

Low Volatility: Searching for a Durable Edge

A Tour of Low-Volatility Funds and ETFs in EMEA

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Executive Summary

Low-volatility strategies have gained significant traction among investors. In the past five years alone, the number of such funds available in Europe has doubled to almost 100 open-end funds or exchange-traded funds. These funds have amassed substantial assets. In Europe alone, we estimate that they have racked up EUR 27 billion of net flows since 2012 and that assets under management reached EUR 40 billion by the end of 2016. As low-volatility investing has grown, investors have also learned about the limitations of the investment style. In this paper, we analyse the increasing popularity of low-volatility strategies, discuss their pitfalls, and examine the solutions active managers have devised to tackle these issues. We also look under the hood of these funds' portfolios and show that biases towards smaller and higher-quality companies are found across regions. Finally, we review the risk, performance, and other metrics of low-volatility strategies and find that, for the most part, the results in recent history are convincing from a risk-adjusted standpoint.

Key Takeaways

- ▶ At the end of 2016, we identified 89 low-volatility funds in Europe. **This number has doubled in the past five years.** Assets under management reached almost **EUR 40 billion at the end of 2016**, with 15% of assets in exchange-traded funds.
- ▶ Low-volatility strategies typically trade some market risk for other **potentially undesirable risks** such as high valuation or interest-rate exposure. Both active and passive funds are trying to mitigate these shortcomings with some success.
- ▶ Low-volatility funds across markets have **tilts towards small and mid-caps and higher-quality stocks.**
- ▶ Most funds have demonstrated **compelling risk-adjusted performance**, in agreement with academic research. The US equity market seems to be the hardest to crack for low-volatility funds.
- ▶ Morningstar acknowledges the **risk-reduction benefits** low-volatility strategies can bring to an investment portfolio over the long term.
- ▶ However, the experience of each investor will also be determined by the valuation at which they enter the strategy. Given the growing popularity and rising valuations of low-volatility stocks, **future rewards may be lower** and investors should set their expectations accordingly.

Introduction

The minimum-variance (or minimum-volatility) anomaly refers to low-risk stocks producing higher returns than what is suggested by the Modern Portfolio Theory model. The idea has been studied since the 1970s by academics and practitioners,¹ who have showed that portfolios of low-volatility stocks have produced higher risk-adjusted returns than portfolios with high-volatility stocks in most markets. Several hypotheses have been advanced to explain the "volatility" effect, such as benchmark constraints, investors' preference for high-beta stocks to overcome their inability to use leverage to amplify returns, and the "gambling" behavior making highly volatile stocks more interesting as lottery tickets than their less volatile counterparts.

Most studies on low-volatility investing have been conducted on hypothetical stock portfolios, and we think it is therefore interesting to see what happens in the real world of investing. The goal of this paper is to examine what low-volatility funds look like and how they have behaved thus far. In order to do so, we have screened our database to identify strategies with a clear mandate to mitigate volatility by looking up names and strategy descriptions, as well as relying on the Morningstar Manager Research team's knowledge of the fund market.

The study is limited to European-domiciled funds in the following five regional buckets: Global, emerging markets, Europe, Eurozone, and US equity.²

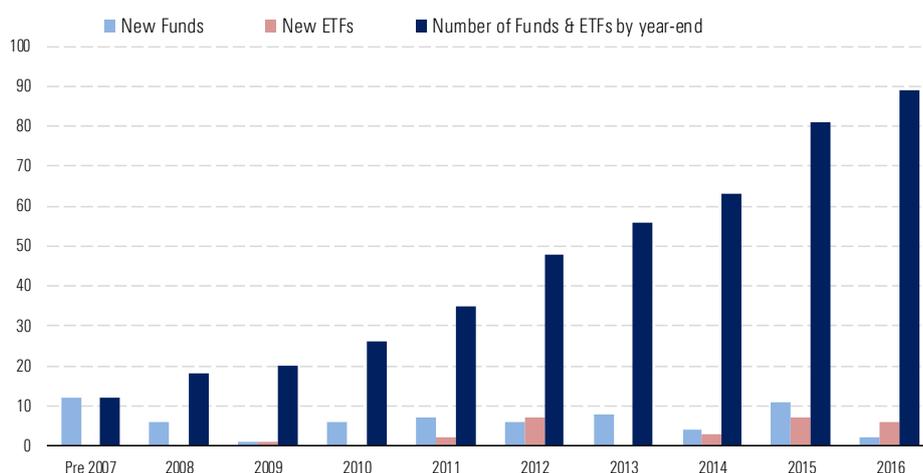
1 Haugen, R.A., & Heins, A.J. 1975. "Risk and the Rate of Return on Financial Assets: Some Old Wine in New Bottles." *J. Financial and Quant. Analysis*, Vol. 10, No. 5, P. 775; Baker, N.L., & Haugen, R.A. 2012. "Low Risk Stocks Outperform within All Observable Markets of the World." <https://ssrn.com/abstract=2055431>; Blitz, D., & van Vliet, P. 2007. "The Volatility Effect: Lower Risk Without Lower Return." *J. Portfolio Management*, Vol. 34, No. 1, P. 102

