They say you can’t have your cake and eat it too. Yet, over the last few years, investors have enjoyed a fantastic mix of high returns, low volatility and low correlations. All of these factors have been tailwinds to portfolio construction. There are uncertainties facing each of these key inputs and it is time to ask the ‘what-ifs’ and plan the ‘to-dos’ in light of these new circumstances. We offer a framework for thinking about portfolio construction going forward, crucially questioning our assumptions, and taking nothing for granted.

The portfolio construction challenge

Classic portfolio theory suggests that more returns can be gained if more risk is taken. The curve that captures this is the efficient frontier. A ‘good’ efficient frontier is one which is upward sloping and steep, reflecting a good trade-off between returns and risk.

However, levels and slopes of efficient frontiers can change. Over the last six decades, the realised efficient frontier of a two asset combination between equities and bonds, using the decade’s realised return, volatility and correlation, have yielded very different efficient frontiers.

The efficient frontier of the 1950s can probably be deemed the ‘classical’ efficient frontier, which is steep and upward sloping.

Contrast this with the efficient frontier of the 1980s; even though the slope of that curve was much flatter than that of the 1950s frontier, the level of returns from equities and bonds was significantly higher. This was obviously a great decade for returns.

Now consider the efficient frontiers of the 1970s and 2000s. The former was characterised by high inflation while the latter period was marred by the Global Financial Crisis (GFC). The efficient frontier of the 70s appears as a dot relative to other decades’ efficient frontiers due to the narrow range of returns. In that decade, equities returned 5.5% while bonds returned 7.3%, therefore there was very little opportunity to harness returns from just equities and bonds. In the 2000s, equities lost 1% while bonds returned 6%. Investors were rewarded if they were predominantly invested in bonds during that decade.

Figure 1: Efficient frontiers are not static

Source: Schroders, Bloomberg, Thomson Reuters Datastream, Shiller for the respective periods stated. Efficient frontiers were generated using realised historical returns, volatility and correlation for equities and bonds for each decade. Results shown are for illustrative purposes only.
In recent years, the efficient frontier has benefited from a decline in volatility, below average correlations and above average returns. This has been due to low macroeconomic volatility, further magnified by the unconventional measures adopted by central banks globally. GDP growth has been extraordinarily stable while inflation has steadied at the 2% mark.

Financial market volatility has fallen in tandem with macroeconomic volatility, aiding financial assets. Equity returns have been stellar for a majority of the last 30 years while bond yields have been on a clear downward trend. Current volatility is significantly low, lying at the bottom of its long-term history. Finally, the negative correlation between equities and bonds has meant that investors have found diversification easily.

The tailwinds that have delivered the ideal efficient frontier through a combination of high returns and less risk are fading. As the economic cycle matures and central banks move from quantitative easing to tightening, the suppression of financial market volatility will come to an end and correlations are likely to rise. Furthermore, protectionist rhetoric on international trade could well bring back more macro volatility to the table. Finally, while we can’t say for sure whether and when inflation will structurally move higher, it is worth remembering that inflation can rise a lot quicker than many expect, like the experience in the 60s. These signposts are worrying, turning tailwinds into headwinds, and we expect future returns to be lower than average.
Figure 3: Future returns are expected to be lower than average

Historical vs. future returns

Source: Schroders, Bloomberg, Thomson Reuters Datastream. Future returns are based on Schroders economic team's 30-year forecast. Data as of August 31, 2018. Historical data based on the last 30 years.

Tailwinds to headwinds

The ‘current’ efficient frontier reflects the desirable mix of higher returns, low volatility and correlations, which investors have enjoyed in recent years. A minor shift in returns, volatility and correlations will have a meaningful impact on the portfolio construction results. As these variables change, the risk that the portfolio construction yields disappointing results will rise, as we depict in Figure 4. If we assume a lower expected return, say 5.3%, we see a material shift in the efficient frontier downwards and to the right ('lower returns, higher volatility'). Next, if we assume equity volatility moves back to its historical average (~15%), the efficient frontier shifts even lower. Finally, if we assume correlation goes from mildly negative to positive, we further exacerbate the downward trend.

