Joseph Davis, Ph.D., Global Chief Economist, Vanguard

Lead authors of this paper also include:
- Roger A. Aliaga-Díaz, Ph.D., Chief Economist (Americas), Vanguard
- Peter Westaway, Ph.D., Chief Economist (Europe), Vanguard
- Qian Wang, Ph.D., Chief Economist (Asia-Pacific), Vanguard
- Andrew J. Patterson, CFA, Senior Investment Strategist, Vanguard
- Harshdeep Ahluwalia, M.Sc., Senior Investment Strategist, Vanguard

VANGUARD ECONOMIC AND MARKET OUTLOOK FOR 2018 (PART TWO)

Rising risks to the status quo

Vanguard

Global economic perspectives (continued from Part One)

Part One of this paper, from the previous week, discussed Vanguard's global economic and growth outlooks, as well their perspective on Australia and the United States.

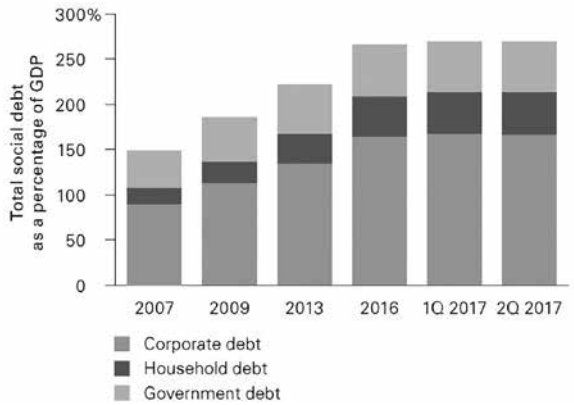
China: Two steps forward, one step back

Following a decade of aggressive credit expansion, China's credit profile has stabilised recently, as tighter financial controls and a rebound in nominal growth helped stunt a rise in corporate liabilities – the crux of China's debt fears (see Figure 17). Although this bodes well for China's medium-term goal of maintaining financial stability, we are conscious of the negative impact it will have on growth in the near term. Alongside tighter property regulations and supply-side adjustments, the financial tightening is likely to cause China to decelerate modestly in 2018, reaching about 6.0%–6.5%.

Nonetheless, the chance of a significant deceleration in the near term – that is, a hard-landing scenario – is low for several reasons.

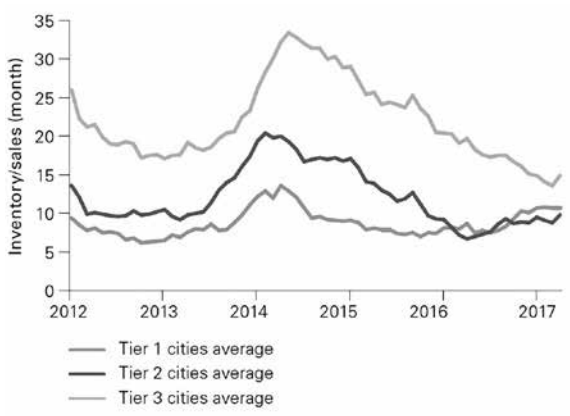
First, the oversupply and overcapacity drags in the real estate and heavy industrial sectors, which have weighed on China's investment growth for years, are likely to be less intense going forward. In the property market, for example, a combination of strong demand and a sharp contraction in investment from the middle of 2013 to 2015 has reduced the extent of inventory overhang (see Figure 18a). Additionally, it appears that the peak of the industrial capacity reduction is behind us.

Figure 17. China's debt-to-GDP ratio has stabilised on financial tightening and better growth



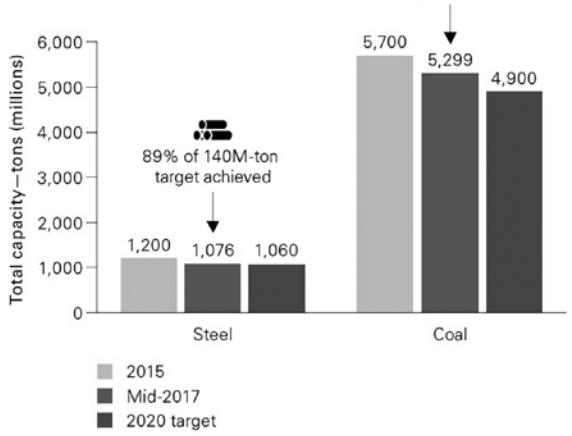
Source: Vanguard, using data from the People's Bank of China (PBoC) and the National Bureau of Statistics of China (NBS).

Figure 18a. Rapid destocking has taken place in smaller cities



Source: Vanguard, using data from CEIC.

Figure 18b. The peak of industrial capacity reduction has passed



Source: Vanguard, using data from NBS.

Figure 19. Priority and progress of structural reforms to date

Priority	Reform	Target	Progress
High	Overcapacity and environmental protection	Improve the quality of growth by reducing excess capacity and highly polluting investment.	Supply-side reforms have played a key role in reducing overcapacity.
↑	Financial	Foster development of domestic capital markets and improve the resilience of the financial system.	A proposal for a registration-based IPO system was recently approved; regulation and financial tightening have restricted shadow banking activity.
	Fiscal	Redefine central/local government responsibilities and centralise spending on basic pension and public security.	"Lifelong accountability" for local government officials will help control financial risk.
	State-owned enterprises (SOEs)	Finish restructuring and deleverage.	Trials are ongoing in mergers and acquisitions and mixed ownership, but nonperforming loan disclosure is still low as banks support SOE debt rollover.
	Urbanisation	Loosen household registration restrictions and even out the urbanisation process.	Quality lags quantitative improvement: Most new urban residents are still not legally allowed to access services.
↓	Service sector	Lower entry barriers to introduce competition.	Barriers are lower, but further deregulation is needed for fair competition.
Low	Capital account	Achieve IMF classification of capital account transactions, expand cross-border portfolio investment schemes, and relax rules on cross-border financing.	Special Drawing Right inclusion, stock and bond connection, a Shanghai free-trade zone, a wider yuan daily trading band, and one-way asymmetric capital account liberalisation have been implemented. More must be done to allow two-way capital flows.

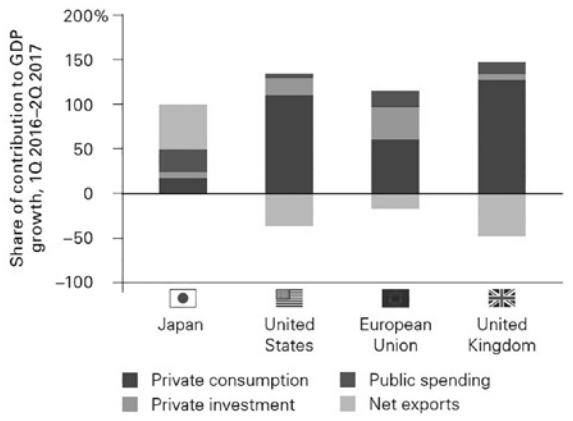
Source: Vanguard.