2 Throughout the paper, we grouped the following EAA equity categories into five regional buckets : Global emerging markets = Emerging Markets ; Europe large-cap blend = Europe , Eurozone large-cap + Eurozone flex-cap = Eurozone ; Global large-cap blend + Global income + Global currency hedged = Global ; US flex-cap, US large-cap blend, US large-cap value= US

Gaining Assets

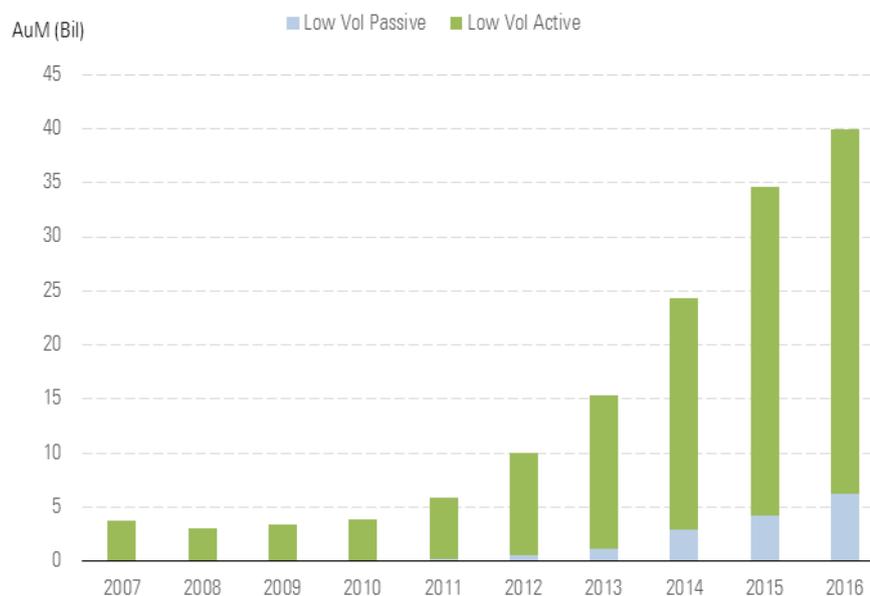
Low-volatility strategies have gained significant traction in the past 10 years. The global financial crisis in 2007-08 was a big hit and profoundly shifted risk appetites among investors. Then, the eurozone debt crisis of 2011 translated into steep losses, again, for equity investors. Both events nourished a growing demand for lower-risk equity products that asset managers have rushed to satisfy. From a dozen specialised low-volatility funds 10 years ago, European investors today have access to a large panel of low-volatility strategies, both active and passive (see **Exhibit 1** below). In the past five years alone, the number of such products available in Europe has doubled. At the end of 2016, we identified 89 funds, split between 63 open-end funds and 26 ETFs, available for sale in Europe.

Exhibit 1 Number of Low-Volatility Open-End Funds and ETFs Through Time in EMEA



Source: Morningstar Direct. Data as of 31/12/2016

Altogether, these funds have registered a robust growth in assets fueled by their strong outperformance in volatile market conditions. The MSCI World Minimum Volatility Index outperformed the MSCI World Index benchmark by more than 10% in the two down markets of 2008 and 2011 but also saw robust relative returns after 2011. Since 2007, assets under management in low-volatility equity funds have increased tenfold, with a growing number of investors choosing passive ETFs. We estimate that assets managed with a low-volatility approach across Europe reached EUR 39.9 billion by year-end 2016 with a 15%- 85% split between passive and active strategies (see **Exhibit 2**).

Exhibit 2 Assets Under Management in Low-Volatility Funds in Europe (EUR Billion)

Source: Morningstar Direct. Data as of 31/12/2016

Interestingly, these funds have been particularly resistant in terms of flows (see **Exhibit 3**). They still saw net inflows even when their respective broader asset class experienced net redemptions. For instance, in 2016 low-volatility funds investing in European equities registered modest but positive net flows of EUR 156 million, whereas the broader Europe equity categories experienced record outflows; funds within the Europe large-cap blend equity Morningstar Category funds alone saw EUR 19.5 billion walking out the door on the back of political and economic uncertainties surrounding the future of Europe and the Brexit vote. Emerging markets shared a similar fate in 2015, with investors pulling a net EUR 11.5 billion from global emerging-markets funds, but the low-volatility funds within this peer group gathered a net EUR 900 million. The weakest spot seems to be in US equity, where low volatility has experienced modest growth. That said, overall these funds have racked up EUR 26.9 billion in net assets since 2012.

