The dynamic nature of risk analysis: a multi asset perspective

Whitepaper

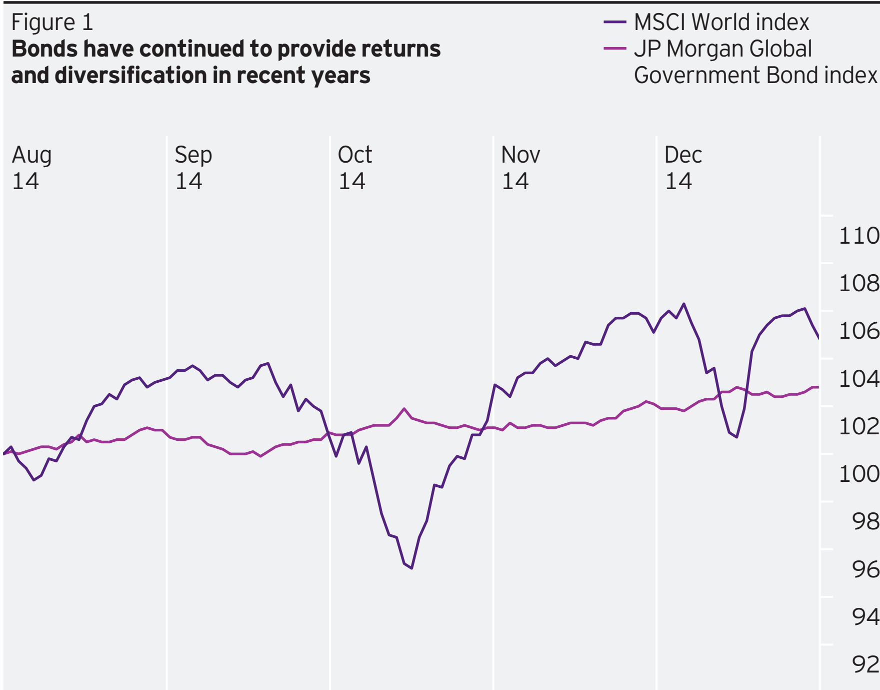
Challenges for multi asset investing

Multi asset portfolios with return and volatility targets have a dual focus: return and risk. This means that there are two important dynamics for the investment managers of such portfolios to consider: firstly, finding return opportunities that can deliver throughout the economic cycle and secondly, ensuring there is sufficient diversification within the portfolio through time to consistently manage volatility. Although it is widely appreciated that past performance is not a guide to future returns, we believe it is less appreciated that past diversification is not a guide to future risk. This paper discusses the challenges involved in measuring and forecasting diversification and the different techniques used for managing the downside within a multi asset strategy.

The Economic Cycle

Over the past few years fixed income assets have continued to be a helpful investment tool for multi asset investors. The global government bond market has delivered 7% since the beginning of 2013 (as measured by the JP Morgan Global Government Bond index) and, during a number of periods of poor performance for equity markets, such as in September to October 2014, bonds proved a useful investment for balancing multi asset portfolios, as they delivered a positive return when equity markets fell (Figure 1).

Figure 1
Bonds have continued to provide returns and diversification in recent years



Source: Thomson Reuters Datastream as at 31 December 2014. MSCI World index: price, local currency. JP Morgan Global Government Bond index: price, local currency.

However, bonds recent and lengthy positive diversification role within a multi asset strategy cannot be assumed to continue unabated. The recent signalling by some major central banks of a turn in the interest rate cycle, with both the US Federal Reserve and the Bank of England indicating a possible turn in the cycle at the end of 2015, is significant for multi asset portfolios, not just in terms of finding the best return opportunities, but also because it requires a review of the bond market's future potential diversification benefits.

Typically interest rates rise to stave off an increase in inflation and/or as a response to strong economic growth which could lead to inflationary pressure in the economic system. This time around the signals are not so clear. Global economies have witnessed a period of extraordinary monetary policy which has continued for an extended period of time. That has been necessary in order for the global economy to try to get back on track, but as a consequence, policy makers have very few levers to pull if the economy were to stall, or even worse economic growth starts going into reverse. At some point interest rates need to rise so that during the next part of the cycle policy makers can cut interest rates in response to a slowdown in economic growth.

There are many economic indicators to consider for when, and if, interest rates should rise and secondly, how aggressive central banks will be in the speed of rate rises once they do start to increase. Figure 2 shows just two very simple indicators – inflation and GDP growth. Not exactly a compelling set of data for fuelling an aggressive rate tightening cycle but perhaps it is enough for at least the US and UK to start thinking about rate rises in 2015 and into 2016.

