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Aberdeen Standard Investments

Long-term investment outlook

2018

Europe Edition
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“Today's economic environment will reward investors who are willing to look further afield in their search for portfolio diversification.”

Rod Paris
Chief Investment Officer
Aberdeen Standard Investments

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Foreword

Rod Paris,
Chief Investment Officer
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One of the benefits of the recent merger between Aberdeen and Standard Life is the wider range of asset-class expertise that the combined company can offer.

Aberdeen Standard Investments is one of the largest multi-asset investors in Europe. A large proportion of the assets we manage are run for clients on a multi-asset basis. Our approach to multi-asset investing is founded on the belief that strategic and tactical asset allocation can add value to client portfolios. We have developed substantial teams of research and asset-allocation specialists to do this work. This report is an indication of the detailed thinking and advice they provide.

Perhaps the most striking conclusion of this report is the growing importance of alternative assets today. The traditional 'balanced' equity-bond approach to asset allocation is no longer the best option for many investors. With bond yields near all-time lows, growth sluggish and equity valuations starting to look stretched, alternative assets deserve a larger allocation in portfolios.

We are increasingly creating portfolios for clients that have a much more diversified combination of asset classes – for example, including substantial weights for emerging market debt, infrastructure, alternative credit and absolute-return strategies – and with more private market diversifiers for clients that can bear illiquidity risk. While we can offer no guarantees, more aggressively diversified portfolios that include these alternative assets may offer significantly higher risk-adjusted returns than conventional equity-bond portfolios.

This is not, we think, a temporary phenomenon, but it calls for a secular shift in strategic allocation. This report argues that today's slower growth and low interest rates are the result of deep structural changes to the world economy that are likely to be with us for many years to come. This environment will reward investors who are willing to look further afield in their search for portfolio diversification, rather than simply accepting the traditional equity-bond mix.

One of the benefits of the recent merger between Aberdeen and Standard Life is the wider range of asset-class expertise that the combined companies offer. This will allow us to further increase the range of assets we can include in client portfolios, and the confidence with which we do so.

Introduction

Craig Mackenzie, Editor
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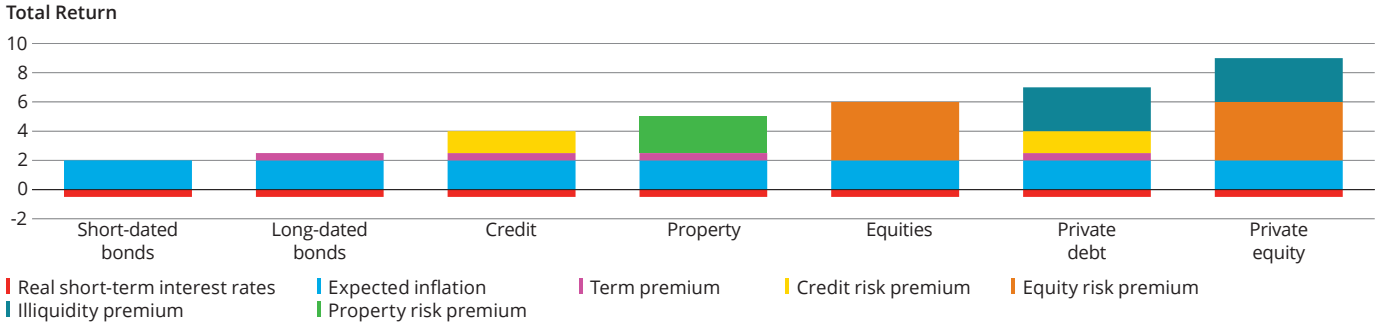
This long-term investment outlook report sets out the economic and asset class views that inform our strategic asset allocation (SAA) work for clients. At its heart, it is a set of views on the risk premia that underlie investment returns.

What are risk premia? Unlike the interest paid on cash, investment returns are the compensation investors receive for bearing risk. If risky assets did not offer this 'risk premium', investors would have no incentive to take risk: they'd keep their money in the bank.

Assets are priced by markets to allow this premium to be delivered. How does this work? If market participants collectively believe that the risk premium for, say, equities is too low, they will look to sell their shares; equity prices will fall as a result. But now the lower prices mean that expected returns (and the equity risk premium) have increased. The equilibrium market price adjusts so that there is a sufficient premium to compensate investors for the risks they believe they are taking.

We think of asset class returns in terms of bundles of risk premia. Figure A illustrates this idea. Each asset class is exposed to different economic risk factors and provides different risk premia as a result. The equity risk premium, for example, compensates investors not just for being last in the queue to get their money back when things go wrong, but also for the fact that equities tend to crash during economic recessions, when investors need their wealth most and risk aversion is at its highest.[1] The bond 'term' premium compensates investors for the risk that future inflation and interest rates will turn out different from expectations. Credit spreads offer compensation for the risk of default. Private assets enjoy an illiquidity premium, rewarding investors for the risk of not being able to access their capital when they need it. Many asset classes offer combinations of different risk premia.

Fig. A: Illustrative view on asset class risk premia (%)



Source: ASI, 2H2017.
Note: Risk premia and total returns are for illustrative purposes, and offer no guarantee of future outcomes. Real interest rates are currently negative in most developed markets, providing a low risk-free starting point for returns.

[1] Cochrane, J (2017) Macro finance. Review of Finance.

How strategic asset allocation adds value

These risk premia building blocks help us organise our views on expected returns, ensuring a degree of consistency in our thinking, and allowing us to evaluate the value that each component of return can deliver for our clients. The goal of our research is to understand the economic risk factors that drive these premia, and to see what market prices are telling us about the levels of risk premia on offer today. Ultimately, we must take a view on which assets offer sufficient premia relative to their risks.

Valuation and risk premia

Strategic asset allocation improves investment outcomes for clients by taking valuation seriously. One of the most robust and important findings in finance research is that today's valuation levels predict long-term returns.[2] This is particularly true for equities and corporate credit, but applies to other asset classes too.

The equity risk premium varies substantially over time. When times are good and investors are optimistic about the future, risk premia compress to sometimes very low levels, so expected returns are low. When times are bad, in the midst of a recession, for example, investors need their wealth and their risk aversion increases. In bad times, risk premia expand, sometimes to double digits, so expected returns are high.

Strategic asset allocation can improve returns by providing a disciplined process for recycling capital from expensive assets with sub-par risk premia, to cheaper assets with higher risk-adjusted expected returns.

Understanding economic change

Another key contribution of strategic asset allocation is to take a view of how the future will be different from the past. Economic circumstances can change in structural ways that have a dramatic impact on asset class returns. Sometimes investors seem to forget this, assuming instead that the returns received in the past are a reliable guide to the future. SAA aims to correct this mistake by understanding structural trends and adjusting forecasts accordingly.

For example, government bonds have delivered returns of 5–7% over the last 20 years. Does this mean that they will do so in the next 20? Current economic circumstances are very different to those of the late 1990s and early 2000s. Policy interest rates are near zero in Europe and well below average in the US, driven by extremely low equilibrium real interest rates (see Chapter 3). On top of this, the term premium is much lower than it has been, around 0% versus a long-term average of 1–2%. Consequently, yields on long-dated bonds are also unusually low. These very low starting yields make for expected returns closer to 1% than the historical 5–7%. As we explain in Chapter 3, this is a structural shift in bond returns, not a temporary problem. And, in Chapter 1, we discuss why this demands a substantial change to asset allocation.

This illustrates a more general principle. Historical investment returns reflect yesterday's economic circumstances and are not a good guide to the future. So, for us, strategic asset allocation must start with a view of where the economy is now, and how it might evolve over the long term. This requires an understanding of the secular trends that will shape tomorrow's global economy.

We think about these forces on two distinct time horizons: long term and medium term. Our long-term horizon is five to 10 years in the future. On this horizon, our assumptions about economic developments are driven by secular factors: trends in demography, productivity, inflation and equilibrium interest rates. How will ageing populations affect economic growth? How will today's weak business investment affect future productivity? Will the global savings glut persist in depressing interest rates? These long-term factors are discussed primarily in Chapters 2 and 3.

We also consider a medium-term time horizon of three to five years in Chapter 4. Over this horizon, markets are driven more by the familiar pattern of recession and recovery associated with the business cycle – together with related credit and policy interest rate cycles. We think about these issues through the lens of global economic scenarios. On this time frame, the risk premia of economically exposed assets varies substantially. This is a key driver of returns.[3]

Business cycles are often regionally specific, so Chapter 4 considers the outlook for each region, as well as more idiosyncratic questions: Will China have a hard landing? How far will the Trump take his trade war? What will be the outcome of Brexit for the UK economy? Will Italian politics shake up the Eurozone?

Diversification

A third way that SAA can improve long-term performance is by ensuring that investors are effectively diversified. Diversification is the only 'free lunch' in investment. Combine assets whose returns are uncorrelated and you reduce portfolio risk. As we discuss in the next chapter, this has become a lot more challenging in a world where the most powerful traditional diversifier – government bonds – offers very low expected returns. Diversification may be a free lunch, but getting to the restaurant is not always easy.

One reason why diversification can be difficult to achieve is that two asset classes may look very different, but if they are exposed to the same economic risk factors their risk premia are likely to be correlated, particularly in troubled times for markets.

In putting together a genuinely diversified portfolio, the key is finding assets whose returns are driven by genuinely unconnected economic risk factors. Equity returns are driven by the business cycle, so effective equity diversification requires assets whose returns are not affected by the cycle downswing. Catastrophe bonds are an example. These instruments receive a premium for bearing exposure to the risk of severe hurricanes. Hurricanes and equity market crashes are unconnected risks, so returns from catastrophe bonds and equities should have low correlation (see Chapter 9 for more on this asset class).

One of the most basic goals of asset allocation is to achieve the considerable risk-return benefits that are available from effective diversification. If diversification proves to be a mirage, because apparently uncorrelated asset classes are actually exposed to the same underlying economic risk factor, then we will have failed. Understanding the common and differentiated exposure of each asset class to risk factors is, therefore, a central preoccupation of our work. Our asset class analysis, in Chapters 5 to 13, discusses the factors that drive risk premia for each asset class, and our views about their future trends. We also discuss the methods we use to model risk premia and expected returns.

A very brief summary of each asset class is provided in figure C.

[2] Cochrane, J (2011) Discount rates. Journal of Finance.

[3] Lettau and Ludvigson (2014) Shocks and Crashes. National Bureau of Economic Research Annual. Shows that over multi-decade horizons equity returns have been driven by long-term growth and secular shifts in the labour share of profits, but over the shorter term they are driven by cyclical changes in risk aversion and the equity risk premium.

Fig. B: Risk and return for EUR investors

Asset	Local Currency	Local			EUR			EUR Hedged			Volatility	5Y Sharpe Ratio
		3Y	5Y	10Y	3Y	5Y	10Y	3Y	5Y	10Y		
UK Equities	GBP	6.1	5.8	5.6	6.2	6.2	5.7	4.6	4.4	4.3	16.3	0.28
US Equities	USD	4.2	4.1	3.2	3.2	3.0	1.8	1.0	1.1	0.7	16.4	0.07
Europe ex UK Equities	EUR	4.3	3.7	2.5	4.3	3.7	2.5	4.3	3.7	2.5	19.4	0.19
Japan Equities	JPY	4.7	4.5	4.7	5.2	5.0	5.5	4.4	4.5	5.0	21.4	0.22
Pacific ex Japan Equities	Various	6.4	6.3	5.9	5.8	5.7	4.9	3.7	3.6	3.6	17.2	0.22
Emerging Markets Equities*	Various	6.5	6.3	6.3	5.8	5.4	5.3	n/a	n/a	n/a	5.4	0.22
Global Equities	Various	4.7	4.5	3.8	4.1	3.8	3.0	2.5	2.4	2.1	16.1	0.16
UK Gilts	GBP	0.3	0.8	1.2	0.5	1.2	1.4	-1.0	-0.5	0.1	5.9	-0.07
US Treasuries	USD	2.6	2.7	2.8	1.6	1.6	1.4	-0.5	-0.3	0.4	4.7	-0.03
Euro Govt Bonds	EUR	0.5	0.9	1.6	0.5	0.9	1.6	0.5	0.9	1.6	4.0	0.25
Euro Inflation-Linked Govt Bonds	EUR	1.0	1.4	2.1	1.0	1.4	2.1	1.0	1.4	2.1	6.2	0.25
Japanese Govt Bonds	JPY	-0.1	-0.3	-0.1	0.3	0.2	0.7	-0.4	-0.3	0.3	3.6	-0.04
Global DM Govt Bonds	Various	1.1	1.2	1.5	0.9	1.0	1.3	-0.2	0.0	0.7	3.3	0.05
Euro IG Bonds	EUR	0.8	1.2	1.8	0.8	1.2	1.8	0.8	1.2	1.8	3.1	0.41
UK IG Bonds	GBP	1.9	2.3	2.9	2.1	2.7	3.1	0.6	0.9	1.7	6.7	0.15
US IG Bonds	USD	3.6	3.8	4.0	2.6	2.7	2.6	0.4	0.8	1.6	5.4	0.17
Global IG Bonds	Various	2.8	3.0	3.4	2.2	2.3	2.5	0.5	0.9	1.6	4.5	0.22
Europe High Yield Bonds	EUR	1.5	2.1	3.1	1.5	2.1	3.1	1.5	2.1	3.1	12.6	0.18
US High Yield Bonds	USD	4.2	4.7	5.3	3.2	3.5	3.9	1.0	1.6	2.8	9.4	0.18
EM Debt (Hard)	USD	5.2	5.5	6.0	4.2	4.3	4.6	2.0	2.5	3.5	8.9	0.29
EM Debt (Local)*	Various	6.7	6.7	6.7	6.0	6.0	6.0	n/a	n/a	n/a	6.0	0.66
Senior Secured Loans	USD	5.3	5.7	6.1	4.3	4.5	4.6	2.1	2.6	3.5	8.2	0.33
ABS - Mezzanine	EUR	3.2	4.0	5.1	3.2	4.0	5.1	3.2	4.0	5.1	6.9	0.59
Insurance Linked Securities	USD	5.9	5.9	5.9	4.9	4.7	4.5	2.6	2.8	3.3	5.2	0.56
UK Commercial Property	GBP	2.9	3.8	5.1	3.0	4.2	5.2	1.5	2.4	3.8	13.0	0.19
US Commercial Property	USD	4.9	5.3	4.4	3.9	4.1	2.9	1.6	2.2	1.8	12.7	0.18
Europe ex UK Commercial Property	EUR	5.7	4.9	4.3	5.7	4.9	4.3	5.7	4.9	4.3	13.1	0.38
Global Commercial Property	Various	5.1	4.9	4.5	4.7	4.5	4.0	3.4	3.4	3.2	9.4	0.37
Europe ex UK REIT	EUR	5.0	4.4	3.9	5.0	4.4	3.9	5.0	4.4	3.9	15.5	0.28
US Private Equity Buyout	USD	6.9	6.9	6.2	5.9	5.8	4.8	3.6	3.8	3.6	n/a	n/a
Europe Private Equity Buyout	EUR	8.7	8.2	7.5	8.7	8.2	7.5	8.7	8.2	7.5	n/a	n/a
US Venture Capital	USD	6.3	6.2	5.5	5.2	5.1	4.1	3.0	3.1	2.9	n/a	n/a
Infrastructure Social	GBP	5.9	5.9	6.1	6.0	6.3	6.2	4.4	4.5	4.8	10.5	0.44
Infrastructure Renewables	GBP	6.1	6.1	6.2	6.3	6.5	6.3	4.7	4.7	4.9	8.1	0.59
Alternative Risk Premia	USD	7.2	7.2	7.2	6.2	6.0	5.7	3.9	4.1	4.6	10.2	0.41
Hedge Funds	USD	5.2	5.2	5.2	4.2	4.0	3.7	1.9	2.1	2.6	6.8	0.33
Commodity Futures	USD	2.8	2.9	3.0	1.9	1.8	1.6	-0.3	-0.1	0.5	20.9	0.00
UK Cash 3M LIBOR	GBP	1.2	1.5	2.0	1.4	1.9	2.1	-0.1	0.1	0.7	0.9	0.29
USD Cash 3M LIBOR	USD	3.0	3.1	3.2	2.0	2.0	1.7	-0.2	0.1	0.6	0.9	0.23
EUR Cash 3M LIBOR	EUR	0.0	0.3	0.9	0.0	0.3	0.9	0.0	0.3	0.9	0.9	0.47

Source: ASI, 2H2018.
Note: Local returns for assets comprised of various currencies exclude any foreign currency movement. Volatility and Sharpe ratio refers to EUR Hedged (except for "*" which refers to EUR Unhedged). Private Equity buyout and venture capital volatilities and Sharpe ratios cannot be calculated because the required high frequency data is not available. Return projections are estimates and provide no guarantee of future results.
DM = developed market, IG = investment grade, EM = emerging market, REIT = real estate investment trust, ABS = asset-backed security, LIBOR = London interbank offered rate.

Fig. C: Asset summary view

Asset class	Summary view
Equities	Our long-term view is that global equity returns, at around 4% per annum, will be weaker than they have been in recent years. Valuations in the US market (60%+ of global equities) are now stretched. Profit margins have most likely reached their cycle peak; we expect only sluggish earnings growth from here. A slower but still solid growth outlook supports equities in the near term, but worries persist about risks resulting from tighter monetary policy and slower growth in China. While it is hard to be too pessimistic about the US market in the short term, cheaper valuations drive our preference for other regions. Emerging markets and Japan are cheapest, but on balance we prefer the UK's combination of high dividends and relative value. Brexit is a risk for the UK, but not for the FTSE 100, given that most earnings are generated overseas.
Rates	Yields remain near historical lows in developed markets, with the exception of the US. Low starting yields make for low long-term bond returns: our 10-year forecast is just under 1% per annum in the UK, and no better in Europe and Japan. Higher US-based yields mean returns in dollars are now higher, but hedging costs erase this gain for non-US investors. In the short term, we expect higher short-dated yields in the US and Europe, but we don't expect as much movement at longer maturities. This is due to low equilibrium real interest rates, which are held down by slow-moving demographic forces that we think will persist. Equally, we think that term premium will increase only gradually.
Credit	The US credit cycle is maturing, with corporate leverage edging higher. Investment-grade credit spreads have widened a little recently and are closer to long run fair values, but high yield spreads are still tight, offering a small premium for bearing credit risk. Our returns forecasts have increased but are fairly modest, with US investment grade offering about 1% more than similar maturity government bonds and US high yield about 2% over governments. European equivalents seem slightly more attractive.
Alternative credit	We expect higher risk-adjusted returns from less familiar forms of credit. Corporate loans are typically floating rate, so are not exposed to the risk of rising interest rates. Asset-backed securities (ABS) also offer attractions compared with conventional corporate credit. Like loans, they benefit from floating rates, but they also typically have wider spreads for the same credit quality, though weaker covenants are a growing concern. At the mezzanine level, BB-rated ABS spreads are 2% higher than BB-rated HY bonds. This boost to returns is compensation for the greater complexity and more limited liquidity in this sector.
Emerging market debt (EMD)	Emerging market government bonds are a relatively attractive asset class – particularly the local currency variety. Yields are high (6.8%) relative to developed markets, offering strong income return. The recent crisis in Turkey has deterred a lot of investors. But a lot of bad news is now priced in. Emerging market currencies have depreciated 40% versus the dollar in the last three years. The combination of high yields and cheap currencies means that this asset class offers good value for long-term investors. A strong dollar and tighter US monetary policy are likely to continue to create volatility in the short term, but overall the main emerging market economies are in relatively good shape with solid growth, controlled inflation and modest debt levels.
Real assets	The high yields on offer from these assets have made them very attractive to investors in a low bond yield environment. Strong demand has compressed risk premia, although expected returns remain competitive. Property return expectations are depressed by Brexit in the UK, but reasonable elsewhere, driven by robust rental income growth. Europe looks particularly attractive. Listed and private infrastructure assets continue to offer relatively attractive returns and useful diversification from equities as we move to the later stages of the business cycle.
Absolute return strategies and alternative risk premia	When considered as an excess return over cash, we expect well-executed hedge fund and absolute return strategies to deliver a meaningful return. Alternative risk premia and certain hedge fund strategies can offer effective diversification from traditional financial markets. We expect the high dispersion of manager returns to persist, so careful manager selection is key to benefiting from this category.
Currencies	The dollar remains expensive on a trade-weighted basis, on our preferred set of equilibrium exchange rate models. We expect the gap in interest rates between the US and other developed-market economies to maintain this strength in the near term, but over the long term we expect negative currency returns for unhedged overseas investors in US assets. The euro, sterling and the yen are all cheap relative to the dollar on our fair value metrics. We expect them to strengthen in the long term by at least 1% per year. Sterling's fate in the near term is strongly linked to the outcome of Brexit.

Source: ASI, 2H2018.

Fig. D: Changes to returns and forecasts since the last edition

Asset	Local currency	2H2018 3Y	2H2018 5Y	2H2018 10Y	2H2018 5Y Sharpe Ratio	2H2017 3Y	2H2017 5Y	2H2017 10Y	2H2017 5Y Sharpe Ratio	Difference 3Y	Difference 5Y	Difference 10Y	Difference 5Y Sharpe Ratio
UK Equities	GBP	6.1	5.8	5.6	0.28	5.2	5.4	5.9	0.29	0.9	0.4	-0.3	-0.01
US Equities	USD	4.2	4.1	3.2	0.07	4.4	4.1	3.6	0.12	-0.2	0.0	-0.4	-0.05
Europe ex UK Equities	EUR	4.3	3.7	2.5	0.19	5.9	5.1	3.6	0.26	-1.6	-1.5	-1.0	-0.07
Japan Equities	JPY	4.7	4.5	4.7	0.22	4.0	4.1	3.9	0.19	0.7	0.4	0.8	0.02
Emerging Markets Equities*	Various	6.5	6.3	6.3	0.20	4.3	4.3	4.0	0.12	2.2	2.0	2.3	0.08
UK Gilts (All Maturity)	GBP	0.3	0.8	1.2	-0.07	0.6	0.8	1.0	0.04	-0.3	0.0	0.2	-0.12
US Treasuries (All Maturity)	USD	2.6	2.7	2.8	-0.03	1.5	1.7	2.1	-0.06	1.1	0.9	0.7	0.03
Euro Govt Bonds (All Maturity)	EUR	0.5	0.9	1.6	0.25	0.7	0.8	1.3	0.20	-0.2	0.1	0.3	0.05
UK IG Bonds	GBP	1.9	2.3	2.9	0.15	1.0	1.2	1.9	0.11	0.9	1.0	1.0	0.04
US IG Bonds	USD	3.6	3.8	4.0	0.17	2.3	2.5	3.0	0.09	1.2	1.3	1.0	0.08
Euro IG Bonds	EUR	0.8	1.2	1.8	0.41	1.0	1.3	2.0	0.38	-0.2	-0.1	-0.2	0.03
US High Yield Bonds	USD	4.2	4.7	5.3	0.18	3.3	3.7	4.7	0.18	0.9	1.0	0.6	0.01
EM Debt (Hard)	USD	5.2	5.5	6.0	0.29	2.8	3.3	4.4	0.14	2.5	2.2	1.7	0.14
EM Debt (Local)*	Various	6.7	6.7	6.7	0.64	6.3	5.7	5.6	0.58	0.4	1.0	1.1	0.05
Senior Secured Loans	USD	5.3	5.7	6.1	0.33	4.8	4.9	5.4	0.35	0.5	0.8	0.7	-0.02
ABS - Mezzanine	GBP	3.2	4.0	5.1	0.59	4.1	4.5	5.0	0.41	-0.9	-0.5	0.1	0.19
UK Commercial Property	GBP	2.9	3.8	5.1	0.19	2.0	3.5	5.5	0.23	0.8	0.3	-0.4	-0.03
US Commercial Property	USD	4.9	5.3	4.4	0.18	6.1	5.9	5.5	0.30	-1.2	-0.7	-1.2	-0.11
Europe ex UK Commercial Property	EUR	5.7	4.9	4.3	0.38	5.4	5.7	6.0	0.42	0.3	-0.8	-1.7	-0.04
Infrastructure Social	GBP	5.9	5.9	6.1	0.44	5.2	5.4	5.4	0.42	0.7	0.5	0.6	0.01
Hedge Funds	USD	5.2	5.2	5.2	0.33	4.2	4.4	4.5	0.33	1.0	0.8	0.7	0.00
UK Cash 3M LIBOR	USD	1.2	1.5	2.0	0.29	0.6	0.9	1.5	0.46	0.6	0.6	0.5	-0.17
USD Cash 3M LIBOR	USD	3.0	3.1	3.2	0.23	2.3	2.4	2.5	0.37	0.8	0.8	0.6	-0.14
EUR Cash 3M LIBOR	EUR	0.0	0.3	0.9	0.47	0.0	0.2	0.6	0.23	0.0	0.1	0.2	0.24

Source: ASI, 2H2018.
Note: Returns are in local currency (assets comprised of various currencies exclude any foreign currency movement) and in percentage, per annum. Sharpe ratio refers to EUR Hedged (except for "*" which refers to EUR Unhedged). Return projections are estimates and provide no guarantee of future results. IG = investment grade, EM = emerging market, ABS = asset-backed security, LIBOR = London interbank offered rate.

Overall, the message from our forecasts is that we continue to expect sub-par returns from the main conventional asset classes. Low yields mean very low expected returns from government bonds – particularly ex-US. Credit spreads have widened a little since late 2017, so our forecasts are a little higher than before, but still low compared to the past. US equities remain expensive, which drags down our expectations for global equity returns (though valuations have improved a fair bit in emerging markets).

As a result, we continue to believe that the best risk-adjusted expected returns will come from a variety of less familiar asset classes. Local currency emerging market sovereign debt is now offering yields of 7%, and after the recent sell off, emerging market currencies are now cheap, so the long-term prospects for this asset class are unusually strong (Chapter 7).

"We think the best risk adjusted returns will come from less familiar asset classes."

In a world where conventional diversifiers are offering such meagre returns, we prefer infrastructure, insurance-linked securities and alternative risk premia, which all offer much higher risk-adjusted returns than conventional and bonds (see Sharpe ratio column in figure D) but low correlation with equities. These assets classes are covered in detail in Chapters 9 (Alternative Credit), 12 (Real assets and Property) and 13 (Absolute Return Strategies).

Private assets remain very popular. The illiquidity premium continues to offer an opportunity to enhance portfolio performance, but we think returns from this source are now below average. Heavy flows into private assets have resulted in managers having exceptional levels of 'dry powder' to draw on. History suggests that high levels of dry powder are associated with sub-par illiquidity premia.

Our Forecaster tool

It is sometimes difficult to interpret the large amounts of data in the risk-return tables at the back of this report. So we have developed a tool that allows investors to select a combination of assets, currencies and time horizons that they care about and see how they compare on a risk-return chart. This tool is available at **aberdeenstandardforecaster.com**

Below is a sample chart.

Fig. E: Forecaster tool (%)

* EUR Unhedged.
Source: ASI, 2H2018.

"Strategic asset allocation adds value for clients by taking valuation seriously and adapting to structural shifts in the economic environment."

01

Strategic asset allocation overview

- Traditional asset allocation relies on high-grade bonds to diversify equity risk
- Very low bond yields, expensive equities and a mature business cycle mean traditional balanced portfolios are expected to deliver poor returns
- Better risk-adjusted returns are available for investors who diversify across a wider range of less familiar asset classes

Strategic asset allocation overview

In a world of slower growth and low bond yields, conventional approaches to investment will increasingly struggle to fulfil investors' long-term goals. 30 years of high and falling yields mean that investors have been able to rely on returns of 5% or even 6% from their government-bond portfolios. But, with today's low yields, European investors can expect little more than 1% and, in the US, around 2.5%.

Similarly, with a sluggish global economy and valuations now rather stretched, in our view, equities look unlikely to match the high returns they have delivered over the last decade.

In this environment, investors are not well served by traditional asset-allocation approaches. The standard 'balanced' equity-bond portfolio mix is unlikely to be the best option for most investors, for reasons that we explain below.

We think many investors will do better by diversifying their portfolios more widely, including a range of less familiar asset classes – for example, asset-backed securities, emerging market debt, infrastructure funds, insurance-linked securities, alternative risk premia and other absolute-return strategies. For investors who accept illiquidity, private assets also offer additional rewards. We expect a diversified portfolio of these assets to offer material improvement in expected returns, per unit risk. Over the next 10 years, we expect the return from a 60:40 equity-bond portfolio to be only around 3%, with an expected volatility of 11%; whereas our favoured, highly diversified liquid portfolio targets a return of around 4.5% per annum, with an expected volatility of just 7.5%.[1]

Needless to say, adopting a more ambitious diversification strategy that incorporates unfamiliar sources of return brings its own challenges. It requires access to expertise on the subtleties of each asset class and solid understanding of the economic factors that drive their returns – as well as a sophisticated ability to monitor and model risk for both individual assets and for portfolios as a whole.

With over £66 billion of multi-asset funds under management,[2] we have been able to develop a strong capability to support clients in navigating this unfamiliar terrain. We have built a set of sophisticated tools for risk modelling and return forecasting. Our strategic asset allocation (SAA) research draws on an experienced Global Strategy team, a specialised Portfolio Engineering group, and a large array of asset-class specialists across our global business. As one of the largest active managers in Europe, we have considerable breadth of expertise to draw on. This chapter provides an overview of the investment themes driving expected returns across asset classes. It indicates which investment opportunities will, in our view, offer the best risk-adjusted returns in the coming years, and what these mean for SAA.

Aiming for the best outcome in a low-return environment

There is no sugar-coating it: we think investment returns from conventional balanced portfolios are likely to be on the low side in the future. Over the last 20 years, for a UK investor, global equity returns have averaged 8% and UK government bonds 6.5%.[3] A classic 60:40 balanced portfolio would have returned over 7% per year. Over the next decade, our modelling suggests, for a UK-based investor, 3% per year is a realistic expectation.

Compounded over many years, the difference between 7% and 3% per year has a substantial impact on capital accumulation and retirement income. By way of illustration, if someone saves £10,000 a year for 30 years and reinvests investment income, a 7% investment return will result in a capital sum of £950,000, which, in turn, might provide an annual retirement income of around £38,000 (assuming a realistic 4% annuity rate). By contrast, a lower investment return of 3% per annum results in a total capital sum of £500,000, and a retirement income of just £20,000.

To achieve the same level of income (£38,000) with an investment return of 3%, one would need to save £19,000 per year, nearly twice as much as before. Needless to say, increasing personal saving by 90% would, to put it mildly, be challenging for many in today's workforce, who must also pay off student debt and save for a down payment on a house.

[1] Figures are provided at the end of this chapter (figure 1.6). Target returns are no guarantee of future results.
[2] Standard Life Aberdeen plc, Half year results 2018.
[3] Annualised returns of FTSE All World total return index and BoAML Gilt index 31/12/1996 - 31/12/2016.

Is there any alternative? We have to accept that the last few decades have been a golden era for investors, delivering returns that are unlikely to be repeated. With risk-free interest rates several per cent lower than in the past, a 7% annual return is too ambitious a goal for investors who want only moderate risk exposure. But including a much wider range of assets and diversifying more aggressively provides a route for investors to do significantly better than they could if they relied only on equities and low-risk bonds alone. We think an expectation of 5–6% per year is achievable for a diversified liquid portfolio, and 7–8% for those who can allocate to good private equity and debt funds.

We should add that, while this is a simple example based on an individual investor, the basic challenge is not very different for pension funds, insurance companies and other institutional investors. Under conventional investment strategies, low returns from equities and low-risk bonds may require higher contributions from scheme sponsors, or renegotiation of future commitments to safeguard scheme solvency.

This is not news to many in the investment industry, which has been grappling with the prospect of lower future returns for several years now. To some extent, the problem has been masked by the high equity returns achieved in recent years. There is a tendency to extrapolate. But, for the reasons given below, these high returns are unlikely to continue much longer. In today's investment environment, past returns are not really a good guide to the future, and the challenge is likely to become more acute.

The structural causes of lower expected returns

Why do we expect lower returns from conventional asset classes in the future? Equity returns will most likely be lower due to a combination of sluggish global economic growth and the fact that, on most measures, equity valuations are now stretched, particularly in the US.

We expect bond returns to be lower, as a mathematical function of the low yields they offer today. But this is not a temporary blip: we expect low yields to persist for a decade or more, due to structurally low 'equilibrium' real interest rates.

The problem is not one of low government-bond returns for a year or two, which can be endured – it is low returns for a decade or more. This requires a strategic response. We explore the secular trends that cause slower economic growth and lower interest rates in more detail in Chapter 2 and Chapter 3. For now, a summary will suffice.

Slower trend growth

At a high level, the long-term economic growth rate is determined by two main factors: the number of people employed in the economy, and how productive they are. Economic growth is faster if you add more workers or increase the output they generate per hour worked; it is slower if the workforce shrinks or productivity growth slows.

For the last 100 years or so, the labour force in most large economies has been growing at a steady rate of one or two per cent a year. But declining fertility rates in recent decades mean that populations in many economies are now growing much more slowly. In fact, in many countries in Europe and East Asia, including China, the labour force is actually shrinking, or soon will be. The tailwind of rapid population growth has become a headwind. Slower trend growth is the likely result.

Similarly, in the first two thirds of the 20th century, productivity improved at a rapid pace in advanced economies. But, around 1970, productivity growth slowed significantly. There was a brief burst of faster growth in the late 1990s and early 2000s, but productivity growth has slowed again since the financial crisis, and is now slower than it was, even in the 1970s. There is much debate about why this slowdown has happened and what might happen next (see chapter 2). In short, there are some reasons to hope that productivity growth will rise from its recent average level of 0.5% or so per year, but it is unrealistic to expect it to accelerate sufficiently to compensate for low or negative growth in the labour force.

As per figure 1.1 below, the combination of slower labour-force growth and relatively modest rates of productivity growth results in lower rates of trend GDP growth than we have been used to.

Fig. 1.1: 10-year average real GDP, historical and projected

	1988-1997	1998-2007	2008-2017	2018-2027
US	3.1	3.1	1.5	1.9
UK	2.4	2.9	1.1	1.8
Germany	2.3	1.7	1.2	1.1
Japan	2.8	1.0	0.5	0.6
China	10.0	10.0	8.3	5.3
World	3.0	3.4	2.4	2.7

Source: ASI, Oxford Economics, August 2018.
Note: Percentage changes YoY. Real GDP calculated in local currency except for World in PPP USD (projections start in 2017 for World). Projections are not guaranteed.

China, Trump and other factors

Another important factor affecting the global economy in the medium term (the next five years or so) is China. China's economy is now vying with that of the US to be the biggest in the world, and it is still growing strongly – at over 6% per year. As a result, China alone is responsible for around one third of global GDP growth.

But China's current growth rate is unlikely to be sustained for much longer. It is based on rapidly expanding credit-financed investment in property, infrastructure and other fixed assets. The productivity of this investment has been declining steadily. History suggests that periods of exceptionally fast credit growth are usually followed by periods of much slower growth, as the economy reduces leverage and balance sheets are repaired.[4] China is unlikely to prove an exception to this rule.

China has many strengths, and the necessary economic reforms should, if implemented, lay the foundation for more sustainable growth in the future. But deleveraging will result in markedly slower growth in China, which will prove a challenge for the rest of the world, particularly for those commodity economies that are most dependent on Chinese demand.

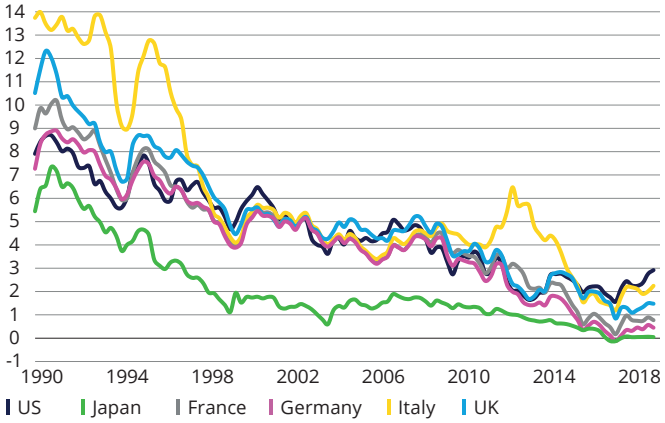
The economic policies of the Trump administration are also likely to have a big effect on the global economy in the medium term. Tax cuts and deregulation have boosted growth in the short term, but this will fade. There is a chance that it might result in sufficient business investment to delivery faster productivity

[4] Maliszewski et al. (2016) Resolving China's Corporate Debt Problem, International Monetary Fund.

growth, but, on balance, we think US growth is more likely to fade. If Trump's trade war escalates much further, it will become a substantial drag on US and global growth.

Of course, China and the US are not the only regions that might affect global growth in the medium term. We review the outlook for all regions in Chapter 4.

Fig. 1.2: 10-year nominal yields (%)



Source: Oxford Economics, August 2018.
Note: Chart shows yield on 10-year maturity government bond in each country.

Lower growth is not the only challenge facing investors. Many of the same structural trends that are depressing economic growth are also depressing interest rates. For economists, the real interest rate is the price that balances the markets for savings and investment. Ageing baby-boomers and rapidly emerging economies are generating high levels of saving. On the other hand, slower growth, less appetite for business and public-sector investment, and lower costs of capital equipment mean that there is not enough demand to use these savings for capital investment projects. As a result, we have a 'savings glut', which depresses equilibrium interest rates (see Chapter 3). This helps explain the long-term decline in global interest rates from the 1980s to today's historically low levels. Although interest rates may rise marginally, as the global economy strengthens, these factors will keep bond yields low for many years.

For decades investors have relied on government bonds to provide a low risk source of income, and growth-oriented investors have used them as the principal means to diversify their risk from equities. While government bonds may continue to provide some diversification, they no longer provide much of a return. UK government bonds have provided an average return of 6.5% over the last 20 years. The return we expect on a typical UK index over the next 10 years is between little more than 1% per annum.

Secular stagnation

While low interest rates are a problem for investors in their own right, they are also a problem for the wider economy. When faced with a recession, central banks reduce interest rates aggressively to stimulate recovery. In previous recessions, central banks have reduced interest rates by three or four percentage points. But when central bank interest rates are only a little above zero, there is much less room for this kind of stimulus. Of course, there are alternatives, such as quantitative easing and negative interest rates, but there are worries that these are less effective and create their own problems.

This 'zero lower bound' problem is a reason why the recovery from the financial crisis has been so painfully slow. With low equilibrium real interest rates likely to be an ongoing feature of the economic landscape, this zero lower bound problem may reoccur, resulting in more sluggish recoveries in the years to come, and producing average growth rates that fall short of their already modest potential.

Disappointing economies beget unstable politics

The recent success of anti-establishment political parties seems to owe something to the disappointing economic performance of modern economies. The idea that a substantial section of the population has been 'left behind' may have been a contributor to the result of the Brexit referendum, Donald Trump's election and the success of Italy's populists.

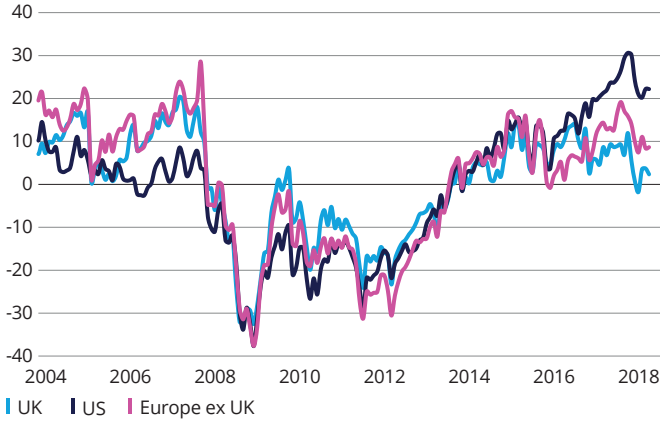
How much this is a problem depends on one's political point of view. The fear, from an investment perspective, is that anti-establishment parties will pursue populist, beggar-your-neighbour economic policies that further undermine growth rates. The current surge in protectionism may trigger a decline in global trade, resulting in even slower growth.

Elevated valuations?

Another potential hurdle facing investors is the fact that asset prices have appreciated significantly in recent years, and many asset classes are now looking on the expensive side relative to their historical levels.

Since the financial crisis, equity returns have been above their long-term average. In the last 10 years, the MSCI World Index is up 112% in total-return terms, or nearly 8% per year. Much of this performance is down to earnings growth, but returns have been boosted by expansion in valuation multiples, as figure 1.3 shows.

Fig. 1.3: Historical equity valuations (%)



Source: ASI, Bloomberg, July 2018.
Note: Chart shows the level of ASI's equity valuation basket versus its 15-year average. Underlying Price/Sales have been adjusted for structural changes to profit margins.

Equities are no longer cheap on a historical basis anywhere except Japan and, after the recent sell-off, emerging markets (EM). Valuations are particularly stretched in the US, as shown in figure 1.3. High valuations today normally mean lower returns in the long term.

There is a debate about the true valuation picture for equities. Some argue that the very low interest rates we have today mean that valuation ratios are showing a misleading picture. There is something in this: low risk-free rates mean a low discount rate and a higher value for future cash flows. But, as we discuss in Chapter 10, corporate earnings growth is also likely to be lower than in the past. Lower growth largely offsets the effect of lower risk-free rates. The conclusion stands: US equities are expensive compared to history.

Valuations have improved a little since their highs in January, but risk premia remain compressed in many asset classes.

A more diversified investment strategy

To sum up so far: we can expect slower growth in the future than we experienced in the past, together with persistently low interest rates. This means returns are lower. On a 10-year horizon, we expect equity returns of 3–5% rather than the 30-year average of 7–8%. Our expected government-bond returns range from 1–2% compared with a long-term average of 6–7%. We might expect a traditional balanced investment portfolio to deliver a return of around 3% versus a 7% average over the last 20 years.

We think investors can do better by reducing reliance on both high-grade bonds and equities in favour of a range of alternative diversifiers; and, where possible, making use of illiquid private assets.

Alternative diversifiers

Prior to the 2008 financial crisis, investors had invested in a variety of unconventional asset classes that they thought offered them diversification from equities. In the event, they were disappointed to discover during the 2008–09 equity bear market that this diversification was largely illusory. These 'diversifiers' were highly correlated with equities.

Armed with this experience, investors are now, rightly, rather more sceptical about apparent claims to diversification. We do extensive research to test these claims are robust.

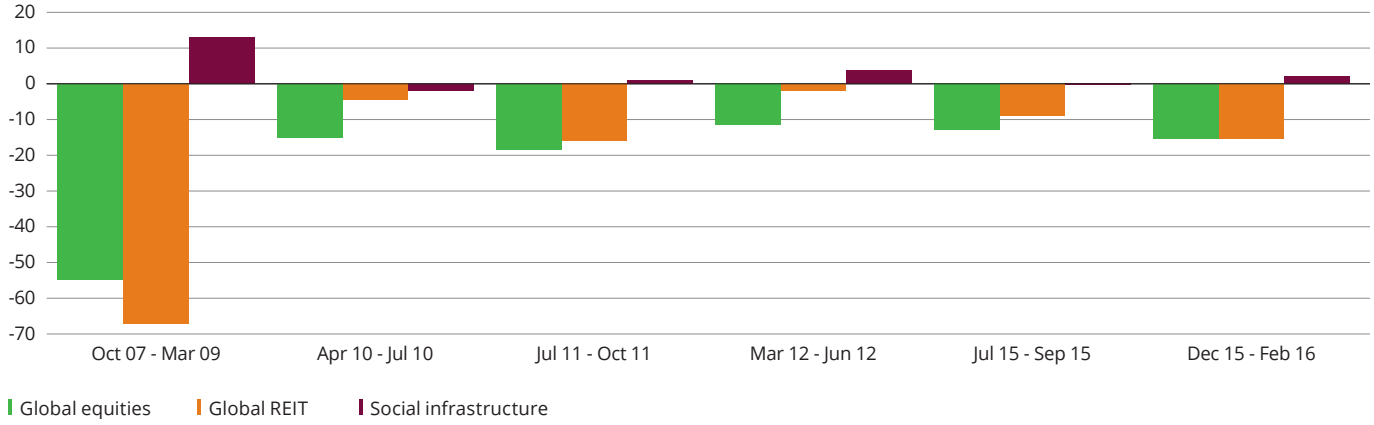
The asset classes that provide the most robust diversification from equities are those whose underlying cashflows are insensitive to the health of the economy. Equity risk is driven primarily by market expectations of volatility in the economy. The worst equity returns tend to occur during economic recessions. So a more reliable way to diversify equity risk is to invest in assets that are insensitive to changes in the economy.

Infrastructure is an example of an asset class that can be economically insensitive. Many underlying infrastructure assets – wind farms, hospitals, electricity grids – have cash flows that are driven by long-term government-backed contracts or renewable energy subsidies. This makes them relatively insensitive to the waxing and waning of the business cycle. Their correlation with equities is, therefore, low. As figure 1.4 shows, these assets do not tend to sell off when equity markets experience strongly negative returns – observe how well social infrastructure has fared when equities and real estate have experienced large price declines.

Insurance-linked catastrophe bonds are another good example. These bonds are issued by insurance companies who have, for example, written insurance policies on properties in Florida that may be damaged by a severe hurricane. In return for sharing the risk of loss from a bad hurricane season, catastrophe bond investors are paid an annual insurance premium. These investments generate an attractive return in most years, but lose money in the event of a severe hurricane season (see Chapter 9 on Alternative Credit).

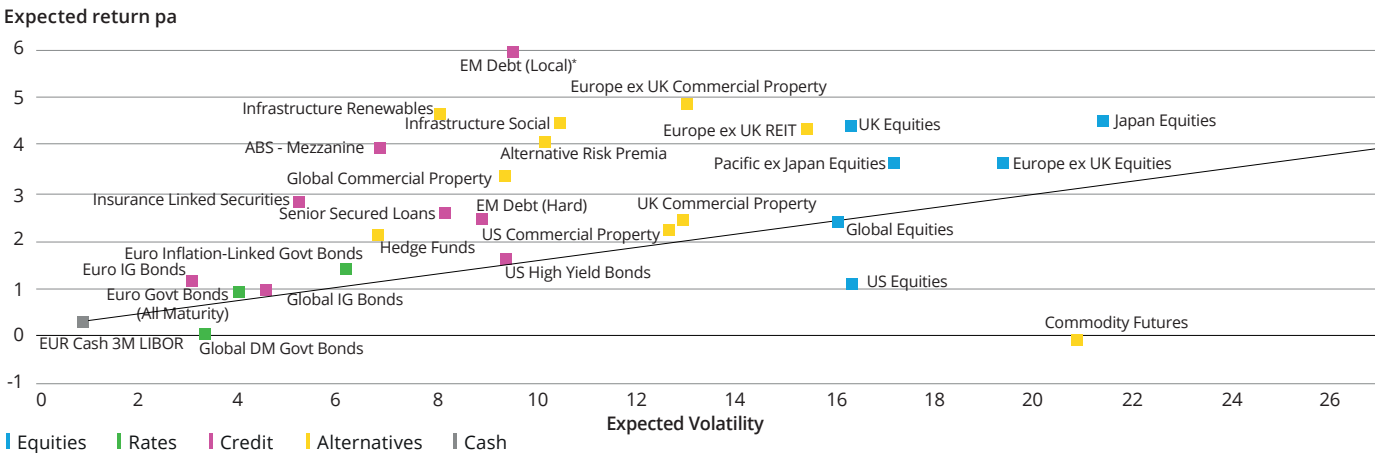
The key point is that these risk events are unlikely to occur at the same time as stock market crashes, so the returns from catastrophe bonds show low correlation with equity returns. They are good diversifiers. Returns are currently on the low side for the most popular catastrophe bonds, given strong investor interest, but remain attractive in the more sophisticated vehicles.

Fig. 1.4: Returns in periods of negative equity sentiment (%)



Source: ASI, Bloomberg, March 2017.
Note: Calculated as the total return (share price plus gross dividends) over the period. Social infrastructure is based on HICL Infrastructure. Past performance provides no guarantee of future results. Global equities is in GBP Hedged; Global REIT is in EUR (local currency); Social infrastructure in GBP. REIT = real estate investment trust.

Fig. 1.5: Expected asset risk and return (%)



* EUR Unhedged.
Source: ASI, 2H2018.
Note: Returns are over five years (EUR hedged) on a per annum basis. Return projections are estimates and provide no guarantee of future results.

Higher returns at lower risk

As figure 1.5 shows, many of our diversifying assets also potentially offer returns that are nearly as high as equities, but with much lower risk.

One asset class that is particularly interesting at present is emerging market government bonds (EM debt, or EMD, for short). Trade wars, a strong dollar and twin crises in Turkey and Argentina mean that EM assets have sold off this year. As a result, yields have widened and EM currencies have become unusually cheap. While worries are justified in Turkey and Argentina, most EM economies are still in relatively good shape – a systemic EM crisis like the one in Asia in 1997 is unlikely.

This makes for an interesting long-term buying opportunity. The gap between EM and developed-market yields is close to the widest it has been for decades; and our long-term fair-value currency models suggest that EM currencies are cheap. It is quite possible that EM worries will get worse before they get better, but, for long-term investors, we think the risk-reward for EMD is now looking more attractive than for global equities.

Asset backed securities (ABS) are another interesting asset class from a returns point of view. The higher complexity and illiquidity of this class result in a significant risk premium for investors.

For mezzanine ABS, this translates into a yield 2% higher than for equivalent high-yield corporate bonds. Volatility, on the other hand, is rather lower. The implosion of sub-prime mortgage-backed ABS during the financial crisis gave this asset class a bad name. But, in fact, default rates for the vast majority of ABS were low during the crisis. In an age of meagre returns from conventional bonds, ABS merits a second look. We discuss this class and other alternative credit assets in Chapter 9.

"EMD offers high yields and EM currencies are now cheap. This is a good buying opportunity."

Equity preferences

Lower expected returns mean that equities currently receive a lower proportion of asset allocation than they have in previous years. However, they remain the single biggest asset class in many of our multi-asset portfolios. But rather than the 50–60% allocation we used to hold in our conventional 'balanced' portfolios, they now comprise less than one third of our more diversified multi-asset portfolios.

We do not have a particularly strong preference between equity regions, though there are some differences. On valuation grounds, we continue to give the US market an underweight allocation. This has not been a comfortable position to hold in the last year. But this is the nature of SAA: valuation-driven views only come good when valuations revert to their mean. In the US, valuations have moved away from their mean in the last 12 months, so we have not benefited. As we discuss in Chapter 10, history suggests patience will eventually be rewarded.

Conversely, we have been underweight emerging markets this year, and have profited from the sell-off. Now that these markets are cheap, we have moved to neutral. We are overweight the UK – Brexit worries have driven international investors away and the market is relatively inexpensive. While the shape of Brexit remains very uncertain, FTSE 100 companies are insulated by their overseas earnings. We also like the UK's rich dividends.

We also like 'alternative risk premia' and 'smart-beta' strategies in equities. There is a large amount of academic evidence that equity portfolios that exploit market anomalies such as low volatility, value, quality and momentum can offer more attractive risk-return characteristics.

We allocate a share of equity exposure to these quantitative equity strategies, primarily with the goal of reducing risk. Our favoured smart-beta equity strategy has volatility of around 15% lower than a global equity index, with a higher expected return.

Adding illiquid assets

Most investors rely exclusively on assets that are listed on public markets, but, as we discuss in Chapter 11, higher returns are often available from unlisted or privately held assets like private equity, private infrastructure, direct property and private debt. Private assets typically offer higher returns than their listed versions because investors receive an 'illiquidity premium' in compensation for losing the ability to release their capital at short notice. This premium typically adds 2–4% to returns, depending on the asset class. Strong demand for private markets in recent years means that this premium is now at the low end of the range, but, given the low expected returns elsewhere, it is still worthwhile.

Investors sometimes mistakenly believe that, because private assets are illiquid, this means that they get no cash return in the short term. Naturally enough, this would be unattractive for investors who require income in the near term. In fact, many private assets offer a substantial income return during the period they are held. For example, private infrastructure funds might pay their investors a dividend of 5–6% per annum.

One of the biggest challenges for investors in private assets is identifying and accessing the best funds. As we discuss in Chapter 11, the difference in performance between top and bottom-quartile managers is much bigger for private asset classes than it is for listed markets. Picking a bottom-quartile manager can result in returns well below those of public markets. Manager selection is critical, and the funds with the best track records can be hard to access. Private assets tend to be restricted to large institutional investors. However, some more liquid vehicles offer exposure to these assets through closed-end investment trust vehicles.

We manage a wide range of portfolios to meet a variety of different needs. The diversified growth portfolio above is a simplified version of our Diversified Assets approach. This kind of portfolio won't suit everyone, but aims to meet the needs of investors who previously invested using a typical balanced equity-bond approach. The portfolio has no allocation to government bonds or investment-grade credit, a lower exposure to equities and a much wider range of diversified sources of returns.

One attractive feature of the diversified asset classes that we hold in our portfolios is that their returns not only have a low correlation with equities, but they also have a low correlation with each other. The addition of each diversifier to the portfolio lowers the portfolio risk. Given that their individual returns are reasonably attractive, this means we believe it is possible to construct a lower-risk portfolio with a higher expected return than equities.

We believe that, in an environment of very low government-bond yields and sluggish global growth, this portfolio may offer rather better return prospects than traditional balanced strategies, while preserving the defensive characteristics that, in the past, were provided by developed-market government bonds. This approach also has the benefit of a natural bias towards assets with reliable cashflows, and hence an annual income stream to investors of 4%.

Our 10-year annualised expected return forecast for the portfolio above is around 4.2% – roughly the same as equities. But risk is less than half that of equities. Using our long-term risk model, portfolio volatility is estimated to be 7.1%, little more than that offered by government bonds (volatility of 3.2%), two-thirds of a 60:40 equity-bond portfolio (10.4%) and well under half of that offered by equities on their own (16.3%).

Our conclusion is that our more aggressive diversification strategies may deliver higher returns than equities with lower risk.

For clients that can bear illiquidity risk, it is possible to replace some components of this portfolio with a private asset version, which further enhances expected returns.

Fig. 1.6: Better results are possible from a more radically diversified portfolio

	Traditional balanced		Modern balanced		Diversified Growth			
	Weight (%)	Expected return (%)	Weight (%)	Expected return (%)	Weight (%)	Expected return (%)	Volatility (%)	Sharpe Ratio
Global Equities	60	2.1	50	2.1			16.1	0.10
Global Equities Low Volatility					30	2.1	13.7	0.12
Global DM Govt Bonds	25	0.7	15	0.7			3.3	0.07
Global IG Bonds	15	1.6	15	1.6			4.5	0.26
Global High Yield Bonds			10	2.8	10	2.8	11.1	0.21
EM Debt (Local)*					15	6.0	9.7	0.58
Senior Secured Loans					10	3.5	8.2	0.37
ABS - Mezzanine					5	5.1	6.9	0.68
Insurance Linked Securities					5	3.3	5.2	0.55
Global Commercial Property			10	3.2	5	3.2	9.4	0.29
Infrastructure Social					10	4.8	8.2	0.52
Hedge Funds					5	2.6	3.9	0.56
Other Diversifiers					5	4.6	10.2	0.41
Portfolio Total Return (%)		1.6		2.0		3.6		
Portfolio Volatility (%)		10.3		9.8		7.2		
Portfolio Sharpe Ratio		0.12		0.15		0.43		

* EUR Unhedged.
Source: ASI, 2H2018.
Note: Returns and volatilities are in percent and based on our 10-year horizon (EUR hedged on a per annum basis) standard forecasts for market benchmark, they include no assumption of additional returns from active manager skill. Returns are gross of fees and does not reflect investment management fees. Had such fees been deducted, returns would have been lower. Expected return is not an indication of future results.

02

Long-term growth trends

- The long-term global growth outlook is the foundation on which our asset class return projections are built
- We use a 'production function' approach to think about the determinants of long-term growth, looking at trends in population growth, participation rates, the natural rate of unemployment, hours worked and labour productivity
- Shrinking labour forces will result in lower potential rates of global growth
- Sluggish productivity growth should improve, but not by enough to offset worsening demographics
- Low equilibrium interest rates make it harder for central bankers to stimulate economies, leading to longer periods where growth will be below its already modest potential rate
- Lower and less inclusive growth makes for volatile politics and rising anti-globalisation pressures, hampering necessary growth-oriented structural reforms

Long-term growth trends

In forming our views about asset class returns, we start by reviewing the long-term economic context in which those returns will be generated. As this chapter explains, the long-term growth outlook is dominated by marked changes in demographic trends around the world, together with hard questions about the future rate of productivity growth, and the extent to which economies face 'secular stagnation'. Our conclusion is that structural changes in the global economy mean that growth will be lower in the future than it was in the decades prior to the financial crisis.

In the long run, returns from equities and many other risk assets are driven by economic growth. Earnings growth and dividends are the key components of long-run equity returns, and these are ultimately derived from nominal growth in the economy. Economic growth is not the whole story – for equities, trends in profit margins, share issuance and cyclical swings in the equity risk premium also matter – but over the long term, growth is the main engine of returns.

Judging how fast economies are likely to grow is therefore a fundamental starting point for our long-term return forecasts. We distinguish between two timeframes.

Over the long term (5–10 years and beyond), our growth forecasts are driven mainly by our view on the long-term potential growth rate of economies. Potential growth is determined by structural trends in labour-force growth and labour productivity.

In the short-to-medium term (1–5 years), growth may deviate from its potential according to the oscillations of the business cycle. Risk premia in equities and elsewhere are highly variable through the cycle. Equity bear markets tend to coincide with recessions, and equity bull markets with economic recoveries. Chapter 4 discusses our view on the state of the business cycle and the medium-term prospects for regional economies.

In this chapter, we take a 'production function' approach to thinking about the long-term determinants of potential growth. The production function explains the growth in output of an economy to changes in its main inputs: the so-called factors of production. This starts with the drivers of labour-force growth (population growth, participation rates, hours worked and the natural rate of unemployment), and moves on to consider labour productivity growth. Finally, we think about headwinds that could cause growth to fall short of its potential.

Labour-force growth

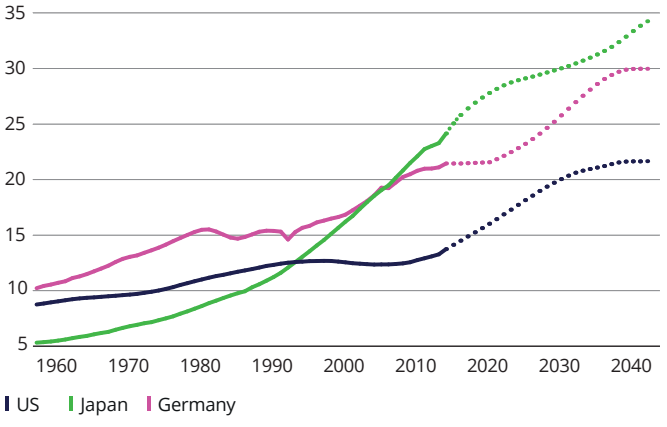
One of the most important factors driving long-term economic growth is the change in the size of an economy's labour force. Crudely speaking, the faster the growth in the number of workers, the faster the economy can grow. Demographic trends and changing participation rates are likely to be the key drivers of labour-force growth in the years ahead.

The great demographic transition

Much of the world is in the early stages of a major demographic transition, which is likely to result in a global economy that grows more slowly.

Populations are ageing as people live longer and the 'baby boomers' reach retirement. Meanwhile, fertility rates are falling as people get wealthier and cultural norms change.

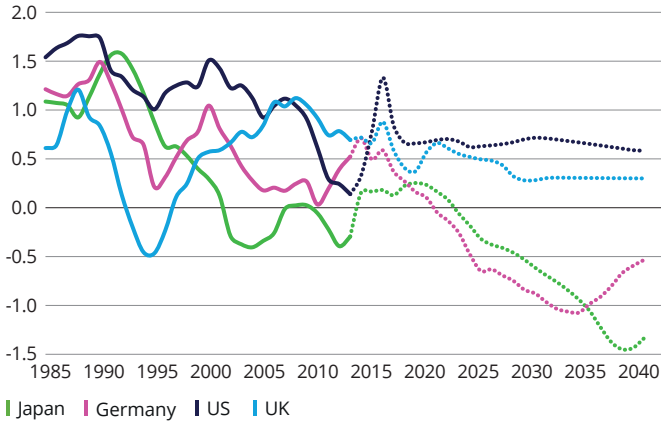
Fig. 2.1: Ageing populations (% share above 65 years old)



Source: ASI, Oxford Economics, February 2017.
Note: Percentage change in YoY labour force total, historical data uses a five-year moving average in order reduce the volatility of the underlying data.

As such, working-age populations in much of the developed world and in large parts of east Asia are shrinking, or soon will be. In countries where working-age populations may not shrink outright even over a very long horizon, such as the US, UK, or India, they are set to grow much more slowly. This shift is unprecedented in modern history.

Fig. 2.2: Developed markets' labour-force growth (%)



Source: ASI, Oxford Economics, February 2017.
Note: Percentage change in YoY labour force total, historical data uses a five-year moving average in order reduce the volatility of the underlying data.

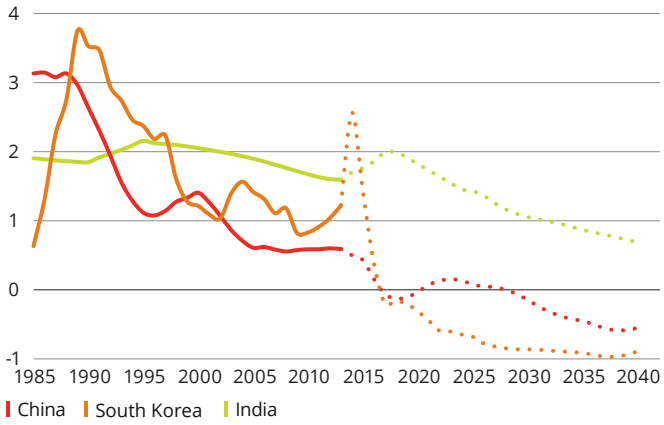
Japan was the first major economy to enter this transition, with demographic changes resulting in working-age population growth turning negative in the late 1990s, and bouncing around zero ever since. Japan's subsequent experience is informative. As expected, economic growth has slowed significantly. This has not been good for company revenue growth or equity investment returns.

> "Working-age populations in much of the developed world and in large parts of east Asia are shrinking."

The working-age population in many European countries is also now shrinking, or poised to do so soon. The decline is concentrated in Germany and some southern European countries, with France and the UK doing slightly better. Overall, though, Eurozone potential growth is likely to be significantly slower than seen pre-crisis.

