2012 around 60% of this index was invested in only two sectors, utilities and consumer staples. This means that any sector-specific developments can have a large negative impact on total performance. Optimised portfolios, which construct low volatility portfolios by taking correlations between stocks into account, are also vulnerable to increased concentration risk. These portfolios are highly dependent on input data like correlation estimates, which can result in extreme portfolio positions.

Robeco approach

Robeco mitigates concentration risk by having strict research-based concentration limits for region, country, (sub-)sector and single stock weights. Furthermore, Robeco combines low volatility, valuation and momentum, which have low correlations, in its selection model. This leads to a varied stock selection while avoiding excessive sector and country tilts.

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Pitfall 5 of a generic approach

5 Arbitrage risk

Generic products based on generic low volatility indices are also prone to significant arbitrage. Strategies based on indices may be fully transparent, but this transparency comes at a cost to investors. It means that other investors can identify in advance which trades are going to be executed, and can opportunistically take advantage of this. Recent research by Robeco shows strong empirical evidence supporting that this arbitrage is happening. It suggests that many market participants anticipate upcoming trades in these public low volatility indices, at the cost of those who invest based on these indices, either via ETFs or index-funds.

Robeco approach

At Robeco, we avoid this pitfall by keeping all our Conservative Equity strategies transparent for our clients only.

The construction of a Robeco Conservative Equity portfolio

The aim of the Robeco Conservative Equities strategy is to realise a long-term full-cycle performance equal to, or greater than, the equity market with substantially lower downside risk. Pure bottom-up stock selection is the sole performance driver of the strategy.

I. Stock ranking

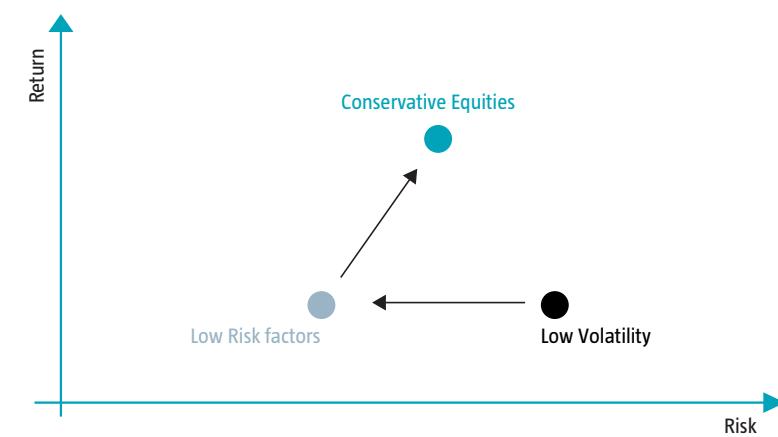
The starting point is the definition of an investment universe. Our investment universe is based on the S&P Broad Market Index, the MSCI indices and the S&P IFC and FTSE Emerging Markets Index for emerging markets. Dual listings and stocks with data issues are excluded and a liquidity screen based on a minimum average trading volume and minimum market cap. This results in a total investable universe of 4000, 2400, 1800 and 1200 stocks for Global, US, Emerging and European Conservative Equities respectively.

In order to realise the goal of the Conservative Equities strategy, the model not only focusses on the generic low volatility characteristics of stocks but also takes distress risk, valuation and momentum factors into account to further enhance the portfolio's risk-return profile. In our approach we focus first on reducing risk by using a combination of statistical low-risk factors and proprietary distress factors and secondly on enhancing return by adding customised valuation and momentum factors to the model (Figure 3).

The stock-selection model produces a total score for each stock in the investable universe by combining the outcomes on the different factors (low risk, valuation and momentum).

'The model not only focusses on the generic low volatility characteristics of stocks'

Figure 3: Conservative Equities strategy: Lower risk and enhanced returns



Broad portfolio of low volatility stocks

- Single statistical risk measure
- Low conviction, large numbers of stocks

Robeco proprietary low-risk factors

- Combination of statistical risk factors
- Proprietary distress factors

Robeco Conservative Equity

- Integration of valuation and momentum factors
- High conviction, higher active share

II. Portfolio construction

The next phase consists of model portfolio construction. The model's results (the stock ranking) are implemented using a proprietary portfolio-construction algorithm, which uses validated rankings from the stock-selection model to create a portfolio. The tool's objective is to construct the portfolio by selecting the highest ranked stocks with low expected risk and attractive upside potential. It aims to maximise the exposure of the portfolio to the highest ranked stocks. Portfolio turnover is regulated by only selling stocks when they fall into the bottom 40% of the ranked, or if another stock with a much higher ranking can be bought instead. In the long run this approach leads to lower transaction costs and higher returns. Figure 4 provides an overview of this process.