Figure 4: The portfolio construction challenge

Because volatility is expected to increase, investors have to be prepared to be exposed to more volatility even if they stick to their current asset allocation. Furthermore, the heightened relationship between equities and bonds means that we have to deal with a ‘flatter’ efficient frontier. Risk is no longer rewarded as handsomely as before.

A framework to improve the odds of an optimal outcome

Many institutions still need to achieve a reasonable return, around 7% on average. We interviewed a large number of investors about how much return they expect to generate going forward. More than 40% of global investors expect more than 7% return while this proportion is higher in North America, at 54%. This is fairly reflective of an inflation +4% target.

Figure 5: Investors still expect a high return on average

Investors’ expected returns of equity


To improve the odds of meeting the required 7% return, or equivalent inflation +4% return, investors will need to embrace the riskier areas that offer value. Given where starting valuations of most traditional assets are, we expect returns to be harder to come by. We believe investors should therefore consider some of the following approaches:

- Increase allocation to laggards such as emerging market (EM) assets
- Increase allocation to active managers
- Add leverage

Emerging market assets

Emerging market assets generally offer a premium over developed markets. While this premium has not always been consistent, we do expect return prospects of emerging markets from both the equity and debt side to be higher than their developed market counterparts (left hand chart of Figure 6). While emerging markets offer value, valuations can diverge from fair value for a considerable length of time. In fact, emerging markets have been trading at a large discount as compared to the US (right hand chart of Figure 6) for about a decade but yet, US equities outperformance has been well-documented.

The final result is unnerving, especially considering how far it is from the ‘current’ efficient frontier. This is precisely what concerns us as the ‘new’ efficient frontier is telling us that returns are going to be much harder to achieve and requires us to take on more risk in order to achieve returns.

1 Schroders Economics team forecast

2 500 institutional respondents: 115 in North America, 200 in Europe, 150 in Asia and 35 in Latin America. Respondents were sourced from 15 different countries.
Emerging market assets, however, are also much more volatile especially when currency valuations are taken into account too. Investors therefore have to embrace more volatility and possibly adopt a longer-term view to unlock the emerging market premium.

**Active managers**
Investing in bottom-up, unconstrained active managers allows investors to tap into alpha potential. This approach is especially useful in certain environments, which we will discuss later on in the paper. However, alpha is never a guarantee and the alpha delivered by active managers can vary over time. Figure 7 shows that the proportion of US equity managers outperforming their benchmarks can be inconsistent, or ‘lumpy’ over time. Investors also need to accept more idiosyncratic risk when investing in active managers, i.e. not all the risk is reflected in the macro environment and the risk may actually be style, or even manager specific.

**Figure 7: Percentage of US equity managers outperforming their benchmarks**

Leverage can help enhance returns as it magnifies portfolio positions. Consider a hypothetical leveraged strategy which identifies the allocation between equities and bonds that yields the highest risk-adjusted returns on the efficient frontier.³

The portfolio is then scaled to a certain target risk, say 8%, using leverage.

The identification of the ‘right’ portfolio is crucial and will heavily depend on the correct correlation assumption. In Figure 8, we show what happens to the realised (or ex-post) volatility of this leveraged strategy if the correlation is stretched from -0.3 (current correlation between equities and bonds) to +0.5. In essence, this measures how much excess risk is taken as correlation rises. The strategy takes on too much leverage and therefore excess risk is taken.

Contrast this with a diversified strategy, which is fully invested but not leveraged. We have basically assumed our diversified strategy consists of the equity/bond split that creates a portfolio with 8% risk while assuming current correlations. When the correlation between equities and bonds start rising, as expected, the realised volatility of the portfolio also rises, but at a lower rate of change as a leveraged portfolio. Leverage therefore amplifies the issue with rising correlations and can lead to excess risk taking more quickly.