Figure 2
A mixed set of data for policy makers

	Core inflation		Real GDP growth (QoQ annualised)	
	Latest (%)	10-year average (%)	Latest (%)	10-year average (%)
US	1.8	1.9	2.3	2.8
UK	0.5	2.2	1.5	2.1
Eurozone	0.7	1.5	2.9	1.6
Australia	2.3	2.7	3.8	3.2
Japan	0.4	-0.2	3.9	0.9
China	1.7	1.1	7.0	7.8

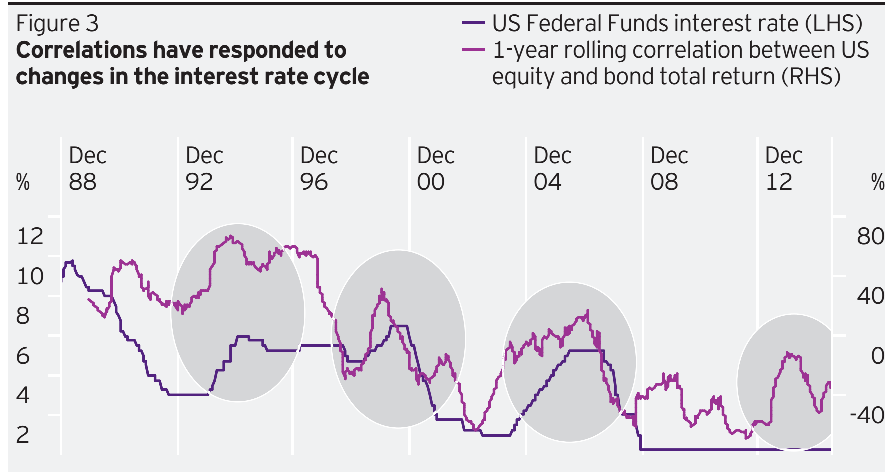
Source: Thomson Reuters Datastream as at 30 June 2015.

Another challenge faced by global investors is that the global economy is far from co-ordinated. Figure 2 highlights that the Eurozone is still struggling, while in Japan inflation is above where it has been in the past. The UK and the US may be ready to start thinking about interest rate rises, but in contrast, the Eurozone is far from tightening policy and policy makers in Australia are still focused on whether policy should loosen rather than tighten from here. This makes investing in global markets challenging, but also provides some interesting relative opportunities across markets as policy makers implement different policy plans in order to deal with global as well as domestic economic influences.

The diversification dilemma

The economic backdrop discussed above underpins the need to continually challenge the key drivers of financial markets and where diversification can be achieved. We believe the most significant event from a diversification perspective over the coming year is the timing of the first interest rate rise in either the US or UK. Figure 3 shows that in the past when rates started to rise, using the US as an example, the correlation between the total return of bonds and equities also began to increase. Interestingly, the correlation between bonds and equities has recently turned less negative as perhaps investors have started to discount a turn in the rate cycle ahead, as shown in Figure 3.

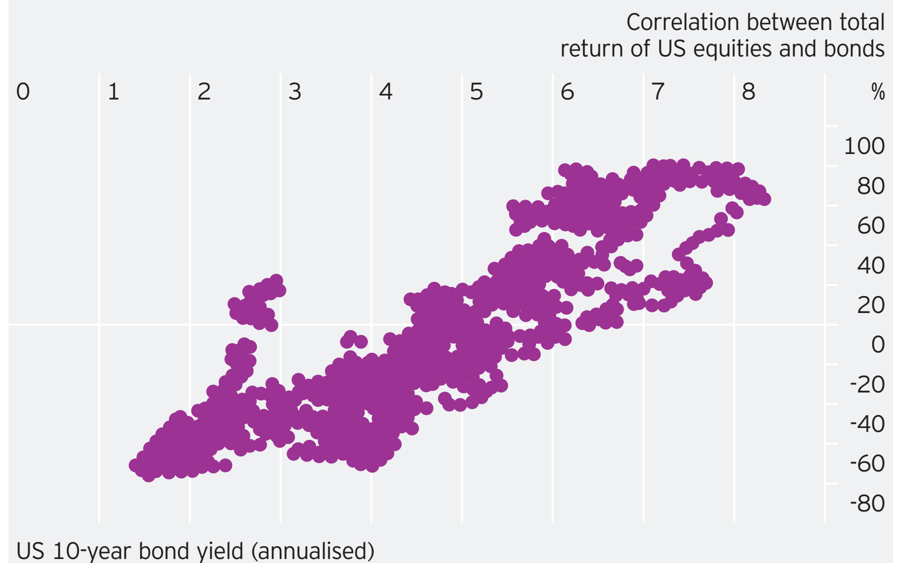
Figure 3
Correlations have responded to changes in the interest rate cycle



