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## Cross-Asset Almanac

# A Spotter's Guide to Bull Corrections and Bear Markets

We examine the common characteristics of equity bull market corrections and bear markets, and analyse how assets tend to perform in the run-up to, and aftermath of, these episodes.



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# A Spotter's Guide to Bull Corrections and Bear Markets

**Equity drawdowns are more common than you think:** Since 1987, there have been at least 14 episodes of a 5%+ ACWI sell-off. Going back further to 1950, we count at least 100 episodes of 5%+ S&P sell-offs, 32 where the drawdown was 10%+. But recoveries from these episodes tend to differ greatly between bull market corrections and bear markets, emphasising the importance of identifying the environment correctly.

**What are the signs of a bull correction? Sharp drawdowns:** The lead-up to equity bull corrections tends to see an orderly risk-on environment – US stocks lead, credit spreads tighten, yields rise slowly and USD strengthens against EMFX. Drawdowns of 5% or more over one month tend to point to a bull correction rather than a bear market. Volatility tends to stay elevated after a bull correction top.

**What are the signs of a bear market start?** Run-ups to bear markets see exuberance – equities can rally by 20%+ in the final 12 months of a bull market. EM outperforms, US 10-year yields rise 110bp on average, EMFX strengthens materially, credit spreads widen and crude peaks before equities make their final cycle high. For rates, the front end rallies and the curve bull steepens in an equity bear market.

**The end of the market cycle has not necessarily meant the end of the business cycle:** Growth has historically peaked around six months *after* S&P bear markets start. Overlaps between bear markets and US recessions are also fewer than you'd think – 'only' about half of large S&P sell-offs have been followed by a recession in the following 12 months.

**Sequencing and the late-cycle rotation roadmap:** Not all corrections are followed by bear markets, but almost all bear markets have been preceded by corrections, a potential signal for investors. Credit tends to be the first to 'crack', providing a bearish market signal 3-12 months in advance, with government bond yields, on average, peaking about three months before ACWI and S&P 500 do. The roadmap to a late-bull market environment suggests a preference for equities over fixed income, US curves to bear flatten, and EMFX and crude to rally hard as renewed hope turns to exuberance.

**What looks most consistent with a mid-cycle market? What looks the most late-cycle?** US equities, global discretionary and materials, JGBs, gilts and copper are all historically consistent with stocks being within 12 months off a peak, but EM and European equity and global staples performances are not. Credit spread and UST yield moves are also out of line with 'late-cycle', being much lower on a trailing 12-month basis than what is expected from the late-cycle playbook.

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[Cross-Asset Strategy: Global In the Flow - March 2018 \(1 Mar 2018\)](#)

[Cross-Asset Dispatches: Was it Worth it? \(27 Feb 2018\)](#)

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[Cross-Asset Dispatches: Messages from the Correction \(19 Feb 2018\)](#)

[Cross-Asset Brief: Screening for Dislocations \(12 Feb 2018\)](#)

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# A spotter's guide to bull corrections and bear markets

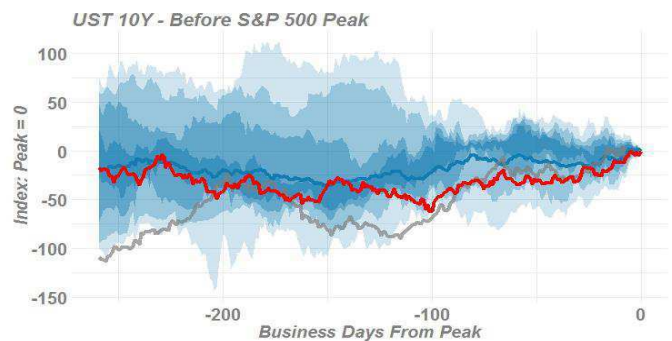
Our current environment of rising inflation, strong data, tighter policy, flatter yield curves and more volatility is consistent with a late-cycle market. But late-cycle doesn't necessarily mean every drawdown must be 'the big one' – **looking at S&P, the market for which we have the longest history, since 1950, bull corrections (10%+ declines with quick recoveries) have happened almost twice as frequently as bear markets for the S&P, with the two having very different recovery trajectories and incentivising very different strategies.**

So, what should investors watch out for to make sure risk assets are still on an uptrend? How should investors position for a last stretch of the rally that brings us to cycle tops? What's the strategy for a drawdown that's 'just' a bull correction versus a full-blown bear market? In this report, we examine the common characteristics of equity bull market corrections and bear markets, and analyse how risk assets tend to perform in the run-up to, and aftermath of, these episodes. We find that:

- **Equity drawdowns are not uncommon:** Since 2005, ACWI has seen at least eight major sell-offs (>10% drawdowns), and S&P has experienced at least five episodes. Pushing back further, since 1950, S&P 500 has seen at least 100 episodes of 5%+ sell-offs, 32 where the drawdown was 10%+. Going all the way back to 1920s, the probabilities that S&P is down by more than 5% or 10% at any point over the following 12 months are 46% and 29%, respectively.
- **Bull correction and bear market backdrops tend to be different:** While equities tend to see a strong run-up to both, other assets tend to behave differently when equities are still on an uptrend versus market tops. Credit spreads widening and UST yields rising materially (+100bp) typically herald end-of-cycle drawdowns.
- **Bad is good – a heavy equity sell-off tends to mean a bull market stays intact...** Drawdowns of 5% or more over one month tend to point to a bull correction rather than a bear market, which typically sees a more drawn-out 'bleed'.