**Figure 8: Leverage can lead to excess risk taking**

³ In portfolio theory, this is referred to as the tangency portfolio.
The challenge with all of the aforementioned approaches (emerging markets, active management and leverage) is that they all involve taking on more risk. However, not all investors will be able to take on more risk; for example, underfunded plans. Likewise, not all investors have a long time horizon and therefore the path of returns matter. A volatile sequence of returns can have an adverse impact on the desired outcome. For participants of defined contribution plans, high returns in the early years when cashflows are usually small followed by low returns in later years when cashflows are larger can be problematic. In contrast, retirees and endowment funds in the net withdrawal phase are adversely impacted by lower near-term returns versus stronger returns in the later years.

Narrowing the range of outcomes

Taking on more risk to generate higher returns is thus not necessarily the answer for all investors. To increase the probability of a positive outcome, investors need to stay invested but favour strategies that help to narrow the range of outcomes, provide a smoother path of returns and allow for the benefits of compounded returns to come through.

Some strategies which we think allow investors to do so are:
- Private assets
- Minimum volatility equity
- Multi-asset strategies

Private assets

Many plans have diversified into alternative asset classes in recent years with the intention of eking out return sources that are less correlated to equities. Not all alternatives are equal however, and an objective assessment of risk premium is crucial. In the US for instance, private equity (buyouts only in our example) has generally outperformed public markets but this spread has narrowed in recent years. Going forward, we expect this spread to return to its historical norm and offer an important premium over public markets.

Private debt markets tend to offer wider net spreads to liquid markets due to lower default rates and higher recovery rates. Spreads do vary in the private debt world so investors have to ensure that they are getting a decent trade-off for the risk that they are taking.

We expect private assets to outperform. However, investing in private assets requires a significant amount of resources, and manager selection within the asset class is crucial. Private assets would also require a long-term horizon for investors to unlock their illiquidity premium.

Minimum volatility equity

Minimum or low volatility equity has been a popular equity style among investors. The style prescribes that there is a low volatility anomaly among stocks, whereby low volatility stocks tend outperform high volatility ones. Furthermore, the style is attractive as investors stay invested in equities while bringing down the risk of that allocation.

However, the style is very much predicated on using volatility/standard deviation as a sole measure of outperformance. We do not have a view on which equity style will outperform, but we do believe that using a single, backward looking measure in isolation is suboptimal. Such an approach ignores fundamental variables such as valuations, quality and interest rate sensitivity. A more holistic approach to investing in equities, which combines a wider range of risk and valuation measures, is a better approach.
We can show the danger of using volatility as a sole measure for future performance in the above two charts. In this analysis, we look at subsequent returns following low/medium/high volatility periods in a few markets. The first clear conclusion is that subsequent returns are lower following a period of low volatility. Furthermore, the average returns for US and emerging equities actually tend to be higher following periods of mid to high volatility. The pattern is less clear cut for developed equities but it is safe to say that low volatility in the present can pose a material danger to returns in the future.

Lower average returns directly translates to a higher likelihood of future underperformance. In fact, the probability of underperformance for US equities is around 65% when volatility is high and 100% for both developed and emerging equities. We’ve assumed that the performance target here is 7%, but clearly the target is irrelevant as the pattern will be exactly the same even if the actual probability differs. This suggests some vulnerabilities for minimum volatility equity styles.

Multi-asset strategies

Multi-asset strategies generally aim to deliver a smoother path of returns by diversifying away from traditional asset classes. Nevertheless, a few of these strategies have taken this to the extreme by targeting a low to zero correlation to equities and/or aim to deliver a tail risk hedge. This has come at the expense of returns as there is no such thing as a free lunch. Multi-asset strategies, in our view, should narrow the range of outcomes to ensure a favourable path of returns, while not completely sacrificing returns.