Source: Thomson Reuters Datastream as at 17 July 2015.
US equity is represented by the S&P 500 Total Return index in USD. Bonds are represented by the US Benchmark 10 Year Government Bond index in USD.

This has very important implications for multi asset investing. When interest rates rise, bond prices fall. But at the same time a rise in interest rates can signal a change in the growth prospects for equity markets and therefore, in some cases equity market prices also decline. However, investors must also be mindful of another broad based relationship between equities and bonds, that is, that the level of interest rates matters. Figure 4 shows that the correlation between equity and bond total return indices for the US have tended to turn positive when interest rates are above 5%.

Figure 4
The level of bond yields has mattered for the correlation between equities and bonds



Source: Thomson Reuters Datastream as at 13 July 2015. Period covered: 1 January 1990 to 13 July 2015, weekly rolling periods. Benchmarks: US Benchmark 10 Year Government index used as a proxy for US interest rates and with regard to correlation figures is compared to S&P 500 Total Return index in USD.

But even here it is not definitive as a relationship. Figure 4 shows a small cluster of datapoints which show a positive correlation between equities and bonds when interest rates have been below 5%. Up until recently, when interest rates have been low and have then started rising, equity markets have still performed relatively well captured by a negative correlation between equities and bonds. However, more recently that relationship has been challenged.

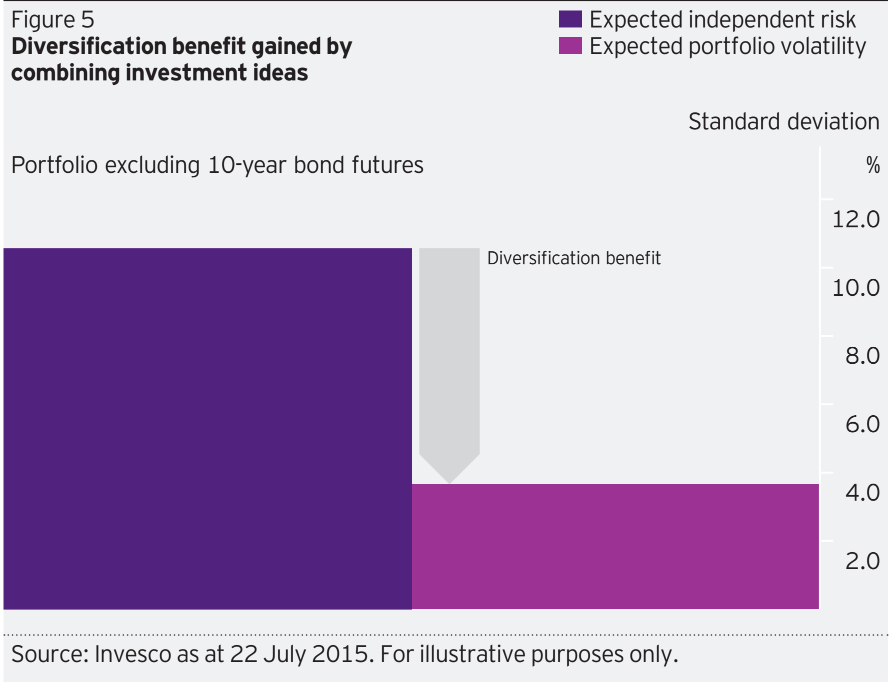
Over the past few years all asset classes have been underpinned by global monetary policy remaining incredibly loose. Any signal that the policy landscape was going to change significantly (e.g. the taper tantrum of 2013) has impacted bond and equity markets negatively. In Figure 4 the cluster of datapoints which signal a positive correlation when interest rates were around 3% relate to December 2013 through to January 2014, a period which included the taper tantrum (as this data is based on 1-year rolling correlations), and also includes December 2013 when a small pick-up in US inflation fed through to a rise in US bond yields.