East Asia is following Europe down this demographic path. In fact, the change will be rather more dramatic for this region, which until fairly recently experienced much faster working-age population growth. In China, the change has a lot to do with its recently abandoned 'one child' policy. But it is also a function of growing wealth and women joining the workforce, both of which tend to result in smaller families. This demographic shift is particularly important when thinking about future returns for emerging market equities. The most popular equity-market benchmarks have very high exposure to countries where the working-age population is expected to shrink – Chinese, Korean and Taiwanese companies make up over 50% of the MSCI EM Equity index.

Fig. 2.3: Asia labour-force growth (%)



Source: ASI, Oxford Economics, February 2017.
Note: Percentage change in YoY labour force total, historical data uses a five-year moving average in order reduce the volatility of the underlying data.

Working-age population will not shrink in all countries. There are some stand-out exceptions among emerging markets, especially India, Indonesia and much of sub-Saharan Africa. We expect this stronger population growth to lead to more rapid GDP growth in these countries. However, it is notable that these rapidly growing economies currently form a very small part of the global equity index. Despite their rapid rate of growth, this will change only gradually.

Demography is not necessarily destiny

If these trends develop as projected, the demographic dividend of the previous 50 years or so will turn into a demographic headwind that will be enough to lower economic growth in much of the world, relative to the pre-financial-crisis decades.

It is the nature of demographics that these trends are already largely determined: the workforce of 20 years' time has already been born. However, birth rates are not the only determinant of labour-force growth – immigration, labour-force participation, hours worked and unemployment rates all matter.

Immigration

Net migration can have a major impact on labour-force growth, and is an important reason why working-age populations are forecast to continue growing in the US and UK. Migrants contribute to labour-force growth in two ways: first, because they are disproportionately of working age, they directly increase total working age population; and second, they tend to raise the average fertility rate of the country to which they migrate.

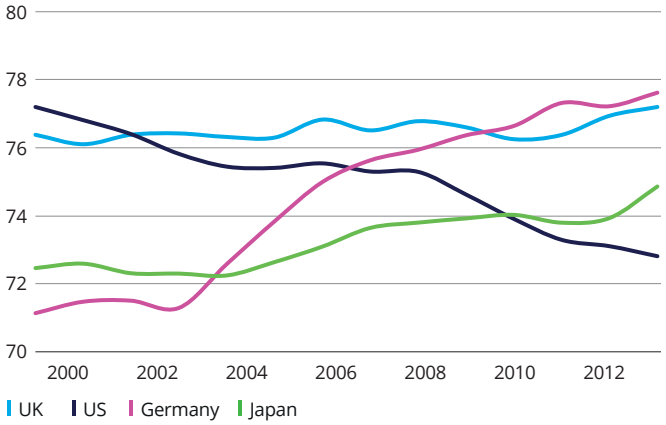
Of course, tolerance for immigration can change. The recent electoral success of populist anti-immigration movements suggests that tolerance is declining in many places, potentially reducing the positive future impact of immigration on labour-force growth. But given rapidly growing populations in Africa and the extent of persistent income inequality between countries, we assume a broad continuation of current migration trends, which partly offsets the drag on growth from demographic headwinds.

Labour-force participation, hours worked, and trend unemployment

The size of the labour force is not solely a function of working-age-population growth; it also depends on what proportion of the population participates in the labour force, the hours worked by the labour force and the share of the labour force that is employed versus unemployed.

In the long run, participation is driven by a combination of cultural and policy factors. For example, one of the biggest changes in the last 100 years has been the rapidly increasing participation of women in the paid labour force. This shift provided a major one-off boost to potential GDP growth in most developed countries. Among the developed economies, Italy and Japan have scope to raise female labour-force participation further as a way to achieve faster growth. Emerging market economies, particularly in Asia, should see a substantial increase in labour-force participation, as female participation rises.

Fig. 2.4: Diverging labour-force participation (%)



Source: OECD, February 2017.
Note: Labour-force participation rate (15-64 year-olds).

The participation rate is also a function of the age at which people choose to retire. Given longer life expectancy and the decreasingly physical nature of work, people may be able to work longer. Low retirement savings rates may force many to do so. Furthermore, governments are raising the age at which state benefits and pensions are paid. This can raise participation rates.

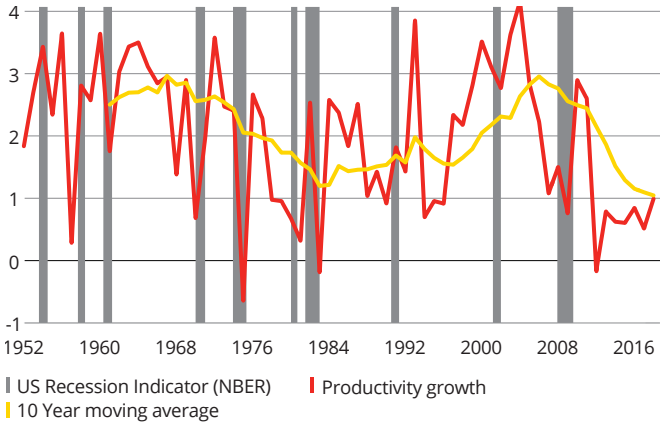
The US is somewhat of a special case, as the participation rate there has been on a downward trajectory for the past 15 years. This represents a loss of several million potential employees, and a drag on US potential GDP growth. There appear to be several explanations, including job losses associated with the financial crisis causing workers to leave the labour force, a longer-term loss of manufacturing jobs lowering prime working-age male participation in the 'rust belt' states, and rising disability rates keeping people out of the labour force. Government policies have the potential to reverse some of these trends, but for now we assume a further drift lower in the US labour-force participation rate.

Over a short-to-medium-term horizon, cyclical swings in the unemployment rate and hours worked also determine realised growth rates: if average hours worked and the unemployment rate are below their trend levels, an eventual rise towards trend can raise GDP growth. In most economies these factors are now, if anything, a headwind for future growth expectations. In the US and Japan, the unemployment rate appears to be below its sustainable level, suggesting that we should expect the unemployment rate to be higher on average in the future, which would drag on growth. Among the large advanced economies, only the Eurozone appears to have scope to sustainably lower the unemployment rate from current levels, thereby boosting growth.

Productivity

Economies grow either because the total number of hours worked increases, or because the output produced each hour (labour productivity) increases. As we have seen, demographic change, immigration, labour force participation, average hours worked and trend unemployment account for the former. But changes in output per hour worked depend entirely on labour productivity growth, leading Paul Krugman to quip that "productivity isn't everything but, in the long run, it is almost everything".

Fig. 2.5: Slowdown of US labour productivity growth (%)

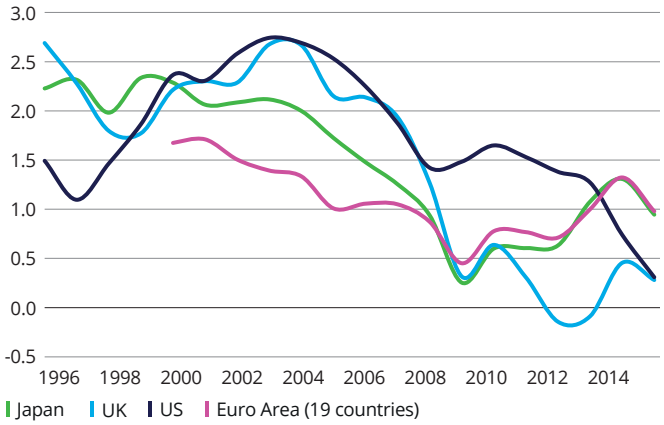


Source: Conference Board (TED), May 2017.
Note: Growth of labour productivity per hour worked, percent change.

As figure 2.5 shows, productivity growth in the US has varied significantly over time. Between the end of the Second World War and 1970, labour productivity grew at 2.6% per year. Since then, with the exception of a brief period starting in the late 1990s, it grew at only 1.7%. In recent years, productivity growth has been dismal, averaging around 0.5% since 2010.

The productivity slowdown is not confined to the US. Similar trends are observed in all advanced economies.

Fig. 2.6: Slowdown of OECD labour productivity (%)



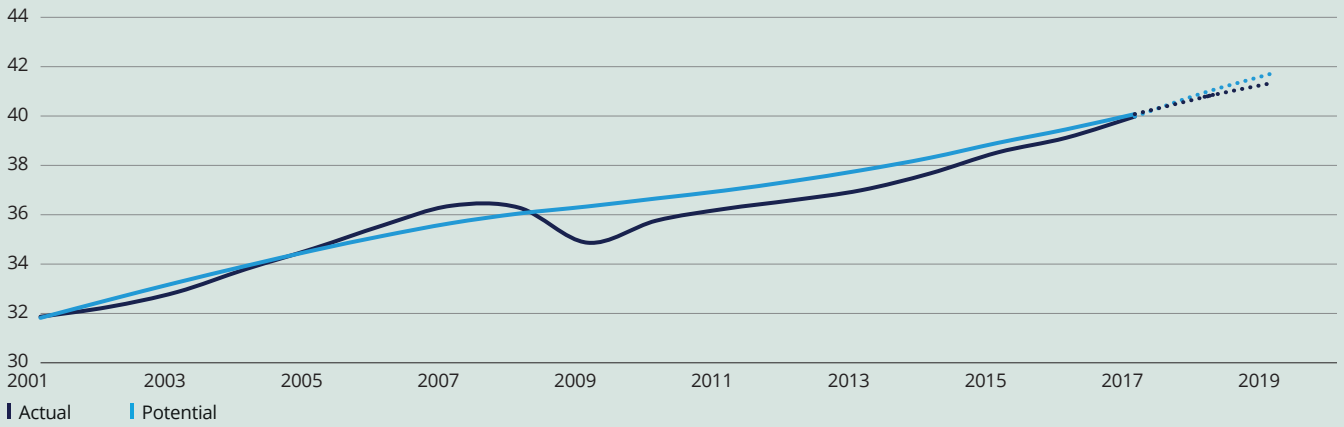
Source: ASI, OECD, April 2017.
Note: Annual change in output per hour worked, five year moving average.

Alternative methods to estimate potential growth

The 'production function' approach to estimating potential, or long-term, growth rates used in this chapter is only one method economists use to estimate potential growth. It is a 'bottom up' method, which puts together a potential growth estimate from the building blocks of labour-force growth and labour productivity.

Other 'top down' methods include 'univariate' and 'multivariate' statistical filters: econometric methods to extract the underlying trends in GDP data, in order to understand the long-term evolution of potential growth.

Fig. 2.7: US long-term potential real GDP



Source: ASI, Haver, Thomson Reuters Datastream, August 2018.
Note: $ Trillions (constant prices & exchange rates).

Crucially, all of the methods to estimate long-term potential growth are subject to uncertainty. While demographic factors may be largely 'baked in', immigration levels, participation rates, trend unemployment rates and productivity growth could all turn out different from our expectations.

Should we assume productivity growth will remain at the current dismal levels? Would a return to long-term average growth rates be a reasonable forecast, or should we consider forecasting even higher growth to take productivity levels back to pre-crisis trends?

False hopes from the digital revolution?

The MIT economist Erik Brynjolfsson has articulated four possible explanations for the slowdown in productivity growth: unexpectedly low impact of new technologies, implementation lags, mismeasurement, and the very narrow diffusion of productivity gains.[1]

Perhaps the best known recent work about the impact on productivity from recent technological advances is Northwestern University economist Robert Gordon's analysis of the history of American growth.[2] This suggests that the high levels of productivity growth achieved in the past were truly exceptional and unlikely to be repeated. The late 19th and early 20th centuries brought clean water, indoor plumbing, the internal combustion engine and powered flight. The post-war period brought the mass adoption of electricity and electric motors, and with them a radical improvement to the productivity of factory production lines, turbocharged by massive government-funded capital investment in factory modernisation during the Second World War that was then turned to peacetime use.

In addition, there was rapid improvement in the education of the workforce as a much greater proportion of the population went to college or university – including a vastly greater percentage of the female population. These factors allowed an extraordinary pace of improvement in productivity.

This pace of improvement has not been sustained. Once most of the population with the aptitude for university-level education are receiving it, it is much harder to make further rapid gains in the population's educational attainment. The scale of wartime government-funded capital investment in industrial infrastructure is also unlikely to be repeated.

By contrast, argues Gordon, the gains to productivity growth we should expect from today's technological frontier – the internet, smartphones, artificial intelligence – may be more modest than the step-change technological transformations of the past. Lofty expectations for the impact of the latest innovations may simply be unrealistic. Broadband internet and smartphones may enhance consumer welfare and give people another way to spend their leisure time, but with only modest impacts on economy-wide productivity growth.

> "Productivity isn't everything. But in the long run it is almost everything."

[1] Brynjolfsson, E et al. (2017) Artificial Intelligence and the Modern Productivity Paradox: A Clash of Expectations and Statistics, NBER.
[2] Gordon (2016) The Rise and Fall of American Growth.

Lags in the diffusion of new innovations

Alternatively, it may be that there are natural lags between the invention of a technology and its full impact on productivity growth. The full application of, say, AI and machine learning to productivity-enhancing tasks may have simply not taken place yet, and will require waves of complementary innovations to be developed and implemented first.

The comparison with the spurt of faster productivity growth in the late 1990s and early 2000s is worth highlighting (see figure 2.5). In 1987, the economist Robert Solow famously quipped that "you can see the computer age everywhere but in the productivity statistics". Shortly thereafter, productivity accelerated, driven by the universal adoption of computers and computer networks in the business community, as well as the extremely rapid improvement in telecommunications, computer processing power and software that took place during this period. A sector-by-sector analysis of productivity growth shows that the sectors where productivity improved fastest were those that use information technology most intensively.

However, once businesses were fully computerised, the subsequent productivity growth rate slowed. The biggest productivity improvements typically come during the relatively short period when a technology goes from early commercialisation to full-scale mass adoption. For example, we may see a period of rapid change in the next 20 years as trucking fleets are upgraded with driverless technologies. This will most likely boost productivity growth, but once it is complete, productivity growth rates will slow again.

This may be the pattern for the future. We could see periods of slow productivity growth punctuated by bursts of faster growth during phases of mass adoption of new technologies. The emergence of driverless vehicles, the replacement of routine clerical jobs with machine-learning algorithms, and the development of new genetic engineering techniques might all significantly improve productivity at some point in the future, perhaps substantially. But after the one-off improvement in the productivity level, we should expect productivity growth to slow again.

Gordon makes the point that the effects of most technologies are quite local in their economic impact. Electrification was an exception to this, and computerisation to some extent. However, driverless vehicles will primarily affect the trucking, logistics and taxi-driving sectors, which are worth less than 5% of the economy. While output per person may rise dramatically in these sectors, the effect on average national productivity is likely to be small.

This highlights a wider problem. Historically, there has been much faster productivity growth in manufacturing than in service sectors. The latter often depends on human interaction (for example: haircuts, restaurant service, elderly care). Although driverless taxis are an exception, it is, in general, hard to make productivity improvements in these industries. A one-hour massage takes an hour's work, by definition.

As manufacturing shrinks as a proportion of the total economy, it is consequently harder to achieve rapid productivity growth. The service sector accounts for 80% of GDP in the US today, compared with less than 50% in 1950. Manufacturing has steadily contributed less, declining from nearly 40% to 12% over this period. As a result, productivity-enhancing innovations must take a different form than in the past, and the scope for improvement might be permanently reduced.

Mismeasurement

Some analysts have suggested the slowdown in productivity growth since the early 2000s is a mirage resulting from mismeasurement.

One argument is that the ongoing improvement in the quality of technological products is being underestimated, which results in inflation being overstated. If inflation is overstated, true real output (output growth after subtracting inflation) and productivity (real output per hour worked) would be higher than the reported statistics suggest.

For example, domestic broadband speeds are 10 times faster than a decade ago, but the cost is more or less the same. You are getting far more bandwidth for your money, so on a quality-adjusted basis, inflation in broadband prices has been highly negative.

> "Historically, there has been much faster productivity growth in manufacturing than in service sectors."

An influential Brookings Institute paper[3] finds that inflation in the digital economy is indeed being overstated. The level of output and productivity should be higher. However, the paper notes that this effect was even greater with technological innovations in the past. Arguably, relative to the past, current productivity growth rates are even worse than we thought.

It is also sometimes argued that GDP-based output measures fail to capture the large benefits of modern technologies. Today we spend far more time browsing the internet in our homes and on our smartphones than we used to. Most of us consider this to be a huge benefit, but because much of the content we consume is offered for zero cost (you don't pay to search Google, for example), it is not recognised by GDP data. GDP may therefore be dramatically under-reporting the welfare benefits from the new technologies.

This seems plausible, but it is hardly new. Many of the vast benefits of unpaid housework, electric lighting, air-conditioning, central heating and plumbing did not show up in the GDP numbers and were therefore similarly undercounted.

Perhaps the biggest problem with this last argument, at least for our purposes, is that investors do not get returns from gains in welfare. Capital invested must generate financial profits, so investors get returns from increases in market output. Internet services, even if valuable to their users, do not generate returns for investors unless they are effectively monetised, or allow businesses to be more productive in other ways. The commercial value of much of our internet browsing is modest and concentrated in the revenues of a very small number of companies, notably Google and Facebook.

[3] Byrne, Fernald and Reinsdorf (2017), Does growing mismeasurement explain disappointing growth?

Productivity gains have been narrowly concentrated

Another explanation for slower productivity growth is that the benefits of new technologies are being enjoyed by a relatively narrow section of the economy. In leading companies, productivity is growing as fast as ever. The problem is that a large disparity has emerged between the leading companies and the rest.[4]

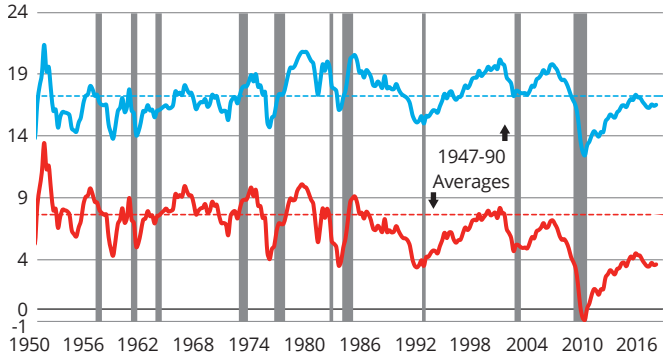
There are various theories about why this has happened. Perhaps increasing industry concentration and the distortions of a small number of firms having significant market power has concentrated innovation and productivity growth in a subset of companies. The nature of recent technological advances may also favour industry concentration – technology based on building large networks tends towards an industrial structure dominated by a few firms, who then reap the rewards of that technology.

There may also be wider problems with the uptake of new business practices if laggard companies do not have the right skills to implement them. There is clear evidence from the UK that productivity growth demonstrates strong regional patterns. Productivity is 60% higher in companies based in London than those in Northern Ireland, and there is a large divergence between skills levels in these two regions.[5]

Low investment levels

To Brynjolfsson's four explanations of lower productivity growth, we would add an important fifth driver: the relatively low level of business investment in recent years. As shown in the chart below, investment has fallen well below the long-run average in the US, and especially so when depreciation of the capital stock is taken into account.

Fig. 2.8: US gross and net investment (%)

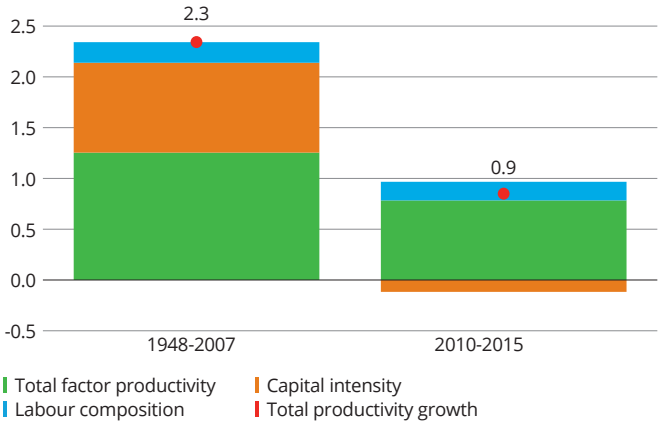


Source: ASI, Federal Reserve Bank of St. Louis (FRED), Thomson Reuters Datastream, October 2017.
Note: Gross/net private domestic investment, as a percentage of GDP, seasonally adjusted.

Workers produce more per hour when equipped with the latest tools and technologies. Some studies suggest that as much as two thirds of the recent productivity slowdown is as a result of slower growth in business investment, as demonstrated by the reduction in capital intensity growth in figure 2.9.[6]

This is more of a problem in some countries than others. Business investment in the UK, for example, has been extremely low – and the country's productivity performance has followed suit.

Fig. 2.9: Composition of US business productivity growth (%)



Source: ASI, US Bureau of Labor Statistics, March 2017.
Note: Private Non-Farm Business Sector (Excluding Government Enterprises).
In percentage points, average annual rate. Chart shows the average productivity growth between WW2 and the financial crisis compared with the average since 2010. In both cases, the subcomponents are shown.

Economists have various theories about the reasons for the slowdown in business investment. One argument is that there is less competition in the business community and fewer start-ups, reducing economic dynamism. A lack of competition tends to result in less efficient use of resources, and lower productivity.

Another suggestion is that, with unemployment high and wages low for much of the period since the financial crisis, companies have substituted cheap labour for capital and held back on making investments.

It is also possible that lower business investment is simply a function of lower growth expectations. Standard 'accelerator' theories of business investment suggest that investment levels are a function of growth expectations. The lower the rate of growth expected, the less management will be keen to invest. Sluggish growth and lower global growth expectations thereby create a vicious circle.

If this is part of the cause of unusually low productivity, policies that encourage capital expenditures – such as recent US tax cuts – could enable a recovery in productivity growth.

However, given the demographic trends discussed above, long-term growth expectations are likely to remain depressed, so incentives for business investment will most likely remain low despite policy changes.

Finally, declining skill levels are probably a headwind to productivity growth. There has been an accelerating loss of skilled workers from the labour force, as baby boomers retire and are replaced by younger workers that are less skilled and productive. More of these workers are therefore required to fulfil the same duties. This is consistent with the OECD finding that, for the first time in the 240-year history of the US, the next generation will be less educated than the preceding generation. This trend is likely to endure for at least the next decade, continuing to depress productivity.

[4] Adler et al. (2017) Gone with the headwinds: global productivity headwinds. IMF.
[5] CBI (2016) Unlocking regional growth. CBI.
[6] Furman, J (2015) Productivity growth in advanced economies. Peterson Institute.

Conclusion on productivity

Technological progress is alive and well and we can expect periods of more rapid productivity growth in the future. Artificial intelligence looks set to offer large – if rather disruptive – gains in productivity across a wide range of business sectors.

However, it seems unlikely that these benefits will appear at scale in the next few years. For example, it may take a decade or two of experimentation and regulatory change before we see the mass adoption of driverless commercial vehicles.

In addition, the current barriers to productivity growth described above – the narrow concentration of productivity gains, low levels of capital expenditure, the loss of experienced older workers – will not be quickly resolved. So it does seem reasonably safe to conclude that even if productivity growth does, at some point, return to something approaching the rapid pace of the 20th century, this is not imminent.

The biggest near-term cause for optimism is the possibility of higher levels of business investment, particularly in the US, as wages start to rise and companies invest to improve productivity in response, perhaps aided by Trump-administration tax cuts.

Addressing low productivity is one of the most important challenges for economic policymakers. Faster productivity growth is our best hope for offsetting slow or negative labour-force growth. If we are unable to improve on today's dismal productivity growth, western economies will see very low levels of GDP growth, with negative consequences for incomes and investment returns.

The somewhat eclectic and tentative discussion above demonstrates that the causes of the productivity slowdown are still not fully understood. There is an urgent need to remedy this lack of knowledge, and to develop and implement a more robust set of policy solutions.

In the meantime, we forecast only modest productivity growth in developed countries, somewhat faster than the current dismal levels, but rather lower than the faster growth before the crisis.

Economic convergence

We have discussed the rate of improvement in productivity in developed economies, which are at or near the technological frontier. However, even if the pace of innovation has permanently slowed down at the frontier, income levels in lower-income economies can increase, converging on the richest economies, just by catching up to the technologies, legal structures and institutional norms already in place elsewhere.

Economists call this process 'convergence' or 'emerging market catch-up'. Convergence of 'clubs' of similar economies is fairly clear in the data (as shown in figure 2.10 and figure 2.11), and becomes even clearer once we control, econometrically, for a range of conditioning variables.

Fig. 2.10: Europe economic convergence

Growth rate over period, annualised (%)

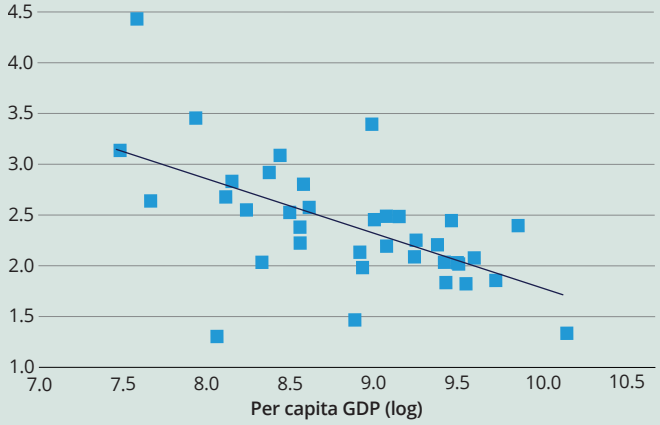
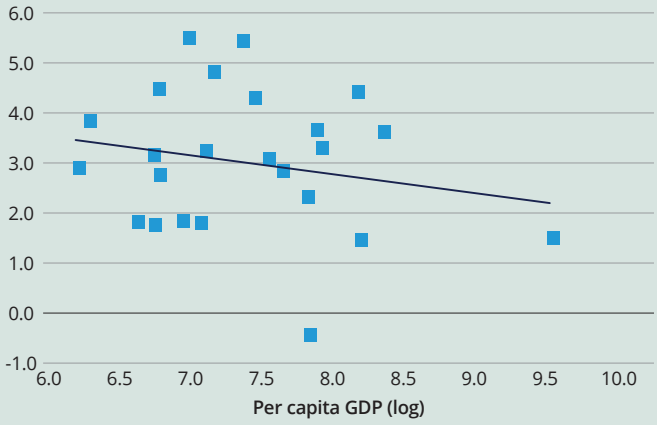


Fig. 2.11: Asia economic convergence

Growth rate over period, annualised (%)



Source: ASI, The Maddison Project, August 2018.

In the last 50 years Japan, South Korea, and, most significantly, China have grown exceptionally through dramatic and sustained increases in the productivity of their economies. However, convergence is not inevitable. A large number of emerging market economies have become mired in what is known as the 'middle-income trap', where productivity growth slows and convergence stalls.

This is a concern given the fact that, in line with the disappointing productivity story elsewhere, productivity growth in emerging economies has slowed down too in the last decade.[7]

Overall, however, there is good evidence that we should expect economies with lower per capita GDP to be able to sustain higher GDP growth rates.

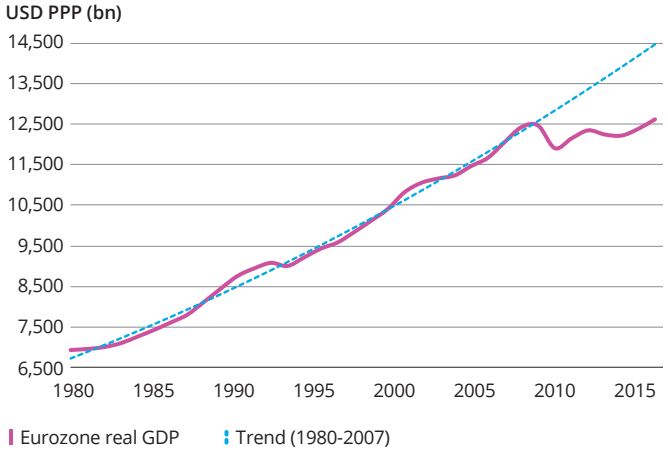
[7] Haldane, A (2017) Productivity puzzles. Bank of England.

Secular stagnation and other factors

In typical business cycles, recessions are rapidly followed by strong recoveries, during which growth rises above the economy's long-term potential growth rate, making up for some or all of the ground lost during the recession. Total output goes back to the full productive capacity of the economy.

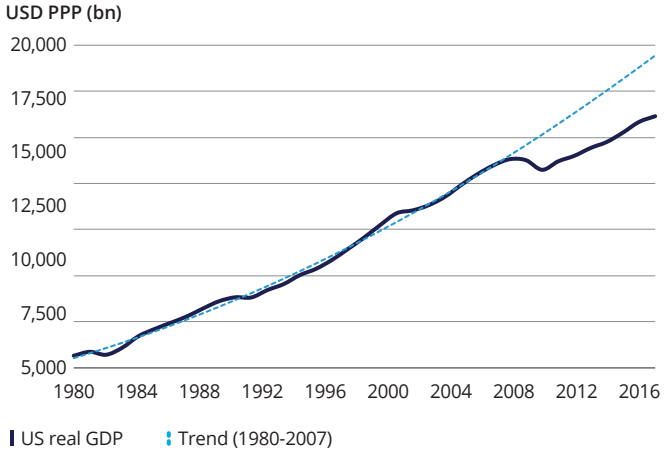
As the charts (figure 2.12 and figure 2.13) below show, the post-financial-crisis business cycle is very unusual in that growth did not quickly recover to take output back to the previous trend. There has been no making up for lost ground. Households, companies and even governments have continued trying to save too much and spend too little – 'aggregate demand' has been weak. As a consequence, it has taken a long time to reduce unemployment to pre-crisis levels. In Europe, this still has not happened eight years on, though faster progress has been made recently.

Fig. 2.12: Eurozone potential GDP pre-financial crisis versus outcome



Source: ASI, Oxford Economics, October 2017.
Note: Trendlines consists of polynomial regression of 1980-2007. Real GDP is in USD PPP billion (in 2010) exchange rate.

Fig. 2.13: US potential GDP pre-financial crisis versus outcome



Source: ASI, Oxford Economics, October 2017.
Note: Trendlines consists of polynomial regression of 1980-2007. Real GDP is in USD PPP billion (in 2010) exchange rate.

In the past, it has made sense to largely ignore the business cycle in long-term economic forecasts. Over a 10-year time horizon, the slower growth in the downturn is offset by the faster growth in the recovery, and the economy will, on average, grow in line with labour-force growth and productivity growth. But this assumption does not seem to be playing out during the post-financial-crisis period, leaving many economists concerned that permanent output losses relative to the previous trend might be a persistent problem in the future.

A world in which aggregate demand does not rebound quickly from recessions is one where the global economy spends more time below potential than above – with lower than potential growth on average. This is particularly unappealing, given potential growth itself is expected be fairly low for the reasons discussed in the previous sections. This is the scenario US economist Larry Summers describes in his revival of the idea of 'secular stagnation'.

The extent to which this concern is justified depends on understanding why the recovery has been so weak since the last recession.

> "A world in which aggregate demand does not rebound quickly from recessions is one where the global economy spends more time below potential than above."

Balance sheet recessions

It could be argued that the recovery has been so muted because we have been recovering from a 'balance sheet' recession. This describes a world where, prompted by an economic downturn, companies and households reduce their debt levels and strengthen their balance sheets. While doing so, they must save more and consume less, weakening demand. Similarly, banks must cleanse their balance sheets of bad loans. During this process, they are less willing to extend new credit. The process of balance sheet repair takes time, hence the extended period of slow demand growth.[8]

The positive aspect of this line of argument is that, once balance sheets are repaired, the economy will eventually get back to normal. If this is true, we should still expect faster growth to make up for at least part of the ground lost since the financial crisis.

However, global debt levels are now higher than they were before the financial crisis. This is mainly because emerging economies, particularly China, have considerably added to their debt levels. But even in regions like the US, where there was initially meaningful deleveraging, debt levels have started to rise again as firms and households start to borrow more. This suggests that the period of widespread deleveraging has finished, but we have still not seen a sharp rebound in growth rates. Balance sheet strength is probably not the only factor at work.

[8] Koo, R (2014) Balance sheet recession is the reason for "secular stagnation". VoxEU.

The zero lower bound

A very different kind of problem is that equilibrium interest rates – the interest rate at which monetary policy would be neither stimulative nor contractionary, but neutral – have declined, as Larry Summers points out in his discussions of secular stagnation.[9]

Very low equilibrium interest rates make it much harder for central banks to cut interest rates to a low enough level to stimulate the economy in a recession. One of the main reasons why there is typically a strong rebound following a recession is that central banks reduce interest rates by several percentage points, well below equilibrium, providing a strong monetary stimulus that encourages faster growth. But if equilibrium interest rates are already very low, it is much harder to cut actual interest rates enough to give the economy a boost.

This is especially the case in the context of the 'zero lower bound' – the fact that central banks are unable to push interest rates much below zero before investors hold only cash (earning zero interest, rather than negative interest) and thereby impair the transmission of central bank policy. In response, central banks have developed other tools, such as forward guidance on interest rates and quantitative easing, and have experimented with negative interest rates. But there are concerns that these policies are less effective – as recent history perhaps demonstrates – and may have unwelcome financial stability and distributive side effects.

As we discuss in the next chapter, low equilibrium interest rates are caused by demographic and other structural factors. As a result, they are likely to be with us for an extended period of time, and central banks are likely to face further episodes where they cannot cut interest rates by enough to bring output up to potential.

Consequently, Summers fears an extended period of secular stagnation, where recessions are followed by weak and protracted recoveries.

Hysteresis

A further related problem is 'hysteresis'. In the absence of sufficient policy support to bring growth up to potential, the economy faces a persistent lack of demand. Hysteresis is a process by which a persistent shortfall in demand has a negative effect on the productive capacity of the economy. People who remain unemployed for a long time may drop out of the labour force and fall behind on skills, while companies invest less in new projects and equipment. Hysteresis means that failure to stimulate demand sufficiently – for example, because of the zero lower bound – means that slow recoveries do not merely mean lower growth in the short term, but they also reduce potential growth in the long run.

Weak economies lead to disruptive politics

Recent experience suggests that the weak economic performance of developed economies is politically destabilising. Slow economic growth tends to result in low growth in wages. In addition, growth may not be spread evenly. Some regions do better than others, and the rich may fare better than the middle classes. People who feel 'left behind' by the economic policies of conventional political parties, unsurprisingly, vote for populist, anti-establishment politicians who offer radical solutions.

The economic policies prescribed by populists will not necessarily increase incomes. Policies such as drastically reducing immigration or walking away from free trade agreements may end up reducing growth in incomes even further.

This is not to dismiss the need for radical solutions. The structural problems with productivity and low interest rates described previously are unlikely to be solved by business-as-usual policies. Ambitious new policies are likely to be needed. For example, many economic policymakers have suggested the world embarks on large-scale infrastructure investment to boost demand, capital investment and productivity. Given that sensible infrastructure investment pays for itself, this should be a high priority.

Conclusions

Fig. 2.14: 10-year average real GDP, historical and projected

	1988-1997	1998-2007	2008-2017	2018-2027
US	3.1	3.1	1.5	1.9
UK	2.4	2.9	1.1	1.8
Germany	2.3	1.7	1.2	1.1
Japan	2.8	1.0	0.5	0.6
China	10.0	10.0	8.3	5.3
World	3.0	3.4	2.4	2.7

Source: ASI, Oxford Economics, August 2018.
Note: Percentage changes YoY. Real GDP calculated in local currency except for World in PPP USD (projections start in 2017 for World). Projections are not guaranteed.

Our assumptions about labour-force growth and productivity are the key inputs to our projections for growth in potential GDP, which in turn provide the foundation for our long-term forecasts for growth assets like equities.

As figure 2.14 shows, our GDP projections for the next decade are significantly lower than they were in the pre-crisis decades. Demographic trends are not destiny, but they are hard to change. We can be confident the demographic transition we have described means that trend growth is likely to be slower than in the past in most countries. This is embedded in our long-term growth forecasts.

It is much harder to be confident about productivity forecasts. Our base case is that productivity growth will improve from its current levels, though not to the high rates of growth seen before the financial crisis. We think these reflected an unusually fast period of technological change, not a sustainable long-term trend. There is a downside risk that we do not manage to achieve these faster growth rates, and we are left with something like the trend of the last few years. This would be a very disappointing outcome, and would result in growth projections even lower than those we forecast.

There is also considerable uncertainty about the secular stagnation question. We do think equilibrium interest rates are likely to remain unusually low. If this is right, then the zero lower bound is likely to be a persistent barrier to effective central bank economic stimulus. This may result in persistently below-trend growth. For the time being, we see this as a downside risk rather than our base case.

[9] Larry Summers (2014) US economic prospects: secular stagnation, hysteresis and the zero lower bound. Business Economics.

"Demographic headwinds, sluggish productivity growth and the 'zero lower bound' problem mean growth will most likely be significantly lower in the next decade than it was before the financial crisis."

03

Trends in interest rates and inflation

- Today's low interest rates are driven by structural trends in productivity, demographics and inequality among other factors
- These trends are not likely to reverse in the near future
- The advent of inflation targeting has permanently shifted the outlook and risks for inflation
- Central banks have failed to hit their inflation targets since the financial crisis, but we expect more success in the next few years

Trends in interest rates and inflation

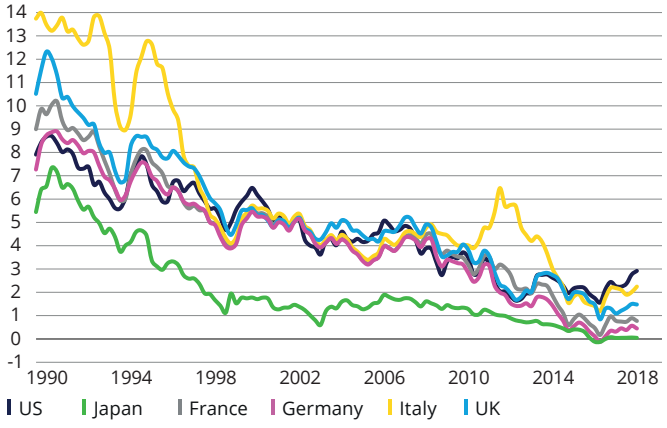
Over the last few decades, both inflation and real interest rates have moved steadily downwards. Whether they stay at today's low levels or move significantly higher is one of the most important questions facing investors.

Trends in interest rates

Government bond yields are the most immediately obvious manifestation of the level of interest rates. In particular, they give a snapshot of the nominal interest rate on safe, generally default-risk-free assets.

The extraordinary decline in bond yields

Fig. 3.1: 10-year nominal yields (%)

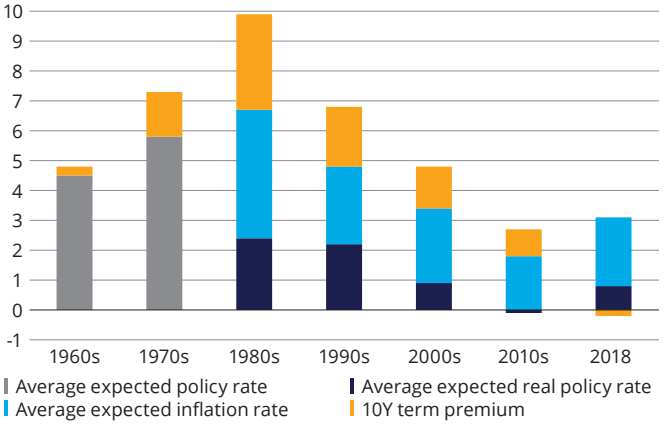


Source: Oxford Economics, August 2018.
Note: Chart shows yield on 10-year maturity government bond in each country.

The decline in yields to such low levels is not just a post-financial-crisis phenomenon – it is part of a 30-year trend. Average 10-year bond yields have fallen 4.5 percentage points since the 1980s.[1] It is also a global phenomenon, occurring across developed and developing markets. This is an exceptional state of affairs: according to Bank of England research, nominal interest rates may be lower now than ever before, or at least the last 5,000 years.[2]

The yield on nominal government bonds can, in principle, be split into three components: the average rate of inflation that market participants expect over the duration of the bond, the average short-term real interest rate expected, and a premium for holding a long-term bond with interest rate risk – otherwise called a term premium. There is evidence that each of these components has declined over the past 30 years, as shown in figure 3.2. Expected inflation rates have fallen, which we will look at in more detail in the second part of this chapter. Estimates of the term premium have also declined and in many cases are negative, as discussed in Chapter 5. Finally, the short-term interest rate expected to prevail over the coming years has fallen. All of these components add up to substantially lower government bond yields, across a wide range of economies.

Fig. 3.2: Components of US Treasury yields (%)



Source: ASI, Adrian et al (2013), Haunrich et al (2012), Federal Reserve, 2H2018.
Note: Chart shows average of each component by decade. A decomposition of expected policy rates into inflation and real components is not possible before 1982, so the combination is shown instead. 2010s refers to 2010-2015 only. 2018 shows starting values used in 2H2018 forecasts.

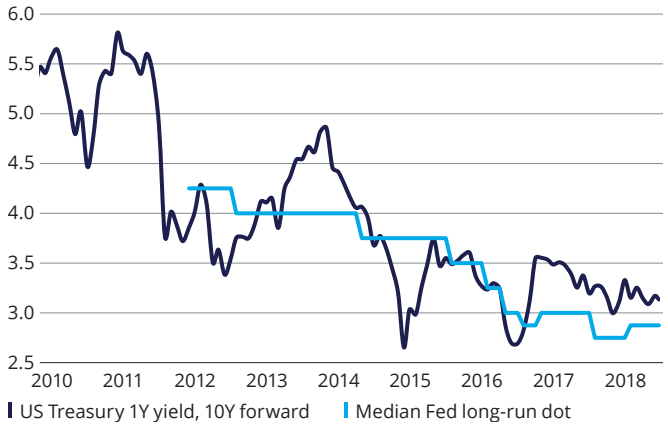
[1] Rachel and Smith, Bank of England (2015) Secular drivers of the global real interest rate.
[2] Haldane, Bank of England (2015) Stuck – note that real rates are still well above their historical lows.

A slow rebound from the financial crisis, or something deeper?

For several years after the financial crisis, many assumed that low interest rates were just a hangover from an unusually deep recession. Indeed, there is strong evidence that financial crises are followed by slow recoveries, with headwinds from an extended period of 'debt-deleveraging'[3] requiring accommodative policy settings. In time, these headwinds were expected to dissipate, allowing interest rates to bounce back to levels closer to historical averages.

However, a decade on from the crisis, there is a growing acknowledgement that there are deeper and more persistent forces at work. The bond market seems to have accepted this view, with forward yields falling progressively over the last decade. The Federal Reserve (Fed), it seems, has also accepted this new reality. Its 'dot plot' view of the long-term level for interest rates has fallen in a similar way.

Fig. 3.3: Falling market and Fed interest rate expectations (%)



Source: Bloomberg, Federal Reserve, September 2018.
Note: Chart shows market-implied expectations of interest rates, as proxied by 10-year forward, 1-year maturity US Treasury yield.

Are central banks, then, to blame for persisting with low interest rate policies and quantitative easing? We do not think so. It is true that central bank policy has depressed market interest rates, but this confuses cause and effect. Indeed, central banks have simply responded to the underlying economic fundamentals when setting policy. If they were to start mechanically raising rates towards historical levels, economies would be unable to withstand this adjustment. Instead, this would be a recipe for even lower expected rates, as the market would anticipate a necessary reversal to correct for what would be a policy mistake.

What is driving this change in underlying economic fundamentals? Both central bankers and bond markets believe that the so-called 'equilibrium' real rate of interest (also known as the 'natural' or 'neutral' rate, or r* for short)[4] has declined, explaining why markets are pricing in a permanently lower path for short-term policy rates.

Equilibrium interest rates

Economists imagine a global market for savings and investment where would-be suppliers of savings are matched with other households, businesses and governments who require funds for investment. The resultant market price is the rate of interest that investors must pay to reward savers for access to their capital at the margin.

In the long run, when the economy is at full employment, there is one particular interest rate that will balance this market in such a way that the economy will remain at full employment. Economists call this the 'equilibrium' real interest rate – the rate necessary to balance desired savings with desired investment when the economy is operating at capacity and inflation is stable.[5]

This long-run equilibrium rate can, and does, vary as structural changes take place in the economy. In general, the greater demand there is for saving, and the less demand for investment, the lower the equilibrium interest rate. These patterns of demand can be affected by a multitude of factors.

Perhaps the most commonly cited influence on the equilibrium real rate is the expected trend rate of economic growth, which affects desired saving and investment through several channels. Downgrades to expectations of trend growth should lower consumers' expected income, prompting them to save more in order to smooth their consumption profile. Equally, a weaker trend growth outlook implies a lower rate of return for investors, discouraging new investments.

There is an oft-cited rule of thumb that the equilibrium real interest rate should equate to the expected trend growth rate of an economy. More formally, Fed economists Laubach and Williams found a close historical link between trend growth and equilibrium rates in an influential 2003 paper. However, this consensus has come under scrutiny in recent years.

A frequently cited paper by Hamilton et al[6] found a weak empirical relationship between growth and real rates, arguing instead that the determinants of the equilibrium rate are 'manifold and time varying'.

What seems clear from this debate is that there are other forces, aside from trend growth, which can influence equilibrium interest rates. These might be factors that affect consumers' willingness to forgo current consumption to save for the future, such as changing life expectancy. Similarly, the perceived riskiness of their future income streams might affect their current behaviour. Meanwhile, on the investment front, the perceived riskiness of investment will affect behaviour, as will the relative costs of capital spending and labour.

Finally, there are cyclical factors that can also shift the equilibrium interest rate over shorter periods. For example, after the financial crisis, the desire to save was particularly high as borrowers tried to pay down debts. At the same time, the desire to invest was hampered by considerable economic uncertainty and tight financial conditions. These cyclical influences meant that an even lower real interest rate was

[3] Rogoff (2015) Debt supercycle, not secular stagnation.
[4] Hamilton J et al. (2015) The Equilibrium Read Funds Rate: Past, Present and Future.
[5] Federal Reserve chair Janet Yellen recently referred to equilibrium interest rates no fewer than 25 times in a single speech.
[6] The concept was first used by Swedish economist Knut Wicksell in the 19th century, but is also a key part of the modern New Keynesian models used by many central banks today. The canonical model is Woodford, M (2003) Interest and Prices: Foundations of a Theory of Monetary Policy. Princeton University Press.

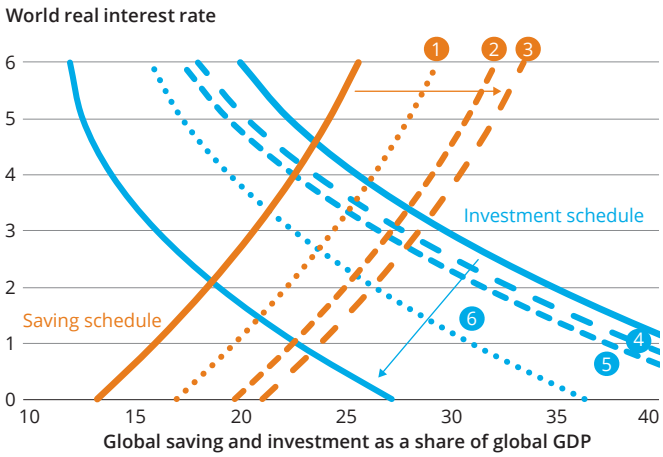
required to balance saving and investment in a way that would bring about full employment. However, in theory at least, as temporary factors like these wear off, the short-term equilibrium rate should rise.

This savings and investment framework is central to nearly all macroeconomic models, and can explain many economic puzzles. For example, before the financial crisis, Ben Bernanke, who later became Chair of the Fed, used it to explain the persistence of low long-term interest rates, even while the Fed was raising policy rates. He suggested that there was a 'savings glut' – that is to say, an excess of global desired saving over global desired investment, particularly outside the US.[7]

More recently, Larry Summers, former US Treasury Secretary, argued that, as a result of an excess in desired saving, we may be facing an extended period of 'secular stagnation' because the equilibrium interest rate may be stuck well below zero, and indeed below the lower bound, as discussed in Chapter 2.[8] In practice, this means that central banks will struggle to loosen policy sufficiently to bring economies back to full employment.

How the equilibrium rate has changed in the past and will develop in the future is crucial for our long-term forecasts. A recent working paper from the Bank of England[9] suggested how various structural factors might have affected the equilibrium rate since the 1980s, relating to both desired saving and desired investment. Figure 3.5 provides a stylised illustration of these drivers, which are discussed in more detail in the following sections.

Fig. 3.4: Global long-term neutral rate: savings and investments shift (%)



Source: Bank of England, ASI, February 2017.
Note: The chart shows the level of % of GDP saved and the % invested on the x axis and the interest rate on the y axis. It plots savings/investment level and interest rates over the last 20 years. While the intersection between savings/investment levels and interest rates can be measured, the desired savings and desired investment curves cannot be observed and can only be hypothesised. Illustrative shifts: (1) Demographics, (2) Rising inequality, (3) Global savings glut, (4) Relative price of capital, (5) Public investment, (6) Spreads.

Savings factors

Demographic change

People's savings and investment behaviours change over their lifetime. In general, the working-age population saves more than either the old, who run down their savings, or the young, who have no earnings to save from. Over the last 30 years, the working-age population has grown relative to the non-working age population. As fertility rates have fallen, the younger cohort has fallen in size relative to the working-age cohort. The old-age cohort has started to grow but not enough to compensate, partly because retirement ages are rising.

The average age of the working-age population has also risen over the last 30 years, again increasing supply of savings as people tend to save more in the second half of their working lives than in the first. These demographic shifts mean that the global propensity to save has risen.

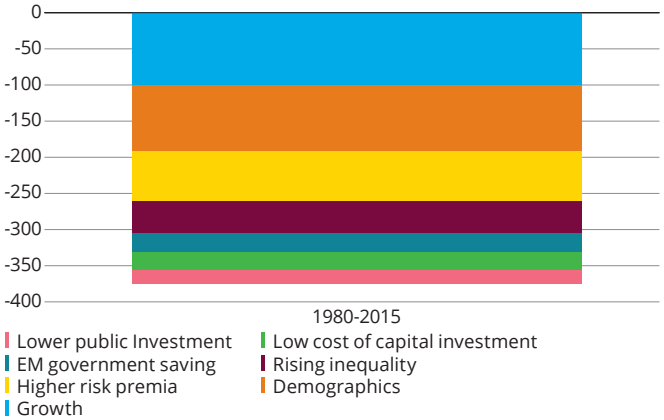
Rising inequality

Another important factor is rising inequality. The top 1% of the income distribution save over 40% of their income compared with an average of less than 10% for the rest.[10] The greater the proportion of national income that goes to the rich, the more desired saving there will be. In much of the world, the share of income going to the richest has increased markedly since the 1980s.

Emerging market savings

After the painful experience of the Asian crisis in the 1990s, many emerging economies chose to build large foreign currency reserves. This build-up of reserves is a form of saving. At the same time, a steady, decade-long rise in oil prices meant that oil-exporting nations experienced substantial budget surpluses, adding to global savings – though this pressure has waned recently. Finally, the lack of a social security net in many emerging economies means that households are required to save more of their income, to insure against unemployment or illness in the future.

Fig. 3.5: Explaining the decline in global real interest rates



Source: ASI, Bank of England, February 2017.

[7] Bernanke, Federal Reserve (2005) The Global Saving Glut and the U.S. Current Account Deficit.
[8] Summers (2014) Secular Stagnation, Hysteresis, and the Zero Lower Bound.
[9] Rachel and Smith (2015).
[10] Rachel and Smith (2015).

Investment factors

Lower cost of investment

The price of the capital goods required for investment projects has fallen dramatically in recent decades – by 30% since the 1980s[11] – largely as a result of cheaper information and communications technology. Equally, developed economies have seen a sectoral shift away from capital-intensive sectors (such as manufacturing) towards sectors that need less capital (including services, especially internet-based operations). For example, many of the world's most valuable technology companies have become very large with very little capital investment.

Lower public investment

Public investment in infrastructure has been on a long-term downward trend in developed economies for decades. This trend has not been helped by the sharp rise in government deficits and debt-to-GDP during the financial crisis, and the subsequent austerity policies introduced to reduce deficits. In this environment, governments have generally been unwilling to increase borrowing for infrastructure investment, even though the interest rate on government borrowing is low.

Higher risk premia

Private-sector borrowers do not, in practice, make investment decisions based on the risk-free interest rate. They need to consider their overall cost of capital: the risk-free rate combined with the risk premium they must pay for equity or credit. Risk premia vary significantly over time and can offset or amplify the effects of changes to the risk-free rate. International Monetary Fund modelling suggests that risk premia have risen since the 1990s – perhaps in part due to the lower and more uncertain growth expectations discussed in the previous chapter. Higher risk premia have a downward impact on desired investment for any given risk-free rate.

Lower growth expectations

A final reason for low desired investment is lower growth expectations. According to the Bank of England analysis, this contributed to the downward trend in equilibrium interest rates in the period since the crisis. Before this point, growth expectations were largely stable. More recently, it has become clear that demographic change and sharply lower productivity growth mean that potential GDP growth will be lower than it was before the crisis. This reduces the amount of investment required by the economy to meet growing demand, and dampens investors' expectations about returns on new investments.

> "Germany, Japan and a few other countries continue to have large surpluses of savings over domestic investment."

The future

Are low interest rates now a permanent state of affairs? Eventually, some of the demographic changes and shifting preferences described previously may reverse, though others look likely to endure. The timing of these reversals is highly uncertain, although it does not look likely that equilibrium rates will move dramatically higher any time soon.

Demographic trends

Given all the talk about the ageing population, it is tempting to think that the ratio of retired people to the working population will shift rapidly higher. Old people gradually spend their savings, particularly the very old spending on healthcare and other forms of support. A higher retired-to-working ratio therefore results in a lower overall propensity to save. This is expected to materialise eventually, and may eventually eliminate the savings glut, but the process is likely to be protracted. Other factors point in the opposite direction.

First, in an effort to offset the fiscal implications of ageing populations, governments are raising retirement ages. This lowers the retired-to-working ratio. Second, the duration of retirement increases as people live longer. Everyone will need to save more, and start saving earlier, to ensure sufficient income in retirement. These changes raise the overall propensity to save.

It is not clear how or when the trade-off between these various factors will play out, although some studies suggest there will be further downward pressure on equilibrium rates from demographics before a reversal over the coming decades.[12]

Income inequality

Income inequality is driven by many factors. If technology means many middle-income jobs are automated then there could be an even stronger bifurcation in the labour market, with more income inequality. Indeed, this could offset the potential boost to productivity from these new technologies. Similarly, if the economy creates more winner-takes-all business models with high barriers to entry, then we may see the spoils increasingly concentrated in the hands of the lucky few.

But inequality is also a public policy choice. It results from taxation policy, competition policy, public education policy and levels of investment in development projects. The kind of frustration that motivates some supporters of Brexit and of Donald Trump, or indeed Jeremy Corbyn and Bernie Sanders, could possibly result in a realignment of policy priorities and a reversal of current trends. On balance, however, it seems unlikely that we will see a great deal of progress in this area in the near future.

Global capital balances

A major source of Bernanke's 'savings glut' was the growth in emerging market foreign exchange reserves and high rates of precautionary savings in some regions. This seems to have peaked and has fallen back somewhat, particularly in China. The decline may continue a little, though it is likely that most countries will wish to maintain much larger reserves than they held in the 1990s.

[11] Rachel and Smith (2015).
[12] Goodhart, BIS (2017) Demographics will reverse three multi-decade global trends.

Aside from foreign exchange reserves, it remains the case that Germany, Japan and a few other countries continue to have large surpluses of savings over domestic investment, which show up in the form of large current account surpluses. Many of the causes of these savings surpluses are deep-seated, resulting from the accumulation of economic policy choices and cultural preferences, and thus are not easily resolved.

Lower cost of investment
The technological factors that have driven down the cost of investment are not diminishing. Further downward pressure on the cost of investment is likely.

> "Despite grand talk from politicians ranging from Donald Trump to Jean-Claude Juncker, plans for a step-change in public investment have failed to appear."

Public investment
Despite grand talk from politicians ranging from Donald Trump to Jean-Claude Juncker, concrete plans to boost public investment have failed to appear. The prospects for infrastructure projects and other schemes in developed countries are mixed. They face a trade-off between appearing attractive to politicians on the surface but being tricky to implement, and expensive to fund in an environment where debt-financed government spending is not always popular. It seems most likely that public investment will not increase sufficiently to materially boost equilibrium interest rates.

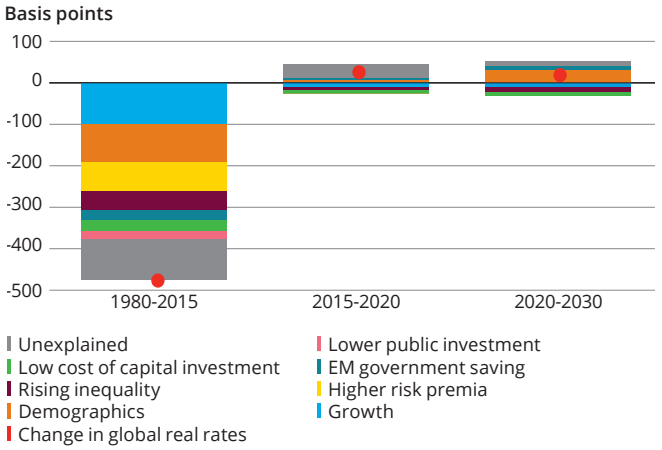
Higher risk premia
There is some evidence that risk premia are related to macroeconomic uncertainty. Low risk premia in the late 1990s and mid-2000s corresponded to rising productivity growth, economic stability and optimism about the future ('the Great Moderation'). This contrasts with higher observed risk premia in the 1970s and the post-financial-crisis period, where growth uncertainty has been elevated. As the global economy continues to recover, we might see some mean reversion in risk premia, with a positive impact on equilibrium interest rates. Indeed, as discussed in later chapters, risk premia in financial markets have been declining steadily for the last few years.

Low growth
It seems likely that the lower growth rate since the financial crisis will be persistent, given that it is driven by ongoing demographic changes and structurally weaker productivity growth. While productivity has shown signs of a small cyclical improvement, it is still likely to be undermined by a lack of progress on supply side reforms, low rates of diffusion from high productivity firms to low productivity firms and weak public infrastructure investment. Overall potential growth rates are likely to remain restrained over coming years, dampening consumers' expectations about their future incomes and indicating a lower rate of return for many investments.

Conclusion

Most of the projections made by the Bank of England are for little or no change to the structural factors that seem to drive equilibrium rates, with the exception of the modest rebound from demographic trends. As a result, based on these projections, equilibrium real interest rates will be only slightly higher (perhaps less than 1%) over the next 15 years.

Fig. 3.6: The past versus the future – real interest rates remain close to today's levels



Source: ASI, Bank of England, February 2017.
Note: Chart decomposes changes in equilibrium real rates in the past and two future periods. While rates do not continue to fall in the future, they only grow very slowly (circa 20bps per decade from current levels).

We must emphasise the uncertainty of these estimates. Both the estimates for the current equilibrium rate and the analysis of the various factors that combine to drive long-run equilibrium interest rates are uncertain. So it is important to accept that there is a wide range of possible values.

It is also worth noting that this is an equilibrium concept; central banks actively push interest rates above or below their long-term equilibrium values as the business cycle progresses, in order to manage shocks to demand and supply.

Criticisms

Some economists have alternative explanations for the secular decline in interest rates. The Bank for International Settlements argues that today's low rates have more to do with the asymmetric response of central banks to previous business cycles.[13] Too much easing during recessions and not enough tightening in recoveries has supposedly resulted in a massive rise in global debt levels over the last few decades, and large-scale allocation of capital to unproductive activities (for example, to property speculation rather than productive investment).

As Hyman Minsky argued, too much stability begets instability. By analogy, if you prevent small fires from clearing the scrub, you eventually provide fuel for a much bigger fire. The financial crisis was, arguably, just such a fire. Stability encourages risk-taking, particularly in the financial sector, and over a long period the accumulation of balance-sheet fragilities results in a bust.

[13] Borio, Bank of International Settlements (2017) Secular stagnation or financial cycle drag.

This argument is intriguing – it implies a different definition of equilibrium interest rates which takes into account financial stability. In this framework, policy rates need to be raised far more to prevent debt 'excesses' that risk future crises from developing. However, it is controversial, not least because it raises fundamental questions about the current monetary policy orthodoxy.

For our current purposes, this debt-based view does not change our conclusion much. The consensus among mainstream academics and policymakers is currently that monetary policy can, and should, be separated from financial stability concerns (apart from maybe as a last resort). Other 'macro-prudential' tools, as well as financial sector regulation, which have been given new focus since the crisis, are sufficient to maintain financial stability. This consensus appears strong even if the theoretical and empirical backing is still developing. It is too early to tell how successful these policies will be.

Overall, despite concerns about inaccuracy and incompleteness, we think mainstream analysis of equilibrium real rates is useful. One of the most striking features of economic life in the last 30 years has been the decline in interest rates. This approach explains most of this decline in an intuitively plausible way by appealing to empirically observable data. It gives us fairly strong reasons for thinking that, on average, interest rates will tend to remain at a low level for an extended period of time, perhaps more than 10 years. However, 'lower for longer' does not mean 'lower forever'. Eventually, interest rates may rise as spending – for example on healthcare – by larger ageing populations outweighs the saving of the smaller working-age population.

"Equilibrium interest rates are likely to remain very low for a long time."

Long-term inflation

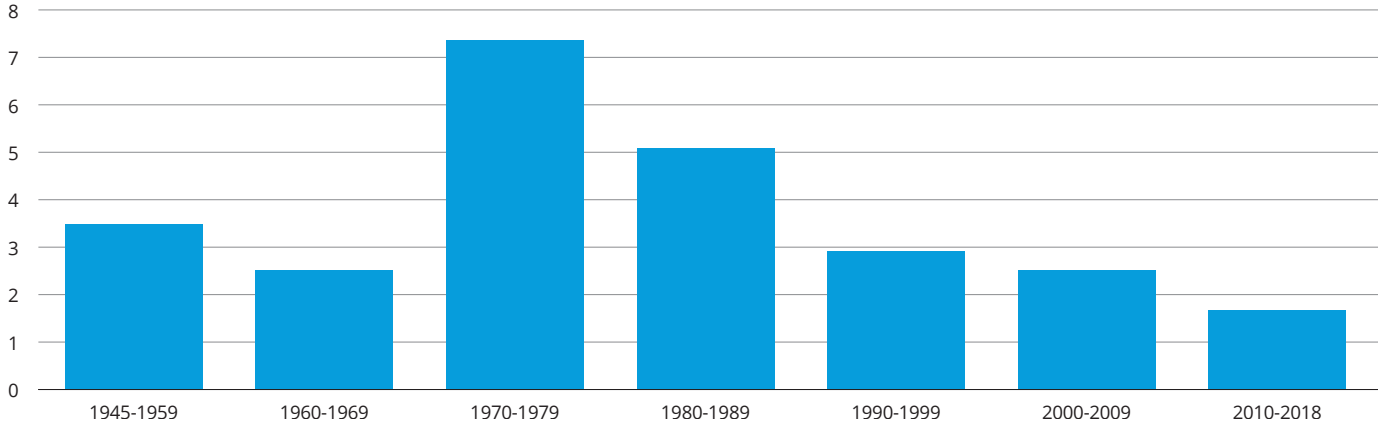
The history of inflation in developed countries tells the story of macroeconomic stabilisation policy through different eras and regimes.