We illustrate this in Figure 12, which shows the distribution of annualised returns in a simulation for a few strategies. Equities, as expected, offers the highest median return, but at a much bigger range too. Bonds are safer and have a narrower range of outcomes but at much lower returns. A portfolio made up of 60% equities, 40% bonds has historically offered an attractive range of outcomes but at some expense of returns. Multi-asset tries to balance the returns versus range of outcomes dilemma and can therefore play a crucial role in portfolios.
High cross-asset and bottom-up correlation (top right)

Low cross-asset and bottom-up correlation (bottom left)

Average

Low cross-asset correlation, high bottom-up correlation

In this scenario, the economy is now in recession.

Top 10%

This scenario is usually a late cycle expansion phase.

Average monthly returns during months of high cross-asset correlations tend to be much lower than when bottom-up correlation is low. This is because when correlations between stocks start rising, it is likely that significant macro factors have filtered through the index and to individual stocks, which is usually a bad environment for risk assets.

We believe investors should favour multi-asset strategies that are flexible and adaptable to different market environments. Strategies that target low to zero correlation are anything but flexible. For example, correlations are not static and subject to change. As a rule of thumb, high correlations are usually associated with low returns. However, there can be ‘good’ types of high correlation, such as a broad bull market rally. When we look at correlations calculated on a cross-asset basis, we found little difference between the average monthly returns of assets in high versus low correlation environments. We actually found average monthly returns during months of high cross-asset correlations to be higher than months of low cross-asset correlations, rather contrary to the rule of thumb. This represents very conducive periods in markets where performance is broad and strong across assets.

We also analysed bottom-up correlation, which in this case refers to the correlation between constituent stocks of the S&P 500. This is essentially a measure of how narrow or broad the performance in the market is. We can immediately see that the difference in the average monthly returns between high versus low bottom-up correlations is much starker. Furthermore, the returns when bottom-up correlation is high tends to be much lower than when bottom-up correlation is low. This is because when correlations between stocks start rising, it is likely that significant macro factors have filtered through the index and to individual stocks, which is usually a bad environment for risk assets.

Using these two distinct views of correlations allows us to discern what kind of environment we are in. We introduce the concept of the correlation ‘clock’, created from plotting cross-asset and bottom-up correlations on two separate axes. We can then relate the different combinations to different parts of the cycle:

- High cross-asset and bottom-up correlation (top right)
  - This environment is typically when the economy is in slowdown. Macro issues have already impacted asset classes on a high level and are now beginning to impact underlying stocks too. An example of this was 2007, which was obviously the period directly before the GFC.

- Low cross-asset correlation, high bottom-up correlation (bottom right)
  - In this scenario, the economy is now in recession. Macro factors that have impacted markets are still present and are affecting underlying stocks but recovery in some assets is on the way. The bursting of the Dotcom bubble is a good historical example.

- Low cross-asset and bottom-up correlation (bottom left)
  - This scenario tends to be a great environment for investment as investors can add value through asset allocation and security selection. The most recent example of this would be 2017, which saw a strong bull market across risk assets. Stockpickers would find it easy to identify the winners from the losers.

- High cross-asset correlation, low bottom-up correlation (top left)
  - This scenario is usually a late cycle expansion phase. Performance has been strong across asset classes but there is still breadth in the underlying markets. Pure macro investors may struggle to identify winning asset classes but stockpickers are still able to sift through winning stocks. An example of this period was the year leading up to the peak of the Dotcom bubble.

Source: Schroders. Monte Carlo simulation for each strategy, 30-year annualized returns depicted on vertical axis. The hypothetical results shown must be considered as no more than an approximate representation of performance, not as indicative of how it would have performed in the past or future. It is the result of statistical modeling, with the benefit of hindsight, based on a number of assumptions and there are a number of material limitations on the retrospective reconstruction of any performance results from performance records. Monte Carlo performance simulations have inherent limitations, including modeling risk and probability (or tail) risk; that is, simulation results may not account for highly unlikely positive or negative outcomes which can occur in live portfolios. This data is provided to you for information purposes only as at today's date and should not be relied on to predict possible future performance. There can be no guarantee that these or any simulated results will occur, generate a positive return or protect against loss of principal.