Exhibit 3 Open-End Funds and ETFs - Estimated Net Flows and Assets Under Management (EUR Million)

Estimated Net Flows € Mil	2015	2016	2012-2016	Assets Dec-2016
Low Vol Emerging Markets Equity	901	1 614	8 213	7 808
Low Vol Europe Equity	4 684	156	9 287	16 171
Low Vol Global Equity (incl. Jap)	2 607	1 664	8 564	12 858
Low Vol US Equity	-303	177	823	3 058
Total Low Vol Equity	7 890	3 611	26 887	39 896

Source: Morningstar Direct. Data as of 31/12/2016

X-Raying Low-Volatility Portfolios

Of the basic approaches used to construct an investable low-volatility portfolio, we can distinguish between heuristic and optimisation-based methods. Heuristic approaches rely on ranking a universe of stocks based on their volatility, selecting the least volatile stocks, and weighting them according to the inverse of volatility or other weighting schemes. While heuristic approaches don't consider how stocks in the portfolio interact with each other, optimisation-based approaches incorporate both volatility and correlation effects and therefore don't just target the least volatile stocks.

Most active and passive low-volatility or minimum-variance funds use the optimisation-based method. However, within active funds, there are many ways to construct an optimised portfolio, with different methods of covariance estimation and differences in the constraints applied in the quantitative optimisation combined with qualitative judgement at varying degrees. (We do a deeper dive of these methods in the next section).

Our analysis shows that the resulting portfolios tend to have pronounced portfolio tilts. Funds across each of the five regions in our study have a tilt towards smaller companies, and they tend to show larger exposures to so-called quality stocks. For the purposes of this study, we have combined Morningstar's proprietary metrics to gauge the profitability and financial stability of holdings within low-volatility funds. Our results show that the portfolios tend to score higher on each of these metrics than their indexes and category averages.

Passive vs Active

There are differences between low-volatility portfolios, however, depending on the portfolio construction approach applied. The heuristic approach used by some passive funds produces a different portfolio compared with the optimisation-based approach. To demonstrate these differences, we can compare two passive funds: SPDR S&P 500 Low Volatility and iShares S&P 500 Minimum Volatility. Both strategies aim to reduce volatility versus the market-cap-weighted S&P 500. The SPDR ETF employs a heuristic approach by ranking the 100 least volatile stocks from the S&P 500 by the inverse of their volatility. As of this writing, the SDPR ETF has large overweightings in utilities, industrials, and consumer defensive stocks both against the category index and other US low-volatility funds. However, relative to the SPDR fund, the optimisation-formed portfolio of iShares ETF recorded approximately 10% less volatility during the past three- and five-year periods on an annualised basis (as of end December 2016). This is because the heuristic approach fails to effectively limit the exposure to unintended factor and sector tilts. As a result, the strategy loses the diversification and risk-reduction benefits of using correlations in the portfolio construction. For example, it is often skewed towards interest-rate-sensitive sectors, such as utilities, which results in greater under- and overperformance in rising and falling interest-rate environments, respectively.³

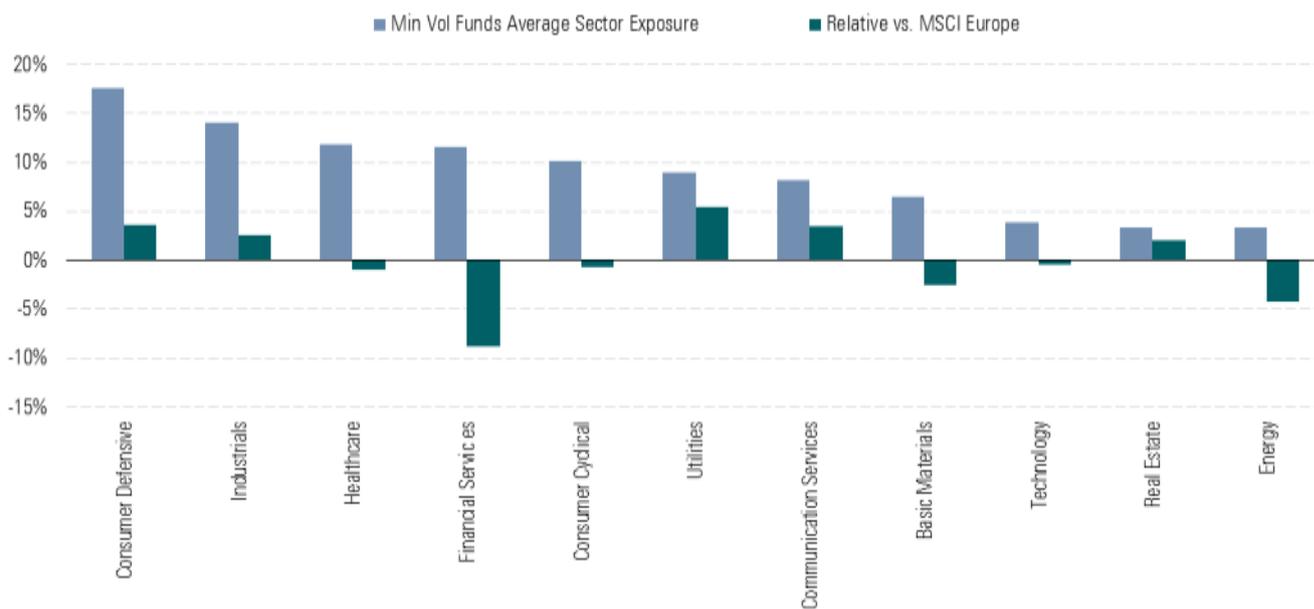
³ Bryan, A. 2017. "The Hidden Risk of Low-Volatility Investing." <http://news.morningstar.com/articlenet/article.aspx?id=796107>

Actively managed strategies follow their own course around the low-volatility concept. Most portfolio managers would implement their views through a number of constraints that need to be met before the final set of stocks is optimised for minimum volatility. There is often leeway in qualitative judgement from the fund management team to implement (or not) the model's results. In comparison with passive strategies, which rebalance at least semiannually, active managers can choose to adjust their portfolios more often.

