INSIGHT

In search of a free lunch

05 Nov 2019

For today's investor

“Diversification offers the only free lunch in investing”

Correlations between groups of assets and within individual asset classes have changed in unexpected ways thanks to a decade of easy monetary policy. Our portfolio managers tell us what impact this has had on the way they manage money.

Nobel Prize winner Harry Markowitz is widely credited with claiming diversification offers “the only free lunch in investing”. The founder of Modern Portfolio Theory (MPT) coined the phrase to highlight his idea that by diversifying, an investor gets the benefit of reduced risk while sacrificing little in expected returns over the long run.

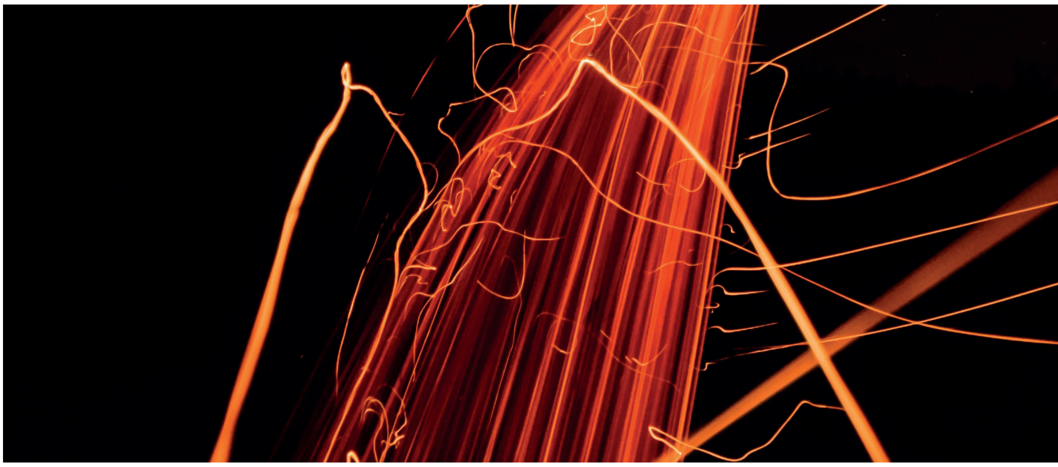
Markowitz used a mathematical framework to explain that while all investors face a trade-off between risk and return, they could make use of the fact returns offered by individual assets are less than perfectly correlated to one another. He proved that for any given level of risk, it was possible to construct a series of optimal portfolios that maximised expected returns.

“For the past fifty years or so Harry Markowitz’s arguments formed a key component of many investment processes

For the past fifty years or so his arguments formed a key component of many investment processes. That was especially true within the world of multi-asset funds, where it led to the adoption of strategic asset allocation (SAA) and tactical asset allocation (TAA).

The idea was that if future returns and cross-asset correlations could be predicted with a degree of confidence, an optimal SAA could be set to capture medium and long-term investment trends, thereby maximising the chance of an investor meeting their return objectives while taking as little risk as possible. Meanwhile, TAA could be employed – dynamically adjusting those allocations when prices deviate from long-term values due to short-term market fluctuations – to augment returns or reduce risk.

However, for this process to work an investor needs to be able to forecast changes in asset prices with a reasonable level of accuracy. An arguably even harder task, yet no less important, is to be able to predict the way in which those price changes will be correlated with one another.



The impact of globalisation

In general, correlations have been rising across many asset classes for at least 40 years. For example, if we regress the monthly returns delivered by emerging market stocks on the S&P 500, we find the level of correlation between the two has risen by around 60 per cent since the early 1990s, as shown in Figure 1.

