

Global financial markets

Volatility is back. Are you prepared?

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- Volatility has returned to financial markets after an abnormally calm 2017, but we don't believe a pickup in volatility means the end of the bull market.
- We recommend that investors remain invested, but make sure they are carefully managing risks.
- Investors in properly diversified portfolios are well-prepared for the return of volatility. But many others are not, and should add sources of return and diversification beyond classic equity and bond indexes.
- Portfolios that are concentrated in familiar assets or risky sources of income, or which have few long-term investments would benefit from a thorough review and adjustments where necessary.
- Investors can also benefit by aligning their portfolios with their financial goals and reframing risk in terms of not achieving them, and not measuring risk as day-to-day volatility.
- Our Liquidity. Longevity. Legacy. (3L) wealth management approach can improve portfolio robustness, enabling investors to meet their financial goals, even during choppy markets.

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After historically calm financial markets in 2017, 2018 has seen the return of volatility. Concerns about the end of the cycle are mounting amid higher inflation, rising US interest rates, and the end of quantitative easing. Meanwhile, a trade dispute between the US and China threatens global growth, among other political and geopolitical risks.

Yet the presence of heightened risk and normalized volatility does not mean that investing has become unattractive, or that investors should expect negative returns. On the contrary, global growth is still good, earnings growth is strong, and equity market valuations remain appealing relative to cash and fixed income. In short, we think being invested in equities is quite likely to work in the short run, and very likely to in the long run.

So investors need to both be invested *and* manage risks. Those in properly diversified portfolios are well prepared for the return of volatility. But many others are not, with multiple potential shortcomings in their portfolios: relying too heavily on passive approaches in traditional markets; not managing equity downside risks appropriately; holding concentrated positions in assets they feel comfortable with; focusing too heavily on generating yield

while neglecting risks; and not looking beyond the headline noise when making investment decisions.

To prepare for this new environment, it is our view that investors instead need to add alternative sources of return and diversification beyond classic equity and bond indexes, reduce portfolio vulnerability to equity drawdowns, look beyond the familiar to diversify sector and country risks, reconsider sources of income away from risky credit and excess foreign-exchange exposure, and invest long term in assets that can deliver returns throughout and beyond the current market cycle.

Beyond these changes, investors would also benefit by reframing their notion of “risk.” Thinking about risk in terms of day-to-day volatility can encourage investors to jump into low-volatility assets, such as cash, at times of higher equity market uncertainty. Yet this approach can leave portfolios lacking long-term growth potential and at risk of underperforming inflation. By instead measuring risk in terms of the probability of achieving their financial goals, investors should use different strategies to fulfill goals with different time horizons. This is the logic behind our wealth management approach called “Liquidity. Longevity. Legacy.” (3L), a framework that we believe better equips investors to handle increased market volatility and potential drawdowns.

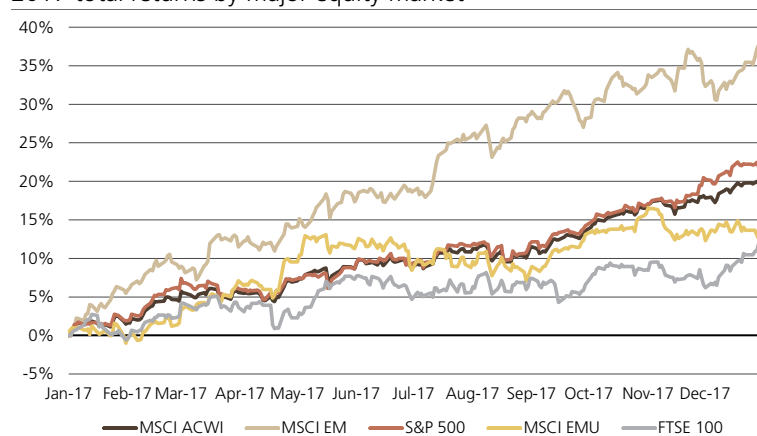
Chapter 1a: Why investors need to manage risk carefully

Volatility is back

2017 was an exceptionally calm year for financial markets. The VIX index of implied US stock market volatility averaged just 11.1, its lowest annual average on record. Implied bond market volatility hit the lowest level ever. The largest peak-to-trough drawdown for global equities in all of 2017 was less than 3%. Global equities returned 20%, with major markets delivering returns between 12% (UK equities) and 38% (emerging market equities).

Fig. 1: A smooth ride in 2017

2017 total returns by major equity market



Source: Bloomberg, UBS, as of May 2018

But 2018 is different. Returns will likely be lower – we're assuming annualized equity market returns in the mid-to-high single digits. And volatility, with the potential for larger drawdowns, is already

much higher. Global equity markets fell by 9% peak-to-trough between January and March, with implied volatility rising to levels seen only three times since the global financial crisis. Volatility in bond markets has normalized, too, amid uncertainty about the path of US interest rates. The road ahead will be more difficult to navigate than the road that's behind us.

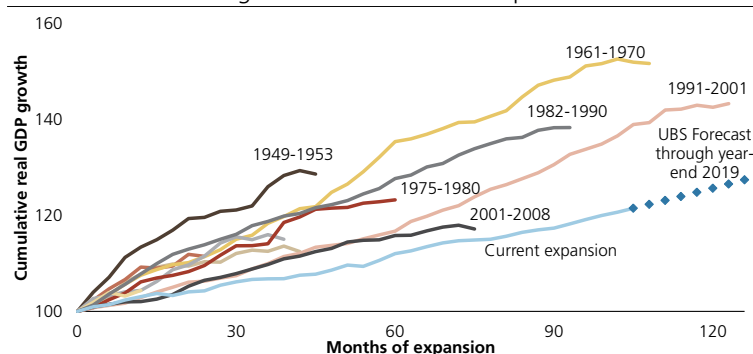
The change in the market environment is being driven by multiple factors:

1. The cycle is maturing

It's been a long time since the last global recession in 2008–09. The expansion in the world's largest economy, the US, has been particularly long; it is now the second-longest of the post-World War II era.

Fig. 3: A long economic cycle

Cumulative real GDP growth and months of expansion



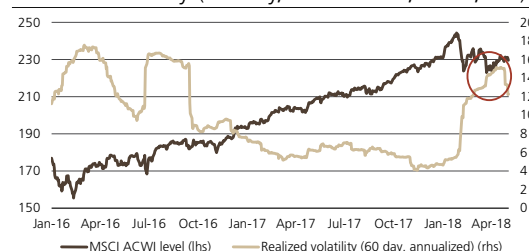
Source: St. Louis Federal Reserve, UBS, as of 16 February 2018

And there are signs that the economic cycle is well past its midpoint. After close to a decade of expansion, it is getting harder for companies to expand production. The unemployment rate in the US, at just 3.9%, is close to a record low. In Europe and Japan, surveys suggest that labor shortages are beginning to constrain growth. And companies are having to increase pay settlements, as well as increase prices, which is contributing to an increase in inflation overall.

To prevent inflation from rising too quickly, central banks have now begun the process of withdrawing liquidity from the global economy for the first time since the financial crisis. Some central banks, most notably the US Federal Reserve, have already started increasing interest rates. High liquidity and low interest rates over the past decade helped reduce volatility and increase financial market returns. Holding all else equal, measures to increase rates and reduce liquidity imply higher corporate and household borrowing costs, slower economic and corporate profit growth, and less certain returns in financial markets.