In the immediate post-war period, the Bretton Woods system of fixed exchange rates, which were ultimately pegged to gold (via the US dollar), helped to keep inflation low and fairly stable. However, by the late 1960s, this system started to unravel. Large international capital flows, rising stocks of foreign dollar reserves and depleting US gold reserves forced the US government to suspend the convertibility of dollars into gold.

In the chaotic aftermath of the shift to floating currencies across the developed world, rising unemployment prompted the Fed to boost the supply of money. Inflation rose dramatically as the central bank kept policy loose to meet their primary 'maximum employment' goal, in the belief that there was a stable and limited trade-off between unemployment and inflation.[14] Indeed, when inflation started to rise, the Fed advocated non-monetary steps to limit price increases, such as price and income control policies, rather than tighter monetary policy. These had limited success, and both inflation and inflation expectations rose, ultimately to something like 10%,[15] alongside energy-price shocks.

These high inflation expectations required a forceful response. With the blessings of Congress, the Fed's mandate was altered in 1978 to focus more on price stability, and, under Fed Chair Paul Volcker, interest rates were raised sharply.[16] This era saw a dramatic shift in the beliefs of the Fed, backed up by Milton Friedman's famous reminder that inflation is "always and everywhere a monetary phenomenon".[17]

Fig. 3.7: US inflation regimes (%)



Source: ASI, Bloomberg, 2H2018.
Note: Chart refers to average US inflation by decade.

[14] Romer and Romer (2013) The Most Dangerous Idea in Federal Reserve History: Monetary Policy Doesn't Matter.
[15] University of Michigan Survey – Median expected change in prices in 5-10 years (Bloomberg Oct 2017).
[16] Richmond Fed (2011) The Federal Reserve's "Dual Mandate": The Evolution of an Idea.
[17] Friedman (1970) The Counter-Revolution in Monetary Theory.

First, the Volcker Fed accepted the view that, in the long run, changes in the money supply affect only nominal prices and wages, leaving real economic variables such as unemployment, real output and real wages unchanged. Money is therefore 'neutral', in economics jargon[18]. If you hold this belief, you have to conclude that the Fed ultimately has control of the long-run price level, and so the high inflation of the 1970s was both avoidable and curable by the Fed.

Second, the Volcker Fed reassessed the relationship between inflation and economic slack in the short run. Economists look at this relationship through the lens of the 'Phillips curve', which plots inflation against unemployment. The steeper the curve, the more sensitive inflation is to unemployment, which represents economic slack.

In the 1970s, the Fed took the view that the Phillips curve was both flat and stable. Under this framework they would be able to lower unemployment, while generating only modest and temporary increases in inflation. Conversely, as inflation rose to high levels, they believed that increasing unemployment would not be particularly effective in lowering inflation.

However, in the 1980s, the Fed acknowledged that the Phillips curve was both steeper than anticipated and could shift up and down. Under this new framework they believed that higher unemployment today would result in lower inflation. They also deemed that as the central bank persisted with loose policy in the 1970s it pushed inflation expectations higher, causing the Phillips curve to shift upwards. In practice this meant that for any given level of unemployment the inflation rate would be higher. The upshot was that even higher unemployment would be required to tackle inflation, but this painful medicine would eventually lower inflation expectations to more stable levels.

Together, these changes of view motivated much tighter policy from the Fed, particularly dramatic rate hikes up to 20%. Unemployment rose to a peak of 10%, and inflation fell from 15% down to a relatively stable rate of around 4% by the late 1980s. Establishing inflation-fighting credibility had been costly – high interest rates triggered a recession with high unemployment – but the reward was a long period of stability for prices and, eventually, the broader economy.

The period following Volcker, spanning most of the 1990s and 2000s, is known as the Great Moderation. This was a period characterised by low and stable inflation, and much reduced economic instability in general. Throughout the period, the dominant regime in central banking shifted further, away from targeting maximum employment towards targeting inflation. The Phillips curve was the key underlying theoretical framework. As this regime appeared to be successful in stabilising both prices and the economy, and to help avoid political involvement, central banks were widely granted operational independence. Indeed, in 1997, the Bank of England was made independent and given a formal inflation target, a goal later adopted across most of the developed world.

The inflation-targeting era continues to this day and hence, as a starting point, it is reasonable to assume that inflation in the long term will be around the typical central bank target of 2%. That said, events since the financial crisis pose some challenges to the framework.

Despite their efforts, central banks have largely failed to achieve their inflation targets for most of the period following the financial crisis. The major shock created very strong disinflationary pressures, sufficient to force central bank interest rates down to their lower bound. We discussed this 'zero lower bound' problem in Chapter 2: central banks cannot push nominal interest rates much below zero, which limits their ability to stimulate the economy in a slump.

Through the post-crisis period, central banks developed other tools to boost demand and inflation, like quantitative easing and forward guidance, but there is still debate about why central banks have been unable to meet their targets. Some argue that they lack sufficient policy ammunition, even when taking into account more unconventional measures. A more critical view is that central banks have persistently underestimated the scale of disinflationary forces they face, and as a result their policy response was too restrained after the crisis.

The US and UK economies are no longer stuck at the lower bound, with unemployment down to levels generally considered around 'full employment' and inflation close to, or above, target. But the lower bound and efficacy of other policy measures remains a major issue in the Eurozone and Japan, where inflation continues to be well below target.

Importantly for our forecasts, this issue is unresolved across the central banking establishment. When the next big shock hits, central banks are almost guaranteed to find the lower bound a constraint on policy again. One study[19] suggests that lower bound episodes could be very common, occurring 30–40% of the time if the equilibrium nominal interest rate is 3%. The model used in this study produced a corresponding long-run average inflation rate of 1.2%, despite a 2% central bank target. An option would be to step more boldly into unconventional policies, but these steps may be politically controversial. For this reason our long-run average inflation forecasts are a little lower than central bank targets, especially for the Eurozone and Japan.

In order to tackle the lower bound issue, several influential economists have argued that central banks should target a higher inflation rate[20]. If central banks were to target an inflation rate of, say, 4%, interest rates would be far less likely to hit the zero lower bound. The advantage of a higher inflation rate is that central banks would be able to reduce real interest rates further. A 0% nominal interest rate and an inflation rate of 2% translate into a -2% real interest rate. But a zero nominal rate with inflation at 4% translates into a -4% real rate. A shift in central bank inflation targeting policy would result in higher inflation forecasts, which we must take into account.

[18] One interpretation is that absolute prices are arbitrary, even if relative prices are not. One loaf of bread might be worth the same as two pints of milk, but why couldn't a pint of milk cost £823.20 and a loaf of bread £1646.40?
[19] Kiley and Roberts (2017), as discussed in Bernanke blog post.
[20] Krugman (2014) Inflation Targets Reconsidered.

For now, we think the likelihood of the targeted rate of inflation rising is very low. Current and former central bankers have argued forcefully against it. Perhaps another deep crisis would be required to change minds. However, a variety of other possible targets have been proposed and discussed at length, including 'level targets' that would require central banks to make up for previous shortfalls in inflation (or nominal growth). [21] Essentially, all these alternative proposals would most likely result in higher average inflation over the long run, and bias our forecasts upwards at the margin.

An alternative solution to the lower bound issue is changing the financial system to allow negative nominal interest rates. Central banks in Europe have tested out the lower bound, and found that with their particular institutional arrangements rates can be lowered to -0.5% or so without setting off a mad dash to hoard cash. However, to allow rates to be much more flexible below zero, further changes are required. For example, eliminating paper currency may be a necessary step. Although this would not be politically feasible today, the rise of electronic payments means that this could be possible in future. Other schemes are more feasible now, in particular rationing the supply of paper cash to banks,[22] which could allow nominal rates to be cut to something like -3%. Approaches such as these appear more likely than eliminating cash – when the next major shock hits, central bank rates will probably fall even lower than after the financial crisis, but this should help to keep inflation closer to target.

Today, although interest rates are rising in the US and UK, another conundrum is puzzling policymakers. Despite low unemployment, domestically generated inflationary pressure has been slow to build. Central bankers have been reassessing the slope of Phillips curves, which seem to have flattened considerably since the financial crisis. Some analysts have gone so far as to declare the Phillips curve "dead".[23]

There are many explanations for the weak and slow response of inflation to declining economic slack. These include the effects of globalisation, which might make inflation less sensitive to domestic slack; the increased credibility of central bank inflation targets, which makes inflation less variable; and the declining power of collective labour bargaining. Should Phillips curves be permanently flat, central banks' ability to control inflation in the short run would be hampered, even if inflation may turn out to be more stable. Given the recent experience, this could suggest lower inflation forecasts.

Today, despite recent experience, central banks are broadly persisting with their Phillips curve frameworks. There is no obvious alternative. The Fed is currently hiking rates, based on the view that falling unemployment will gradually continue to generate inflationary pressure.

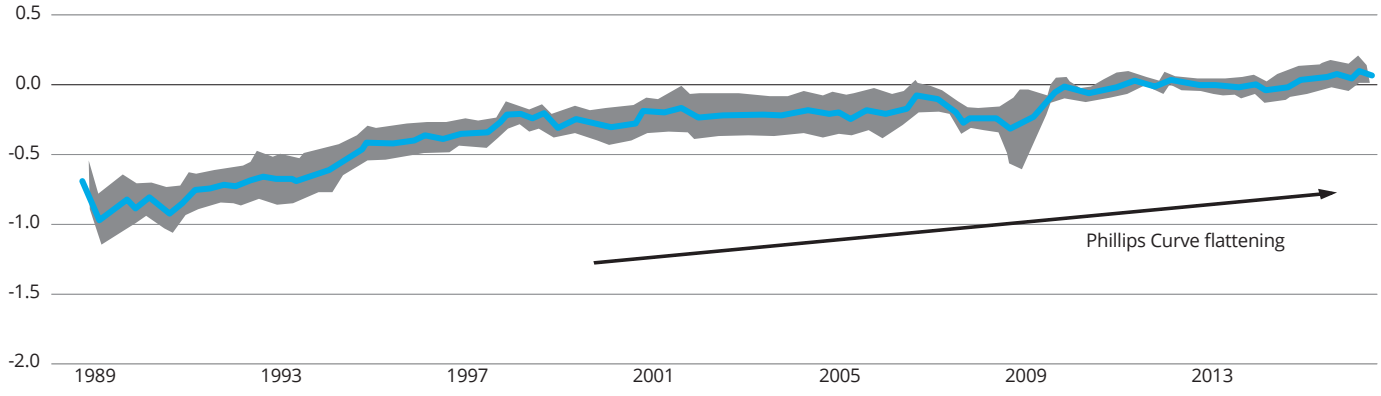
There are a few factors to justify this. First, some studies have shown, using localised data, that the Phillips curve is still a good tool for linking regional unemployment to regional wages.[24] This suggests we should continue to expect it to be a valid tool at national levels. Second, unemployment may not be a good measure of overall slack, or the level of unemployment consistent with full employment might have declined over the last decade, perhaps as the internet has improved matching between employers and job applicants. Third, the Phillips curve might be 'kinked' – inflation might become more sensitive to unemployment at lower levels of slack, and we just haven't reached the kink yet. Finally, there could simply be more slack than the central banks believe, so we shouldn't yet be expecting much of a rise in inflationary pressure.

For the time being, we assume the Phillips curve will maintain its slope on average, and be a useful guide to inflationary pressure. Despite the delay, this suggests inflation will re-emerge as slack diminishes. Even if our inflation forecasts are below target in the near-term, a flat Phillips curve does not justify forecasts below target in the long run.

Pulling the various influences together, we forecast long-run inflation to be close to target in the US and UK, but below in the Eurozone and Japan.

Fig. 3.8: Phillips curve has flattened throughout globalisation

Time-varying Phillips Curve slope coefficients



Source: Bank of International Settlements 87th Annual Report, June 2017.

[21] Bernanke (2017) Monetary policy in a new era.
[22] JP Koning (2016) Central banks' shiny new tool: cash escape inhibitors.
[23] Anthony Murphy Dallas Fed (2018) The Death of the Phillips Curve?
[24] Minneapolis Fed (2013) Is There a Stable Phillips Curve After All?

04

Macroeconomic outlook

- The period of strong synchronised global growth seen in 2017 is coming to an end, replaced by a more moderate and less synchronised expansion
- This is partly the result of fading global policy stimulus; US monetary policy, US fiscal policy and Chinese credit conditions are all becoming less accommodative
- It also reflects the protectionist turn in US trade policy, which is leading to increased trade barriers across a wide variety of goods markets

Macroeconomic outlook

Our medium-term macroeconomic views are driven by our assessment of the main developments and risks on the horizon, and the current performance of each regional economy. In this chapter we explore key regions and risk scenarios that could affect investment outcomes.

Recessions are among the few episodes that have the power to reduce multi-year equity-market returns substantially below their trend level. There also tend to be major shifts in bond markets through the cycle.

If we think the risk is high of a shock that might lead to recession, we are likely to want to lower our exposure to economically sensitive assets like equities. Conversely, if the economy is weak, but we expect improvement, we might want to increase our exposure. Brave investors, who are willing to buy equities during the recession when the equity risk premium is at its largest, are often rewarded with high returns over the long term.

Forecasting approach

To produce our economic forecasts for this medium-term horizon, we use a state-of-the-art global economic modelling tool. This is a variant of the 'structural' models that are commonly used by economic forecasters. The model provides a rigorous and consistent framework for analysis and forecasting, taking into account the linkages within and between economies – through trade, commodity prices, financial markets and capital flows.

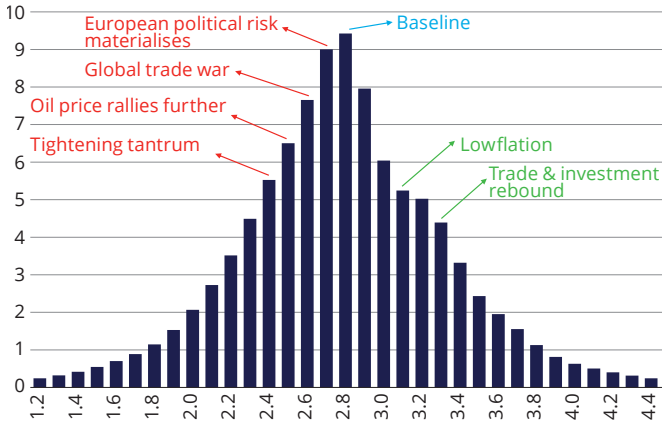
The great strength of a general equilibrium model is that it handles all relationships between the components of the macro economy at once. Crucially, this includes policy responses. For example, if we throw a shock at the economy that would raise inflation, like a big new package of fiscal spending, the model will show the central bank raising interest rates to offset the impact of the fiscal spending on inflation. This type of relationship is widespread in the real world, so it is important to be able to model it.

We input our judgement on the most likely developments in the global economy to generate our central case, or 'baseline', scenario. This judgement is informed by tools such as macro momentum trackers, 'nowcasts' (which attempt to measure real-time growth by combining a range of other indicators) and measures of financial conditions. This baseline forecast is the starting point for our assessment of a range of other possible scenarios.

Uncertainty and scenarios

In addition to our central case, we acknowledge that there is considerable uncertainty about how the global economy will develop. To combat this, we consider a variety of risks to future economic prospects, both positive and negative. We model these risks as scenarios. Each scenario is based on a set of plausible assumptions and initial shocks to our baseline forecast. We run these scenarios through our global economic model to see what it tells us about potential outcomes. For example, if we see a risk that European political developments might result in better credit conditions, we will create a scenario where credit spreads tighten, and see what the impact is on growth and inflation – slightly positive, in this case.

Fig. 4.1: Scenarios for Global GDP growth over next three years (%)



Source: ASI, Oxford Economics, 2H2018.
Note: Chart shows probability-weighted histogram of scenarios for GDP growth from 2018 to 2021, in percentage per annum (x-axis). Y-axis shows probability. Labels show the GDP impact of the individual scenarios we modelled. Projections are estimates and provide no guarantee of future results.

Although there are limits to the number of scenarios we can consider, we try to model all of the major risks we see on the horizon. We combine the output from our scenarios, based on judgments about their probability. These probabilities are subjective, but we use a wide range of analysis and other modelling approaches to ensure they are as accurate as possible.

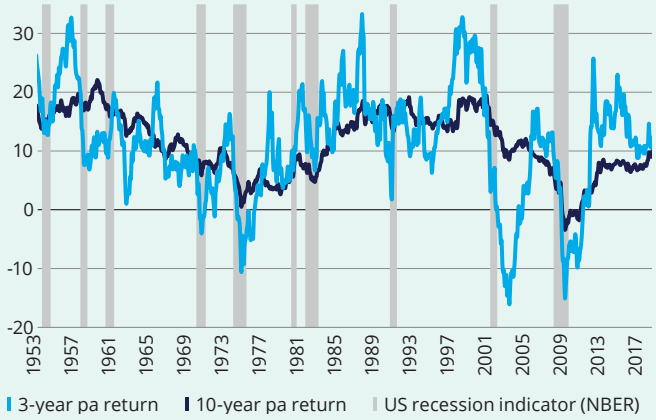
For example, we have econometric recession-risk models, which look at the behaviour of economic and market variables that have foreshadowed recessions successfully in the past (see recession risk model box).

Using our scenario probabilities, and allowing some (but not all) of the scenarios to happen concurrently, we combine the output from the global macroeconomic model. This allows us to present 'scenario-weighted' mean average forecasts for key variables like GDP growth, inflation and central-bank interest rates. Though this method is imperfect, we think these figures are the best way to represent our overall views. We use scenario-weighted forecasts as inputs into our asset return models.

Recession risk model

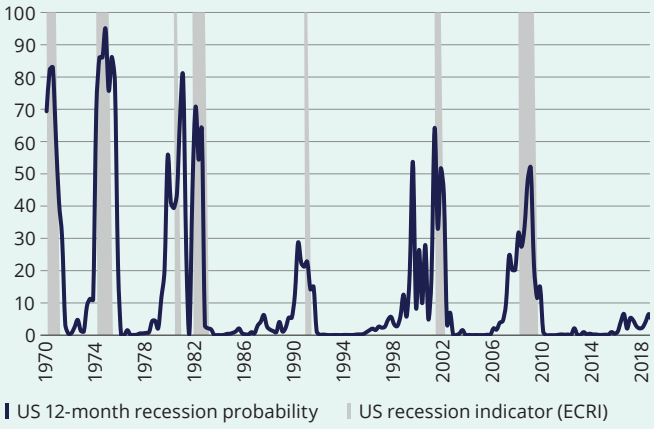
History suggests that a US recession is the risk event with the most power to negatively affect returns on most risk assets over a medium-term forecasting period. Many other factors can affect returns in the short term. And in the long term (for example, 10 years) even big events like recessions tend not to affect average returns very strongly. But, as figure 4.2 shows, on a three-year horizon, recessions are very significant.

Fig. 4.2: S&P 500 per annum returns over 3Y and 10Y horizons (%)



Source: ASI, Bloomberg, August 2018.
Note: US recession indicator (monthly), as defined by The National Bureau of Economic Research. Past performance provides no guarantee of future results.

Fig. 4.3: US 6-month recession risk indicator (%)

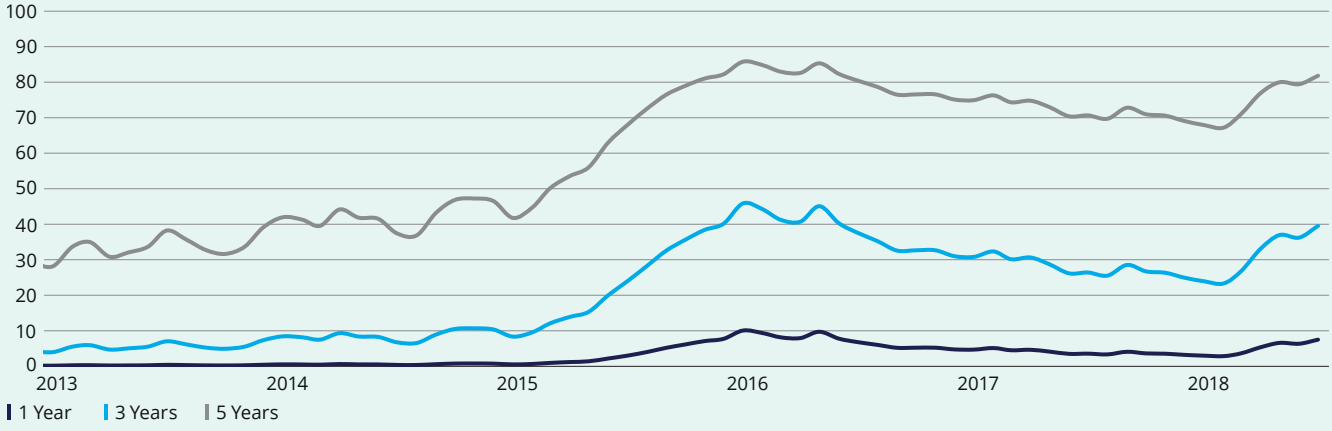


Source: ASI, Thomson Reuters Datastream, July 2018.

To forecast recession risks over the short, medium and long term, we estimate econometric models using economic and financial variables that have been reliable predictors of past downturns over the relevant horizon.

Currently our models imply that US recession risks are very low over the next 12 months, mainly because near-term economic, policy and financial trends remain benign.

Fig. 4.4: US Current risk levels (%)



Source: ASI, Thomson Reuters Datastream, July 2018.

On a medium-term basis, however, recession risks appear to be rising, mostly because the economy is expecting to be operating beyond full employment, which will eventually lead the Fed to push its policy rate into restrictive territory. Indeed, our models based on Minsky-style credit imbalances suggest that the median number of months to recession is now 41 months. This suggests taking a more cautious approach in our long-term asset allocation to more economically sensitive assets like equities and high-yield credit.

We can also present our scenarios as a distribution of the risks around our central case, allowing for two main sources of error. First, we add some model error, which reflects the inaccuracy of the model in predicting the behaviour of variables even if the shock turns out precisely as assumed. Second, we include an error term to capture the fact that our scenarios are not a complete set of the possible risks. The resulting distributions represent our risk-adjusted view on a whole range of economic and market variables, and should, in our view, be reflected in market pricing. In this way, we are able to give a much richer description of our views on key economic and market variables than our baseline forecasts provide.

"After a spell of relatively fast growth, the global economy is set to slow over the next two years to levels that are towards the bottom of the post-financial-crisis range."

Baseline forecasts

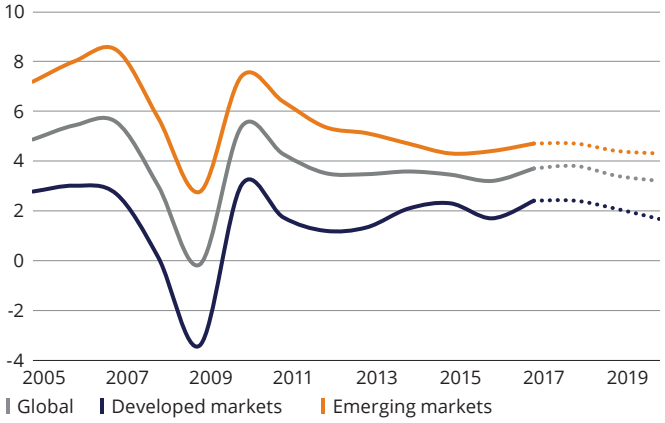
After a spell of relatively fast growth, the global economy is set to slow over the next two years, to levels that are towards the bottom of the post-financial-crisis range. This slowdown is the result of fading fiscal stimulus in the US and increasing trade barriers, coupled with spill-overs from tighter monetary policy.

The slowdown will be felt in both developed and emerging markets, though for different reasons. Growth in the developed markets will be pulled down primarily by fading US fiscal stimulus and the maturing of growth cycles. Emerging market growth, on the other hand, is more exposed to rising barriers to trade and the increasing cost of dollar financing. At a sector level, the biggest impact is likely to be felt in trade-exposed sectors.

Recent growth rates have been well above most estimates of potential output growth, as shown by our 'nowcast' shown in figure 4.4. The deceleration expected would bring growth rates below trend by the end of 2020, though we do not expect a US recession as part of our three-year base case view (see figure 4.3).

Our base case for trade is that the US will follow through on its threat to enact tariffs on $200 billion of additional imports from China; continue to push for a reformed and less liberal NAFTA, but not exit; and implement tariffs on autos, including parts – potentially at low levels initially, excluding the EU. We expect other countries to retaliate, but less than proportionately. We estimate that this might reduce developed market and Chinese GDP by 0.3–0.4% by 2020, and the most open Asian economies by more than that, though there is wide uncertainty on both sides in this estimate.

Fig. 4.5: GDP growth (%)



Source: ASI, Haver, August 2018.
Note: Projections are estimates and provide no guarantee of future results.

Fig. 4.6: CPI inflation (%)

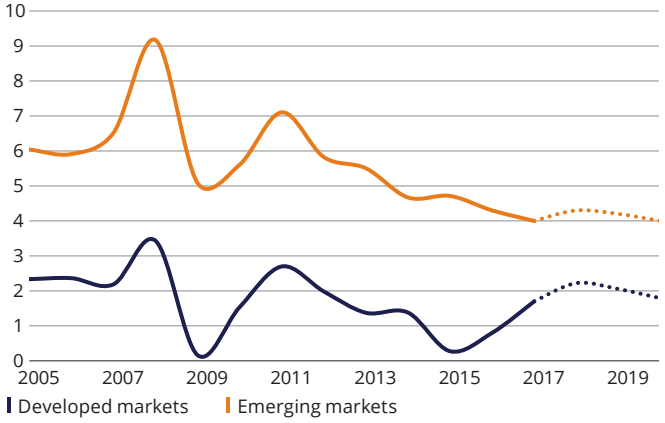


Fig. 4.7: Global GDP and inflation forecast summary

	GDP growth			CPI inflation		
	2018	2019	2020	2018	2019	2020
Global	3.8	3.4	3.2	3.4	3.3	3.1
DM	2.4	2.1	1.7	2.2	2.1	1.8
US	2.9	2.5	1.7	2.6	2.3	2.2
UK	1.4	1.4	1.5	2.2	1.8	1.9
Japan	0.9	0.9	0.5	1.0	1.1	1.0
Eurozone	2.0	1.7	1.6	1.7	1.4	1.4
EM	4.7	4.4	4.3	4.3	4.2	4.0
China	6.4	5.9	5.7	2.2	2.1	2.1

Source: ASI, September 2018.
Note: GDP and inflation are in annual percentage changes. Global and Emerging Markets GDP measure based on 2010 purchasing power parities, a technique used to determine the relative value of different currencies. Projections are estimates and provide no guarantee of future result.

We continue to expect slightly higher inflation in developed markets. Wage growth and underlying inflation in the advanced economies remains consistent with our view that there will be only a gentle upward trajectory over time. The outlook for inflation in emerging markets is less sanguine in the near term, because of the feed-through of weaker exchange rates.

Building inflationary pressure means we continue to expect monetary policy to tighten around the world. However, the weaker growth outlook suggests a slightly softer path of tightening than we previously expected.

Fig. 4.8: Central bank policy rates

	2018	2019	2020
US	2.40	3.10	3.10
UK	0.75	1.00	1.50
Japan	-0.10	-0.10	-0.10
Eurozone (depo rate)	-0.40	-0.25	0.25

Source: ASI, Haver, September 2018.
Note: Policy rates are in percentage at year-end. Projections are estimates and provide no guarantee of future results.

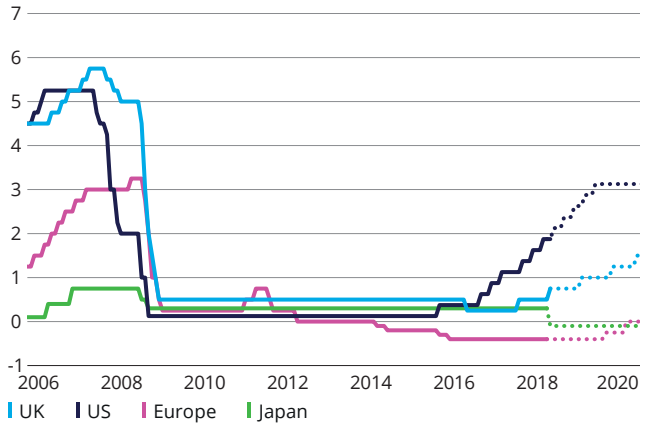
US

A large fiscal stimulus and still-easy financial conditions have driven growth well above trend in 2018. We think we have now passed the peak. Fading effects of the stimulus, combined with the impact of tariffs, increasing capacity constraints and the tightening stance of monetary policy, will return growth to trend or a little below over the next three years.

Tight labour markets mean than inflation pressures are building. Tariffs have also nudged our expectations for inflation a little higher, to 2.3% next year, with firms absorbing some of these taxes into margins but passing the rest on to consumers.

As a result, the Fed is hiking interest rates. We expect two further 25-basis-point increases this year, three in 2019, but none in 2020. This tightening is expected to take rates from accommodative to a mildly restrictive 3%, by the second half of 2019. This is slightly below our previous forecast. This is partly a function of the slower domestic growth we expect, but also the backwash from the deterioration in growth elsewhere.

Fig. 4.9: Central bank policy projections (%)



Source: ASI, Haver, August 2018.
Note: UK = Bank Rate; US = effective policy rate; Europe = Euroarea deposit rate; Japan = discount rate (policy-rate balance rate post-2015). Projections are estimates and provide no guarantee of future results.

Risks

- **Higher inflation**
  Unemployment is now below estimates of its equilibrium level. The Phillips curve relationship suggests that tight labour markets should result in higher wage inflation. Wages have been rising, but the growth rate is still moderate. The risk is that there might be a kink in the Phillips curve – below a certain level, falling unemployment might trigger a faster rate of wage and price increases. If so, it is possible that the Fed might have to raise rates rapidly. This would be a shock for markets and would most likely result in a sharper slowdown than we expect.

- **Productivity gains**
  There are also downside risks to inflation that would be positive for markets. Tight labour markets could drive supply-side improvements. The post-financial-crisis decline in labour-force participation could go into reverse, easing pressure on wages. Tight labour markets might prompt businesses to increase capital investment, boosting productivity. A weakening of inflationary pressure would also allow the Fed to reduce tightening. A stronger supply side and more relaxed monetary policy may allow faster growth for longer.

- **The end of the credit cycle**
  Higher interest rates raise borrowing costs. The US household sector has de-levered since the financial crisis – and locked in mortgages at low fixed rates – so is less vulnerable. However, segments of the corporate sector are now highly levered, and may struggle in the face of higher interest rates, leading to rising credit spreads and a wave of defaults. There is also a possibility that the Fed's reversal of quantitative easing might have negative impacts on asset prices – though the mechanism for this is uncertain, and there has been little sign of this so far.

- **A full-blown trade war**
  Our base case now assumes substantial impact from new trade barriers. The risks around this base case are still tilted to the downside, but less so than a few months ago when our base case was more benign. An upside risk is that both sides will back away from the brink, and a downside risk is that the trade dispute escalates, with several rounds of tit-for-tat retaliation, serving to weaken US growth further than we currently expect.

"Tight labour markets means than inflation pressures are building. Tariffs have also nudged our expectations for inflation a little higher, to 2.3% next year."

UK

The UK growth rate has fallen back to its new lower trend, at around 1.4%, in the last 18 months, in part due to uncertainty created by Brexit and the consequent decline in business investment. Assuming a Withdrawal Agreement is agreed with the EU, we expect this sluggish growth to continue at around the current rate. The trend rate of growth is disappointingly low in the UK partly because of weaker demographics, but mainly due to Britain's abysmal post-crisis productivity growth.

UK core inflation has now moved back below target, to 1.9%, as the effects of sterling's post-Brexit-vote depreciation continue to fade. However, despite weaker wage growth, there has been more pressure from higher unit labour costs as productivity growth has declined. Overall, UK inflation is expected to dip below the bank's target as exchange rate pass-through continues to fade, before gradually building in a couple of years' time.

The Bank of England (BoE) has now raised rates twice, driven by its belief that wage growth will soon pick up, with unemployment below its estimate of full employment. However, the UK economy's ability to sustain tighter policy is in question. We now expect the BoE to deliver just one more rate hike over the next three years.

Brexit risk

The biggest risk for the UK remains Brexit. Though our base case is that the UK and EU will reach a deal on a Withdrawal Agreement, the outcome remains uncertain, with just a few months left till the exit date. The problem of how to secure a frictionless border in Ireland has yet to be solved, and obtaining a majority in Parliament for any specific version of Brexit is proving difficult. The prospect of a chaotic, no-deal Brexit can therefore not be ruled out. The economic impact of an orderly shift through a stand-still transition to some sort of customs union would be negative but mild. However, the impact of a no-deal Brexit could be severe. There is some dispute about how severe, but most studies suggest a large deceleration in both near and medium-term growth.

Europe

Europe has enjoyed a period of growth well above trend, but this is coming to an end as the output gap closes and demand from the rest of the world weakens. We expect growth to slow to 1.6% by 2020, still around 0.5% above trend. Worsening demographics and structural problems in southern Europe mean Europe's trend growth rate is much slower than it was a decade ago.

A closed output gap should result in rising inflation pressure. However, core Eurozone inflation is still well below target (currently 1%). Wage growth has been showing signs of strengthening and our measure of core inflation has been picking up. But there has so far been limited upward pressure on unit labour costs, and our core inflation measure is not strengthening to the extent that we have seen when the output gap has been at similar levels in the past. Slowing activity and flat Phillips curves imply only glacial increases in underlying price pressures in the Eurozone.

As a result, we expect that the European Central Bank (ECB) is likely keep rates on hold until end-2019, beyond the point set by its previous forward guidance. We do expect the ECB to follow through with its intention to taper its asset-purchase programme over the fourth quarter of 2018, reducing monthly purchases from €30 billion at present to €15 billion in each of October, November and December, before ceasing net asset purchases.

Risks from Italian populism

Populism remains a concern in several European countries. Italy is the clear and present danger. The country is now governed by a coalition of two populist parties, which look set to announce a fiscal package in the autumn that risks unwinding reforms and increasing the deficit. If the government follows through on the expansionary package promised, it may come into direct conflict with the EU and create concerns about Italy's long-term fiscal and debt sustainability. Italy's government debt levels are high, and the spread over German bunds has widened this year and could go further. There is a particular worry about what will happen to spreads when the ECB stops its bond-purchasing programme. The other concern is that Italian populists are also anti-euro. While they have no plans to hold a referendum to leave the euro, the risk of another Eurozone crisis is rising.

Japan

Growth in Japan is expected to remain slow, at 0.9% in 2019. Japan has a shrinking working-age population and modest productivity growth, so trend growth is most likely barely above zero. The picture is better on a per capita basis, but for our SAA purposes it is economy-level GDP that matters most. We forecast more of the same.

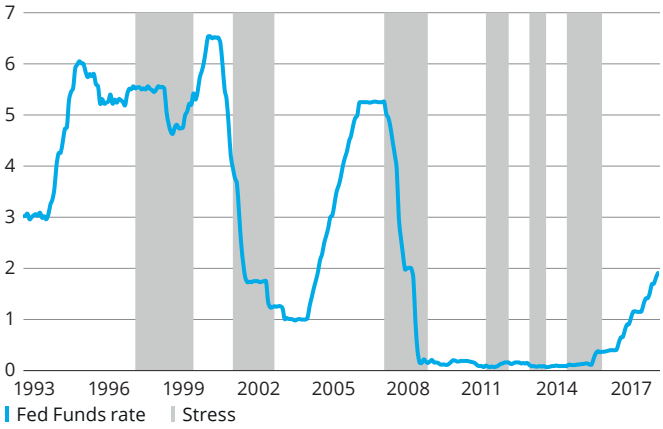
Despite low unemployment, Japanese inflation remains muted, with core prices (excluding fresh food and energy) rising just 0.3% in July. Although household income dynamics are improving and the labour market appears tight, base pay growth remains subdued. The Bank of Japan (BoJ) once again lowered its core CPI forecast recently. Japanese policymakers still look to be a long way from establishing credibility in their inflation target, and our forecast for tepid price pressures remains.

The BoJ is hard to read. It has recently adjusted the 'yield curve control' framework it uses to maintain loose monetary policy, suggesting some very mild tightening. However, we do not expect a major change in monetary policy in the next three years.

"Populism remains a concern in several European countries. Italy is the clear and present danger."

Fig. 4.10: US trade weighted dollar and EM stress

Fig. 4.11: US Fed Funds rate (%) and EM stress



Source: Haver, ASI, August 2018.
Note: US trade weighted broad dollar, January 1997 = 100. Stress episodes are based on a mix of indicators, including the extent of widening of sovereign credit spreads, the number of currencies affected and overall ease of USD financing.

Emerging markets (EM)

We expect slower growth in EM as a result of rising barriers to trade and a more sluggish China, together with spill-overs from tighter US monetary policy.

Higher US interest rates, wider spreads for EM dollar borrowing and weaker currencies all make dollar financing more expensive in EM. These tighter financial conditions will make life more difficult, particularly for the most vulnerable EM economies. The recent crises in Turkey and Argentina are a case in point. But these are exceptions rather than the rule: EM economies are, overall, in better shape to weather these headwinds than they have been in previous periods of rising US interest rates and slower global growth. Less reliance on dollar borrowing, low external imbalances and large dollar reserves mean that systematic crises in EM are unlikely.

Inflation in EM has been running at multi-year lows, but there has been a small pick-up in core inflation recently. The slower activity rates we now expect should dampen domestic price pressures across the region, maintaining the trend towards lower inflation in the medium term. However, recent currency depreciation will boost inflation meaningfully over the next year or two.

Many EM central banks have been forced to lift interest rates to stem capital outflows and currency weakness. This includes some, such as India and Indonesia, where imbalances are quite modest, though other country-specific factors have also been at play. Given the ongoing pressure from tighter policy in the US and a strong dollar, they are unlikely to be able to relax policy in the near future.

In China, growth is expected to slow materially over the next two years, reflecting a further deceleration in potential growth, the effects of deleveraging and the fallout from the trade conflict with the US. That said, unlike in most other EM, the stance of Chinese policy is becoming more accommodative, though we do not expect easing on anything like the scale put in place after the financial crisis – or even in 2016.

Risks

- **Spill-overs from US monetary policy**
  Higher US interest rates raise financing costs for dollar-denominated debts everywhere. A stronger dollar makes these costs harder to finance from EM-currency cash flows. There is a risk that this results in a sharper slowdown than expected, and that currency crises in Turkey and Argentina are repeated in a number of other vulnerable economies, with more systematic effects.

- **China credit disruption**
  China has embarked on a process of corporate deleveraging and tighter controls over lending institutions. So far this has been handled smoothly, with little disruption or impact on growth. In part, this is due to an offsetting expansion of household credit. It is possible that this process will become harder to manage, resulting in less orderly unwinding of debt and materially slower growth in China, and a more acute slowdown in global growth. On the other hand, it is possible China may respond to slower growth with another major credit stimulus. This would most likely be effective in raising growth in the short term, but would stretch balance sheets closer to breaking point, increasing the risk of a debt-deflation bust in the longer term.

Scenarios around our baseline

There are a wide range of risks to our outlook. We choose the most important of these to model in detail using our global macroeconomic model, based on likelihood and potential impact. The economic forecasts we generate in each of these scenarios are used to construct distributions of possible outcomes for key macroeconomic variables, as seen in figure 4.1, which we calculate mean scenario-weighted forecasts. These mean macro forecasts are used widely as an input to our market return forecasting models, as described in later chapters.

Global trade war

Tit-for-tat trade war breaks out as the US turns towards protectionism, slowing global growth.

- In this scenario, the US imposes 25% tariffs on all imports from China and 10% tariffs on imports from South Korea and Taiwan, prompting matching retaliatory measures. The administration gives its Canadian and Mexican counterparts the required six-month notice that the US will no longer participate in NAFTA.
- Global growth falters. World GDP growth slows to 2.3% in 2019. In general, the countries at the heart of the trade war – Mexico in particular – are affected most, as loss of confidence undermines investment, higher prices hit consumption, and exports fall. Risk appetite is hit hard, with the S&P 500 falling 15% below the baseline in the latter part of 2018.

Oil price rallies further

Oil price spikes in response to geopolitical tensions and capacity constraints in the US, causing a global slowing.

- In this scenario, oil prices surge due to further sanctions on Iran, declining Venezuelan production and capacity constraints in the US preventing an offsetting increase in oil production. The result is a period of underperformance for the global economy. Global growth slows to 2% in 2019, with the US and Eurozone notably weaker.
- Against a backdrop of rising inflation but slowing demand, the Fed continues to raise the Federal funds rate in the near term, but a little more slowly than in the baseline. Equities suffer losses, with the S&P 500 falling more than 10% below baseline by early 2019.

Aggressive monetary tightening.

Financial markets react badly to monetary policy tightening, with the effects spilling over into the real economy.

- Tight labour markets and fiscal easing cause a near-term spike in US inflation. This prompts an acceleration in the pace of US monetary policy tightening, triggering further market turmoil. US bond yields rise towards 4% and equities lose 25% of their value over the next year. Emerging market assets are particularly badly hit by rising funding costs and currency depreciation.
- Amid the market turmoil, the recovery in the world economy falters. In 2019, growth falls to 1.7% for the global economy and just 0.3% in the US. Emerging markets vulnerable to sudden outflows of foreign investment and rising interest rates are hit more severely.

European political risk materialise

Markets once again become concerned about Italy's membership of the Eurozone.

- After a brief period of market turmoil, fears that Italy's new populist-led government will attempt to take Italy out of the euro seem to have subsided. In our baseline, the government's polices cause some conflict with the EU, but do not represent systemic risk. In this scenario, we consider the economic and market reaction if investors once again start to worry about an Italian exit from the Eurozone.
- The initial market reaction is a widening of the spread between Italian and German bond yields above 700 basis points. Eurozone GDP growth slows to 1.5% in 2018 and just 0.6% in 2019. Eurozone inflation is initially higher than baseline – rising as high as 2.5% – reflecting the impact of euro depreciation, but demand weakness sees inflation subsequently fall below baseline.

Trade and investment rebound

Synchronised cyclical resurgence continues, boosting trade and investment and raising equilibrium real interest rates.

- A constellation of tailwinds including revived animal spirits in Europe, fiscal stimulus in the US, an investment upturn in Japan, fading one-off drags in India, and improved terms of trade for Russia and Brazil drive persistent strength in global trade, a further pick-up in investment and continued strong growth.
- Despite some supply-side expansion, the strength of aggregate demand sees global inflation rise, prompting additional monetary tightening. Higher equilibrium interest rates mean bond yields rise further, while strong earnings growth boosts equity prices above baseline.

Improved inflation trade-off

Benign forces keep price pressures subdued, allowing a combination of robust growth and low inflation.

- The forces weighing on inflation prove to be more persistent – and benign – than we expect. There is more spare capacity in developed market economies than we incorporate into the baseline, making it possible to sustain a lower rate of unemployment without generating inflationary pressures.
- Policy rates are lower for longer across the advanced economies. In the US, the Fed funds rate is around 100 basis points below our baseline by 2020. The BoE, Bank of Canada and ECB also delay rate hikes. The developed economies experience a boost to growth from easier financial conditions, while investor sentiment improves, supporting equity valuations.

05

Rates

- Government bond yields are low on long historical comparisons, and we consequently expect very low returns
- Structural imbalances between desired saving and investment in the economy will hold yields down
- As the Fed raises interest rates, US Treasury yields will therefore rise only gradually
- UK and German yields will follow but remain below the US

Rates

Developed-market government bonds have long been the mainstay of low-risk investment portfolios, and offer valuable diversification for equity-focused higher-risk investors. However, after a 30-year bull market, bond returns are likely to be a lot lower than in the past, even without a bond market crash. This will be a major challenge for asset allocators.

Approach to forecasting bond yields

Our forecasts for government bond yields build upon both our long-term views on central bank interest rates and inflation, as described in Chapter 3, and our shorter-term views in each of the main developed market economies, as described in Chapter 4.

The basic model we use to forecast government bond yields is a simple decomposition. Bond yields are made up of expected real policy rates, expected inflation and a risk premium reflecting uncertainty about these two components, known as the 'term premium'. We derive the real rate and inflation expectations from our economic views in Chapters 3 and 4, while term premium is discussed in this chapter.

As discussed in these chapters, inflation expectations depend primarily on the credibility of central bank targets, although over shorter horizons the amount of slack in an economy might also be important. Over the past 25 years or so, central bank mandates have become increasingly focused on keeping inflation low and stable. This is generally interpreted as a 2% consumer price inflation target, and central banks have broadly achieved outcomes close to their targets. Accordingly, our long-term inflation forecasts are grouped around 2%.

Future real policy rates depend on both the current macroeconomic situation and on long-term structural factors such as demographics and productivity. Our forecasts for policy rates in the main developed-market countries over the next few years are linked to our inflation and growth forecasts, and our understanding of central bank reaction functions. For example, if we see developments that could push inflation above a central bank's target, we will forecast a rising path for policy rates. If we think output gaps will grow, or the risks of recession are high, our expectations of policy rates will be lower. In the longer term, our real interest rate forecasts tend towards our equilibrium estimates, which recognise the trend to lower rates as population and productivity growth slow.

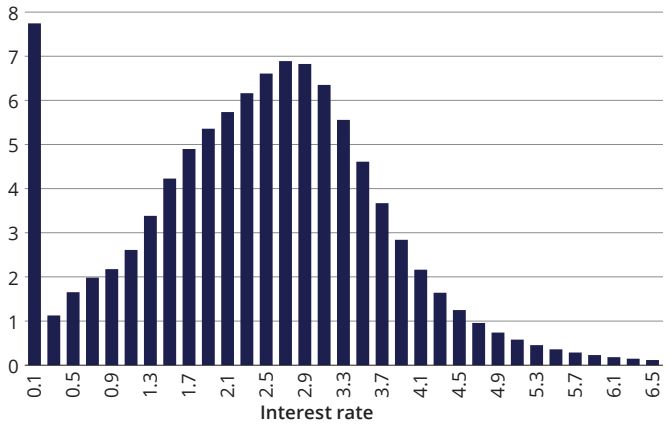
Term premium is the compensation investors receive for bearing the risk that policy rates and inflation might differ from expectations over a long horizon. The term premium is dependent on various factors including the extent of risk aversion in the market for government bonds, or, more fundamentally, on the credibility of the inflation-targeting regime. As credibility has improved, market pricing of the risk of high inflation has declined significantly, and with it the term premium seen on government bonds, as we will discuss.

Nominal bond yields

In order to estimate expected returns from government bonds, we need to forecast how yields will change over time. We focus on two parts of the yield curve: short-term bonds (1Y for simplicity), which are primarily driven by the central bank policy interest rate, and longer-maturity (10Y) bonds. For strategic asset allocation purposes we need estimated expected returns for bond indices, so we extrapolate from these forecasts to a full yield curve of bonds with maturities from one to at least 30 years.

For short-term bonds, our forecasts are based on the monetary policy/nominal interest rate forecasts for each region in the various global scenarios discussed in Chapter 4. These scenarios cover outcomes for the short rate under a range of possible states of the world, from different policy decisions to structural changes to the global economy. We apply probabilities to the scenarios, and allow for forecasting errors, before combining in a distribution of the possible outcomes, as shown in figure 5.1. Because we take a scenario-based approach to forecasting monetary policy over the first five years or so, we use the weighted average of our set of scenarios for our bond forecasts, which is consistent with our other macroeconomic inputs.

Fig. 5.1: Scenarios for US interest rates in 2021 (%)



Source: ASI, Oxford Economics Global Economic Model (10 year), 2H2018.
Note: Chart shows probability-weighted histogram of scenarios for US Fed Funds target lower bound interest rate projections for 2021, in percentage (x-axis). Y-axis shows probability. Projections are estimates and provide no guarantee of future results.

Beyond five years, our short-term bond yield forecasts move gradually to our risk-adjusted equilibrium rate (r*) estimates from Chapter 3, plus our trend inflation forecasts, and remain at that level thereafter. Our r* forecasts for each country are based on academic and central bank literature, but we make adjustments depending on our view of the risks around our estimates. For example, for the UK, we have used a figure of 0.25% – lower than most published estimates because we view the risks to be to the downside.

"Our short-term bond yield forecasts move gradually to our risk-adjusted equilibrium rate estimates."

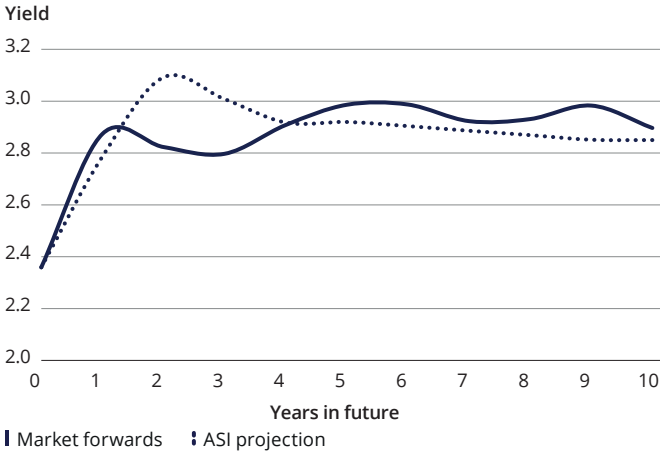
For short-term bonds we assume there is no term premium – investors in 1Y bonds are not taking sufficient additional risk above cash for a premium to be required as compensation for the risk of interest rates changing. However, other small adjustments are necessary. Our macroeconomic forecasts are for central bank policy rates, but short bond yields are often materially different from expected policy rates. This typically reflects technical issues in the money markets specific to that region. For example, German 1Y yields are currently around 40 basis points below European Central Bank (ECB) policy rates, but Australian 1Y yields are about 40 basis points above Reserve Bank of Australia policy rates, reflecting differences in liquidity availability. We adjust for this, and assume that these spreads revert to long-run averages.

For 10-year yields, we use the decomposition into rate expectations and term premium. This is a theoretical model, in the style of risk-premium-based models common across financial asset pricing theory.

The first part of the decomposition is nominal rates expectations, grouping inflation and real rates together. This term appears because of what is, in essence, an arbitrage condition: if you knew the path for nominal short rates over the next 10 years, the return you would require on a 10Y bond would be the same as the return you would achieve by investing in a sequence of short bonds. This is known as the 'expectations hypothesis'. As a result, the first component of the 10Y yield forecast is an average of the expected nominal short rate over the following 10 years.[1]

However, as the path for short rates is unknown, investors in long bonds face the risk that the actual path for short rates does not play out as expected, and returns from long and short bonds may differ. A risk premium, known as 'term premium', is required to compensate investors in long bonds for taking this risk.

Fig. 5.2: US Treasury 1Y yield forecast (%)



Source: ASI, Bloomberg, Oxford Economics Global Economic Model (10 year), 2H2018.
Note: 1 Year refers to maturity of the bond. Projections are estimates and provide no guarantee of future results.

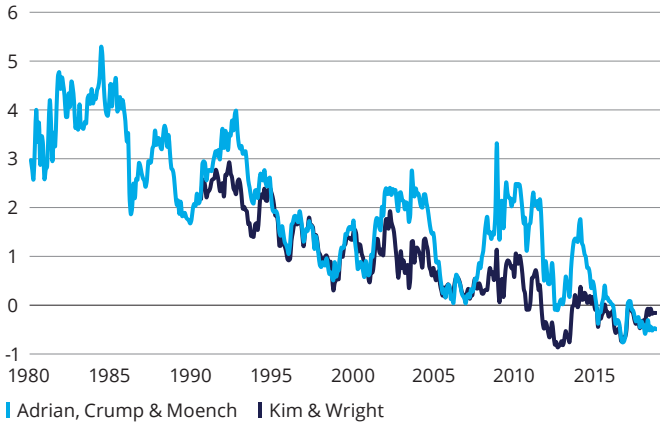
Term premium

While it is easy to justify the need for a term premium, digging deeper into the fundamentals of what it reflects and what drives changes in the level is far harder. Even estimating the historical term premium is a significant challenge, as pure expectations for rates and inflation cannot be observed directly.

Various statistical techniques have been developed for teasing rate expectations out of the yield curve. The largest variety of estimates is available for the US, including the widely followed Kim Wright (KW) and Adrian Crump Moench (ACM) estimation methods published by the Fed. The key difference is that the KW approach incorporates survey data for rate expectations, while the ACM method takes all the information required from market prices. The results are fairly similar, and are highly correlated, although the level can differ meaningfully as seen in figure 5.3. As good survey data is not always available, for the estimates we have sourced for outside the US, the ACM method is used exclusively.

[1] Fisher (2001) Forces That Shape the Yield Curve.

Fig. 5.3: US 10Y term premium methodologies (%)



Source: Federal Reserve, Federal Reserve Bank of New York, Bloomberg, August 2018.
Note: Chart shows estimates of term premium on 10 year maturity US Treasury bonds.

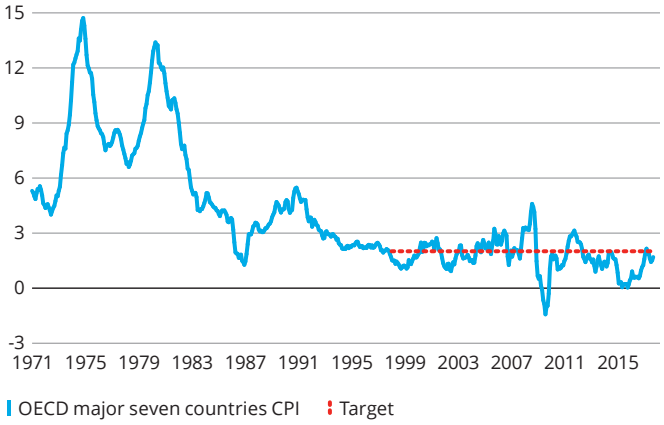
A wide range of factors is commonly discussed as possibly influencing the term premium, from deep fundamentals to technical market features.

The primary fundamental factor is uncertainty around future inflation. In the era of inflation-targeting central banks, this can largely be equated with how credible investors find central banks' inflation targets. The more likely investors consider an inflation overshoot that the central bank tolerates, the higher the 'inflation risk premium' they will require on government bonds, which forms part of the term premium. Since inflation targeting became the dominant regime for monetary policy in the mid-1990s, credibility has built up considerably across developed countries as inflation outcomes have been consistently close to target, as seen in figure 5.4, while expectations have remained 'well anchored' to targets. The much-reduced uncertainty surrounding future inflation has most likely resulted in lower term premium on long-dated government bonds.[2]

In fact, we can take this a step further. There is a plausible argument that not only has the overall level of inflation uncertainty fallen, but that the skew of the distribution of inflation outcomes might also have changed. Before the era of inflation targeting, the impact of shocks hitting either the supply or demand side of the economy was not necessarily offset by policy changes. As a result, negative supply shocks in particular (oil production disruption, for example) often resulted in large inflation spikes. The skew of inflation outcomes appeared to be to the upside, and as a result the inflation risk premium was high.

However, in the inflation-targeting era, this upside skew seems to have been eliminated. In the US and the UK, inflation targets are officially symmetrical – misses on the upside are considered to be equally costly as misses on the downside. Where possible, policy has broadly been set to take account of this. Unfortunately, since the 2008 crisis, this has not always been possible. The lower bound on interest rates (that is, the fact that rates cannot fall far below zero) has been a constraint on policy, and inflation has systematically missed targets on the low side. With low equilibrium interest rate estimates now broadly accepted, the likelihood is that the lower bound will continue to constrain policy in the future. As a result, it seems reasonable to think that the distribution of likely inflation outcomes should now have a downside skew, and the inflation risk premium will be persistently low or even negative. This is a good candidate for explaining the downward trend in the term premium.

Fig. 5.4: G7 historic inflation (%)



Source: ASI, Bloomberg, OECD, October 2017.
Note: OECD G7 countries are Canada, United States, Japan, France, Germany, Italy and United Kingdom. Zone totals for consumer price index (CPI) are annually chain-linked Laspeyres indices. The weights for each individual link are based on the previous year's private final consumption expenditure of households and non-profits institution serving households expressed in purchasing power parity (PPP).

A similar line of thinking might apply to real interest rates.[3] There is significant uncertainty over future real interest rates, which is one of the risks underlying the term premium. In Chapter 3, we concluded that the level of future equilibrium rates has most likely shifted down considerably over the past few decades. But the distribution around this could also have changed in width or skew over time, with an associated impact on the term premium.

Given the long-term decline in the term premium, we might guess that the uncertainty around real interest rates has fallen. In this vein, the volatility of long-term real interest rates has declined gradually. However, the structural changes that may have caused this are not immediately apparent. Demographic changes or productivity growth, for example, are not obviously more or less predictable than they were last century. But over the period where the term premium has been falling, there have been several crucial developments in macroeconomic policymaking that are likely to have contributed to the reduced uncertainty about real interest rates. First, policy has shifted towards allowing exchange rates to adjust to macroeconomic shocks, reducing the adjustment required in interest rates. Second, increasingly transparent policy goals and decision-making processes have anchored expectations about broad macroeconomic outcomes. These seem likely to have reduced uncertainty about future real interest rates.

[2] Wright (2008) Term Premiums and Inflation Uncertainty: Empirical Evidence from an International Panel Dataset.
[3] Benson Durham (2007) Implied Interest Rate Skew, Term Premiums, and the "Conundrum".

One technical factor offsets part of the effect of this reduced uncertainty on the term premium. The price of a bond is related to the yield by the duration, as explained in the box at the end of this chapter. But duration is not constant – it changes as the bond yield changes. This relationship is known as 'convexity'. For investors in government bonds, this convexity is valuable. It reduces the sensitivity of the (falling) bond price to interest-rate rises, and vice versa. The more uncertain the yield, the more valuable the convexity and the lower the term premium. For most bonds this effect is swamped by the uncertainty itself, but for particularly long maturity bonds (which have more convexity) the effect can be large enough to reduce term premium. This is one reason that the UK government yield curve is downward-sloping past 30 years maturity.

Other factors that could affect the term premium focus on market dynamics. Periods where illiquidity risk is higher across the government bond market would most likely result in higher term premia. Other technical supply/demand factors could also affect the term premium. For example 'preferred habitat theory' – the idea that certain types of investors are drawn to particular parts of the yield curve – might result in quite different premia at different bond maturities. In the post-crisis period, combining the global 'savings glut' with regulations forcing banks and insurance companies to hold more 'safe assets' has arguably raised the demand for developed market government bonds and lowered the term premium.[4]

Central bank purchases of government bonds under quantitative easing (QE) programmes have potentially had a material impact on the term premium. A range of studies argue convincingly that QE has lowered bond yields across developed economies.[5] However, whether QE affects yields either by lowering the term premium or by changing expectations for short-term interest rates is a trickier question.

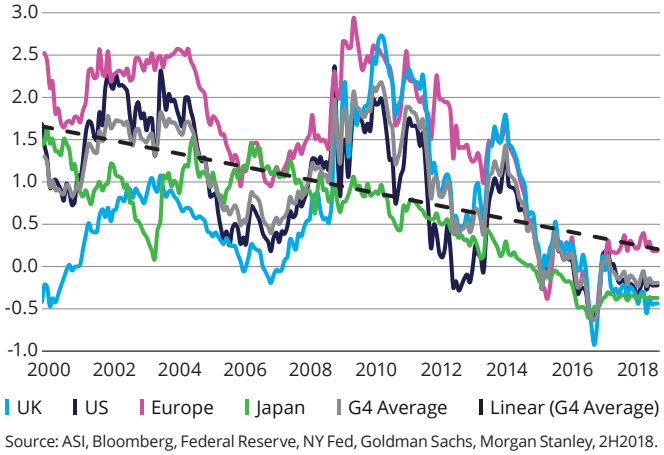
In a 2016 speech, Bank of England Monetary Policy Committee member Gertjan Vlieghe presented evidence that changing expectations for policy rates was the main mechanism for QE lowering bond yields in the UK.[6] This reflects the theory in Michael Woodford's canonical paper, which was presented at the Fed's Jackson Hole Symposium in 2012, that large-scale asset purchases may be a credible way for central banks to commit to easier policy for an extended period.[7] By contrast, some studies attempting to model the 'portfolio balance channel' find that QE had a significant term premium impact.[8] The idea is that reducing the supply of particular assets in the market affects the price of the assets, relying on theories such as the preferred habitat theory to justify the price changing despite no change in the fundamental value of the asset. Empirical evidence for both has many flaws, but we lean towards the former explanation for why QE apparently had a large impact on bond yields. One point to make here is that, thanks to large fiscal deficits in the post-crisis period, the stock of government bonds held by the public was increasing despite QE.

For our forecasts, we avoid making an absolute judgement on the extent to which QE has affected the term premium. We broadly expect asset purchases to continue to be wound down and partially reversed over the years ahead. As a result, even if QE has depressed the term premium, this should unwind over our forecast period. In the long run, we believe that term premium is pinned down by the fundamental riskiness of long-duration bonds, not flows in markets.

This still requires that our forecasts take into account the long-run trends in term premium, as well as shorter-term impacts and developments. We make four key assumptions to put our forecasts together.

First, we construct a global developed-market term premium index by taking a weighted average of estimates from the US, UK, Germany and Japan. The US provides the widest variety of methods and number of estimates, and is the most important market, so gains the highest weight. This global series is used to forecast term premium in all developed markets. We assume that, in the long run, the premium on government bonds from developed counties should be equal, even if the starting values might differ, unless we have strong justification for a divergence. This reflects the similar risk faced by investors, where no default risk is present and inflation expectations are well anchored. Co-movement in term premium for the main developed-country bond markets, as seen in figure 5.5, also supports this assumption.

Fig. 5.5: Regional 10-year term premium estimates (%)



Source: ASI, Bloomberg, Federal Reserve, NY Fed, Goldman Sachs, Morgan Stanley, 2H2018.