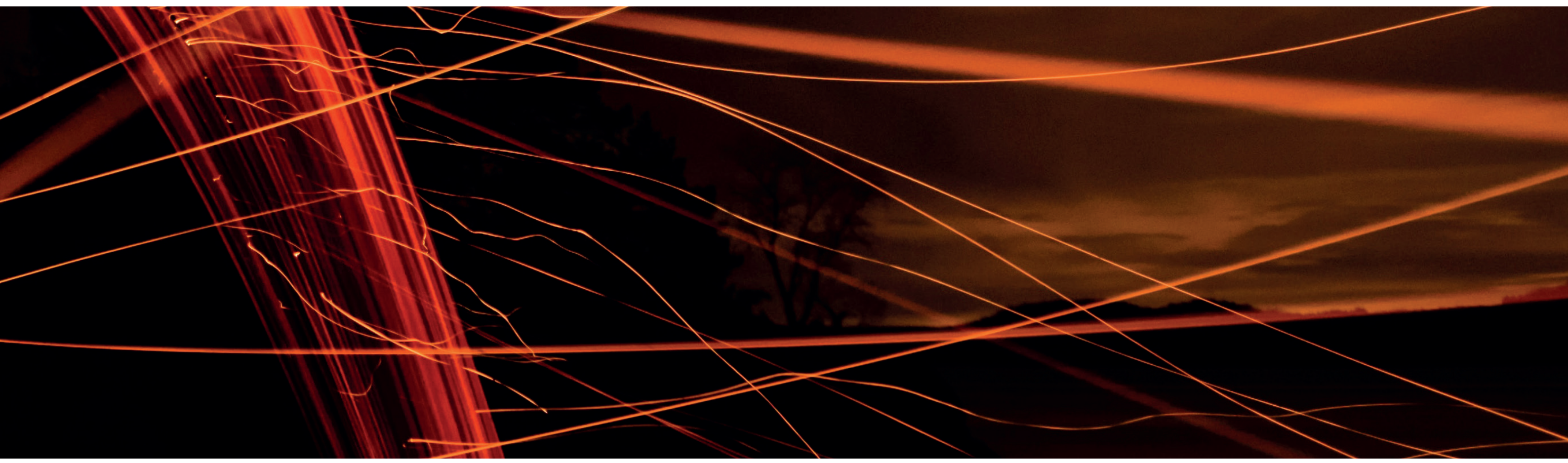
> *In some cases, correlations have remained high due to the unprecedented degree of monetary easing*

Figure 1: Rising correlation between US and emerging equities

Note: Shows correlation of weekly returns (from 9/1/1989 to 02/09/2019) over rolling two-year periods between S&P 500 and MSCI emerging markets US$ index. Blue dotted line shows simple linear regression. Source: Refinitiv Datastream / Aviva Investors

Since this period has coincided with rising globalisation, there are good reasons why the degree of inter-relationship between international stock markets should have strengthened. Not only have the world's economies become ever more interconnected via trade, most companies have become far less reliant on their home market. At the same time, financial markets have become increasingly intertwined as countries around the world eased capital constraints, with growing numbers of companies taking out dual listings, and as price-sensitive information was transmitted faster and more cheaply.

Correlations, which hit record levels during the global financial crisis, have in some cases remained high since thanks to the unprecedented degree of monetary easing carried out by the world's leading central banks.



“Prior to the financial crisis, it is unlikely people would have attributed the strength of US bonds to demand from international investors”

Cross-border spill-overs becoming more obvious

According to Sunil Krishnan, Aviva Investors’ head of multi-asset funds, that is especially true of ‘developed’ government bond markets. He says negative yields in Japan and Europe have resulted in “much stronger and more consistent appetite” for investors in both regions for US bonds.

“Prior to the financial crisis, it is unlikely people would have attributed the strength of US bonds to demand from international investors, or other central banks’ policy stance. Cross-border spill-overs are becoming more obvious, even in the world’s largest bond market,” he says.

The picture in other markets is less straightforward, however. As the following two tables show, the average absolute value of correlations between an array of assets climbed by around a third between 2008 and 2012 compared with the previous four years, jumping to 0.42, from 0.31. The bulk of assets became more positively correlated. For example, the average correlation between the four major equity indices shown rose to 0.71 from 0.55 prior to the crisis. Meanwhile, US Treasury bonds and the US dollar became increasingly effective diversifiers of risk.