Fig. 2: The return of volatility

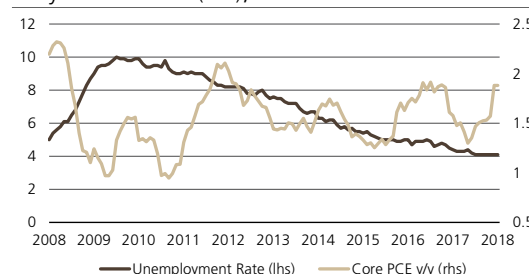
MSCI All Country World (index level, lhs) and realized volatility (60-day, annualized, in %, rhs)



Source: Bloomberg, UBS, as of May 2018

Fig. 4: A tighter US labor market adds to inflationary pressures

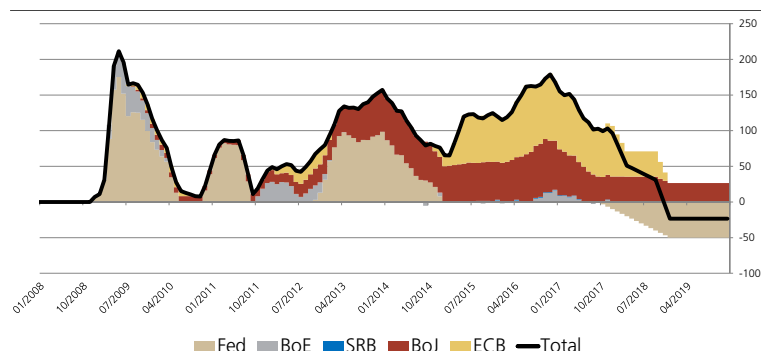
US unemployment rate (lhs) and core PCE year-on-year inflation (rhs), in %



Source: Bloomberg, UBS, as of May 2018

Fig. 5: Central banks will be withdrawing liquidity by end-2018

Monthly net securities purchases by the world's major central banks, in USD billions



Source: Haver Analytics, UBS, as of May 2018

2. Protectionism is a risk

The world economy and corporate profits have benefited substantially from the rising tide of globalization. But protectionist policies, such as those promoted by US President Donald Trump in response to the belief that the US trade deficit is too high, pose a potential risk to those gains.

In the event of a significant escalation in trade restrictions – e.g. a scenario in which the US imposes high and widespread tariffs on Chinese goods – we expect global GDP growth to slow by 0.5–1% over a 12-month horizon, relative to our base case forecast. At the upper end of this range, this could switch global growth from being the fastest in seven years to the slowest in nine. Global equities would suffer as lower revenue growth and tariffs would reduce corporate profits.

Other threats, including geopolitics, lurk

A variety of other risks could damage economic growth and global equity markets, or at least contribute to higher volatility:

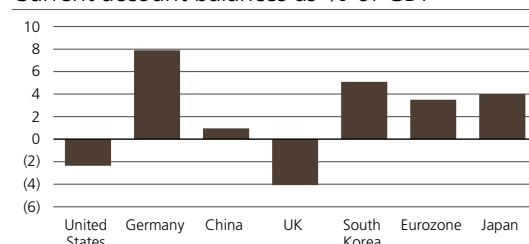
The results of Italy's general election reduce the probability that the country enacts necessary reforms, and increases the medium-term risk of a new Eurozone debt crisis.

China's credit-fueled expansion, with total debt rising from 152% of GDP in 2007 to 272% by 2017, raises the possibility of a regional credit crunch, with negative consequences for global growth.

Geopolitical risks are wide-ranging, from tensions between Russia, the US, Iran, and Saudi Arabia in the Middle East, to territorial disputes in the South China Sea, to negotiations over North Korea's nuclear program. At the very least, these risks could strain business sentiment and commodity supply chains. For more, see our regular *Global Risk radar* publications.

Fig. 6: Revenge of the debtors?

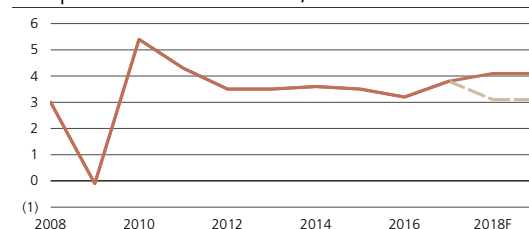
Current account balances as % of GDP



Source: Bloomberg, UBS, as of May 2018

Fig. 7: Global growth at risk from protectionism

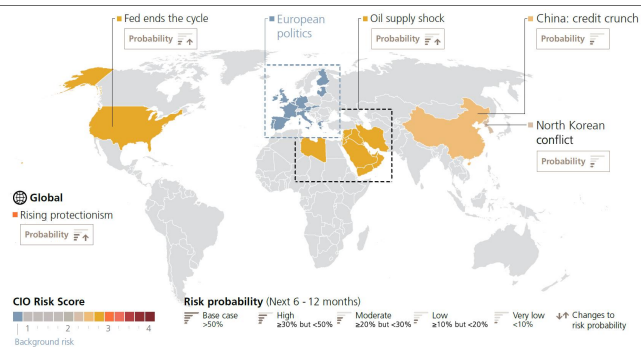
UBS global GDP growth forecast, under base case and protectionist scenarios, in %



Source: UBS, as of May 2018

Fig. 8: Global risk radar

Risks that could influence markets



Source: UBS

Managing uncertainty

In short, the period of exceptionally low volatility that investors enjoyed in 2017 is over. 2018 has seen a number of risks surface that could end the economic cycle, triggering a bear market in global equities or, at a minimum, leading to even higher market volatility. Investors need to think more carefully about risk than they have in recent years; the range of potential financial outcomes is now much wider, and investors need to respond.

Chapter 1b: Why being invested still makes sense

The presence of heightened risk, however, does not mean that investing has become unattractive, or that negative returns are necessarily in store. Despite the volatility, global growth is still good and has room to run further. Earnings growth is strong and equity market valuations remain appealing relative to cash and fixed income. In our view, being invested is still quite likely to pay off in the short run. And it is very likely to pay off over the long run. The cost of being uninvested remains high.

1. Global growth is good.

The global economy remains strong. In developed markets, low or falling rates of unemployment have boosted consumer confidence, incomes, and spending. And this has stimulated demand for Asian exports. We expect global growth in 2018 to match 2017, making 2017–18 the best two-year period for the global economy since 2010–11.

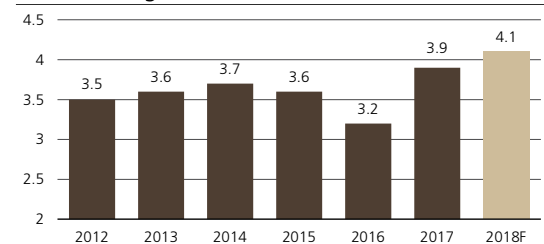
2. Earnings growth is strong.

Robust economic growth is translating into higher corporate earnings growth. We estimate that companies are likely to deliver 10–15% earnings growth globally this year.

Profit growth in the world's largest equity market, the US, is particularly high, thanks to recent corporate tax cuts. We estimate tax cuts should add 8% to corporate earnings in 2018, making for a total of 16% growth year-over-year.

Fig. 9: Good global growth

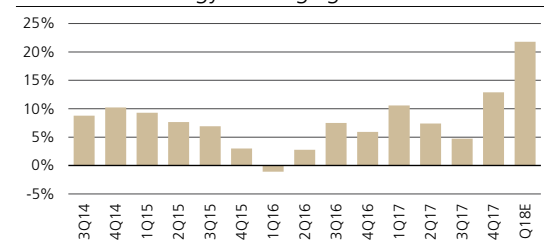
Global GDP growth, actual and UBS forecast, in %



Source: UBS, as of May 2018

Fig. 10: Strong earnings growth

S&P 500 ex-energy earnings growth



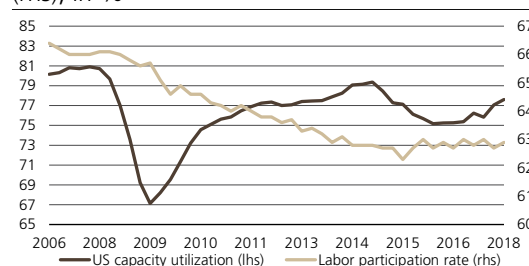
Source: Thomson Reuters FactSet, UBS, as of May 2018

3. Growth has room to run.

We believe that the economic and earnings expansion still has further to go. Unemployment has fallen to low levels in the US, UK, and Japan, but other measures of spare capacity, such as capacity utilization and labor market participation rates, suggest there is still scope for the economy to expand further.