As Figure 18b illustrates, in the last 18 months, 50% of the five-year capacity reduction target has been achieved in the coal sector, and nearly 90% has been achieved in the steel sector.

Second, Chinese policymakers possess the toolkit and flexibility to cushion downturns. Policymakers remain in a "fight and retreat" mode, with the recent easing of capital outflow pressures temporarily providing them with some operational independence to achieve this internal objective. While Fed normalisation in 2018 could trigger renewed capital outflow pressure, the tighter enforcement of capital flow management measures could limit the negative feedback loop between a weakening currency and capital outflows.

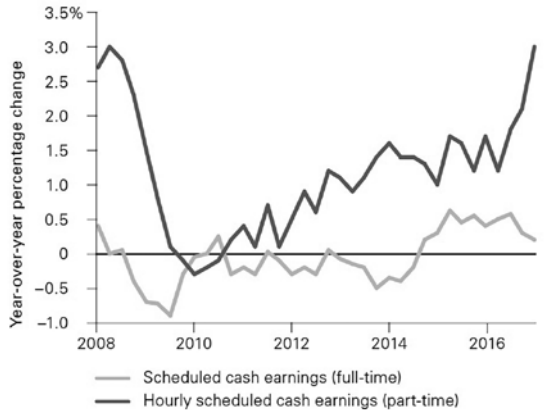
Third, positive developments in the transformation of China's growth model could mitigate downside pressures coming from a slowdown in fixed investment and the highly leveraged industrial sector. Growth in household consumption remains resilient and has outpaced that of investment and exports. With disposable income growing faster than headline GDP growth, Chinese consumers have experienced a consumption upgrade, which, in turn, has provided a boost to the tertiary sector even as the secondary industrial sector has dwindled in recent years.

Figure 20. Expansion has yet to extend into private demand in Japan



Source: Vanguard, using data from Thomson Reuters Datastream.

Figure 21. Part-time wages to accelerate, although full-time wage growth remains subdued

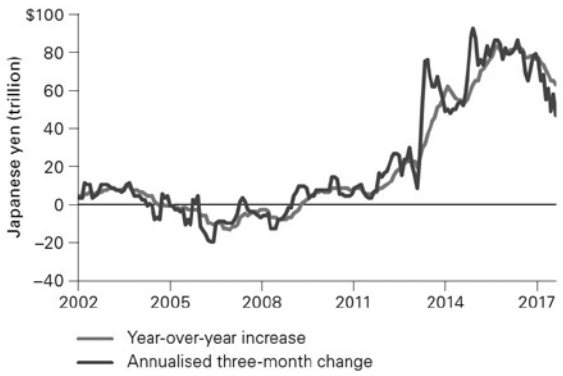


Source: Vanguard, using data from the Ministry of Health, Labour and Welfare.

Our worry lies in the longer term. While many market observers are concerned that aggressive pursuit of economic and financial reforms could trigger a hard landing, overly focusing on near-term growth stability without instituting necessary market reforms to correct distortion in resource allocation will eventually lead to further slowdown in productivity growth.

On that front, it is encouraging that President Xi Jinping, during his political report in the 19th National Party Congress, prioritised the quality of growth over the speed. This suggests that policymakers could have a slightly higher tolerance for a lower growth rate in coming years. In Figure 19, we explore the areas in which policymakers will most likely focus their reform efforts. The key will be to relax government control to allow market forces to play a bigger role in the economy and address the inefficiencies created by state-owned enterprises (SOEs). Whether China can successfully transition to a productivity-led growth model will ultimately shape its future as a global growth driver or as the next Japan.

Figure 22. The Bank of Japan's 'tapering' is not 'tightening'



Source: Vanguard, using data from CEIC.

Japan: Rising with the tide … for now

After nearly two decades of low growth and persistent deflation, Japan's economy is showing signs of recovery. Unlike in other developed countries where monetary easing has partly succeeded in shoring up private demand, Japan's latest expansion cycle has come primarily from an acceleration in the export cycle and a mildly expansionary fiscal policy, while household and business spending remains modest (see Figure 20).

In 2018, we expect the recovery to become more broad-based, as rising confidence, a gradual increase in real wages, and solid profitability leave room for domestic demand to pick up in coming quarters. Although this is unlikely to fully offset the drag from the fading 2016 fiscal stimulus, the more diversified pool of growth drivers suggests Japan is likely to record another year of above-trend growth in 2018.

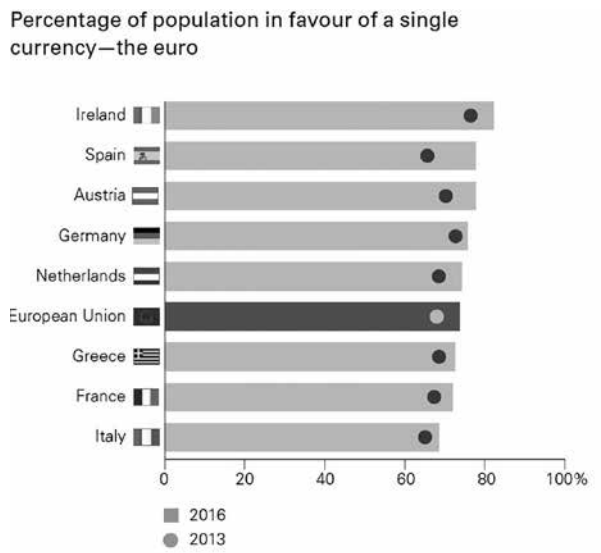
The cyclical upturn is likely to lead to a further tightening in labour market conditions. In fact, Japan's market is already as tight as it was during the early to mid-1990s, with the unemployment rate at the lower bound of its 3%–3.5% natural rate.

Wage inflation remains anemic, though, and skepticism about Japan's reflation efforts still runs deep. In our view, this partly reflects the recent rise in labour supply and the shift in workforce composition toward low- income part-time workers. In particular, the recent increase in labour supply is largely concentrated in two population segments, namely women and the elderly; both tend to work part-time jobs and therefore earn only a third to half of that of a full-time employee.

As demographic headwinds begin to bite, the labour market in Japan could tighten further and lead to an acceleration in part-time wages (see Figure 21). Together with a widening positive output gap and weakening currency, core inflation is likely to pick up gradually toward 1% in 2018. However, without further progress in labour market reforms and an acceleration in full-time wages, Japan is unlikely to achieve and sustain its 2% inflation target in the near term.