Figure 2: Pre-crisis correlations

	S&P	Eurostoxx	Nikkei 225	MSCI EM	Oil price	Gold	High yield	Global Agg	US 10-yr
Eurostoxx	0.79781								
Nikkei 225	0.28285	0.25946							
MSCI EM	0.82433	0.72216	0.40951						
Oil price	0.06083	0.01334	0.24288	0.22408					
Gold	0.25823	0.16796	0.54472	0.44192	0.37985				
High yield	0.55182	0.42245	0.24989	0.58938	0.11586	0.36639			
Global Agg	0.09500	-0.13791	0.21283	0.16836	0.12910	0.35860	0.48568		
US 10-yr	-0.07101	-0.20546	-0.09251	-0.10934	-0.07584	0.01992	0.22487	0.66617	
USD	-0.15346	0.05753	-0.31436	-0.28890	-0.24230	-0.47152	-0.49244	-0.81764	-0.28316

Correlations spectrum

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Note: Shows average correlation of weekly returns (from 20/09/2004 to 31/12/2007) over rolling 52-week periods.
Source: Bloomberg, Aviva Investors

Figure 3: Correlations in the wake of the financial crisis

	S&P	Eurostoxx	Nikkei 225	MSCI EM	Oil price	Gold	High yield	Global Agg	US 10-yr
Eurostoxx	0.84836								
Nikkei 225	0.56362	0.58046							
MSCI EM	0.88213	0.78831	0.60674						
Oil price	0.54420	0.45328	0.56321	0.59475					
Gold	0.10835	0.04383	0.16345	0.26007	0.24091				
High yield	0.57824	0.54945	0.42904	0.57238	0.37744	0.12982			
Global Agg	0.14673	0.18793	0.19275	0.24929	0.14031	0.33436	0.39164		
US 10-yr	-0.52677	-0.53406	-0.37910	-0.48949	-0.39240	0.11559	-0.29632	0.38440	
USD	-0.50351	-0.52575	-0.47509	-0.59901	-0.46565	-0.32115	-0.51659	-0.75123	0.17467

Correlations spectrum

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Note: Shows average correlation of weekly returns (from 20/09/2004 to 31/12/2007) over rolling 52-week periods.
Source: Bloomberg, Aviva Investors

However, contrary to popular belief, since 2012 the strength of correlations between assets – both positive and negative – has declined. The table below shows the average correlation over this period has fallen to 0.30 in absolute terms, close to its pre-crisis level, while the average correlation between the four equity indices has tumbled to 0.47.

Figure 4: Correlations 2013-present

	S&P	Eurostoxx	Nikkei 225	MSCI EM	Oil price	Gold	High yield	Global Agg	US 10-yr
Eurostoxx	0.70553								
Nikkei 225	0.27304	0.22347							
MSCI EM	0.68288	0.59838	0.36401						
Oil price	0.30204	0.22856	0.27482	0.31785					
Gold	-0.09540	-0.17493	0.17352	0.19254	0.10796				
High yield	0.56312	0.50804	0.29193	0.63273	0.35422	0.21404			
Global Agg	-0.10951	-0.18942	0.07731	0.17782	0.02139	0.62078	0.34848		
US 10-yr	-0.30599	-0.27803	-0.14904	-0.07096	-0.17718	0.41011	-0.00427	0.66445	
USD	0.01042	0.13799	-0.20327	-0.22145	-0.13140	-0.51167	-0.38337	-0.74915	-0.15533

Correlations spectrum

-1 1

Note: Shows average correlation of weekly returns (from 20/09/2004 to 31/12/2007) over rolling 52-week periods.
Source: Bloomberg, Aviva Investors

While this fall in correlations may at first glance seem beneficial to an investor looking to boost the diversification of their portfolio, this is not necessarily proving to be the reality. For a start, while correlations may have fallen since 2012, they have tended to rise quite sharply during episodes of market stress; precisely those moments when diversification is most needed.