Sector Allocation

There is no clear consistency between passive or active low-volatility funds in their sector allocations across the different regions. This is because the majority of funds use optimisation-based techniques that enable managers to address potential risk drivers within their portfolios on a much more granular and accurate level than adjusting sector or country allocations. The European region is where we find the most consistency in terms of sector exposure (see **Exhibit 4**). On average, low-volatility strategies are less exposed to the financial sector, for example. Since the global financial crisis and the eurozone debt crisis in 2011, the financial services sector has been volatile, and the intrasector correlations have been higher than in other industries, making financials less interesting in the portfolio construction of low-volatility funds.

Exhibit 4 Europe Region Sector Allocation of Low-Volatility Funds and Market Benchmark



Source: Morningstar Direct. Data as of 31/12/2016

Factor Exposures in Common: Lower Size and Higher Quality

As opposed to sector weightings, an area where low-volatility funds share a common style bias with regard to company size. Looking at market cap allocations (as defined by Morningstar⁴) reveals a strong preference for smaller companies in comparison with the market-cap benchmarks across the five regions (**Exhibit 5**). Starting universes can be made up of thousands of different stocks, and small and mid-caps often offer diversification benefits and lower correlations with the broader market, making them particularly appealing from a portfolio construction standpoint.

Exhibit 5 Exposure to Small, Mid-, and Large Caps and Average Market Cap Across Regions

	Allocation difference vs index			Average market cap vs index	
	Large Cap	Mid Cap	Small cap		
EM	-13%	8%	5%	11.1	24.4
Global	-18%	12%	6%	23.6	54.0
US	-16%	11%	4%	34.9	65.6
EMU	-21%	14%	7%	19.5	34.5
Europe	-21%	19%	1%	17.8	38.9

Source: Morningstar Direct. Data as of 31/12/2016

In combination with their preference for smaller companies, we found that low-volatility funds tend to favour higher-quality companies, which contribute to their tendency to offer good downside protection. There are several ways to assess quality, but generally companies of this type have profitable businesses, robust balance sheets, and stable earnings. By using Morningstar's Global Risk Model,⁵ we are able to identify the low-volatility funds' exposure to two factors that are particularly relevant to assess quality: financial health and economic moat (**Exhibit 6**).

Exhibit 6 Morningstar Factor Exposure: Economic Moat and Financial Health

	Financial Health	Economic Moat
MSCI EM NR USD	0.49	0.28
EM Low Vol Funds	0.71	0.39
MSCI EMU NR EUR	0.37	0.23
EMU Low Vol Funds	0.39	0.54
MSCI Europe NR EUR	0.42	0.37
Europe Low Vol Funds	0.47	0.61
MSCI World NR USD	0.54	0.77
Global Low Vol Funds	0.56	0.82
Russell 1000 TR USD	0.58	1.09
US Low Vol Funds	0.55	1.13

Source: Morningstar Direct. Data as of 31/12/2016

⁴ Within each region, large-cap stocks are those that together account for the top 70% of the capitalisation of all listed stocks, mid-cap stocks represent the next 20%, and small-cap stocks represent the balance.

⁵ <https://corporate.morningstar.com/us/documents/PR/Risk-Model-Fact-Sheet.pdf>.

The Quantitative Financial Health metric assesses the strength of a firm's financial position and ranks companies on the likelihood that they will tumble into financial distress. In contrast to traditional accounting-based metrics, this metric is calculated using both a firm's leverage and stock volatility and is an approximation of the distance-to-default metric developed by Kealhofer, Merton, and Vasicek (KMV model). Higher scores imply stronger financial health and a lower risk of bankruptcy. Each individual company's score is then aggregated at the portfolio level. Interestingly, we find no strong preference for financially healthy companies except in emerging markets where low-volatility funds own companies with better financial health than the index. The higher financial health results from underweighting the largest companies in China, Russia, Brazil, and South Africa, which are often highly indebted state-owned enterprises. Such firms are more likely to serve political, rather than shareholder, interests and are often involved in investigations and scandals.

For our second assessment—on quality of business models and profitability—we used Morningstar's Economic Moat⁶ Rating, which assesses a company's ability to deliver excess return on capital for many years. Companies with higher scores are identified to have sustainable competitive advantages. Aggregated at the portfolio level, low-volatility funds score higher than the broader market but with some differences across regions. In the US, the economic moat advantage is not as obvious as in emerging markets or Europe. The moat advantage is a key element in explaining the capital protection offered by such funds in times of crisis.