## Exhibit 1:

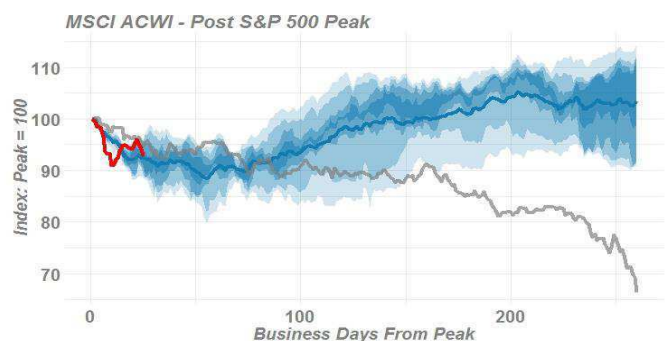
UST 10-year yields tend to rise by >100bp before equity tops, but move sideways into bull corrections



Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

## Exhibit 2:

ACWI tends to recover six months after a bull correction, but sell-off continues in a bear market



Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

- **...but bull corrections are also a sign of a potential bear market...** While not all corrections are followed by bear markets, it's not uncommon for bear markets to be preceded by corrections ([Exhibit 3](#) and [Exhibit 4](#)). For ACWI, all the bear markets since 1987 have followed 5%+ drawdowns within 12 months. For the 16 S&P bear markets since 1927, 14 saw a 5%+ drawdown and correction within 12 months before stocks top out for the cycle.

**Exhibit 3:**

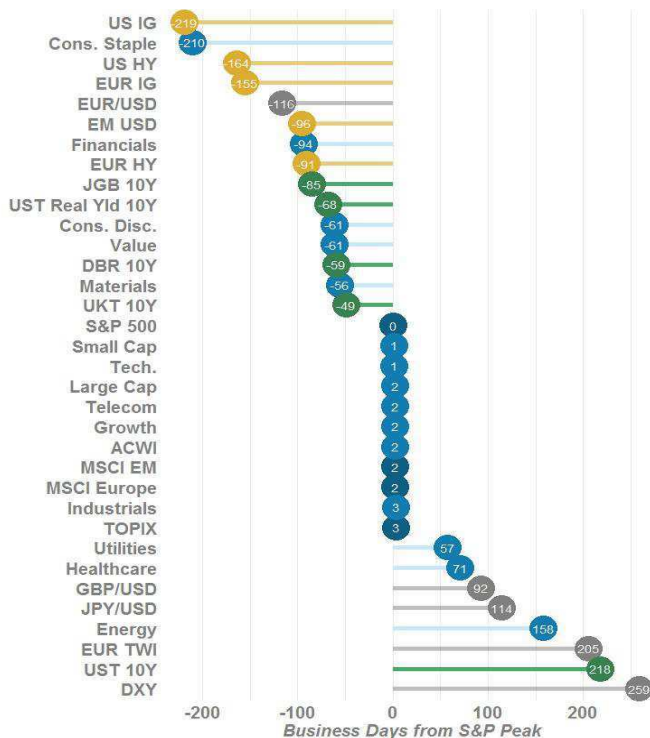
Bull correction before bear market – '98-'02

**S&P 500****Exhibit 4:**

Bull correction before bear market – '07-'09

**S&P 500****Exhibit 5:**

Typical sequencing around S&amp;P cyclical tops – credit spreads and staples peak first, followed by real yields

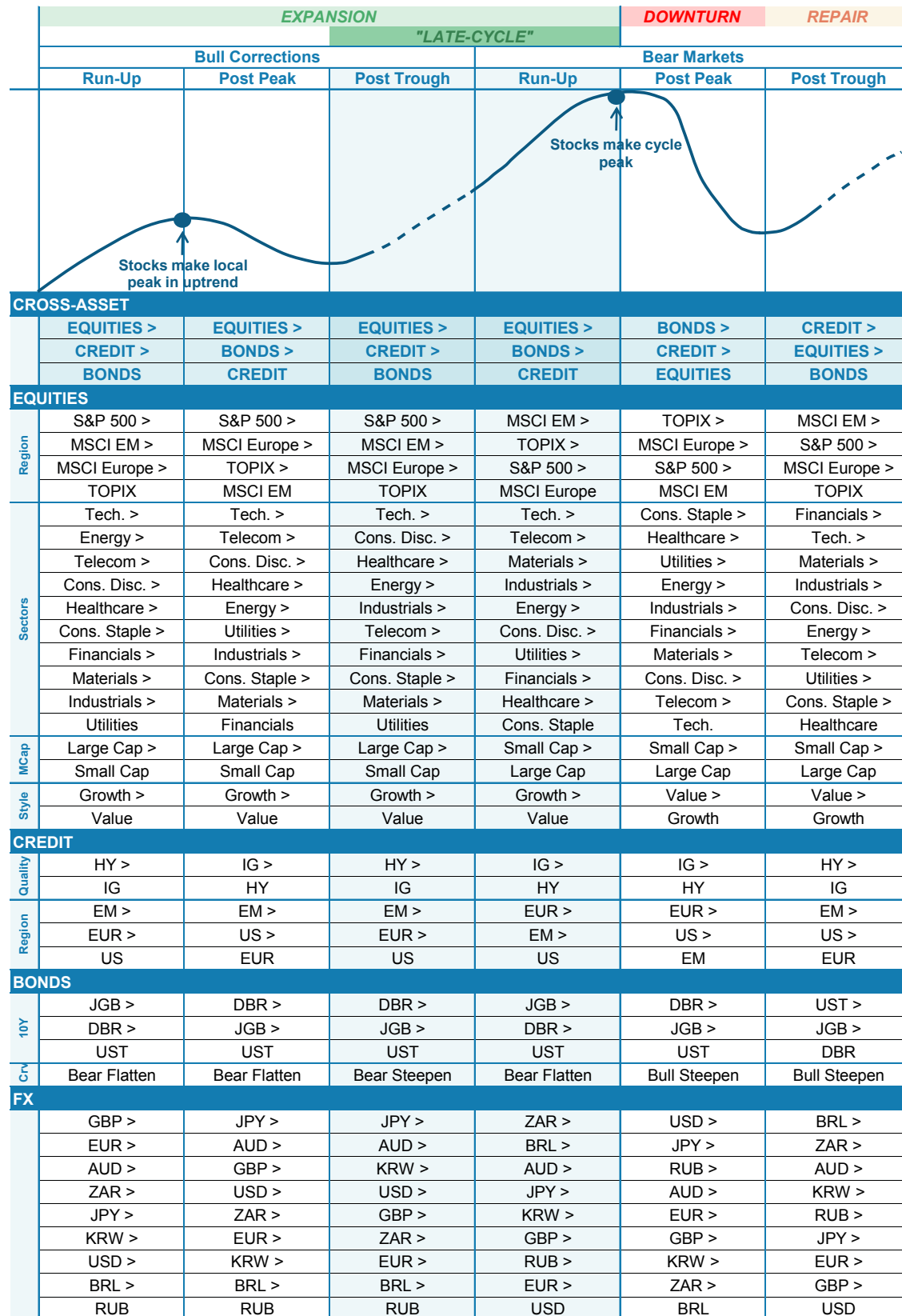


Source: Bloomberg, Morgan Stanley Research; Note: Yellow indicates credit, blue indicates equities, green shows bonds, grey shows FX. Numbers indicate average number of days asset peaks/troughs before S&P. Sectors, styles and market cap all based on ACWI.