We also analysed bottom-up correlation, which in this case refers to the correlation between constituent stocks of the S&P 500. This is essentially a measure of how narrow or broad the performance in the market is. We can immediately see that the difference in the average monthly returns between high versus low bottom-up correlations is much starker. Furthermore, the returns when bottom-up correlation is high tends to be much lower than when bottom-up correlation is low. This is because when correlations between stocks start rising, it is likely that significant macro factors have filtered through the index and to individual stocks, which is usually a bad environment for risk assets.
Conclusion

Investors have enjoyed a great environment for portfolio construction over the last few years. However, tailwinds are turning into headwinds and going forward, portfolio construction will be more difficult.

Now is an opportune time to review what can be done to navigate the future environment. If investors have the capacity and time horizon to embrace higher risk, we believe that there are certain areas that are attractive. Emerging market assets can offer a premium over developed markets, while active managers can boost returns through alpha. Leverage can also further boost returns. All of these approaches have individual idiosyncrasies that investors need to embrace.

If investors are unable to take on more risk, then one should think about narrowing the range of potential outcomes and smoothing the path of returns. Private assets can offer a ‘true’ alternative exposure but require large amount of resources. Equity styles such as minimum volatility can also be useful, but may be susceptible to ignoring fundamental factors. Multi-asset strategies are another good option but investors need to focus on those that are truly flexible in their approach as well as balance the trade-off between returns and range of outcomes well.

The best sailors are ones that can spot a storm from afar and are also able to navigate their ships accordingly to avoid the worst of the tempest. We believe that this is no different for investors, and it is imperative to accept the uncertain future and begin preparations on how to navigate through it.

Important information

The views and opinions contained herein are those of the authors as at the date of publication and are subject to change due to market and other conditions. Such views and opinions may not necessarily represent those expressed or reflected in other Schroders communications, strategies or funds.

This document is intended to be for information purposes only. The material is not intended as an offer or solicitation for the purchase or sale of any financial instrument or security or to adopt any investment strategy. The information provided is not intended to constitute investment advice, an investment recommendation or investment research and does not take into account specific circumstances of any recipient. The material is not intended to provide, and should not be relied on for, accounting, legal or tax advice. Any references to securities, sectors, regions and/or countries are for illustrative purposes only.

Information herein is believed to be reliable but Schroders does not represent or warrant its completeness or accuracy. No responsibility or liability is accepted by Schroders, its officers, employees or agents for errors of fact or opinion or for any loss arising from use of all or any part of the information in this document. No reliance should be placed on the views and information in the document when taking individual investment and/or strategic decisions. Schroders has no obligation to notify any recipient should any information contained herein change or subsequently become inaccurate. Unless otherwise authorised by Schroders, any reproduction of all or part of the information in this document is prohibited.
Any data contained in this document have been obtained from sources we consider to be reliable. Schroders has not independently verified or validated such data and they should be independently verified before further publication or use. Schroders does not represent or warrant the accuracy or completeness of any such data.

All investing involves risk including the possible loss of principal.

Exchange rate changes may cause the value of any overseas investments to rise or fall. Past Performance is not a guide to future performance and may not be repeated. This document may contain “forward-looking” information, such as forecasts or projections. Please note that any such information is not a guarantee of any future performance and there is no assurance that any forecast or projection will be realised. For your security, communications may be taped or monitored.

**Note to viewers in the European Union/European Economic Area:** Schroders will be a data controller in respect of your personal data. For information on how Schroders might process your personal data, please view our Privacy Policy available at HYPERLINK "http://www.schroders.com/en/privacy-policy" www.schroders.com/en/privacy-policy or on request should you not have access to this webpage. Issued by Schroder Investment Management Limited, 1 London Wall Place, London EC2Y 5AU. Registered Number 1893220 England. Authorised and regulated by the Financial Conduct Authority.