⁶ <http://www.morningstar.co.uk/uk/news/120912/what-is-an-economic-moat.aspx>

Pitfalls of Low-Volatility Investing

As highlighted in the previous sections, low-volatility strategies have grown popular with risk-averse investors in the wake of the financial crisis. However, they are not risk-free. Instead, low-volatility strategies typically trade some market risk for exposure to other potentially undesirable risks.

We review below the main pitfalls of low volatility and how actively managed Morningstar Medallist funds in this space (see **Exhibit 7**) typically go beyond simple portfolio optimisation in an attempt to mitigate them.

Exhibit 7 Low-Volatility Actively Managed Funds With a Morningstar Analyst Rating

Name	Morningstar Category	Branding Name	Morningstar Analyst Rating
Invesco Pan European StructEq C EUR Acc	Europe Large-Cap Blend Equity	Invesco	Silver
Robeco QI European Conservative Eqs I €	Europe Large-Cap Blend Equity	Robeco	Bronze
Robeco QI Emerging Conservative Eqs I €	Global Emerging Markets Equity	Robeco	Bronze
Robeco QI Global Conservative Eqs I €	Global Large-Cap Blend Equity	Robeco	Bronze
Uni-Global Equities Europe SA-EUR	Europe Large-Cap Blend Equity	Unigestion	Gold
Uni-Global Equities Emerg Mkts SA-USD	Global Emerging Markets Equity	Unigestion	Silver
Uni-Global Equities World SA-USD	Global Large-Cap Blend Equity	Unigestion	Silver
Uni-Global Equities Japan SA-JPY	Japan Large-Cap Equity	Unigestion	Silver
Uni-Global Equities US SA-USD	US Flex-Cap Equity	Unigestion	Bronze

Source: Morningstar Direct. Data as of 31/03/2017

Reliance on Backward-Looking Risk Data

Among the potential pitfalls to low-volatility investing is the reliance on past risk data. One can question the use of historic volatility as an indicator for expected risk in the future, even if correlations are not ignored. Trailing volatility does not account for other information that may be available about a company, and there is no guarantee that the least volatile stocks historically will remain so going forward. In fact, these stocks may become more volatile as more money flows into them and their valuations increase, as has been witnessed in recent years.

Actively managed low-volatility strategies aim to address this shortcoming by incorporating additional measures of risk (both macro and company-specific) in their risk assessment or applying forward-looking risk and return indicators in their stock-selection approach. Unigestion, for instance, uses a risk model that produces correlation and volatility forecasts but also relies on a more qualitative judgement whenever a particular event, like mergers and acquisitions or fraud, is likely to make past risk metrics irrelevant. In their “Structured Equity” fund range, Invesco uses a multifactor model that builds on fundamental and behavioral concepts such as earnings expectations, market sentiment, management action, and valuations to identify what it thinks are the most attractive low-volatility stocks and limit reliance on backward-looking data. There is no qualitative overlay except for data validation or when stocks are placed on a restricted list temporarily owing to major events such as mergers and acquisitions.

High Trading Costs

A low-volatility strategy can be associated with high turnover, resulting in elevated trading costs. To prevent excessive trading, most strategies we know implement turnover constraints like penalties for stocks that cost more to trade by incorporating transaction cost estimates, changing the frequency of rebalancing, using in- and outflows to smooth out turnover, or taking into account the trade-off between turnover and volatility reduction. More stable outcomes in risk/return forecasts also help to slow down turnover.

Limited Upside Participation

As indicated by **Exhibit 8** for the Europe equity funds, low-volatility strategies can be observed to lag the broader market in market rallies as their portfolios are typically dominated by the utilities, consumer staples, and healthcare sectors, which tend to be less sensitive to the overall economy and the business cycle. Coupled with elevated valuations, low-volatility stocks may be more likely sold in exchange of cyclical stocks in a rallying market, thus amplifying their potential underperformance in such a context.

Exhibit 8 Upside and Downside Capture Ratios Compared With the MSCI Europe NR Index

	Downside Capture Ratio 3 Yr	Upside Capture Ratio 3 Yr	Downside Capture Ratio 5 Yr	Upside Capture Ratio 5 Yr
Europe Category Average	99.0	95.9	97.5	96.3
Low Vol Europe Equity Funds Weighted Average	67.0	84.1	63.7	83.1
Invesco Pan European StructEq C EUR Acc	79.5	96.8	70.6	97.2
Robeco QI European Conservative Eqs I €	71.8	87.2	68.4	88.7
Uni-Global Equities Europe SA-EUR	66.2	88.2	63.6	82.8

Source: Morningstar Direct. Data as of 31/12/2016

Among the medallists, Bronze-rated Robeco QI European Conservative uses a momentum factor to help improve its behavior on the upside. Silver-rated Invesco Pan European Structured Equity takes a similar path by incorporating stock return forecasts, which are based on forward-looking factors such as earnings growth and momentum. During a five-year period, these two funds have managed to show better upside participation than both the peer group average and Gold-rated Uni-Global Equities Europe, which doesn't take momentum into account in its stock selection. However, the Invesco and Robeco funds appear slightly less effective on the downside.