Are correlations getting more unpredictable?

Moreover, in order to profit from it, investors need to be able to predict future correlations with a reasonable degree of confidence. While this process has always been fraught with difficulty, in recent years it has arguably got even harder. As Figure 5 shows, although the correlation between the US and UK stock markets has fluctuated wildly for the past three decades, the gyrations have been especially pronounced since 2013. It plunged in 2017 as a surge in US equity prices failed to translate into significantly higher UK prices, before rebounding just as sharply in 2018.

Figure 5: Correlation between US and UK equities has fluctuated wildly

Note: Shows correlation of weekly returns (from 9/1/1989 to 02/09/2019) over rolling two-year periods between S&P 500 and FTSE 100 index. Source: Refinitiv Datastream / Aviva Investors

“Correlations data only provide you with so much information”

From a multi-asset investor’s perspective, Krishnan says the divergence in performance between the US and other equity markets highlights the perils of focusing too narrowly on correlations in an effort to try to boost risk-adjusted performance.

“Correlations data only provide you with so much information. Even where they have been implying a high degree of convergence between markets, the call on which equity markets to own has been the critical factor explaining performance over the last three or four years,” he says.

He believes the performance differential between the US and most other equity markets has been so stark that multi-asset investors would have been better off having had exposure to equities solely through the US, or better still sub-sections of it, and looking for diversification via other asset classes.

One obvious asset class that has been a fairly reliable diversifier of risk is government bonds. As the chart below shows, the correlation between US equities and US government bonds has been negative for the bulk of the past two decades, having been on a declining trend since at least 1991.

Figure 6: Government bonds have been a reliable diversifier of risk

Note: Shows correlation of weekly returns (from 9/1/1989 to 02/09/2019) over rolling two-year periods between S&P 500 and US 10-year total return index. Source: Refinitiv Datastream / Aviva Investors

Given that both Treasuries and US equities have generated solid returns for investors since the financial crisis, it may seem strange that government bonds have helped diversify a portfolio of shares and other 'risky' assets. However, the apparent incongruity of an increasingly inverse relationship between the price of two assets that have simultaneously risen is explained by the fact that, while exceptionally loose monetary policy has driven a wide variety of financial asset prices higher in recent years, they have not always risen simultaneously.

Wild gyrations

During this period, market sentiment has gyrated wildly with optimism interspersed with bouts of extreme pessimism as investors questioned central banks' ability to first reignite, and then sustain, economic growth. The result, in market parlance, has been a pronounced 'risk on: risk off' environment, with investors often behaving in a herd-like manner; at times clamouring for 'safe havens' such as government bonds only to suddenly switch back into risky assets once the panic has subsided.

Peter Fitzgerald, Aviva Investors' chief investment officer, multi-asset and macro, says while MPT, and in particular the concept of an 'efficient frontier', have always provided a handy framework for investment decisions, the inherent instability of asset price correlations limits its usefulness.

"Correlation assumptions are important, but they are just that: assumptions. The danger is that a high number of positions leads to a false sense of security that a portfolio is more diversified than it actually is," he says.

"The inherent instability of asset price correlations limits its usefulness"

> *We try to be more specific and granular than just taking a 20-year average*

A scenario-based approach

Partly for this reason, Fitzgerald, like Krishnan, believes it makes more sense to adopt a scenario-based approach to constructing portfolios, stressing them to see what could happen both in worst-case scenarios and assuming correlations were to change, either abruptly, or for a sustained period.

As Krishnan explains, while one portfolio may look superior to another from a risk-return perspective, focusing on the worst five per cent of historical experiences may tell a different story.

"Whenever people use correlation matrices they are looking at history. But we're concerned with looking at particular periods in history. We try to be more specific and granular than just taking a 20-year average, which is not going to help you understand how sensitive the portfolio is to a re-run of 1998 or 2008," he says.