Challenges for a multi asset portfolio

A turning point in the economic cycle provides a challenge for multi asset investing, primarily due to the risk analysis used for assessing the return potential, but more importantly the risk embedded within a multi asset portfolio. Risk models are hostage to the look back period of analysis which means that there is a certain level of reliance on history teaching investors about what to expect in the future. This is clearly dangerous; the following example goes some way to illustrate the current dilemma faced by investors.

Figure 5 shows an illustrative portfolio of investment ideas and the amount of diversification embedded within the portfolio based on a look back window of 180 weeks. The left hand side of the chart shows the undiversified expected risk of the portfolio i.e. if all ideas were correlated to 1. The right hand side of the chart takes account of the correlations between the ideas, and therefore, shows that a certain level of return can be achieved with much lower expected risk once the diversification benefit of the blend of ideas is considered.

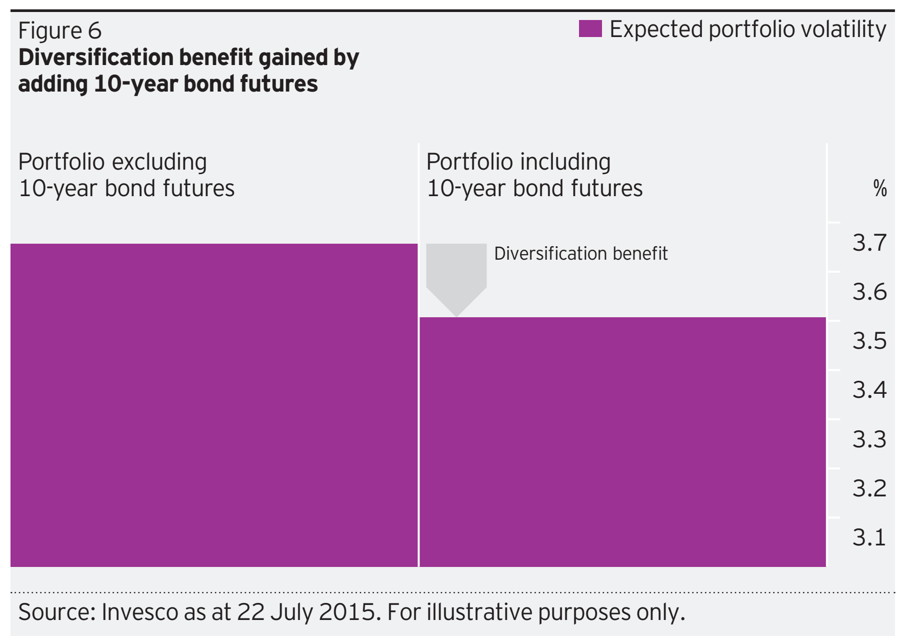
The level of diversification suggested by this risk model is based on the correlations which have driven financial markets over the past 180 weeks. Clearly, if markets continue to behave as they have over the last 180 weeks going forward then the level of diversification would be accurate. However, markets change and evolve, which requires multi asset investment managers to consider diversification and risk in a far greater context.



Source: Invesco as at 22 July 2015. For illustrative purposes only.

Figure 6 shows the same illustrative portfolio with the addition of a long position in US 10 year treasuries. The risk on the right hand side of the chart has fallen showing the diversification benefit of adding duration to the portfolio, which has been the case over the last 180 weeks.

However, is this reflective of the risk given a potential turning point in the interest rate cycle? Arguably not. Therefore, it is incredibly important that a forward looking view of risk is also embedded within a multi asset investment process.



Source: Invesco as at 22 July 2015. For illustrative purposes only.

Risk mitigation: Scenario testing

One way to challenge risk models and their limitations discussed above is to incorporate scenario and stress testing into the investment process. History is helpful as a guide but investors should not let it dictate their investment decisions, as the environment could be meaningfully different going forward. One common question for a multi asset manager today is how their current portfolio would fare if the global financial crisis were to repeat itself. This is a fair question but perhaps a misguided one. Back in 2007 and 2008 bonds ultimately bailed out a multi asset investor because bond yields were still above 3.5% and so had room to compress to reflect the deteriorating economic backdrop.

Today we start with bond yields below 2.5% in the US which is quite a different backdrop and means that perhaps bond markets will not provide the cushion for the performance of multi asset portfolios. A more appropriate test for a multi asset portfolio is assessing the performance of the portfolio when equities and bonds are both falling and whether the portfolio can cope under this type of 'cash is king' scenario. We believe it is this type of scenario analysis that is critical to incorporate into any kind of multi asset investment process.