Fig. 11: Scope for economic growth

US capacity utilization (lhs) and labor participation (rhs), in %



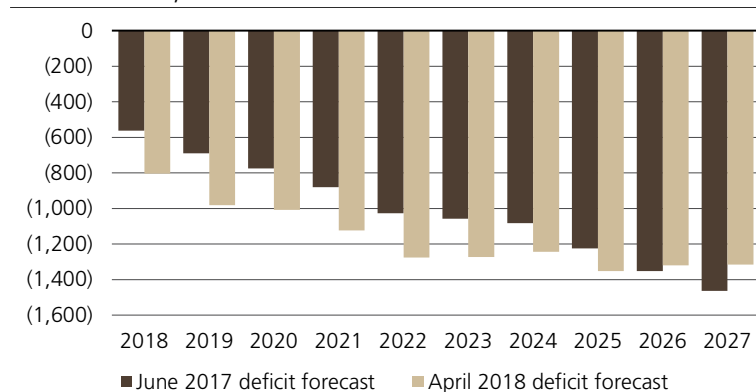
Source: Bloomberg, UBS, as of May 2018

Although the sharp rise in debt in China has increased global debt levels, debt-to-GDP ratios – especially those in the private sector – are generally below pre-crisis levels in developed markets.

And the USD 1.5 trillion US fiscal stimulus from tax reform and increased spending will provide a boost to growth in the near term.

Fig. 13: US stimulus to boost growth

US fiscal deficit, in USD billions



Source: US Congressional Budget Office, UBS, as of May 2018

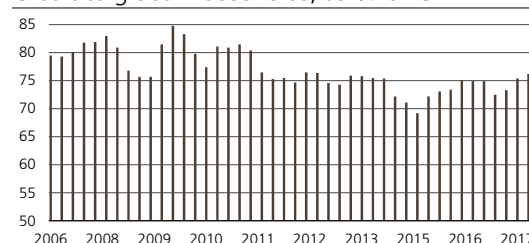
Overall, we expect global GDP growth of 4.1% in 2018 and 4.1% in 2019, after 3.9% in 2017.

4. Valuations are not high relative to fixed income or cash.

Contrary to some perceptions, equity market valuations are not high. In the last six months, global equity markets have risen by 3.8%, but profits have risen by 10.6%. The price-to-earnings ratio of global equities is currently 16.7x, compared to a 30-year average of 17.8x.

Fig. 12: Debt levels generally are below pre-crisis norms

Credit to global households, as % of GDP

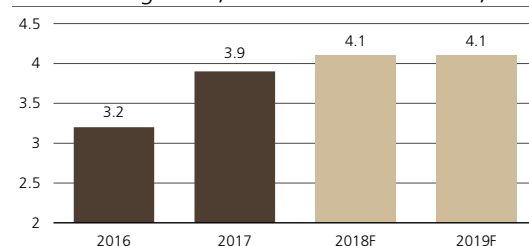


Note: NPISH = Non-profit institutions serving households

Source: Bank for International Settlements, UBS, as of May 2018

Fig. 14: Growth expected to persist

Global GDP growth, actual and UBS forecast, in %



Source: UBS, as of May 2018

Fig. 15: Equity market valuations are not excessive
MSCI ACWI price-to-earnings ratio and historical average



Source: Thomson Reuters, UBS, as of May 2018

When compared to fixed income, equity valuations are notably cheap. The equity risk premium, a measure of equity market valuations relative to bond yields, is currently roughly 5%, compared with a long-term average of 3.4%. And even the more richly valued US market's equity risk premium is above its historic average at 4%, and still attractive relative to bonds and longer-term norms.

5. Being uninvested is quite likely to be the wrong decision in the short run...

This positive backdrop is supportive of equities. Historically, equity market returns have tended to be positive when earnings growth is strong. Over the long term, equity prices tend to rise in line with earnings growth rates.

Fig. 17: Equities tend to rise in tandem with earnings growth rates
MSCI ACWI total return and 12-month-trailing EPS growth, y/y in %



Source: Thomson Reuters, UBS, as of May 2018

Subsequent equity market returns have tended to be positive following periods with valuations close to current levels. Historically, only price-to-earnings ratios above 23x have been consistent with negative average subsequent returns.

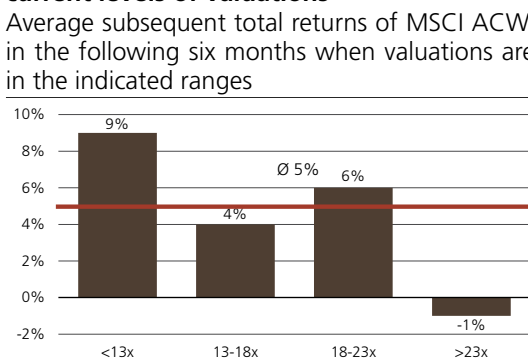
And history shows us that returns in the latter part of the cycle have tended to outstrip returns earlier in the cycle. Using data since 1928, returns in the final year of a bull market have averaged 22%, compared to 11% average returns in mid-bull-market years.

Fig. 16: Equities are cheap relative to bonds
12-month-trailing earnings yield for MSCI ACWI, less yield on Barclays index of Eurodollar bonds (5–7 years) rated Aa or higher



Source: Thomson Reuters, UBS, as of May 2018

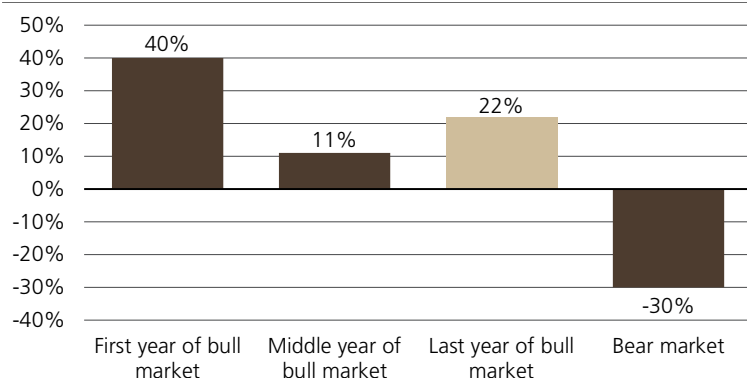
Fig. 18: Returns tend to be positive with current levels of valuations
Average subsequent total returns of MSCI ACWI in the following six months when valuations are in the indicated ranges



Source: Thomson Reuters, UBS, as of 2 August 2017

Fig. 19: Selling too early can be costly

Annualized S&P 500 price performance since 1928, by market phase



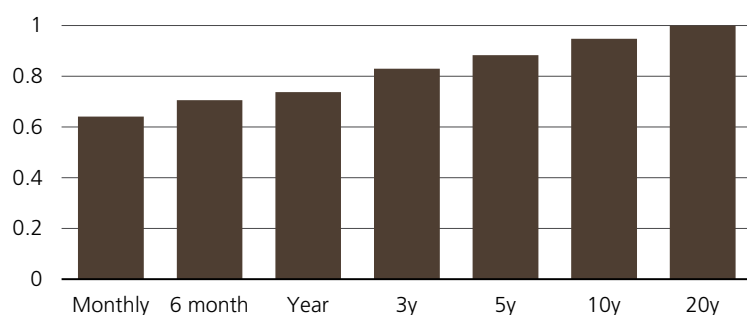
Source: Bloomberg, UBS, as of November 2017

6. ...and is very likely to be the wrong decision in the long run

Putting the short-term picture aside, the long-term case for investing in equities is almost unequivocal. Over longer-term horizons, the probability of earning positive equity market returns is high. Using data since 1928, investors with a 10-year time horizon have earned a positive return on the S&P 500 on 95% of occasions. And compounded since 1928, equities have delivered around 200x greater returns than cash, and more than 50x greater than bonds.