- **...as are credit spreads widening and real yields peaking:** Looking at the typical sequencing of major assets' peak/trough around stocks' cyclical tops, we find that credit in general tends to be the first to 'crack', providing a bearish market signal 3-12 months in advance, with government bond yields, on average, peaking about three months before ACWI and S&P 500 do.
- **But the end of the market cycle has not necessarily meant the end of the business cycle:** Growth has historically peaked around six months after S&P peaks in a bear market but remained stable 6-12 months after S&P peaks in a bull correction. On the other hand, inflation has on average remained strong going in and out of S&P peaks. Overlaps between bear markets and US recessions are also lower than you'd think – 'only' about half of large S&P sell-offs have been followed by a recession in following 12 months.
- **Winners and losers in late-cycle bull corrections and bear market = rotation roadmap:** The shift from renewed hope to exuberance, from bull correction to end-of-cycle market top, leads to divergent asset performance. Equities outperform other assets through this late-cycle period, but region and sector rankings shift. Notably, credit tends to underperform consistently and JPY strengthen consistently in this part of the cycle.

**Exhibit 6:**

Stylised asset rankings in late-cycle



Source: Morgan Stanley Research; Note: For equities, rankings based on price returns in local currency. For credit and bonds, based on spread/yield change. For FX, price returns. Curve is based on UST 2s10s. Based on 12-month performance into and out of peaks/troughs. Sector, market cap and style based on MSCI ACWI.

- What looks most consistent with mid-cycle market? What looks the most late-cycle? US equities, consumer discretionary, JGBs, gilts and copper are all historically consistent with stocks being within 12 months of a peak, but EM and European equity performance are not. Credit moves have also been more typical 'mid-cycle' than 'late-cycle', with spreads still tighter on a trailing 12-month basis versus materially wider.

### Defining bull corrections and bear markets

For the purpose of this exercise, we define a 'bull correction' as an episode where an equity market has seen a 10% or greater drawdown, but recovers to the prior peak within 12 months, a 'bear market' when stocks sell off 20% or more, with no recovery within 12 months, and a 'correction' as all the other big sell-offs which don't fall into either category. We show how the S&P drawdowns since 1950 are categorised in [Exhibit 7](#), and show what the same looks like for other major equity markets in [Appendix: Equity sell-offs](#). Given the long history we have for the S&P 500, and our finding that [global equities tend to peak within 1-2 days of S&P](#), our analysis below on how assets behave around equity peaks and troughs will be based on the US stock market peak/troughs.