Against this backdrop, the Bank of Japan, unlike most developed central banks, is expected to maintain easy policy, anchoring the country's 10-year government bond yield at about 0% in 2018. By targeting price over quantity, however, the Bank of Japan has effectively started to taper its asset purchases (see Figure 22). It should be clear, though, that this is not an attempt to reverse stimulus but rather an indirect consequence of moving the policy goalposts.

Figure 23. Anti-euro sentiment: Is the tide turning?



Source: Eurobarometer

Figure 24. Four Brexit scenarios

Our probabilities

35% Crash Brexit
The U.K. fails to reach a deal and effectively falls out of the EU with no backstop. The U.K. moves to World Trade Organisation rules.

35% Hard Brexit
The U.K. leaves the EU Single Market and the Customs Union and reintroduces immigration controls.

20% Soft Brexit
The U.K. joins the European Economic Area and retains access to the EU Single Market and the Customs Union.

10% No Brexit
Article 50 is revoked and Brexit does not take place.

Source: Vanguard.

Importantly, monetary policy alone cannot lift up Japan's long-term growth potential, which ultimately influences wage-setting and business investment decisions. More structural reforms, from equalising the wage gap between full- and part-timers to raising medium-term growth and inflation expectations, are needed to improve the effectiveness of such cyclical policies.

With Prime Minister Shinzo Abe securing a solid mandate in the October 2017 snap election and expected to stay in power until 2021, Japan's future now depends on whether Abe focuses his political capital on economic reforms to lift productivity and long-term growth potential.

Europe: A brighter horizon

In the context of an increasingly synchronised global recovery, the outlook for the euro-area economy over the next 12 months is as bright as it has been since the 2008–2009 financial crisis. After years of recession, crises, and political uncertainty, the clouds are starting to clear. This is not to say that all the underlying issues have been resolved. Nonetheless, all countries are growing again, and unemployment is steadily falling.

We anticipate that growth in the euro area will be just below 2% in 2018, with risks tilted to the upside for the first time since the 2008–2009 crisis. Political risk, in the form of a rise in anti-European Union parties, was dominant during 2017. The risk has not disappeared, but it has diminished (see Figure 23).

In the United Kingdom, by contrast, the economic outlook is much more uncertain given the lack of clarity over Brexit. Our base case is for growth in the 1.5%– 2.5% range. Ultimately, the major effects of Brexit will be felt only once the country actually leaves the European Union (EU), which won't happen until 2019 and possibly later if a transition is agreed to. We anticipate four possible exit scenarios (see Figure 24). We still believe that no Brexit is a possible outcome, with roughly a 15% probability.

Despite the positive growth picture, euro-area core inflation has remained stubbornly low, at 1.2%. The U.K. situation looks different superficially, given that U.K. Consumer Price Index inflation, at 3%, is about 1% above target, but much of this was caused by rising import prices prompted by the falling value of sterling. Abstracting from that, domestically generated inflation in the United Kingdom has similarly been more subdued than expected.

As with other developed economies, this inflation puzzle has a number of potential explanations:

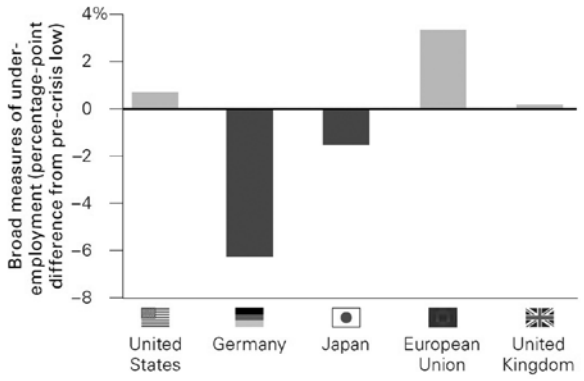
- Measured unemployment possibly disguising underemployment of workers (see Figure 25a).
- Decreasing bargaining power of labour because of continued declines in unionisation (see Figure 25b).
- Increasing influence of global rather than local measures of slack (globalisation).
- New technology reducing production costs and putting downward pressure on profit margins.

Notwithstanding these influences, which are leading the inflation response to be slower than in previous upturns, our view is that inflation will eventually reawaken as unemployment continues to fall toward the equilibrium rate, which is assumed to be 8.5%–9% in the euro area and as low as 4% in the United Kingdom.

Given this environment of gradually tightening product and labour markets in the euro area, we expect the European Central Bank, under our base-case scenario, to terminate its asset purchase at the end of 2018, slightly beyond the ECB's existing commitment to purchase assets until September 2018. We do not anticipate rate increases until at least 2019, and possibly not until the next decade, given the ECB's commitment to keep rates on hold until well past the end of its quantitative easing.

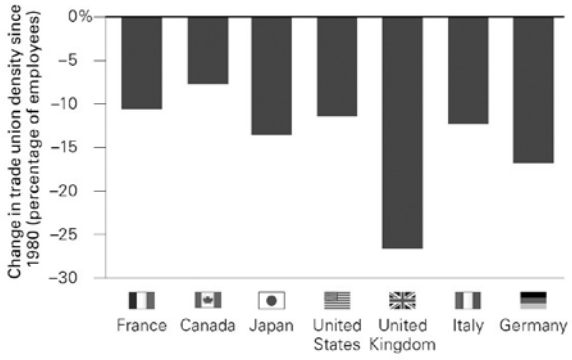
In the United Kingdom, given Brexit uncertainty, the policy outlook for the Bank of England over the coming years is challenging. The U.K. recovery has continued since the 2016 Brexit referendum, with unemployment falling to a 42-year low although estimates of trend productivity growth have been revised down, partly because of the weakness of the supply side since the financial crisis and, looking forward, because of the likely shock to productive potential caused by Brexit. And headline inflation has been pushed well above target by the sharp fall in the sterling following the EU referendum. For these

Figure 25a. Underemployment is still very high in the euro area



Source: Capital Economics.

Figure 25b: Trade union membership has declined across developed markets



Source: Macrobond.

reasons, the Bank of England has now removed the emergency rate hike made in the summer of 2016 and signalled that rates may need to rise further, albeit gradually.

Emerging markets: A varied outlook

Growth in emerging markets in aggregate is expected to be 4.9% in 2018, in line with a lower structural trend post-GFC. We maintain that emerging markets are unlikely to go back to the pre-recession levels of economic growth.

However, the emerging-market grouping hides vast heterogeneity across regions and countries (see Figure 26). In Latin America, growth will continue improving in 2018, but it will remain below potential trend levels for the region over the medium term.

Forecasts for emerging Asia remain robust, with an average growth rate of 6.2% for 2018–2022.