Fig. 20: Longer-term returns are highly probable

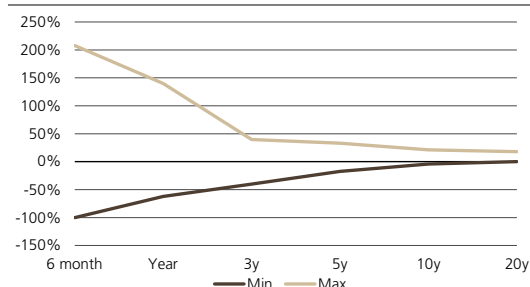
Probability of positive total returns on the S&P 500 since 1928



Source: Robert Shiller, Bloomberg, UBS, as of May 2018

Fig. 21: Range of returns declines over time

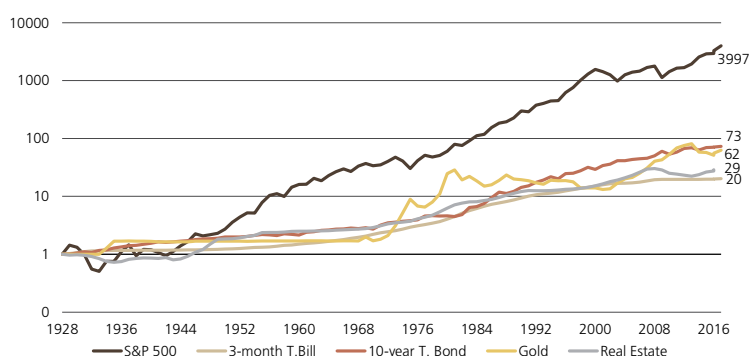
Minimum and maximum annualized rate of total returns on S&P 500 by length of investment since 1928



Source: Robert Shiller, Bloomberg, UBS, as of May 2018

Fig. 22: Equities have significantly outperformed other asset classes over the long term

Total returns on the S&P 500, 3-month Treasury bills, 10-year Treasury bonds, gold, and price return on real estate on a logarithmic scale



Source: Aswath Damodaran, Stern Business School New York University, Bloomberg, UBS, as of 2017

Chapter 2: How to be invested but also manage risks

In an environment of heightened risk alongside positive potential returns, investors need to be invested, but also manage risk carefully.

We believe that those in properly diversified, risk-managed portfolios are well-equipped for the new market environment. Yet, based on our analysis of our own positioning data, many investors are entering this higher volatility environment ill-prepared:

- Relying too heavily on passive approaches in traditional markets.
- Not managing equity downside risks appropriately.
- Focusing too heavily on getting higher yields, while underestimating risks.
- Concentrating in “familiar” assets (e.g. those close to home, or in a well-known industry).
- Not thinking sufficiently long-term.

To prepare for the new environment, we believe that investors will need to think differently:

- Adding alternative sources of return and diversification, beyond classic equity and bond indexes.
- Reducing exposure to equity market downside, while retaining upside.
- Reconsidering sources of income away from risky credit or excess foreign-exchange exposure.
- Diversifying sector and country risks.
- Investing with a longer-term mind-set in assets that can deliver returns throughout and beyond the current market cycle.

Table 1: Summary

Investing for the road behind	Investing for the road ahead	Specific investment ideas
Relying too heavily on passive approaches in traditional markets.	Adding alternative sources of return and diversification, beyond classic equity and bond indexes.	<ul style="list-style-type: none"> • Hedge funds • Smart beta • Equity buy-write strategies
Not managing equity downside risks appropriately.	Reducing exposure to equity market downside, while retaining upside.	<ul style="list-style-type: none"> • Put options • Systematic hedging • Barrier reverse convertibles
Focusing too heavily on getting higher yields, while underestimating risks.	Reconsidering sources of income away from risky credit or excess foreign exchange exposure.	<ul style="list-style-type: none"> • Diversified yield-focused portfolio • Extending duration • Dividend investing
Concentrating in “familiar” assets.	Diversifying sector and country risks.	<ul style="list-style-type: none"> • Global equity diversification • Borrowing for diversification • Greater overseas exposure in domestic investments
Not thinking sufficiently long term.	Investing with a longer-term mindset in assets that can deliver returns throughout and beyond the current market cycle.	<ul style="list-style-type: none"> • 3Ls • Longer-term investment themes • Sustainable investing • Private equity

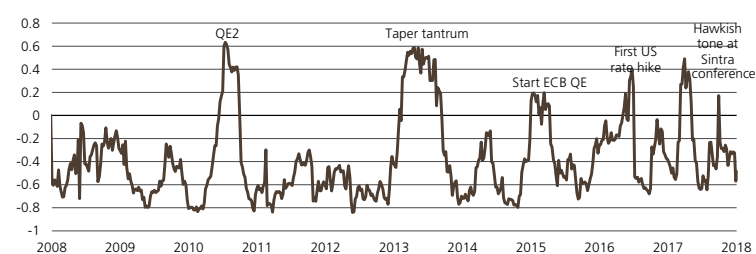
Look beyond passive approaches to traditional markets

Recent years have seen strong performance for investors holding traditional balanced portfolios of equities and bonds. The bull market in 60/40 equity/bond portfolios is the longest on record, with annualized returns of around 10%.

But as we enter a higher-volatility environment, generating return and limiting risk will require investors to look beyond traditional strategies. At points of market uncertainty over interest rate policy, correlations between equities and bonds can rise, increasing the volatility of traditional equity-bond portfolios, making returns less certain.

Fig. 23: Bond-equity correlations can turn positive at monetary turning points

13-week rolling correlation, S&P 500, US 5-year Treasuries



Source: Bloomberg, UBS, as of May 2018

While we believe that a negative correlation between bonds and equities will persist over the medium to long term, periodic jumps in correlation means that strategies that are less correlated to equities and bonds become important for reducing short-term portfolio volatility.

Investment ideas – adding alternative sources of return and diversification

Three particular alternative sources of return that we believe could help portfolios navigate the road ahead are hedge funds, smart beta, and equity buy-write strategies.

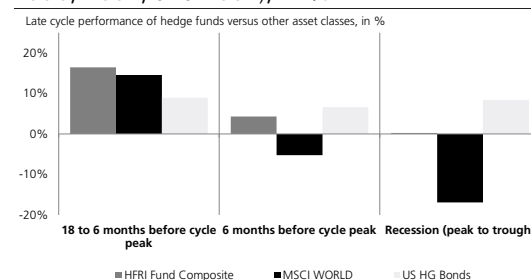
Hedge funds

Historically, hedge funds have shown they can manage the latter phases of the cycle more effectively than traditional assets. Some strategies, in particular macro/trading and relative value, are able to capitalize on periods of market stress to generate positive returns. Hedge funds also tend to outperform equities during years when equities fall.

On an absolute return basis, hedge funds have also typically outperformed other asset classes in a rising US rate environment, with equity hedge, event-driven, and relative-value in particular outperforming other strategies. For more, see our regular *UBS Hedge Fund Monthly Extended*.