Although the degree of negative correlation between US government bonds and equities has once again weakened since 2012, it seems likely Treasuries and other 'safe-haven' assets will continue to lure investors looking to diversify their exposure to riskier asset classes.

However, Aviva Investors' head of rates James McAlevey warns that even if the relationship seems likely to persist for a while longer, there is no guarantee bonds and equities will remain negatively correlated with one another indefinitely.

With more than US$17 trillion of debt offering negative yields as of September 22, McAlevey argues investors should worry about bonds' long-term ability to continue cushioning portfolios against losses on their equity holdings.[1]

> *In the final three months of 2018 a sharp rise in US bond yields triggered a steep decline in equity prices*

The Holy Grail

"We've had a 30-year bull market in bonds, equities have made money and the two have had a negative correlation for much of that time. That's the Holy Grail. It doesn't get any better than that. How much longer it can go on for is another matter," says McAlevey.

The danger of relying on bonds as a diversifier became all too apparent, albeit briefly, in the final three months of 2018 when a sharp rise in US bond yields triggered a steep decline in equity prices. Whereas previously a 'long' position in Treasuries would have provided downside protection to a portfolio of risky assets, suddenly at the end of last year the opposite happened. Investors were instead left nursing losses on their holdings of both risk and risk-free assets, until central banks came to their rescue.

McAlevey believes that so long as worries over the global economic outlook persist, bonds will continue to help to diversify multi-asset portfolios. But if economic conditions were to improve, investors will need to find more creative ways of ensuring their portfolios are sufficiently diversified and protected against the threat of rising bond yields triggering steep declines in equity prices.

"Duration has been the traditional way for multi-asset investors to hedge their exposure to equities. But even if you're wary of owning bonds at such low yields, there are other ways bonds can hedge your risks," he says.

Trades that look to profit from changes in the shape of yield curves; shifts in credit spreads or the relative outperformance of one type of corporate debt relative to another; foreign exchange movements; and new volatility and inflation environments, are just some of the methods investors can use to hedge against a multitude of risks. If they have the ability to adopt both 'long' and 'short' positions, so much the better.

McAlevey says one way to try to ensure portfolios are sufficiently diverse is to think of trades in terms of pairs, the aim being to guard against specific risks. For example, for the past 18 months he has been running a long position in emerging market debt offset by a short position in the Australian dollar. While he believes both strategies should make money through time, the added benefit is they have a well-established negative correlation.

"While you might like emerging market debt, you may be worried about the impact of the trade war. Being short the Australian dollar can be a pretty effective hedge against that risk," he explains.

As for Krishnan, he says absolute return strategies are beginning to look more attractive in the current low-yield environment given that return streams are usually designed to be relatively uncorrelated to both equities and bonds.

An underrated asset

He also describes cash as an "underrated" asset. "Yes you don't earn much in the way of returns, but there is a great deal of optionality there as it allows you to buy assets that become undervalued or distressed, using a currency that has not become distressed."

As for equity portfolios, Giles Parkinson, global equity portfolio manager at Aviva Investors, says it is important to be aware of correlations to the extent they can inform you of hidden risks.

You need to know how much risk you're able to tolerate and where those risks might come from

"The worst thing is to have a portfolio of the cheapest stocks in the world but to get stopped out because you've had a bad run. You need to know how much risk you're able to tolerate and where those risks might come from," he says.

The rise of exchange-traded funds is widely believed to have led to less dispersion within individual equity markets, at least over shorter periods of time. Parkinson says that can present a challenge for controlling risk. But at the same time, high correlations within an equity market, or sectors of it, can also present opportunities.

"You need to know how much risk you're able to tolerate and where those risks might come from"

“Over longer time horizons there is little correlation between the multi-year returns of an individual stock and the market”

“Diversification’s virtues are likely to become all too apparent when the market turns”

Don’t throw the baby out with the bathwater

“It is precisely when correlations are highest you have the most chance of adding value as you tend to find babies are getting thrown out with the bath water. While over shorter intervals stocks are dragged around as much as anything by changes in their (price-earnings) multiple, changes in earnings and cash flow are what really matter over the long run,” he says.