III. Execution & Monitoring

The portfolio consists of approximately 150 (European and US Conservative Equities) or 200 (Global, All Countries and Emerging Markets Conservative Equities) positions. It follows a monthly cycle of ranking the stocks and adjusting the portfolio accordingly. The portfolio is continuously monitored between monthly rebalancing dates. Corporate actions, position limits, foreign currency exposure and performance are constantly assessed.

If it is necessary to take action intra-month for example due to significant cash inflows or outflows, or to reduce unintended risks, an extra portfolio adjustment takes place. Portfolio managers carefully check all proposed transactions and the new portfolio as they have final responsibility for buy-sell decisions.

Figure 4: Portfolio management: A disciplined process to manage client portfolios

Monthly rebalancing process

1. Stock Ranking

- Proprietary quantitative stock selection model
- Qualitative review on stock rankings



2. Portfolio Optimization

- Robeco portfolio construction algorithm
- Determine most efficient instruments
- Check proposed trades

3. Execution and Monitoring

- Order execution by global trading desks
- Continuous monitoring of portfolio
- Portfolio rebalancing aligned with cash flows

Source: Robeco

Losing less in down markets

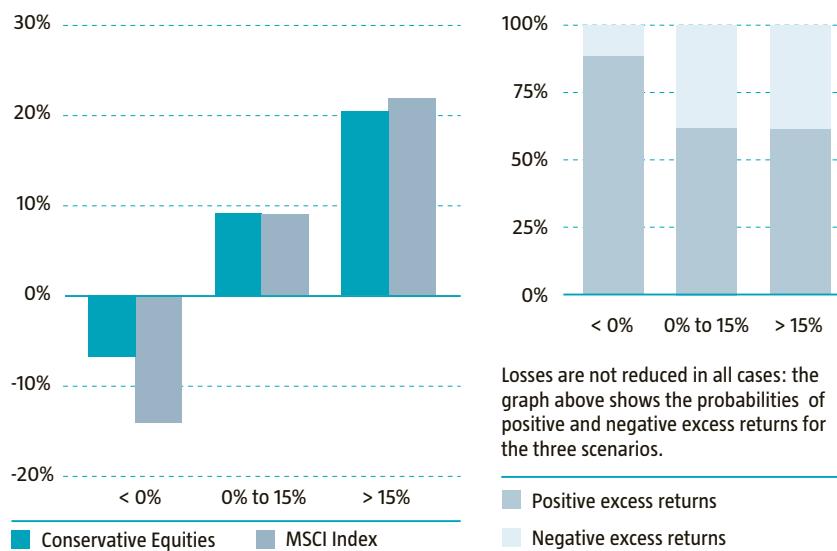
Capital preservation can be achieved due to significant reduction of losses during down markets.

The main objective of the Robeco Conservative Equities strategy is to achieve a long-term full-cycle performance equal to, or greater than, the MSCI Index, but with a lower degree of volatility. An advantage of Robeco's low volatility strategy is that, in a declining market, the stocks in the portfolio typically fall less than other stocks. Once the market recovers, low volatility stocks have less ground to make up. The preservation of capital compensates for the fact that the strategy may lag the MSCI Index in a strong (thematic) up market.

Figure 5 provides details of the risk-reduction potential in three scenarios: down markets (negative one year rolling returns), moderate up markets (returns between 0% to 15%) and strong up markets (returns above >15%).

The chart on the right-hand side of Figure 5 shows the 'hit ratio' of the Conservative Equity Strategy since its inception. Investors should be aware that the probabilities indicated below for the three scenarios are no guarantee that positive excess returns will always be generated in declining markets. However, on average, positive excess returns are archived in the long run, which is one of the key benefits of this strategy.

Figure 5: Track record: Losing less in down markets and keeping track in up markets



The average return series are based on the net asset values of Robeco Institutional Conservative Equity Fund since inception (October 2006) until December 2018, gross of fees, based in EUR. The Robeco Institutional Conservative Equity Fund and its reference indices are unhedged for currency risk as of June 30 2012. The value of your investments may fluctuate. Results obtained in the past are no guarantee for the future.