Second, we narrow our focus on the history of this global series to the period since the current inflation regime became established. In the 1990s, inflation expectations were only beginning to become well anchored to central bank goals, and term premium was falling rapidly. We view the advent of credible inflation-targeting central banks as a regime change, and want to be sure we use only data from this period. While inflation targeting was instituted around 2000, it probably took a few more years to become fully credible and reflected in term premium. Indeed, US term premium fell about 1% in 2004–5.

[4] Caballero (2017) The Safe Assets Shortage Conundrum.
[5] Gagnon (2016) Quantitative Easing: An Underappreciated Success.
[6] Vlieghe (2016) Monetary policy expectations and long term interest rates.
[7] Woodford (2012) Methods of Policy Accommodation at the Interest-Rate Lower Bound.
[8] Fed Staff Note (2017) The Effect of the Federal Reserve's Securities Holdings on Longer-term Interest Rates.

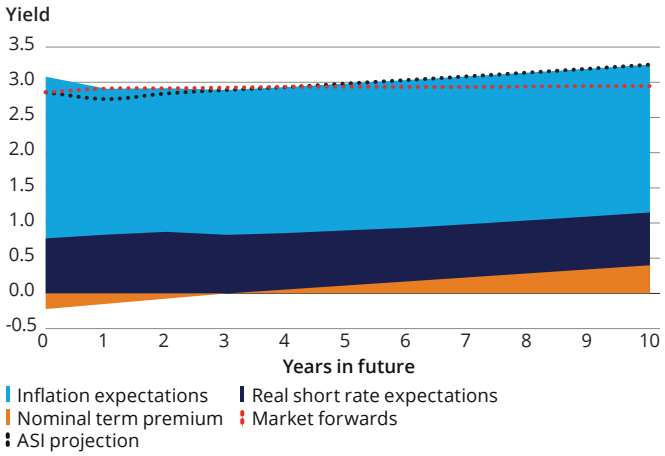
Third, we make an assumption about the trend. Since 2000 the term premium has continued to trend lower. We have previously laid out some plausible explanations for this trend, particularly the changing distribution of inflation outcomes. However, with the reduced risks to inflation now well established, we have no reason to think that the trend will continue. As such, we take our long-run global term premium estimate to be the average since the start of the current inflation regime around 2005, with an adjustment to reduce the impact of the financial crisis. This gives us a value of under 0.5%.

Finally, we assume that the term premium will revert to equilibrium in the long run. We are currently well below this, possibly because of some temporary crisis-related influences such as QE, which will reverse gradually over a long horizon. We assume that term premium reverts from the starting country-specific estimated level to our long-run estimate over 10 years, but allow a subjective view over a shorter (three year) horizon.

"The inflation risk premium has been declining gradually since the 1990s."

Bringing the components together by combining our average short rate and term premium forecasts gives us 10-year bond yield forecasts:

Fig. 5.6: US Treasury 10Y yield forecast (%)



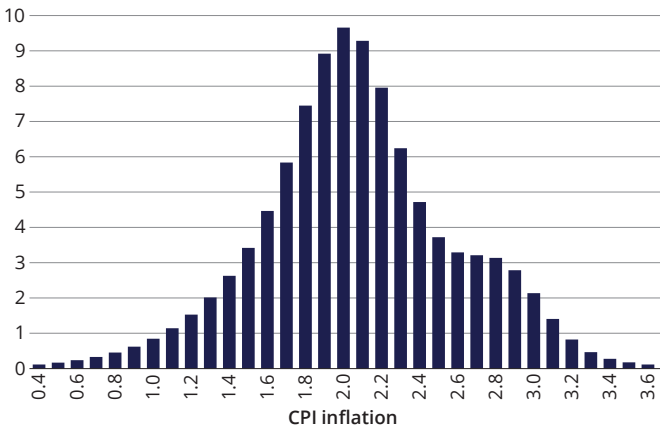
Source: ASI, Bloomberg, Oxford Economics Global Economic Model (10 year), 2H2018.
Note: 10 Year refers to maturity of the bond. Projections are estimates and provide no guarantee of future results.

Inflation-linked bond yields

Our forecasts for inflation-linked bond yields follow a similar approach. Where nominal yields can be decomposed into nominal rate expectations and nominal term premium, real yields can be decomposed into real rate expectations and a 'real term premium'. Inflation-linked bonds are generally less liquid than nominal bonds, so also offer a liquidity premium.

To generate short-term (1Y) real interest rate forecasts we subtract our inflation forecasts from our short-term nominal rate forecasts. Our inflation forecasts for the first five years are based on our scenario-weighted macroeconomic modelling described in Chapter 4. Beyond this, we use our long-run estimates, as discussed in Chapter 3. Inflation is expected to be close to central banks' targets, although slightly below on average.

Fig. 5.7: Scenarios for US CPI inflation over next three years (%)



Source: ASI, Oxford Economics Global Economic Model (10 year), 2H2018.
Note: Chart shows probability-weighted histogram of scenarios for US CPI inflation from 2018 to 2021, in percentage per annum (x-axis). Y-axis shows probability. Projections are estimates and provide no guarantee of future results.

It follows that real rates are expected to move gradually towards our risk-adjusted forecast for the long-run real equilibrium rate (r*), and remain at that level thereafter.

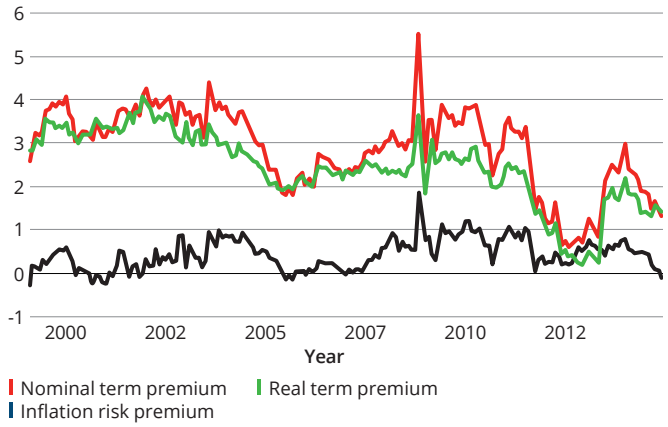
Real term premium

In a similar fashion to decomposing nominal rate expectations into real and inflation components, nominal term premium can be decomposed into real term premium and inflation risk premium. The real term premium is compensation for taking real rates risk – the risk that future short-term real rates may turn out higher than expected. This is earned by investors in both nominal and inflation-linked bonds. As we have estimates for the nominal term premium, to find the real term premium we prefer to quantify the inflation risk premium.

The inflation risk premium is the compensation an investor receives for taking on the risk that an investment with fixed nominal payments will have its real value eroded by higher-than-expected inflation. This is earned only by investors in nominal bonds, as inflation-linked bond payments increase with inflation. It is worth noting that the inflation risk premium may be negative, should the risk of inflation falling below previous expectations be bigger than the risk of unexpectedly high inflation.

A brief survey of academic research[9] suggests a long-term value for inflation risk premium of around 20 basis points, but a negative value in the current environment. In general, the inflation risk premium has been declining gradually since the 1990s. It is more stable than the real term premium, and may be positively related to the size of the output gap. We assume that the inflation risk premium reverts to its long-term value over 10 years, but allow for a subjective shorter-term (three year) view.

Fig. 5.8: Nominal term premium decomposition (%)

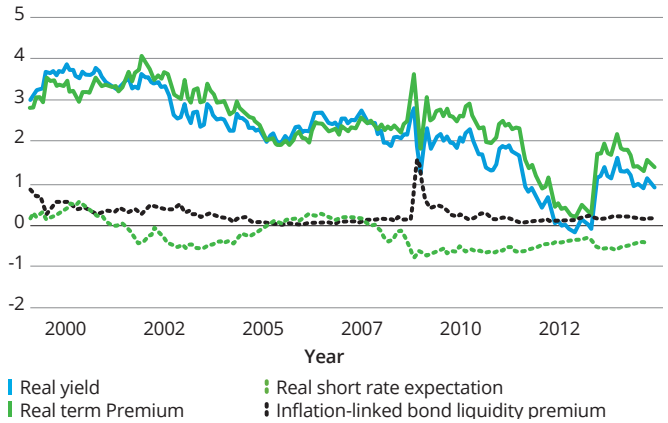


Source: New York Federal Reserve Bank, February 2015.

Liquidity premium

Inflation-linked bonds are typically less liquid than nominal government bonds, especially in times of market stress. As such, investors typically require an additional premium as compensation for the risk of not being able to sell their bonds.

Fig. 5.9: TIPS yield decomposition (%)

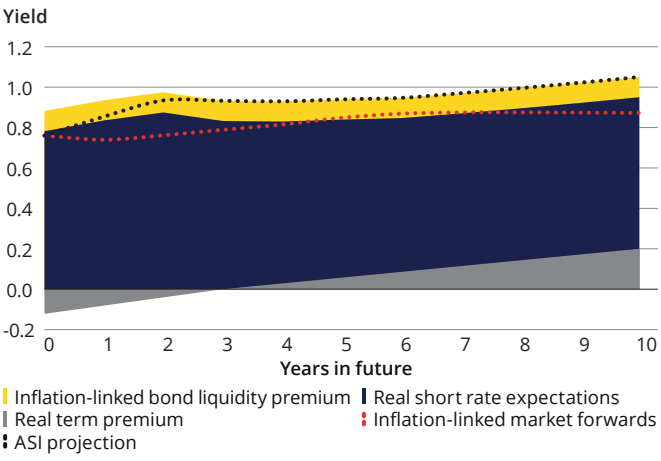


Source: New York Federal Reserve Bank, February 2015.

From a survey of academic literature, a value of around 20 basis points seems appropriate for the liquidity risk premium, depending on the market. This figure is stable outside irregular spikes, and, as we are not making our forecasts in a period of market stress, we assume it is constant over our forecast horizon.

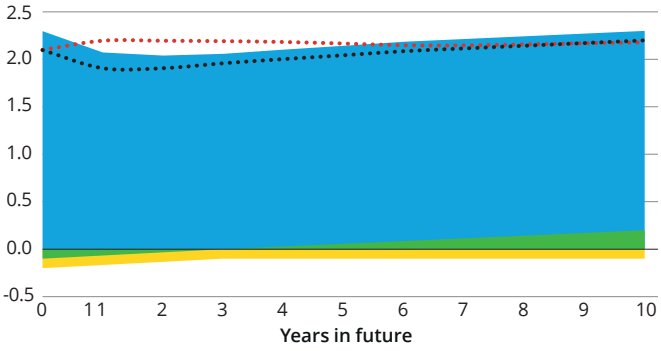
Combining the components gives us forecasts for real yields and, by considering the difference between nominal and real yield forecasts, for inflation 'breakevens' as shown in figure 5.10 and figure 5.11, respectively.

Fig. 5.10: US inflation-linked 10Y yield forecast (%)



Source: ASI, Bloomberg, Oxford Economics Global Economic Model (10 year), 2H2018. Note: 10 Year refers to maturity of the bond. Projections are estimates and provide no guarantee of future results.

Fig. 5.11: US inflation breakeven 10Y yield forecast (%)



Source: ASI, Bloomberg, Oxford Economics Global Economic Model (10 year), 2H2018. Note: 10 Year refers to maturity of the bond. Projections are estimates and provide no guarantee of future results.

Starting yields

Using our forecast methodology gives 'fair value' bond yields at all horizons. We choose to impose these fully from year one. This makes sense, as markets are forward-looking. If the views implied in market yields for long-term interest rates and inflation shift towards our forecasts, yields could converge on our forecasts in the near term. Consequently, according to our forecasts, yields may move relatively quickly in year one before following a smoother path for the remainder of the forecast period. However, given the gradual approach we have taken to reversions to longer-term estimates for interest rates, inflation and the various risk premia, our forecasts should be a better guide to yields at longer horizons.

"There are limits to how far bond yields can fall."

[9] Garcia (2010) Inflation risks and inflation risk premia.

Risks around our forecasts

Before discussing our detailed views on yields, it is worth making some more general observations about the risks around our forecasts.

Are risks asymmetric?

With bond yields at particularly low levels, there is potentially an asymmetric risk facing bond investors. Although there are no firm rules, there are limits to how far bond yields can fall. Until recently, it was assumed that bond yields could not drop below zero because investors would sell bonds and hold cash instead. This was tested by negative-interest-rate policies in Japan and Europe. It turns out that investors are prepared to continue to hold bonds with slightly negative yields. There are various reasons for this, likely relating to liquidity and diversification, as well as issues with getting hold of or storing large volumes of bank notes. However, it remains the case that the downside for yields is limited.

In economies where there already is a negative rates policy – for example, Europe and Japan – the return profile is in some ways even more asymmetric. If yields are already negative, you might only hope to pick up an upside return in the low single digits in scenarios where yields fall across the developed world. Conversely, should it turn out that expectations for weak inflationary pressures are wrong and central banks have to raise rates rapidly, and well above our forecasts, the upside for yields could be large.

Equally, with term premium estimates for most developed markets near or below zero, there appears to be greater scope for increasing than decreasing yields. For example, we may discover that the unwinding of QE has a much bigger impact on term premium than expected. On the face of it, there appears to be little reward for a significant downside risk.

Uncertainty about equilibrium rates

Despite this apparent asymmetry, we do not think the risk of a sell-off is high. Bond yields are near their lows for good reason. Demographic and other structural factors have depressed the equilibrium real interest rate, especially in those regions where yields are currently negative. In the absence of a major change in public policy, the imbalance between high desired saving and low desired investment in the global economy should hold rates down.

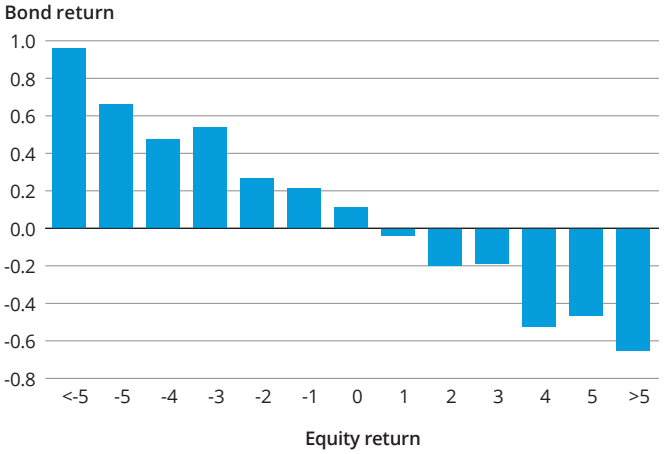
Unfortunately, this comfort is not as reliable as we might like. Equilibrium interest rates are not observable and so cannot be measured. They might not be as low as we think, and there are counter arguments to the view that they will remain low. For example, retiring baby boomers may spend more than we expect in their retirement, particularly on health care, and run down their savings. It should also be emphasised that equilibrium interest rates are, by definition, an equilibrium concept. The economy can depart from equilibrium for long periods of time. Rates could rise above their equilibrium level. Further, the evidence so far is that inflationary pressures are building only very slowly as output gaps are closed and labour markets tighten. Possible structural changes to 'Phillips curves' could mean inflation jumps are much less likely, while the threat of another lower bound episode keeps inflation forecasts down. Evidence also suggests scaling back – and even reversing – QE will have limited impact, as central banks have gone to great lengths to separate interest-rate policy from asset purchases.

Government bonds as a diversifier

Despite the ostensibly unattractive returns on offer from government bonds, it is worth reviewing the diversification benefits. Government bonds are most likely to offer attractive relative returns in scenarios where most 'risky' assets will be falling in value, as central banks cut rates, rate expectations fall and investors flock to low-risk assets.

There is always a risk that the current phase of economic expansion could come to an end unexpectedly. This is not a happy thought, but it is another reason for not expecting a rapid return to a world of high government-bond yields, and potentially an argument for holding some long-bond risk in portfolios.

Fig. 5.12: US Treasury returns by equity return buckets (%)



Source: ASI, Bloomberg, October 2017.
Note: Average over 10 years to October 2017. Chart shows average monthly US Treasury Index returns when monthly S&P500 equity return was in a particular range (i.e. when S&P500 returns were between -3.5% and -2.5% US Treasury returns were +0.5% on average).

There are limits to the diversification provided by government bonds. First, even though bonds are likely to perform well in a downturn as interest-rate expectations fall, this also lowers the discount rate on risky assets, which supports risk asset prices. Equally, the term premium on government bonds tends to be pro-cyclical, rising during a downturn as uncertainty increases. This offsets part of the fall in rate expectations, reducing the diversification benefits of government bonds.

Our risk models suggest that, on average over the long run, correlation between government bonds and equities will be close to zero, making bonds a useful, but far from perfect, diversifier.

"Government bonds offer attractive relative returns in scenarios where most 'risky' assets will be falling in value."

Outlook by region

US government bonds

US unemployment is now low, below levels generally considered to represent 'full employment'. This is being bolstered by fiscal policy, with stimulus resulting in stronger growth and lower unemployment. As a result, wage growth is rising modestly, and the Fed has pressed on with tightening monetary policy. On current forecasts, rates are set to rise further in 2018 and 2019.

For most of the post-crisis period, the Fed has been too optimistic about the strength of the economy and the resulting future path of interest rates. The 'dot plot' forecasts consistently suggested faster rate rises than the Fed could implement, as wage growth remained sluggish. Bond market investors, on the other hand, have tended to expect lower policy rates through this period, possibly reflecting a less optimistic economic outlook. This remains the situation today, with market pricing around 80 basis points below the median Fed dot for 2020.

Our baseline forecast is fairly close to the Fed dots, but our scenario-weighted forecast follows a path in between the Fed dots and the market. We expect the Fed to raise policy rates roughly five more times, taking rates to around 3.1% by the end of 2020.

This path of policy rate rises is slow compared with previous tightening cycles. The slower rate of ascent is partly a reflection of the slow recovery and consequently limited increase in inflationary pressure. The Fed may only need to tighten financial conditions – a broad measure of how easily and cheaply borrowers can access finance – modestly to meet its mandate. Equally, the unbalanced nature of global business cycles means that hikes may result in a bigger difference between interest rates in US dollars and other currencies and, consequently, in a stronger dollar. This would serve to tighten financial conditions, partly through spillover effects on emerging market economies. Ultimately, though, the slow pace of hikes depends on the Fed's belief that the equilibrium real interest rate is structurally depressed, so the terminal rate is less far away.

We largely share the Fed's assessment of the trend in equilibrium rates, as described in Chapter 3. The risk-free interest rate required to balance desired saving and investment in such a way that the US economy is at full employment has fallen significantly, as it has across the developed world. This is for a variety of reasons, including slower population and productivity growth. For our 'risk-adjusted' long-run estimate of the real equilibrium interest rate in the US, we have used a figure of 0.75%. Combining this with a forecast that inflation will average 2.1% in the long run (on the CPI index, slightly above the Fed's target for PCE inflation), gives us a long-run nominal short rate forecast of 2.85%, as seen in figure 5.12. This is marginally higher than our previous forecast, and is now in line with the median long-run estimate in the Fed's dot plot of 2.88%. This might be interpreted as a higher forecast than the Fed median, as we broadly think that risks to r* estimates are to the downside. Given that the US economy has failed to generate much wage growth with interest rates well below these r* estimates, it may well be the case that they are simply too high.

There are risks on both sides of our forecasts, both for the long-run estimates and shorter-term outlook, as highlighted in the scenarios we described in Chapter 4. On the upside for Fed rates, a surprisingly large impact from fiscal stimulus in the US is a possibility. With output gaps nearly closed, the risk of resulting inflationary pressure may force the Fed to raise rates to neutralise the effects of the stimulus on inflation. Equally, Trump might pursue further stimulus to keep the economy buoyant ahead of the 2020 election.

More broadly, our forecasts reflect a sanguine but unexciting path for the global economy. World trade and investment rebounding more rapidly would have positive implications for productivity. As a result, the scope for Fed rate rises and more optimistic long-term forecasts could result in a bond sell-off.

"The slow pace of hikes depends on the Fed's belief that the equilibrium real interest rate is structurally depressed."

There are various risks to the downside for Fed rates. On the domestic front, the US economy could slow dramatically as fiscal stimulus wears off over the next couple of years. Our baseline forecast suggests some slowing, but this could be an underestimate, which would require a pause in Fed hikes, or even rate cuts.

Elsewhere on the supply side there could be scope for faster growth without increasing inflationary pressure. Higher wages coupled with deregulation and tax cuts on capital expenditure could promote more productivity-enhancing business investment, or even increase labour market participation.

The perennial risk is that this business cycle will turn down. A big shock to the economy will come eventually, and the Fed will probably have to bring rates back down towards zero. One possible scenario is that anticipated inflation prompts the Fed to tighten monetary policy sharply, but the economy is not strong enough and inflation falls well below target. Whatever the shock, should Fed policy be constrained by the lower bound on interest rates again, the economic outlook would deteriorate meaningfully. We now know all about the challenges of supporting the economy sufficiently in that situation – it is very tricky. In this vein over the long run, secular stagnation poses a major downside risk to Fed rates and inflation, and is the main reason for the downward bias to the risks around our r* estimates.

While we expect policy rates to rise by over a percentage point over the next three years, we do not expect a parallel rise further out in the curve. Pulling the components of our view together, as shown in figure 5.6, we expect US 10Y yields to rise only modestly to around 2.9% over the next three years and to around 3.2% by year 10 as term premium gradually returns. These forecasts are a little above market forwards by the end of our horizon.

In some respects, we expect to see a pattern similar to the period prior to the financial crisis. The Fed chair at the time, Alan Greenspan, called it a 'conundrum'. He was puzzled why 10-year yields failed to rise much despite an increase in policy rates of several percentage points. The answer suggested by Ben Bernanke was that, due to a global 'savings glut', equilibrium rates are structurally depressed. Equally, the trend to a structurally lower term premium results in flatter yield curves.

As seen in figure 5.11, our forecasts for breakeven inflation are marginally below current market pricing, by around 0.2% for the next few years. This results in forecasts for real yields that are above forwards by a similar margin, as seen in figure 5.10. This results in a capital loss, but is offset by our inflation forecasts, which are above market pricing. Overall, we have no strong view on Treasury Inflation-Protected Securities compared with US Treasuries.

UK government bonds

The impact of Brexit on the UK economy is a key uncertainty for gilt yields.

The risks around Brexit are high, especially the risk that a deal with the EU cannot be reached. Falling out of the EU without a trade deal – a 'no deal' Brexit – would prove a major shock to the economy. A transitional arrangement would allow for a much smoother path for the UK economy.

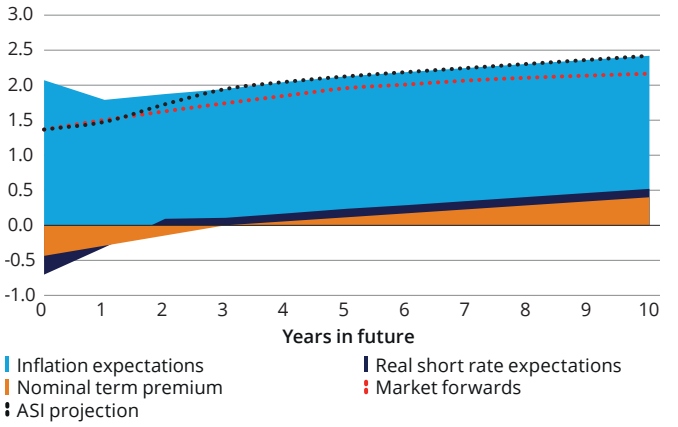
> "Falling out of the EU without a trade deal – a 'no deal' Brexit – would prove a major shock to the economy."

So far we have felt the impact of Brexit primarily on the demand side of the economy. Although the response was delayed, consumption weakened as the depreciation of sterling was felt in higher inflation. More recently, the high inflation has waned, and the Bank of England felt sufficiently confident in the strength of the labour market to raise interest rates, although gilt yields remain very low.

The supply side implications of Brexit will be more important in the long run, and have a greater impact on gilt yields. Depending on the trading arrangements reached, productivity growth in the UK will most likely be noticeably lower in the years after Brexit than it would have been otherwise. This is already affecting the Bank of England's thinking on interest rates, as a weaker supply side means less capacity for demand to grow without overheating. Further out, it would most probably reduce the equilibrium real interest rate, given the negative implications for corporate investment.

Although we forecast some gradual interest-rate hikes from the Bank of England over the next three years, our long run r* estimate is as low as 0.25%, or 2.15% in nominal terms. This is a particularly low number for the UK compared with estimates from academic literature, but we feel it is justified by the risks around Brexit. In fact, combining our nominal rates forecasts with our term premium estimates results in 10Y yield forecasts that are close to, but slightly above, market pricing.

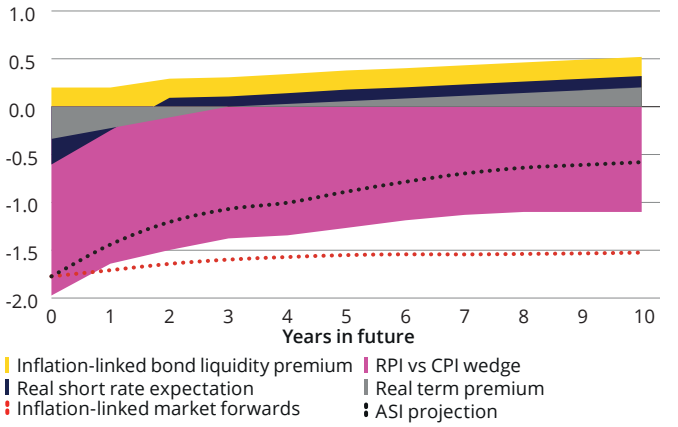
Fig. 5.13: UK 10Y yield forecast (%)



Source: ASI, Bloomberg, Oxford Economics Global Economic Model (10 year), 2H2018.
Note: 10 Year refers to maturity of the bond. Projections are estimates and provide no guarantee of future results.

Our forecasts for yields on inflation-linked bonds are less close to those implied by market pricing. We think that inflation-linked bonds are pricing higher inflation than is likely.

Fig. 5.14: UK inflation-linked 10Y yield forecast (%)



Source: ASI, Bloomberg, Oxford Economics Global Economic Model (10 year), 2H2018.
Note: 10 Year refers to maturity of the bond. Projections are estimates and provide no guarantee of future results.

There are a variety of possible explanations for this. Firstly, it might be that markets genuinely reflect higher inflation expectations than our forecasts, especially given that current inflation readings are elevated. We view the recent high inflation as a temporary result of Brexit, which should not affect inflation expectations further out. Our CPI forecast is around 2% in the long term, in line with the Bank of England's target.

Alternatively, it is possible that market prices reflect a different view on the gap between CPI and RPI inflation, which is the index used for inflation-linked gilts. RPI is typically higher than CPI due to calculation differences, but markets might be pricing a larger gap than our forecast of 1.4% over the next 10 years. We note that this is already well above our long-run equilibrium estimate, and that of external forecasters.[10]

Finally, we may disagree with the market on the inflation risk and liquidity premiums. Our forecast is for the inflation risk premium to remain low, with the risk of an unexpected jump in inflation no

[10] OBR (2015) Revised assumption for the long-run wedge between RPI and CPI inflation.

higher than the risk of falling towards deflation. This reflects developments since the financial crisis. Other investors may still require a higher premium for taking inflation risk.

Whatever the reason for the difference, by the 10th year of our forecast we expect 10Y inflation-linked gilt yields to be around 90 basis points higher than the market is pricing – a material difference. This results in poor returns from inflation-linked gilts relative to nominal bonds.

Eurozone government bonds

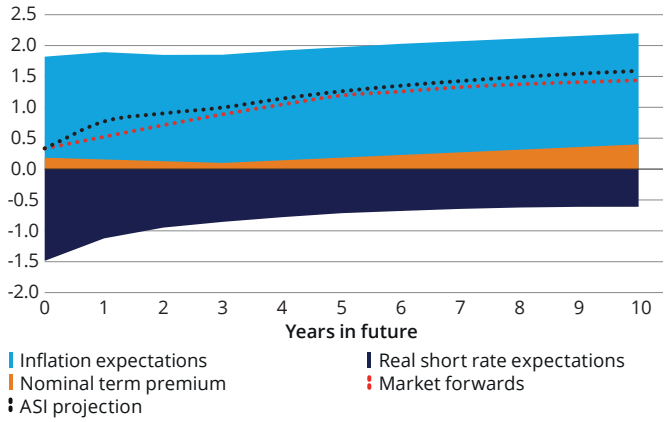
The European economy is now performing fairly well, and expanding a little faster than potential growth. Despite this, it still has an output gap and fairly high unemployment. This results in downward pressure on inflation, which remains well below the ECB's target. For this reason the ECB is unlikely to tighten policy materially for a number of years.

However, the ECB has already ended its programme of government-bond purchases. This has been accompanied by concrete guidance from the ECB that this does not mean rate rises will follow soon, but market pricing and our forecasts suggest a rate rise in late 2019 is a possibility.

In the longer run, even once the Eurozone economy has reached full employment and inflation has risen back to target, we believe interest rates will have to remain very low. Our r* estimate is as low as -0.5%, reflecting the particularly poor demographic outlook for most of western Europe, although current market pricing suggests even lower real rates. Our long-term inflation forecast is also on the low side as a result of the asymmetric 'below but close to 2%' mandate of the ECB, and the elevated risk of lower-bound episodes in a region with such a low r*.

This gives us forecasts for German (default-risk free) yields, both long and short term, that are a touch above market forwards at both three and 10-year horizons.

Fig. 5.15: German 10Y yield forecast (%)



Source: ASI, Bloomberg, Oxford Economics Global Economic Model (10 year), 2H2018.
Note: 10 Year refers to maturity of the bond. Projections are estimates and provide no guarantee of future results.

Yields on government bonds from the more fragile southern European economies incorporate a risk premium or spread above German yields to reflect higher risks. There is still potential for European government-bond spreads to widen on perceived risk to the future of the Eurozone, if individual countries' economies are faring poorly, or local politicians are seen as a risk to future eurozone membership by the markets. Italy is the prime example at the moment.

The willingness of the ECB to act as a 'lender of last resort' to governments is the key defence against threats to the Eurozone from economic risks, or contagion across countries. And despite doubts about this creeping in when Greece was in acute difficulty in 2015, it is generally thought to be reliable, especially for larger member states. This suggests Eurozone government spreads might offer plenty of extra return for the risks faced.

However, political risks could derail the euro if voters turn forcefully against the common currency. For example, were the new Italian administration to increase its anti-euro rhetoric, or completely ignore EU fiscal rules, this risk could increase significantly. Spreads already suggest that markets are more concerned about Italy than since 2013. Currently, there have been few policies implemented that carry large risks, but the upcoming budget may change that. Despite Le Pen and other populists broadly losing elections elsewhere across the Eurozone, there are still a number of political risks threatening the established order.

Our forecasts incorporate a largely static view on European spreads, widening in sympathy with credit spreads over the next few years but reverting thereafter. We include only modest losses from the risk of downgrades (for example, were Portugal or Italy to fall below investment grade). This makes Euro government bonds appear fairly attractive – comparable to investment-grade corporate credit in risk and return profile.

Japanese government bonds

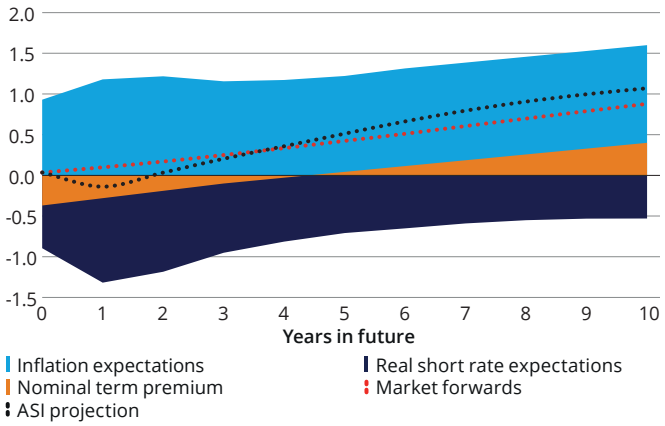
Enthusiasm about a major regime shift in Japan – towards permanently higher inflation expectations – has been pared back over the last couple of years, despite unemployment falling to low levels. The Bank of Japan's (BoJ) continued failure to create domestic inflation despite extensive and inventive monetary policy stimulus measures raises questions about the ability of monetary policymakers to create inflation when nominal interest rates are at the zero lower bound.

The BoJ policy of targeting the yield on the 10Y Japanese government bond makes forecasting yields relatively straightforward for the next couple of years, despite a small increase in flexibility around the target recently. We assume the BoJ will hit its target, though we might expect a steeper curve from this point as expectations of inflation build.

However, it is difficult to be optimistic that inflation will rise to target levels in the near future. The corporate sector continues to save a large share of its income, and wage growth remains low. Until these circumstances change, it seems likely that the BoJ will maintain policy rates at or below zero. As a result, our long-term forecast for r* is low, at -0.5%. We take a pessimistic view on the BoJ hitting its inflation target of 2%, forecasting only 1.2% inflation over the coming years. Rising inflation and term premium building is sufficient to give rising yields, but our yield forecasts are largely in line with market pricing.

This policy of targeting 10Y yields makes assessing risks around the target tricky. Scope for further downward movement in yields relies on the BoJ lowering the target in a further attempt to promote inflation. It is also possible that the current set of policies starts to work and delivers a sustainable rise in inflation, allowing the BoJ to raise or even remove its 10Y yield target, resulting in a significant bond sell-off.

Fig. 5.16: Japan 10Y yield forecast (%)



Source: ASI, Bloomberg, Oxford Economics Global Economic Model (10 year), 2H2018.
Note: 10 Year refers to maturity of the bond. Projections are estimates and provide no guarantee of future results.

Conclusion

Return expectations

We convert our yield forecasts into index returns, as described in the box on calculating government bond returns.

Modestly rising yields result in a small capital loss for all the major markets, offset by the slightly higher income provided by higher yields. On average, returns from government bond indices are barely higher than returns from cash. In an environment where the initial term premium is close to zero across developed market government bonds, this is largely what you would expect. At our longest 10-year horizon, investors may begin to capture some return from the term premium, but the overall outlook for returns from government bonds is very weak.

In the US, yields are currently higher than those in the other major regions. This gap will remain, resulting in higher returns than for elsewhere in local currency. However, on a currency-hedged basis, US Treasuries are no more attractive than their counterparts.

Eurozone government bonds are a slight exception, given that the index includes more risky peripheral debt. Based on our forecasts, investors do earn a premium for taking additional risk, as we do not expect significant losses from default. But returns from German bunds are barely above cash, similar to other default-risk-free bonds.

Despite low returns, government bonds are still highly likely to provide useful diversification in periods where risk assets perform poorly. This may be sufficient justification for them remaining an important part of many investors' portfolios.

However, the central message is that bond returns everywhere are much lower than they have been in the past. This creates an incentive for investors to look for other sources of income and diversification from equities.

Fig. 5.17: Government bond returns

	3Y	5Y	10Y
UK Gilts	0.3	0.8	1.2
UK Inflation-Linked Gilts	-2.1	-1.3	0.3
US Government Bonds	2.6	2.7	2.8
US Inflation-Linked Government Bonds	2.5	2.7	3.0
Euro Government Bonds	0.5	0.9	1.6
Euro Inflation-Linked Government Bonds	1.0	1.4	2.1
Japanese Government Bonds	-0.1	-0.3	-0.1
Japanese Inflation-Linked Government Bonds	1.1	0.8	0.7
Australian Government Bonds	2.0	2.1	2.7
Australian Inflation-Linked Government Bonds	3.0	3.0	3.4

Source: ASI, 2H2018.
Note: Returns are in local currency and in percentage, per annum.
Projections are estimates and provide no guarantee of future returns.

> "On average, returns from government bond indices are barely higher than returns from cash."

Calculating government bond returns

The return on a typical government bond has two main components: an income component and a capital return component.

The income component for a bond can be approximated by the yield-to-maturity (in the following we refer to this simply as the 'yield'). This is the annualised return an investor will make on an individual bond if they buy today and hold it until it matures.

The capital return is a little more complicated. It is a function of the change in the yield and the duration of the bond. Duration is a bond-market concept related to the maturity of a bond. Duration measures the sensitivity of the price of the bond to changes in the bond's yield. The longer the duration of a bond (that is, the longer you have to wait for the bulk of the cash payments), the more sensitive the price is to changes in yield. This concept is useful because it makes it easy to calculate the capital return of a bond, simply by multiplying the duration of the bond by the change in yield.

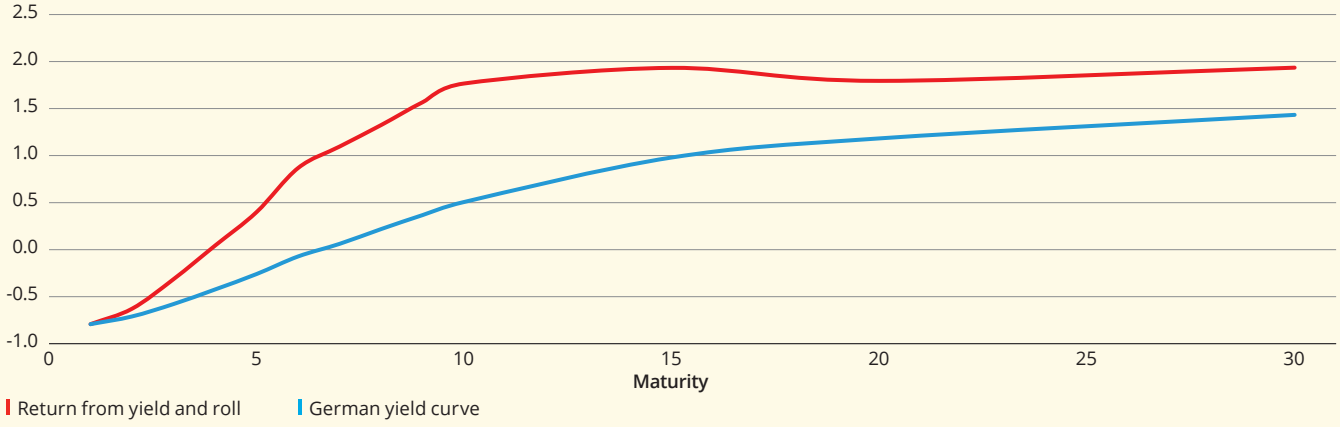
In the upside-down world of bond investment, yields rise as the price of a bond falls, and vice versa. So a fall in yield gives a positive capital return and a rise in yield gives a negative capital return. For example, the 10-year maturity US government bond currently has a duration of around nine years. This means that if the yield on the bond rises from 2.5% to 3.5%, this one percentage point movement in yields, multiplied by the duration (1% x 9) results in a capital loss of 9%.

For an individual bond, the return can be approximated by simply adding the duration-related capital return to the income return. However, for our strategic asset allocation views, we need to estimate the returns from whole bond indices.

How do bond indices differ from individual bonds? Thanks to a never-ending process of short-dated bonds maturing and new, longer-dated bonds being issued, the average maturity of a bond index is roughly constant. The passage of time shortens the maturity of each individual bond, but bond indices stay more or less unchanged. This introduces another form of return, known as 'roll'.

Usually, longer-maturity bonds have a higher yield than shorter-maturity bonds, reflecting greater uncertainty over longer horizons. As time passes and maturity reduces, an individual bond 'rolls down the yield curve', so the yield falls and the price rises. Old bonds maturing and new bonds being issued is equivalent to investors selling high-priced bonds and buying low-priced bonds, and consequently increasing returns.

Fig. 5.18: Roll returns can be significant (%)



Source: ASI, Bloomberg, 2H2017.
Note: 10 Year refers to maturity of the bond. Projections are estimates and provide no guarantee of future results.

For bond indices, income and capital returns can be approximated in the same way as for individual bonds, using the average yield and average duration. We include the three sources of returns in our calculations for bond indices.

It is worth noting that, despite yields moving up and down in the short term, income returns tend to offset capital returns for bond indices over the long term. In the previous US government-bond example, the 2.5% per year income has risen to 3.5%. Over time, this higher income gradually offsets the 9% capital loss. As a rough rule of thumb, on a 10-year horizon, the yield at the point you buy the bond index is a fairly good first approximation of the annualised expected return you can hope to achieve, plus a little extra for roll.

06

Currencies

- The dollar is expensive, based on equilibrium measures, and will revert in the long run as interest rate differentials narrow
- The euro is weak, reflecting the economic situation, but will gradually appreciate in the long term
- Sterling faces Brexit-related uncertainty, but could appreciate towards historical levels when this is eventually resolved

Currencies

Investors today are more inclined than ever to invest globally, in the name of diversification or better opportunities overseas. While this has its benefits, buying assets in foreign currency exposes investors to exchange-rate risk.

Currency movements can be large enough to dominate the beneficial characteristics of the foreign assets chosen. Many investors are able to reduce this risk by hedging currency exposures, but the costs of hedging can add up. It is, therefore, crucial to consider currency risks and returns when investing.

Currency forecasting approach

Currency movements are undoubtedly hard to predict, particularly in the short term, but are related to changes in interest rates and a few other variables. In the longer term, 'equilibrium exchange rate' models can provide a useful guide, as exchange rates move to bring economies into some sort of balance.

Fair value models

There are various ways of measuring what a 'fair' exchange rate might be in the long run. In general, these approaches focus on an area in which two economies are out of balance, such as relative prices or net trade.

The most widely known measure of currency equilibrium values is 'purchasing power parity' (PPP). This is the theory behind The Economist's Big Mac Index.[1] The idea is that, in the long term, goods prices should be the same in different countries; otherwise there would be a systematic opportunity to profit by buying in one country and selling in others. There is some evidence that aggregate price levels may converge in the very long run (over decades),[2] partly through currency movements and partly through inflation differentials. However, many currencies have remained persistently above or below their PPP values for long periods. Empirical evidence suggests that reversion towards PPP is very slow,[3] to the extent that we consider PPP to be a useful input only for our long-run currency projections over a 10-year horizon.

The 'real effective exchange rate' (REER) is a related concept. This gives a measure of the purchasing power of a particular currency against a selection of other currencies, where the difference in inflation has been removed. For example, if inflation in the UK was 1% and inflation in the US 4% over the last year, but the nominal exchange rate had not changed, the real exchange rate of sterling against the dollar would have depreciated by 3%. REER measures the real value of a currency, like in our example, but against a broad basket of the main trading partners of the relevant country. These adjustments tend to mean that REERs are roughly stable over long horizons, as currencies generally preserve their purchasing power against their trading partners in the long run, at least in developed markets. As a result, we use long-run mean reversion of REERs as an input for our currency forecasts, with a slightly quicker reversion than for PPP.[4]

"Currency movements can be large enough to dominate the beneficial characteristics of the foreign assets chosen."

Another approach, the 'fundamental equilibrium exchange rate' (FEER) model, focuses on internal and external macroeconomic balances.[5] Internal balance generally means full employment and price stability, while external balance means a sustainable current account position, as reflected in underlying and desired net capital flows. FEER estimates the exchange rate that would theoretically be required to bring a panel of countries' current accounts into balance when all are operating at full employment. We use FEER estimates as an input for our currency forecasts. Given the fairly slow rate at which economies revert to internal and external equilibrium, we let the importance of FEER estimates in our fair values increase at longer horizons.

[1] The Economist Big Mac Index.
[2] Meier (1997) Assessing Convergence to Purchasing Power Parity: A Panel Study for Ten OECD Countries.
[3] ECB (2000) Determinants of the 'equilibrium' value of a currency.
[4] Ca' Zorzi (2018) Exchange rate forecasting on a napkin.
[5] MacDonald (2000) Concepts to Calculate Equilibrium Exchange Rates: An Overview.

Lastly, one can use econometric models based on factors that have explained exchange-rate movements in the past to predict the future path of exchange rates. This is known as the 'behavioural equilibrium exchange rate' (BEER) approach. The factors chosen tend to be structural and fairly slow-moving in nature, typically including trends in relative manufacturing productivity, terms of trade, net external investment positions and interest rates.[6] Unlike for FEER models, the inputs are chosen primarily for their empirical rather than theoretical relationship with exchange rates.[7]

The relative level of interest rates is one of the key determinants of exchange rate movements over shorter horizons, and a key part of our preferred BEER models. This relationship is far from perfectly reliable, especially over longer periods, but does make some sense: higher interest rates in a country tend to reflect higher returns available on investments. This might result in capital flows towards the country, and eventually currency appreciation. We include our forecasts for interest rates from Chapter 5 in our BEER models where possible.

Fig. 6.1: Relationship between rates and currencies

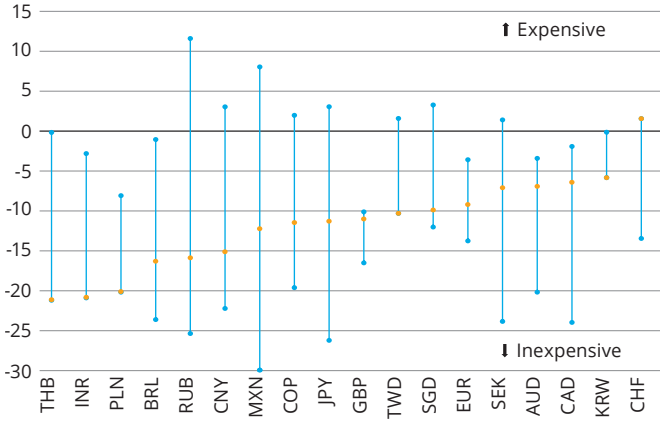
Source: ASI, Bloomberg, September 2018.

Thanks to the choice of variables, BEER models are likely to offer a better explanation of past movements in exchange rates than the other models discussed, and tend to be more useful for forecasting currencies over somewhat shorter horizons. As a result, our views over three years are driven primarily by signals from a range of BEER models.

Similarly to our interest-rate forecasts, we tend to view shorter-term developments that might affect exchange rates through our global scenarios. By considering what might happen to the major currencies in various scenarios, we can consider a range of possible outcomes and generate forecasts that take into account a number of risks. We model the impact of these scenarios through our preferred BEER models, which are incorporated into our global economic model described in Chapter 4. For example, we consider a scenario where European politics takes a turn against popular support for the euro, especially in Italy. This has implications for various exchange rates, but has an outsized negative impact on the euro. Our BEER fair value estimates are a weighted average of forecasts under each of our global scenarios, and thus consistent with our forecasts for other asset classes.

We use a combination of equilibrium exchange rate metrics to generate our final fair value estimates. We use different weights on the various types of model at different horizons, with scenario-weighted BEER models most important for the first three years but FEER, PPP and REER metrics much more important further out. We use these fair value estimates to assess whether currencies are mispriced, and assume that a fraction of that mispricing will dissipate each year – currencies will gradually revert to fair value. We assume that currencies will return fully to our fair value levels over 10 years.

Fig. 6.2: 10Y Future currency fair values vs. USD (%)



Source: ASI, consensus FEER, BEER and FEER model estimates, Oxford Economics Global Economic Model (10 year), July 2018.
Note: Chart shows comparison between spot exchange rates and ASI's fair value metrics, as of today. Blue lines show range of estimates (excluding PPP). Orange dots show ASI weighted fair value, using our long-term weights. Return forecasts also incorporate inflation projections.

It is worth noting the considerable uncertainty around these estimates. At lower levels of over or under-valuation (maybe when currencies are less than 10% away from their equilibrium level) these fair value metrics do not offer a strong signal. It is clear from history (see figure 6.3) that currencies can trend significantly in one direction or another for several years before reverting to fair value.

Fig. 6.3: Trade Weighted US Dollar Index

Source: Federal Reserve Bank of St. Louis (FRED), September 2018.
Note: Trade Weighted US Dollar Index against major currencies (March 1973=100, not seasonally adjusted).

[6] IMF (1998) Exchange Rates and Economic Fundamentals: A Methodological Comparison of BEERs and FEERs.
[7] Ricci (2013) Real Exchange Rates and Fundamentals: A Cross-Country Perspective.

This can result from a wide range of temporary factors, such as differences in monetary policy or business cycles, or events that might change desired capital flows. For this reason, we sometimes take a short-term view on currencies that is different from the longer-term mean-reversion assumption.

Currency movements in the short run

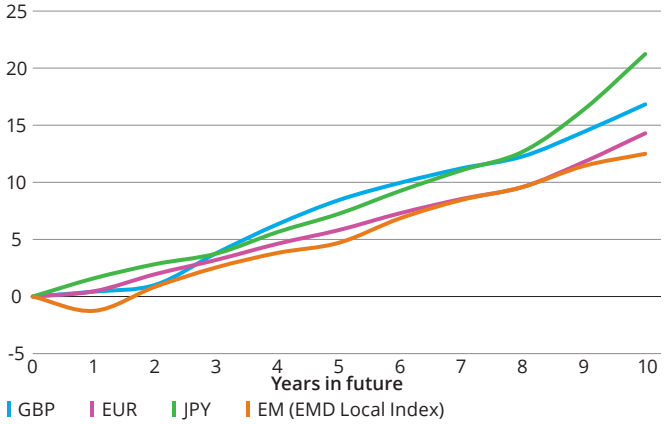
Although our long-term equilibrium currency estimates are most important for our currency forecasts, we also allow ourselves the flexibility to impose a shorter-term view. This view is most likely related to our macroeconomic views discussed in Chapter 4, but otherwise may reflect factors that we do not believe our models or scenarios are picking up sufficiently. For example, we make adjustments to our sterling forecasts because we do not think our models are fully capturing the uncertainty around Brexit.

Currency views

US dollar

The US dollar is currently expensive on our long-term equilibrium metrics – the major currencies are all forecast to appreciate against the dollar over 10 years. This recent strength is closely linked to the significant and increasing interest-rate differential between the US and most other developed economies, as shown against the euro in figure 6.1. This reflects the stronger recovery that the US experienced after the financial crisis, and possibly a smaller fall in equilibrium interest rates. We expect the interest-rate differential to increase as the Fed hikes rates slightly faster than markets currently suggest, but the bulk of dollar strength resulting from diverging paths for monetary policy is now reflected in market prices. Dollar strength will eventually fade as other regions catch up with the US and raise policy rates gradually. Dollar depreciation may also be required to balance out the US current-account deficit in the long term.

Fig. 6.4: Currency spot returns against US dollars (%)



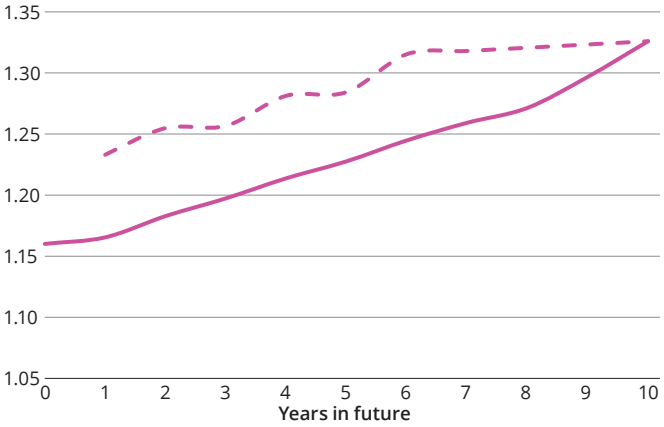
Source: ASI, 2H2018.
Note: Returns are in cumulative percentage, and are for spot exchange rate changes only, excluding carry. EMD Local refers to currencies which make up the J.P Morgan GBI-EM Global Diversified bond index. Projections are estimates and provide no guarantee of future results.

Euro

Conversely, the euro is historically cheap versus the dollar and forecast to appreciate over 10 years. This historic weakness is best understood as a product of the relative economic developments in Europe and other developed markets, particularly the US. Although Europe suffered less from the initial financial bust in 2008, the secondary waves of disaster that hit the Eurozone in the form of the sovereign crisis from 2010 onwards resulted in a far worse macroeconomic situation than elsewhere. Despite a period of strength as the Eurozone current-account surplus rose rapidly around 2013, the euro depreciated further as interest rates were cut into negative territory through 2014–15. More recently, the euro has partially recovered in line with the acceleration in Eurozone growth rates and a closing growth differential with other major regions. This is now largely reflected in market pricing.

Widening interest-rate differentials, as the ECB keeps rates low for at least a couple more years, will most likely keep the euro from appreciating in the short term. Political risks also remain in Italy and elsewhere, and justify a delay in reversion to fair value of a year in our forecast. But the large current-account surplus and eventual rise in interest rates mean that the euro is expected to appreciate in the long term towards our fair value estimate, as seen in figure 6.5.

Fig. 6.5: EUR forecast and fair value against US dollars



Source: ASI, 2H2018.
Note: Forecasts are for spot EURUSD exchange rate. Solid lines refer to exchange rate forecast, dashed lines refer to fair value. Projections are estimates and provide no guarantee of future results.

British pound sterling

Sterling is also fundamentally cheap, primarily as a result of the post-Brexit depreciation. After a large and rapid depreciation during the financial crisis, which took sterling to cheap valuation levels, the pound had largely recovered by 2015 as UK growth accelerated, a couple of years before growth in the Eurozone. But the Brexit referendum and related uncertainty changed the attractiveness of investing in the UK materially, taking the pound back to post-crisis lows.

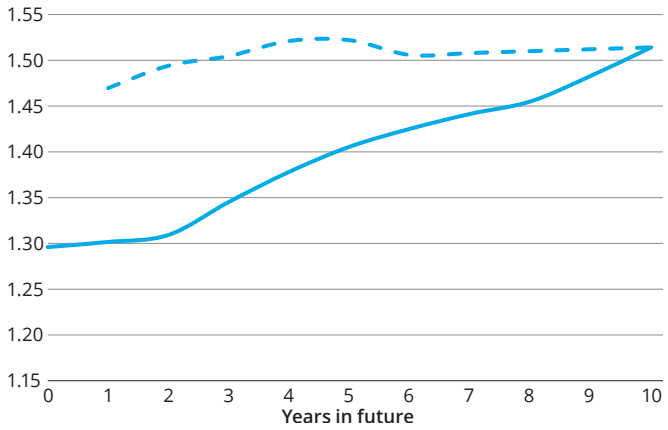
Brexit introduces considerable uncertainty for the pound, as possible long-term Brexit trade outcomes span a wide range of possibilities. Should the final Brexit deal result in a major structural shift, as markets currently appear to assume, the negative impact on sterling could be permanent. Equilibrium estimates would also adjust lower, in time, as the new structural features of the UK economy appear in the data.

Current market pricing also reflects a significant chance of a 'hard' Brexit – for example, if there is 'no deal' on transition arrangements, let alone a comprehensive free trade deal – in which case sterling may decline further. The odds of such an outcome have been increasing recently as progress in negotiations between the UK and EU has been limited.

To account for this risk, which may not be resolved for a few years, we have delayed reversion of sterling to our long-run fair value by two years.

However, if the final Brexit deal is less of a departure from previous arrangements, the currency would be expected to appreciate towards a fair value that pre-dates the referendum. This is largely what our long-term forecast reflects, with sterling currently well below fair value, as seen in figure 6.6.

Fig. 6.6: GBP forecast and fair value against US dollars



Source: ASI, 2H2018.
Note: Forecasts are for spot GBPUSD exchange rate. Solid lines refer to exchange rate forecast, dashed lines refer to fair value. Projections are estimates and provide no guarantee of future results.

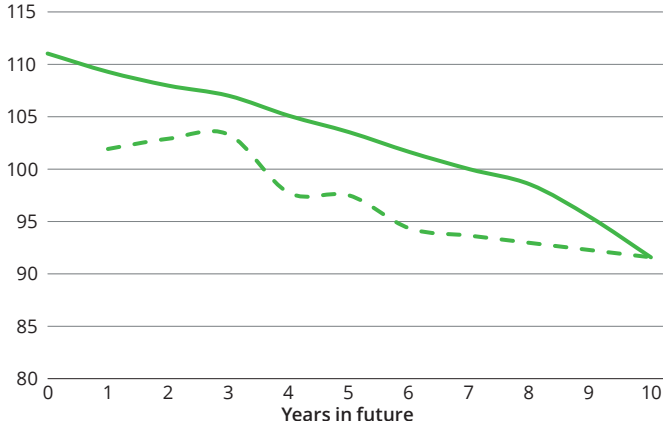
Japanese yen

The Japanese yen is especially cheap on long-term measures – the cheapest among the major developed market currencies. Most of this cheapness came about during the introduction of 'Abenomics', the set of policies undertaken by Prime Minister Abe after his (second) election in 2012. The first of Abe's 'Three Arrows' was aggressive monetary easing to raise inflation to a new 2% target. The commitment from both the government and central bank seemed sufficiently powerful to be described as a regime shift,[8] and the yen depreciated accordingly.

Since the initial depreciation, inflation has broadly failed to reach the target. Although monetary policy tools have generally been pointed in the right direction to raise inflation expectations, fiscal policy has been less equivocal, as taxes have been hiked. Questions have understandably been asked about the commitment to the regime shift. If this commitment is absolute, and the 2% target is the best long-term inflation forecast, the equilibrium value of the yen was changed structurally by Abe's reforms. However, should the commitment wane, the yen could appreciate towards pre-Abe equilibrium values. Given the lack of progress on inflation over the last few years, and the Bank of Japan's failure to take any additional steps to stimulate over the past year – if anything, it has done the opposite – this is what we have embedded in our forecasts. This is in accordance with our long term 1.2% inflation forecast discussed in Chapter 5, and Japan's large current-account surplus.

Persistently lower inflation in Japan than in the US is also a direct reason for nominal exchange-rate appreciation, as the purchasing power of the yen falls by less than the dollar. This is reflected in our appreciating fair value estimate, as shown in figure 6.7.

Fig. 6.7: JPY forecast and fair value against US dollars



Source: ASI, 2H2018.
Note: Forecasts are for spot USDJPY exchange rate. Solid lines refer to exchange rate forecast, dashed lines refer to fair value. Projections are estimates and provide no guarantee of future results.

Australian dollar

The Australian dollar is only slightly undervalued on long-term metrics, having depreciated considerably since 2012 as the terms of trade shock from the mining boom wore off and commodity prices fell. Over 10 years, we forecast only modest appreciation, with interest-rate rises offset by a current-account deficit.

> "The impact of Brexit on sterling could be permanent."

Emerging markets

After depreciating considerably through 2014–15 as commodity prices fell, and a sharp fall in 2018 reflecting spillovers from Fed policy tightening, emerging market currencies are generally now cheap against the US dollar on our fundamental metrics. Equally, we forecast appreciating fair values for many emerging market real exchange rates. This primarily reflects emerging market economies improving manufacturing productivity relative to developed market economies.[9] Our forecasts are now broadly for real exchange-rate appreciation over the long term.

However, we have to weigh higher inflation in emerging markets against faster 'catch-up' productivity growth. Higher inflation would generally be expected to result in nominal exchange-rate depreciation, as the purchasing power of currencies is maintained. Emerging market inflation varies widely by country, but on average is likely to be 1–2% higher than developed market inflation. This feeds through directly to our forecasts for nominal exchange rates, providing a material drag on returns from emerging market assets. Overall, we forecast some modest appreciation in the long term.

[8] Romer (2013) It Takes a Regime Shift.
[9] IMF (2004) Real Exchange Rates In Developing Countries: Are Balassa-Samuelson Effects Present?

Fig. 6.8: Currency returns for EUR based investors

	3Y	5Y	10Y
GBP	0.2	0.4	0.1
USD	-1.0	-1.1	-1.3
JPY	0.4	0.5	0.8
AUD	-0.4	-0.4	-1.0
EM (EMD Local Index)	-0.7	-0.6	-0.6
EM (EM Equities Index)	-0.7	-0.8	-0.8

Source: ASI, 2H2018.
Note: Returns are in percentage on a per annum basis, and are for spot exchange rate changes only, excluding carry. Projections are estimates and provide no guarantee of future results.

"We have to weigh higher inflation in emerging markets against faster 'catch-up' productivity growth."

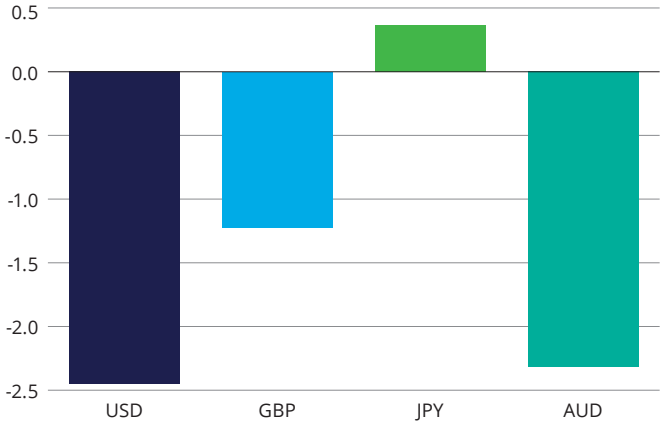
Costs of currency hedging

Currency risks can be mitigated via currency hedging. This can be achieved in various ways, but the simplest method is to use foreign exchange forward contracts.

Currency forward contracts are priced based on interest-rate differentials. This reflects the no-arbitrage principle: with efficient markets you should not be able to systematically exploit interest rate differences between countries by borrowing in one currency to lend in another.

The process of currency hedging, therefore, generates a cost or return itself. When hedging, the initial exposure to interest rates in the currency of the asset being hedged becomes an exposure to interest rates in the 'base' currency.[10] When local rates are higher than overseas rates, the hedge return is positive and vice versa. Our hedging-cost forecasts are based on our forecasts for the interest-rate differential.

Fig. 6.9: 10Y EUR hedging cost (%)



Source: ASI, 2H2018.
Note: Cost of hedging foreign currency to EUR over 10 years, in percentage per annum. Positive cost refers to a gain from hedging. Projections are estimates and provide no guarantee of future results.

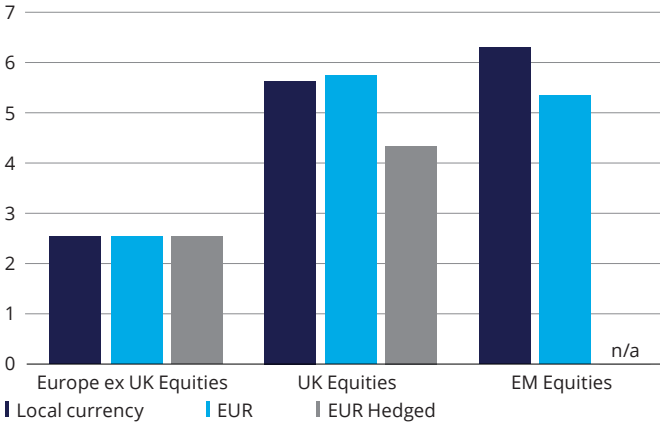
There are some exceptions to this rule. Over recent years, a 'basis' has frequently opened up between interest-rate differentials and the yields implied in currency forward contracts, especially in euros and yen. There are a number of explanations for this. The marginal buyer of currency forward contracts seems to have shifted since the financial crisis from banks, which cared primarily about short-term funding requirements in different currencies, to longer-term investors who want to hedge risky asset exposures. These different participants perceive different interest rates at which they borrow and invest, so are willing to hedge at different implied yields. However, over long horizons, the interest-rate differential will continue to be a reasonable guide for hedging costs.