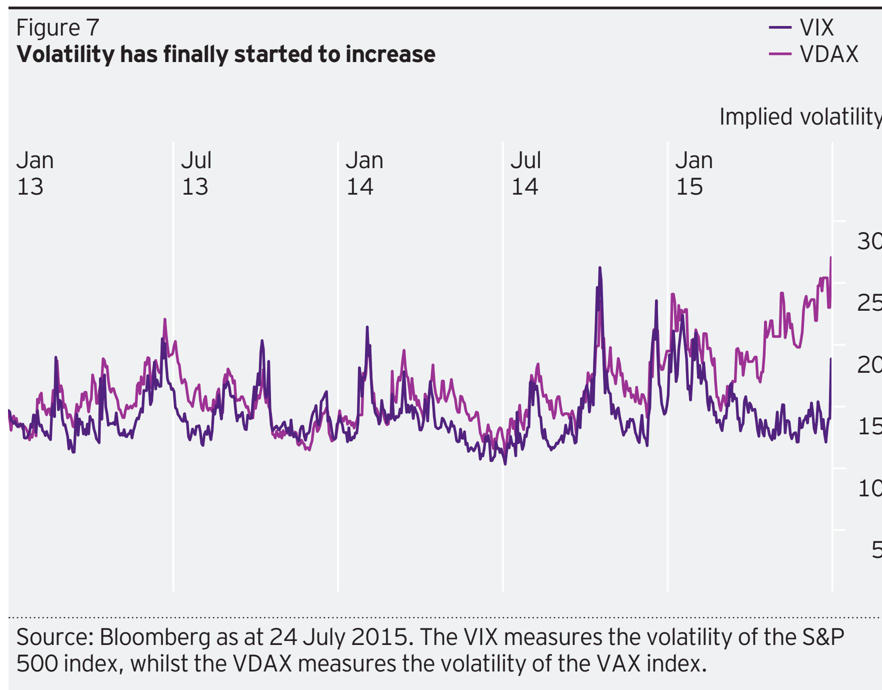
Alternative diversification sources

The scenario analysis discussed above helps with two areas which are important for a multi asset portfolio: diversification and managing downside risk. Diversification is potentially achieved by increasing the flexibility of a multi asset portfolio and the way in which it can access capital markets.

Recent history suggests that investing in bonds would help achieve returns and diversification within a multi asset portfolio, but as discussed above, a turn in the interest rate cycle suggests that history may not be a good indicator for future returns or diversification. So how can a multi asset portfolio find alternative sources of diversification? There are alternatives for a multi asset portfolio that has the flexibility to move away from traditional asset classes for investment. The first important tool is volatility.

Volatility has remained low over the past few years, and therefore, has not provided much of a diversification buffer for a multi asset portfolio. This year that appears to be changing. Figure 7 shows the volatility for the S&P 500 and the DAX index. A multi-asset portfolio with flexibility to utilise volatility as an asset class can buy volatility directly as an alternative way to increase defensive exposure in the portfolio.