### Exhibit 7:

S&P – 10%+ drawdowns in history

| Peak Date           | Trough Date | Days | Peak | Trough | Drawdown | Run Up |      | From Peak |      |      |      | From Trough |     |     |     | Type            |
|---------------------|-------------|------|------|--------|----------|--------|------|-----------|------|------|------|-------------|-----|-----|-----|-----------------|
|                     |             |      |      |        |          | 1M     | 12M  | 1M        | 3M   | 6M   | 12M  | 1M          | 3M  | 6M  | 12M |                 |
| 12-Jun-50           | 17-Jul-50   | 26   | 19   | 17     | -14%     | 6%     | 43%  | -13%      | -4%  | 2%   | 11%  | 10%         | 18% | 28% | 30% | Bull Correction |
| 05-Jan-53           | 14-Sep-53   | 181  | 27   | 23     | -15%     | 4%     | 12%  | -1%       | -8%  | -9%  | -6%  | 4%          | 9%  | 17% | 37% | Correction      |
| 23-Sep-55           | 11-Oct-55   | 13   | 46   | 41     | -11%     | 7%     | 41%  | -7%       | 0%   | 7%   | 2%   | 10%         | 8%  | 17% | 13% | Bull Correction |
| 02-Aug-56           | 22-Oct-57   | 319  | 50   | 39     | -22%     | 5%     | 17%  | -4%       | -6%  | -10% | -4%  | 4%          | 6%  | 10% | 32% | Bear Market     |
| 03-Aug-59           | 25-Oct-60   | 322  | 61   | 52     | -14%     | 2%     | 27%  | -3%       | -5%  | -8%  | -9%  | 7%          | 16% | 25% | 30% | Correction      |
| 12-Dec-61           | 26-Jun-62   | 141  | 73   | 52     | -28%     | 2%     | 28%  | -5%       | -3%  | -22% | -14% | 9%          | 9%  | 20% | 34% | Bear Market     |
| 22-Aug-62           | 23-Oct-62   | 45   | 60   | 53     | -11%     | 5%     | -12% | -3%       | 2%   | 10%  | 19%  | 14%         | 22% | 30% | 36% | Bull Correction |
| 09-Feb-66           | 07-Oct-66   | 173  | 94   | 73     | -22%     | 1%     | 9%   | -6%       | -7%  | -12% | -7%  | 10%         | 12% | 22% | 33% | Bear Market     |
| 25-Sep-67           | 05-Mar-68   | 117  | 98   | 88     | -10%     | 5%     | 25%  | -3%       | -2%  | -9%  | 5%   | 7%          | 14% | 13% | 13% | Bull Correction |
| 29-Nov-68           | 26-May-70   | 388  | 108  | 69     | -36%     | 4%     | 15%  | -4%       | -9%  | -5%  | -13% | 7%          | 17% | 22% | 44% | Bear Market     |
| 28-Apr-71           | 23-Nov-71   | 150  | 105  | 90     | -14%     | 5%     | 28%  | -5%       | -7%  | -10% | 2%   | 12%         | 17% | 22% | 29% | Bull Correction |
| 11-Jan-73           | 03-Oct-74   | 451  | 120  | 62     | -48%     | 1%     | 17%  | -3%       | -6%  | -12% | -23% | 17%         | 13% | 31% | 35% | Bear Market     |
| 15-Jul-75           | 16-Sep-75   | 46   | 96   | 82     | -14%     | 6%     | 15%  | -10%      | -7%  | 0%   | 11%  | 9%          | 8%  | 23% | 27% | Bull Correction |
| 21-Sep-76           | 06-Mar-78   | 380  | 108  | 87     | -19%     | 5%     | 27%  | -7%       | -3%  | -6%  | -11% | 3%          | 15% | 19% | 13% | Correction      |
| 12-Sep-78           | 14-Nov-78   | 46   | 107  | 92     | -14%     | 3%     | 11%  | -2%       | -10% | -7%  | 0%   | 4%          | 7%  | 6%  | 11% | Bull Correction |
| 05-Oct-79           | 07-Nov-79   | 24   | 111  | 100    | -10%     | 5%     | 7%   | -9%       | -4%  | -8%  | 16%  | 8%          | 16% | 7%  | 32% | Bull Correction |
| 13-Feb-80           | 27-Mar-80   | 32   | 118  | 98     | -17%     | 7%     | 20%  | -11%      | -10% | 4%   | 8%   | 8%          | 18% | 31% | 39% | Bull Correction |
| 28-Nov-80           | 12-Aug-82   | 445  | 141  | 102    | -27%     | 10%    | 32%  | -4%       | -7%  | -6%  | -11% | 19%         | 38% | 44% | 58% | Bear Market     |
| 10-Oct-83           | 24-Jul-84   | 207  | 173  | 148    | -14%     | 3%     | 28%  | -5%       | -2%  | -10% | -6%  | 13%         | 13% | 19% | 30% | Correction      |
| 25-Aug-87           | 04-Dec-87   | 74   | 337  | 224    | -34%     | 9%     | 33%  | -5%       | -27% | -21% | -24% | 16%         | 19% | 19% | 21% | Bear Market     |
| 09-Oct-89           | 30-Jan-90   | 82   | 360  | 323    | -10%     | 3%     | 29%  | -6%       | -2%  | -5%  | -13% | 3%          | 3%  | 10% | 4%  | Correction      |
| 16-Jul-90           | 11-Oct-90   | 64   | 369  | 295    | -20%     | 2%     | 11%  | -8%       | -18% | -15% | 4%   | 8%          | 6%  | 28% | 29% | Bull Correction |
| 07-Oct-97           | 27-Oct-97   | 15   | 983  | 877    | -11%     | 6%     | 40%  | -5%       | -2%  | 13%  | 0%   | 9%          | 9%  | 24% | 22% | Bull Correction |
| 17-Jul-98           | 31-Aug-98   | 32   | 1187 | 957    | -19%     | 7%     | 30%  | -7%       | -11% | 5%   | 20%  | 6%          | 22% | 29% | 38% | Bull Correction |
| 16-Jul-99           | 15-Oct-99   | 66   | 1419 | 1247   | -12%     | 7%     | 20%  | -5%       | -12% | 3%   | 6%   | 14%         | 17% | 9%  | 10% | Bull Correction |
| 24-Mar-00           | 09-Oct-02   | 664  | 1527 | 777    | -49%     | 12%    | 19%  | -3%       | -6%  | -5%  | -25% | 15%         | 17% | 11% | 33% | Bear Market     |
| 28-Nov-02           | 11-Mar-03   | 74   | 939  | 801    | -15%     | 6%     | -18% | -6%       | -11% | 1%   | 13%  | 9%          | 23% | 28% | 42% | Bull Correction |
| 09-Oct-07           | 09-Mar-09   | 370  | 1565 | 677    | -57%     | 8%     | 16%  | -6%       | -11% | -13% | -36% | 22%         | 39% | 50% | 68% | Bear Market     |
| 23-Apr-10           | 02-Jul-10   | 51   | 1217 | 1023   | -16%     | 4%     | 41%  | -12%      | -9%  | -3%  | 10%  | 10%         | 12% | 23% | 31% | Bull Correction |
| 29-Apr-11           | 03-Oct-11   | 112  | 1364 | 1099   | -19%     | 3%     | 15%  | -1%       | -5%  | -6%  | 3%   | 13%         | 14% | 29% | 31% | Bull Correction |
| 21-May-15           | 11-Feb-16   | 191  | 2131 | 1829   | -14%     | 2%     | 13%  | 0%        | -4%  | -2%  | -4%  | 10%         | 13% | 20% | 26% | Correction      |
| 26-Jan-18           | 08-Feb-18   | 10   | 2873 | 2581   | -10%     | 7%     | 25%  | NA        | NA   | NA   | NA   | NA          | NA  | NA  | NA  | ?               |
| SUMMARY STATS - ALL |             |      |      |        |          |        |      |           |      |      |      |             |     |     |     |                 |
| Average             | 166         |      |      |        | -20%     | 5%     | 21%  | -5%       | -7%  | -5%  | -2%  | 4%          | 6%  | 10% | 32% |                 |
| Median              | 97          |      |      |        | -15%     | 5%     | 20%  | -5%       | -6%  | -6%  | 0%   | 4%          | 7%  | 15% | 37% |                 |
| Bull Corrections    |             |      |      |        |          |        |      |           |      |      |      |             |     |     |     |                 |
| Average             | 57          |      |      |        | -14%     | 5%     | 20%  | -7%       | -7%  | -1%  | 8%   | 9%          | 15% | 22% | 27% |                 |
| Median              | 46          |      |      |        | -14%     | 5%     | 20%  | -6%       | -7%  | 1%   | 7%   | 9%          | 15% | 23% | 30% |                 |
| Bear Markets        |             |      |      |        |          |        |      |           |      |      |      |             |     |     |     |                 |
| Average             | 336         |      |      |        | -36%     | 6%     | 21%  | -4%       | -9%  | -12% | -18% | 13%         | 19% | 26% | 40% |                 |
| Median              | 370         |      |      |        | -34%     | 5%     | 17%  | -4%       | -7%  | -12% | -14% | 15%         | 17% | 22% | 34% |                 |

Source: Bloomberg, Morgan Stanley Research; Note: A 'bull correction' defined as an episode where an equity market has seen a 10% or greater drawdown, but recovers to the prior peak within 12 months, a 'bear market' when stocks sell off 20% or more, with no recovery within 12 months, and a 'correction' as all the other big sell-offs which don't fall into either category.