Citing a January 2017 study, Parkinson says over longer time horizons there is little correlation between the multi-year returns of an individual stock and the market. Most stocks underperform the index while a select band of winners outperform massively.[2]

For now, with global interest rates seemingly set to remain lower for longer, many investors may not see it as a priority to ensure their portfolios are sufficiently diversified. After all, so long as the actions of the world’s central banks succeed in pushing a wide variety of asset prices higher, it is probably more important to choose those that deliver the highest returns.

This does not, however, lessen the importance of investors preparing for the unexpected. While diversification may not seem so important in a world of rising asset prices, its virtues are likely to become all too apparent when the market turns. Investors need to beware of the risks of relying too heavily on historic correlations that are prone to change. Instead, they are better off trying to assess how financial markets would likely respond to a range of hypothetical scenarios and building portfolios that at least stand a chance of coping with the most extreme of them.

To the extent there ever was a free lunch available to investors, it probably disappeared some time ago. But while it may be getting ever harder to ensure portfolios are sufficiently diverse, for those looking to dine out cheaply there are still plenty of ways of limiting risk beyond piling into government bonds.

References

1. Marc Jones, ‘Acceptance of negative interest rates ‘vaguely troubling’: BIS,’ Reuters, 22 September 2019
2. Hendrik Bessembinder, ‘Do Stocks Outperform Treasury Bills?’, February 2017

Correlation definition:

Correlation is a statistical technique designed to show the extent to which pairs of variables are related. The closer the r correlation coefficient is to +1 or -1, the more closely the two variables are related. If r is positive, it means that as one variable gets larger the other gets larger. If r is negative it means that as one gets larger, the other gets smaller. If r is 0, it means there is no relationship between the variables.

However, users of statistical data need to be aware that just because two variables appear to be related does not imply causation. Since some variables may be related by chance, further statistical tests can be carried out to determine how meaningful different correlations are.

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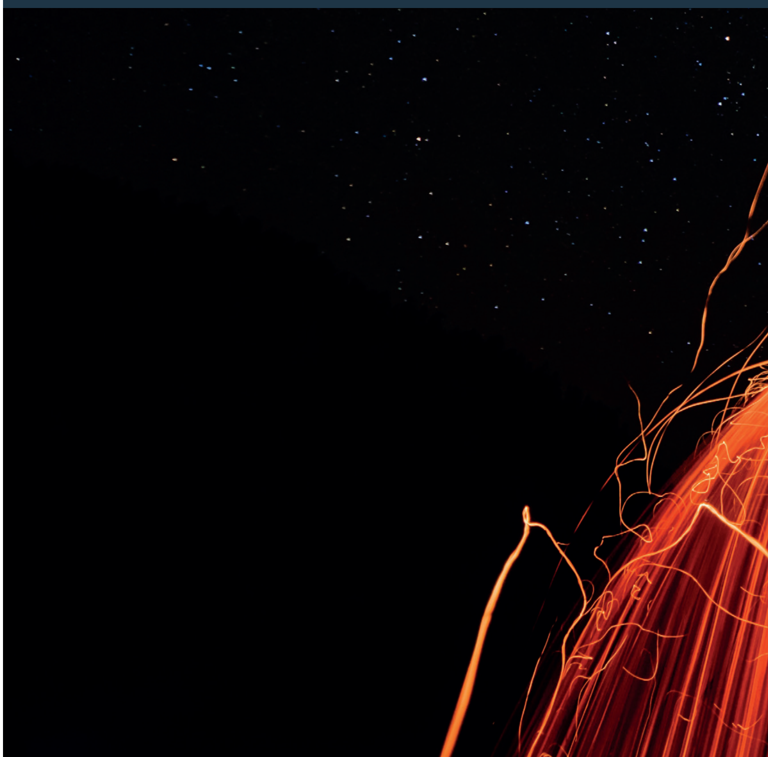

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