Figure 7
Volatility has finally started to increase

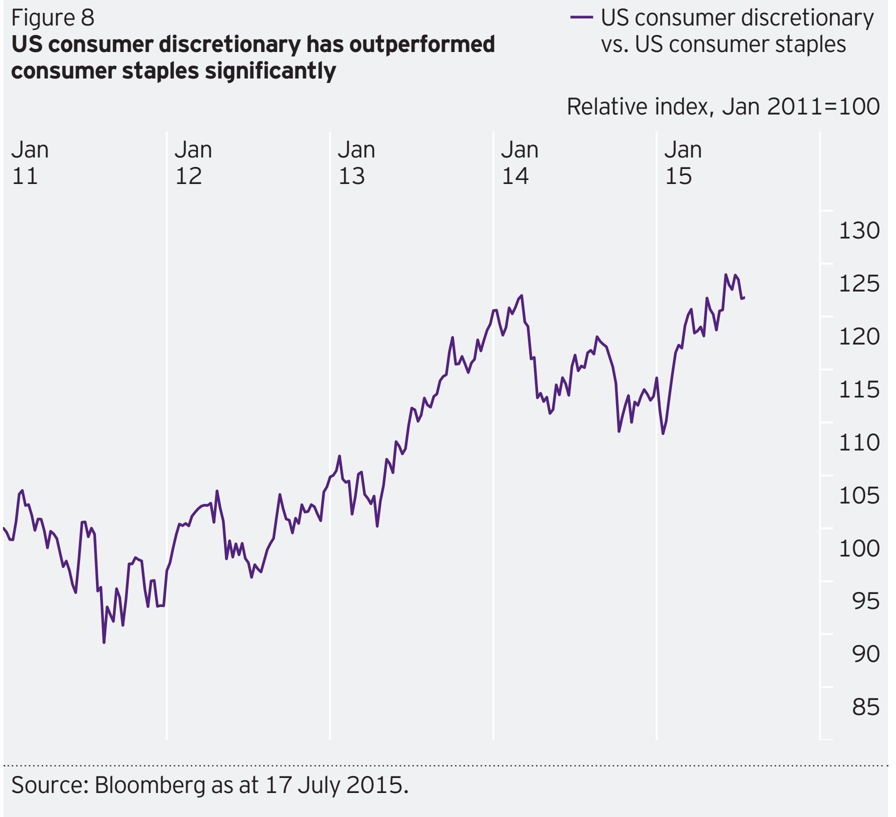


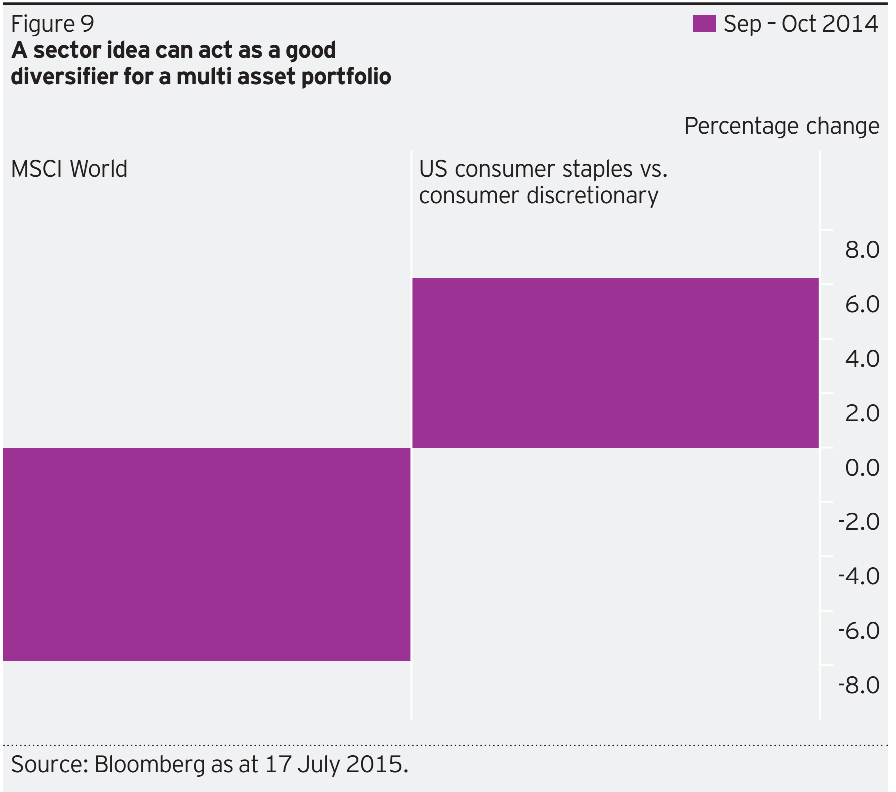
Source: Bloomberg as at 24 July 2015. The VIX measures the volatility of the S&P 500 index, whilst the VDAX measures the volatility of the VAX index.

Another way of gaining access to alternative diversification sources is through relative value ideas which display certain characteristics. Relative sector ideas can be one way to achieve this. As an example, we believe that in the US the consumer sector provides an investment opportunity. The consumer discretionary sector has outperformed the consumer staples sector over the past couple of years (Figure 8), and we believe is now pricing in a fairly robust continued US economic recovery. There are various risks for the sector given the potential for growth to slow down in the US and for profits growth to be sluggish given the build-up in inventory across the retail space. This is the fundamental reasoning behind a recent decision by us to buy the consumer staples sector relative to the consumer discretionary sector.

But there is another important portfolio management reason for holding this type of idea in a multi asset portfolio – its potential diversification benefits. Over the past 180 weeks to 30 June 2015 (the look back window of the APT[1] medium term risk model) the correlation is -49%. This means that the idea could work from a fundamental perspective, but if equities have a setback this could be a better way of getting diversification into a multi asset portfolio rather than just relying on fixed income as an asset class to provide some form of cushioning for performance. As an example Figure 9 shows that US consumer staples outperformed US consumer discretionary by 6.2% when equities fell by 7.8% from September to October 2014.