Fig. 24 Hedge funds perform well in more advanced stages of the cycle

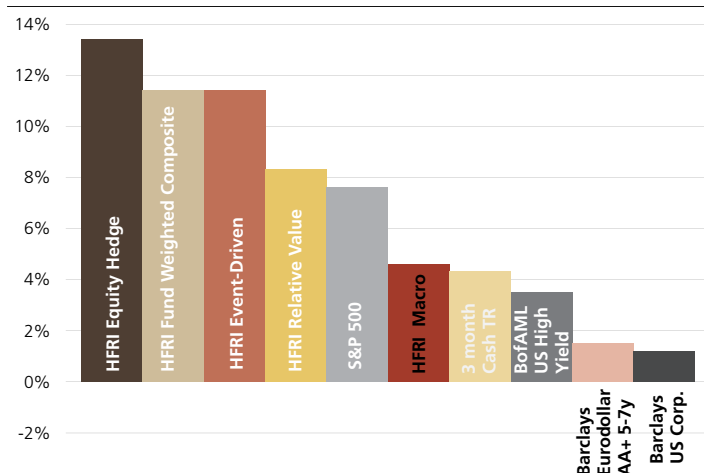
Late-cycle performance of hedge funds versus other asset classes (considering US recessions of 1990, 2001, and 2007), in %



Source: Bloomberg, HFR, NBER, UBS, as of March 2018

Fig. 25: Fed policy still supports hedge fund returns

Annualized total return during the past three rate-hike periods



Source: Bloomberg, UBS, as of April 2018

Smart beta

Smart beta refers to strategies that take a regular market-capitalization index (e.g. MSCI USA or S&P 500) and adjust the stock composition to capture non-traditional risk premiums that arise from taking certain risks, structural drivers, or from investors' behavioral biases. The most frequently cited factors with some of the best track records are momentum, quality, size, low volatility, value, and high dividend. Our research found that there are currently five robust factors (size, momentum, quality, low volatility, and high dividend) according to our three criteria of profitability, consistency, and effectiveness. We monitor the robustness of factors on an annual basis.

Each factor has different drivers, and so the short-term performance of individual factors can vary. But diversified holdings of different factors have performed consistently well. An equally weighted portfolio of five of the most frequently cited US factors would have, since 1998, outperformed the S&P 500 by 1.9% a year.

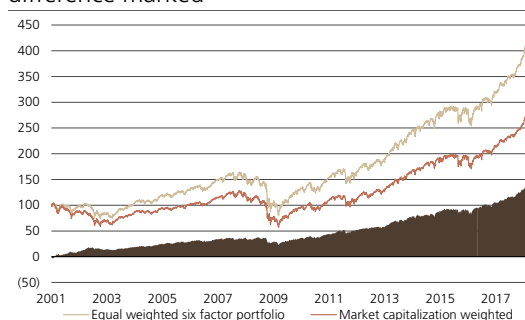
Equity buy-write strategies

An equity buy-write strategy mixes equity purchases ("buy") with the systematic selling ("writing") of call options. In effect, investors are exchanging exposure to significant potential upside in equity markets for a smaller, but certain, extra return.

This approach has historically offered attractive risk-return characteristics. Between June 1988 and January 2018, a buy-write strategy matched the annual returns of the index, but with a lower annualized volatility. Buy-write strategies typically outperform traditional long-equity strategies in down, or sideways to gently rising, equity markets. Moderating return expectations for equities and heightened volatility make them attractive at this stage of the cycle. Since the spike in volatility on 26 January, the BXY Index has outperformed the S&P 500 Total Return Index by 1.8%. For more, see "Generate yield: buy-write on US equities."

Fig. 26: Historically, smart beta has outperformed the MSCI USA market-capitalization-weighted index

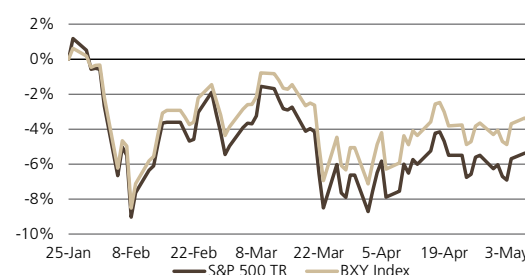
Performance benchmarked to 100, with absolute difference marked



Source: Bloomberg, UBS, as of 6 April 2018

Fig. 27: Buy-write strategies can outperform in down or sideways equity markets

BXY Index, S&P 500 Total Return Index since 25 January 2018



Note: BXY Index = CBOE S&P 500 2% OTM BuyWrite Index.

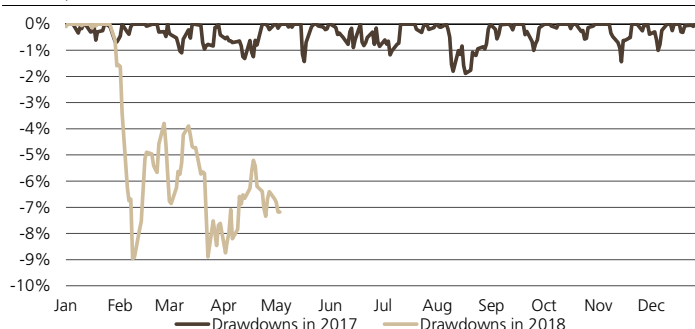
Source: Bloomberg, UBS, as of May 2018

Manage exposure to equity downside, while retaining upside

During the low-volatility period, it was more profitable to be invested without downside exposure than to pay insurance premiums. Indeed, those strategies that sold downside protection, instead buying it, saw outsize returns – that is, until we entered the new, higher-volatility environment. Thus far in 2018, realized drawdowns have been larger than last year and we don't expect a return to 2017's abnormal calm.

Fig. 29: The maximum peak-to-trough drawdown in 2017 was unusually low

2018 marks a return to a more normal level of realized volatility (MSCI ACWI)



Source: Bloomberg, UBS, as of May 2018

As described earlier in this report, we think it's important that investors retain exposure to equity market upside. But in this new environment, investors now need to offset this with some downside protection as well.

Investment ideas

Put options

For those investors who can use options, one method of downside protection is to buy put options.

The price of insurance, as measured by the VIX index of implied equity market volatility, is currently running below its long-term median, so protection is relatively cheap. Investors can also further reduce the cost of hedging by taking out insurance on only part of their portfolio, or by choosing a strike price of around 10% out of the money.

Since it is hard to predict when tail risks might push the market into correction territory, there is a strong case for choosing relatively long-duration put options – around 12 months. While these are more expensive than shorter-duration options, they provide more lasting protection.

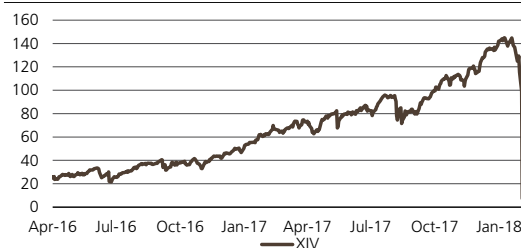
Systematic hedging

Investors can further improve the cost and effectiveness of hedging by employing a more systematic approach, including:

- Selecting hedges from a broad universe. Put options on the more prominent or popular markets, such as the S&P 500, can be more expensive than those on less well-known or utilized indexes.
- Looking for markets that exhibit volatile and correlated drawdowns during market sell-offs and actively diversify or hedge

Fig. 28: Investors who positioned for continued low volatility suffered heavy losses

VIX-linked exchange traded products made it possible to profit from calm markets



Note: VIX = CBOE Volatility Index.

Source: Bloomberg, UBS, as of May 2018

this exposure. For instance, in recent history, Eurozone and Asian indexes have tended to sell off more sharply during periods of market uncertainty than those in the US.

- Employing a methodology that systematically buys protection while it is "cheap," rather than waiting for a market sell-off, when it can become more expensive.

At present, we believe the best "bang for your buck" in terms of downside protection comes from three-month, 25 delta, put options on the Euro Stoxx 50 index, the FTSE MIB (Italy) Index, and the Hang Seng China Enterprises Index.

For more, see our regular *Systematic hedging* reports.

Barrier reverse convertibles

A barrier reverse convertible (BRC) is a short-term note linked to an underlying asset. It typically earns a coupon and offers downside protection (contingent on the underlying asset not falling very sharply) but surrenders the upside of the underlying asset.

Barrier reverse convertibles can be useful in times of higher volatility since they can provide investors with greater "predictability" of returns. During periods of higher volatility, available yields and coupon rates on BRCs can improve, since implied volatility increases. Furthermore, rising interest rates can increase the coupon since investors require higher compensation for funding the issuer.

Although barrier reverse convertibles may not be suitable for investors looking to protect against large drawdowns (such as those seen during the 2008–09 financial crisis), they can still deliver positive returns when underlying assets suffer smaller drawdowns. And they have historically seen smaller drawdowns than underlying equity indexes. In a portfolio context, BRCs can also add value by improving diversification and reducing portfolio volatility. The most consistent returns are achieved when a BRC investment strategy is executed consistently and systematically.