Valuation Risk

Volatility-reducing strategies that focus only on historical volatility do not factor in valuation. In some periods, low-volatility stocks become more expensive because risk-averse investors prefer defensive characteristics and stability. One legitimate concern is that the return of volatility-reducing strategies that have become more expensive might not be enough to compensate for the limited upside participation. We looked at the average price/book and price/earnings ratios of low-volatility portfolios in our regional buckets by comparing them with market-cap-weighted benchmarks.

In all developed-markets groups, the low-volatility portfolios tended to be more expensive compared with the market-cap-weighted benchmarks (**Exhibit 9**) when measured by price/book and price/earnings ratios. One-year trailing numbers indicate that low-volatility strategies have become more expensive

than the cap-weighted indexes in most regions. Within emerging markets, there is still a valuation premium for the low-volatility set, but it seems to have been on a decline recently. This is hardly surprising considering the strong reversal in risk appetite in the past year and investors favouring higher-beta emerging-markets stocks.

Exhibit 9 Relative Valuations of Low-Volatility Funds Compared With Benchmark Valuations

	Price-to-book			Price-to-Earnings (TTM)		
	1 Year	3 Years	5 Years	1 Year	3 Years	5 Years
Emerging Markets						
Average LV funds vs MSCI EM	109.5%	116.2%	113.7%	105.0%	112.9%	110.2%
EMU						
Average LV funds vs MSCI EMU	134.5%	131.4%	128.5%	106.5%	102.7%	100.8%
Europe						
Average LV funds vs MSCI Europe	143.5%	143.2%	141.6%	105.8%	109.4%	106.5%
Global						
Average LV funds vs MSCI World	114.0%	114.8%	112.2%	102.5%	101.4%	100.9%
US						
Average LV funds vs Russell 1000	109.4%	106.2%	105.1%	107.8%	105.6%	105.0%

Source: Morningstar Direct. Data as of 31/12/2016

To limit exposure to richly valued stocks, active managers can take into account absolute and relative valuation measures. As an example, Unigestion is analyzing valuation both at the security and sector level and can implement constraints in its optimisation model if it identifies pockets of high valuation. Robeco is explicitly using a valuation factor based on dividend yield in its ranking, alongside volatility and momentum. Finally, Invesco considers valuation indicators such as cash flow yield, gross profit yield, earnings yield, or dividend yield. Valuation factors account for 25%-30% within the multifactor model that generates stock return forecasts. Their weighting has remained broadly stable during the past five years. While the weighting of factors can be adjusted strategically in response to the overall valuation of the broader market, forecasting quality, or turnover, there is no attempt at tactical factor timing.

Liquidity Risk and Crowding

Low volatility has been a winning factor for a very long time, and there are solid scientific arguments underpinning it. However, like all factor-based strategies, low volatility is cyclical in nature and may experience periods of underperformance.⁷ Furthermore, with large capital flows into this type of strategy, there is a valid concern that they could run into liquidity problems when they buy stocks from the same reduced universe. As they attract more money, their market impact at the rebalancing dates becomes more substantial. Crowded trades are also more vulnerable to sudden reversals.

⁷ Johnson, B. 2017. "2016 Shows That Factors Are Fickle." <http://news.morningstar.com/articlenet/article.aspx?id=787709>

Our active medallist funds typically apply liquidity screens, consider the popularity of stocks, and implement more flexible rebalancing schemes, which can help managers deal with these risks. In this regard, it's important that managers measure their capacity and liquidity impact by taking into account the allocation decisions of other managers with overlapping approaches.

Invesco requires a minimum liquidity of EUR 500 million and a minimum market cap of EUR 1 billion for stocks to be eligible for the portfolio. The European version of the strategy has experienced large asset growth in recent years, with the fund itself receiving inflows of EUR 4.5 billion according to Morningstar estimates. Assets peaked at more than EUR 7 billion in mid-2016. They have fallen since then to around EUR 6.3 billion as at the end of March 2017. Such a large asset base is manageable when it comes to investing in large-cap stocks, but it can be challenging in the small- and mid-cap segments of the market. The managers seek to reduce liquidity risk through more flexible order processing and twice-monthly rebalancing (since 2016). Institutional strategies using the same approach also have different rebalancing dates to ease pressure on liquidity. According to Invesco, the firm stopped actively marketing the strategy in 2016, and outflows in that year have mitigated liquidity risk somewhat. Crowding risk is monitored indirectly by looking at valuations.