Returns in different currencies

For nearly all of the assets we forecast, we provide return estimates on three different currency bases – local currency, unhedged foreign currency and currency hedged.
Local currency returns are straightforward. We present the return forecast in the currency in which the asset is denominated. Unhedged foreign currency returns take into account our forecasts for how the foreign currency will behave against the base currency. Finally, hedged returns take into account our forecast for the hedging costs.

Figure 6.10 shows an example of this, for investors with euro as their base currency buying various equity indices. For example, for UK equities we show a 'local' sterling expected return and an euro expected return. If we expect the euro to appreciate against sterling, then the local return will be lower than the return expressed in sterling terms. Note that only the foreign unhedged and hedged returns are available to the investor – it is not possible to capture the local return without some additional currency return or cost.

Fig. 6.10: 10Y Global equity returns - currency impact (%)



Source: ASI, 2H2018.
Note: Returns are over ten years in percentage on a per annum basis. Projections are estimates and provide no guarantee of future results. No EUR Hedged return shown for Emerging Market Equity index as too expensive and impractical to hedge.

In our forecasts, we present expected returns in the various base currencies of our clients: a similar table is available for investors with a dollar or euro base currency, for example.

[10] Alternatively, a currency forward can be thought of a borrowing in one currency, buying another with the proceeds and earning interest, but with a promise to buy the original currency back in future.

"Currency returns have a large impact on total returns. Equilibrium models suggest that the dollar is expensive today. The long-term correction to fair value will depress returns on dollar assets for European investors."

07

Emerging market debt (EMD)

- While Turkey and a few other countries are a cause of concern, most emerging market (EM) economies are in better shape than in previous bouts of EM stress
- Yields are high relative to developed-market bonds, offering higher expected returns
- EM currencies are now cheap, reducing the risk of further losses for long-term investors

Emerging market debt (EMD)

With developed-market government-bond yields still extremely low outside the US, the higher yields available on EM government bonds provide investors with a meaningful risk premium.

Macroeconomic risks

2018 has been an uncomfortable year for emerging markets. A trade war, higher US rates, a strong dollar and twin crises in Turkey and Argentina have shaken investor confidence.

There are echoes of the Asian crisis of the late 1990s. During this period, EM investors experienced dramatic currency depreciations and feared widespread sovereign defaults. At the heart of the problem was a mismatch between the currency in which debts were denominated and the currency available for repayment. Like Asian economies in the 1990s, Turkey's government and corporate sector have made the mistake of accumulating large dollar-denominated debts, while relying on income in lira to repay it. The precipitous fall in the lira (70% year to date) now makes dollar debts very hard to repay. Lenders are reluctant to provide new loans.

Prior to the 1998 Asian crisis, this 'sudden stop' problem was widespread; today, most EM economies are in much better shape. Debt levels are relatively low as a proportion of GDP, and have longer maturities. Emerging market central banks hold a much larger stock of dollars in their reserves. A much greater proportion of debt is issued in local currencies, so the risk of currency mismatch is smaller. Fiscal and monetary policy institutions have also improved, and debt markets have matured and deepened. Finally, in the Asian crisis, many countries had large current-account deficits, draining foreign currency reserves. This time most countries have much smaller imbalances.

There is no denying that the environment is now more challenging for EM economies. Higher interest rates in the US and a stronger dollar both increase the financial stress for foreign issuers of US-dollar-denominated debt. Donald Trump's trade wars may escalate, slowing global trade. And China's economy looks set to decelerate, as the authorities continue to restrain growth in leverage. These risks may make life difficult for EM investors in the short term.

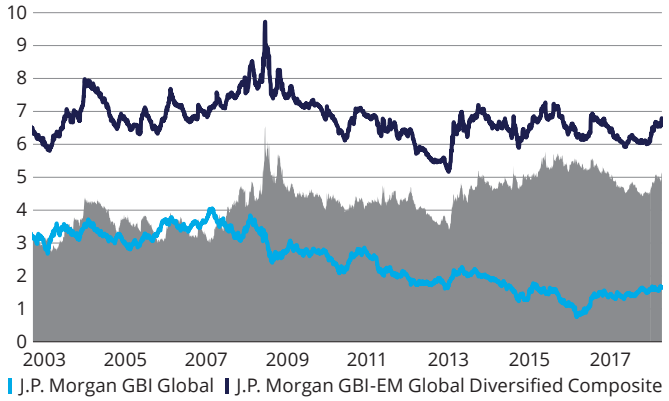
But a lot of the potential bad news is now priced into EM assets. Emerging market currencies have depreciated 45% against the dollar, since their post-crisis high in 2011, including 20% in the year to date (early September). Our equilibrium exchange rate models suggest they are now cheap. There may be further volatility ahead, but this creates an attractive starting point for long-term investors.

As Chapter 4 indicates, the overall economic outlook is still fairly positive for emerging markets, as they have been boosted by stronger demand from developed markets. Our outlook is weaker than it was six months ago, but is still for reasonably solid growth. Inflation is under control, and falling in several economies.

Expected returns

The main attraction of EMD assets is the high yield they offer, when compared with developed-market bonds (currently 7% for the EMD local-currency index and 6.6% for the hard-currency variant). The yield gap is close to the highest it has been for 20 years.

Fig. 7.1: Emerging-Developed Market yield spread (%)

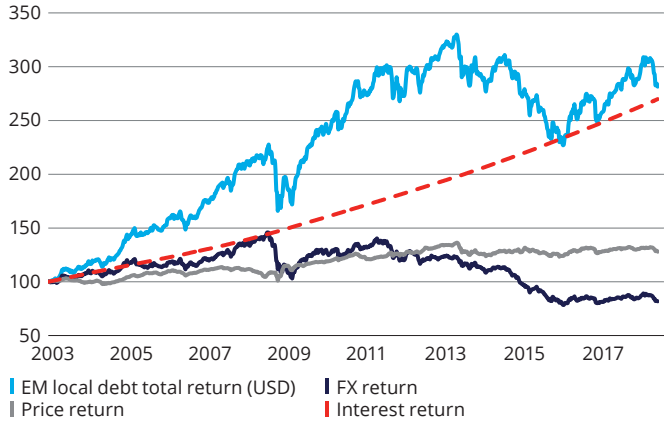


Source: Bloomberg, August 2018.

Over the long time horizons that motivate our strategic asset allocation (SAA) thinking, higher yields are particularly attractive because of the cumulative compounding effect of reinvested income. The cumulative value of EMD's 7% reinvested income is 97% after 10 years, compared with 34% compounded from US Treasuries yielding 3%, and 15% from UK gilts yielding 1.4%.

As the chart below shows, for EMD, this compounded income is the core driver of expected returns on SAA time horizons. Currency and yield shifts matter over the short term, adding to returns prior to 2013 and detracting since, but the income delivers the long-term return.

Fig. 7.2: Decomposition of EM sovereign debt returns (USD, in basis points)



Source: Bloomberg, September 2018.
Note: Rebased to 100 at 31 December, 2002. Past performance provides no guarantee of future results.

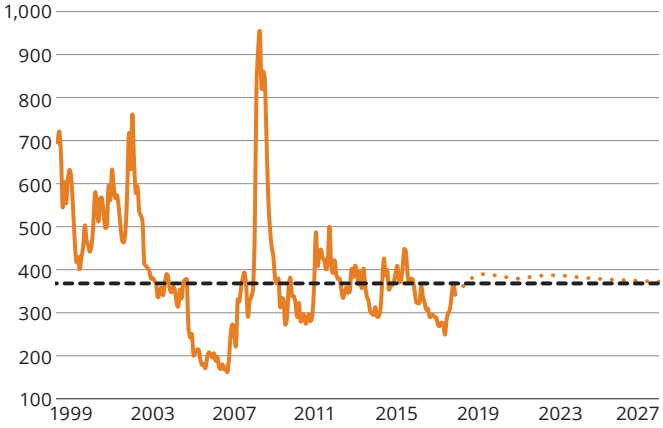
There are two categories of EM sovereign debt: 'hard-currency' debt, issued in foreign currency (dollars or, less frequently, euros); and 'local-currency' debt, issued in the currency of the issuer (for example, Turkish lira). This distinction means that somewhat different approaches are required for estimating returns for two categories of debt.

Hard-currency EM debt

Hard-currency EM debt is modelled in a very similar way to corporate credit. For dollar-denominated EM debt, we start with our forecasts for yields on US government bonds (Chapter 5). Then, as with corporate credit, we form a view of the evolution of the spread of dollar EM debt yields over the US government yield. On a 10-year horizon, we typically assume spreads will revert to their long-term median. In the nearer term, we consider whether spreads are likely to deviate temporarily from this reversion trend. For example, if spreads are unusually wide, we consider whether they are likely to widen further before beginning their mean reversion.

Returns are calculated in the same way as for other bonds, based on income from the yield and capital returns from yield movements (multiplied by duration). We also make a small adjustment for default.

Fig. 7.3: Forecast spread over US Treasuries, EM sovereign debt (hard currency, in basis points)



Source: ASI, Bloomberg, 2H2018.
Note: Adjusted for index composition changes. Black dashed lines indicate historic median. Past performance is not necessarily a reliable indicator of future results. Projections are estimates and provide no guarantee of future results.

Yields for hard-currency debt are currently close to their high point since the financial crisis. This is a combination of high spreads and higher US Treasury yields. We assume slightly higher yields from here (as underlying US Treasury yields move up a little). This provides a small drag on returns.

Our default loss assumptions also reduce returns, but only by a fraction. Emerging market sovereigns rarely default on their debt. Given the greater fundamental resilience of EM region overall, we think it very unlikely that there will be widespread defaults. The index is highly diversified, so the default of a single country would have a small impact for the index as a whole. The conclusion is that today's high yield will translate into relatively high expected returns.

Many non-US investors in hard-currency EM debt prefer not to take the currency risk associated with exchange-rate movements between their currencies and the US dollar. Hedging these risks has the benefit of significantly reducing the volatility of this asset class. The downside is that, for now at least, it also reduces expected returns. Hedging costs are a function of the difference in short-term interest rates; so, for European investors, we currently expect US-dollar-hedging costs of around 2%.

"The high compounded income of EMD is the core driver of long-term returns, currency and duration have a more modest impact."

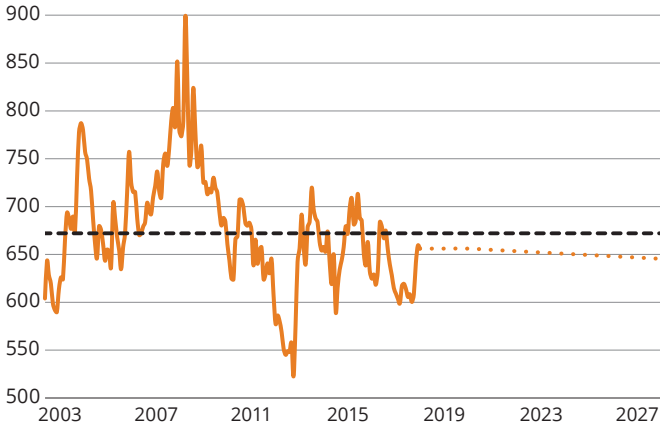
Local-currency EM debt

Our approach to modelling EM local-currency bonds differs in two ways. First, we model yields differently, and, second, exchange-rate shifts play a bigger role because currency risk cannot realistically be hedged.

The spread approach used for forecasting hard-currency EMD is not useful for the local currency variety. Shifts in local-currency yields are not highly correlated with those of US government bonds. Instead, we take a view on the likely path of yields for a basket of EM economies, based on our view of the economies of these countries and, in particular, the path of inflation and short-term interest rates.

Inflation in many emerging markets has risen slightly in the last six months, but this is a temporary function of higher commodity prices. We believe the structural trend towards modestly lower inflation remains in place. Lower inflation should, in the long term, give central banks space to reduce policy interest rates. However, in the short term, the recent depreciation in EM currencies has forced some central banks to tighten.

Fig. 7.4: Forecast yield, EM sovereign debt (local currency, in basis points)



Source: ASI, Bloomberg, 2H2018.

Over the long term, we expect EM yields to remain, on average, around current levels over the next decade, with a slight downward bias.

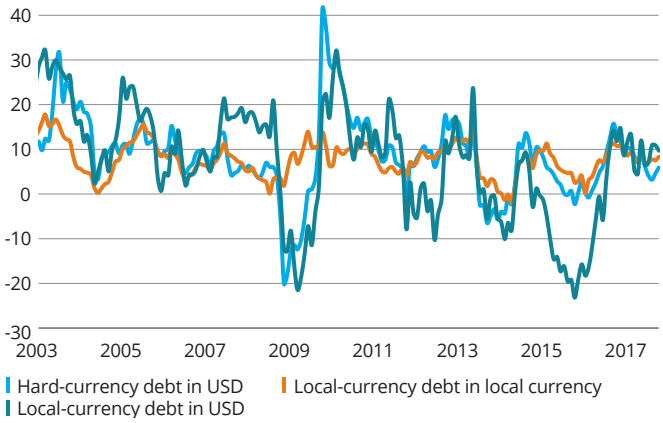
Currency returns

While yields are the dominant source of return for EMD in the long term, currency can have a big impact over the short term. Emerging market currencies are volatile, so the impact of currency movements on returns can be substantial.

Figure 7.3 shows returns of the local-currency EM index in dollars and figure 7.4 in local currency (equivalent to assuming no changes in spot exchange rates). Returns are fairly stable when expressed in local-currency terms, but the dollar return is much more volatile. This difference reflects the high volatility of EM currencies against the dollar.

Unlike hard-currency EMD, the local-currency variety cannot profitably be hedged. Given hedging costs are a function of interest-rate differences, the high yields associated with EM currencies makes foreign-exchange (FX) hedging prohibitively expensive for developed-market investors. So, typically, investors accept the currency risk.

Fig. 7.5: EM debt total returns (%)



Source: ASI, Bloomberg, J.P Morgan indices, October 2017.
Note: Calculated as 12 month rolling total return.
Past performance provide no guarantee of future results.

There are two slightly different concerns about currency risks: exchange-rate volatility and structural exchange-rate depreciation. Volatile currencies make for volatile returns, which reduces the Sharpe ratio for EMD and makes the asset class less competitive. This is not fatal from an SAA perspective – equities have higher volatility, so EMD can still win the optimisation race.

Though it is impracticable to hedge currency risk, there is, in fact, a way to reduce it using a currency funding strategy. Emerging market currencies are particularly volatile versus the dollar, but less so against some other developed-market currencies, such as the Swedish krona (SEK) or the Australian dollar (AUD). Countries like Sweden and Australia are exposed to some of the same Fed/US-dollar stresses that affect emerging markets. As a result, their currencies have weakened this year alongside those of EM. This means that EM FX losses when expressed in SEK and AUD have been relatively small. We expect this approach to significantly mitigate FX volatility for EMD local investors, significantly raising the Sharpe ratio of the asset (see table).

> "Currency fair-value models suggest EM currencies are now cheap versus the dollar, and roughly at fair value versus sterling."

Structural exchange-rate depreciation is more of a problem for SAA investors; it undermines long-term expected returns. If you buy EMD local when EM currencies are expensive, you can expect a substantial drag on returns – subtracting as much as 2–3% per year on average. On the other hand, if you buy when EM currencies are cheap – as they are now – you can hope for exchange-rate appreciation to boost long-term returns.

Today's currency crises in Turkey and Argentina, and more widespread stresses driven by rising US rates and a strong dollar, are certainly creating a great deal of exchange-rate volatility. However, the risk of structural FX depreciation has fallen significantly.

For investors who are not able or willing to take this approach, the outlook for EM exchange rates versus their domestic currency is, therefore, very important for our overall view on EM local-currency bond returns. This has been a particular issue in 2018, which has seen a strong deprecation in EM currencies, particularly versus the US dollar.

The sharp fall in currencies (-15% in the year to end August versus the US dollar) means that EM currencies now offer a significantly larger risk premium to investors. Our long-term currency fair-value models (see Chapter 6) show that, on average, EM currencies are now cheap versus the dollar, and roughly at fair value versus sterling. Emerging market currencies have not been this inexpensive to own since before the 2008 crisis.

This does not eliminate the risk of EM currency losses in the short term. Deteriorating investor sentiment may result in further outflows from EM assets, even though they are cheap. But it does mean that a value opportunity is emerging. Long-term investors can expect to receive much higher EM sovereign yields with less risk that returns will be eroded by long-term currency deprecation.

The combination of relatively high yields and cheap EM currencies makes EMD local increasingly attractive for long-term investors – particularly given the relatively low returns available elsewhere. Our preference is to fund our exposure using a basket of cyclical developed-market currencies (such as AUD or Swedish krona). This reduces currency volatility, and dampens worries about the systematic impact of a strong US dollar. However, as the EM risk premium rises, the attractions for this asset class increase even when not using this approach.

Of course, as with most value investment opportunities, investors need to be willing to tolerate some short-term volatility in order to benefit from the higher risk premium now available.

"The combination of relatively high yields and cheap EM currencies makes EMD local increasingly attractive for long-term investors."

Fig. 7.6: EM sovereign debt returns

	Forecast currency	3Y	5Y	10Y	5Y Volatility	5Y Sharpe Ratio
EM Sovereign Debt (Hard)	USD	5.2	5.5	6.0	9.2	0.29
	GBP	4.0	3.9	4.5	13.2	0.20
	GBP hedged	3.4	3.9	4.7	9.1	0.28
EM Sovereign Debt (Local)	EM currency basket to Local currency	6.7	6.7	6.7	n/a	n/a
	GBP	5.8	5.5	5.9	12.3	0.34
	DM funding basket*	5.3	5.3	6.1	8.2	0.50

* Equally weighted basket of AUD, CAD, GBP, NOK, NZD, SEK.
Source: ASI, 2H2018.
Note: EM Sovereign Debt (Local) is funded using a basket of cyclical developed market (DM) currencies. Returns are in local currency and in percentage, per annum. Projections are estimates and provide no guarantee of future returns.

08

Credit

- Our view on the economic and credit cycles drives our corporate bond forecasts, in combination with long-term reversion to fair value spread levels
- Current spread levels are now closer to fair value in investment-grade markets, but well below in high yield
- The risk of a spike in spreads may be rising as the credit cycle matures and the Fed raises interest rates

Credit

Investors are attracted to corporate bonds for the yield pickup they offer over government bonds. These higher yields are earned by investors in return for bearing the risk that companies will default.

Drivers of corporate bond returns

Corporate bonds are fairly similar to government bonds in many respects. Both generally pay fixed coupons, and expose investors to changing interest-rate expectations and inflation risk.

However, unlike government bonds, corporate bonds also have a degree of credit risk: the risk that the bond issuer will fail to make the payments on its debt. This risk manifests in credit spreads and losses from defaults, and can change the risk profile of corporate bonds substantially, compared with government bonds.

Credit spreads

Bond investors think about corporate bond yields as being composed of the underlying government-bond 'risk-free' yield and a 'credit spread'. Typically, the risk-free yield used is that for a similar duration government bond. The spread is also known as the credit risk premium, and represents the additional return required by investors as compensation for taking the risk that bonds will default, or at least that the chance of default will increase.

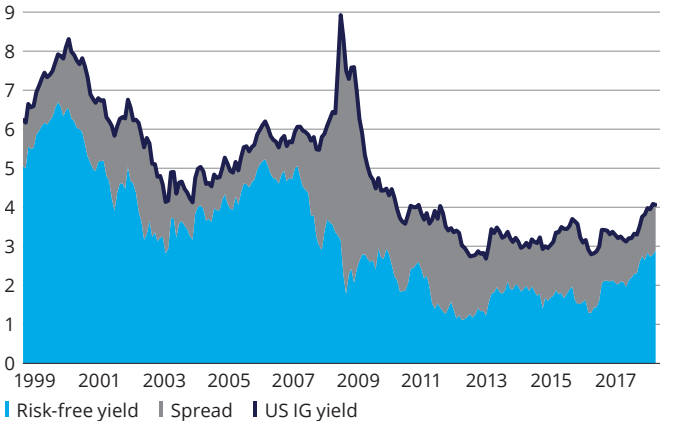
Yields on corporate bonds can therefore change for two reasons: a change to market views on government-bond yields or a change in market perceptions of credit risk.

As with government bonds, corporate bond returns can be broken down into income and capital return components. Income is approximately the bond yield, while capital returns depend on changes in yield. Equally, it is often useful to consider just the return from a corporate bond compared with a similar duration government bond. Here, spread widening (tightening) results in a reduced (increased) 'excess return' thanks to capital returns, while the level of the spread gives rise to a positive income 'excess return'.

Default loss

The other main component of returns from corporate bonds is losses from defaults. Over time, a small fraction of bonds will end up defaulting on payments. Defaults are losses, which reduce returns directly. Normally, some of the value of defaulting bonds is eventually recovered, so we estimate both a default rate and a recovery rate for each of the bond indices we forecast, and combine these to give a loss rate. Default losses are part of credit excess returns.

Fig. 8.1: US IG corporate bond index yield decomposition (%)



Source: ASI, ICE indices, Bloomberg, September 2018.
Note: Chart compares index yield-to-maturity and option-adjusted spread.

Investment-grade versus high-yield bonds

Corporate bonds have different degrees of credit risk. Bonds issued by financially strong companies have high credit ratings (from AAA to BBB) and normally carry low credit risk. Their default rates are very low (less than 1%) and, as a result, their spread over government bonds is also low. US 'investment-grade' (IG) bonds have an average spread of around 155 basis points over the past 20 years.[1]

Bonds issued by weaker companies have lower credit ratings (BB or lower), higher default rates and higher credit spreads. These bonds are not eligible for inclusion in the investment-grade indices and find a place in the 'high-yield' (HY) index. The US high-yield index has an average spread of around 570 basis points over the past 20 years.[2]

[1] Source: Deutsche Bank, Bloomberg, August 2018.
[2] Source: Deutsche Bank, Bloomberg, August 2018.

For the US high-yield index, the long-term average default rate is around 4% per year. The recovery rate is a little below 50%, giving an expected loss rate of around 2% per year, which is subtracted from our forecasts for long-term bond returns.[3]

For investment-grade bond indices, defaults are highly unusual because high-rated bonds will typically be downgraded and fall out of the index before default occurs. As such, defaults have little direct bearing on our returns forecasts. However, there is a parallel source of loss.

The process of bonds falling out of the index reduces returns from investment-grade bond indices. Bonds will typically 'price in' bad news before being removed from the index. So the index return is lower than the average yield would suggest – income returns are offset by losses from ratings downgrades. Over long horizons, this may cut the annual excess return from investment-grade credit indices to something in the region of half the credit spread, although this is highly variable. Our models take this into account.

Maturity differences

Investment-grade bonds tend to have longer maturities than high-yield bonds. This is important, because it means the duration of the indices differs significantly.

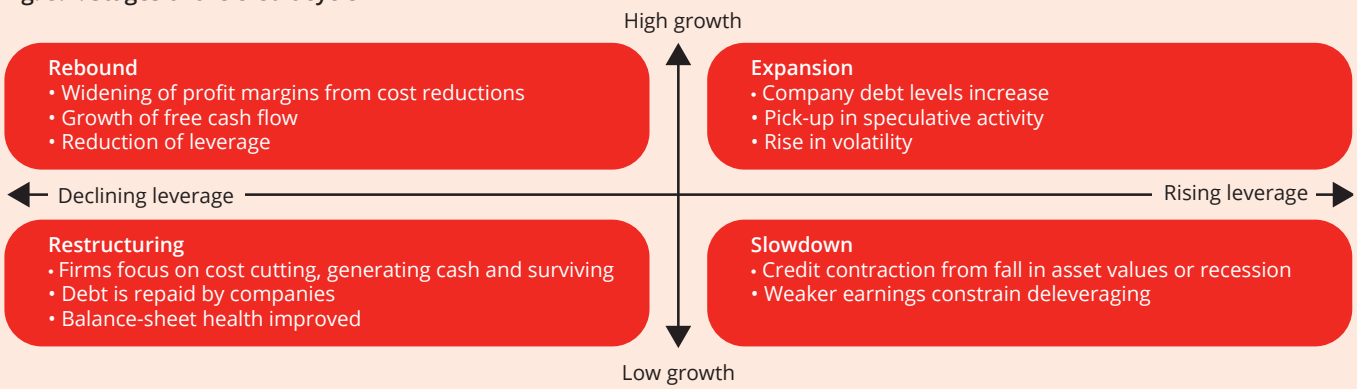
The combination of lower credit spreads and higher duration means that investment-grade bond returns are more similar to government-bond returns and less influenced by credit risk, and vice versa for high-yield bonds.

Bonds in different regions have different combinations of these risks. UK investment-grade bonds tend to have longer maturities, so they are more influenced by duration risk than US investment-grade bonds.

The credit cycle

The credit cycle is one of the most important factors when thinking about credit risk. It describes the expansion and contraction of access to credit over time, and is generally aligned with the business cycle. A stylised credit cycle proceeds through some distinct stages, as seen in figure 8.2.

Fig. 8.2: Stages of the credit cycle



Source: ASI, February 2017.

At the beginning of the cycle, in the period following a recession, many of the weakest companies have defaulted on their bonds and have been removed from the bond index. Companies that survived the recession have reduced leverage on their balance sheets. Corporate bond issuers tend to be in fairly good financial shape, and bond indices have reduced exposure to vulnerable companies. As a result, default rates are low and credit spreads are tight.

This benign environment may last several years, but as the cycle develops and memory of the recession fades, companies start to become increasingly enthusiastic about their prospects. They tend to borrow more, allowing 'financial excesses' to build in the system. Investors start to become nervous about credit risk and spreads may begin to rise.

As the cycle matures, central banks raise interest rates, making funding costs higher. Corporate earnings are often weaker as companies face higher borrowing costs and margins are squeezed. Weaker companies, now highly leveraged, begin to struggle. Default rates start creeping up and credit spreads rise further.

This process can become self-reinforcing. Higher interest rates and wider credit spreads make it harder for companies to refinance when their existing bonds mature, increasing default risks. Normally, at this point, spreads widen and there is a surge in defaults as the cycle comes to an end, possibly culminating in a recession and preparing the ground for a new cycle.

The end-of-cycle spike in yields and defaults can have a dramatic effect on investment returns. Remember, the excess return on corporate bonds is a function of the change in yield and the default loss. If we put some indicative numbers to this, high-yield credit spreads could widen from an initial 4% to a high of 10% or more over the course of the cycle. Default rates might also rise from 2% to 10% per year.

This translates roughly into a capital loss from default of 5% (10% default rate x 50% recovery rate, assuming the spike lasts one year) and a capital loss from widening spreads of 24% (duration 4 years x 6% change in yield). This would result in a 29% loss by the end of the cycle, only partially offset by higher income from the 6% wider spreads.

The good news for high-yield credit investors is that, as spreads fall back to normal levels after the economy picks up and lenders become more comfortable taking credit risk, they enjoy a symmetrical positive capital return. Buy-and-hold investors suffer permanent losses from the higher default rate, but this is at least partially offset by higher income. In the end, long-term investors may not be permanently affected, but nervous investors who sell when spreads are wide suffer most.

[3] Source: Moody's Annual default study: corporate default and recovery, 1920–2016, February 2017.

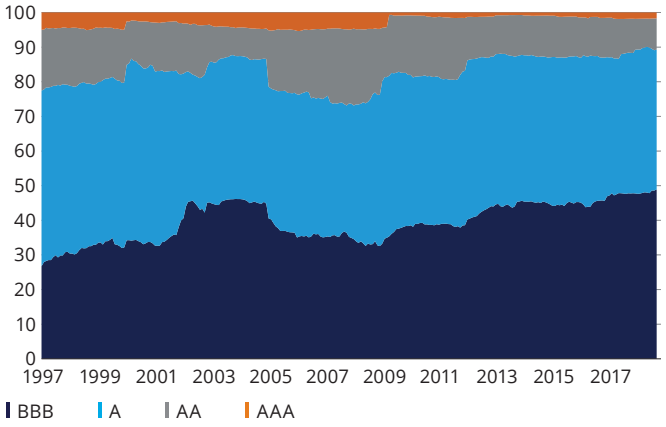
Our approach to forecasting corporate bond returns

Long term

Over a 10-year horizon, we assume credit spreads revert to their long-term 'fair value' level. This can have important implications for returns. If current spreads are unusually high (maybe when nearing the end of the credit cycle or when markets are nervous), this results in a high return forecast because we assume that, over time, spreads will return to normal levels. Similarly, we assume default losses revert to long-term average levels over 10 years.

Our long-term average spread level estimates attempt to take into account changes to the composition of credit indices over time. Some credit indices have changed materially over the past 20 years or so, both in average maturity and average credit quality. A large part of this change has been for structural reasons. Most notably, in the US, the corporate bond market has deepened considerably and the provision of financing to large companies has moved almost entirely from banks to the bond market. As a result, issuance of bonds with lower ratings has become much more common. Indeed, the average rating of bonds in both the investment-grade and high-yield indices has fallen. Bonds with BBB ratings made up under 30% of the US investment-grade index in the late 90s, but are now approaching 50% of the index, as seen in figure 8.3.

Fig. 8.3: US IG corporate bond index, breakdown by rating (%)



Source: ASI, Bank of America Merrill Lynch, September 2018.

Similar trends have been evident elsewhere, in particular in the UK and Eurozone, where bond market capital provision has been replacing bank funding fairly briskly. The resulting structural change in index composition must be taken into account when measuring long-run spread reversion levels. For indices that have seen a structural reduction in credit quality, a long-run median of historical index spreads would most likely understate the fair-value spread, given today's index constituents.

Average maturities have also changed significantly over the period for some credit indices. The US high-yield index has seen average maturity fall by around two years (from about 8.5 to 6.0 years) over the past two decades.

The impact of changing maturity on average spreads is not necessarily so clear cut. For high-grade bond indices, spreads would generally be expected to increase as maturity (or duration) increases. Investors require more compensation to hold long-maturity bonds, with some credit risk, than short-maturity ones, as the chance of credit quality deteriorating at longer horizons is higher. There is a credit risk 'term premium', along similar lines to the government-bond term premium.

However, for lower quality corporate bonds where default is more likely, spreads might decrease as maturities increase. For longer-dated bonds, a greater proportion of the total cash payments due are coupons, but shorter-dated bonds are due to be paid the principal of the bond in the near future. This large one-off lump sum payment might be more risky than smaller regular interest payments, and so requires a bigger discount. As a result, spreads may be higher at shorter maturities. By considering changes in the maturity breakdown of indices, we hope to account for this.

> "US IG credit quality has deteriorated in the last decade, suggesting higher fair value spreads than in the past."

It is worth noting that average ratings and maturities are also sensitive to economic conditions. A rapid deterioration in the macro backdrop can cause big shifts in index composition as bonds are downgraded, for example. However, over a long history, say 20 years, structural changes are likely to dominate.

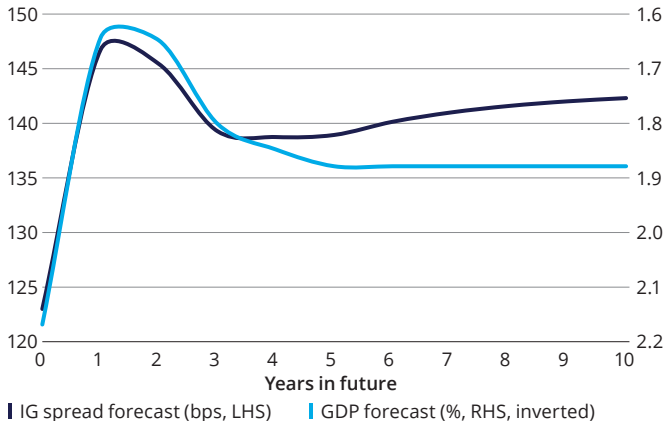
In order to account for these structural shifts, we take a median spread over 20 years for each rating and maturity bucket (for example, US HY BB-rated 3–5-year maturity). Although credit spreads within these narrow buckets are still volatile as broad credit risk varies, within each bucket the credit quality and maturity is held approximately constant. We then combine these median spreads using recent (12-month average) weights on the various buckets to give an index-level spread that reflects an up-to-date composition.

Medium term

Over a three to five-year horizon, our economic outlook, along with our view of the stage the credit cycle has reached, are central to our approach to forecasting credit returns.

We use a simple proprietary model for forecasting credit spreads, based on a few important factors. First, to ensure our credit forecasts are consistent with our broad economic forecasts, we link our views on credit spreads directly to macro variables. Empirical evidence suggests a reasonably strong relationship between GDP forecast changes and credit spread moves,[4] especially for the US. This is reflected in our model.

Fig. 8.4: US credit spread forecasts based on GDP forecasts



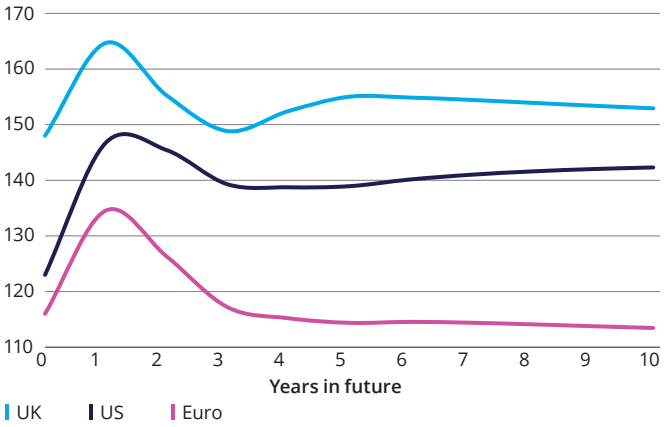
Source: ASI, Bloomberg, ICE indices, 2H2018.
Note: Forecasts are for corporate bond option-adjusted spreads on ICE indices. Projections are estimates and provide no guarantee of future results.

Second, credit spreads are highly correlated across markets, as seen in figure 8.6. This reflects the global nature of most of the risks faced by credit investors. We capture this by relating spreads on all corporate bond indices to spreads on US IG.

Third, credit spreads are known to exhibit mean-reverting properties.[5] We make use of this in our model, by assuming that spreads will revert gradually to our assessment of the long-run, fair-value level. Empirical evidence suggests reversion has a half-life of around two years – that is, in the absence of other influences, half of the gap between credit spreads and the long run fair value will be closed every two years.

"Our medium-term recession risk indicator gives us a rough guide to the position in the credit cycle."

Fig. 8.5: IG credit spread forecasts (in basis points)



Source: ASI, Bloomberg, ICE indices, 2H2018.
Note: Forecasts are for corporate bond option-adjusted spreads on ICE indices. Projections are estimates and provide no guarantee of future results.

We also use our medium-term recession risk indicator to give us a rough guide to the position in the credit cycle. Typically, a recession coincides with the end of the credit cycle, as the two cycles are causally linked in various ways. For example, a recession would most likely result in a collapse in corporate earnings, which forces weaker companies into default. Equally, a sharp tightening in credit availability could result in a recession. It is highly unlikely that a recession would occur without triggering a wave of defaults, and vice versa. As described in Chapter 4, this indicator is also used to inform our scenarios for GDP growth, so influences our credit-spread forecasts.

When our medium-term recession risk indicator suggests recession risks are very low and the business cycle has several more years to run, we assume credit defaults will be below their long-term average. At mid-cycle, when recession risks are at their average level, we assume defaults will be around their long-term average. Then, as we get to late cycle, we assume a rising path for defaults.

Recession risk is not the whole story. For example, in 2016, the US energy sector underwent a major default cycle following the collapse of oil prices over 2014 and 2015. This resulted in very wide spreads on bonds from oil-related companies and a high default rate. Credit spreads increased elsewhere over 2015 and early 2016 due to fears that credit problems might emerge in other sectors. In the end, this turned out not to be the case, and credit spreads fell sharply during 2016, back towards average levels (and providing investors with a bumper capital return). We consider a range of factors in coming to our credit views, such as average corporate leverage levels, interest servicing cover and earnings growth. Pulling these factors together, we take a view on credit defaults over the first few years of our forecast period. Often this will involve accelerating or delaying reversion to our long-run-average estimates.

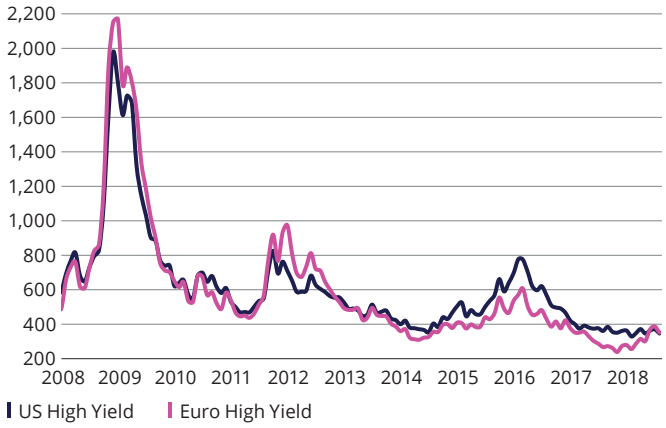
[4] Brahimi (2017) The impact of macroeconomic indicators on credit spreads.
[5] Bhanot (2004) What causes mean reversion in corporate bond index spreads? The impact of survival.

Our view on corporate bond returns

The most important factor for our return forecasts is the gap between initial spreads and long-term fair values. Over 2018, corporate credit spreads have generally risen from near post-crisis lows in late 2017. Investment-grade spreads are now close to fair value in the UK and Europe. High-yield spreads remain well below fair value despite rising in Europe, as seen in figure 8.6. As a result, we are relatively more optimistic on risk-adjusted excess returns from higher-grade issuers.

The environment for credit has largely remained benign, with above-trend growth and still-easy monetary policy overall. Risk sentiment wobbled early in the year, but since picked up, at least in developed markets. Corporate default rates are also currently very low, across both Europe and the US, where high-yield default rates have dropped back after the 2016 energy-related spike. However, continued Fed tightening may be playing a role in the gradual increase in credit spreads, along with some concerns that the credit cycle has been in an expansion phase for a long period.

Fig. 8.6: Low current high-yield credit spreads (in basis points)



Source: Bloomberg, ICE indices, August 2018.

One area of concern is a gradual loosening in covenant protections for investors. Covenants are terms in the legal agreement between bond issuers and holders, which make requirements of the issuer. These might include restrictions on issuing debt above a specified limit, or a requirement on disclosures to investors. Some analysts have suggested that the amount of protection offered to investors by covenants on the latest bond issues has fallen close to the weakest levels on record.[6] This might suggest wider fair-value spreads on corporate bonds would be appropriate.

US credit outlook

Our scenario-weighted economic forecasts for the US paint a slightly soft picture for corporate credit spreads. Although growth has been particularly strong recently, thanks largely to the sizeable fiscal stimulus package enacted by the Trump administration, our forecast is for a material slowing over the next couple of years as the impact of fiscal stimulus wears off and tighter Fed policy begins to bite. This results in widening credit-spread forecasts in the US, for both investment-grade and high-yield indices.

There are some risks to the US credit cycle, as flagged by our recession risk indicator. Leverage has built up in some areas, with auto loans of some concern to policy makers. However, net corporate leverage does not appear to be a pressing risk while profit margins and interest coverage ratios are high. Equally, the US energy sector has now repaired balance sheets.

> "The credit cycle in Europe is in some ways probably at an earlier stage than in the US. But if the US credit cycle were to come to an end, we would almost certainly see European spreads widen in sympathy."

A possible headwind to returns is a rise in underlying government-bond yields as the Fed raises policy interest rates. This is a particular issue for investment-grade credit, which has a higher duration (and so a higher capital loss from rising yields), although for some investors it is possible to hedge this duration risk. Higher rates also create a refinancing risk: as bonds that were issued when rates were low expire, new ones must be issued at higher rates.

Defaults have fallen back

After the oil-related spike in early 2016, defaults on US high-yield bonds have fallen back to around 2%, well below the long-run average of around 4%. The credit outlook is fairly sanguine, so we expect this rate of defaults to continue for a year before an increase in defaults to average levels, as the credit cycle is maturing.

The extent of ratings downgrades of high quality companies is also modest. The rate at which investment-grade companies were downgraded to junk status was around 1.9% in 2017, well below the long-run average of over 5%.[7] This could suggest that the end of the credit cycle is still some way off. Nevertheless, low spreads provide a relatively low reward for bearing credit risk.

[6] Moody's (2017) North American high-yield bond covenant quality weakens across rating categories in August.
[7] S&P (2018) 2017 Annual Global Corporate Default Study And Rating Transitions.

European credit outlook

The credit cycle in Europe is probably at an earlier stage than in the US. European economies still have significant output gaps and interest rates are likely to remain low for some years, despite above-trend growth. Some companies, especially financials, are still deleveraging their balance sheets. This is a particularly benign environment for credit, and suggests that the European credit cycle has longer to run.

However, even if the stage of the credit cycle in Europe would suggest a more positive view than for the US, there is good reason to expect contagion in credit markets. Most straightforwardly, many of the corporate bond issuers are global companies, so are only partially affected by the local credit environment. Equally, if the US credit cycle were to come to an end, we would almost certainly see European spreads widen in sympathy, and a wave of defaults. As a result, we forecast European credit spreads to widen over the next couple of years, but by less than their US equivalents.

European defaults have been remarkably stable since the financial crisis, running at a rate of close to 2% a year for high-yield issuers. We expect this to continue for a couple of years, before returning to a long-term average of 3%.

Fig. 8.7: Global credit returns

	3Y	5Y	10Y
UK Investment Grade	1.9	2.3	2.9
US Investment Grade	3.6	3.8	4.0
Euro Investment Grade	0.8	1.2	1.8
US High Yield	4.2	4.7	5.3
Europe High Yield	1.5	2.1	3.1

Source: ASI, 2H2018.
Note: Returns are in local currency and in percentage, per annum.
Projections are estimates and provide no guarantee of future returns.

"Our forecasts for weaker growth and higher US rates suggest strains will build in US credit, resulting in wider spreads for both investment-grade and high-yield indices."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09

Alternative credit

- Post-crisis regulations have pushed banks to retreat from credit finance, making space for investors
- Higher allocations to senior secured loans, direct lending, private debt, ABS and a range of other credit opportunities have resulted
- Well-informed investors can benefit from additional risk premia from illiquidity and higher complexity in this sector

Alternative credit

Low bond yields have encouraged investors to look further afield for yielding assets. Since the financial crisis, new banking regulations have created opportunities for investors to replace banks in commercial lending. A thriving market has emerged, with investors providing credit directly to companies rather than via bond markets.

Approach

We divide alternative credit into three categories: corporate lending; asset backed securities (ABS); and a more eclectic pool of specialised credit opportunities, including insurance-linked securities (ILS), litigation finance and trade finance.

Ultimately, the credit risk premium is the core source of returns for most assets in this category, but these assets also have other benefits over conventional credit.

- They offer somewhat higher credit-risk-adjusted returns, earning an additional premium from their lower liquidity and additional complexity.
- Interest payments are often floating rate, so useful in a rising rate environment.
- Volatility tends to be lower, on average, than other forms of high-yield credit.
- Correlations with equity returns tend to be lower than conventional high-yield credit, so these assets can add portfolio diversification.

These features are particularly attractive to investors who are unhappy with low returns from conventional bonds, who expect rising US interest rates and who are concerned about equity valuations.

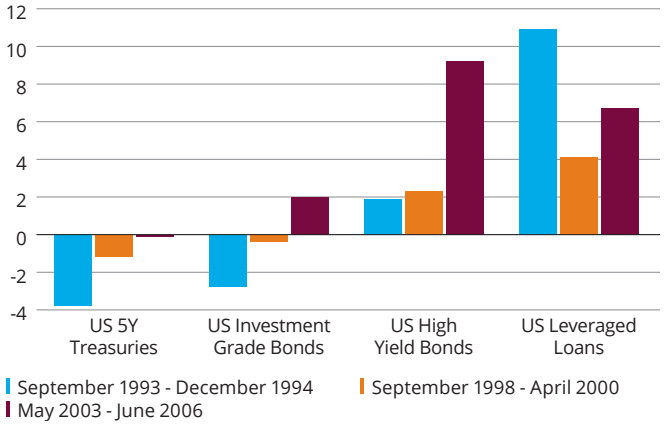
But there is also an important structural reason why this asset class has gathered momentum in recent years. Since the financial crisis, regulators have sought to reduce the risk of future bank failures by making it more difficult and expensive for banks to provide risky credit finance. The new Basel III regulations increase the amount of capital banks need to hold against riskier loans. Banks too have developed a more conservative view on risk. As a result, banks have withdrawn from many markets, removing an estimated $5 trillion of lending capacity. This has created a substantial new opportunity for asset managers and other institutional investors who can step in to fill the gap.

New technologies are also part of the story. New-technology-enabled platforms are allowing institutional and peer-to-peer lending to individuals and smaller companies. There is now a vibrant 'fintech' sector, which offers institutional investors a new way to provide finance to segments of the market that previously would have been the preserve of banks.

Floating-rate yields

One key feature of many alternative-credit assets is that they pay floating interest rates. As central banks raise policy interest rates, the interest paid by borrowers rises too. The interest paid is normally expressed as a spread above the domestic LIBOR or equivalent money-market interest rate (for example, LIBOR +4). Not all alternative credit assets have this feature, but most do.

Fig. 9.1: Senior loans: outperforming in a rising environment (%)



Source: ASI, October 2017.
Note: Total return during periods when the five year US treasury increases > 200bps. Selected for illustrative purposes only to demonstrate management style and not as an indication of future performance or investment recommendation.
Past performance is not a guide to future results.

As figure 9.1 shows, floating-rate yields are particularly attractive in the current strategic asset allocation environment. We expect the Fed to continue to raise US policy interest rates in the next few years and we expect the ECB should follow suit from the end of 2019. Rising interest rates are a drag on total returns for conventional corporate bonds, but boost returns for floating-rate credit. However, there are limits to this good news. If interest rates rise too high, higher interest costs will strain corporate balance sheets and increase credit risk.

Illiquidity, complexity premia and leverage

Many alternative-credit assets offer higher risk-adjusted spreads than conventional corporate credit. Currently, a BB CLO (collateralised loan obligation, see ABS section below) might offer a spread of 6% over government bonds, compared with only 4% for a conventional corporate bond with the same credit rating. Similarly, the yields available on more illiquid senior secured loans and smaller-scale club loans are significantly higher than conventional credit.

These higher returns are partly compensation for lower levels of liquidity. This is most obvious for direct lending, where no short-term liquidity is available. But it also applies to some extent to other alternative-credit assets, where the secondary market for loans is illiquid.

Another source of higher returns is the additional complexity of these assets and the greater difficulty of due diligence and access. Making a direct loan to a small business requires far more due diligence and legal work than buying a bond in the public markets, so higher returns are required.

Many vehicles – particularly US private debt and CLO equity – also gain higher returns as a result of the leverage employed in their structures.

While illiquidity, complexity and leverage may result in higher returns for investors, it is important to emphasise that these premia are being 'earned'. They are not costless. Only investors who can bear illiquidity in their portfolios, or who are comfortable with the complexities of ABS and the risks of higher leverage, should seek exposure to these assets.

Diversification

As we indicated in Chapter 1, a key challenge in today's investment environment is to find ways to diversify equity risk in portfolios, now that high-grade bonds no longer provide substantial returns.

Alternative credit can be helpful in this context. Cash flows for some categories of credit have lower sensitivity to the business cycle than conventional corporate credit. Insurance-linked securities are a good example. Their returns are linked to insurance events like severe hurricanes. These events have a low correlation with equity market crashes. Other examples of diversifying credit are litigation finance, medicines royalties and trade finance.

To a lesser extent, diversification is available from mortgaged-backed securities and direct lending. These assets are sensitive to economic downturns, but the specialist nature of market participants and the lower liquidity in the market mean that correlations with equity are lower than for high-yield corporate credit.

Lower volatility

Alternative-credit assets tend to have lower volatility than conventional credit with similar credit ratings. This is partly a function of the lower default rates, but it is also a function of the lower levels of liquidity in this market and the specialised nature of many market participants. There is less trading in response to news. However, we still expect spreads to widen materially during times of extreme market stress.

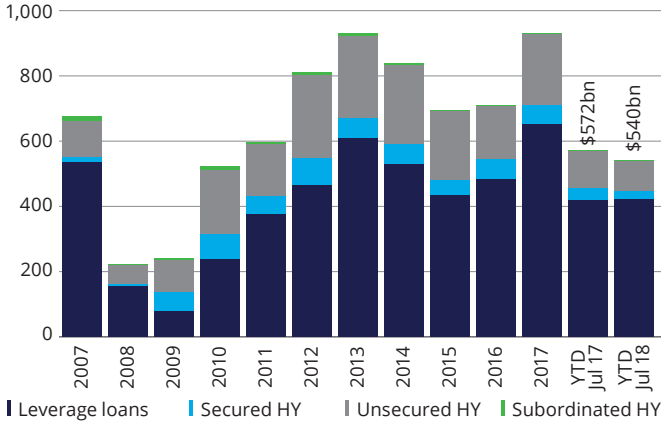
Alternative credit asset classes

The following is a summary of the major categories of alternative credit held in our portfolios.

Corporate loans

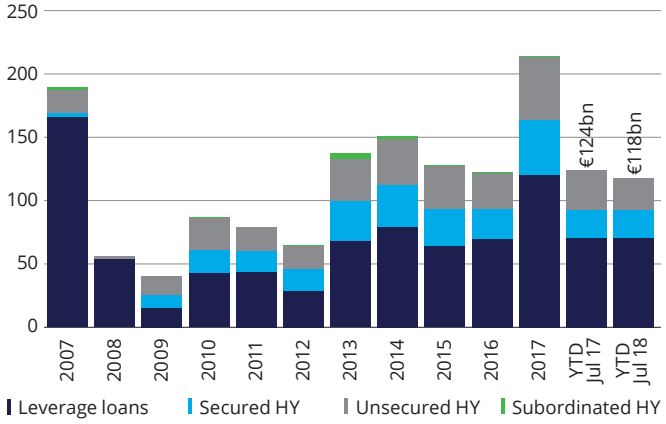
Corporates and financial institutions who do not have the scale to access the international capital markets by issuing bonds, or have a bespoke borrower requirement, often approach the loan market. Today they increasingly look to investors for their loans. It is not just small companies; larger companies, particularly those with sub-investment grade credit ratings, also increasingly borrow via a combination of bonds and syndicated loans. In fact, in recent years, syndicated loans have overtaken bonds as the major source of credit to this part of the market.

Fig. 9.2: US Senior loans new-issue volume (in $US bn)



Source: LCD, an offering of S&P Global Market Intelligence, August 2018.

Fig. 9.3: European Senior loans new-issue volume (in € bn)



Source: LCD, an offering of S&P Global Market Intelligence, August 2018.

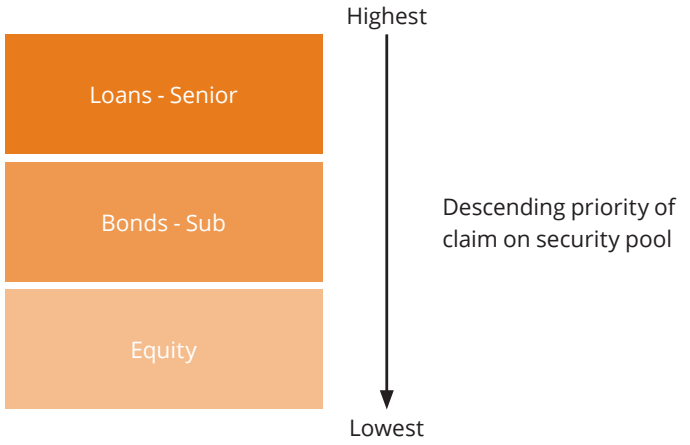
Senior secured syndicated loans

The most liquid segment of the corporate-loans market is syndicated loans issued by large companies. These loans are arranged and underwritten by a bank and then syndicated to a number of investors, including CLOs (discussed in the ABS section below), asset managers, credit opportunities funds and hedge funds. Bank investors often retain a small interest. Over 60% of the institutional demand for syndicated loans is from CLO investors.

The largest market for loans is the US, with over $2 trillion of loan assets. It has significant scope for investment opportunity and depth of liquidity, but there is also a mature market in Europe with over $0.5 trillion of assets. The emerging market loans universe is still largely populated by banks, although this is beginning to change.

Loans tend to be issued by companies with sub-investment-grade credit ratings – often the same companies that issue high yield bonds. However, these loans are 'senior' in the capital structure. They are first in the queue for repayment in the event of a company entering bankruptcy. Bonds are further down the pecking order (and equity is at the bottom).

Fig. 9.4: Loans: senior secured in structure



These loans are also 'secured' in the sense that loan holders have a claim on corporate assets. Loans also benefit from more comprehensive covenants and a closer relationship between lender and borrower. All this means that the risk of loss is lower than for comparable unsecured bonds. In the event of default, the historical recovery rate for senior secured loans is 70% versus 40% for high-yield bonds. However, as we discuss below, the poor covenant quality of recent loans means that recovery rates are likely to be lower than this in the next downturn.

Senior secured loans are much more liquid than direct loans to smaller companies. There is an active secondary market provided by banks and brokers. Large loans issued by well-known names are the most liquid, small unfamiliar loans the least. Investors earn a significant illiquidity premium of perhaps 100–200 basis points in the latter case. However, while loans do have some liquidity, they are less liquid than high yield. Loans are not securities and require due diligence and transfer fees to transact. Many participants buy and hold loans rather than actively trading portfolios, reducing liquidity.

As discussed previously, most loans pay a 'floating-rate' coupon. Coupons are typically linked to LIBOR, the standard money-market measure of short-term rates. So in today's rising interest-rate environment, loans are particularly attractive for investors.

Many loans also have a 'LIBOR floor'. This has been particularly important in recent years, where LIBOR rates have been near zero. A loan offering a 3% spread over LIBOR, with a floor of 1%, will pay a 4% coupon (3% + 1%) even if the current LIBOR rate is below 1%, as it was for much of the post-financial-crisis period.

Loans can be repaid before their maturity, as they typically have only six months' call protection. This makes them more flexible for companies, but can reduce expected returns, particularly in environments with falling credit spreads.

Approach to expected returns

Our approach for forecasting loan returns is similar to that used for high-yield bonds, forecasting the path of spreads and default losses.

Changes in yield are partly a function of our forecast for the path of LIBOR interest rates, to which loan coupons are linked. If a loan pays a 4% spread over LIBOR and we think policy interest rates will rise from 1% to 2% in two years' time, then the income yield will rise from 5% to 6% over the period.

Average LIBOR spreads for loans vary over time, broadly in line with mainstream corporate credit spreads. We take the current spread as our starting point and assume a reversion to the long-term mean spread over several years.

Calculating the capital return is more complicated. The fact that the coupons on loans float with LIBOR rates means that they have little interest-rate sensitivity – their 'duration' is near zero. However, the same is not true of spreads. Loans are marked to market and prices (and so spreads) can fluctuate significantly below and, to a lesser extent, above par, particularly in the US. So there is some capital return volatility along with the relatively stable income component.

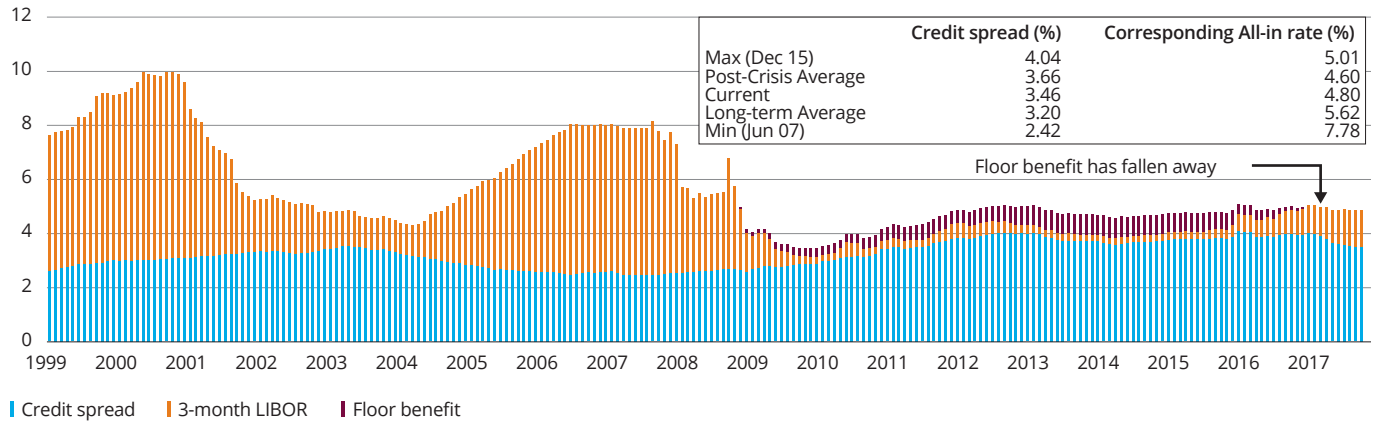
Outlook for senior secured syndicated loans

Credit risk premia have decompressed a little during 2018; however, for most credit assets, they are still a fair bit tighter than the long-run average. Loans are no different. Higher spreads mean higher income returns and lower expected capital loss when spreads return to long-term averages. On the other hand, these wider spreads are the expression of slightly higher market concern about future credit risks.

In the US, rising LIBOR rates (see figure 9.5) have pushed floating rate yields higher, improving yields. We expect LIBOR rates to rise steadily in the next three years as continued growth with low unemployment creates inflation pressure and a response from the Fed. This will further increase the yield on loan portfolios.

Our forecasts take account of expected losses. Current default rates are low, and the positive macroeconomic backdrop suggests a benign outlook for credit in the next year or two. There is much less certainty beyond that. We currently assume that expected default rates will rise to the cycle average as the credit cycle turns.

Fig. 9.5: Tightening credit spreads are compensated for by increasing LIBOR



Source: ASI, S&P/LSTA Leveraged Loan Index, St. Louis Federal Reserve, 30/09/2017. Credit spread and floor benefit data are shown on a weighted average basis. Past performance is not indicative of future results. LIBOR floor benefit is measured as the difference between prevailing LIBOR rates and the average LIBOR floor. Excludes facilities in default.

When estimating expected losses, we need to consider recovery rates as well as defaults. Historically, the seniority of loans led us to assume a 70% recovery rate. But there has been significant deterioration in covenant quality in the last few years. The majority of new loans have significantly weaker protections for investors than in the past. Given that we are probably approaching the later stages of the current credit cycle, this is a concern.

There are some benefits of weaker covenants – companies have more flexibility in managing financial distress and are less likely to be forced into default. But overall, weaker covenants are not good for borrowers. Investors should now expect a lower recovery rate, perhaps 60%.

This, together with relatively high corporate-leverage levels, encourages a more cautious view on credit risk.

Wider spreads means that our expected returns for loans are more appealing than last year, and, given their floating-rate yield and lower expected loss, loans are more attractive than high-yield bonds.

Direct lending

The syndicated loan market is based on large loans, typically several hundred million dollars, being subdivided between a number of syndicate members. Mid-sized and smaller companies do not have the scale to borrow such large amounts, and so do not have access to this market. In the past, they would have borrowed from banks. Today they increasingly borrow directly from individual investment funds or small groups of investors in 'club deals'.

Direct loans of this kind can be made with different levels of seniority – senior secured, second lien and junior.

The assets under management in private-debt funds have doubled in size in the last five years to around $600 billion. Over half of this total is in the US, with Europe as the next biggest region, by some margin. Though this popularity has also come with an increase in 'dry powder' (capital awaiting deployment).

Direct loans to individual companies are based on bespoke contracts and there is only a very limited secondary market. In general, investors must wait for the loan to be repaid at the end of its term. A revolving pool of loans maturing on different dates can offer some liquidity for investment funds. Nevertheless, this is necessarily a private market, where only investors who can bear a high degree of illiquidity can participate.

> "Post-crisis banking regulations have made it more expensive for banks to make longer term, riskier loans. Asset managers have stepped in to replace them."

This illiquidity earns a significant premium for investors. In addition, the fact that these loans are not underwritten by banks means there is greater due diligence and more legal work required. This greater complexity adds to the premium. As a result, yields are 3–4% higher than for conventional corporate credit, for the same perceived credit rating. Having said that, growing investor interest in this sector has led to some compression in this premium; the compensation for illiquidity is less generous.

European private-debt funds generally make little or no use of leverage at the fund level. In the US, leverage of one to two times is common. This increases both returns and risk. In recent years, the internal rate of return for private-debt funds has drifted downward from 10–12% in 2010 to 6–8% more recently. The long-term average is around 8%. This parallels a decline in credit-risk premia more generally. However, given low interest rates and highly compressed credit spreads in the public markets, even at 6–8%, there is still a meaningful premium for illiquidity.

Asset-backed securities

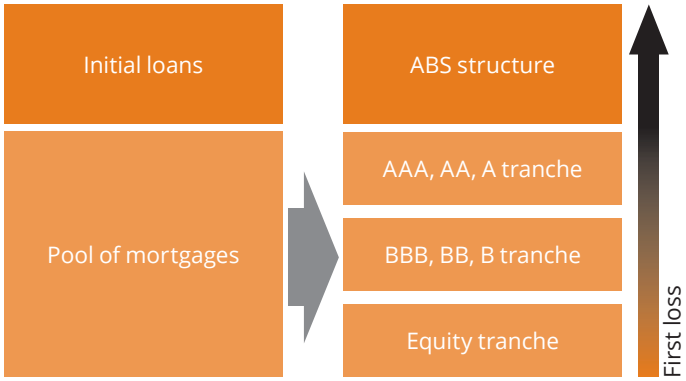
There are many different flavours of ABS, based on the different underlying pools of debt assets used to 'back' the securities. One of the biggest debt pools is the senior secured syndicated loans described in the previous section. These provide the asset-backing for collateralised loan obligations (CLOs). Another major source of securitisation assets is residential mortgages, which are transformed into residential mortgage-backed securities (RMBS). There are also various other forms of commercial real estate and consumer credit asset-backed securities.

How does the process of securitisation work? First, a bank or other arranger bundles a collection of loans (such as residential mortgages), and sells them to a free-standing investment vehicle created for the sole purpose of holding these assets. This vehicle then issues bonds or notes secured against the pool of assets. These new securities are organised in tranches, starting with the senior AAA tranche, progressing through AA, A, BBB, BB and more junior unrated notes and equity tranches. Interest payments from the underlying pool of loans are paid to the most senior tranches first, typically flowing down like a waterfall, to the next most senior, and then to the more junior, with the residual going to the equity holders. In the event of default, the reverse occurs: losses are borne first by the equity holders, then in sequence by junior, mezzanine and, lastly, senior investors.