The main risks for emerging markets are externally based; the most notable are the impact of a slowing China on world commodity markets and a potential faster pace of monetary policy normalisation in the United States and other developed economies. In particular, central banks in emerging markets will be alert to any news coming out of the U.S. Federal Reserve, which could create disruptions in foreign exchange and domestic financial markets.

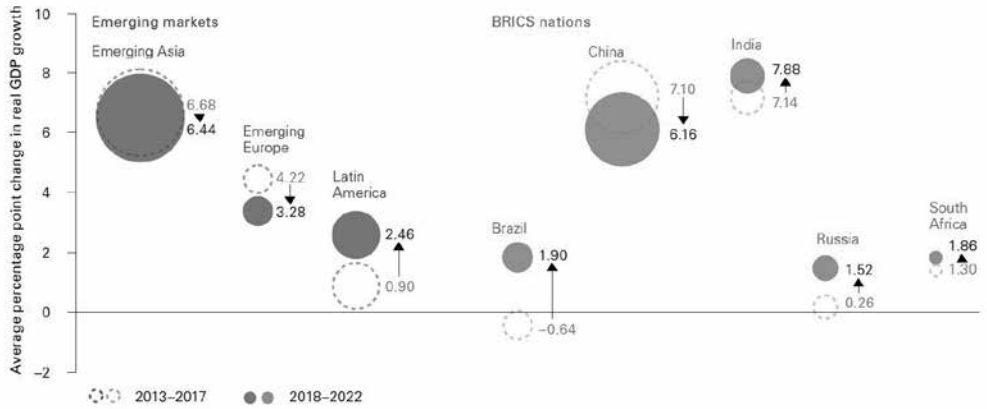
Corporate leverage also poses a key risk, since it has increased continuously since the GFC, with high levels of debt issuance in hard currencies (U.S. dollars or euros). Sudden movement of the U.S. dollar could severely damage the balance sheets of local corporations.

Global capital markets outlook

Vanguard's outlook for global stocks and bonds is subdued at best given high equity valuations in a few regions around the world and low interest rates. Downside risks are particularly elevated in the equity market. Although we are hard-pressed to find compelling evidence of financial bubbles, risk premiums for many asset classes appear slim.

The market's efficient frontier of expected returns for a unit of portfolio risk is now in a lower return orbit. More importantly, common return-centric portfolio tilts, seeking higher return or yield, are unlikely to escape the strong gravitational pull of low-return forces in play.

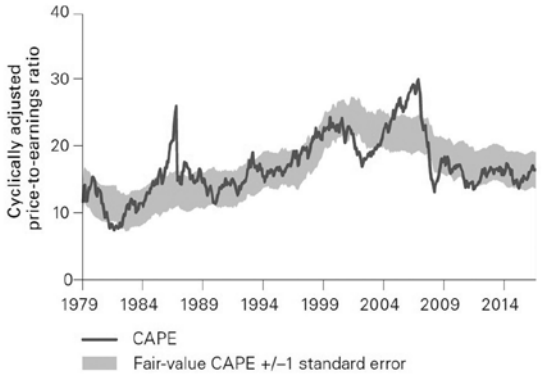
Figure 26. Economic growth prospects



Source: IMF World Economics Outlook.

Figure 27. Divergence in global equity valuations

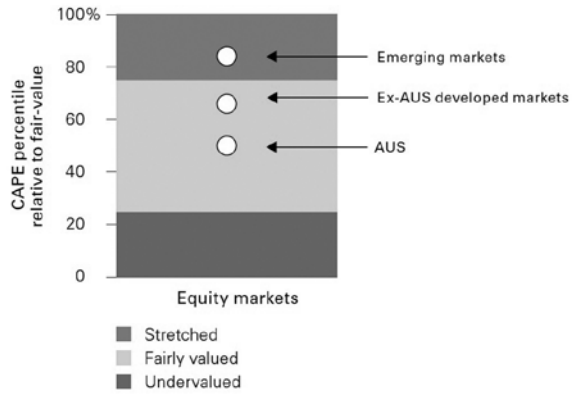
a. Domestic market appears fairly valued



Notes: "Fair-value CAPE" is based on statistical model that corrects CAPE measures for the level of inflation expectations and for interest rates. The statistical model specification is a five-variable vector error correction (VEC), including equity earnings-yield (MSCI Australia index), Australian ten-year trailing inflation, ten-year Govt. bond yield, 10 year trailing equity and bond volatility estimated over the period January 1970 – September 2017.

Source: Vanguard calculations, based on data from Thomson Reuters Datastream and the Reserve Bank of Australia

b. Other developed markets approaching over-valued territory



Notes: Australia valuation measure is the current CAPE percentile relative to "fair-value CAPE" for the MSCI AUS Australia index from estimated over the period December 1969 – September 2017. Developed markets valuation measure is the weighted average of each region's (U.S., U.K., Euro-area, Japan and Canada) current CAPE percentile relative to each region's own "fair-value CAPE" from estimated over the period January 1970– September 2017, except for the U.S. which is estimated over the period January 1940 – September 2017. Emerging Markets valuation measure is a composite valuation measure of EM to U.S. relative valuations and current U.S. CAPE percentile relative to its fair value CAPE. The relative valuation is the current ratio of EM to U.S. P/E metrics relative to its historical average, using 3 year trailing average earnings from January 1990 to September 2017.

Source: Vanguard calculations, based on data from Robert Shiller Online Data, the U.S. Bureau of Labor Statistics, the Federal Reserve Board, and Thomson Reuters Datastream.

Global equity markets: Higher risk, lower return

Global equity has rewarded patient investors with a 11.9% annualised return over the 8½ years since the lows of the global financial crisis. As part of this strong performance, valuations have risen gradually. For instance, valuations in the global emerging markets appear stretched and those for ex-Australia developed market equities appear to be approaching over-valued territory relative to our proprietary fair-value benchmark, making our global equity outlook highly guarded. The ten-year outlook for global equities has deteriorated since last year and is now centred in the 4.5%–6.5% range, based on our Vanguard Capital Markets Model® (VCMM) projections.

Equity valuations and Vanguard's "fair value" CAPE

Our equity market outlook for the stock market is based primarily on market valuations, such as price/earnings (P/E) ratios. Another popular P/E ratio is the cyclically adjusted price earnings ratio (CAPE). Practitioners typically compare these valuation metrics with their long- run averages to assess whether the market is over or under-valued. However, a straight comparison of CAPE (and any other valuation multiple) with its historical average can be misleading, failing to account for today's low inflation and interest rates.

Because a secular decline in interest rates and inflation depresses the discount rates used in asset-pricing models, investors are willing to pay a higher price for future earnings, thus inflating P/E ratios. Therefore, a high CAPE may not be indicating overvalued stock prices, but rather may be an outcome of low interest rates.