# The run-up to market peaks – how do assets typically perform?

We've already explored some of the qualitative flags of a cycle end – exuberance, excessive leverage, extreme policy tightening – but are there ways we can quantify the risk? Below we examine the types of returns assets tend to see going into an equities peak. We find that, in general, **markets tend to perform differently going into a bull market correction compared to going into a bear market, potentially giving investors a useful set of signposts: Equities tend to rally too fast, too furious, even as credit widens and nominal rates rise in earnest in the 12 months before stocks make a cycle top.**

## Equities

Global equities tend to rally more sharply into an equities bear market than into bull corrections. **US equities tend to see the biggest run-up over 12 months before bull corrections**, with Europe and Japan lagging, while **EM equities have typically been the best late-cycle market**, achieving the highest returns before a bear market. Sector-wise, technology and energy tend to lead 12 months going into a bull correction, with utilities and industrials as laggards; **technology also stands as one the best-performing late-cycle sectors, along with telecoms and materials, while staples and health care typically underperform going into a market top, most likely a function of rising rates.**

### Exhibit 8:

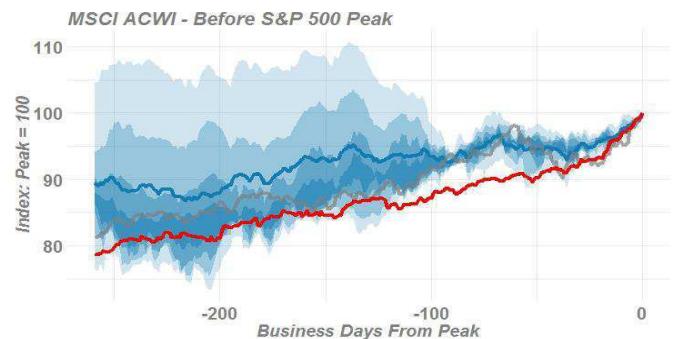
Stocks performance 1-12 months going into an equity market peak

| % chg        | Run-up to S&P Peak |     |     |     |              |     |     |     |
|--------------|--------------------|-----|-----|-----|--------------|-----|-----|-----|
|              | BULL CORRECTION    |     |     |     | BEAR MARKETS |     |     |     |
|              | 12M                | 6M  | 3M  | 1M  | 12M          | 6M  | 3M  | 1M  |
| MSCI ACWI    | 12%                | 7%  | 5%  | 5%  | 21%          | 14% | 3%  | 8%  |
| S&P 500      | 16%                | 14% | 8%  | 5%  | 21%          | 15% | 9%  | 7%  |
| MSCI Europe  | 10%                | 8%  | 5%  | 4%  | 16%          | 11% | 5%  | 2%  |
| TOPIX        | -1%                | 6%  | 3%  | 2%  | 27%          | 14% | 3%  | 3%  |
| MSCI EM      | 11%                | 5%  | 2%  | 5%  | 46%          | 26% | 11% | 8%  |
| Energy       | 16%                | 11% | 4%  | 4%  | 22%          | 11% | 0%  | 8%  |
| Materials    | 10%                | 8%  | 1%  | 3%  | 30%          | 10% | -1% | 7%  |
| Industrials  | 9%                 | 9%  | 2%  | 4%  | 24%          | 12% | 1%  | 8%  |
| Cons. Disc.  | 14%                | 10% | 5%  | 5%  | 17%          | 10% | -1% | 7%  |
| Cons. Staple | 13%                | 4%  | 2%  | 2%  | -4%          | -6% | -6% | 1%  |
| Healthcare   | 14%                | 7%  | 2%  | 4%  | -1%          | 2%  | 1%  | 5%  |
| Financials   | 12%                | 7%  | 3%  | 5%  | 8%           | 5%  | 1%  | 10% |
| Tech.        | 22%                | 18% | 11% | 10% | 48%          | 33% | 12% | 9%  |
| Telecom      | 15%                | 9%  | 6%  | 6%  | 36%          | 25% | 8%  | 7%  |
| Utilities    | 4%                 | -1% | -1% | 2%  | 12%          | 3%  | 4%  | 5%  |
| Large Cap    | 13%                | 9%  | 4%  | 5%  | 23%          | 15% | 4%  | 8%  |
| Small Cap    | 13%                | 9%  | 5%  | 5%  | 29%          | 13% | 6%  | 5%  |
| Growth       | 13%                | 9%  | 5%  | 5%  | 28%          | 20% | 6%  | 8%  |
| Value        | 11%                | 8%  | 3%  | 5%  | 14%          | 7%  | 1%  | 7%  |

Source: Bloomberg, Morgan Stanley Research; Note: Shows summary performance of episodes where S&P sold off by 10% or more. Data since 1950, or whenever history begins.

### Exhibit 9:

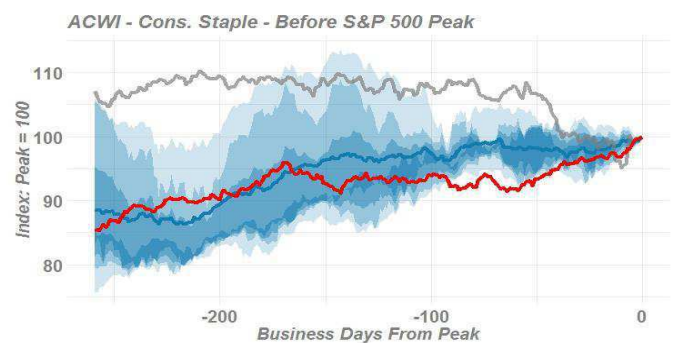
ACWI tends to see a 10-20% run-up 12 months before market tops



Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

### Exhibit 10:

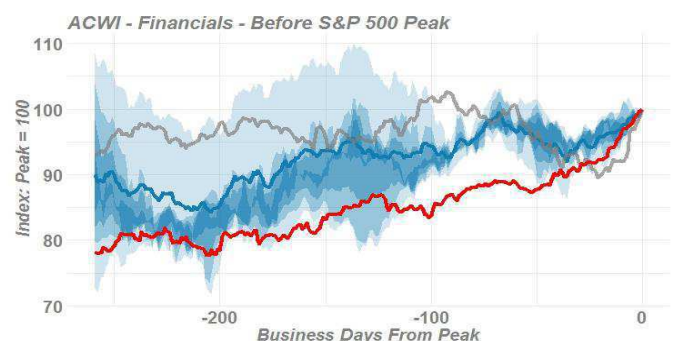
Staples tend to fall into end of cycle...



Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

### Exhibit 11:

...while financials tend to see positive return going into an equity top



Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

## Credit

Credit behaves very differently going into an equities market peak depending on whether it's a bull correction or an end-of-cycle bear market. For drawdown episodes where stocks are still on a general uptrend, credit tends to tighten into an S&P top – much like what has happened in the last 12 months going into the February sell-off. **However, for bear markets, credit spreads have tended to widen a year before equities peak**, consistent with our finding that US credit

### Exhibit 12:

Credit performance 1-12 months going into a stock market top

| bp chg  | Run-up to S&P Peak |      |     |     |              |     |    |     |
|---------|--------------------|------|-----|-----|--------------|-----|----|-----|
|         | BULL CORRECTION    |      |     |     | BEAR MARKETS |     |    |     |
|         | 12M                | 6M   | 3M  | 1M  | 12M          | 6M  | 3M | 1M  |
| US IG   | -36                | -10  | -9  | -9  | 31           | 22  | 25 | -4  |
| US HY   | -102               | -28  | -24 | -33 | 45           | 63  | 38 | -31 |
| US BBB  | -42                | -13  | -6  | 0   | 27           | 24  | 23 | -1  |
| US BB   | -64                | -34  | -22 | -23 | 76           | 69  | 44 | -20 |
| EUR IG  | -47                | -5   | -10 | -10 | 15           | 19  | 19 | -1  |
| EUR HY  | -467               | -90  | -79 | -86 | 43           | 55  | 51 | -32 |
| EUR BBB | -104               | -11  | -21 | -22 | 22           | 39  | 38 | -1  |
| EUR BB  | -368               | 92   | -33 | -73 | -14          | 28  | 47 | -22 |
| EM USD  | -185               | 20   | -60 | -38 | 30           | 51  | 35 | -46 |
| CDX IG  | -45                | -8   | 0   | -3  | 10           | 11  | 6  | -24 |
| CDX HY  | -413               | -118 | -32 | -24 | 99           | 120 | 14 | -23 |
| Main    | -27                | 1    | 1   | 1   | 3            | 7   | 4  | -21 |
| Xover   | -244               | -91  | -47 | -26 | 13           | 66  | 17 | -62 |

Source: Bloomberg, Morgan Stanley Research; Note: Shows summary performance of episodes where S&P sold off by 10% or more. Data since 1950, or whenever history begins.

## Bonds

**Nominal bond yields tend to rise prior to bull corrections**, likely a function of a healthy macro backdrop that drives both growth and inflation higher. However, going into end-of-cycle bear markets, rates rise much faster—**in the 12 months going into an equities cycle high, UST 10Y have on average widened by more than 100bp. US 2s10s**

### Exhibit 14:

Rates performance 1-12 months going into a stock market peak

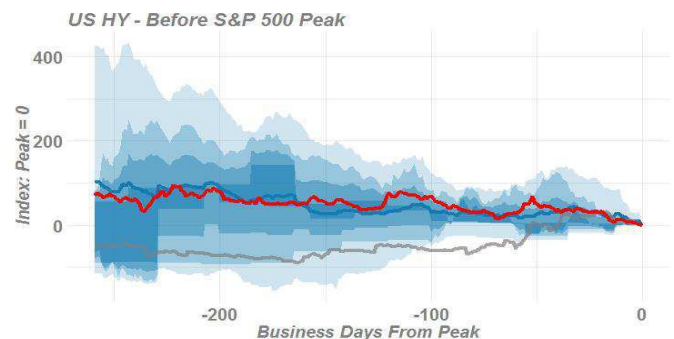
| bp chg      | Run-up to S&P Peak |    |     |     |              |     |     |     |
|-------------|--------------------|----|-----|-----|--------------|-----|-----|-----|
|             | BULL CORRECTION    |    |     |     | BEAR MARKETS |     |     |     |
|             | 12M                | 6M | 3M  | 1M  | 12M          | 6M  | 3M  | 1M  |
| UST 2Y      | 48                 | 44 | 25  | 8   | 136          | 170 | 61  | 41  |
| DBR 2Y      | 7                  | 2  | 12  | 4   | 94           | 46  | -7  | 7   |
| UKT 2Y      | -19                | 13 | 10  | 0   | 82           | 2   | -34 | -9  |
| JGB 2Y      | -15                | -5 | -2  | 4   | 23           | 15  | -4  | 11  |
| UST 10Y     | 35                 | 43 | 15  | 10  | 111          | 93  | 15  | 10  |
| DBR 10Y     | 6                  | 14 | 4   | -5  | 86           | 22  | -13 | 0   |
| UKT 10Y     | -23                | 3  | -12 | -6  | 48           | -23 | -36 | -13 |
| JGB 10Y     | -9                 | -6 | -15 | 4   | 2            | 9   | -6  | 8   |
| UST-DBR 5Y  | -16                | -2 | -9  | -16 | -56          | -15 | -21 | 1   |
| UST-JGB 5Y  | -19                | 6  | 9   | -14 | 31           | 11  | -13 | -6  |
| UST-DBR 10Y | -19                | -6 | -3  | -2  | -41          | -4  | -16 | 2   |
| UST-JGB 10Y | -3                 | 14 | 16  | -11 | 42           | 8   | -24 | -6  |
| US 2s10s    | -10                | -2 | -6  | 0   | -11          | -61 | -41 | -30 |
| US 10s30s   | 1                  | -4 | -2  | 2   | -16          | -25 | -6  | -5  |

Source: Bloomberg, Morgan Stanley Research; Note: Shows summary performance of episodes where S&P sold off by 10% or more. Data since 1950, or whenever history begins.

tends to trough about seven months before S&P peaks. Returns are not all negative – the last month before equities peak tends to see significant spread tightening, just as stocks can rally by another 8% in that final stretch, but given the trajectory of spreads after equities peak (hint: it's wider), we don't think the pennies are worth the oncoming steamroller.