[1] The primary system used by Invesco Perpetual's Multi Asset team for the purpose of risk monitoring is APT – an independent, third-party risk system provided by SunGard.





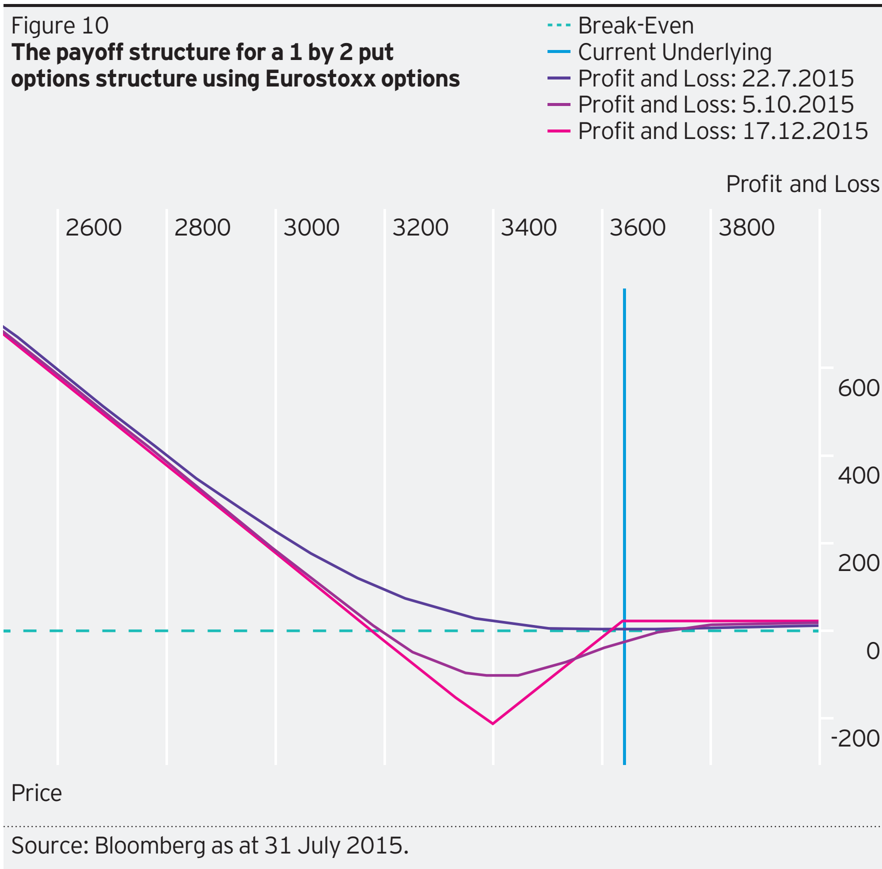
Methods to manage downside risk
Multi asset portfolios are often added to broader portfolios to provide both diversification and the potential for cushioning against a broad based sell off in other asset classes, primarily fixed income and equities. This means that incorporating some form of downside risk mitigation into these portfolios is an important element of the investment process. There are numerous ways this might be achieved – here we discuss two: adding outright crash protection and reducing beta exposure within equity focused investment ideas.

Adding outright crash protection to individual investment ideas.

One way of implementing crash protection is to buy equity put options. However, this can be expensive so investment managers often look at put spreads to see whether there is an opportunity to add protection in a relatively cost effective way.

A put spread works by selling one option whilst at the same time buying another option. To construct a crash protection strategy investors can look at selling an 'at the money' put option whilst at the same time buying twice as many 'out of the money' put options. This is called a one by two put option structure. The attraction of this type of approach is that the protection in effect funds itself – the premium gained from selling the put option funds buying the 'out of the money' put options which results in a net position of, for example, being long 90% put options. The payoff structure for this strategy is shown in Figure 10 below. As at the end of July 2015, the level of the Eurostoxx 50 index was around 3600, therefore, this chart is anchored around that level. The payoff structure illustrates that if this crash protection, using December 2015 options, was held close to maturity the payoff would turn positive post an 11% sell off in the Eurostoxx 50 equity market index. The reason for the negative portion of the chart is because selling an 'at the money' put option and buying 90% 'out of the money' put options means that the investor has some market exposure between approximately a 0% to 5% sell off in equities before the 90% put options are 'in the money'.