For more, see our CIO *barrier reverse convertibles* reports.

Table 2: Barrier reverse convertibles can deliver superior risk-adjusted rates of return

	Portfolio with BRCs	Portfolio without BRCs
Return	36%	40%
Return (annualized)	3.90%	4.20%
Volatility	7.40%	8.90%
Risk-adjusted return	0.52	0.48
Maximum drawdown	-24%	-27%

Source: Bloomberg, Deutsche Bank, UBS, as of May 2018

Reconsider sources of income away from risky credit or excess foreign-exchange risk

Investors have been dealing with a low-interest-rate environment for around a decade.

In response to a lack of return in cash and high-quality bonds, many investors have sought higher income by investing in riskier companies, or in overseas currencies, in emerging markets, or more recently in the US dollar. Such yield-seeking strategies were effective in a low-volatility environment.

But now that volatility is back, investors need to take stock. Those with excess holdings of sub-investment-grade credit, or unhedged foreign-currency exposure, could now be at risk.

The first risk for investors in sub-investment-grade bonds is a rise in defaults. Currently, default rates are around 1.4% for the US and 0.8% for Europe, versus a long-run average of 4%. If defaults return to average, CCC to C rated bonds would deliver a negative return, as they are not offering sufficient yield to compensate. If defaults reach financial-crisis levels, no part of the high yield market would see positive returns.

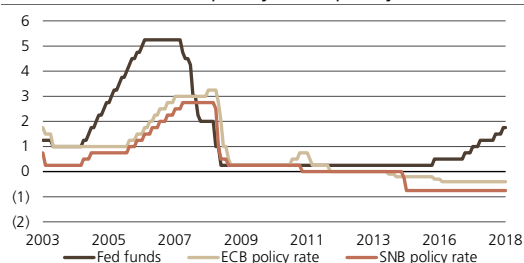
But even if defaults do not rise over the coming months, sub-investment-grade bonds face a risk of rising spreads. Since yields are so low, it would now only take 110 basis points of spread widening to erode a full year's worth of yield on US dollar-denominated BB bonds. This is not an extreme event; the standard deviation of spreads is 130 basis points. For euro-denominated bonds, just 50 basis points of widening would erase 12 months of yield. For more, see our Bond markets report "Are you taking too much risk?" of 8 May 2018.

Meanwhile, investors taking currency risk to find yield could also be at risk. The wide interest-rate differential between higher-yielding currencies such as the US dollar or emerging market currencies, and lower-yielding currencies such as the euro, Swiss franc, or Japanese yen naturally incentivizes investors to sell or borrow low-yielders and buy high-yielders.

But if our foreign exchange forecasts prove correct, this strategy could be risky, as the losses from exchange-rate movements can easily exceed the return on the fixed income investment. We expect low-yielding currencies like the euro and the Japanese yen to appreciate in the months ahead. In our view, the euro will appreciate thanks to the Eurozone's large current account surplus and the coming end of quantitative easing in the region, and the yen is one of the world's most undervalued currencies and would likely appreciate sharply in case of a downturn in global markets.

Fig. 30: Low interest rates have prevailed for around a decade

Federal funds, ECB policy, SNB policy rates

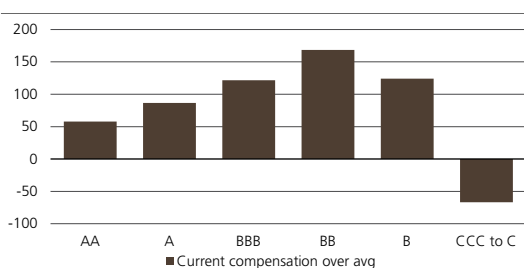


Note: Fed funds = US federal funds rate; ECB = European Central Bank; SNB = Swiss National Bank.

Source: Bloomberg, UBS, as of May 2018

Fig. 31: Certain categories of corporate bonds no longer offer yield sufficient to compensate for average default rates

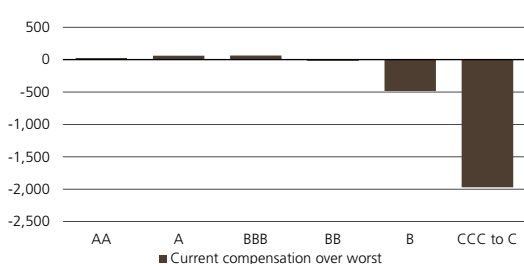
Annual credit loss rating by letter rating, 1983–2017



Source: Moody's, ICE BAML, UBS, as of May 2018

Fig. 32: Certain categories of corporate bonds no longer offer yield sufficient to compensate for average default rates

Annual credit loss rating by letter rating, 1983–2017



Source: Moody's, ICE BAML, UBS, as of May 2018

And regardless of our currency views, we believe that taking on significant foreign-exchange exposure is not the best way for investors to earn yield. Carry trading may be favorable in times of low volatility, but it often does not pay out when volatility rises. And, if we assume interest-rate parity holds, long-term expected total returns from foreign-exchange investments are zero.

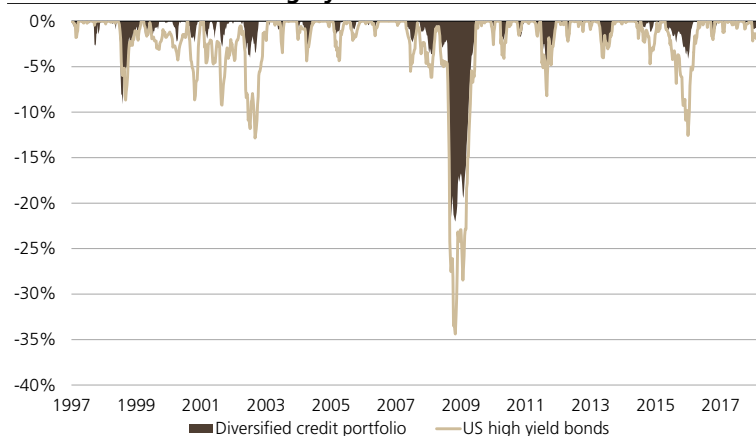
Investment ideas – diversifying yield asset exposure and adding duration

We believe that a strategic holding of high yield bonds upwards of 20% need not generate excessive portfolio risk. But this only applies if investors have this position in the context of a well-diversified portfolio. In an attempt to generate more yield, many investors have taken on large positions in sub-investment-grade credit without properly managing the risks. We think there are more effective means of earning yield without taking on excessive risks:

A diversified yield-focused portfolio

Concentrated positions in high yield bonds or similarly high-yielding assets are considerably more risky than a portfolio that is broadly diversified across many types of bonds, equities, and other income-generating assets. Our diversified credit strategic asset allocation provides a similar yield to high yield credit, but due to its wide diversification across a range of fixed income asset types, it has more limited drawdown risk.

Fig. 33: A diversified credit portfolio has shown lower draw-downs relative to US high yield bonds.



Source: Bloomberg, UBS, as of May 2018

Dividend investing

Investors should also consider alternative sources of income apart from traditional fixed income assets, such as gaining more exposure to dividend growth stocks within their portfolios. With bond yields still near generational lows, the current dividend yield on equity markets appears relatively attractive. But even more important, investing in companies with an ability, willingness, and commitment to increase those dividends over time allows for growing income streams over the intermediate- and longer-term horizons. For more, see our themes “Eurozone dividend growth,” “Swiss high-quality dividends,” and “UK diversified dividends.”