**Note to viewers in Brazil:** Schroder Investment Management Brasil Ltda., Rua Joaquim Floriano, 100 – cj. 142 Itaim Bibi, São Paulo, 04534-000 Brasil. Registered/Company Number 92.886.662/0001-29. Authorised as an asset manager by the Securities and Exchange Commission of Brazil/Comissão de Valores Mobiliários (“CVM”) according to the Declaratory Act number 6816.

**Note to viewers in Hong Kong:** Schroder Investment Management (Hong Kong) Limited, Level 33, Two Pacific Place 88 Queensway, Hong Kong. Central Entity Number (CE No.) ACJ591. Regulated by the Securities and Futures Commission. In Hong Kong, this material is issued by Schroder Investment Management (Hong Kong) Limited and has not been reviewed by the SFC.

**Note to viewers in Indonesia:** PT Schroder Investment Management Indonesia, Indonesia Stock Exchange Building Tower 1, 30th Floor, Jalan Jend. Sudirman Kav 52-53 Jakarta 12190 Indonesia. Registered/Company Number by Bapepam Chairman’s Decree No: KEP-04/PM/MI/1997 dated April 25, 1997 on the investment management activities and Regulated by Otoritas Jasa Keuangan (“OJK”), formerly the Capital Market and Financial Institution Supervisory Agency (“Bapepam dan LK”). OJK makes no representation of approving or does not approve this advertisement or publication, nor declare the truth or adequacy of the contents of this advertisement or publication.

**Note to viewers in Japan:** Schroder Investment Management (Japan) Limited, 21st Floor, Marunouchi Trust Tower Main, 1-8-3 Marunouchi, Chiyoda-Ku, Tokyo 100-0005, Japan. Registered as a Financial Instruments Business Operator regulated by the Financial Services Agency of Japan. Kanto Local Finance Bureau (FIBO) No. 90.

**Note to viewers in People's Republic of China:** Schroder Investment Management (Shanghai) Co., Ltd., RM1101 11/F Shanghai IFC Phase (HSBC Building) 8 Century Avenue, Pudong, Shanghai, China, AMAC registration NO. P1066560. Regulated by Asset Management Association of China.

**Note to viewers in Singapore:** Schroder Investment Management (Singapore) Ltd, 138 Market Street #23-01, CapitaGreen, Singapore 048946. Company Registration No. 199201080H. Regulated by the Monetary Authority of Singapore. This advertisement or publication has not been reviewed by the Monetary Authority of Singapore.

**Note to viewers in South Korea:** Schroders Korea Limited, 26th Floor, 136, Sejong-daero, (Taepyeongno 1-ga, Seoul Finance Center), Jung-gu, Seoul 100-768, South Korea. Registered and regulated by Financial Supervisory Service of Korea.

**Note to viewers in Switzerland:** Schroder Investment Management (Switzerland) AG, Central 2, CH-8001 Zürich, Postfach 1820, CH-8021 Zürich, Switzerland. Enterprise identification number (UID) CHE-101.447.114. Authorised and regulated by the Swiss Financial Market Supervisory Authority (FINMA).

**Note to viewers in Taiwan:** Schroder Investment Management (Taiwan) Limited, 9F, 108, Sec.5, Hsin-Yi Road, Hsin-Yi District, Taipei 11047 Taiwan, R.O.C. Registered as a Securities Investment Trust Enterprise regulated by the Securities and Futures Bureau, Financial Supervisory Commission, R.O.C.

**Note to viewers in the United Arab Emirates:** Schroder Investment Management Limited, located on 1st Floor, Gate Village Six, Dubai International Financial Centre, PO Box 506612 Dubai, United Arab Emirates is regulated by the Dubai Financial Services Authority.

CS00851