Vanguard's fair-value CAPE accounts for current interest rates and inflation levels and provides a more useful time-varying benchmark against which the traditional CAPE ratio can be compared, instead of the popular use of historical average benchmarks.

Figure 27a plots Shiller's CAPE versus our fair-value model. Today, the CAPE for the MSCI Australia Index appears fairly valued.

We have also extended this fair-value concept to other regions. As illustrated in Figure 27b, our equity valuation dashboard indicates that non-Australian developed markets are approaching overvalued territory, even after adjusting valuations for rates and inflation. For emerging markets, it is important to note that their stocks typically trade at lower multiples than stocks in developed markets because of the higher risk and higher earning yields required by investors. Even after adjusting for higher risk, emerging markets are above their fair-value levels and slightly overvalued.

Global equities and the diversification of domestic risks

As shown in Figure 28b, our expected return outlook for Australian equities over the next decade is centred in the 5%–7% range, in stark contrast to the 9.4% annualised return generated over the last 30 years.

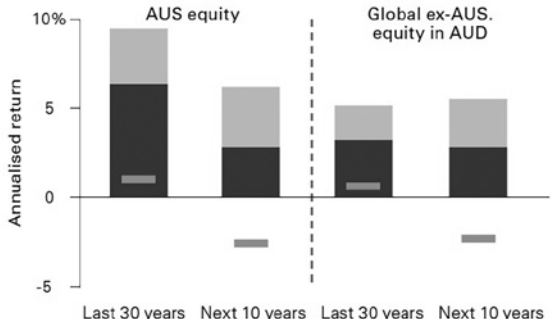
Although valuation expansion proved to be a tailwind to returns, we expect valuations to contract as interest rates gradually rise over the next decade. An expected valuation contraction of about 2.6% is the primary reason behind our muted ten-year outlook for Australian equity.

From an Australian investor's perspective, the expected return outlook for ex-Australia equity markets is in the 4.5%–6.5% range, modestly lower than that of Australian equity (see Figures 28a and b). A closer look at the long- term median expected return for ex-Australia equity versus its 3 decade historical average, as illustrated in Figure 28a, suggests that two total returns may not be that different.

This result is a function of the high level of valuations as well as long-

Figure 28. The outlook for equity markets is subdued

a. Ex-Australia equity exposure may provide returns that are similar to domestic market

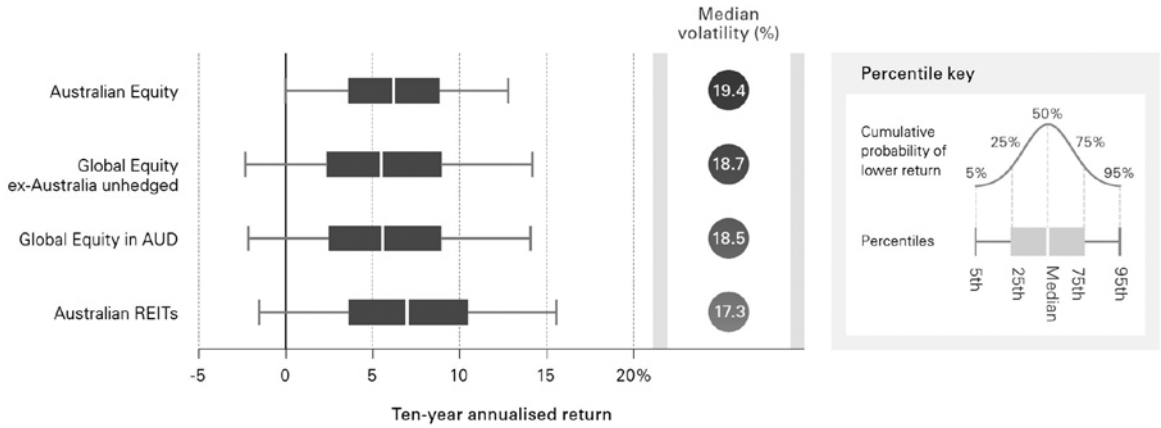


Cash return (hedged)
Equity risk premium
Valuation expansion (%)

Notes: Statistics shown above are from January 1987 – December 2016 for the last 30 years, in AUD. Next 10 year statistics are based on the median of 10,000 simulations from VCMM as of September 30, 2017 in AUD. Historical returns are computed using indexes defined in "Indexes used in our historical calculations" on page 5. Historical cash returns are from Dimson-Marsh-Staunton data. See appendix section titled "Index simulations" for further details on asset classes shown here.

Sources: Vanguard calculations, Dimson-Marsh-Staunton data, FactSet, Morningstar Direct and Thomson Reuters Datastream.

b. Equity market ten-year return outlook: Setting reasonable expectations



Notes: Forecast corresponds to distribution of 10,000 VCMM simulations for ten-year annualised nominal returns as of September 30, 2017 in AUD for asset classes highlighted here. Median volatility is the 50th percentile of an asset class's distribution of annualised standard deviation of returns. See appendix section title Index benchmarks for further details on asset classes.

Source: Vanguard.

term expectations for the Australian dollar to decline priced in by the markets, especially with respect to other major currencies such as the euro and yen. As illustrated in Figure 31, an asset-return-centric strategy, which focuses primarily on higher return expectations of Australian equity by eliminating a portfolio's exposure to ex-Australian equities, has lower expected risk-adjusted returns because it ignores the diversification benefits of international equities.

Our 10-year outlook for global equity (in AUD) is in the 4.5%-6.5% range, as shown in Figure 28b. For the purposes of asset allocation, we caution investors against implementing tactical tilts based on just the median expected return – that is, ignoring the entire distribution of asset returns and their correlations.

Global fixed income markets: Positive but muted

The return forecast for global fixed income is positive but muted, given our long-term outlook of modest growth and inflation, as outlined in Section I. As shown in Figure ll-3, it is in the 2%–4% range for the next decade, slightly higher than projected at this time last year. Expected returns for many fixed income sub-asset classes appear more similar than differentiated compared with previous years, in part because of compressed credit spreads (see Figure ll-4).