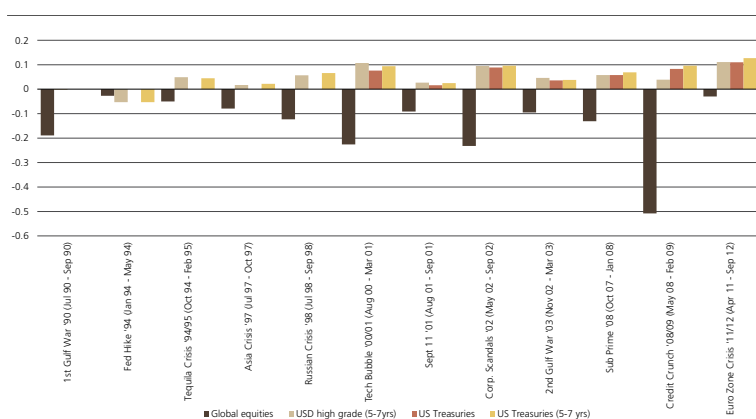
Extending duration

Aside from increasing credit quality and diversifying credit risk, investors may also wish to opportunistically extend the duration of

their bond holdings to provide a comparable yield with lower portfolio risk.

In particular, US dollar high grade bonds with longer durations offer potentially attractive returns after the recent rise in US dollar yields, with the added benefit of these bonds historically tending to increase in value during times of market turbulence, potentially offsetting losses elsewhere in a portfolio.

Fig. 34: US Treasuries have proved an effective cushion in periods of risk aversion
in %



Source: Bloomberg, UBS, as of April 2018

Looking beyond the familiar

In an environment of higher volatility, it's impossible to predict which of the many risks will materialize, if any. But this also means that it's equally impossible to be sure whether investments in any one particular country, sector, or company are secure.

To mitigate risk, investors need to enter this higher-volatility environment properly diversified across countries, sectors, and securities.

Table 3: The main risk scenarios will impact asset classes differently

Risk scenario	Probability	Potentially negatively affected asset classes
Federal Reserve ends the cycle	10–20%	<ul style="list-style-type: none"> - US equities, global equities - Developed market high yield bonds - Emerging market credit - Energy and base metal commodities
Trade war	20–30%	<ul style="list-style-type: none"> - Emerging market currencies - Equities, in particular of countries that have large trade surpluses with the US (e.g. Mexico, Japan, Germany) or are linked to the US-China supply chain (e.g. Korea, Taiwan), - Emerging market bonds
Oil supply shock	20–30%	<ul style="list-style-type: none"> - Equities, especially commodity-importing countries with high-beta markets (e.g. Japan, Eurozone, Asia)
Military escalation in North Korea	10–20%	<ul style="list-style-type: none"> - Asian equities, especially Korea, Taiwan - Korean won
China credit crunch	10–20%	<ul style="list-style-type: none"> - Asian assets (equities, currencies, credit) - Global commodities, especially energy and base metals

Source: UBS, as of April 2018

For illustration, many US investors are comfortable holding investments closely linked to the S&P 500 because it is already a well-diversified index. But while it is geographically well-diversified, it also has concentrated exposure to US monetary policy. At a time when the economic cycle in the US is more advanced than in other regions, a plausible scenario is one in which Federal Reserve policy becomes a headwind for US corporate profits, while regions with more accommodative central banks fare better. In any case, globally diversified investors are likely to experience smoother returns than US-focused investors. From the start of 2018 until the time of writing, the S&P 500 has seen 28 daily moves greater than 1%. By contrast, the MSCI All Country World Index has had only 17, or 40% fewer.

Similarly, Swiss investors buying stakes in multinational companies based in Switzerland may feel safe. But they are also effectively taking the view that we will not see a significant increase in global trade tensions or a sharp rise in oil prices. Swiss companies are highly dependent on international trade and are largely oil-consuming. High exposure to large individual Swiss companies, and volatility in the Swiss franc, add to the uncertainty.

The issue for investors in Asia Pacific is a bit different. They benefit from exposure to the fastest-growing region in the world. But this also doesn't come for free. The volatility of the MSCI China Index has been about twice that of the broader MSCI All Country World Index over the past six months. Higher economic growth does not necessarily translate into higher market performance. The Chinese economy has grown, on average, more than five times faster than the US economy over the past decade (8.1% versus 1.4%). Yet

between the start of 2008 and the end of 2017, the S&P 500 was up 82% and the Shanghai Composite was down 37%. And in the event of a credit crunch in China, or military escalation in North Korea or the South China Sea, equities in the region could be particularly vulnerable.

For more, see our regular *Risk radar* reports.

Investment ideas

The obvious action for investors with concentration risk is to diversify, by either making equity portfolios more global, or shifting toward a well-diversified multi-asset portfolio. But where this is not possible, there are other options that investors could consider:

Borrowing for diversification: Some investors cannot avoid excessive exposure to individual companies or countries, such as when they are subject to lock-up periods on corporate stock. Our research suggests that borrowing against a concentrated portfolio, and using the proceeds to invest in a diversified portfolio, can improve the risk-return characteristics of the overall portfolio. The diversification benefits of investing more widely can more than offset the extra cost and volatility associated with borrowing. For more, see our report "Single-stock lending in a portfolio context."

Seek greater overseas exposure through domestic investments: Investors unable to invest overseas for other reasons can also look to improve the diversity in their portfolio by seeking exposure to multinationals based in their own region that sell into other regions of the world. This will not fully mitigate political or monetary policy risks, but does at least reduce economic exposure to an individual country or region, and can boost potential portfolio growth by investing in companies with faster-growing overseas operations.

One of our themes, "EM(U) Winners," is based on identifying stocks based in the Eurozone with at least 20% exposure to faster-growing emerging markets. Our current selection of companies has emerging market exposure of around 40% on average, which should bode well for sales and earnings growth.

Investing with a longer-term mind-set

Beyond these changes, investors would also benefit by reframing their notion of “risk.” For most, their investment objectives are about meeting a series of financial responsibilities – retirement spending, vacations, and gifts to grandchildren, among others – that stretch over decades and even generations. In this context, risk is not about day-to-day volatility but about whether the portfolio is on track to meet those goals.

By constructing portfolios to align with the time-frame of their financial objectives, investors can look through short-term volatility and avoid the temptation to try to time the market. This is the foundation of our wealth management approach called “Liquidity. Longevity. Legacy.” (3L), which we believe better equips investors to achieve their financial goals:

- **Liquidity:** A portfolio of more stable assets to maintain investors' lifestyle over the next 3 years.
- **Longevity:** A balanced portfolio designed to help improve investors' lifestyle by providing for spending needs through the end of their lifetimes.
- **Legacy:** A long-term portfolio to improve the lives of others through philanthropy and the transfer of wealth to future generations.

By embracing this framework, investors can avoid behavioral traps – and stay invested through volatile markets – while remaining confident that they are still on target to meet their financial goals.

Investment ideas

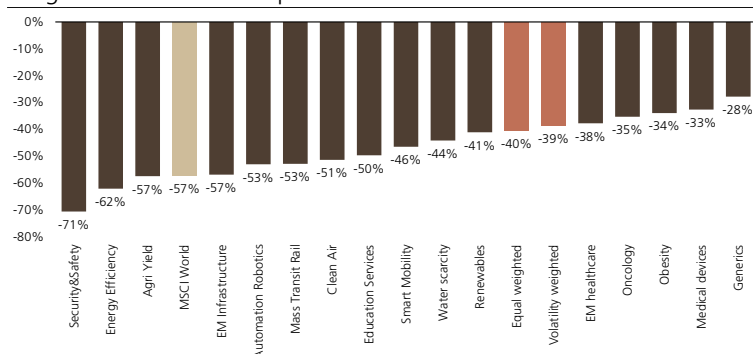
So what kind of investments might perform best over a very long-term time horizon?

We believe that investing in companies that benefit from long-term secular trends, have good or improving sustainability standards, and benefit from illiquidity premiums seen in private equity can deliver above-benchmark levels of return over the long run, while also benefiting from financial drivers uncorrelated to the short-term economic cycle.

Longer-term investment themes

We expect companies exposed to long-term trends such as population growth, aging, and urbanization to deliver faster-than-GDP revenue growth. While individual companies and themes can be negatively affected by the economic cycle and changes in competitive positioning, investing in a diversified range of companies exposed to a broad range of themes can offer good risk-adjusted rates of return.