Figure 10
The payoff structure for a 1 by 2 put options structure using Eurostoxx options



Source: Bloomberg as at 31 July 2015.

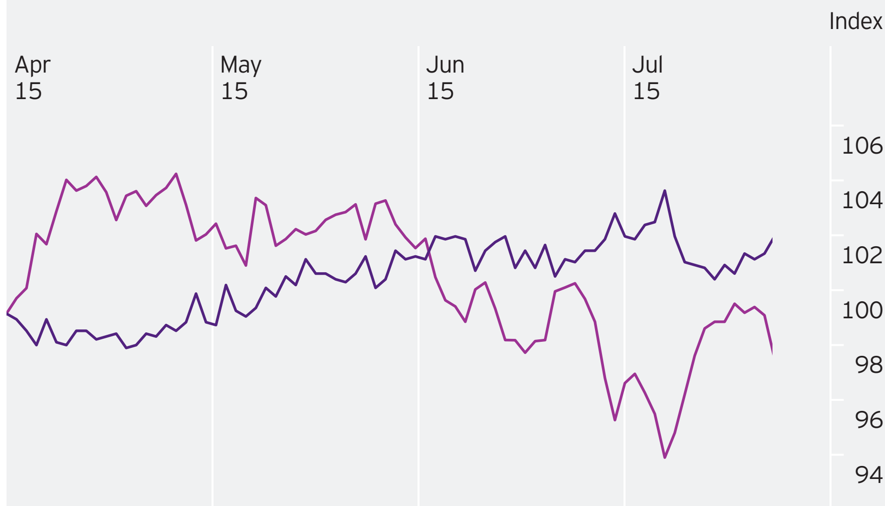
This crash protection options structure is an incredibly useful tool to help protect equity exposure within a multi asset portfolio if a scenario such as the global financial crisis were to ensue. However, it is less helpful when equity markets see a gradual decline over a period of time, with an overall sell off in equities which is less than 10%.

A second approach to mitigate capital losses is anchored around assessing the right combination of beta and alpha that is embedded within an equity focused idea. Multi asset investors could use actively managed funds to reflect some of the ideas within the portfolio. This gives more flexibility regarding the amount of outright beta exposure within the portfolio, and can give more flexibility in dealing with a downturn in equity markets.

Q2 2015 proved to be a challenging period for equity markets. However it was defined by a less than 10% fall in equity markets globally, and therefore, crash protection was a less useful tool for a multi asset portfolio when structured as discussed above. However, what proved to be more useful was using actively managed funds to isolate alpha generation rather than taking an outright long equity beta position within a portfolio to capture an equity based idea. Figure 11 highlights the performance of the FTSE All Share index in Q2 2015 versus the alpha generation of combining two actively managed funds invested in UK equities versus the FTSE All Share index when hedged on a one for one basis. This highlights why we believe having as many tools as possible within a multi asset toolkit is essential for achieving diversification alongside returns over time and throughout the economic cycle.

Figure 11
Alpha strategies have helped cushion performance during an equity market sell-off

— Two actively managed funds invested in UK equities versus the FTSE All Share index
— FTSE All Share index



Source: Bloomberg as at 22 July 2015. For illustrative purposes only. The combined fund performance is fund-weighted. Fund performance figures are shown in GBP on a mid-to-mid basis, inclusive of net reinvested income and net of ongoing charges and portfolio transaction costs. The figures do not reflect the entry charge paid by individual investors. Index: total return, in GBP.

Conclusion

The label multi asset covers a number of different approaches to investing. However there are some key characteristics which we believe all multi asset portfolios need to display in order to satisfy the needs of investors which incorporate multi asset into their broader portfolios. Dual targets, focused on both returns and risk, are an important element of these portfolios. Achieving diversification throughout the cycle involves firstly thinking carefully about regime changes triggered by a significant change in the economic cycle, secondly, focusing on forward looking analysis rather than relying on history to dictate investment decisions, and finally, having the flexibility to access different return streams in order to seek alternative ways to achieve diversification as correlations between asset classes change. The final part of the multi asset jigsaw, alongside finding return opportunities, is to try and build in some protection against significant downward moves in equity markets. Crash protection, using options markets, is incredibly helpful in a disaster scenario, but using alpha rather than beta strategies in a more challenging market environment can also help cushion portfolios from excessive drawdowns. All of these factors help multi asset portfolios offer something different for investors' broader portfolios, particularly when the valuation of equity and bond markets continues to look challenging.

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