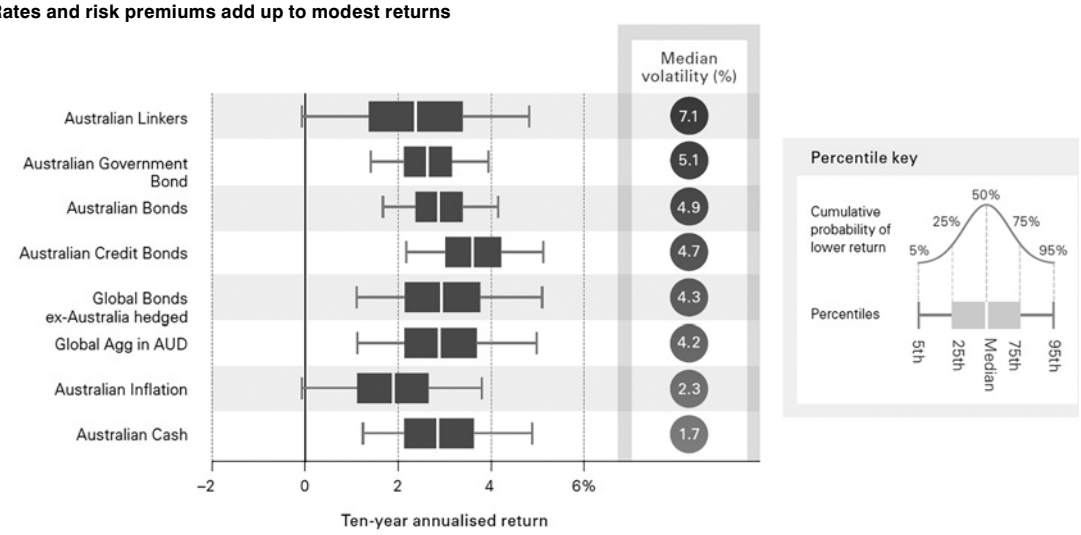
Australian interest rates: Higher long-term rates than last year

Compared to Vanguard's 2017 outlook, our expectation for the rise in 10-year government bond yields have increased by about 70 basis for the decade ahead, thereby resulting in an increase in the outlook for the Australian government bond index, as shown in Figure 29. The central tendency of our forecast for the 10-year yield is around 3%, higher than last year's estimate, but still well below its long-run average. Our 2.5% - 3.5% outlook for cash over the next decade is also modestly higher than last year.

The quote

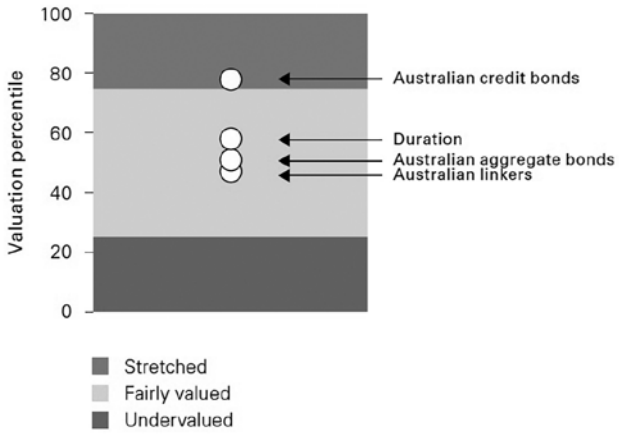
It is encouraging that President Xi Jinping, during his political report in the 19th National Party Congress, prioritised the quality of growth over the speed.

Figure 29. Rates and risk premiums add up to modest returns



Notes: This forecast corresponds to the distribution of 10,000 VCMM simulations for ten-year annualised nominal returns as of September 30, 2017, in AUD. Median volatility is the 50th percentile of an asset class's distribution of annual standardised deviation of returns. See Appendix section "Index simulations" for further details on the asset classes shown.
Source: Vanguard.

Figure 30. Frothy credit valuations



Notes: Valuation percentile are relative to year 30 projections from VCMM . Australian credit bond and Australian aggregate bond valuations are current spreads relative to year 30 from VCMM. Duration valuation is the expected return differential over the next decade between long-term government bond index and short-term government bond index, to that of year 21-30. Australian linkers is the 10-year ahead annualised inflation expectation relative to year 21-30 from VCMM.
Source: Vanguard.

Credit Bonds: Risk premium still comes with equity correlation
The central tendency for Australian credit bonds is in the 2.5% - 4.5% range, slightly higher than that of the government bond index. This reflects the accumulation of credit and default risk premia that accompanies the higher risk of credit bonds. As illustrated in Fig 30, the Australian credit bonds spreads are stretched and indicate signs of froth in the credit market. One must keep in mind that the credit spreads tend to widen in times of equity market stress, thereby reducing diversification benefits. As shown in Figure 31, a 20% overweight or tilt to credit increases a portfolio's volatility excessively relative to a marginal increase in return.

Inflation-Linked bonds: Markets don't see inflation coming
Break-even inflation expectations for Australian inflation linked bonds currently at 1.9% remain near historical lows and at the same level as our inflation expectation for the next decade. Markets are placing extremely low odds for higher inflation outcomes. While not as attractive in terms of return, linkers could be a valuable inflation hedge for some institutions and investors sensitive to inflation risk.

Domestic versus international: Benefits of diversification remain
The central tendency of expected return for ex-Australian aggregate bonds appears to be similar to that of Australian aggregate bonds (Figure 29). We expect the diversification benefits of global fixed income in a balanced portfolio to persist under most scenarios. Yields in most developed markets are at historically low levels, particularly in Europe and Japan, yet diversification through exposure to hedged ex-Australian bonds should help offset some risk specific to the Australian fixed income market (Philips et al., 2014).

Less-than-perfect correlation between two of the main drivers of bond returns – interest rates and inflation – is expected as global central bank policies are likely to diverge in the near term.

Portfolio implications: A low return orbit
Investors have experienced spectacular returns over the last few decades. Figure 31a contrasts our 4.5%–6.5% outlook for a global 60% equity/40% bond portfolio for the next decade against the extraordinary 11.1% return since 1970 and 8.5% since 1990. As highlighted in previous sections, elevated equity international valuations, low rates, and compressed spreads have pulled the expected returns into a lower orbit. The efficient frontier is also flatter (that is, with less return per unit of risk), as seen from the return and volatility expectations of balanced portfolios, as shown in Figure 31b.

In an attempt to try to increase portfolio returns, a popular strategy is to overweight higher-expected-return assets or higher-yield assets. A common "reach for yield" strategy includes overweighting higher-yielding credit bonds. Similarly, "reach for return" strategies involve tilting the portfolio toward emerging markets equities to take advantage of higher growth prospects. Home bias leads some to shy away from ex-Australian equities.

Figure 31b illustrates that these common return-centric strategies are unlikely, by themselves, to restore portfolios to the higher orbits of historical returns.