Unigestion is also taking the liquidity issue seriously and periodically reviews the maximum size the strategy can handle in each region. The team was also very early in considering crowding risks. In 2012, it undertook a study on potentially "overcrowded" low-volatility stocks to find out how these could alter the risk-adjusted returns of their portfolios. Unigestion refined its investment process in 2013 to identify and exclude or constrain the weightings of these stocks in the funds if deemed necessary. Robeco doesn't specifically look for crowded names but uses a liquidity screen and requires minimum daily market volume to include stocks in its investment universe. Capacity is monitored for each region, with the firm stating that the funds could be soft-closed when 80% of the maximum capacity is reached.

Concentration Risk and Potentially Large Deviations from the Broad Market

Optimised portfolios have a high sensitivity to correlation estimates and can therefore carry significant concentration risk, as reflected in large biases towards defensive sectors such as consumer staples or utilities, which are typical of many low-volatility approaches. Excessive portfolio tilts can be avoided by constraining risk-factor exposures or sector, country, and single stock weightings in the optimisation, or introducing lower-correlation factors such as valuation or momentum into the stock-selection process.

Imposing constraints relative to the relevant market-cap-weighted benchmark tends to lower exposure to smaller-cap stocks, reduce concentration in the top holdings, increase the number of holdings, and mitigate liquidity risk. Overall, it helps to move the portfolio towards the cap-weighted benchmark, thereby limiting tracking error and the deviations from broader market performance. That said, during the five years through February 2017, the 21 low-volatility portfolios that we identified among Europe large-cap equity funds still had a tracking error between 4.2% and 8.0% against the MSCI Europe Index, which is well above the average of the Europe large-cap blend equity category (3.5%).

High Interest-Rate Sensitivity

Low-volatility stocks are often viewed as bond proxies. They exhibit relatively stable cash flows because they tend to be less dependent on changing economic environments or operate in heavily regulated industries. When bond yields fall, minimum-volatility strategies tend to outperform the broader market.

Equally, when bond yields rise, minimum-volatility approaches start to underperform.⁸ Many years of falling rates have contributed to low-volatility returns, benefitting highly leveraged sectors such as utilities and telecom, which tend to be over-represented in low-volatility approaches, but this tailwind will likely be limited going forward.

To counter this risk, active managers can implement interest-rate sensitivity screens or constrain certain sector exposures to control the degree to which a portfolio is exposed to changing interest rates. In this way, they can exploit differences in interest-rate sensitivity within sectors as well as across sectors to benefit from the diversification potential offered by stocks with diverging interest-rate sensitivities.

The team at Invesco monitors interest-rate sensitivity but does not actively manage it, nor does Robeco. Among our medallists, only Unigestion is actively putting in place constraints on certain sectors and countries to minimise the negative impact of potential interest rate increases.

⁸ Bryan, A. 2017. "The Hidden Risk of Low-Volatility Investing." <http://news.morningstar.com/articlenet/article.aspx?id=796107>

Living Up to Their Promise?

Low-volatility strategies are designed first and foremost to reduce risk compared with traditional market-cap-weighted indexes. Low-volatility funds have undeniably delivered on that front. Our data below (**Exhibit 10**) show that, on average, these funds have been able to significantly reduce the levels of volatility when compared with their respective category benchmarks and peers in the medium to long term. Looking at our five regional buckets, we found that low-volatility funds had 11%-25% lower realised standard deviation versus the benchmarks during three- and five-year periods.

Reducing Risk

Low-volatility strategies available to European investors have successfully reduced volatility and drawdowns in all developed markets. Europe- and EMU-focused low-volatility funds have generated stronger volatility reduction and lesser drawdowns versus their respective benchmarks compared with US-focused funds. This is partly because US markets have experienced strong returns on the back of stable economic growth, while the European recovery has been sluggish and more vulnerable to market shocks, giving Europe and EMU low-volatility funds more opportunities to shine. Also, we noticed that the edge of these strategies in terms of risk reduction and performance (see also **Exhibit 11**) is much less pronounced in the more efficient US equity market where benchmarks are tougher to beat for active managers compared with other regions.

Exhibit 10 Maximum Drawdowns and Volatility Reduction

Region	Number of Funds	5- year Maximum Drawdowns		Volatility Reduction vs. Benchmark	
		LV Funds Average	Benchmarks	3 -Year Annualised	5 -Year Annualised
EM	10	-31%	-33.4%	25%	23%
Europe	21	-14.5%	-23.4%	19%	19%
EMU	9	-17.3%	-24.3%	14%	21%
US	12	-9.7%	-12.4%	17%	11%
Global	34	-11.6%	-16.7%	15%	11%

Source: Morningstar Direct. Weekly returns. Data as of 28/02/2017

Returns Are Not That Impressive...

The medium-term returns are mixed (**Exhibit 11**). During the past three years, low-volatility funds on average have outperformed the MSCI indexes in Europe, the eurozone, and globally but failed to do so in emerging markets and US equity. It should be noted that the low-volatility factor has performed poorly in most regions in the past 12 months up to February 2017, hence affecting the three-year numbers. All funds under examination in this paper underperformed their respective benchmarks during the past 12-month period. The market rally driven by higher-beta stocks and sector rotation, notably towards energy, has been painful.