> "Asset-backed securities take a pool of loans or mortgages and convert them into tradeable instruments with different risk-return profiles."

This process transforms an illiquid pool of mortgages or loans sitting inaccessibly on a bank's balance sheet into an array of liquid securities with different risk-return profiles, which can be bought and sold by investors. The bank gains by freeing its balance sheet capacity to make new loans or reducing its required regulatory capital, and investors benefit from gaining exposure to attractive credit assets.

Fig. 9.6: The process of securitisation



Source: ASI, October 2017.

Following new, post-financial-crisis risk-retention regulations, the originator of the ABS structure is required to hold an equity stake, which, in principle, ensures incentives are aligned. In addition, ABS structures tend to be 'over-collateralised'. They hold more assets than they are contractually required to pay out.

A key feature of the securitisation process is the way it transforms risk. An investor holding a portfolio of loans would typically expect a small percentage to default each year. By contrast, investors in a AAA tranche of a CLO would expect next to no default loss, even though these bonds are securitised against the same pool of loans. In the CLO structure the senior investors are protected by the junior tranches, who bear first loss. Of course, with lower credit risk, these AAA investors expect lower return.

The attraction of ABS structures is that they can take a homogenous basket of credit risks as input and transform them into a stack of tranches that meet a variety of different investor requirements: low risk, low return AAA assets for investors wanting a liquid return 30 or 40 basis points above cash; A-rated investment grade assets offering a return of 2% above cash; mezzanine BB and B assets offering cash +4% or 5%; and a riskier, leveraged equity tranche offering 10% or more above cash.

Our clients use the full range of ABS tranches as complements or replacements to their asset allocation to conventional credit.

The ABS track record

Any consideration of ABS has to take into account the experience during the 2008 financial crisis. The securitisation of US sub-prime mortgages provided the fuel that led to the collapse of Lehman Brothers and several other banks during the crisis, and the subsequent trillion-dollar international government bail-out effort.

While sub-prime mortgage ABS provided the fuel for this crisis, its huge scale was the result of poor risk management in banks. If the banks had not retained very large blocks of poor quality ABS securities on their balance sheets, their default would have been confined to investors: painful, but not a systemic financial crisis.

However, it is fair to say that banks held the assets in part because they did not understand the risks they were taking. Poor underwriting of loans, lack of awareness of conflicts of interest and inaccurate credit ratings mistakenly suggested default risk was extremely remote – and banks relied blindly on these ratings rather than their own due diligence. The complexity of securitisation and the opacity of underlying credit risks, as well as the irresponsible behaviour of some participants, all played a part.

It is important not to lose perspective, however – securitisation at its core is a tool for risk transfer and liquidity transformation. It was not the tool that caused the problem, but its misuse – and in some cases wilful misuse.

Regulators and the securitisation industry have both learned many lessons, and the frameworks of risk assessment, credit rating and structuring have improved considerably. Securitisations have also been subject to a new regulatory regime since the financial crisis. New rules have come into place to ensure better alignment of interest and governance in the structuring of asset-backed securities. For example, the risk retention rules now require originators to have 'skin in the game' in the securitisations they create (though the Trump

administration is now loosening some of this). In both the US and the UK, residential mortgage origination businesses have been brought under new consumer protection regulation. Data quality of the underlying loans has also improved since the crisis, with increasingly granular data available to investors across mortgage-backed securities and corporate data that allow for more accurate due diligence and, ultimately, the pricing of credit risk.

We also take comfort from the historical default and impairment data. The fact is, default losses in ABS were largely restricted to US sub-prime and a few related segments of the ABS market. The well-known failure of this small market segment masks the fact that the vast majority of ABS categories performed well – which is a surprise to many.

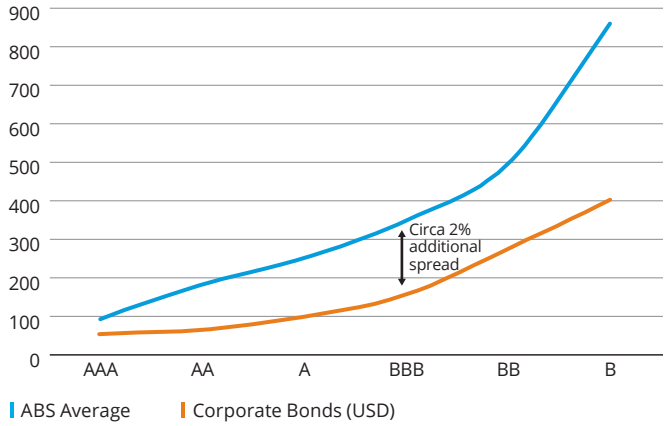
European RMBS and US CLO debt tranches for example, did not experience substantial default losses, even in what became a deep recession coupled with a financial crisis. There was considerable volatility in mark-to-market prices across the ABS spectrum, but this was true for almost all asset classes. ABS volatility was exacerbated by excessive leverage, and subsequent forced deleveraging by some investors. But, once the dust settled, the underlying losses for holders of debt tranches were very modest, even in what became the most extreme market stress environment of recent decades.

Expected returns

A key attraction of ABS for investors is the additional yield on offer. As figure 9.7 shows, for any given credit rating, the yield paid by the comparable ABS tranche is significantly higher than for corporate bonds. This spread is tightest for AAA and widest for junior ABS.

Outside the financial crisis, this spread has proven relatively stable over time. We consider it to reflect an additional risk premium to compensate investors for lower liquidity, additional complexity, lower recovery rates, and the understandable behavioural bias to avoid the area given the lingering taint arising from the role of sub-prime ABS in the crisis.

Fig. 9.7: ABS/Corporate spreads (in basis points)



Source: ASI, TwentyFour, Barclays, January 2017.
Note: Selected for illustrative purposes only to demonstrate management style and not as an indication of future performance or investment recommendation.

In forecasting returns, we use current spreads on ABS and adjust for expected losses. We also implicitly assume reinvestment at the same spread level.

When thinking about risk, we note that mark-to-market volatility and drawdowns were far higher in the financial crisis than in prior or subsequent periods. In our view, key drivers of these extreme drawdowns were the very tight spreads and high leverage levels of investors going into the crisis. Currently, there is an absence of leveraged investors and spreads are at far more attractive levels, providing a greater margin of safety. We therefore believe that the asset class is far less likely to suffer an extreme sell-off; though we remain vigilant to any changes in these key parameters. It is also worth noting that our concerns about poor covenant quality in the loans feeds through to CLOs.

Nevertheless, the additional spread for ABS yields suggests this class should deliver higher returns than conventional corporate credit at each credit rating, with somewhat lower volatility, and the added benefit of lower duration risk.

Specialised alternative credit

There are a number of more specialist areas in the alternative credit market. These assets can fulfil a useful purpose in portfolios, particularly because of the additional fundamental diversification they can bring.

Insurance-linked securities

The ILS market is a way of transferring the risk of insurance losses due to extreme natural catastrophes from insurers to capital-market investors. In return, investors receive a stream of insurance risk premiums. This market has grown markedly over the past 10 years, from $20 billion in 2008 to $89 billion in 2017. It is a small market compared to corporate credit and ABS. However, it is particularly attractive for diversification purposes.

> "Catastrophe bonds allow insurers to share the risk of disasters. This is attractive to investors because hurricanes are not correlated with stock market crashes: ILS provides strong diversification."

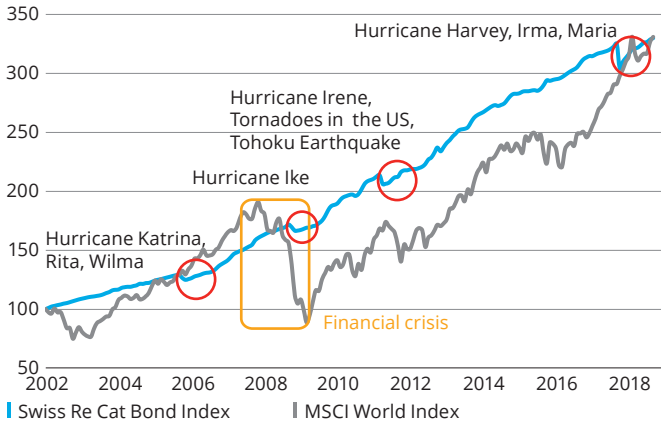
The market includes a diverse range of underlying risks including Florida hurricanes, Californian earthquakes, European storms, Australian floods and Japanese typhoons. The asset class can be accessed in two ways:

1. The catastrophe-bond market, which is an approximately $25 billion market and is the most accessible and liquid route for investors.
2. Investing with specialist managers who write direct reinsurance contracts with insurers and reinsurers. This amounts to around $50 billion of assets under management and is less liquid.

Catastrophe bonds pay investors a regular premium for bearing a share of the risk of loss associated with a specific event – such as US property damage associated with a severe hurricane. The value of a catastrophe bond falls if the risk event occurs and the insurer's losses exceed a certain threshold trigger – the recent US hurricane season is a case in point. Triggers can be structured to adjust the magnitude of actual losses borne by the issuer, thereby finding the most appropriate balance between reinsurance appeal and investor return.

Figure 9.8 shows that negative returns for catastrophe bonds are correlated with natural catastrophes, not equity market events.

Fig. 9.8: Returns of ILS compared to returns of equities



Source: ASI, Bloomberg, Swiss Re, September 2018.
Note: The chart shows that negative returns for catastrophe bonds are correlated with natural catastrophes, not equity market events. Rebased to 100 at 31 December, 2001. Past performance provides no guarantee of future results.

A major attraction of catastrophe bonds and other ILS is that their returns are uncorrelated with equities. Fluctuations in equity returns are driven by the business cycle. The worst equity losses occur during recessions; the best in recoveries. The risks for insurance-linked assets, on the other hand, are associated with natural disasters and other events that are unrelated to the business cycle. Hurricanes are not correlated to recessions.

In addition, investors typically hold a diversified portfolio of different kinds of insured risks, which are themselves uncorrelated, to ensure that any losses are spread over time.

Our projections for catastrophe bonds are derived from current market yields. Net of expected losses (but before any allowance for manager fees) this implies an expected return of around cash +2–3% per annum.

Specialist managers have the potential to offer higher returns. This reflects the ability to offer contracts more tailored to insurers'/reinsurers' requirements, writing protection at higher levels of risk and an illiquidity premium. Within this area the retrocession market (reinsuring the reinsurers) can offer particularly attractive returns.

Recent returns have been hit by the unusually severe 2017 hurricane season in the US. Hurricanes Harvey, Irma and Maria have led to high insurance claims, impacting the returns on the asset class. However, there were some mitigating factors. Harvey's damage was mostly via flood, which is typically not covered by standard insurance policies, and Irma just missed Miami, so the damage was significantly less than feared. The catastrophe bond market had a lucky escape with Irma and, as a result, the catastrophe bond index is only down a few per cent this year. Specialist funds have experienced greater losses (around 10–25%) in 2017–18, reflecting their lower payout thresholds.

While recent losses have been painful for current investors, they do demonstrate the diversification argument above. Hurricane losses in 2017 were offset by a good year for equity markets, with returns of +20%.

There is also another silver lining. The asset class tends to offer investors the highest returns in the period immediately following a major loss: premiums are usually highest at this point. As a result of this year's losses, we expect significantly higher expected returns in 2018 for specialist managers, especially in the retrocession market. There might be somewhat higher returns in the catastrophe bond market too, but the more limited losses mean that the uplift will most likely be lower.

Commercial real estate debt

Commercial real estate (CRE) loans provide mortgages to owners of commercial real estate, covering diverse sectors such as office, industrial and retail. Both senior and 'whole' loans are available. The latter are more exposed to credit risk and offer higher spreads as a result. Senior loans are typically conservatively underwritten, with average loan-to-values of approximately 60%, and are secured on the physical property with robust covenants. As a result, such loans usually get an investment-grade rating, and performance generally has a low correlation with broader economic growth. Both floating and fixed-rate loans are available, with tenors typically in the range of 4 to 12 years. We expect investment-grade CRE loans to deliver a spread of 300 basis points over LIBOR, 150 basis points higher than similarly rated corporate bonds. Expected returns should be around the same level as this yield.

Infrastructure debt

Infrastructure debt is used to finance infrastructure projects in diverse sectors such as transport, energy and social infrastructure (see Chapter 12, Real Assets). Many infrastructure projects are essential to the economy and to society, and therefore frequently benefit from explicit or implicit government support. Loans are typically secured on hard assets, and senior loans are often investment-grade quality. A key benefit of infrastructure loans is their low correlation to broad economic growth and other assets. Loans typically have long maturities – often in the range of 15–30 years – due to the long-term nature of the infrastructure projects they finance, and fully amortise over their life, providing investors a high-quality stream of reliable cash flows. We expect investment-grade infrastructure debt to offer a spread of 250 basis points over government bonds, 100 basis points higher than similarly rated investment-grade bonds.

Private placement debt

Corporate entities may choose to issue bonds privately, rather than publicly, for a variety of reasons. Large companies may only have a small incremental fundraising requirement, making a public issuance too costly. They may also value having a more concentrated investor base. Some issuers may be fundraising for a particular project that requires complex diligence, and therefore is not appropriate for public listing. Often, private-placement bonds are used to finance projects that have a notable infrastructure or real estate component, and are often secured by such assets. Although the loan is still made to the corporate entity and interest is paid from general corporate earnings rather than directly emanating from the underlying project or asset. Private-placement bonds are typically investment-grade quality with fixed-rate coupons, and widely varying maturities in the general range of 3 to 15 years. In the UK, we expect investment-grade private bonds to offer a spread of 200 basis points over government bonds, perhaps 50 basis points higher than conventional UK investment-grade bonds.

Distressed debt

In addition to direct lending, private-debt funds also specialise in distressed debt. These are loans from companies that are facing financial difficulties and whose prices have fallen to less than 80% of par value. Distressed-debt funds buy non-performing loans from banks and other lenders at a discount in the expectation that they can secure a positive return. They have been successful, generating an internal rate of return of 9.5% on average in the 2004–2014 period. This business is highly cyclical, with the largest number of opportunities appearing in recessions.

Small business lending

Another rapidly growing part of the direct-lending market is small business lending through platforms. For example, Funding Circle is a lending platform that has provided over £3 billion of loans to the small business sector in the UK, US and Europe, funded by institutional and individual investors. Given the positive economic benefits and job creation from small business lending, there is often support from government-backed development banks. These platforms have plugged the gap of reduced lending from the banking sector and have used technology to provide a more efficient and client-friendly lending experience.

Loans tend to be relatively short-term (2 years, for example) and the large volume of loans means there is a natural level of regular liquidity as loans mature. This is a relatively immature sector and so careful due diligence is required on the platform to ensure that the credit and operational processes are robust. However, this research can be well rewarded with expected returns of mid-to-high single digits, net of losses and costs, with low volatility.

"New 'fintech' investment platforms allow investors to lend money to small businesses, increasing capital availability for an under-served segment of the economy."

Litigation finance

Litigation finance is a relatively new asset class that has been very lucrative for many early investors. Specialist managers provide third-party financing for commercial litigation in return for a share of the settlement proceeds. This is particularly beneficial to smaller companies who lack the capital to fund expensive, drawn-out litigation (for example, against a large company that has stolen their intellectual capital) even if they have a cast-iron case.

Risk is diversified across a portfolio of individual cases. Funds in this sector have delivered attractive returns given the lack of competition from banks and the specialist expertise required. A key feature of this area is that returns are not related to economic factors and so are uncorrelated to equity markets.

Healthcare royalties

When a biotech company develops a successful medicine, they are rewarded with a royalty stream over a period of 10 years or more. However, the company is often keen to realise the value of that royalty stream so that they can reinvest in researching new medicines. This has led to healthcare royalties funds being established by specialist managers who buy these royalties and benefit from a healthy income stream. As with litigation finance, the risks to these cash flows are insensitive to the business cycle, or equity market sentiment, which drives equity risk.

Trade finance

Trade finance refers to the short-term financing of importers, exporters and other companies as they engage in the international trading of physical goods and/or services. It is a huge market (estimated at $16–18 trillion per annum) and is dominated by banks. Investor interest in trade finance is focused on regional funds that have developed a niche network of SMEs (such as Latin American food producers) or funds focused on supporting banks in their trade finance activities by alleviating capital needs. There is an increasing opportunity in the latter, given higher bank regulatory capital requirements.

Lending tends to be short term and is secured, meaning low historic loss rates. There are a variety of trade finance funds, some are low risk and low return while others play more specialised roles in the sector and can target returns in the high single digits. Return volatility tends to be low and has exhibited a low correlation with equities, even in stressed market environments.

Conclusion

As we have shown, alternative credit presents investors with a very wide set of opportunities. Some are essentially illiquid forms of conventional credit assets, offering investors a higher yield in return. Other forms of alternative credit are more interesting, offering investors exposure to very different kinds of risk – from hurricanes to lawsuits, and much in between. These niche asset classes offer the potential for attractive uncorrelated returns. These assets are particularly attractive in an age when high-grade bonds, the conventional diversifier of choice, offer such meagre returns.

10

Equities

- A relatively sluggish long-term growth outlook and elevated profit margins suggest a slower pace of earnings growth in the years ahead
- Equity valuations remain a little stretched, particularly in the US market (around 60% of the global total), but also to some extent in Europe
- Emerging-market equities are now offering much more value after their sell-off earlier this year, but rising US rates, a strong dollar and slower-growing China suggest caution

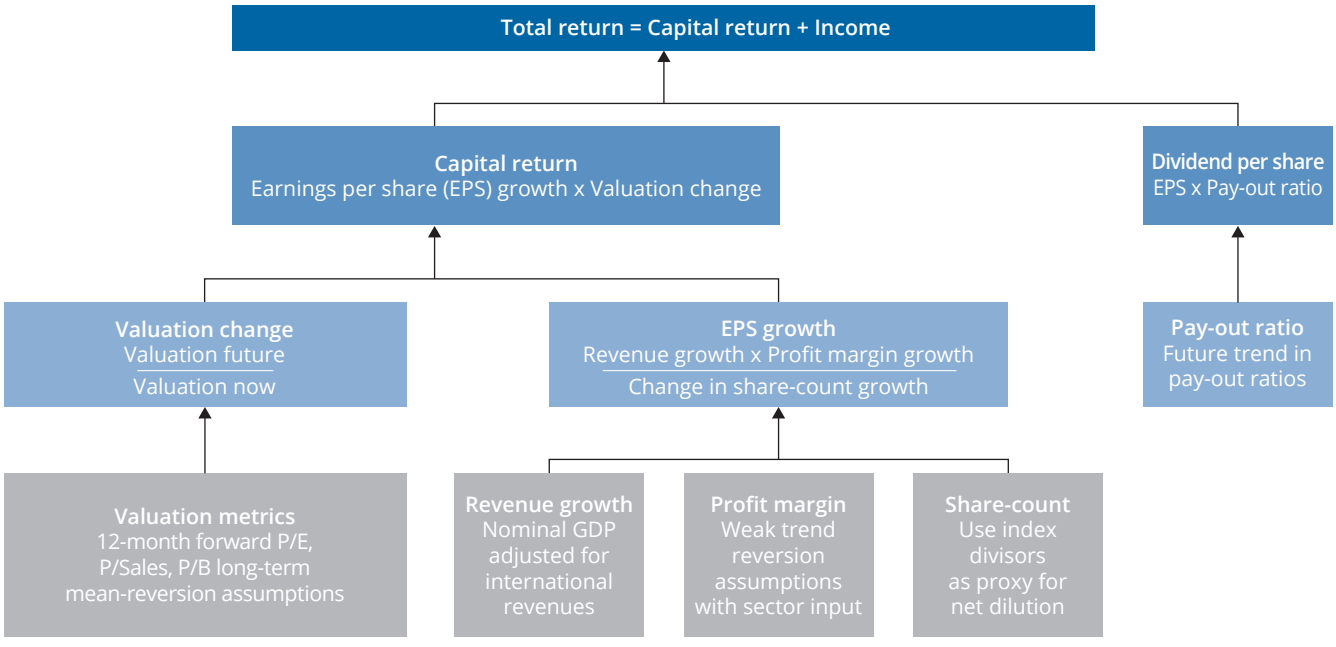
Equities

Historically, equities have provided investors with a handsome premium for bearing equity risk: a return of 5.6% per annum above short-term government bonds.[1] The equity risk premium (ERP) is large, not just because equity returns are volatile, but because the worst equity returns coincide with recessions; a time when investors particularly need their capital because wage incomes are at risk.

The equity risk premium varies widely through the business cycle. During good times, investors become complacent, demanding surprisingly little reward for bearing equity risk. But at the bottom of recessions, when risk aversion is highest, the equity risk premium can reach double digits. This variation is good news for strategic asset allocators: the cyclical nature of equity risk premia means that equity returns are to some extent forecastable.[2] Buying when equities are expensive, and the risk premium is compressed, tends to result in low long-term returns; buying when equities are cheap, and the risk premium is generous, delivers high long-term returns.

Enabling clients to take advantage of the cyclical shifts in equity risk premia is one of the most important ways that strategic asset allocation adds value for client portfolios. We believe that this valuation-based contribution adds value not only at the top level – allowing investors to trade between equities and other asset classes – but also between equity regions. As we discuss below, there is evidence that relative regional valuation predicts long-term relative returns. Rotating from expensive equity regions to cheap regions should help long-term portfolio returns – though there is some devil in the detail.

Fig. 10.1: Equity forecasting model



[1] Norges Bank (2016) Equity risk premium: discussion note.
[2] Cochrane (2012) Presidential address: discount rates. Journal of Finance.

Fig. 10.2: International revenues by source (%)

	UK	US	Europe ex UK	Japan	Developed Asia	Emerging Markets
UK equity	48.2	22.8	12.9	3.3	1.6	11.1
US equity	1.9	81.4	6.3	1.6	0.8	8.0
Europe ex UK equity	14.1	25.6	46.8	3.2	1.6	8.7
Japan equity	2.6	30.4	8.6	39.5	3.5	15.4
Pacific ex Japan equity	1.4	6.6	4.7	9.8	56.6	20.8
Emerging Markets equity	0.9	5.8	3.1	2.4	1.2	86.6

Source: ASI, HSBC, Oxford Economics, August 2018.
Note: Geographic breakdown of revenues by exposure to regional MSCI equity indices.

As an aside, finance research in the last 20 years has comprehensively demonstrated that the old idea that there is a single market-wide ERP is incomplete.[3] In fact, there are more granular risk premia related to value, size, quality, momentum and other factors in equity markets. These new risk premia add another dimension to equity investment. As we discuss at the end of this chapter, they can be exploited via 'smart beta' strategies. But, for now, we focus on the standard ERP that drives returns for the main equity market indices.

Our forecast for the ERP is based on three main factors: our views on corporate earnings growth, dividend levels and valuation multiples. These factors are sub-divided into their component parts (for example, earnings growth is a function of growth in revenues, profit margins and share count changes). We form a view of the likely trends for each component.[4] Figure 10.1 provides an indication of the relationship between them and the sources that inform our views on trends.

"Our forecast for the ERP is based on three main factors: our views on corporate earnings growth, dividend levels and valuation multiples."

Our forecasts operate at two levels: asset class – enabling clients to make informed allocation decisions between equities, government bonds and other classes – and regional – allowing them to make geographical allocation decisions. For some investors, this is as simple as the choice between their domestic market and international equities. For others, it is a more detailed decision about picking the most attractive regional equity market.

In both cases, the allocation decision is informed not only by our returns forecast, but also by our view of the relative risk of different assets and the correlation of their returns with one another. For example, emerging market equity returns are more volatile than developed markets, so higher expected returns are needed to compensate for the higher risk. Similarly, Japanese equities are typically less tightly correlated with other regions, offering greater diversification. We use a software optimisation tool to select the best combination of assets, given our expectations of return, risk and correlation.

Earnings growth

Over the long term, earnings per share (EPS) growth is a large and variable source of return for equity investors. In the last 50 years, there have been decade-long periods with very low EPS growth and other periods where growth has been rapid.[5]

To understand how EPS changes over time, it is useful to consider its components. The core drivers of earnings growth are growth in corporate revenues and changes in corporate profitability. In addition, to get a per-share growth rate, earnings must be adjusted for changes in share count, for example, due to share buybacks.

Revenue growth

Over the long term, economic growth is a good guide to corporate revenue growth. Gross domestic product measures the total output of an economy; and, in market economies, most of this output is composed of the sales companies make to households. The long-term correlation between growth and revenues is high.

There are two adjustments we need to make to GDP before we can use it as the basis for corporate revenue forecasts. GDP is expressed in real terms, after inflation has been subtracted. But corporate revenues are normally expressed in nominal terms (without subtracting inflation). So we use nominal GDP (real GDP + expected inflation) as the basis for our sales forecasts.

Another issue with using GDP to forecast revenues relates to the fact that a portion of the revenues of domestic companies comes from sales overseas. Overseas GDP growth might be slower or faster than domestic growth. For example, GDP growth in Japan is expected to be extremely low, but many Japanese companies derive a large share of their revenue from sales in faster-growing Asian countries. We need to adjust for this.

For each regional stock market index, we adjust our revenue growth assumptions to reflect the weighted average nominal GDP growth rates across the countries from which domestic companies generate their revenues. In some countries, this makes little difference, but in others the difference is large. The London stock market is a case in point: around 48% of FTSE 100 corporate revenues come from the UK, 23% from the US, 13% from the rest of Europe and 15% from the rest of the world. Figure 10.2 shows our assumptions for each region.

[3] Dimson, Marsh & Staunton (2017) Factor-Based Investing: The Long-Term Evidence Journal of Portfolio Management.
[4] This method is intuitive and has been found to be empirically effective. See for example Ferreira and Santa-Clara (2011) Forecasting Stock Market Returns: the sum of the parts is more than the whole. Journal of Financial Economics.
[5] Source: Aberdeen, Thomson Reuters Datastream, March 2017.

There is one final adjustment we make to overseas income. We need to consider our views on long-term exchange rates. Japanese companies, for example, generate half of their revenues from overseas. Today, we think the yen is fundamentally cheap (see Currency chapter), and we expect it to appreciate over the long term. This means that, in yen terms, the value of these overseas earnings will fall over time. We take our expectations for currency appreciation and depreciation into account when estimating the future local-currency value of each region's revenues.

Revenue growth outlook

We discuss our view on each region's growth outlook in more detail below. Our high-level summary view is that we expect somewhat lower revenue growth in the future than in the pre-crisis decade.

The global nominal growth outlook is significantly lower than in the period before the financial crisis, and well below the average of the last few decades. As we discussed in Chapter 2, this is a function of worsening demographics in most regions and relatively anaemic productivity growth. This leads us to assume somewhat lower growth rates for corporate revenues in the next decade than we have seen in the past.

The gap is particularly big for emerging markets. The decade up to 2010 was a golden period for emerging economies, with double-digit growth in nominal GDP. We expect emerging market growth to continue to be higher than for developed markets, but the gap is much smaller than it used to be.

Profit margins

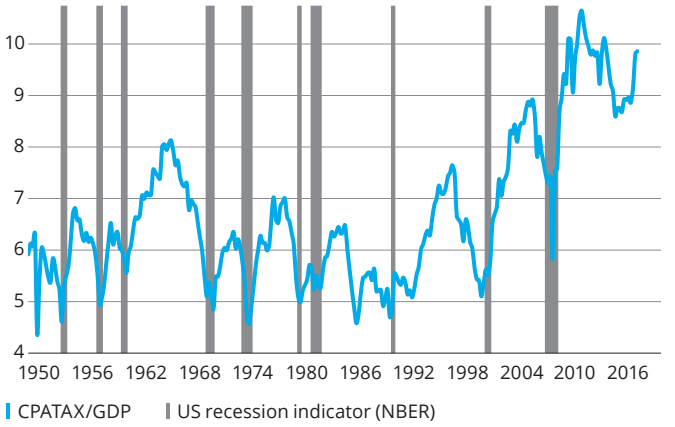
Earnings growth is not just a function of the 'top line', but also of corporate profitability. In fact, during the 1990s and 2000s, changes to the level of profit margins was a very large contributor to earnings growth.

Profit margins vary significantly over time. They show a strong cyclical pattern of expansion during economic recoveries and contraction before, and during, recessions. More significantly, in many regions they also show a marked upward trend over the last 20 years, particularly in the US. Figure 10.3 shows profits as a share of GDP, and provides an indication of these patterns.

It has often been assumed that profit margins revert to their long-term average over the course of the business cycle. This idea has intuitive appeal. If companies become extremely profitable, this will attract new entrants, and profit margins will be driven back down through increased competition, or so the argument goes. There is also some historical evidence for this. In the US, for much of the period between 1950 and 1990, profits seemed to mean-revert as a share of GDP.

However, as figure 10.3 shows, since 1990 the picture has been rather different. In the last 30 years, profit margins have increased substantially in the US and several other countries. Although there has still been some cyclicality, with margins collapsing as usual during recessions, the main trend has been steadily upward. Whether the upward trend in margins continues, plateaus or reverts to a lower mean is a key question for equity investors.

Fig. 10.3: US after-tax corporate profits to GDP (%)



Source: ASI, Federal Reserve Bank of St. Louis (FRED), Thomson Reuters Datastream, August 2018.

Certainly, expected returns would be dramatically lower if margins were to mean-revert to their post-1950 average. But we think this is very unlikely in the foreseeable future. We think aggregate profit margins are driven by structural trends in economies as well as compositional changes to stock market indices. These can override pressures for mean reversion.

"Whether the upward trend in margins continues, plateaus or reverts to a lower mean is a key question for equity investors."

Structural trends in margins

The winner-takes-all nature of the technology sector is one important factor for US profit margins. Many modern technologies have network effects that create a natural monopoly for incumbents. Microsoft with its Windows platform, Google with search, Apple with its high-quality ecosystem and Facebook with its social network all have high profit margins arising in part from the high barriers to entry.

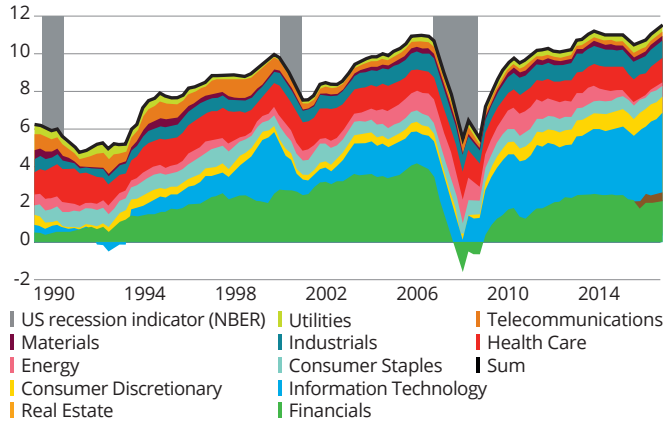
These companies' enviable competitive positions will not last forever, but they may last for a long time. Collectively, they reflect the emergence of an economic structure that is different to the pre-globalisation, pre-internet period, where these kinds of network-monopoly opportunities didn't exist to the same extent.

As a result, they overturn the mean-reversion logic described above. Potential new entrants may be attracted by Google's high profits, but they know that trying to compete with Google's dominant position in internet search-based advertising is a near-impossible task. The result is that Google's profit margins are not eroded by competition. Eventually a new technology will come along, disrupting Google's position, or competition regulators will step in, but neither is an immediate prospect.

For companies enjoying high barriers to entry, profit margins can remain permanently higher. If we decompose US profit margins by sector, it is clear that most of the long-term growth trend in margins has come from just two sectors: technology and banking, both of which have high barriers to entry. While post-financial-crisis regulation has somewhat weakened the profits available in the banking sector, margins in the technology sector have made up the difference.

On top of this, large US corporate tax cuts in 2018 mean that post-tax margins have now reached all-time highs.

Fig. 10.4: S&P 500 index historical sector earnings as a % of sales



Source: ASI, Bloomberg, Siblis Research, October 2017.
Note: Calculated as a function of index earnings/sales multiplied by index weighting. Past performance provide no guarantee of future results.

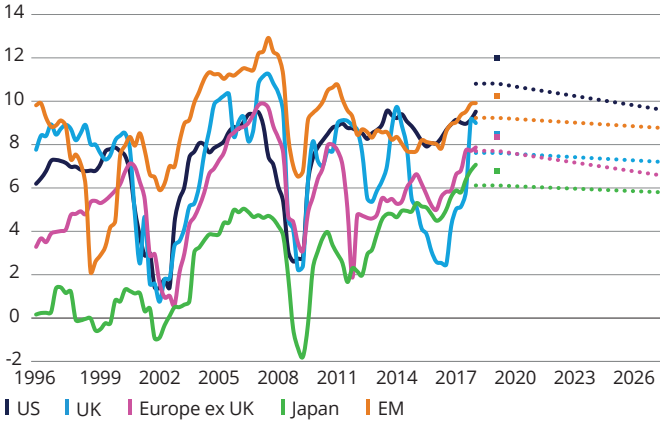
It is also worth noting how average profit margins relate to the changing composition of the index. As banks and tech companies have risen as a share of the total revenues of the US index, their high profit margins have assumed a greater weight. In 1980, the finance and IT sectors accounted for about 10% of the revenues of the S&P 500; by 2017, they were responsible for around 25% of revenues and a huge 40% of profits. These sectors now have much higher profit margins than average, and this has significantly raised the average profit margins of the index. It is unlikely that these sectors will shrink any time soon.

"The winner-takes-all nature of the technology sector has driven US profit margins sustainably higher."

This suggests high margins will persist in the US. We do not expect a material decline in margins to the much lower levels seen for most of the 20th century. On the other hand, we do not see a strong reason for margins to continue to rise above their current peak levels. Most of the secular rise in margins occurred during the 1990s and early 2000s. Since then, apart from the one-off boost from recent tax cuts, profit margins have been reasonably stable in the US.

Margins are relatively high in most parts of the world, but there are regional differences that we discuss at the end of this chapter.

Fig. 10.5: Historical profit margins and projections for consensus forecast margins (%)



Source: ASI, Bloomberg, 2H2018.
Note: Historical data uses trailing 12-month profit margins. Projections are informed by dividing both consensus forward 12-month Price/Sales by Price/Earnings, this forward profit margin value is presented in the square boxes. This starting point guides directionality of margins and explains the gap observed between trailing profit margins.

The cyclical outlook for margins and implications for EPS

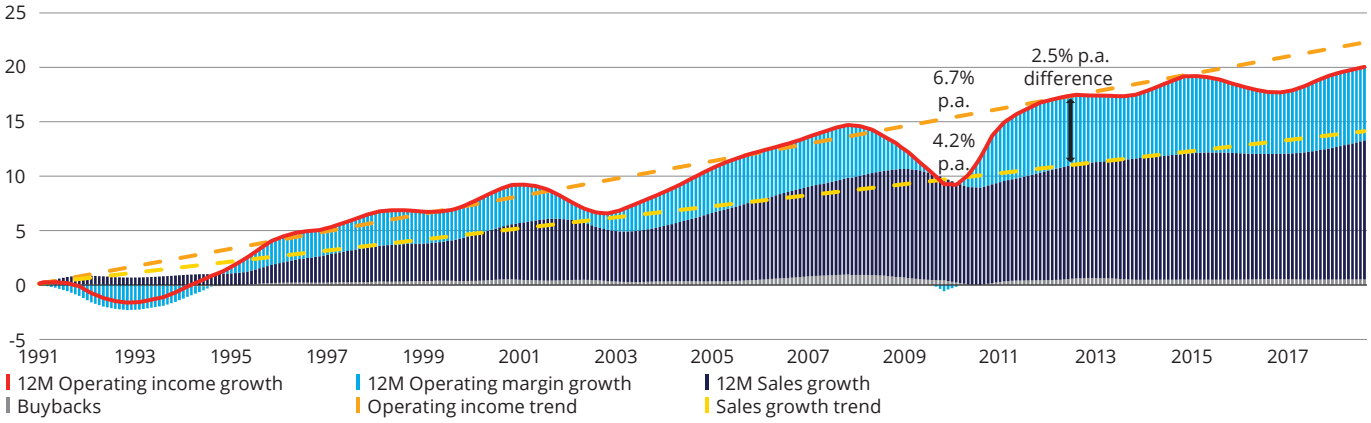
There is one final aspect of margins that we take into account in forecasting EPS. Our goal is to forecast a probability-weighted average value through the business cycle. This must take into account both good times like today, where margins are high, as well as recessionary periods where margins are much lower. As figure 10.5 shows, margins can fall dramatically during downturns, though recessionary periods tend to be much shorter than good times, so they receive less probability weight. We believe that we are at or near the peak of the cycle for margins. This means that, on a probability-weighted basis, our mean forecast is for margins to compress a little in the US and most other regions.

We combine the structural view on margins described in the previous section with our cyclical view. In principle, a further structural increase in margins above today's all-time-high levels could offset the cyclical-reversion effect described above. In practice, as we indicated above, we do not see a convincing case for US margins to expand materially from their current extreme level.

Consequently, our forecast EPS growth is a now lot lower than its long-run average. During the 1990s and early 2000s, US EPS growth received a substantial boost from the secular doubling in the level of margins. This is the blue area of the chart figure 10.6. During this period, EPS was driven by the 4% growth rate in sales, with the boost of an additional 2% growth in margins.

But now, with margins near their all-time peaks in the US and Japan, and not far from these levels in Europe, we suggest that margins are unlikely to continue add to sales growth. As a result, we expect EPS to only grow at 3–4% per annum, not the historical 5–6%. In fact, if anything, on the cyclical probability weighted basis discussed above, our mean forecast for margins is a little lower than today's level.

Fig. 10.6: S&P 500 index historical cumulative income growth (%)



Source: ASI, Bloomberg, September 2018.
Note: Data is calculated on a per share basis and excludes non-operating expenses such as interest and taxes in order to eliminate sector biases. The operating income and sales growth trend lines are for illustrative purposes. Past performance is not indicative of future results.

Share count

Investors often forecast EPS growth without thinking much about changes in the share count. But the number of shares in issue is an important consideration, particularly when thinking about returns at the market-index level.

Since the 1980s, companies in the US have increasingly used share buybacks as a means of returning cash to shareholders. By reducing the share count, buybacks increase the value of the remaining shares, boosting investor returns. However, the US is an exception – in most markets around the world, share count tends to increase over the long term, detracting from EPS growth.

In the US, in the last few years, there has been a net fall in share count of around 1% per year (which, roughly speaking, translates into a 1% boost to EPS). In other developed markets, it is the other way round, with net share issuance increasing at about 1% per year, reducing EPS growth by roughly this amount. The figure is rather higher in emerging markets and Asia, in particular.

There are two main sources of new shares. First, listed companies may raise capital via issuing new shares – so-called 'rights issues'. This dilutes the claims on earnings of existing shareholders.

The second is initial public offerings (IPOs), where private companies raise capital by issuing shares for sale on the public markets. This does not dilute the rights of investors in the companies already listed on the index. However, it does mean that a gap opens between the total earnings of the index and EPS. As companies join the index via IPOs, the index's total earnings rise, but the addition of newly listed shares means that total earnings per share may not.

This share count issue is most significant for emerging markets, particularly those in Asia. Rapid economic growth in Asia has been associated with equally rapid rates of company formation and public listing. In many respects, more new companies are good for these economies: they draw in new capital investment and, as a result, drive faster economic growth.

The problem is that investors sometimes see this rapid growth and assume that the value of their investments will grow equally fast. But they should remember that they have no claim on much of this faster growth. It is not generated organically by their existing investment, but instead by new capital provided by investors in the newly listed companies.

China's rapid growth in the 1990s provides a good illustration. From 1992 to 2002 the total market capitalisation of S&P/IFC China equity index rose from $18 billion to $681 billion, an annualised growth rate of 39%. You might imagine that investors in China were made very rich indeed. Sadly not. During this period, the number of companies listed in China rose from 52 to 1296; or an increase of 32% per year.

In other words, the growth in the total capital value of the market was not primarily from an increase in the value of existing shares. Instead it came from the addition of newly issued shares financed by the additional capital provided by the investors that purchased them. In fact, during the period in question, the price of the S&P/IFC China equity index grew by only 3.5% per year. Rapid economic growth is often driven in part by fast growth in the capital base, and so does not result in equally rapid appreciation in share prices.

Like IPOs, rights issues can also be more of a problem for emerging markets, as they tend to have less developed banking sectors and bond markets. So companies have tended to make more use of equity issuance to finance capital investment. However, this has gradually changed as EM credit markets deepen.

It is worth emphasising that this issue is more of a headwind for market-wide return forecasts than it is for active investors with concentrated portfolios. By ensuring stock selection is focused on companies with strong protections for minority shareholders, active investors can mitigate dilution from rights issues.

A simple way to illustrate this dilution point is by showing the gap between growth in earnings (or profits) and the growth in earnings per share. As a comparison of figure 10.7 and figure 10.8 shows, earnings grow much faster than EPS in emerging market indices. This is what you would expect with high levels of IPOs and rights issues. The reverse is true in the US, where EPS has grown a little faster than earnings in recent years. Again, this is what you would expect when there are net buybacks.

We take account of the change in share count when forecasting regional equity returns. Helpfully, stock market index companies incorporate net share issuance when calculating their index prices. This means that dividing market capitalisation by market price gives a reasonable estimate of the rate of change of share count. We look at the trend for each market and extrapolate to the future (see figures 10.9 and 10.10). We assume that, as emerging economies mature, the dilution rate falls somewhat.

Fig. 10.7: US and Emerging Markets equities earnings

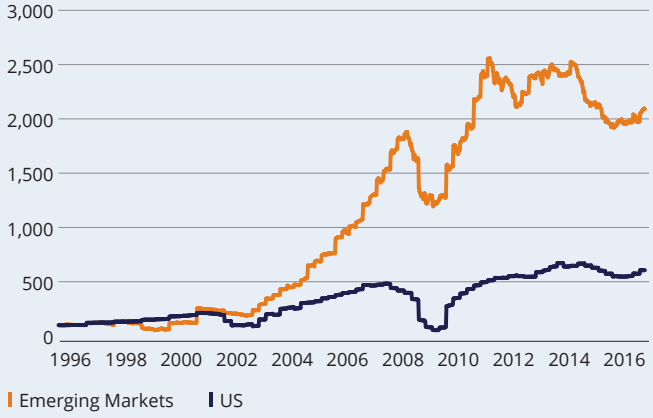
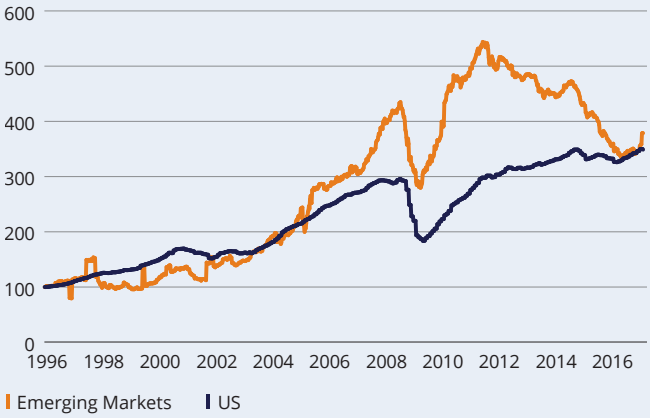


Fig. 10.8: US and Emerging Markets equities EPS



Source: ASI, Thomson Reuters Datastream, March 2017.
Note: Rebased to 100 at 1 January, 1996.

Fig. 10.9: US, UK, Europe ex UK equity 12M net share issuance (%)

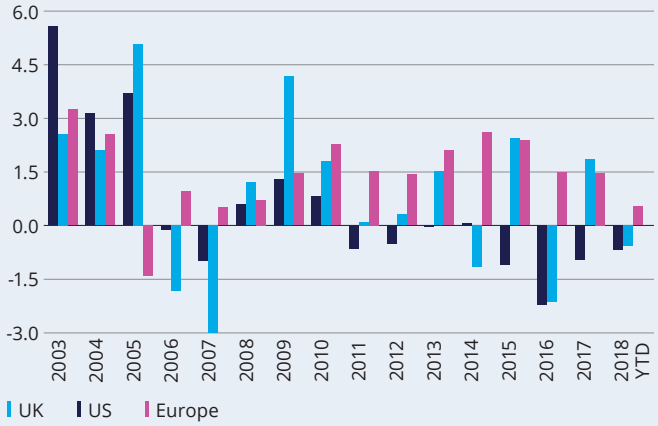
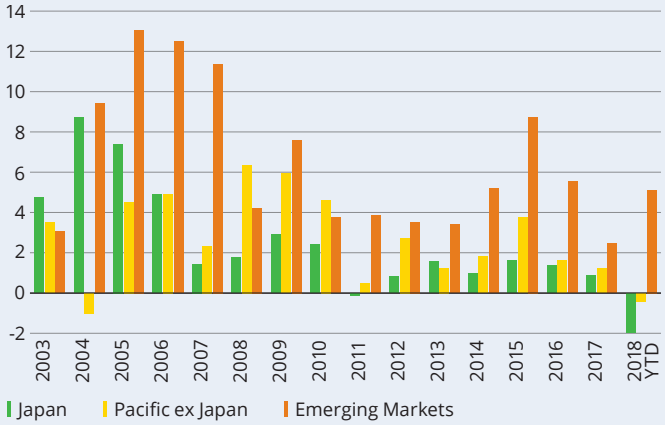


Fig. 10.10: Japan, Pacific ex Japan, Emerging Markets equity 12M net share issuance (%)



Source: ASI, Bloomberg, August 2018.
Note: Net share dilution is obtained through the 12-month change in the market divisor (index market value divided by price).

Equity valuation

While earnings growth is a key driver of long-term, multi-decade equity returns, on shorter, 3–10-year horizons, variations in equity risk premia have a more important role.[6]

Patterns of equity valuations over many business cycles suggest that, in good times, equity investors require relatively little compensation for bearing equity risk; but in bad times – and particularly during recessions – required compensation for risk is very high. This pattern can be seen in simple valuation metrics like the price/earnings ratio.

Fig. 10.11: S&P 500 index CAPE ratio

Source: Robert Shiller (Yale School of Management), September 2018.
Note: The cyclically adjusted price/earnings (CAPE) ratio is derived from the monthly stock price, dividends, and earnings data and the consumer price index (to allow conversion to real values), all starting January 1871.

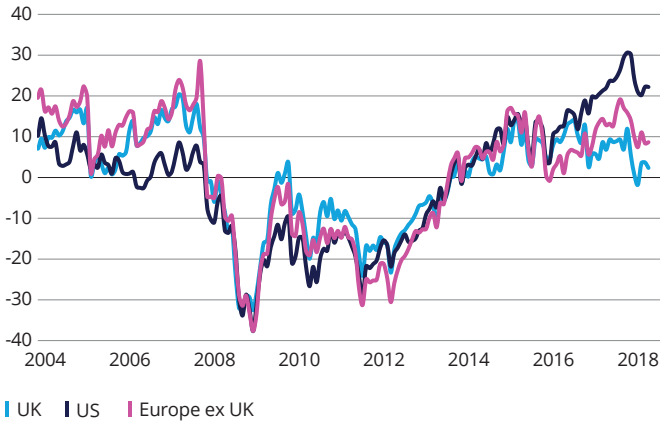
Figure 10.11 shows the well-known Shiller cyclically adjusted price-earnings (CAPE) ratio. As measured by this ratio, US equities have only twice been more expensive than they are today – during the 'dotcom' bubble and during the 1920s stock market boom. Both periods were followed by extended periods of low equity returns. Perhaps the most important question for equity investors today is whether this pattern will be repeated over the next decade.

The CAPE has its critics. The steep fall in earnings during the financial crisis perhaps distorts the average, overstating today's valuations.

But a similar picture is found in the basket of standard valuation metrics (figure 10.12) used in our equity forecasts: price/forward earnings; price/forward sales; price/book value; and dividend yield. We compare each ratio's current level to its long-term average. Figure 10.12 shows how the basket of valuation metrics above has varied against its 15-year average. The central 0% line indicates 'fair value'.

This valuation basket suggests US equities are over 20% above their 15-year average, an average that is itself elevated relative to longer histories. So while the CAPE may be overstating US valuations, equities are expensive on most measures. As the chart indicates, other regions are less expensive using our basket. Europe is the next most richly valued. UK and Pacific ex Japan are fair value, with Japan and emerging markets cheap.

Fig. 10.12: US, UK, Europe ex UK equity valuations (%) compared to 15-year average, 0% = fair value



Source: ASI, Bloomberg, July 2018.
Note: Chart shows the level of ASI's equity valuation basket versus its 15-year average. Underlying Price/Sales have been adjusted for structural changes to profit margins.

Do low interest rates justify high valuations?

A more fundamental objection is that today's high valuations are justified by the unusually low interest rate environment. The basic intuition here is seen in the standard dividend discount model. The fair value price of equity cash flows is a function of dividends, investor expectations for earnings growth and their discount rate.

$$P = D / (R - g)$$

In this formula, P is the fair value price, D is the dividend, g is the dividend growth rate, and R is the discount rate. R has two components, the risk-free rate and the equity risk premium (ERP).

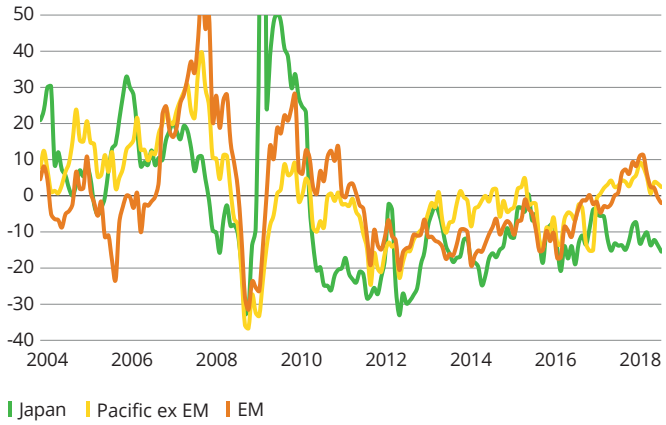
Today, the risk-free rate is very low. Short-term US government bonds have a yield of little over 1%. This is over 3% lower than the average in the five years before the financial crisis. And using the equation above, simple arithmetic says that if you have a lower discount rate (R), you get a higher fair value price (P).

A similar point is made using the well-known 'Fed' valuation model, which compares the equity earnings yield with the yield on a 10-year government bond. In this model, a high yield gap suggests equities are not expensive, and as figure 10.14 shows, the gap between these yields is actually rather high compared with the long-term average. As with the dividend discount model, the main reason why this gap is large is because the risk-free rate is low. Again, a low R justifies a high fair value price for equities.

> "Are today's high valuations justified by the unusually low interest rate environment?"

[6] Lettau and Ludvigson (2013). Shocks and crashes. NBER Macroeconomics annual.

Fig. 10.13: Japan, Pacific ex Japan, Emerging Markets equity valuations (%) compared to 15-year average, 0% = fair value



Source: ASI, Bloomberg, July 2018.
Note: Chart shows the level of ASI's equity valuation basket versus its 15-year average. Underlying Price/Sales have been adjusted for structural changes to profit margins.

This soothing view is not the whole story, however. First, while interest rates are low today, short-term interest rates are expected to rise, in the US at least, by one or two percentage points in the next few years. This would bring R closer to the long-term average, and close the gap in the Fed model.

But there is a more fundamental problem. As the dividend discount model suggests, the fair value price is not simply a function of the discount rate (R), it is also a function of the growth rate (g).

As we argued in the previous section, earnings growth in the US and elsewhere is likely to be significantly lower over the next decade than it has been in recent decades. This is partly because of the generally lower nominal economic growth environment, but also because profit margins are unlikely to keep expanding above their current all-time highs. In the dividend discount equation, P rises if you reduce R, but it falls if you reduce g. For equity valuations, lower expected earnings growth partly offsets the effect of lower interest rates.

This problem affects the Fed model too, which ignores growth altogether. This is one reason why it seems to suggest equities are cheap. There are other reasons why the Fed model is not a trustworthy source of guidance for equity investors (see box Correcting the Fed model).

If you adjust the Fed model so that it provides a mathematically accurate estimate of the equity risk premium, the picture changes markedly. As illustrated by figure 10.14, rather than being cheap compared to history, the adjusted Fed model suggests equities are expensive, in line with other valuation metrics described on the previous page.

Valuation is one of the most useful metrics for strategic asset allocation. Over long time horizons, realised returns are strongly and reliably negatively correlated with valuation levels.

Fig. 10.14: S&P 500 Index price-to-earnings correlations and ratios

	P/E (Forward 12M EPS)	P/E (Trailing 12M EPS)
Returns next year	-0.33	-0.31
Returns in next 3 years	-0.57	-0.41
Returns in next 5 years	-0.59	-0.42
Returns in next 10 years	-0.86	-0.74
Average historical P/E	16.7	16.5
Current P/E	18.3	21.8

Source: ASI, Bloomberg, March 2017.
Notes: Correlations measure relationship between P/E ratio and future total returns (including gross dividends), where a more negative correlation indicates stronger mean reversion. Forward 12M is calculated from Bloomberg broker estimates and consensus, which may exclude one-time extraordinary gains/losses. Trailing 12M is calculated using EPS before extraordinary items. Past performance provide no guarantee of future results.

If you buy when equities are expensive, you are very likely to get a relatively low return over the next decade. If you buy when they are cheap, you are more likely to get a higher return.

The negative correlation between valuation and future returns is stronger over longer periods. As figure 10.15 indicates, it is weak after one year; it is much stronger after three years, and has a very strong negative relationship with returns over periods longer than five years.

Strategic asset allocation adds value by routinely rebalancing portfolios away from assets that have become expensive to those that offer more value. For this reason, we include valuation mean reversion as a key element of our equity forecasts.

"Strategic asset allocation adds value by routinely rebalancing portfolios away from assets that have become expensive to those that offer more value."

We think US equities are now expensive, and so our return forecasts include a negative return contribution from valuation mean reversion for this region. This results in a low US equity forecast of around 4% per annum on a 5-year horizon.

This low average forecast does not necessarily mean we think that valuation mean reversion will happen immediately, or that returns in the next 12 months will be 4%. History shows that it can be several years before expensive assets revert to fair value. This is supported by the correlation data for short time horizons.

Typically, a substantial catalyst is needed to turn investor risk appetite persistently negative. We do not know when the next major risk aversion event will occur. There is a good chance it will not happen next year. But we are sure that eventually a catalyst will strike fear into markets, driving valuations back to the mean – or, more likely, to overshoot on the downside. Until such a catalyst arrives, equity returns may well be higher than our 5-year average forecast.

Correcting the Fed model

The Fed model (which, confusingly, has never been formally used by its namesake, the Federal Reserve) is intended to provide an indication of the size of the equity risk premium by subtracting the 10Y government-bond yield from the equity earnings yield (E/P).

There has been a robust academic debate on the merits of the Fed model. This largely concludes that the model is misleading and of little predictive value.[7] Empirical studies find that, in contrast with conventional valuation metrics, the model does not have any skill in forecasting future returns.[8]

The academic literature suggests the Fed model fails because it isn't in fact a good mathematical representation of the ERP. This can be seen with a little basic algebra, using the dividend discount model and the standard bond yield model.

This dividend discount model can be rearranged so that it expresses an earnings yield.

$E/P = ERP + r - g$

Earnings (E), price (P), real earnings growth (g) and real interest rate (r). The standard bond decomposition says:

$BY = r + i + TP$

Bond yield (BY), real interest rate (r), expected inflation (i) and term premium (TP). The Fed model equation is E/P – BY, so substituting the above formulae, you get:

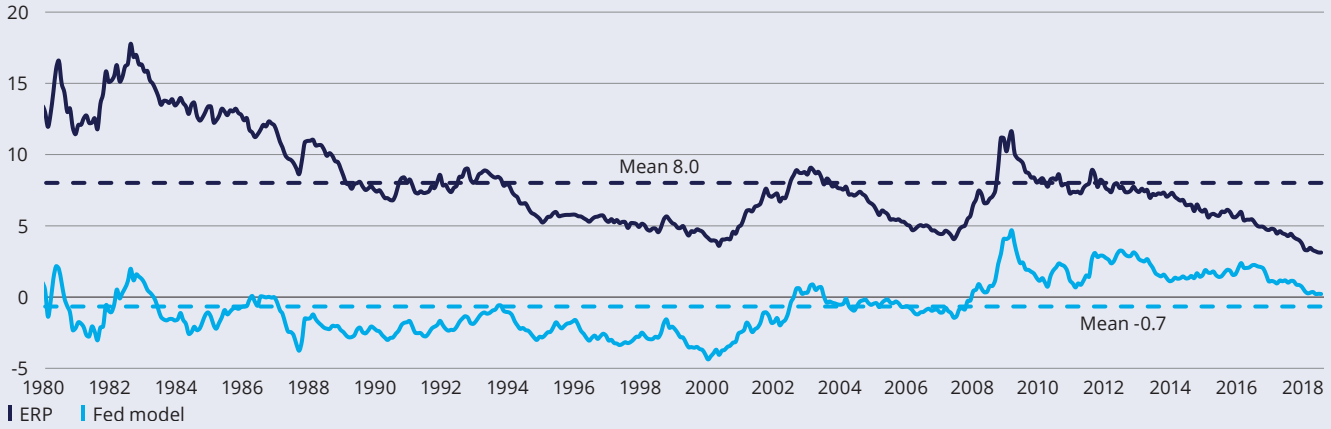
$E/P - BY = ERP - TP - g - i$

In other words, the E/P – BY gap is not just an ERP. It is an ERP distorted by expectations about the term premium, inflation and growth rates. The formula above can be rearranged to give a pure ERP. We plot this ERP below.

$ERP = E/P + g - BY + TP + i$

Figure 10.4's Fed model (light blue) suggests equities are cheap. Adjusting the model to give an ERP (dark blue) says they are expensive. Empirical tests suggest that the adjusted model is moderately successful at forecasting returns, in contrast to the simple model.[9]

Fig. 10.15: Adjusted "Fed model"



Source: ASI, Bloomberg, Federal Reserve Bank of St. Louis (FRED), Robert Shiller (Yale School of Management), September 2018.
Note: Dashed lines refer to respective means. Market data refers to the S&P500 index and macroeconomic data is for the US. The Fed model is calculated as the difference between the (CAPE) earnings yield (see above S&P500 Index CAPE ratio chart for more details) and the US 10Y Treasury yield. The equity risk premium (ERP) includes the 10Y average industrial production index (seasonally adjusted, used as a proxy to GDP in order to obtain monthly data), 10Y average inflation and the Adrian Crump & Moench 10Y Treasury term premium. Floors have been used for the 10Y industrial production averages, in order to reflect our view of market expectations.

[7] Assness (2003) Fight the Fed Model Journal of Portfolio Management and Ritter and Warr (2002) The decline of inflation and the bull market of 1981 to 99. Journal of Finance and Quantitative Analysis.
[8] Durre and Giot (2007) An international analysis of earnings, stock prices and bond yields. Journal of Business Finance and Accounting.
[9] Goldman Sachs (2017) Fixing the Fed model.

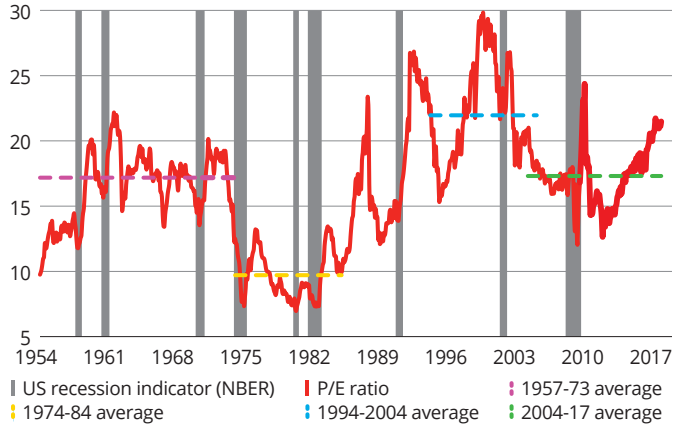
Reversion to what mean?

When forecasting equity returns we assume that valuations will revert to their long-term average. But this raises a question about which long-term average to use. Unfortunately, as figure 10.16 shows, valuation metrics are not particularly stable over time.

There are short-term mean-reversion cycles within the period shown, but these are overwhelmed by longer-term trends. As this chart shows, valuations in the last 20 years have been much higher than valuations in the 1970s and 1980s.

Why did this happen? Equities fell out of favour during the 1970s, as very high inflation and extremely high risk-free interest rates made them relatively unattractive. Collectively, investors reduced their exposure to equities, preferring other asset classes. With less money chasing the same flow of earnings, the P/E ratio fell from 19.4 in 1965 to 8.2 in 1978.

Fig. 10.16: S&P 500 index historical price/earnings (%)



Source: ASI, Bloomberg, October 2017.

These long-term swings in investor sentiment towards equities mean that we cannot simply use a very long-term (for example, 50-year) average P/E and assume equities will revert to it.

Mean reversion should be to a level that reflects the current regime: rather higher than the 1970s, but lower than the irrational exuberance of the technology-bubble period of 2000. This is a matter of educated guess work rather than science.

We use a 15-year period for mean reversion (hence the 15-year average used in figure 10.12). This includes the low valuations during the financial crisis as well as the current period of exceptionally low risk-free interest rates and somewhat subdued growth expectations.

"Our research suggests that cheap equity regions will outperform expensive ones over the long term."

Relative valuation and relative regional returns

While there is good evidence for valuation mean reversion overall, does this work between equity regions? The US is currently expensive relative to its history, while emerging markets are a little cheap. In principle, this should mean that downward valuation mean reversion for the US will be a material drag on returns, and upward mean reversion in emerging markets will be a boost to returns. All else being equal, this should mean that emerging market equities outperform the US over the next five years or so.

As central banks brought inflation under control and interest rates began a 30-year downward trend, equities came back into favour and asset allocation slowly reversed. This drove the trend in valuation multiple expansion, and with it the exceptional period of high equity returns. It is notable that much of the gain for investors during the 1980s came from rising valuations.

This may work in theory, but does it work in practice? We have looked at the historical data to answer this question. We looked at pairs of equity regions and asked: when one region's equities are cheaper than the others, does it have higher returns over the next 10 years?

Our research was based on monthly data from MSCI local-currency regional equity indices, going back to 1980. To compare valuations, we took the ratio of the region's price to book value (P/B) with the region's long-term average P/B. For expensive regions, this ratio is above one, cheap regions are below one. For each region pair, we then subtracted one region's ratio from the other (for example, US P/B ratio minus emerging markets P/B ratio).