Portfolio strategies for three potential economic scenarios

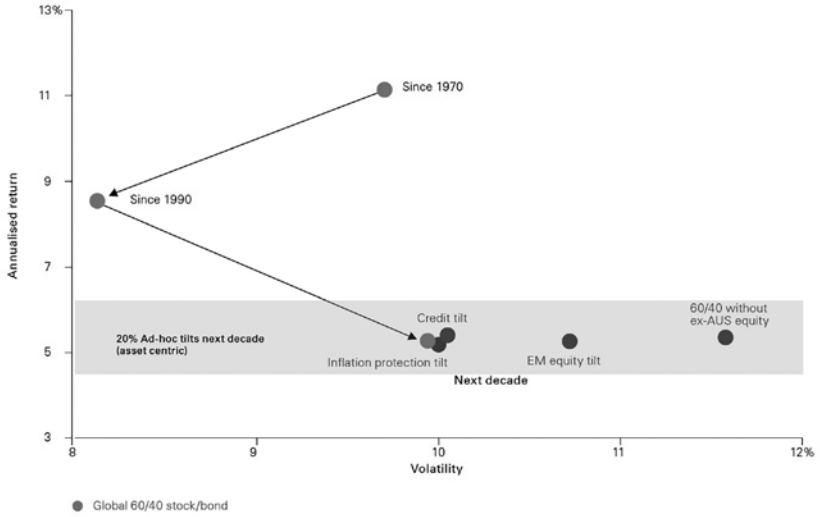
Based on our global economic perspective on the cyclically rising risks to inflation and policy normalisation imposed by tight global labour markets, we examine in Figure 32 three possible economic scenarios occurring over the next three years. The high-growth scenario illustrates an upside risk scenario of sustained economic growth with a tighter labour market and a moderate pick-up in wages and inflation. The two others are a baseline/trend scenario driven by continued low volatility with

The quote

Japan's future now depends on whether Abe focuses his political capital on economic reforms to lift productivity and long-term growth potential.

Figure 31. Asset allocation for a challenging decade

a. A lower return orbit



b. Common asset centric tilts seem sub-par

	Portfolios	5th percentile	25th percentile	Median	75th percentile	95th percentile	Median volatility	Risk-adjusted return
Global balanced portfolios	100% bonds	1.5%	2.3%	2.9%	3.6%	4.6%	3.9%	0.75
	20/80 stock/bond	2.2%	3.2%	3.8%	4.6%	5.7%	4.2%	0.91
	60/40 stock/bond	1.9%	3.8%	5.3%	6.8%	9.0%	9.9%	0.52
	80/20 stock/bond	1.3%	3.9%	5.8%	7.8%	10.7%	13.3%	0.43
	100% equity	0.6%	3.8%	6.2%	8.7%	12.4%	16.8%	0.36
	60/40 stock/bond	**1.9%**	**3.8%**	**5.3%**	**6.8%**	**9.0%**	**9.9%**	**0.53**
Portfolios with common 20% tilts	TIPS tilt	1.7%	3.7%	5.2%	6.7%	9.0%	10.0%	0.51
	EM equity tilt	2.0%	3.9%	5.3%	6.7%	8.8%	10.7%	0.49
	AUS credit tilt	2.0%	4.0%	5.4%	6.9%	9.2%	10.1%	0.53
	60/40 without ex-AUS equity	1.6%	3.8%	5.3%	7.0%	9.3%	11.5%	0.46

■ Lower risk-adjusted return
■ Same or higher risk-adjusted return

Notes: Summary statistics of 10,000 VCMM simulations for projected ten-year annualised nominal returns as of September 2017 in AUD before costs. Historical returns are computed using indexes defined in "Indexes used in our historical calculations" on page 5. The global equity is 50% AUS equity and 50% global ex-AUS equity. The global bond portfolio is 40% AUS bonds and 60% global ex-AUS bonds. Portfolios with tilts include a 20% tilt to the asset specified funded from fixed income allocation for the fixed income tilt and equity allocation for the equity tilt.

Source: Vanguard.

The quote

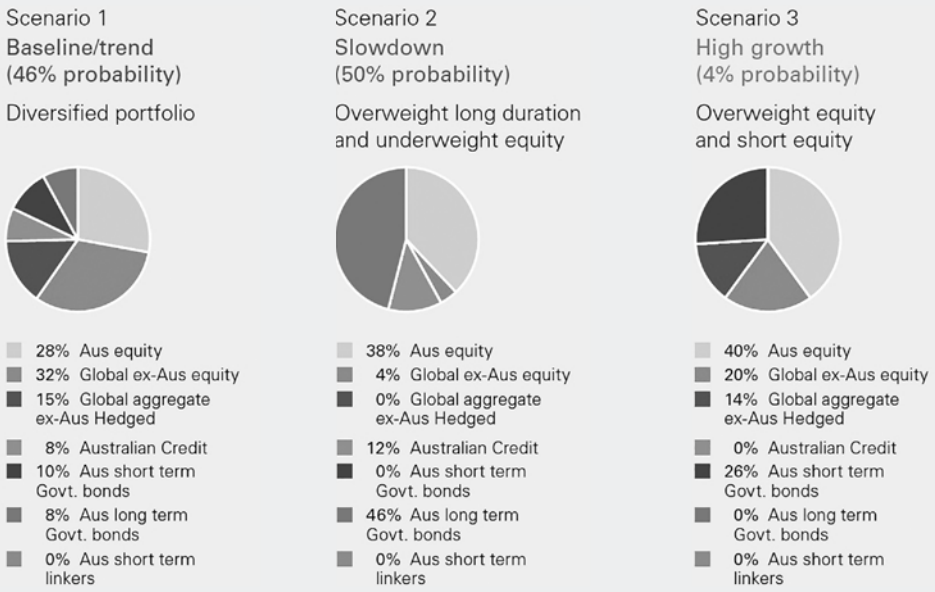
Our equity valuation dashboard indicates that non-Australian developed markets are approaching overvalued territory, even after adjusting valuations for rates and inflation.

The quote

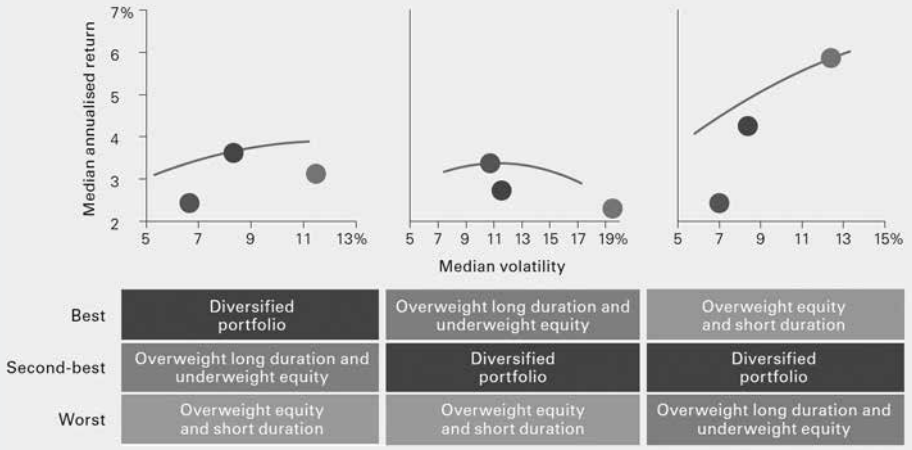
Expected returns for many fixed income sub-asset classes appear more similar than differentiated compared with previous years, in part because of compressed credit spreads.