### Exhibit 13:

US HY tends to tighten 12 months into a bull correction peak, but widen into an equity bear market

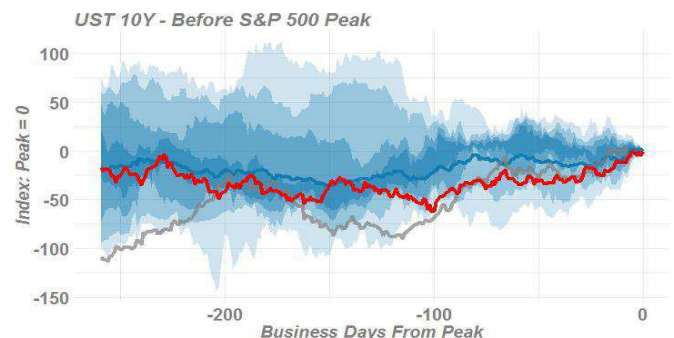


Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

**also tend to bear flatten late-cycle**, consistent with the received wisdom that a flattening/inverting curve is usually a harbinger of bear markets (and recessions). Also notable is that **going into bear markets, UST-DBR differentials fall dramatically**, probably reflective of DBRs 'catching up' with US reflation late in the cycle.

### Exhibit 15:

UST 10-year yields tend to widen significantly before equity tops, but move sideways before bull corrections



Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

## FX

As with credit, FX performance around equity peaks tells us about the nature of the risk rally, with a difference between returns going into bull corrections and into bear markets. JPY tends to not budge when equities are in an uptrend, and USD tends to strengthen versus

### Exhibit 16:

FX performance 1-12 months going into an equity peak

| % chg   | Run-up to S&P Peak |      |     |     |              |     |     |     |
|---------|--------------------|------|-----|-----|--------------|-----|-----|-----|
|         | BULL CORRECTION    |      |     |     | BEAR MARKETS |     |     |     |
|         | 12M                | 6M   | 3M  | 1M  | 12M          | 6M  | 3M  | 1M  |
| DXY     | -3%                | 0%   | -1% | 0%  | -2%          | 1%  | 1%  | 0%  |
| EUR TWI | 2%                 | -1%  | 1%  | 1%  | -2%          | -2% | -1% | -1% |
| EUR/USD | 4%                 | 0%   | 1%  | 1%  | 0%           | -2% | -2% | 0%  |
| GBP/USD | 5%                 | 1%   | 1%  | 0%  | 3%           | 0%  | -1% | 0%  |
| JPY/USD | 0%                 | -1%  | -1% | -1% | 8%           | 2%  | 0%  | 0%  |
| AUD/USD | 2%                 | 0%   | 1%  | 1%  | 9%           | 3%  | 1%  | 3%  |
| BRL/USD | -10%               | -10% | -3% | 2%  | 10%          | 11% | 5%  | 6%  |
| CAD/USD | 1%                 | 0%   | 0%  | 0%  | 4%           | 3%  | 1%  | 1%  |
| CHF/USD | 8%                 | 3%   | 2%  | 1%  | 0%           | -1% | -1% | 0%  |
| IDR/USD | -18%               | -8%  | -9% | 3%  | 10%          | 7%  | -3% | 2%  |
| INR/USD | -1%                | -1%  | 0%  | 0%  | 3%           | 2%  | 0%  | 0%  |
| KRW/USD | -3%                | 4%   | 2%  | 2%  | 7%           | 5%  | 1%  | 1%  |
| MXN/USD | -3%                | 1%   | 1%  | 1%  | -15%         | -7% | -3% | 0%  |
| MYR/USD | -3%                | -1%  | -2% | -1% | 3%           | 0%  | -1% | 0%  |
| NOK/USD | 5%                 | 2%   | 2%  | 1%  | 5%           | 1%  | 0%  | 0%  |
| RUB/USD | -23%               | -1%  | 2%  | 1%  | 1%           | -4% | -2% | 2%  |
| ZAR/USD | 1%                 | -3%  | 0%  | 0%  | 11%          | 1%  | -1% | 1%  |

Source: Bloomberg, Morgan Stanley Research; Note: Shows summary performance of episodes where S&P sold off by 10% or more. Data since 1950, or whenever history begins.

## Commodities

Commodities have tended to see positive returns going into an equity market top, with stronger performance going into bear markets than bull corrections. What's notable is that compared to other risk

### Exhibit 18:

Commodities performance 1-12 months going into a stock market peak

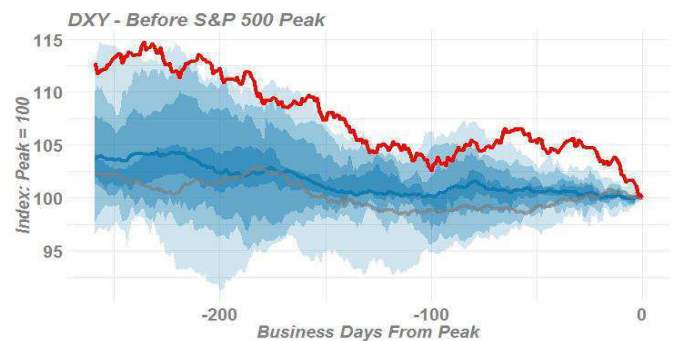
| % chg  | Run-up to S&P Peak |     |     |    |              |     |     |     |
|--------|--------------------|-----|-----|----|--------------|-----|-----|-----|
|        | BULL CORRECTION    |     |     |    | BEAR MARKETS |     |     |     |
|        | 12M                | 6M  | 3M  | 1M | 12M          | 6M  | 3M  | 1M  |
| Crude  | 14%                | 11% | 8%  | 8% | 34%          | 14% | 5%  | -3% |
| Gold   | 20%                | 11% | 9%  | 4% | 25%          | 7%  | 1%  | 0%  |
| Silver | 38%                | 22% | 19% | 6% | 18%          | 8%  | 2%  | 1%  |
| Copper | 9%                 | 7%  | 1%  | 6% | 14%          | 2%  | -2% | 3%  |

Source: Bloomberg, Morgan Stanley Research; Note: Shows summary performance of episodes where S&P sold off by 10% or more. Data since 1950, or whenever history begins.