See also: Blitz, David, and Pim van Vliet (2014), "Low volatility Investing: Expect the Unexpected", [Robeco research paper](#).

Losses are not reduced in all cases: the graph above shows the probabilities of positive and negative excess returns for the three scenarios.

A significant and stable source of dividends

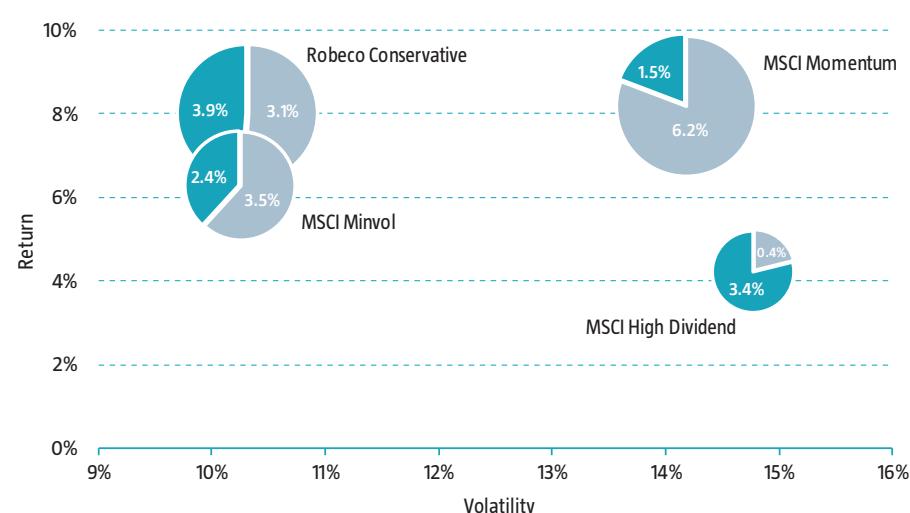
The primary focus of our low volatility strategies is to reduce risk. But the Robeco Conservative Equities also aims to deliver enhanced returns. We do this by adding customised valuation/income and momentum/sentiment components to the stock selection model. High dividend is an interesting characteristic because it usually leads to both lower risk and higher returns.

Therefore, our Conservative Equities strategy involves selecting firms with high and stable dividends. In addition, we take into account share buybacks, as some companies prefer to repurchase shares rather than pay dividends because it is more tax-efficient. Moreover, we believe that if a stock's price momentum is strong, earnings revisions are positive and there is strong credit momentum, the risk of seeing dividends decrease over time is mitigated. Taking price momentum into account also helps us avoid value traps and reduce risk.

Since its launch in October 2006 until December 2017, the average dividend return of our Institutional Conservative Equity Fund was 3.9%, which is double that of the MSCI World Index, at around 2%. The dividend return was in line with the MSCI High Dividend Index, which realised a return of 3.5%.

As a result, the Conservative Equities strategy offers a compelling proposition compared to traditional market capitalisation-weighted indices in terms of three key aspects (see Figure 6): higher dividend (in line with the MSCI High Dividend Yield Index), lower risk (in line with the MSCI Minimum Volatility Index) and higher returns (similar to the MSCI Momentum Index).

Figure 6 | Conservative Equities and MSCI Factor indices returns decomposed into price and dividend return



* Source: MSCI and Robeco. The graph shows the annualized performance of the MSCI style indices and the representative account for Robeco Conservative Equities with the longest available track record (from October 2006 to December 2018). Dividend returns are based on received dividends in the Robeco Institutional Conservative Equities Fund and is hence based on Dutch tax treatment. Other tax regimes may lead to different results. For more information see Pim van Vliet, Maarten Polfliet & Jan-Sytze Mosselaar (2019), "High dividend investing: buy them stable & strong", Robeco White paper.

3

Portfolio

- The Robeco Conservative Equity strategy not only improves the risk-return profile, it also offers good opportunities for income generation and capital preservation
- The Robeco Conservative Equity strategy can be effectively combined with other strategies in the portfolio
- Including Robeco Conservative Equities helps to improve the risk-return profile of the total portfolio

How can low volatility investing be applied to an equity portfolio?

The Robeco Conservative Equity strategy is designed for clients who are interested in capital preservation, dividend income or diversification.

Investors should also consider how Robeco's Conservative Equity strategy can be applied to an existing portfolio of equity funds. It can be combined with a benchmark-driven or higher risk investment strategy or combined with high dividend funds.