Figure 32. Cyclical surprises and asset allocation trade-offs

a. Mean-variance optimal portfolios vary for different economic environments



b. A diversified portfolio is not always the best, but it's never the worst



c. Portfolios designed for a single scenario are tempting but can be risky

Strategy **upside** relative to balanced portfolio	**0.6% higher annualised return** with 0.8% lower volatility in a slowdown scenario	**1.6% higher annualised return** with 4.0% higher volatility in a high growth scenario
Strategy **downside** relative to balanced portfolio	**1.8% lower annualised return** with 1.4% lower volatility in a high growth scenario	**0.4% lower annualised return** with 8.0% higher volatility in a slowdown scenario

Notes: Performance is relative to the efficient frontier. Portfolios are selected from the frontier based on a fixed risk-aversion level. The forecast displays simulations of three-year annualised returns as of September 2017. Scenarios are based on sorting the VCMM simulations by rates, growth, volatility, and equity return. The three scenarios are a subset of the 10,000 VCMM simulations. See Appendix section "Index simulations" for further details on the asset classes shown.
Source: Vanguard.

positive financial conditions and a slowdown scenario caused by a turn in the business cycle and a correction in the equity markets.

Figure 32 shows optimal portfolios for each scenario that vary their exposures to the following four risk premiums: (1) equity-risk premium, (2) term premium, (3) credit premium, and (4) inflation-risk premium. In a high-growth scenario, expected global equity returns would be high, causing the efficient frontier to be steep. Long and short rates would also rise faster than expected, resulting in an optimal portfolio loading on equity, and short duration.

A slowdown-scenario portfolio would underweight equity and overweight long duration. Surprisingly, the allocation to Australian equity remains rather large, as the portfolio that is also heavy on long-term government bonds derives a larger diversification benefit from lower- returning Australian equity (especially in a recession).

The portfolio strategy in our baseline/trend scenario is well diversified.

Using our VCMM simulations, we can not only illustrate the effectiveness of various portfolio strategies designed for each scenario but also show the risks of such strategies. The following conclusions can be drawn from our analysis:

1. **Portfolios designed for specific macroeconomic scenarios entail important trade-offs:** If the scenario for which the portfolio was designed does not take place, then the portfolio performance is the worst of all the options.
2. **A balanced portfolio works well for investors who are agnostic about the future state of the economy:** The 60/40 balanced portfolio is an "all-weather" strategy, with either top or middle- of-the-road performance in each scenario.
3. **Portfolio tilts should be done within a mean-variance optimisation framework:** Ad hoc tilts ignore correlations among assets and lead to inefficient portfolios. For instance, in a recession-scenario strategy, equities can be overweighted (as opposed to underweighted) because of the added diversification benefits of long-term bonds.

Portfolio construction strategies: Time-tested principles apply

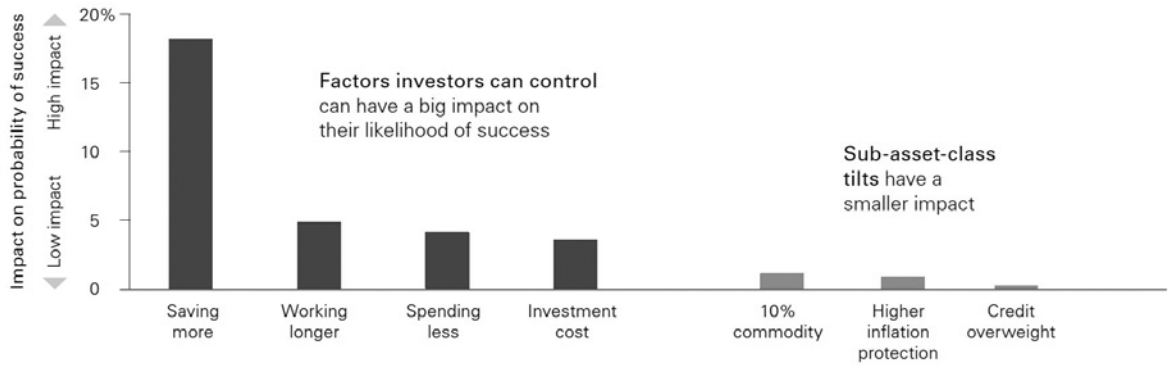
Contrary to suggestions that an environment of low rates and credit-risk premia warrants some radically new investment strategy, Figure 31 reveals that the diversification benefits of global fixed income and global equity are particularly compelling, given the simulated ranges of portfolio returns and volatility.

The market's efficient frontier of expected returns for a unit of portfolio risk now hovers in a lower orbit. More importantly, common asset-return-centric portfolio tilts, seeking higher return or yield, are unlikely to escape the strong gravity of low-return forces in play, as they ignore the benefits of diversification. Modestly outperforming asset-return-centric tilts requires a portfolio-centric approach that leverages the benefits of diversification by weighing risk, return, and correlation simultaneously.

Our prior research (Aliaga-Díaz, et al., 2016) shows that investment success is within the control of long-term investors. Figure 33 illustrates that factors within their control – such as saving more, working longer, spending less, and controlling investment costs – far outweigh the less reliable benefits of ad hoc asset-return-seeking tilts. Thus, decisions related to saving more, spending less, and controlling costs will be much more important than portfolio tilts.

Investment objectives based either on fixed spending requirements or on fixed portfolio-return targets may require that investors consciously weigh their options together with their risk-tolerance levels. Ultimately, our global market outlook suggests a somewhat more challenging and volatile environment ahead, yet one in which investors with an appropriate level of discipline, diversification, and patience are likely to be rewarded over the long term. Adhering to investment principles such as long-term focus, disciplined asset allocation, and periodic portfolio rebalancing will be more crucial than ever before. FS

Figure 33. Taking control



Notes: Probability of success is defined as the probability of having a positive balance in a U.S.-domiciled target-date fund at age 95, based on specific savings and spending assumptions. Data show the impact of each factor changing from low (the 25th percentile of broad population data) to medium (the 50th percentile). VCMM simulations are as of March 2016. Investment cost is the relative impact on the probability of success of a target-date fund with a 50-basis-point higher fee or investment cost. For details, see *Vanguard Life-Cycle Investing Model: A Framework for Building Target-Date Portfolios* (Aliaga-Díaz et al., 2016).

Source: Vanguard.