To compare returns, we subtracted one region's subsequent rolling 10-year total return from the other region's (for example, US 10Y total return minus emerging markets 10Y total return).

The chart shows the results for various region pairs. We have colour coded each decade's data points, to explore whether the effect changes between decades. The charts show that for nearly every region pair and for every decade, the expected relationship between relative starting valuations and relative returns holds. If one region starts out relatively expensive (larger difference in normalised P/B on the x-axis), its subsequent long-term returns are likely to be lower than the other region (negative relative returns on y-axis).

Japan is a partial exception. The basic relationship held as expected, Japan did worse when it was relatively expensive and better when it was relatively cheap, but long-term equity returns in Japan have been so dismal that Japan failed to outperform even when it was relatively cheap.

Fig. 10.17: UK vs. US equities, relative 10Y returns (%) vs. relative P/B

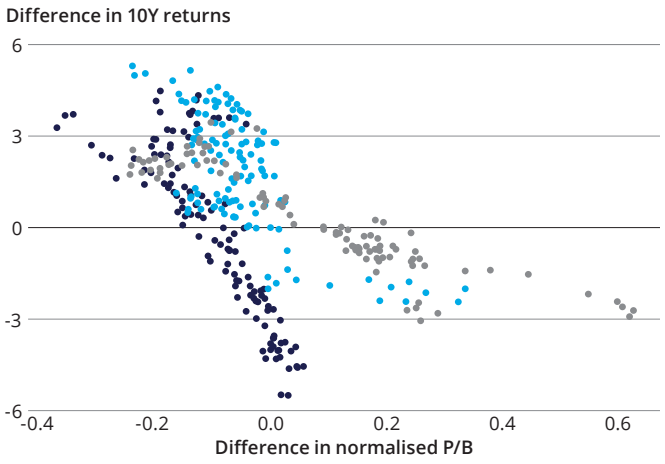


Fig. 10.18: Europe ex UK vs. UK equities, relative 10Y returns (%) vs. relative P/B

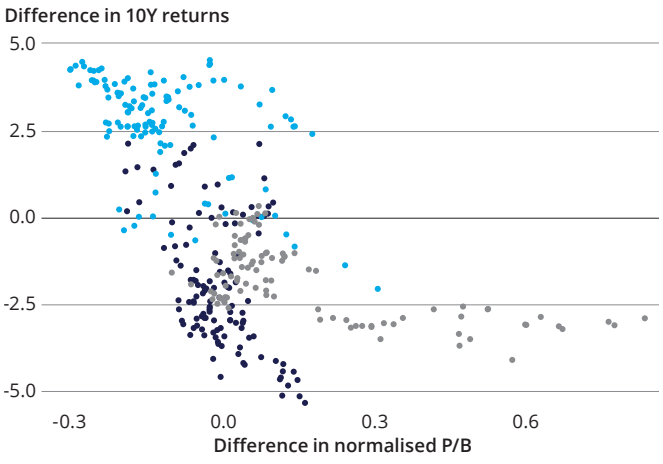


Fig. 10.19: US vs. Emerging Markets equities, relative 10Y returns (%) vs. relative P/B

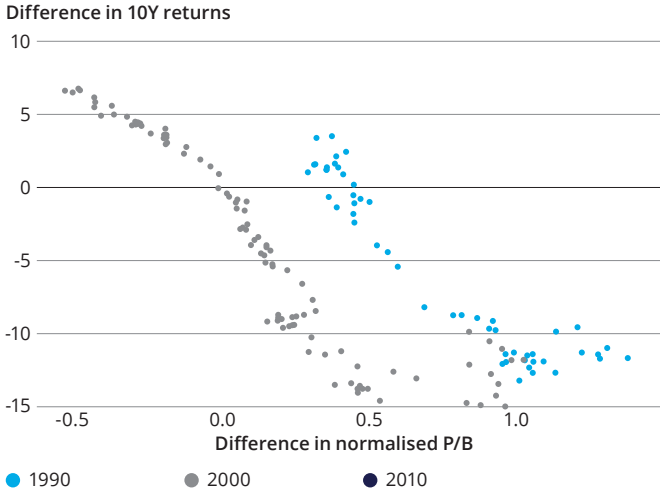
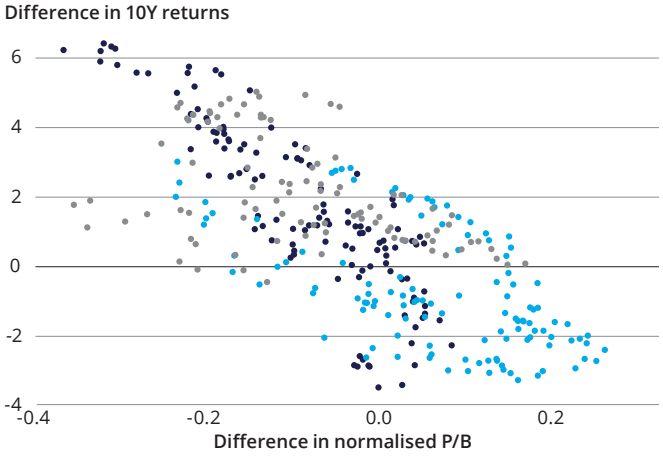


Fig. 10.20: US vs. Europe ex UK equities, relative 10Y returns (%) vs. relative P/B



Source: ASI, Bloomberg, Thomson Reuters Datastream, 1H2018.
Note: Past performance is not indicative of future results.

As the correlation table below shows, the strength of this negative relationship varies between regions, but it holds for all of them.

Fig. 10.21: Historical regional equity correlations, relative return vs. relative starting valuation

	10Y returns	5Y returns		10Y returns	5Y returns
US vs. UK Equities	-0.58	-0.26	Europe ex UK vs. UK Equities	-0.59	-0.49
US vs. Europe ex UK Equities	-0.74	-0.52	Europe ex UK vs. Japan Equities	-0.65	-0.27
US vs. Japan Equities	-0.79	-0.26	Europe ex UK vs. Pacific ex Japan Equities	-0.59	-0.45
US vs. Emerging Markets Equities	-0.80	-0.32	Europe ex UK vs. Emerging Markets Equities	-0.68	-0.35
US vs. Pacific ex Japan Equities	-0.73	-0.39	Emerging Markets vs. Japan Equities	-0.57	-0.31
UK vs. Japan Equities	-0.79	-0.34	Emerging Markets vs. Pacific ex Japan Equities	-0.41	-0.22
UK vs. Emerging Markets Equities	-0.57	-0.17			

Source: ASI, Bloomberg, Thomson Reuters Datastream, 1H2018.
Note: Correlations measure the relationship between relative horizon total return (in local currency, except for Emerging Markets in USD) and relative starting Price/Book valuation.

We repeated the exercise using subsequent returns over five years rather than 10. The picture was the same, but the relationship significantly weaker.

These results should be taken with a little caution. Although the data we used goes back to the 1980s, the 10-year rolling monthly returns overlap with one another. Returns from January 1980 to January 1990 overlap with those of February 1980 to February 1990. This is hard to avoid when looking at 10Y returns. It does not invalidate the conclusion, but it does mean that its statistical robustness is weaker than it would have been if we had been able to make the comparison over many separate decades of returns.

This statistical point notwithstanding, the research supports our conviction that valuation-driven regional equity trades can add value to the strategic asset allocation process.

Regional equity outlook

Fig. 10.22: Global equity returns forecasts

	3Y	5Y	10Y
UK Equities	6.1	5.8	5.6
US Equities	4.2	4.1	3.2
Europe ex UK Equities	4.3	3.7	2.5
Japan Equities	4.7	4.5	4.7
Pacific ex Japan Equities	6.4	6.3	5.9
Emerging Markets Equities	6.5	6.3	6.3

Source: ASI, 2H2018.
Note: Returns are in local currency and in percentage, per annum.
Return projections are estimates and provide no guarantee of future results.

As described above, our regional equity forecasts are built up from forecasts for EPS, built from revenues, margins, share issuance, valuation and dividends. Below we summarise our view for each of these inputs.

The overall picture is for equity returns a little below average, particularly in the US and Europe, where valuation is expected to be an additional drag on returns.

Earnings per share growth

We forecast EPS growth on the basis of forecasts for revenues, margins and net share issuance. On this basis, our outlook is for lower EPS growth over the next few years. This is partly driven by low nominal growth outlook, but also by the belief that margins are close to their peak and are more likely to contract than expand over the next few years. Margin expansion has been a huge tailwind for EPS growth over the last decade, so this is a big change.

Revenue growth

The structural outlook is for weaker revenue growth. The structural backdrop of worsening demographics and still weak productivity growth make for low nominal growth in most global markets.

Cyclically, we expect the growth acceleration of the last 18 months to fade. Output gaps have closed in most markets; trade wars and tighter monetary policy should result in cyclically slower revenue growth.

This applies to all developed markets: less in the US, more in Europe and Japan. It also applies to many emerging markets, where growth remains higher than for developed markets, but the gap is much smaller than it was.

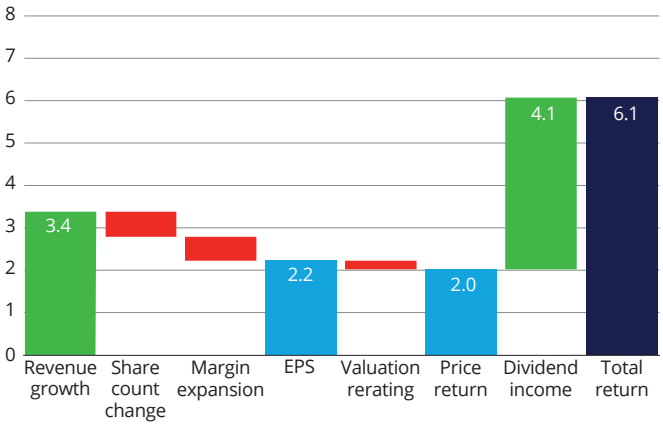
After adjustments for international revenues, on a three-year horizon, we see the fastest revenue growth is in emerging markets (6.6%) and the slowest in Japan (2.5%), with the US, Europe and the UK in the middle.

Profit margin growth

Earnings growth in all equity regions has been boosted in the last decade by a substantial expansion in profit margins. This has been boosted recently by operational leverage amplifying the cyclical growth acceleration we saw in 2017–18. In the US, corporate tax cuts also provided a one-off boost to net margins. Overall, margins have added between 5 and 15 percentage points to annual EPS growth across equity regions last year.

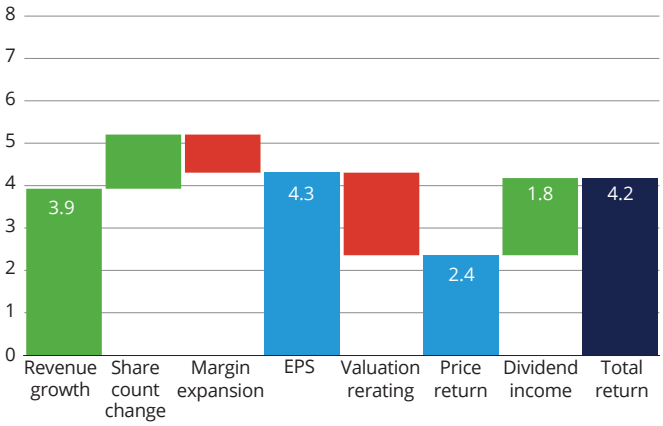
On a 3Y horizon, significant further margin expansion now seems unlikely. Most regions are at or near cyclical highs – and multi-decade highs in the US. A combination of slower growth and higher costs from rising wages and interest costs should, if anything, squeeze margins. So, on a cyclical, probability-weighted basis, we expect modest margin contraction over 3Y. We forecast marginally more impact in the US, where margins are particularly high cost pressures most likely to develop, but we forecast margins to detract slightly from EPS growth everywhere.

Fig. 10.23: UK return factors (%)



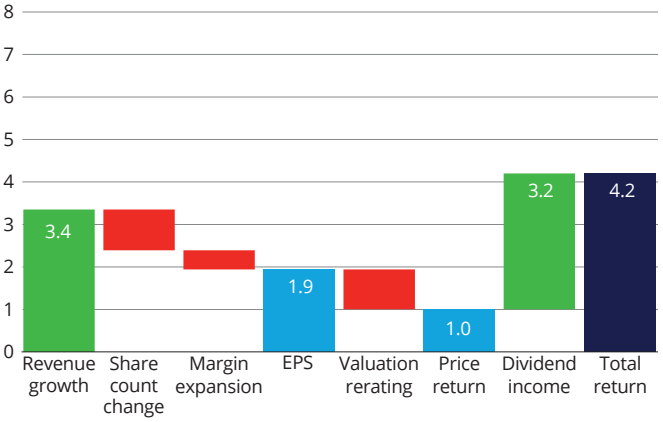
Source: ASI, Bloomberg, 2H2018.
Note: Calculated in local currency terms on a three-year per annum basis.

Fig. 10.24: US return factors (%)



Source: ASI, Bloomberg, 2H2018.
Note: Calculated in local currency terms on a three-year per annum basis.

Fig. 10.25: Europe ex UK return factors (%)



Source: ASI, Bloomberg, 2H2018.
Note: Calculated in local currency terms on a three-year per annum basis.

Share count

In the US, buybacks have been strong in recent years, boosted recently by corporate tax cuts. We assume this will continue on recent trends, at the rate of 1.3% per year.

All other markets apart from the US have a history of net share issuance, though there has been a trend towards less issuance in recent years. The UK, Europe and Japan all tend to have marginal net share issuance, detracting from EPS at the rate of around 0.5–1.5% per annum. We assume this continues.

The net dilution picture is much worse in emerging markets, where share issuance continues to run at 3–4% per annum, and is particularly fast in Asia. Capital raising via equity issuance is a major reason why equity investors fail to benefit from the faster nominal growth in EM economies. The trend in share issuance is moderating, so dilution is becoming less of a problem. However, this moderation is tracking the decline in nominal growth; as a result, EPS growth remains around the same as the developed market average.

Valuation

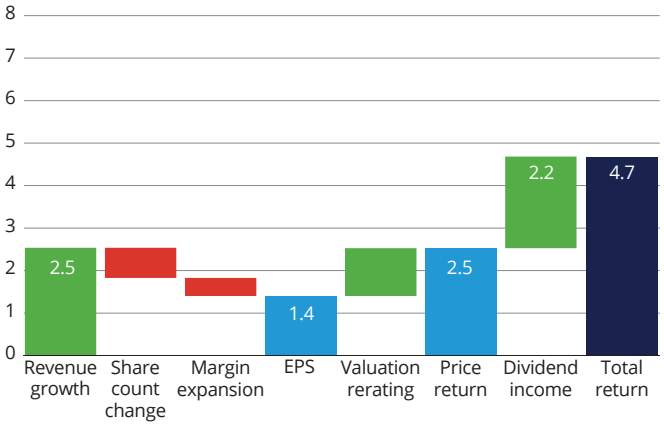
Valuations remain stretched in the US market. Our valuation basket suggests that, after an improvement mid-year, the US market is again around 25% above the 15-year mean. Europe ex UK is also a little stretched, at 10% above average. Emerging markets have sold off materially this year, and as a result is no longer expensive. Japan is also cheap on most measures, though there is a big question about the extent to which today's high earnings levels are sustainable. If not, this cheapness is more apparent than real. The UK remains around fair value.

This valuation picture is negative for our view of US equities on a long-term horizon but not necessarily in the short term. Valuation rerating tends to require a major switch in risk sentiment. The timing of this is hard to predict. Our forecast is based on a scenario-weighted approach. This includes a base case with slower growth, and an overall downside bias. This suggests rising risk aversion and some modest reversion in valuations, but not a full-blown rerating. This is a drag on expected returns in the US over the next few years and, to a lesser extent, in Europe, with a more neutral effect elsewhere.

Dividend yields

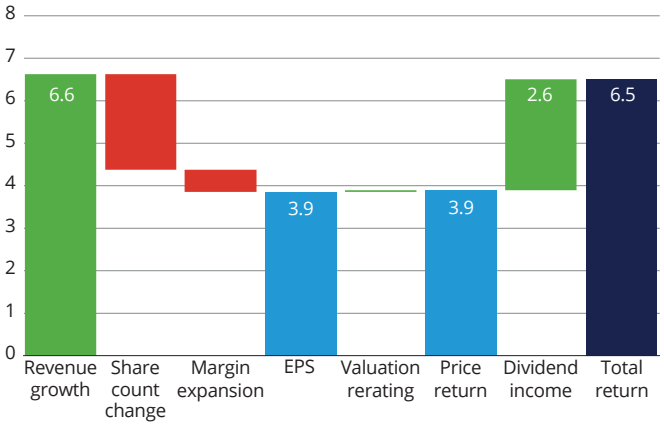
Dividends are one of the most stable components of equity returns. Overall, we believe current pay-out ratios are broadly sustainable. As a result, our forecasts are for dividend yields to continue to follow long-term trends. The UK offers the most generous dividends (4.1%), followed by Europe at 3.2%. Dividends in the other regions around 2–2.5%. Reinvested dividends contribute materially to long-term returns. The UK market's total price return since 2010 has been 35%, but 90% with reinvested dividends. This gap is much smaller in markets paying low dividends.

Fig. 10.26: Japan return factors (%)



Source: ASI, Bloomberg, 2H2018.
Note: Calculated in local currency terms on a three-year per annum basis.

Fig. 10.27: Emerging markets factors (%)



Source: ASI, Bloomberg, 2H2018.
Note: Calculated in local currency terms on a three-year per annum basis.

"This valuation picture is negative for our view of US equities on a long-term horizon but not necessarily in the short term. Valuation rerating tends to require a major switch in risk sentiment."

Smart beta

The capital asset pricing model (CAPM) – for a long time the dominant finance model used by investors – is based on a single equity market risk factor. However, academic finance research has shown that equity returns are not, in fact, a function of a single equity risk premium but multiple risk premia.

Over long time horizons, the evidence (figure 10.28) suggests that small companies beat large; value companies beat growth; companies with price momentum outperform those without it; high quality companies outperform low quality; and low volatility companies outperform high. This is a long list and is getting longer. There is much academic debate about just how many of these new factors there are. As we discuss in Chapter 13, many of these alternative factors are not confined to equities but operate across a range of asset classes.

The evidence supporting the existence of these factors is generally very robust. For example, the evidence for price momentum outperformance is based on over 80 years of historical data, as well as 20 more 'out of sample'. It has been replicated in 40 countries. And multi-factor models like the arbitrage pricing model provide solid theoretical justification for the existence of multiple risk factors.

Standard finance theory argues that this outperformance reflects, in each case, a sustainable risk premium. In other words, higher returns compensate investors for bearing exposure to particular kinds of risk. The fact is, although these alternative risk factors result in long-term outperformance, they also experience violent crashes – as well as extended periods of underperformance. In return for bearing exposure to these additional risks, investors are compensated with risk premia.

There are also behavioural finance explanations for outperformance. For example, momentum stocks may outperform because investors tend to react slowly to news.

As a result, stock prices seem to behave as if they have inertia, gradually gaining momentum with good news and then losing it only slowly in response to bad. There are also complementary stories about investors herding, chasing prices as they move upward.

Behavioural stories still suggest that investors might be able to gain excess returns by exploiting market features like price momentum, even if they do not result from risk premia (that is, compensation for bearing risk). Another key feature of returns from these alternative risk factors is that they have a low correlation with one another.

The outperformance of value stocks has a low correlation with the outperformance of momentum. This means that their combination can result in a significant reduction in risk.

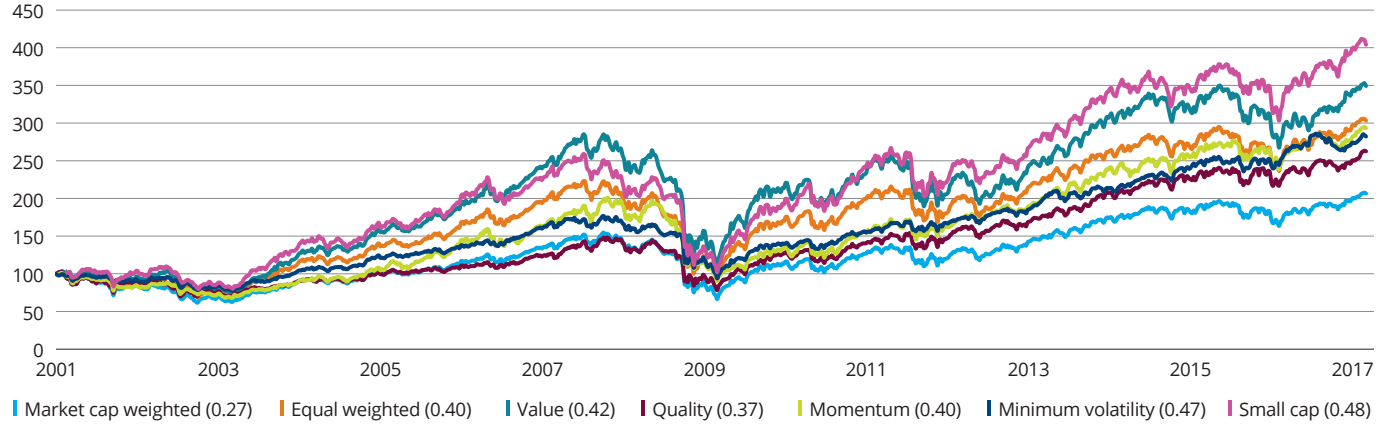
A number of specialist quantitative equity funds have been launched in recent years that exploit individual factors or combinations. These products have come to be known as smart beta. Rather than just exploiting the standard equity-market beta, smart beta funds allow investors to harvest this wider variety of risk premia, offering higher returns and lower risk as a result. They typically do so by creating indices that are weighted based on factor exposure rather than market cap.

There is, it is fair to say, some devil in the detail. Performance can vary significantly depending on how exactly risk premia indices are constructed. So manager selection is important.

We increasingly allocate to some versions of smart beta, partly in expectation of the additional risk premium, but also because of the way that combined factor exposure can increase diversification. But we always bear in mind the fact that higher returns here are a compensation for bearing risk. Our expectation of long-term outperformance will be accompanied by some periods of underperformance.

It is worth emphasising that this issue is more of a headwind for market-wide return forecasts than it is for active investors with concentrated portfolios. By ensuring stock selection is focused on companies with strong protections for minority shareholders, active investors can mitigate dilution from rights issues.

Fig. 10.28: Performance of smart beta vs. market cap weighted indices



Source: ASI, MSCI, March 2017.
Note: MSCI World smart beta indices with their respective Sharpe Ratios in brackets. Net Total Return (including dividends minus withholding taxes) in USD, rebased to 100 at 1 January, 2001. Sharpe Ratio = (Mean portfolio return – Risk-free rate) / Standard deviation of portfolio return. Risk-free rate calculated using 3-month US T-Bills.

11

Private equity

- Private equity (PE) has demonstrated an ability to provide investors with a material illiquidity premium
- High valuations suggest that PE funds' returns may be below average in future
- There is a large dispersion of returns between PE managers and, as a result, manager selection is key

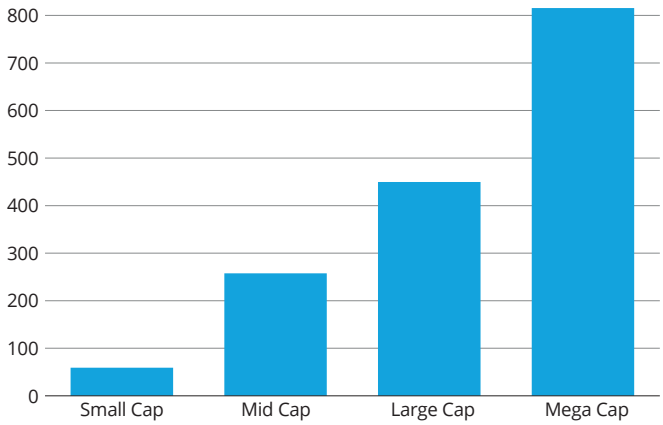
Private equity

Private equity (PE) funds own companies with shares that are not listed on a stock market. In other words, they are privately held and, as a result, cannot be easily traded. This downside has been the main attraction of the asset class. The lack of liquidity means that investors should expect to be compensated with a substantial illiquidity risk premium above public-equity returns. This premium's size varies over time – over the decade until the end of 2013, the US buyout (the largest strategy within PE) illiquidity premium has averaged 3.3%. We stop at 2013, as subsequent vintages are yet to invest the majority of total available capital. There is significant variation between individual managers and funds.

Typically, PE buyout funds purchase companies outright, using a combination of debt and equity. The PE manager expects to improve the portfolio company's performance and value by improving its business strategy and operating efficiency, and by optimising its balance sheet. The debt applied to the company amplifies the return of the equity invested.

PE buyout is often classified by size: small-cap, mid-cap, large-cap and mega-cap. This scale is typically reflected in the size of the companies invested in.

Fig. 11.1: Cambridge Associates Global Private Equity buyout by market capitalisation (in $US bn)



Source: ASI, Thomson Reuters Datastream, Cambridge Associates, July 2018.
Note: Calculated as sum of all active fund managers by total market capitalisation. Sizes according to Cambridge Associates-defined investment stages (over 2000-14 period vintages: Mega Cap >$3.5bn; Large Cap $1bn-$3.5bn; Mid Cap $350m-$1bn; Smal Cap <$350m). This chart is illustrative; the data covers a subset of the universe but is not comprehensive.

Using the Cambridge Associates definitions, small-cap PE funds have assets under management of under $350 million. This is an inefficient segment where intermediaries play less of a role; there is less deal visibility, and deal origination is an important component of the strategy. This means that there is less competition to acquire target portfolio companies, which could lead to more favourable entry prices. The segment contains a rich number of targets, and operates with lower leverage. The PE manager, company management and investors have a strong alignment of interest. The potential returns of funds in this category are high, although the distribution of outcomes is very wide.

Mid-cap PE funds have assets under management of between $350 million and $1 billion. This is the most crowded segment and it is heavily intermediated. Potential returns narrow as the enterprise value (the company's total value) increases, as do the risks.

Large-cap PE funds have assets under management of between $1 billion and $3.5 billion. Mega-cap PE funds have assets under management of over $3.5 billion. Needless to say, there are fewer of these firms. This tends to be the most efficient segment, being heavily intermediated, and is strongly linked to credit markets because of its reliance on them.

There are other, smaller, strategies such as 'growth' and 'distressed'. Growth is where a minority stake is taken in a company. Target portfolio companies are relatively mature and have significant growth potential, but lack the capital for major expansion.

Distressed PE is where companies that are in financial distress are bought out, with the intention that the PE manager will turn the company's performance around.

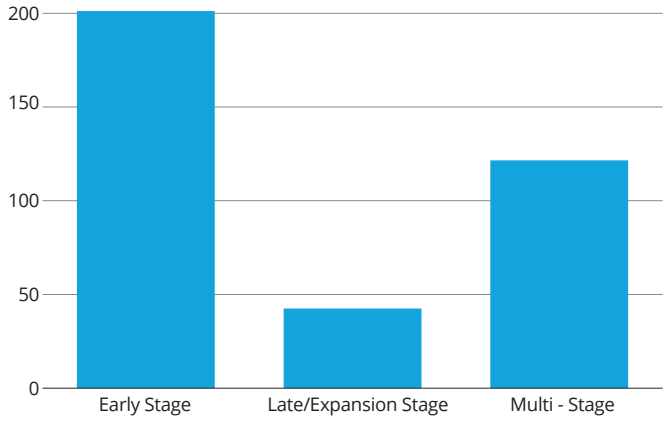
"The public markets are no longer always the go-to place for raising capital; investors recognise this and allocate to private markets accordingly."

While most PE funds are diversified in terms of the sectors they seek exposure to, there are some that are sector focused, which means that their risk and return characteristics are different. In particular, information technology funds are much more risky than the average diversified fund.[1]

Venture capital

Venture capital (VC) is a discrete area of PE where investors look to make equity investments. The VC segment has grown, and funds invest across all stages of a business's life. Early-stage funds are those that invest in companies with high growth potential, or companies that are achieving high growth in one or more areas. There are also VC funds specialising in late-stage investments, although this is a smaller market segment. VC is a risky investment, as the portfolio's underlying companies are not yet well-established businesses.

Fig. 11.2: Cambridge Associates Global Venture Capital by market capitalisation (in $US bn)



Source: ASI, Thomson Reuters Datastream, Cambridge Associates, July 2018.
Note: Calculated as sum of all active fund managers by Venture Capital strategy. This chart is illustrative; the data covers a subset of the universe but is not comprehensive.

The number of VC funds has mushroomed in recent years. The success of companies such as Facebook, Amazon, Netflix and Google – and the rise of 'unicorn' $1 billion+ private technology companies – has encouraged many people to launch their own "me too' start-up. The VC fund population has grown to meet this demand for capital to invest in early-stage companies. Entrepreneurs are increasingly able to define the terms on which they will accept an investment from a VC investor.

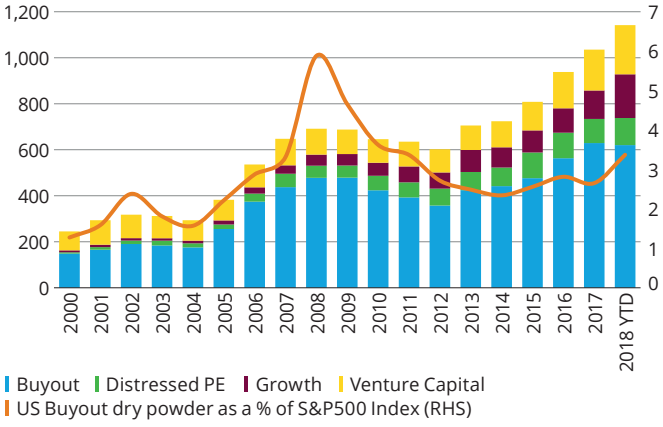
Market trends

The public markets are no longer the go-to place to raise capital; investors recognise this and allocate to private markets accordingly. The proportion of private companies to public has been steadily increasing over time. This means that access to value creation and growth comes increasingly by way of the private markets. This trend appears to be continuing as private companies held by PE managers stay private for longer. Scalable start-up technology companies require very little debt funding, and they can grow into very large companies. Hence the rise of the unicorn – the companies assigned a $1 billion valuation without the need to go public.

It is well documented that assets under management in PE and VC have grown to record levels, partly as a result of increasing investor understanding of these strategies. Traditional investments, particularly government bonds, are forecast to produce lower returns than has historically been the case. This makes private markets increasingly attractive.

While PE managers have been able to deploy a large amount of capital, dry powder (the amount of committed capital available to invest) has grown steadily. The rate of growth in assets under management has slowed in recent years, but the absolute dollar growth is significant. Taken as a proportion of S&P 500 market capitalisation, which is adjusted for fair value in 2018, dry powder has grown over time. This can be seen in figure 11.3.

Fig. 11.3: Global dry powder by private equity strategy ($US bn) and US buyout as a % of S&P500



Source: ASI, Prequin, Bloomberg, July 2018.
Note: Buyout dry powder as a proportion of S&P500 Index market capitalisation is adjusted in 2018 to account for overvaluation using our current equity valuation multiples basket (see Equities chapter for further discussion).

Within PE itself, buyout has been the main recipient of investor allocation of capital, although other strategies – particularly VC and, more recently, growth – have attracted a significant amount of capital. Research shows that returns in VC appear to decline significantly as dry powder increases.[2] There is an argument in favour of taking a counter-cyclical investment approach.

[1] Preqin Private Equity Online.
[2] Harris, Jenkinson, Kaplan (2015) How Do Private Equity Investments Perform Compared to Public Equity?

Valuations

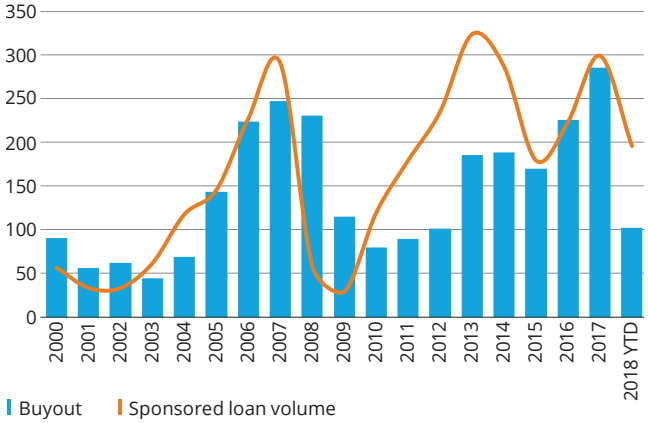
We subscribe to S&P Global Market Intelligence to obtain valuation and leverage data. This is the best available data although it is somewhat limited in nature, and does not give a complete analysis of deal valuation and credit issuance. There is, however, enough data to show that there is a significant correlation with public-market valuation data.

The inverse relationship between valuation and future returns that we see in listed equities applies to PE too. If we compare the internal rate of return (IRR) of each annual PE vintage with the average public-market valuation level over the subsequent 5 years (assuming that this is a reasonable period of time for a PE fund to become fully invested), we see an inverse relationship between valuations and IRRs.

> "Valuations for risk assets are high, and risk premia are compressed. This is also the case in PE."

The relationship is not as clear cut as it is for public markets, partly because funds are unable to maximise returns in recessions, while overvaluation tends to lead to more investment. As demonstrated by figure 11.4, during times of market stress there is less appetite by all parties to commit capital as bid-ask spreads widen, and the availability of both capital and credit decreases.

Fig. 11.4: Global buyout capital raised vs. primary loans ($US bn)



Source: ASI, Prequin, LCD (an offering of S&P Global Market Intelligence), June 2018.
Note: Sponsored loan volume reflects the estimated primary volume in the US and European loan markets. It includes all private equity related transactions, including refinancings and recapitalisations.

Today, valuations for risk assets are high – particularly in the US – and risk premia are compressed. This is also the case in PE. Purchase price multiples of all leveraged buyouts, as measured by S&P Global, reached all-time highs in 2017. This phenomenon is particularly acute for deals above $500 million. Valuations appear to have declined from 2015 highs for smaller deal sizes, although there is less data available here.

Drivers of returns

A substantial part of the total return for a PE portfolio company is the same as for listed equity. However, good PE managers can add incremental returns through additional means.

The core sources of returns for PE are the equity risk premium and the corporate earnings that underpin it – the same as those discussed in the Equity chapter of this book.

But PE managers can also enhance returns through other means. PE firms create value by making operational improvements and strategically repositioning portfolio companies. It is often argued that the PE model benefits from unique advantages. These advantages can be: the ability to conduct deeper due diligence; a longer-term strategic focus; and enhanced corporate governance as a result of active engagement with, and incentivisation of, management teams.

Another key component of the PE strategy is the use of leverage. The increase in leverage that often accompanies PE buyouts magnifies the potential returns on equity invested. Additional gearing often works well for companies, particularly those with too little debt – or if it enables companies to generate higher rates of earnings growth as a result.

While PE managers seem to have been able to manage this well over time, adding leverage can be risky. Loading debt onto weak companies increases balance-sheet fragility. High debt levels make companies more vulnerable to rising interest rates or falling revenues. Equity capital is flexible and able to absorb losses, but debt is binary. Additional leverage may eventually mean that a company is unable to service its debt; at that point the return to equity investors rapidly evaporates.

There is a significant fee drag on the performance of PE funds. PE fees are high compared with those in public-market asset management. Typically, there is a high management fee of 1–2% per annum, and a success fee that can be 10–20% but only when a return hurdle is cleared.

The best PE managers justify these fees by delivering net returns well in excess of public markets. This is not the case for bottom-quartile managers. As we will see, fund selection is dramatically more important in this asset class than for public equity.

PE returns

There are a number of different performance measures available for assessing PE. Normally, these compare performance by vintage year. These include methods such as:

- Internal rate of return (IRR)
- Total value paid in (TVPI)
- Distributed to paid in (DPI)
- Public market equivalent (PME)
- Modified public market equivalent (mPME)
- Public market equivalent plus (PME+)
- Kaplan and Schoar public market equivalent (KS-PME)
- Direct alpha

IRR and TVPI take into account only the returns from the PE investments themselves. IRR assumes that distributions are reinvested at the same rate as the IRR. TVPI only takes into account the contributions and distributions, and the net asset value (NAV) of the holdings. DPI is similar to TVPI but does not take into account the NAV of holdings.

IRR is a time-weighted measure, whereas TVPI is not. However, when looking retrospectively, TVPI is a good measure of the returns finally delivered to investors. The IRR may vary depending on when the returns were delivered. IRR is a return on even that which may not have been reinvested. It is a return on the investments made, not a return on investment in the fund.

There are various public-market equivalent measures that aim to show how PE managers' returns compare with the liquid-market benchmark. These are based on observable cash flows, although there are variations. For example, the KS-PME takes into account the future value of contributions and distributions applied to the public markets. This gives the compounding effect that is absent from other PME measures, and is also time weighted.

Our preferred measure of private-market comparative performance is direct alpha.[3] This discounts the cash flows from a PE vintage, using the total return of the public market. As a result, it provides a direct measure of PE outperformance. This method is used in authoritative academic studies and is calculated by industry data providers.

Performance

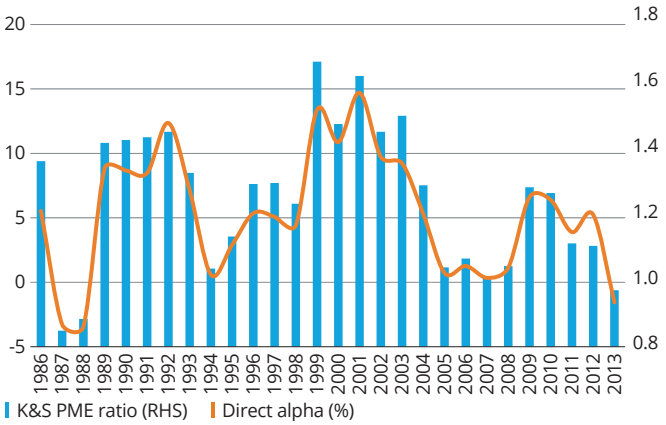
The data clearly shows that PE funds have outperformed public-equity markets over the long term. There is some evidence that this outperformance diminishes if adjustments are made to take account of the higher leverage of PE funds, and the particular 'value-oriented' nature of PE buyout targets.[4] However, the practical comparison most investors make is with the large, listed public-equity markets. On this basis, long-term history supports the assumption of an illiquidity premium of 5% per annum for US buyout on average.

> "The data clearly show that PE funds have outperformed public-equity markets over the long term."

However, outperformance tailed off significantly in 2005, and while it has recovered somewhat, it has not returned to historic levels. Over a 10-year period to 2013, the illiquidity premium was only around 3.3%. This coincided with the beginning of the trend of rising dry powder, which has a link in academic literature to poorer performance.[5]

Venture capital funds have also outperformed public markets on average, although there was a 10-year period from 1999 where there was substantial underperformance. Returns appear to have recovered somewhat after 2009, although outperformance has not recovered to pre-1999 levels.

Fig. 11.5: US Buyout fund performance by vintage year relative to the S&P500 Index

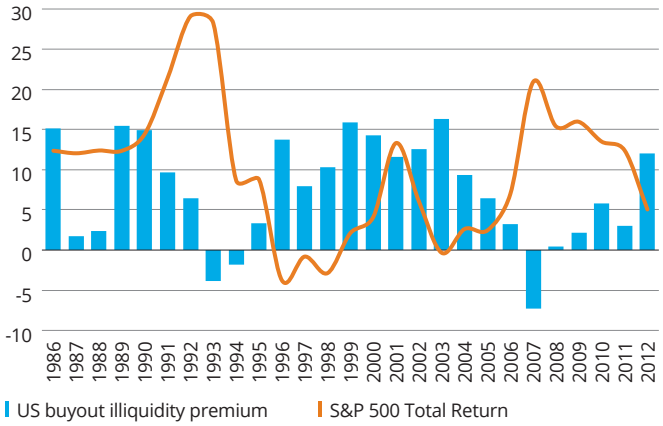


Source: ASI, Cambridge Associates, Thomson Reuters Datastream, June 2018.
Note: The 1990 vintage is an average of the 1989 and 1991 vintages, as no funds were launched in 1990. All vintages refer to inception date. The direct alpha and K&S PME ratio (derived from the total value to paid-in-ratio (TVPI) and Kaplan Schoar public market equivalent) are calculated net to limited partners for pooled returns by vintage for buyout funds across all countries (calculated in USD). The direct alpha is a public-to-private comparison calculation and is an IRR derived from the future value cash flow stream over the public market. The K&S PME is calculated as the future contributions and distributions of private investments using the public market index. A TVPI-like ratio is then calculated dividing the future value of the distributions and any remaining NAV by the future value of the contributions. A value greater than one indicates private market outperformance, while a value below one indicates public market outperformance. Past performance is not a guide to future results.

As shown in figure 11.6, whenever the S&P 500 delivered high returns, US buyout has lagged the S&P 500 materially. US buyout fund performance tends to lag listed markets in bull markets, and outperform in bear markets. This leads allocators to some interesting conclusions for portfolio construction in terms of smoothing of returns.

Fig. 11.6: US buyout illiquidity premium by vintage compared to S&P 500 index total return, based on vintage duration

(% per annum)



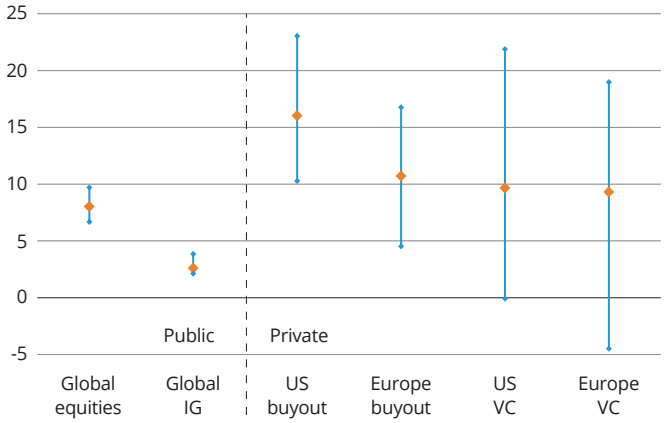
Source: ASI, Thomson Reuters Datastream, Cambridge Associates, Bloomberg, October 2017.
Note: The 1990 vintage is an average of the 1989 and 1991 vintages, as no funds were launched in 1990. All vintages refer to inception date. The US buyout illiquidity premium is calculated as the difference between the annualised S&P 500 total return and the vintage total value to paid-in-ratio (TVPI). The return on investment measurement period begins two years after the first transaction of the vintage and lasts for the average duration of the vintage, which captures the length of deals (obtained by dividing the logarithms of the KS-PME and direct alpha). The TVPI ratio is calculated as the current value of remaining investments within a fund along with the total value of distributions divided by the total amount of paid-in capital.
Past performance is not a guide to future results.

[3] Gredil, Griffiths and Stucke (2014) Benchmarking Private Equity: The Direct Alpha Method.
[4] Phalippou, L (2013) Performance of Buyout Funds Revisited?
[5] Harris, Jenkinson, Kaplan (2015) How Do Private Equity Investments Perform Compared to Public Equity?

Variation in fund returns

The track record of outperformance provides a good reason for investors to bear PE's illiquidity risk. But there is an important qualification to make. There is a large dispersion of returns between PE funds. Top-quartile US buyout funds outperform handsomely, delivering a direct alpha of 8.6% per annum. Bottom-quartile US buyout funds underperform the public markets materially by -2.1% per annum, after fees. While figure 11.7 shows IRRs as opposed to direct alpha, it illustrates the point that dispersion is far wider than for public-equity mutual funds.

Fig. 11.7: Private equity and public-market manager dispersion (%, annual returns)



Source: ASI, Thomson Reuters Datastream, Cambridge Associates, Bloomberg, October 2017.
Note: Orange dots show median fund manager return while the blue lines represent the 75th percentile (top end) and 25th percentile (bottom end). Global equities refers to MSCI AC World Index and Global IG refers to Bloomberg Barclays GlobalAgg Corporate Index, both are calculated as a USD total return for the period. Manager dispersion is based on the five year per annum return from 31 December 2009 to 31 December 2014. Private market data uses 2003-2007 vintages over the period, in order to account for sufficient time for investment to occur since inception. Private market data is based on the IRRs net to limited partners.

So the investment case for PE is heavily dependent on the ability to select and access good PE funds and managers. If not, fund selection risk is a meaningful deterrent to PE allocation.

> "There is a large dispersion of returns between private equity funds and, as a result, fund selection is key."

The performance gap between the top quartile and the bottom quartile is even more pronounced for VC. The best funds do much better than public markets, but the worst funds do much worse. As well as the dispersion of returns between funds, there is also dispersion between different geographies, as shown in figure 11.8.

The complexity of measuring PE and VC performance, the lack of standardisation, and the opacity of the industry mean that it may make sense to use a specialist to help evaluate investment opportunities.

This table shows direct alpha by percentiles, using 10-year-average data. We only show Burgiss data, as Cambridge Associates does not provide direct alpha by percentiles.

Fig. 11.8: Direct alpha by percentiles

	Top	Median	Bottom
US Buyout	8.6	3.4	-2.1
Europe Buyout	6.0	0.9	-6.0
US Venture Capital	4.8	-2.5	-8.4

Source: ASI, Burgiss, October 2017.
Note: Calculated as 10-year averages of 2003 to 2012 vintages. Top refers to 75th percentile, bottom refers to 25th percentile. Returns are in local currency and in percentage, per annum.

> "There is strong cyclicality of returns in private equity."

Performance over time

There is strong cyclicality of returns in PE. It does not matter whether you buy equities via public mutual funds or PE vehicles; if you buy price to earnings when multiples are high, you should expect lower future returns. When excluding the technology bubble in the late 1990s and early 2000s, in which PE did not invest heavily, historical evidence is very clear that high prices mean a low equity risk premium. When public-market valuations are high, this feeds through into the high purchase price multiples PE buyout funds are required to pay. Today, buyout multiples are at record levels. This suggests below-average returns for current PE vintages.

It is not clear, however, whether the PE illiquidity premium – the excess return above public equity – shows additional cyclicality in valuation. One might think that the high purchase price multiples PE funds are paying today, and the high levels of dry powder held by the industry, may result in a lower future excess return for PE investors. However, the historical data does not provide much support for this.

This is possibly because of the performance of public markets during the periods of these vintages. In recent decades, periods of high valuation and high dry powder tend to precede economic recessions. During recessionary periods, public equity performs very poorly. There is, therefore, a lower bar for PE funds to beat to deliver excess returns.

Forecasting approach

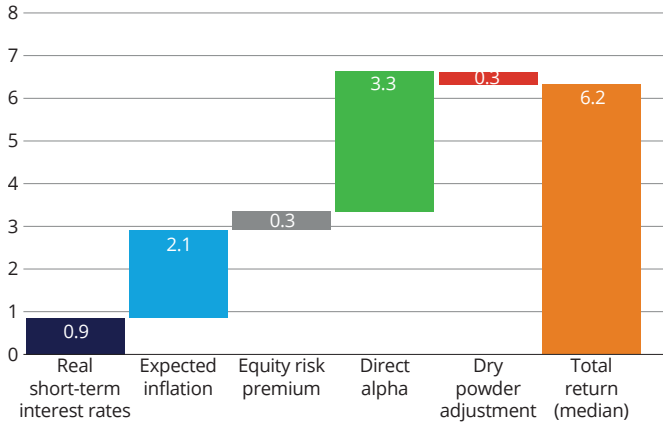
Data selection

Unlike public-equity markets, there is a relative dearth of data in unlisted markets. Private equity really does mean private, so availability of data is more limited. We use a combination of Cambridge Associates and Burgiss data, as they provide the most comprehensive and reliable datasets. We use Preqin's dry powder data.

Process

Our approach to forecasting PE returns is based on adding an illiquidity premium to our public-equity risk premium forecasts. Our public-equity risk premium is made up of real short-term interest rates, expected inflation and equity risk premium forecasts. More information on these premium forecasts can be found in the relevant chapters of this book. We then layer a direct alpha or illiquidity premium forecast on top, and make an adjustment for dry powder.

Fig. 11.9: US buyout 10Y total return (%)



Source: ASI, 2H2018.
Note: Returns are in local currency and in percentage, per annum. Return projections are estimates and provide no guarantee of future results.

We use direct alpha as the basis for the illiquidity premium estimate. We take an average of the direct alpha of the last 10 years' complete PE vintages. This uses data from 2004 to 2013. We stop at 2013 because the later vintages are still in the process of investing capital. We use pooled direct alpha data, as opposed to average data. Pooled data takes into consideration the size of each underlying fund.

This method results in considerable cyclicality of PE returns. When the equity risk premium is relatively low – as we believe it is today – we expect relatively low returns from PE, and vice versa.

We also believe it is sensible to adjust the size of the illiquidity risk premium, to reflect the high levels of dry powder available today. Research shows that dry powder levels affect future PE and VC returns.[6] The intuition is that these high levels of dry powder weaken the price discipline in the market, resulting in lower excess returns. However, as discussed previously, the empirical support for this is ambiguous. So this adjustment is modest.

To make this adjustment we use the ratio of dry powder (as measured by Preqin) to market capitalisation of liquid equities, adjusted to fair value. When this ratio is unusually high, we apply a downward adjustment to our illiquidity premium assumption, and vice versa.

We are able to use this method for US and European PE, and US VC. Figure 11.10 shows PE and VC returns by geography expressed as total return and excess return (adjusted direct alpha).

We publish 10-year return forecasts for PE, the usual term of a PE fund's life. Because of the J-curve effect, when funds are deploying capital, there are often negative returns in the early years of a fund's life.

Fig. 11.10: Private equity returns

	Return	Illiquidity Premium
US Buyout	6.2	3.0
Europe Buyout	7.5	4.8
US Venture Capital	5.5	2.2

Source: ASI, 2H2018.
Note: Returns and illiquidity premiums are over 10 years in local currency and in percentage, per annum. Projections are estimates and provide no guarantee of future returns.

Total returns are relatively low, driven mainly by our low equity risk premium estimates and low bond yields, but remain attractive.

The highest total return and illiquidity premium comes from European buyout. Both the equity risk premium and the illiquidity premium have been the highest in Europe historically, and while there are tentative signs that PE managers are dedicating more resource to Europe, we expect this illiquidity premium to persist.

> "The highest total return and direct alpha comes from European buyout."

Over the last 10 years, the dispersion of returns between the top and bottom managers (as measured by direct alpha) has been an additional 5.2% above and 5.5% below the median for US buyout. With that in mind, the range one could expect for US buyout illiquidity premium is between 7.7% and -2.5%.

The US VC forecast is low, particularly for the illiquidity premium, which is a reflection of history, and the amount of dry powder available to invest, which weighs on forecast returns. The dispersion here is even greater, however. The top-performing quartile might return 5.2%, while the bottom-performing quartile might return -8.6%.

This large dispersion in returns between PE funds means that fund selection is key. This is even more important when selecting VC funds.

[6] Harris, Jenkinson, Kaplan (2015) How Do Private Equity Investments Perform Compared to Public Equity?

12

Real assets

- The high yields on offer from real assets have made them very attractive to investors in a low-bond-yield environment
- High demand has compressed risk premia, but expected returns remain competitive
- These asset classes can offer useful diversification from equities, particularly infrastructure and farmland

Real assets

This chapter considers the returns on commercial real estate, infrastructure and other real assets. These asset classes can play an important part in portfolios, providing diversification from equities and, to a varying extent, providing protection from inflation.

Commercial Property

Fig. 12.1: Global commercial property forecast returns

	3Y	5Y	10Y
UK	2.9	3.8	5.1
US	4.9	5.3	4.4
Europe ex UK	5.7	4.9	4.3
Japan	5.9	4.5	4.4
Australia	5.3	4.6	5.3
Global*	3.4	3.4	3.2

* EUR Hedged.
Source: ASI, 2H2018.
Note: Returns are in local currency and in percentage, per annum.
Return projections are estimates and provide no guarantee of future results.

Approach

Commercial real estate returns have two main components: income and capital return from real estate rental income, and changes in real estate prices. This, in turn, is a function of rental income growth rates, the supply and demand for buildings and the real estate risk premium.

Our rental income expectations are developed by our real estate team. Their views are based on analysis of long-term historical trends for each real estate sector in each regional economy we cover (US, UK, Europe ex UK, Japan and Australia). This is based on assumptions about future structural trends in these real estate markets. For example, we evaluate the extent to which internet retailers may displace physical retailers, resulting in increasing demand for distribution warehouses and lower demand for retail stores. The team also considers the evolution of supply and demand conditions in each market, and the state of the business cycle.

Our long-term view on the direction of market valuations is based primarily on assumptions about the real estate yield. Our forecasts are based on yields for regional variants of the most widely used real estate indices. They include two components: assumptions about the future path of government bond yields in each market, and assumptions about the spread between the real estate yield and the government-bond yield. This is a rough-and-ready measure of the real estate risk premium.

"We assume that this real estate risk premium spread will revert to a fair value level over the long term."

We assume that this real estate risk premium spread will revert to a fair-value level over the long term. Our fair-value assumption takes account of the fact that the quality of real estate cash flows changes over time. In real terms, rental growth has been in long-term decline, lease lengths are getting progressively shorter and more prone to breaks, and tenants are less likely to remain for longer periods. All this suggests a higher risk premium is required than in the past. Our spread reversion is to a higher mean.

We do not always assume that the mean reversion in real estate risk premia is linear. In the short term, risk premia might be higher or lower than straightforward mean reversion suggests. For example, in the UK, there is a risk of a hard Brexit, resulting in a weaker economy and partial loss of access to European markets for financial and office-based service sectors. This means that we assume the risk premium for UK commercial real estate will remain elevated for the next three years.

Our assumption about changing yields has two purposes in our model: it affects our assumption about market prices and so our capital return assumptions, while also providing us with our income return assumption.

Outlook

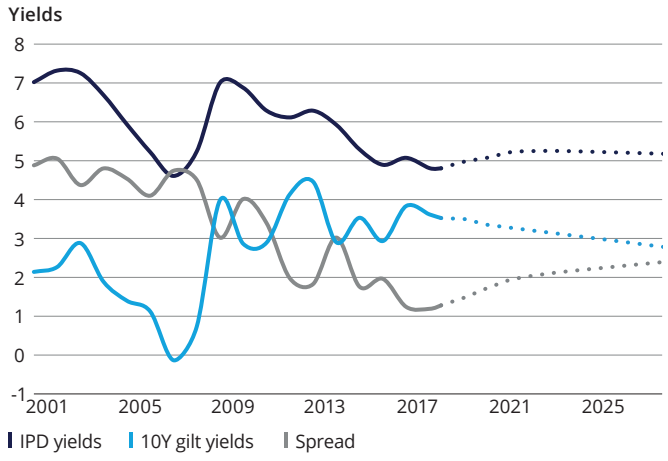
The rental growth picture is fairly positive in most markets at present, particularly the US, where we forecast growth of around 1.5% per annum in the next three years; and Europe, at 2.7%. The exception is the UK, where the picture is clouded by fears about the impact of Brexit on the UK economy, and on the London office market in particular.

In many countries, bricks-and-mortar retail is a substantial share of the total commercial real estate market. The fear is that, as Amazon and other online retailers capture ever more market share, the bricks-and-mortar retail segment enters long-term decline. This would result in more empty properties and much slower rates of rental income growth in this sector. There is an upside to this transition in the form of faster growth in logistics and distribution real estate. But overall, the internet revolution could have a significant negative impact on the commercial real estate sector.

The supply/demand picture suggests a low risk of oversupply in global real estate markets. In most markets, a substantial amount of construction is underway, but less so than during the pre-financial-crisis real estate boom. Rates of investment seem to have peaked in 2015. In the US, a fair amount of speculative construction is concentrated in logistics, but this is still falling behind demand.

In an environment of low government-bond yields, there is strong demand from investors for alternative asset classes with higher yields. Strong demand has driven real estate yields lower than in the past (see regional yield charts figure 12.2 and figure 12.3). However, the spread between real estate yields and underlying government-bond yields remains well above average, except for the US market. On this basis, real estate is not particularly expensive.

Fig. 12.2: UK commercial property yields and spreads (%)



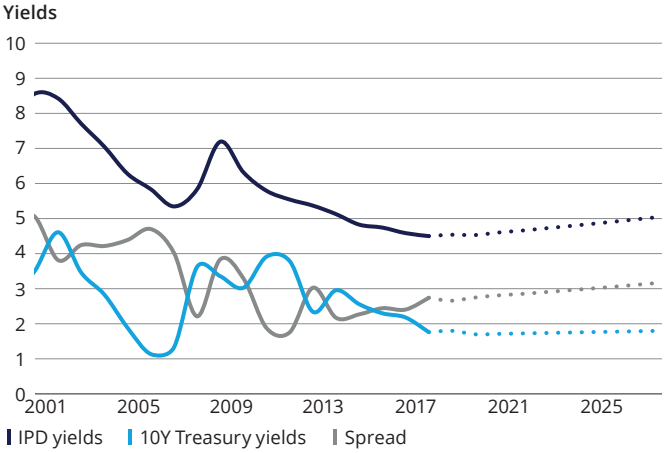
Source: ASI, MSCI Real Estate Analytics, Bloomberg, 2H2018.
Note: Yield and spread projections are estimates and provide no guarantee of future results. Past performance is not a guide to future results.

"The spread between real estate yields and underlying government-bond yields remains well above average, except for the US market."

Government-bond yields in the US and the UK have been rising from their historic lows, and we expect Europe to follow suit by the end of 2019. This will put some upward pressure on yields. However, government-bond yields are unlikely to return to the much higher levels seen in the decade before the financial crisis, so this factor is not as strong a concern as it might be. The fairly large spread between real estate yields and government-bond yields provides a cushion, allowing real estate yields to remain stable.

The one possible exception is the US, where Treasury yields have risen furthest and are expected to continue to rise fastest. Here spreads are already fairly tight (figure 12.3), and rents are at historical peaks, so the room for further growth is limited. On the other hand, the US economy is strong and the property market not oversupplied, so further gains are expected, but the excess return over US Treasuries is likely to be modest.

Fig. 12.3: US commercial property yields and spreads (%)

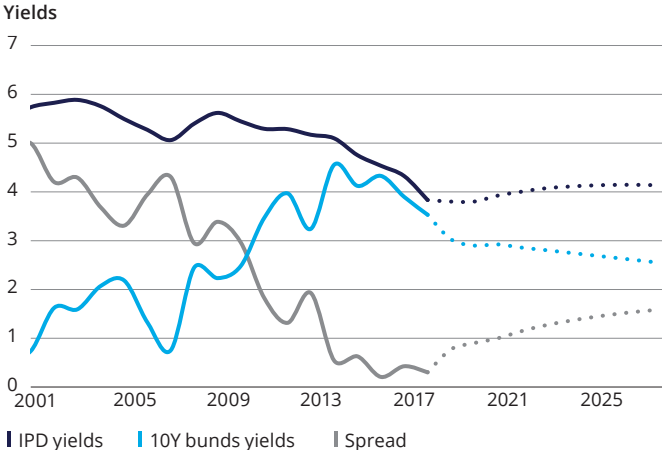


Source: ASI, MSCI Real Estate Analytics, Bloomberg, 2H2018.
Note: Yield and spread projections are estimates and provide no guarantee of future results. Past performance is not a guide to future results.

The UK market also faces risks. The UK retail sector is struggling against the onslaught of internet competition and changing buying habits. As a result, retail rents have been falling across the board. It is hard to see this trend reversing soon. The outlook for industrial and logistics is much more promising, offsetting some of the bad news in retail.

There are also the looming risks from Brexit, with the possible negative impact on the economy, and the London office market in particular. This may feed through into a higher real estate risk premium, pushing prices lower (and yields higher). However, if a 'no deal' outcome is avoided, a potentially long transition to a soft Brexit may mean these worries are overdone.

Fig. 12.4: Europe ex UK commercial property yields and spreads (%)



Source: ASI, MSCI Real Estate Analytics, Bloomberg, 2H2018.
Note: Yield and spread projections are estimates and provide no guarantee of future results. Past performance is not a guide to future results.

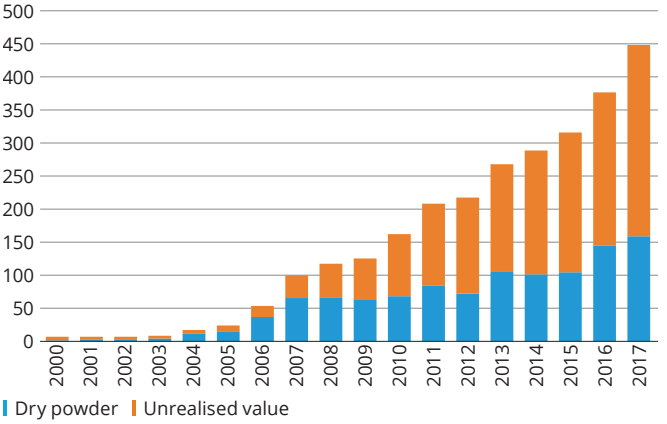
The European (ex-UK) market is our favoured destination at present. Many cities are now seeing high demand from occupiers with limited supply, and this is driving strong rental income growth. The spread of European real estate yields over government bonds is high, and we expect this spread to compress only very slowly. This makes European real estate returns attractive, with strong excess returns over near zero government-bond yields.

Infrastructure

Infrastructure investing has become increasingly popular as a result of increased investor understanding of the strategy, and the hunt for yield. Infrastructure assets can potentially offer both yield and inflation protection, which is attractive to investors, as well as diversification from equities.

Private capital stands at around $450 billion today and around one third of these assets are yet to be invested, as shown in figure 12.5.

Fig. 12.5: Global private infrastructure assets under management ($US bn)



Source: Preqin, July 2018.

Returns available from this asset class remain attractive relative to many other asset classes. But demand for investments and lack of supply of new investment opportunities has driven asset valuations up, and returns down.

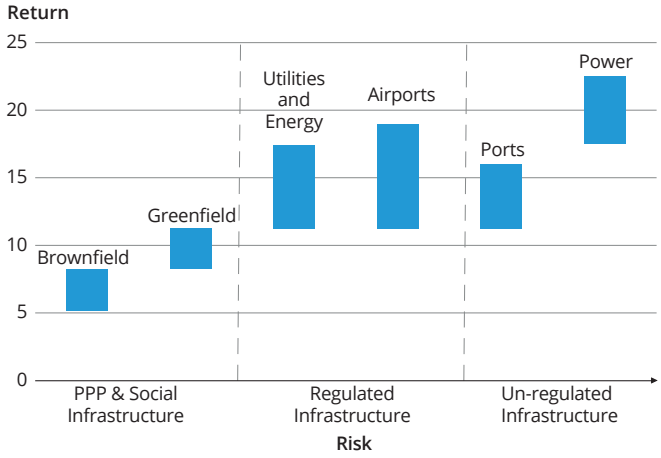
Because of the complexity of building and operating infrastructure assets, and the competitive pricing of projects, we advocate seeking out the most experienced investment managers when allocating capital.