Combined with benchmark-driven funds (Table 1)

The Conservative Equity strategy can offer diversification benefits when it is combined with a benchmark-driven investment strategy (beta close to 1), because it has a less volatile return pattern than many traditional equity funds. This means the volatility of the combined portfolio will go down. However, tracking error will increase gradually. This is because Conservative Equities offer strong diversification benefits through better equity capital preservation, thanks to significant reduction of losses during bear markets, and tends to lag in strong thematic bull markets.

Combined with higher risk funds (Table 2)

The total volatility of an equity portfolio can decrease if you invest a larger proportion in a Conservative Equities fund. Tracking error first goes down due to the diversification benefit of adding Conservative Equities to higher risk investments (beta larger than 1) before it gradually goes up. On the other side the lower risk profile of Conservative Equities creates opportunities for investors to seek out higher risk investments for instance small caps or thematic investing.

Table 1: Adding Robeco Conservative Equity to a beta 1.0 portfolio

% Invested in Conservative Equity	0%	15%	30%	45%	100%
Return %	4.8	5.1	5.5	5.8	7.0
Volatility %	14.2	13.5	12.8	12.2	10.4
Tracking error %	-	1.0	2.0	2.9	6.5

Table 2: Adding Robeco Conservative Equity to a beta 1.1 portfolio

% Invested in Conservative Equity	0%	15%	30%	45%	100%
Return %	5.1	5.5	5.8	6.0	7.0
Volatility %	15.6	14.7	13.8	13.0	10.4
Tracking error %	1.4	0.8	1.4	2.4	6.5

Source: Robeco Performance Measurement. Monthly data from October-06 through December-18, gross of fees, based on net asset value of Robeco Institutional Conservative Equity Fund. For beta 1.0 portfolio we use the MSCI World and for beta 1.1 we use 110% MSCI World excluding lending costs. For better comparison, prior to July 2012 the index returns are hedged to Euro. The value of your investments may fluctuate. Results obtained in the past are no guarantee for the future.

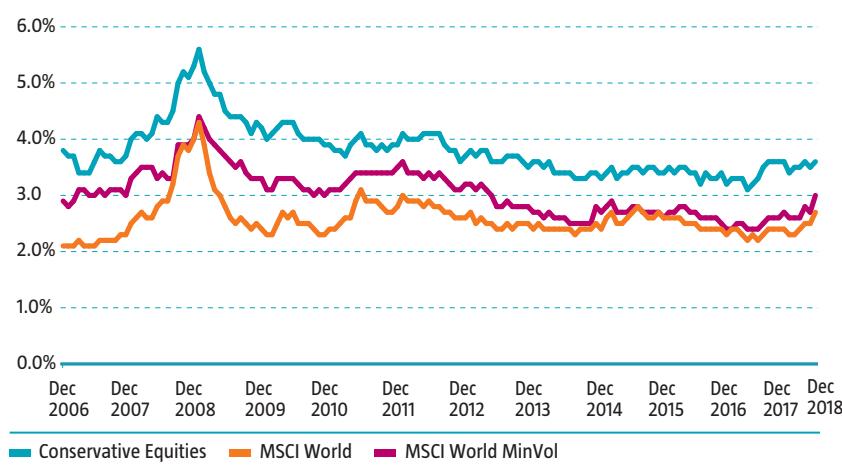
Combined with high dividend funds

Conservative Equity can also offer good opportunities for income generation. Low volatility stocks are generally characterised by above-average dividend yields. A Robeco Conservative Equity fund and a high-dividend fund go together well, because they offer a clear diversification benefit when they are combined.

The reason is that the stocks in both strategies are selected in different ways. Low volatility takes low risk as the starting point with a high dividend yield as a by-product, while a high dividend strategy focuses first on dividend yield. As a result, Conservative Equities typically offer better downside protection than high-dividend funds. This better equity capital preservation provides diversification and more stable equity returns with high income. Also, high-dividend funds typically don't offer downside protection to the extent that Conservative Equities does.

Figure 7 shows that the dividend yield of Global Conservative Equities is consistently higher than the MSCI World and MSCI World Minimum Volatility Indices.