The returns for a five-year period are not better. On a five-year basis, only two buckets, Europe and emerging-markets equity, on average recorded an outperformance. Low-volatility funds in the global and especially US equity buckets underperformed. It must be noted, however, that the number of funds with a five-year track record for most groups is sometimes substantially lower than for the three-year periods.

Looking further back in time, during a 10-year period, we have an even smaller number of funds to evaluate. Only within Europe equity do we have a sufficient number of low-volatility funds to say anything meaningful on their average performance. During a 10-year period, these funds on average are slightly behind the MSCI benchmark. Our medallists, on the other hand, have produced convincing relative returns in this timeframe.

All things considered, it is fair to say that the relative returns of the low-volatility strategies are a mixed bag. And especially in the highly efficient US equity market, they are less impressive than those obtained in other regions.

...But Risk-Adjusted Returns Are Compelling

Nevertheless, low-volatility funds shouldn't be judged only on returns, as the main objective for this type of fund is risk reduction compared with traditional cap-weighted indexes. A risk-adjusted gauge like the Sharpe ratio is a good way to measure the added value of these funds.

Over a three- and five-year period, almost all buckets outperformed their benchmarks on a Sharpe ratio basis. On average, the outperformance is quite significant for low-volatility funds within Europe and eurozone equity. Again, US equity is the exception. Although on a three-year basis low-volatility funds within US equity outperformed, they failed to do so on a five-year basis.

Meanwhile, medallist funds have done an even better job, as they outperformed the average for low-volatility funds in all five buckets during three- and five-year periods. With only one exception, medallist funds in US equity, however, did not match the average performance of low-volatility funds during the five-year period.

Exhibit 11 Returns and Sharpe Ratios by Region**Global Equity (USD)**

	Total Return Ann. (%)			Sharpe Ratio		
	3 Year	5 Year	10 Year	3 Year	5 Year	10 Year
MSCI World NR USD	5,20	9,41	4,29	1,20	1,38	0,49
Min Vol Funds Average	6,03	9,04	2,62	1,44	1,45	0,38
# of low vol funds	24	12	2			
Morningstar Medallists	7,48	8,72		1,62	1,46	
# of low vol funds	3	2		3	2,00	

Global Emerging Markets (USD)

	Total Return Ann. (%)			Sharpe Ratio		
	3 Year	5 Year	10 Year	3 Year	5 Year	10 Year
MSCI EM NR USD	1,35	-0,37	2,86	0,76	0,38	0,35
Min Vol Funds Average	-1,00	0,56		0,69	0,52	
# of low vol funds	7	4				
Morningstar Medallists	0,06	0,64		0,78	0,52	
# of low vol funds	3	2		3	2,00	

US Equity (USD)

	Total Return Ann. (%)			Sharpe Ratio		
	3 Year	5 Year	10 Year	3 Year	5 Year	10 Year
Russell 1000 TR USD	10,19	13,94	7,69	1,51	1,67	0,69
Min Vol Funds Average	9,25	10,96	4,11	1,57	1,45	0,42
# of low vol funds	6	4	1			
Morningstar Medallists	10,12	10,40		1,68	1,42	
# of low vol funds	2	1		2	1,00	

Europe Equity (EUR)

	Total Return Ann. (%)			Sharpe Ratio		
	3 Year	5 Year	10 Year	3 Year	5 Year	10 Year
MSCI Europe NR EUR	5,72	9,61	2,88	0,50	0,84	0,22
Min Vol Funds Average	7,52	10,53	2,77	0,73	1,07	0,24
# of low vol funds	16	15	7			
Morningstar Medallists	8,22	11,52	5,92	0,76	1,11	0,47
# of low vol funds	4	3	2	4	3,00	2,00

Eurozone Equity (EUR)

	Total Return Ann. (%)			Sharpe Ratio		
	3 Year	5 Year	10 Year	3 Year	5 Year	10 Year
MSCI EMU NR EUR	5,85	10,24	1,61	0,47	0,78	0,14
Min Vol Funds Average	6,47	10,05		0,59	0,91	
# of low vol funds	5	5				

Conclusion

Morningstar acknowledges the risk-reduction benefits that low-volatility strategies can bring to an investment portfolio over the long term. Most of them have produced convincing results from a risk-adjusted standpoint in recent history.

Actively managed low-volatility strategies are increasingly going beyond the traditional "minimum-variance" concept by using risk models that recognise the different sources of risk they are exposed to. Their enhanced models should potentially be able to reduce risk more effectively and better adapt their holdings to a changing market environment than simple low-volatility strategies that rely mainly on volatility and correlations. The passive approach follows a more classical route but retains a significant cost advantage. The ongoing charges of Silver-rated European-domiciled low-volatility ETFs range between 20 and 40 basis points.

However, expectations that these strategies will provide significant risk reduction without any sacrifice of long-term return would be overly optimistic. Moreover, the experience of each investor will be determined by the valuation at which they enter the strategy. Given the growing popularity and rising valuations of low-volatility stocks, future rewards from this approach may be lower, and investors should set their expectations accordingly. ■■

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