Types of infrastructure investments

There are three types of infrastructure investments available. Each has different risk and return characteristics.

- Public private partnerships (PPP) and social infrastructure
- Regulated
- Unregulated

Fig. 12.6: Illustrative Infrastructure Risk/Return Curve (%)



Source: ASI, July 2018.
Note: Risk increases from left to right. Returns provided are not intended to reflect the returns of any particular Aberdeen product. For illustrative purposes only and provides no guarantee of future results.

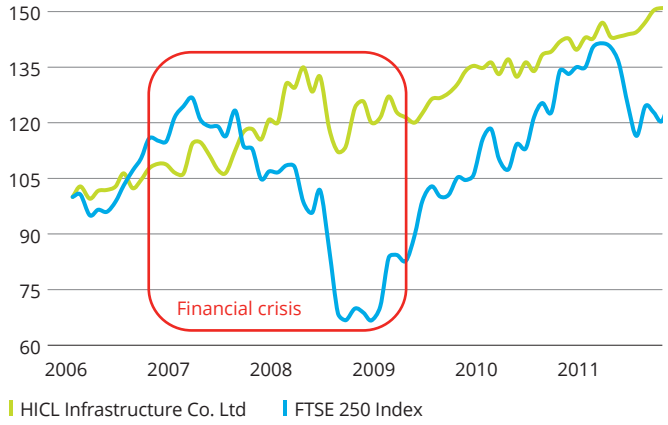
An infrastructure asset's lifecycle is divided between its 'greenfield' and 'brownfield' stages. 'Greenfield' refers to an asset that is being bid for, through to its construction phase. At this point, very little revenue – if any – is generated. Once the asset becomes operational it is referred to as being 'brownfield'. At this point, revenue begins to be generated.

Public Private Partnerships & Social Infrastructure

Social infrastructure operated under public private partnerships (PPP), or similar projects, are underpinned by 25+ year government contracts. Infrastructure assets include schools, hospitals, roads and rail. Revenues are generated when the construction of the infrastructure is complete and working as contractually agreed.

Investments tend to provide stable, long-term yields, which are often inflation-linked. Value can also be enhanced by good management of the concession itself and its financing. PPP investments have defensive characteristics, as the assets tend to provide essential public facilities, so revenues are uncorrelated to macroeconomics and market volatility (see figure 12.7).

Fig. 12.7: Listed social infrastructure during the financial crisis



Source: Bloomberg, October 2017.
Notes: Total return (using gross dividends), rebased to 100 at 31 March 2006.
The chart shows that while equity markets experienced a significant draw down during the financial crisis and again in the Euro-crisis in 2011, social infrastructure was largely unaffected. Past performance provides no guarantee of future results.

Building and operating complex infrastructure projects comes with a range of risks including construction completion risk and operating risk. There are also political and reputational risks due to the national economic importance of the assets. These risks have been highlighted in the past 12 months for certain UK-focused funds. Talk of nationalisation of social infrastructure by the UK's Labour party, and the recent failure of a large construction service company, have led to price volatility and net asset value impairment of some listed funds that have exposure.

Regulated infrastructure

Regulated infrastructure generally takes the form of a company delivering a public service via a 10 to 20-year contract. The service is often subject to set tariffs and other economic criteria, which are reviewed by a regulator. Tariffs are negotiated between the company's management and the regulator, and, as a result, revenues may be volatile over the life of the contract.

> "Infrastructure assets can potentially offer both yield and inflation protection, which is attractive to investors."

Regulated infrastructure assets benefit from high barriers to entry and increased certainty of revenues as a result of a monopoly position. Examples of these assets are water companies and airports.

There is political risk associated with these assets, as they provide essential services, and changes in tariffs can be politically sensitive. Many assets were formerly government-owned, and termination provisions and compensation arrangements are not clearly defined. This leaves the asset owner without a mechanism for redress, should problems arise.

Unregulated infrastructure

Unregulated infrastructure typically relies on a long-term contract with a corporate, not a public, authority. These assets rely on revenues that are linked to the end user, or a 'pay for use' contract, making them linked to the economic cycle. It may be the case that the service provider benefits from a monopoly, however. Investors in unregulated infrastructure must understand that revenue risk is key to determining the value of the asset. These assets could be ports, power stations or a network of pipelines that transport hydrocarbons, among others.

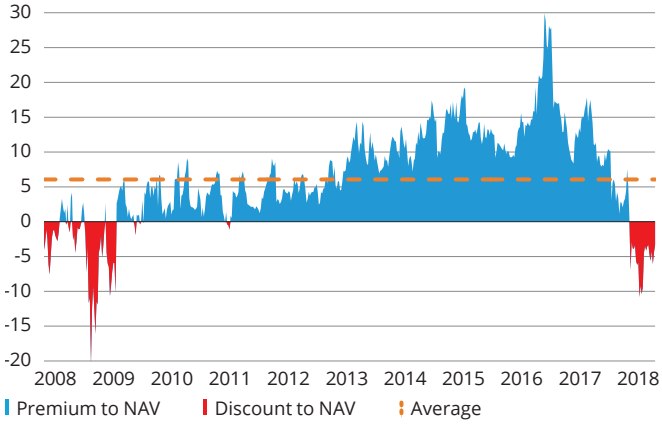
Renewable energy infrastructure is one of the most rapid growth areas within infrastructure. This is like unregulated infrastructure, as prices are often market determined, but renewable energy infrastructure benefits from government subsidy support in many countries, resulting in more stable cash flows.

Listed infrastructure

Traditionally, infrastructure has been the preserve of institutional investors who have invested via illiquid private vehicles. Over the last decade, a new breed of listed infrastructure funds has emerged. In the UK, these funds are now worth £14 billion.[1] While one fund is now subject to a takeover, in the UK there are currently 13 listed investment companies investing in government concessions, renewable energy infrastructure and infrastructure debt. The UK is our preferred source of listed infrastructure assets, given the stable regulatory environment, strong governance of funds and the liquid nature of the market.

These funds are structured as 'closed-ended' investment trusts. This offers investors liquidity (they are traded on the London Stock Exchange) but the underlying assets are illiquid. To make this possible, the fund's prices float independently of the fundamental value of its assets – its net asset value (NAV). When investors are particularly enthusiastic about the return prospects of a given trust, its price will trade at a premium to NAV. When they are unenthusiastic, it will trade at a discount. This factor has an important part to play in the returns provided by these funds.

Fig. 12.8: Evolution of listed social infrastructure share premium (%)



Source: ASI, Bloomberg, July 2018.
Note: Difference between closing share price and NAV (Net Asset Value) for HICL Infrastructure Co. Ltd.

[1] Numis, as at 30 July 2018.

Expected returns

When thinking about return expectations in infrastructure, there are two main distinctions to make:

- Between illiquid private funds and listed funds
- Between greenfield and brownfield infrastructure

Private infrastructure funds are illiquid and should benefit from an illiquidity premium. However, there seems to be some evidence in recent years that the illiquidity premium has compressed substantially.

When investing in greenfield infrastructure, investors take on different and significantly higher risks than they would when investing in brownfield infrastructure. Return expectations should be higher as a result.

We currently forecast returns for the listed UK infrastructure universe, which consists predominantly of brownfield infrastructure projects. There is a reasonable amount of data in this universe, which makes analysis possible.

Our returns forecasts for social and renewable infrastructure are built from capital growth and income components. Reported weighted-average portfolio discount rates provide an anchor for our target returns over the short and medium term. We make adjustments for fund management expenses and material sensitivities. This includes harnessing our projections for inflation and government-bond yields over the period. We also account for reversion to nil premium/discount to NAV over a 10-year period.

For both social and environmental infrastructure, income is by far the biggest component of return – 4.7% for social infrastructure and 5.8% for renewables. There is also a modest capital return available on this asset class, although, for many funds, premiums to NAV are somewhat elevated relative to their history. We assume premiums will revert to zero over 10 years, which reduces the capital return we assume to a little above zero.

Fig. 12.9: Listed alternative returns

	3Y	5Y	10Y
Social Infrastructure	5.9	5.9	6.1
Renewables Infrastructure	6.1	6.1	6.2
Insurance Linked Securities	5.9	5.9	5.9

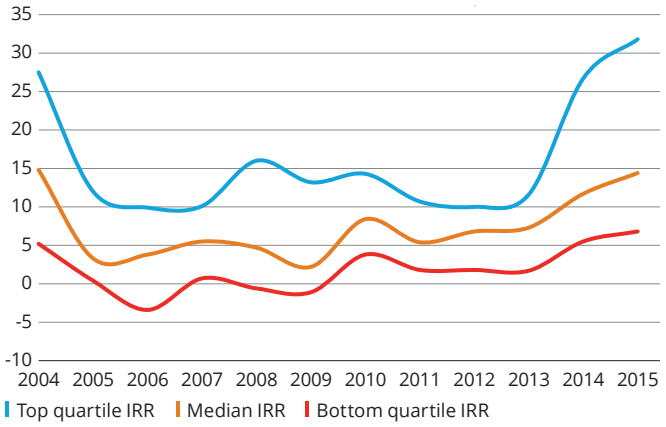
Source: ASI, 2H2018.
Note: Returns are in local currency and in percentage, per annum.
Returns are estimates and provide no guarantee of future results.

Natural resource related real assets

Real assets provide the opportunity to invest in a diverse range of cash-generating assets including the energy, mining, farmland and timber sectors. These assets are called 'real' because unlike many 'financial' equity and bond assets, cash flows arise from the ownership of a real physical asset typically involving land. They can also offer inflation protection, so in this sense they are 'real', not nominal.

Like other private asset classes, there is large dispersion of manager returns, and these can vary significantly. The difference in internal rate of return between a top-quartile manager and a bottom-quartile manager can be as much as 30% or so. Manager selection is key to extracting attractive returns from this strategy.

Fig. 12.10: Natural resources performance by vintage (%)



Source: ASI, Preqin, June 2018.
Note: Quartiles refer to boundary. Top refers to 75th percentile, bottom refers to 25th percentile. Internal rates of return (IRR) calculations are net of fees. Vintage years refer to inception date.

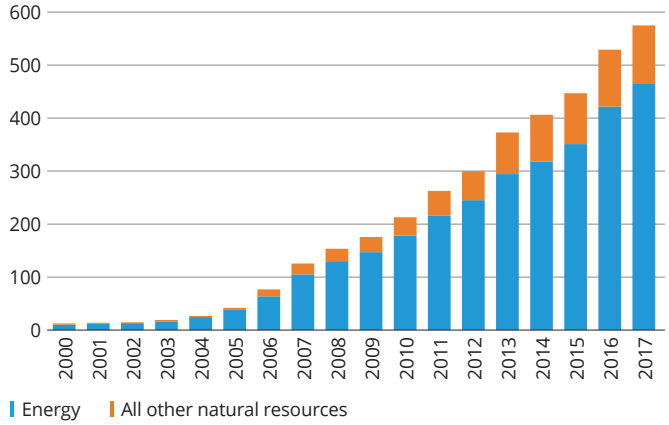
Each real asset category has its own associated idiosyncratic risks. Generally speaking, mining assets offer the highest return and risk profile, followed by energy, agriculture and timber, in that order. There is significant variation in risk and return within each segment. For example, within energy, there are upstream and midstream infrastructure investment opportunities. Upstream, or exploration and production assets, provide a direct exposure to commodity prices, whereas midstream assets are composed of fixed-price leases based on specified terms.

Real assets include oil and gas interests in which underlying owners retain a percentage of the regular cash flows; timberland properties, which provide annual cash flow; and cash-generating farmland. The return from real-asset investing comprises both a return from the movement of the commodity price and an income return from skilful operational management of the asset itself. As the recent history of the US farmland sector shows, it is possible for these assets to deliver positive returns even when commodity prices are falling.

Like many private asset classes, assets under management in this sector have grown over time, particularly in the energy sub-strategy. This has been partly informed by the shale oil and gas revolution that began in the mid-2000s. Capital was attracted to the sub-sector in order to release cash flows from assets that were previously not producing returns.

"For both social and environmental infrastructure, income is by far the biggest component of return, comprising 4-5% of the total."

Fig. 12.11: Global natural resources assets under management ($US bn)



Source: ASI, Preqin, October 2017.

Expected returns

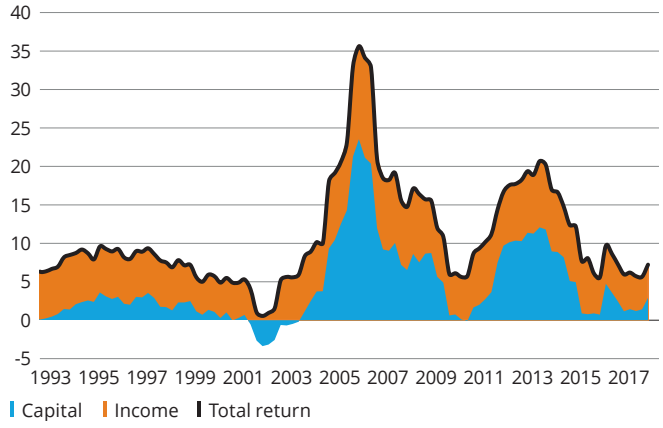
The returns from these assets tend to be positively correlated with inflation, making them good inflation hedges. Timberland, in particular, has a high correlation with inflation.

Many real assets have a low or negative correlation with equities, which makes them attractive diversifiers. Timberland and particularly farmland have performed very well during economic recessions.

However, these investments tend to be long term and illiquid, with the likely investment time horizon being in excess of 10 years.

Returns come in the form of both income and capital appreciation, although the proportional contribution to total return varies.

Fig. 12.12: Farmland annualised returns from income and capital (%)



Source: ASI, NCREIF, June 2018.

In farmland, for example, the contribution to returns from capital has varied over time, with particular peaks in 2004 and 2013 when institutional interest in the asset class increased (see figure 12.12). Income remains an important component of return, but its contribution does rely on healthy commodity prices.

Assets within real-asset categories are uncorrelated to each other (timber should be uncorrelated with energy asset performance for example), as well as to other asset classes and strategies. There should also be the opportunity to generate additional returns through optimal strategy implementation.

The cash flows from investments in land, oil wells and timber assets provide a yield over time, although we would expect it to be less stable than an infrastructure or real estate asset due to implicit commodity-market volatility.

We would also expect farmland and timberland assets to offer inflation protection, as the land value should appreciate over time. This might not be the case for all energy assets, as reserves deplete over time, for example.

"Assets within real-asset categories are uncorrelated to each other (timber should be uncorrelated with energy asset performance for example), as well as to other asset classes and strategies."

This strategy should offer protection from the economic cycle, as it should be relatively insulated over time, much like infrastructure.

There are idiosyncratic risks related to agriculture investments in the US, as 40% of corn production is used for the production of ethanol, to meet the US ethanol standard for gasoline. Should this mandate be changed, there could be a significant effect on price.

13

Hedge funds, absolute return and alternative risk premia strategies

- Hedge fund returns can be explained to a certain extent by alternative risk premia, but there is a significant proportion of return that comes from other sources
- When considered as an excess return over cash, we expect hedge funds to deliver a meaningful return net of fees, but with a wide gap between the best and worst managers
- Liquid alternative risk premia and absolute return funds now incorporate aspects of hedge fund returns, increasing accessibility for a wider range of investors

Hedge funds, absolute return and alternative risk premia strategies

Hedge funds comprise a diverse range of strategies. Most aim to deliver diversified returns by exploiting alternative risk premia, leverage and manager skill. There is a wide gap in performance between the best and the worst funds. Although returns have come down over time, in line with government bond yields, we expect the best hedge fund strategies to deliver an attractive excess return, with strong diversification. Recently, a number of lower cost and more liquid approaches have emerged, allowing a wider range of investors to gain exposure to these strategies. In this chapter, we discuss traditional hedge funds, then turn to these new approaches.

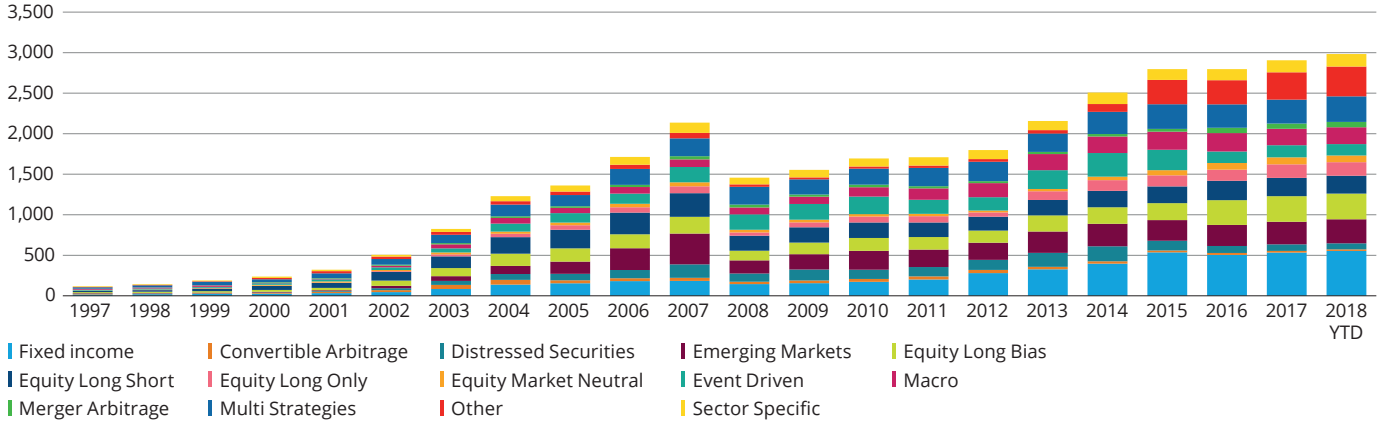
Hedge fund assets under management (AUM) have grown significantly during the last 20 years (as shown in figure 13.1) as institutional investors began investing in increasing size. The number of hedge funds, and funds of hedge funds, has grown rapidly and stands at around 9,700 in the first quarter of 2017, although the number has fallen from its peak of over 10,000.[1] There was a dip in AUM from 2008, as a result of the financial crisis. Consequently, assets in emerging market and equity-related strategies shrank due to both performance and investor asset allocation changes. The hunt for yield and diversification from equities has since led to an increase in fixed-income strategies, particularly credit strategies.

Investors have traditionally looked to hedge funds to serve a number of purposes. Different hedge fund strategies exploit different alternative risk premia in addition to generating alpha. Some managers are exposed to equity-related premia such as size and style, while others will be exposed to macro risk premia such as credit carry and interest-rate spreads, for example.

Hedge funds have historically been the preserve of sophisticated institutional investors: complexity, high fees, large minimum investments and illiquidity have blocked wider access.

In recent years, two approaches have emerged that provide a relatively low-cost alternative: alternative risk premia and accessible absolute return strategies. We consider these at the end of the chapter.

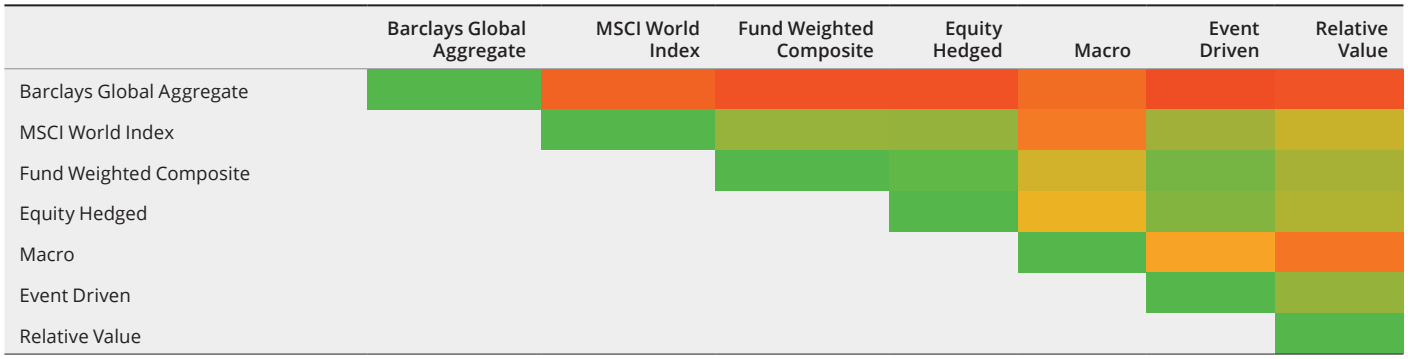
Fig. 13.1: Historical AUM by strategy (in $USbn)



Source: Barclayhedge, June 2018.
Note: Other includes funds categorized as Regulation D, Equity ShortBias, Option Strategies, Mutual Fund Timing, Statistical Arbitrage, Closed-End Funds, Balanced, Equity Dedicated Short and any uncategorized funds. Sector Specific includes sector funds categorized as Technology, Energy, Bio-Tech, Finance, Real Estate, Metals & Mining and Miscellaneous oriented.

[1] Hedge Fund Research Q1 2017.

Fig. 13.2: Historical correlation of hedge fund strategies and public markets



Source: ASI, Bloomberg, June 2018.
Note: Green refers to a high correlation, yellow is a correlation of c. 0.5 (in absolute terms) and red is a low correlation. All hedge fund indices are from Hedge Fund Research (HFRI). All indices calculated in USD unhedged total returns using gross dividends. Correlations measured on the monthly annualised return since 31/12/1997, except for Activist which is measured since 31/12/2007 and Fixed Income Relative Value which is measured since 31/01/2009.

Traditional hedge fund strategies

Traditional hedge funds seek to offer exposure to many of the same kind of investment opportunities described above. The main differences are illiquidity, greater use of leverage and the claim to be able to add more value from manager skill.

Essentially, each fund or strategy should deliver alpha either above, or independent from, liquid markets on a risk-adjusted basis. Generating returns in excess of those of the market is hard, and the ability to persistently outperform is unusual.

Hedge fund strategies are not a homogenous group. We divide them into the following categories: relative value, macro, equity-hedged and event driven.

Each strategy is exposed to different alternative risk premia and market factors. Correlations to liquid markets, and to each other, varies (see figure 13.2). It is important to understand these correlations when thinking about their inclusion in a broader portfolio.

Each strategy relies on leverage, although the amount of leverage applied varies, depending on the volatility of the underlying portfolio and how it is constructed. Relative-value strategies may apply leverage to both the long and short sides of their portfolio, while some equity-hedged strategies may use very little leverage, if any. We discuss this in more detail in the strategy descriptions below.

Relative value strategies and related risk premia

A number of relative-value strategies seek to be market neutral over time, aiming to earn a regular and consistent return on a monthly basis, with relatively low volatility. Most liquid markets are traded in these strategies, although they tend to focus on developed markets. Relative value strategies tend to be exposed to carry, curve and some momentum risk premia.

A relative-value hedge fund manager will look for mispriced securities and apply leverage to both the long and the short sides of the trade, to extract a meaningful return. This strategy tends to rely on markets trading normally, with a reasonable amount of volatility, but not too much. Managers may mitigate against shocks in markets by securing access to credit lines, in order to be able to wait for the market dislocation to close.

One example of a market-neutral strategy is fixed-income relative value. Fixed-income relative-value fund managers typically seek to exploit arbitrage opportunities across the yield curve in government-bond markets, and are exposed to certain interest-rate-related risk premia. This could be in the form of exposure to the curve of a particular interest rate market, or the volatility of that market. In addition, the strategy might have factor exposure to a broad government-bond market such as the Barclays Global Aggregate index.

> "Relative-value strategies tend to be exposed to carry, curve and some momentum risk premia."

Credit strategies have played an increasing role in relative value, taking on credit-related alternative risk premia such as credit carry and credit curve. These strategies have become popular as yields are compressed and can offer a good alternative source of income.

Macro and related risk premia

Macro strategies can be both discretionary and systematic, although they trade the same instruments. These strategies vary considerably but tend to have high risk and return targets. This strategy is applied to liquid markets across any time frame, and aims to benefit from trends. Macro is the least predictable directional strategy in terms of factor exposures, possibly because manager style and approach can be very different. Interest rate momentum and credit carry are alternative risk premia that go some way to explaining returns. Commodity curve and foreign exchange carry are also important factors.

Discretionary macro fund managers look for market trends and perform fundamental analysis of both markets and economics to underpin their portfolio positions. Risk management is key, and the most successful managers operate within a strict risk-management framework. This means that losing portfolio positions are eliminated quickly, while winning positions are increased in size.

Systematic macro and managed futures strategies use algorithms based on market data and/or fundamental data, which are applied to liquid markets across different time frames. These strategies have a low correlation to equity markets and tend to perform well when equity markets are performing poorly.

These strategies also benefit from trends, but can perform poorly in sharp market reversals. Managers in these strategies are in constant competition to improve their algorithms. Algorithms can quickly become redundant as other participants recognise their value and replicate them. The best managers constantly and carefully evolve their investment algorithms as a result of cutting-edge research.

Equity-hedged and related risk premia

The equity-hedged strategy typically applies a fundamental approach to equity security analysis and can be explained by equity-market-related premia. These include size, value and momentum alternative risk premia, as well as the equity market beta factor. Hedge fund managers in this strategy employ the same fundamental analysis tools as traditional active equity managers, but are less constrained. Managers may do this on a discretionary basis, or use algorithms to trade stocks and construct portfolios.

Stocks are selected for both the long and the short sides of the portfolio, and individual stock and sector concentration can be higher than in traditional active equity portfolios. Each manager may have a particular style bias, meaning that they favour value or growth stocks, or have a size bias.

The proportion of net exposure to equity markets varies between hedge fund managers, but, almost invariably, they are net long. Leverage tends to be lower in equity strategies than in relative value and macro strategies. Returns and risk are often a proportion of those of traditional equity markets, depending on the stocks they hold and portfolio construction. Managers aim to add alpha from stock selection and sector or market timing, both on the long and the short sides of the book.

Event-driven and related risk premia

The event-driven strategy mainly invests in equity markets, but also in credit markets, and are usually managed on a discretionary basis. They tend to have significant exposure to equity-market factors, and are highly correlated over time. In terms of alternative risk premia, these strategies tend to be exposed to the equity size factor, particularly for 'activist' hedge funds. Returns vary according to the level of risk that is being taken. 'Hard catalyst events' can be expressed with relatively little market risk. For example, in a stock-for-stock company merger where the manager can go long the acquiree's stock and short the acquirer's stock. This would have relatively little – if any – equity-market factor risk.

As the name suggests, this strategy is typically concerned with corporate actions or events. Some event-driven strategies seek to exploit events that are almost certain to happen, or hard catalyst events. Others seek to exploit events that are less certain to happen, or may be further away from a time perspective, known as 'soft catalyst events'.

Soft catalyst events are subject to more equity-market factor risk. For example, the potential for a company to be broken up and parts of its business sold off to extract value for shareholders. In this model, the manager aims to add value from their due diligence to help them to understand if this is likely to happen, and what the value of the break-up of the company would be to shareholders.

Hedge fund performance over time

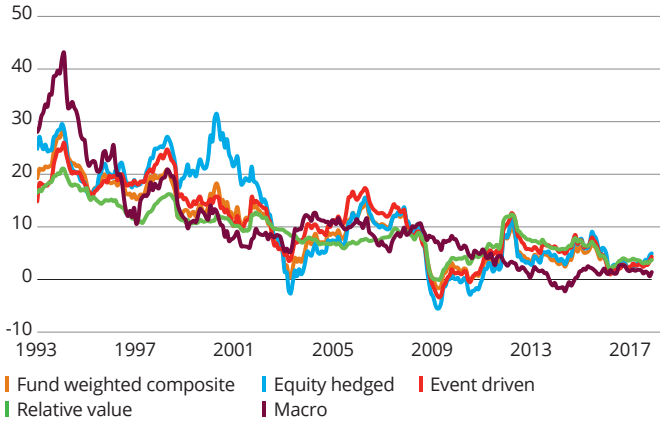
Data

Because hedge funds are generally private, it is difficult for many observers to obtain comprehensive and reliable data. A number of database providers hold large amounts of data covering thousands of hedge funds, but none include all managers. Typically, these databases are updated by the managers themselves and the data is not independently verified. A manager may stop contributing data at any time, which can lead to survivorship bias. Survivorship bias is a very important and perennial problem, making data difficult to analyse. We recognise these challenges when making investment decisions. Investment teams check the data, add to it and reorganise it according to their own classifications, for the purposes of fund due diligence and performance comparisons.

> "Absolute-return hedge funds have delivered a significant return above cash, meaning that these investments remain attractive."

Performance

Fig. 13.3: 3-Year rolling returns (%, annualised)



Source: ASI, Bloomberg, October 2017.
Note: All indices are from Hedge fund Research (HFRI). Returns are in USD and in percentage, per annum. Past performance is not a guide to future results.

In absolute terms, hedge fund returns have come down over time. Annualised returns for the HFRI Fund Weighted Composite index have averaged 6.1% since 1996 (9.9% since inception), but over the last 10 years they have averaged 2.9% (see figure 13.4). Assets under management have grown significantly, possibly eroding returns.

Many hedge funds target an absolute return linked to the LIBOR cash interest rate. As this rate has fallen from 5% in 2007 to just under 1% for most of the last 10 years, their absolute return has declined in step. Absolute-return hedge funds have, nevertheless, delivered a significant return above LIBOR, meaning that these investments remain attractive.

The picture is not quite so positive for higher-beta hedge funds, which aim to offer a superior risk and return profile to equity markets. Public equity markets have delivered high returns since the financial crisis. Hedge funds have struggled to keep up, partly because of exposure to out-of-favour equity style factors, and possibly due to the market effects of central bank intervention. It is possible that this weaker relative performance is also a function of the relatively low dispersion of stock performance during much of this period. In quantitative easing (QE) driven, 'risk-on, risk-off' markets, traditional hedge fund strategies have struggled to gain traction. If QE was the reason for hedge fund underperformance, we should see a return to form as it is unwound.

Fig. 13.4: Hedge fund historical returns by strategy (%)

	3Y	5Y	10Y	Inception
Fund Weighted Composite	3.9	5.0	2.9	9.9
Equity Hedged	5.0	6.5	2.7	11.5
Event Driven	4.3	5.8	3.7	10.4
Relative Value	3.7	4.9	4.7	9.2
Macro	1.4	1.5	1.9	10.2

Source: ASI, Bloomberg, October 2017.
Note: All indices are from Hedge fund Research (HFRI). Inception date is 31 December 1989. Returns are in USD and in percentage, per annum.

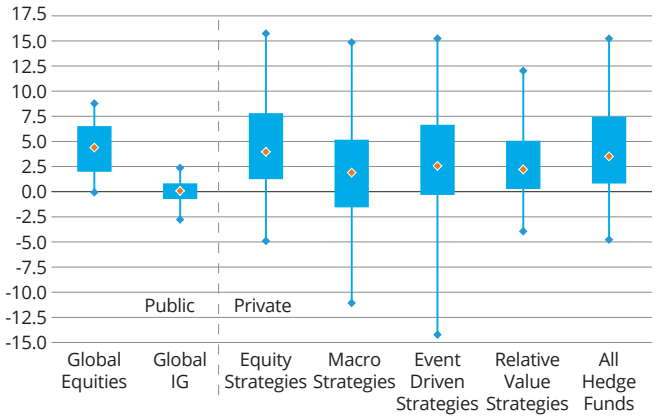
As can be seen in figure 13.4, relative value strategies have performed the best, returning 4.7% over 10 years. However, they have been lower over the last three years, with equity-related strategies performing better over a three-year time horizon.

Macro strategies have returned 10.2% since inception, although returns over the last 10 years have been rather lower, at 1.9%. It is possible that QE and its impact on financial markets explains the compression in returns, although this is still a matter of debate.

Statistical cluster analysis shows that the funds that make up the macro strategy are the most heterogeneous of all the strategies, making strategy return analysis difficult. Macro is not well described by alternative risk premia or traditional market factors, for example.

Compared with public markets, there is significantly bigger performance dispersion between hedge fund managers, so manager selection is key (see figure 13.5). Top-quartile managers deliver strong returns, but bottom-quartile managers deliver returns below cash. Without a good understanding of the manager's strategy and ability to execute, an investor is vulnerable to investing in a poorly performing manager. Academic evidence to support the case for manager selection finds that a subset of fund of funds consistently delivers alpha.[2]

Fig. 13.5: Hedge fund and public market manager dispersion
(%, annualised returns)



Source: ASI, Lipper, Preqin, October 2017.
Note: Orange dots show median fund manager return, blue boxes represent the 75th (top end) and 25th percentile (bottom end), and blue lines represent the 95th (highest value) and 5th percentile (lowest value). Global equities refers to MSCI AC World Index and Global IG refers to Bloomberg Barclays GlobalAgg Corporate Index, both are calculated as a USD total return for the period. Manager dispersion is based on the three year per annum net return from 31 August 2014 to 31 August 2017. IG = investment grade.

The widest dispersion is seen in the directional strategies, as they assume the most market risk. These strategies do not have a defined opportunity set, so each manager may be investing in very different instruments. Managers will have different degrees of freedom, so dispersion is wide. In addition, expected volatility of these strategies is greater than their relative-value counterparts. Dispersion for relative-value managers is lower, as they tend to target lower returns, and have less tolerance for risk as a result.

Conclusion

Institutional investors have been drawn to hedge fund strategies, as they serve a number of purposes. When considered as an excess return over cash, we expect hedge funds to deliver a meaningful return net of fees.

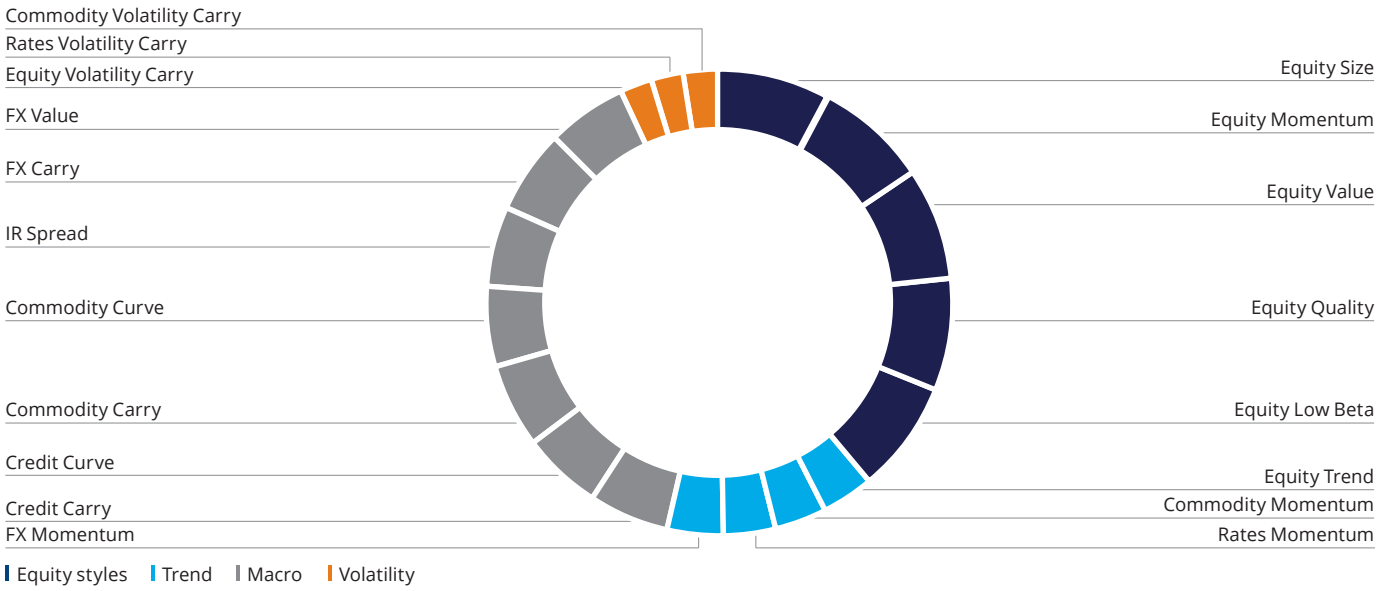
We expect the dispersion of manager returns to persist, and careful manager selection will be key to extracting the best possible returns from these strategies.

In the near term, we expect returns to stay in the range that they have seen more recently, increasing on a gentle slope over time. This is due in part to our expected path of interest-rate rises, and the fact that we expect modest returns from equity markets. These views are discussed in the Rates and Equities chapters.

While hedge fund performance improved in 2017, the last 10 years have seen unprecedented monetary policy action, and this may have had an impact on returns, as it may have had on other asset classes and styles. As this is reversed, there may be an impact on many asset class and style returns, including hedge funds.

[2] Fung, Hsieh and Naik and Ramadorai (2008) Hedge Funds: Performance, Risk, and Capital Formation.

Fig. 13.6: An example of diversified alternative risk premia strategy



Source: ASI, October 2017.
Note: For illustrative purposes only and provides no guarantee of future results.

Alternative risk premia

Many conventional hedge fund strategies generate excess returns by exploiting alternative risk premia – momentum, value and carry, for example. In recent years, quantitative asset managers have been able to replicate these sources of return using low-cost, liquid investment vehicles. Alternative risk premia strategies are unable to replicate all hedge fund returns as the best hedge funds add 'alpha' as well, but they can offer investors a cost-effective alternative.

As we discuss in the Introduction, our approach to long-term returns is shaped by the idea of risk premia: the compensation investors receive for bearing risk. Traditionally, investors have thought about risk premia in terms of asset classes and the risk premia that they offer exposure to. In the last 20 years, the academic finance community has provided robust evidence of risk premia such as value, carry, size, momentum or trend. These offer investors alternative risk premia.

Finance academics first discovered these factors in equity markets,[3] and they are discussed in the context of smart beta in Chapter 10. In fact, many of these factors apply in other markets: currency value, credit and commodity carry, and interest-rate-trend strategies are some examples.

There are different explanations for why these excess returns exist. The standard finance theory account is that the story is the same for conventional risk premia. Investors earn excess returns in compensation for bearing exposure to particular kinds of risk. For some risk premia – value and small-cap premia, for example – the risk is that losses during recessions are worse than for the market has a whole. The point is that, in return for bearing this additional risk, investors receive higher returns in the long run.

There are also behavioural explanations for these excess returns. For example, there is good evidence that low-beta stocks outperform. The behavioural view is that this is because a large number of investors are unable or unwilling to use leverage in their portfolios, and often make up for this by increasing the weight to higher risk, high-beta assets. This reduces the return on these assets and, as a result, low-beta assets outperform.[4]

In the past, accessing the excess returns resulting from alternative risk premia was only possible through hedge funds. Many hedge fund strategies generate returns not only through pure manager skill, but also by exploiting these alternative risk premia. This is good news for the hedge fund community, as it provides support to their claim to be able provide excess returns. Instead of having to invest based on faith in manager ability, investors can now also base their hedge fund allocation on the existence of reliable risk premia.

A key feature of both alternative risk premia and many hedge fund strategies is that they typically have low correlations with one another, so a combined portfolio of strategies increases risk-adjusted returns. Such combined strategies have low beta to equities, and are a useful diversifier for multi-asset portfolios. Figure 13.6 shows an example of such a combined strategy.

Like many of the alternative strategies described in this book, alternative risk premia strategies have a relatively short track record. This makes it hard to draw definitive conclusions about the level of expected returns. Historical data and back-testing make a convincing case that a material excess return over cash should be available from alternative risk premia, with strong diversification. But it is a little too early to be sure that this will be the result in practice.

[3] Fama and French (1992) The cross section of expected stock returns. Journal of Finance.
[4] Frazzini and Pedersen (2014) Betting against beta. Journal of Financial Economics.

Fig. 13.7: An example of an Absolute Return Portfolio

Security Selection

Volatility
Asian Basket vs US Variance
European vs US Volatility
Equity Option Premium

Currencies
Long Japanese Yen vs Australian Dollar
Long US Dollar vs Euro Currency Options
Long Indian Rupee vs Swiss Franc
Other FX

Interest Rates
Australian Short-term Interest Rates
US Real Yields vs Japanese Interest Rates
UK vs German Interest Rates
Short US Interest Rates
Swedish Flattener vs Canadian Steepener
Canadian Interest Rates

Equity
US Equity
Japanese Equity
Korea Equity
European Equity
UK Equity

Relative Value Equity
European Banks vs European Equity
Emerging Markets vs Brazillian Equity
US Large vs US Small Cap Equity
Global Oil Majors vs Global Equity

Real Estate
Global REITs

Credit
Emerging Markets Income
High Yield Credit
Brazillan Government Bonds

Source: ASI UK GARS portfolio, 30 June 2018.
Note: For illustrative purposes only and provides no guarantee of future results.

One concern is that many alternative risk premia have been discovered through statistical regression studies using historical data. There is a danger that they are the result of 'over-fitting' – the statistical model works well in back-testing but does not work well 'out of sample' when implemented. This criticism may prove valid for some strategies, but by no means all. Some alternative risk premia have now had more than two decades of out of sample testing with real money, and have delivered excess returns as expected. We will have to wait and see how much of a problem this is.

Accessible absolute return strategies

Another way hedge funds have succeeded is by taking advantage of market inefficiencies across a very wide range of asset classes, and by making use of derivatives and short-selling strategies.

A category of absolute return funds has emerged in the last decade, which uses similar approaches but in a more accessible way: offering investors liquidity, increased transparency and lower fees. This new breed of absolute return funds tends to rely most on macro-oriented hedge fund strategies (making possible greater liquidity and lower fees).

> "A new category of absolute return funds uses similar approaches but in a more accessible way: offering investors liquidity, increased transparency and lower fees."

These funds aim to achieve their excess return over cash by using a mix of market beta, relative value, currency, derivative and risk-premia strategies. Their absolute return target is achieved through strong diversification across a large number of uncorrelated investment strategies (see figure below) and a multi-pronged approach to risk management. This reduces the expected volatility of portfolio returns compared with traditional investment strategies. Additionally, historical and forward-looking scenario analyses help identify risks from shifting market correlations and volatility events.

Like alternative risk premia strategies, absolute return strategies have a relatively short track record. The history so far suggests that they have been good at delivering on their objective of positive absolute returns. A few of these funds were launched shortly before the financial crisis period, and built early credibility by achieving positive absolute returns during an extremely challenging period for markets, while traditional portfolios suffered double-digit losses. Subsequently, absolute return funds have typically managed to deliver a track record of positive returns in most years. It is, as yet, less clear what level of excess returns investors should expect, as there has been a fair amount of variability in the level of realised returns in this market segment.

Appendix

Expected returns by base currency

Risk and return for UK investors

Asset	Local Currency	Local			GBP			GBP Hedged			Volatility	5Y Sharpe Ratio
		3Y	5Y	10Y	3Y	5Y	10Y	3Y	5Y	10Y		
UK Equities	GBP	6.1	5.8	5.6	6.1	5.8	5.6	6.1	5.8	5.6	16.6	0.27
US Equities	USD	4.2	4.1	3.2	3.0	2.5	1.7	2.4	2.5	2.0	16.6	0.07
Europe ex UK Equities	EUR	4.3	3.7	2.5	4.1	3.2	2.4	5.7	5.1	3.8	19.7	0.19
Japan Equities	JPY	4.7	4.5	4.7	5.0	4.6	5.3	5.8	6.0	6.3	21.8	0.22
Pacific ex Japan Equities	Various	6.4	6.3	5.9	5.6	5.2	4.8	5.1	5.1	4.9	17.5	0.22
Emerging Markets Equities*	Various	6.5	6.3	6.3	5.6	4.9	5.1	n/a	n/a	n/a	27.5	0.13
Global Equities	Various	4.7	4.5	3.8	3.9	3.4	2.8	3.8	3.7	3.2	16.3	0.15
UK Gilts	GBP	0.3	0.8	1.2	0.3	0.8	1.2	0.3	0.8	1.2	6.0	-0.08
UK Inflation-Linked Gilts	GBP	-2.1	-1.3	0.3	-2.1	-1.3	0.3	-2.1	-1.3	0.3	10.7	-0.24
US Treasuries	USD	2.6	2.7	2.8	1.4	1.1	1.3	0.8	1.1	1.6	4.9	-0.03
Euro Govt Bonds	EUR	0.5	0.9	1.6	0.3	0.5	1.4	1.8	2.3	2.9	4.3	0.24
Japanese Govt Bonds	JPY	-0.1	-0.3	-0.1	0.1	-0.3	0.5	1.0	1.1	1.6	3.7	-0.04
Global DM Govt Bonds	Various	1.1	1.2	1.5	0.7	0.6	1.2	1.1	1.4	1.9	3.5	0.04
UK IG Bonds	GBP	1.9	2.3	2.9	1.9	2.3	2.9	1.9	2.3	2.9	6.8	0.15
US IG Bonds	USD	3.6	3.8	4.0	2.4	2.2	2.5	1.8	2.2	2.8	5.5	0.17
Euro IG Bonds	EUR	0.8	1.2	1.8	0.7	0.8	1.7	2.2	2.6	3.1	3.3	0.39
Global IG Bonds	Various	2.8	3.0	3.4	2.0	1.9	2.3	1.9	2.3	2.9	4.7	0.22
US High Yield Bonds	USD	4.2	4.7	5.3	3.0	3.0	3.8	2.4	3.0	4.0	9.6	0.18
Europe High Yield Bonds	EUR	1.5	2.1	3.1	1.4	1.7	2.9	2.9	3.5	4.4	12.8	0.18
EM Debt (Hard)	USD	5.2	5.5	6.0	4.0	3.9	4.5	3.4	3.9	4.7	9.1	0.28
EM Debt (Local)*	Various	6.7	6.7	6.7	5.8	5.5	5.9	n/a	n/a	n/a	12.3	0.34
Senior Secured Loans	USD	5.3	5.7	6.1	4.1	4.0	4.5	3.5	4.0	4.7	8.3	0.33
ABS - Mezzanine	EUR	3.2	4.0	5.1	3.1	3.5	5.0	4.6	5.4	6.4	7.0	0.59
Insurance Linked Securities	USD	5.9	5.9	5.9	4.7	4.3	4.3	4.0	4.2	4.6	5.4	0.55
UK Commercial Property	GBP	2.9	3.8	5.1	2.9	3.8	5.1	2.9	3.8	5.1	13.2	0.19
US Commercial Property	USD	4.9	5.3	4.4	3.7	3.6	2.8	3.0	3.6	3.1	12.9	0.18
Europe ex UK Commercial Property	EUR	5.7	4.9	4.3	5.5	4.5	4.1	7.1	6.3	5.6	13.3	0.38
Global Commercial Property	Various	5.1	4.9	4.5	4.5	4.1	3.8	4.9	4.8	4.5	9.6	0.37
UK REIT	GBP	4.4	4.7	5.4	4.4	4.7	5.4	4.4	4.7	5.4	29.4	0.12
US Private Equity Buyout	USD	6.9	6.9	6.2	5.7	5.3	4.7	5.0	5.2	4.9	n/a	n/a
Europe Private Equity Buyout	EUR	8.7	8.2	7.5	8.5	7.7	7.4	10.2	9.7	8.9	n/a	n/a
US Venture Capital	USD	6.3	6.2	5.5	5.0	4.6	4.0	4.4	4.6	4.2	n/a	n/a
Infrastructure Social	GBP	5.9	5.9	6.1	5.9	5.9	6.1	5.9	5.9	6.1	10.7	0.44
Infrastructure Renewables	GBP	6.1	6.1	6.2	6.1	6.1	6.2	6.1	6.1	6.2	8.2	0.59
Alternative Risk Premia	USD	7.2	7.2	7.2	6.0	5.5	5.6	5.3	5.5	5.9	10.4	0.41
Hedge Funds	USD	5.2	5.2	5.2	4.0	3.5	3.6	3.3	3.5	3.9	6.9	0.33
Commodity Futures	USD	2.8	2.9	3.0	1.7	1.4	1.5	1.0	1.3	1.7	21.2	0.00
UK Cash 3M LIBOR	GBP	1.2	1.5	2.0	1.2	1.5	2.0	1.2	1.5	2.0	1.2	0.21
USD Cash 3M LIBOR	USD	3.0	3.1	3.2	1.8	1.5	1.6	1.2	1.5	1.9	1.2	0.17
EUR Cash 3M LIBOR	EUR	0.0	0.3	0.9	-0.2	-0.1	0.7	1.4	1.7	2.1	1.2	0.34

Source: ASI, 2H2018.
Note: Local returns for assets comprised of various currencies exclude any foreign currency movement. Volatility and Sharpe ratio refers to GBP Hedged (except for "*" which refers to GBP Unhedged). Private Equity buyout and venture capital volatilities and Sharpe ratios cannot be calculated because the required high frequency data is not available. Return projections are estimates and provide no guarantee of future results.
DM = developed market, IG = investment grade, EM = emerging market, REIT = real estate investment trust, ABS = asset-backed security, LIBOR = London interbank offered rate.

Risk and return for EUR investors

Asset	Local Currency	Local			EUR			EUR Hedged			Volatility	5Y Sharpe Ratio
		3Y	5Y	10Y	3Y	5Y	10Y	3Y	5Y	10Y		
UK Equities	GBP	6.1	5.8	5.6	6.2	6.2	5.7	4.6	4.4	4.3	16.3	0.28
US Equities	USD	4.2	4.1	3.2	3.2	3.0	1.8	1.0	1.1	0.7	16.4	0.07
Europe ex UK Equities	EUR	4.3	3.7	2.5	4.3	3.7	2.5	4.3	3.7	2.5	19.4	0.19
Japan Equities	JPY	4.7	4.5	4.7	5.2	5.0	5.5	4.4	4.5	5.0	21.4	0.22
Pacific ex Japan Equities	Various	6.4	6.3	5.9	5.8	5.7	4.9	3.7	3.6	3.6	17.2	0.22
Emerging Markets Equities*	Various	6.5	6.3	6.3	5.8	5.4	5.3	n/a	n/a	n/a	5.4	0.22
Global Equities	Various	4.7	4.5	3.8	4.1	3.8	3.0	2.5	2.4	2.1	16.1	0.16
UK Gilts	GBP	0.3	0.8	1.2	0.5	1.2	1.4	-1.0	-0.5	0.1	5.9	-0.07
US Treasuries	USD	2.6	2.7	2.8	1.6	1.6	1.4	-0.5	-0.3	0.4	4.7	-0.03
Euro Govt Bonds	EUR	0.5	0.9	1.6	0.5	0.9	1.6	0.5	0.9	1.6	4.0	0.25
Euro Inflation-Linked Govt Bonds	EUR	1.0	1.4	2.1	1.0	1.4	2.1	1.0	1.4	2.1	6.2	0.25
Japanese Govt Bonds	JPY	-0.1	-0.3	-0.1	0.3	0.2	0.7	-0.4	-0.3	0.3	3.6	-0.04
Global DM Govt Bonds	Various	1.1	1.2	1.5	0.9	1.0	1.3	-0.2	0.0	0.7	3.3	0.05
Euro IG Bonds	EUR	0.8	1.2	1.8	0.8	1.2	1.8	0.8	1.2	1.8	3.1	0.41
UK IG Bonds	GBP	1.9	2.3	2.9	2.1	2.7	3.1	0.6	0.9	1.7	6.7	0.15
US IG Bonds	USD	3.6	3.8	4.0	2.6	2.7	2.6	0.4	0.8	1.6	5.4	0.17
Global IG Bonds	Various	2.8	3.0	3.4	2.2	2.3	2.5	0.5	0.9	1.6	4.5	0.22
Europe High Yield Bonds	EUR	1.5	2.1	3.1	1.5	2.1	3.1	1.5	2.1	3.1	12.6	0.18
US High Yield Bonds	USD	4.2	4.7	5.3	3.2	3.5	3.9	1.0	1.6	2.8	9.4	0.18
EM Debt (Hard)	USD	5.2	5.5	6.0	4.2	4.3	4.6	2.0	2.5	3.5	8.9	0.29
EM Debt (Local)*	Various	6.7	6.7	6.7	6.0	6.0	6.0	n/a	n/a	n/a	6.0	0.66
Senior Secured Loans	USD	5.3	5.7	6.1	4.3	4.5	4.6	2.1	2.6	3.5	8.2	0.33
ABS - Mezzanine	EUR	3.2	4.0	5.1	3.2	4.0	5.1	3.2	4.0	5.1	6.9	0.59
Insurance Linked Securities	USD	5.9	5.9	5.9	4.9	4.7	4.5	2.6	2.8	3.3	5.2	0.56
UK Commercial Property	GBP	2.9	3.8	5.1	3.0	4.2	5.2	1.5	2.4	3.8	13.0	0.19
US Commercial Property	USD	4.9	5.3	4.4	3.9	4.1	2.9	1.6	2.2	1.8	12.7	0.18
Europe ex UK Commercial Property	EUR	5.7	4.9	4.3	5.7	4.9	4.3	5.7	4.9	4.3	13.1	0.38
Global Commercial Property	Various	5.1	4.9	4.5	4.7	4.5	4.0	3.4	3.4	3.2	9.4	0.37
Europe ex UK REIT	EUR	5.0	4.4	3.9	5.0	4.4	3.9	5.0	4.4	3.9	15.5	0.28
US Private Equity Buyout	USD	6.9	6.9	6.2	5.9	5.8	4.8	3.6	3.8	3.6	n/a	n/a
Europe Private Equity Buyout	EUR	8.7	8.2	7.5	8.7	8.2	7.5	8.7	8.2	7.5	n/a	n/a
US Venture Capital	USD	6.3	6.2	5.5	5.2	5.1	4.1	3.0	3.1	2.9	n/a	n/a
Infrastructure Social	GBP	5.9	5.9	6.1	6.0	6.3	6.2	4.4	4.5	4.8	10.5	0.44
Infrastructure Renewables	GBP	6.1	6.1	6.2	6.3	6.5	6.3	4.7	4.7	4.9	8.1	0.59
Alternative Risk Premia	USD	7.2	7.2	7.2	6.2	6.0	5.7	3.9	4.1	4.6	10.2	0.41
Hedge Funds	USD	5.2	5.2	5.2	4.2	4.0	3.7	1.9	2.1	2.6	6.8	0.33
Commodity Futures	USD	2.8	2.9	3.0	1.9	1.8	1.6	-0.3	-0.1	0.5	20.9	0.00
UK Cash 3M LIBOR	GBP	1.2	1.5	2.0	1.4	1.9	2.1	-0.1	0.1	0.7	0.9	0.29
USD Cash 3M LIBOR	USD	3.0	3.1	3.2	2.0	2.0	1.7	-0.2	0.1	0.6	0.9	0.23
EUR Cash 3M LIBOR	EUR	0.0	0.3	0.9	0.0	0.3	0.9	0.0	0.3	0.9	0.9	0.47

Source: ASI, 2H2018.
Note: Local returns for assets comprised of various currencies exclude any foreign currency movement. Volatility and Sharpe ratio refers to EUR Hedged (except for "*" which refers to EUR Unhedged). Private Equity buyout and venture capital volatilities and Sharpe ratios cannot be calculated because the required high frequency data is not available. Return projections are estimates and provide no guarantee of future results.
DM = developed market, IG = investment grade, EM = emerging market, REIT = real estate investment trust, ABS = asset-backed security, LIBOR = London interbank offered rate.

Risk and return for USD investors

Asset	Local Currency	Local			USD			USD Hedged			Volatility	5Y Sharpe Ratio
		3Y	5Y	10Y	3Y	5Y	10Y	3Y	5Y	10Y		
UK Equities	GBP	6.1	5.8	5.6	7.3	7.5	7.1	8.0	7.5	6.9	16.9	0.27
US Equities	USD	4.2	4.1	3.2	4.2	4.1	3.2	4.2	4.1	3.2	17.0	0.07
Europe ex UK Equities	EUR	4.3	3.7	2.5	5.3	4.8	3.8	7.6	6.7	5.1	20.1	0.19
Japan Equities	JPY	4.7	4.5	4.7	6.3	6.1	6.9	7.7	7.6	7.6	22.2	0.21
Pacific ex Japan Equities	Various	6.4	6.3	5.9	6.9	6.9	6.3	7.0	6.7	6.2	17.8	0.22
Emerging Markets Equities*	Various	6.5	6.3	6.3	6.8	6.5	6.7	n/a	n/a	n/a	28.0	0.13
Global Equities	Various	4.7	4.5	3.8	5.1	5.0	4.3	5.6	5.3	4.5	16.6	0.15
UK Gilts	GBP	0.3	0.8	1.2	1.5	2.4	2.6	2.1	2.4	2.5	6.2	-0.08
US Treasuries	USD	2.6	2.7	2.8	2.6	2.7	2.8	2.6	2.7	2.8	5.1	-0.05
US Inflation-Linked Treasuries	USD	2.5	2.7	3.0	2.5	2.7	3.0	2.5	2.7	3.0	6.0	-0.03
Euro Govt Bonds	EUR	0.5	0.9	1.6	1.5	2.0	2.9	3.7	3.9	4.1	4.5	0.23
Japanese Govt Bonds	JPY	-0.1	-0.3	-0.1	1.3	1.2	2.0	2.8	2.7	2.8	4.0	-0.04
Global DM Govt Bonds	Various	1.1	1.2	1.5	1.9	2.1	2.7	2.9	3.0	3.2	3.8	0.03
UK IG Bonds	GBP	1.9	2.3	2.9	3.2	3.9	4.4	3.8	3.9	4.3	7.1	0.15
US IG Bonds	USD	3.6	3.8	4.0	3.6	3.8	4.0	3.6	3.8	4.0	5.6	0.16
Euro IG Bonds	EUR	0.8	1.2	1.8	1.9	2.3	3.1	4.1	4.2	4.4	3.6	0.37
Global IG Bonds	Various	2.8	3.0	3.4	3.2	3.4	3.8	3.7	3.9	4.1	4.8	0.21
US High Yield Bonds	USD	4.2	4.7	5.3	4.2	4.7	5.3	4.2	4.7	5.3	9.9	0.18
Europe High Yield Bonds	EUR	1.5	2.1	3.1	2.6	3.2	4.4	4.8	5.2	5.7	13.1	0.18
EM Debt (Hard)	USD	5.2	5.5	6.0	5.2	5.5	6.0	5.2	5.5	6.0	9.3	0.28
EM Debt (Local)*	Various	6.7	6.7	6.7	7.0	7.1	7.4	n/a	n/a	n/a	12.8	0.34
Senior Secured Loans	USD	5.3	5.7	6.1	5.3	5.7	6.1	5.3	5.7	6.1	8.6	0.32
ABS - Mezzanine	EUR	3.2	4.0	5.1	4.3	5.1	6.5	6.5	7.1	7.8	7.3	0.58
Insurance Linked Securities	USD	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.6	0.53
UK Commercial Property	GBP	2.9	3.8	5.1	4.1	5.4	6.5	4.7	5.5	6.4	13.5	0.19
US Commercial Property	USD	4.9	5.3	4.4	4.9	5.3	4.4	4.9	5.3	4.4	13.2	0.18
Europe ex UK Commercial Property	EUR	5.7	4.9	4.3	6.8	6.0	5.6	9.1	8.0	6.9	13.6	0.38
Global Commercial Property	Various	5.1	4.9	4.5	5.8	5.7	5.4	6.7	6.5	5.8	9.8	0.36
US REIT	USD	4.6	4.9	4.1	4.6	4.9	4.1	4.6	4.9	4.1	19.9	0.10
US Private Equity Buyout	USD	6.9	6.9	6.2	6.9	6.9	6.2	6.9	6.9	6.2	n/a	n/a
Europe Private Equity Buyout	EUR	8.7	8.2	7.5	9.8	9.4	8.9	12.1	11.4	10.2	n/a	n/a
US Venture Capital	USD	6.3	6.2	5.5	6.3	6.2	5.5	6.3	6.2	5.5	n/a	n/a
Infrastructure Social	GBP	5.9	5.9	6.1	7.1	7.6	7.5	7.8	7.6	7.4	10.9	0.43
Infrastructure Renewables	GBP	6.1	6.1	6.2	7.3	7.8	7.7	8.0	7.8	7.6	8.5	0.58
Alternative Risk Premia	USD	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	7.2	10.6	0.41
Hedge Funds	USD	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	7.1	0.32
Commodity Futures	USD	2.8	2.9	3.0	2.8	2.9	3.0	2.8	2.9	3.0	21.6	0.00
UK Cash 3M LIBOR	GBP	1.2	1.5	2.0	2.4	3.1	3.4	3.1	3.2	3.2	1.7	0.15
USD Cash 3M LIBOR	USD	3.0	3.1	3.2	3.0	3.1	3.2	3.0	3.1	3.2	1.7	0.12
EUR Cash 3M LIBOR	EUR	0.0	0.3	0.9	1.1	1.4	2.2	3.2	3.3	3.4	1.7	0.25

Source: ASI, 2H2018.
Note: Local returns for assets comprised of various currencies exclude any foreign currency movement. Volatility and Sharpe ratio refers to USD Hedged (except for "*" which refers to USD Unhedged). Private Equity buyout and venture capital volatilities and Sharpe ratios cannot be calculated because the required high frequency data is not available.
Return projections are estimates and provide no guarantee of future results.
DM = developed market, IG = investment grade, EM = emerging market, REIT = real estate investment trust, ABS = asset-backed security, LIBOR = London interbank offered rate.

Report team

Our long-term investment outlook reflects the combined expertise of a wide range of investment specialists within Aberdeen.

Most of the writing was done by members of the Global Strategy team together with economists in the ASI Research Institute. They are credited below, but we also warmly acknowledge the many conversations and research insights we have received from numerous portfolio managers and asset class specialists throughout our company.

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2.	Long-term growth	Paul Diggle (Research Institute) and Craig Mackenzie
3.	Trends in interest rates and inflation	James McCann (Research Institute) and Thomas Laskey
4.	Macroeconomic outlook	Jeremy Lawson and Lucy O'Carroll (Research Institute)
5.	Rates	Thomas Laskey
6.	Currencies	Thomas Laskey
7.	Emerging market debt	Craig Mackenzie and Thomas Laskey
8.	Credit	Thomas Laskey
9.	Alternative credit	Craig Mackenzie
10.	Equities	Craig Mackenzie and Alex Tempier
11.	Private equity	Jennifer Mernagh and Alex Tempier
12.	Real assets	Jennifer Mernagh and Craig Mackenzie
13.	Hedge funds, alternative risk premia and other absolute return strategies	Jennifer Mernagh and Craig Mackenzie

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Craig Mackenzie, Editor

Notes

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