Figure 7: Dividend yield Global Conservative Equities



Source: Robeco

'Low volatility stocks are generally characterized by above-average dividend yields'

Extra information

Robeco: a long history in quantitative equity investing

1994 Stock Selection Model Global Markets	2001 Stock Selection Model Emerging Markets	2002 Core Global Markets	2006 Conservative Global Markets & Core Emerging Markets	2008 Active Emerging Markets	2011 Conservative Emerging Markets	2012 Momentum Global Markets	2013 Value Global Markets	2014 Factor Investing Solutions	2016 Conservative Sustainable & Quality Global	2017 Factor Indices

Terms and definitions

Anomaly

This is a phenomenon that cannot be explained by standard theories. In the case of investing, these are often divergences from the CAPM, which assumes that investors are rational and that there is a linear correlation between risk and return.

Capital Asset Pricing Model (CAPM)

The Capital Asset Pricing Model (CAPM) is the product of a financial investment theory that reflects the relationship between risk and expected return. The model assumes a linear relationship.

Diversification

Exposing the portfolio to a variety of factors improves diversification. The aim of diversifying according to underlying factors is to make the portfolio more robust.

Downside risk

Downside risk in financial terms is the chance of an unexpected and undesirable event occurring that will impair the value of an investment.

Efficient (advanced) approach

An investment approach that uses smart rules for stock selection and portfolio construction. The aim of this is to increase returns and to lower both risks and costs.

Passive investing

Passive investing is following a (market-weighted) index without deviating from it to achieve market-like returns. Investors thus obtain the index returns (beta) adjusted for costs.

Premium

Reward or extra return for taking risk or exposure to factors.

Risk factor

In factor investing, the term 'factor premium' can be replaced with 'risk factor' or 'risk premium', on the supposition that a factor premium represents compensation for higher risk.

Sharpe ratio

The Sharpe ratio describes the extent to which an investment offers compensation for extra absolute risk.

Unrewarded risk

Higher risk that is not rewarded with higher returns.

Robeco Conservative Equity strategies

Robeco Conservative Equities aims to achieve long-term full-cycle returns equal to, or greater than, the equity market but at a distinctly lower level of downside risk. The selected low-risk stocks are characterised by low absolute risk, low distress risk, high dividend yields, attractive valuation and positive momentum. This results in a diversified and actively positioned portfolio of defensive stocks to achieve stable equity returns and high income.

Learn more about our products

<https://www.robeco.com/au/themes/emerging-conservative-equities/>
<https://www.robeco.com/au/themes/global-developed-conservative-equities/>

Recommended articles

- *Risk and the Rate of Return on Financial Assets: Some Old Wine in New Bottles*, Robert A. Haugen and A. James Heins, Journal of Financial and Quantitative Analysis Fall 1972.
- *The volatility effect: lower risk without lower return*, David Blitz and Pim van Vliet, Journal of Portfolio Management, Fall 2007, pp. 102-113
- *Enhancing a low volatility strategy is particularly helpful when generic low volatility is expensive*, Pim van Vliet, Robeco Research Paper, June 2012
- *How distress risk improves low volatility strategies: lessons learned since 2006*, Joop Huij, Pim van Vliet, WeiLi Zhou and Wilma de Groot, Robeco Research Paper, February 2012
- *The volatility effect in emerging markets*, David Blitz, Juan Pang and Pim van Vliet, Emerging Markets Review, April 2012, pp 31-45
- *Are low volatility stocks overcrowded?*, David Blitz and Pim van Vliet, Robeco Research Paper, June 2014

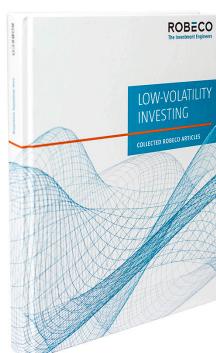
Collected Robeco Articles

Over recent years, Robeco's researchers have written several articles on low volatility investing and these have been collected into a book. This 2015 limited edition of Robeco's book on the volatility effect contains 24 separate articles divided into five parts and offers the most extensive overview of research on the volatility effect available today.

Low volatility investing is a perfect example of how we put our investment beliefs into practice and this is also reflected in the structure of this book.

The book first focuses on the anomaly and possible explanations for it. It then discusses how low volatility investing fits into a strategic portfolio and gives insights into efficient implementation.

Finally, the book responds to questions that have been raised on the strategy. We hope you will find inspiration and new insights in this book of articles.



This book is intended for professional investors and can be requested at your local Robeco office.

For more information about how to contact us, please visit: <https://www.robeco.com/au/about-us/contact/>

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