Fig. 35: Maximum drawdown of long-term investment themes
Weekly data from 2000–2017, stocks within themes market cap weighted with market cap >250m



Source: UBS

At present, we believe the following themes offer the most promise.

- **Emerging market tourism:** Urbanization and income growth are driving demand growth for emerging market tourism and global aviation infrastructure. Emerging market air passengers carried globally already exceed developed market counterparts, and two-thirds of new plane orders in the next 20 years will come from developing countries.
- **Fintech:** Driven by rapid urbanization, strong demand from millennials, and favorable regulations, the global fintech industry is at an inflection point, with industry revenues growing from USD 120bn in 2017 to USD 265bn in 2025.
- **Automation and robotics:** Rising IT penetration in the manufacturing sector should lead to a new wave of automation investment in developed countries. At the same time, higher wages and challenging demographic developments will increase costs for emerging market manufacturers, driving automation investment.
- **Digital data:** We expect the data universe to grow more than 10 times from 2020 to 2030, reaching 456 zettabytes. Rising global internet penetration, increased data use in emerging markets, and secular consumer trends like the Internet of Things are fueling this growth.
- **Energy efficiency:** Energy efficiency helps end-users reduce power demand at source, cutting carbon dioxide emissions, saving resources, and lowering payback periods, thus making efficiency a key business factor for companies and consumers.

For more, see our “Pick of the crop” reports in our *Longer term investments* suite.

Sustainable investing

Investing in a way that has a positive impact on society and the environment can also enhance long-term risk-adjusted rates of return. Companies with high standards of corporate governance face fewer tail risks, such as large fines from regulators or reputational damage. A CIO analysis of US companies found that those with at least three women on the board or 30% in senior management positions outperformed the broader market over a six-year period. Further, more gender-diverse companies tended to exhibit superior operating performance, on average over a five-year period.

For more, see our regular *Sustainable investing* updates.

Private equity

Some exposure to private markets can improve the long-term risk-adjusted return of portfolios by expanding the available universe of instruments and exposures, and by allowing investors to capture additional sources of return including illiquidity premiums, alternative investment premiums, and manager skill. Since these investments do not trade on public exchanges, these investments do not typically demonstrate large short-term swings in value, and have a low correlation to public markets.

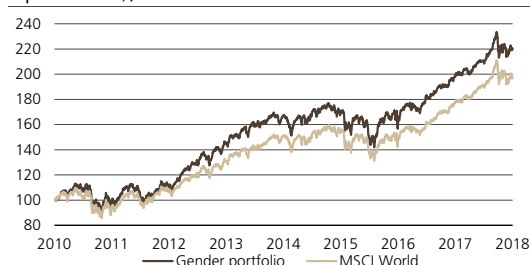
Over a 10-year horizon, the UBS capital market assumptions (CMAs) forecast a diversified private-markets allocation to generate returns of 8.5–12% per annum overall, with risk of 9–12.7%, depending on the strategy.

Conclusion

The return of volatility means investors need to act, and prepare portfolios for a new environment. But this is not a time to jump to cash. Through a range of strategies – improving credit quality, adding downside protection, looking beyond familiar assets and traditional passive approaches, and investing with a longer-term mindset – investors can prepare for the higher-volatility environment, while also positioning their portfolios for long-term growth.

Fig. 36: Gender-diverse companies exhibit higher profitability

Annual performance of gender-focused portfolio vs. world equity market (31 December 2010 – 30 April 2018), in %

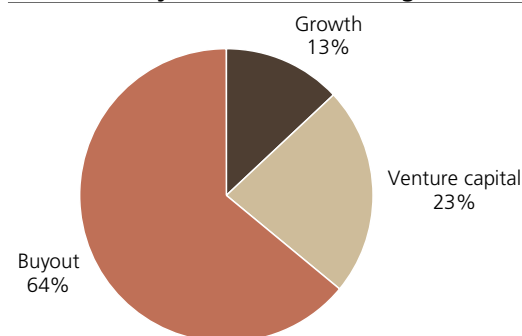


Note: Based on Russell 1000 companies. Gender-diverse companies defined as at least three women on the board or 30% in senior management.

Source: Bloomberg, UBS, as of November 2017

Fig. 37: Private equity asset breakdown by sector

% of industry assets under management



Source: Preqin, UBS

Non-Traditional Assets

Non-traditional asset classes are alternative investments that include hedge funds, private equity, real estate, and managed futures (collectively, alternative investments). Interests of alternative investment funds are sold only to qualified investors, and only by means of offering documents that include information about the risks, performance and expenses of alternative investment funds, and which clients are urged to read carefully before subscribing and retain. An investment in an alternative investment fund is speculative and involves significant risks. Specifically, these investments (1) are not mutual funds and are not subject to the same regulatory requirements as mutual funds; (2) may have performance that is volatile, and investors may lose all or a substantial amount of their investment; (3) may engage in leverage and other speculative investment practices that may increase the risk of investment loss; (4) are long-term, illiquid investments, there is generally no secondary market for the interests of a fund, and none is expected to develop; (5) interests of alternative investment funds typically will be illiquid and subject to restrictions on transfer; (6) may not be required to provide periodic pricing or valuation information to investors; (7) generally involve complex tax strategies and there may be delays in distributing tax information to investors; (8) are subject to high fees, including management fees and other fees and expenses, all of which will reduce profits.

Interests in alternative investment funds are not deposits or obligations of, or guaranteed or endorsed by, any bank or other insured depository institution, and are not federally insured by the Federal Deposit Insurance Corporation, the Federal Reserve Board, or any other governmental agency. Prospective investors should understand these risks and have the financial ability and willingness to accept them for an extended period of time before making an investment in an alternative investment fund and should consider an alternative investment fund as a supplement to an overall investment program.

In addition to the risks that apply to alternative investments generally, the following are additional risks related to an investment in these strategies:

- **Hedge Fund Risk:** There are risks specifically associated with investing in hedge funds, which may include risks associated with investing in short sales, options, small-cap stocks, "junk bonds," derivatives, distressed securities, non-U.S. securities and illiquid investments.
- **Managed Futures:** There are risks specifically associated with investing in managed futures programs. For example, not all managers focus on all strategies at all times, and managed futures strategies may have material directional elements.
- **Real Estate:** There are risks specifically associated with investing in real estate products and real estate investment trusts. They involve risks associated with debt, adverse changes in general economic or local market conditions, changes in governmental, tax, real estate and zoning laws or regulations, risks associated with capital calls and, for some real estate products, the risks associated with the ability to qualify for favorable treatment under the federal tax laws.
- **Private Equity:** There are risks specifically associated with investing in private equity. Capital calls can be made on short notice, and the failure to meet capital calls can result in significant adverse consequences including, but not limited to, a total loss of investment.
- **Foreign Exchange/Currency Risk:** Investors in securities of issuers located outside of the United States should be aware that even for securities denominated in U.S. dollars, changes in the exchange rate between the U.S. dollar and the issuer's "home" currency can have unexpected effects on the market value and liquidity of those securities. Those securities may also be affected by other risks (such as political, economic or regulatory changes) that may not be readily known to a U.S. investor.

Appendix

Independent Generic financial research – Risk information: UBS Chief Investment Office WM's investment views are prepared and published by Wealth Management and Personal & Corporate Banking or Wealth Management Americas, Business Divisions of UBS AG (regulated by FINMA in Switzerland), its subsidiary or affiliate ("UBS"). In certain countries UBS AG is referred to as UBS SA. This material is for your information only and is not intended as an offer, or a solicitation of an offer, to buy or sell any investment or other specific product. Certain services and products are subject to legal restrictions and cannot be offered worldwide on an unrestricted basis and/or may not be eligible for sale to all investors. All information and opinions expressed in this material were obtained from sources believed to be reliable and in good faith, but no representation or warranty, express or implied, is made as to its accuracy or completeness (other than disclosures relating to UBS). 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Appendix

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