EMFX 12 months into a bull correction. **However, prior to bear markets, we see risk-on dominating, with EMFX performing strongly 12 months into an equity top; JPY also strengthens materially late-cycle.**

### Exhibit 17:

DXY tends to weaken into a bull correction S&P peak

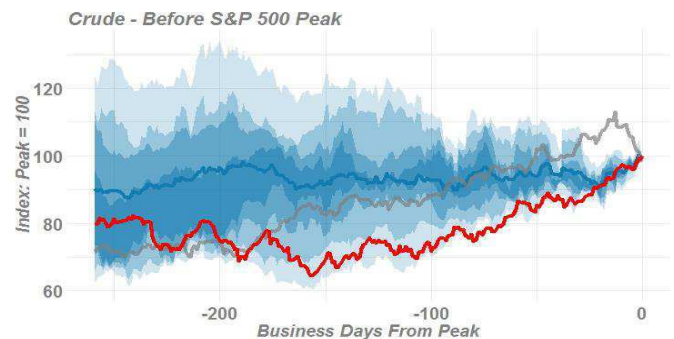


Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

assets, the last one-month performance for commodities prior to equities making a cycle high is relatively muted, with crude in particular peaking before equities do.

### Exhibit 19:

Oil tends to peak before equity cycle tops



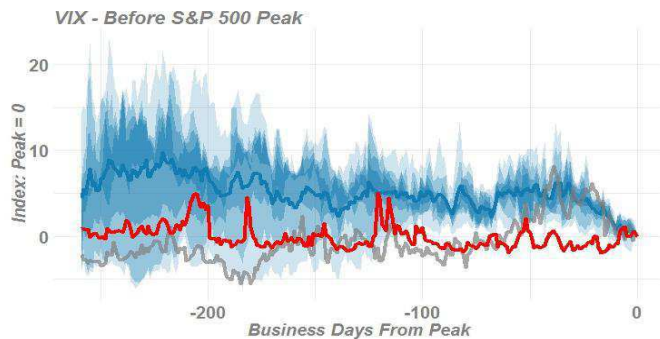
Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

## Volatility

VIX has tended to fall into S&P bull correction peaks, and go sideways into a cycle-end turning point. This is consistent with the notion that in a stocks uptrend environment, implied vol falls as realised vols do.

### Exhibit 20:

Implied vol tends to fall into a bull correction market peak



Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

## Signs of bull corrections, signs of bear markets

Pulling together our observations above, we can form some stylised facts about environments that seem ripe for bull corrections, and ones that seem to be on the edge of a cycle turn:

### Bull corrections

- **Equities:** US equities outperform other regions; Japan and Europe lag. Sector-wise, technology and energy lead, utilities and industrials underperform.
- **Credit:** Spreads tighter across the board, with lower-quality outperforming.
- **Bonds:** Muted rise in yields.
- **FX:** USD strengthens against EMFX; mixed against G10.
- **Commodities:** Positive performance all round, but copper and crude lag.

### Bear markets

- **Equities:** Markets rip higher over last 12 months (20%+ rally). EM on a tear. Sector-wise, staples and health care underperform.
- **Credit:** Spreads wider across the board, with lower-quality underperforming.
- **Bonds:** Nominal yields rise quickly and in earnest; curve bear flattens. UST-DBR yield differential falls.
- **FX:** EMFX rallies in risk-on environment; JPY also strengthens materially.
- **Commodities:** Crude outperforms, but peaks before equity markets.

# The aftermath – what do bull corrections and bear markets mean for cross-asset returns?

What happens to asset performance after equities peak? Below we examine the types of returns assets tend to see coming out of an equity peak. We find that a **drawdown of 5% or more over one month tends to point to a bull correction rather than the start of a bear market**, with the US leading the recovery. **Credit underperforms in both kinds of sell-off scenario**, supporting an underweight in the asset late-cycle, while **safe-haven FX (USD, JPY and CHF) rally in both types of equity drawdowns**. Rates moves tend to be muted in bull corrections, while the front end rallies and the curve bull steepens in bear markets.

## Equities

**Equities tend to sell-off more severely in the first three months after equities peak in a bull correction than in a bear market:**

What's different is that in bull corrections, markets start to claw back losses from six months onwards, while drawdowns at cycle-ends tend to continue. Region-wise, US and Europe lead in bull corrections, while Europe and Japan are the most resilient in bear markets; notably, EM underperforms in both sell-off scenarios. For sectors, in general, the ones which tend to outperform in bull corrections are the laggards in bear markets – technology and telecom are winners in uptrend markets, but see severe losses in cycle-ends, although admittedly, this result could be skewed by the dot-com bubble.

## Exhibit 21:

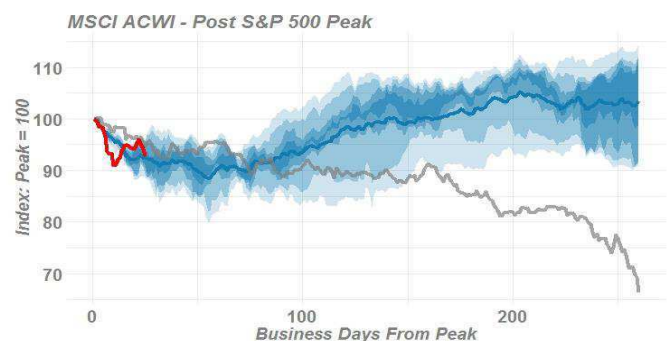
Stocks performance 1-12 months from stock market peaks

| % chg        | From S&P Peak   |      |     |     |              |      |      |      |
|--------------|-----------------|------|-----|-----|--------------|------|------|------|
|              | BULL CORRECTION |      |     |     | BEAR MARKETS |      |      |      |
|              | 1M              | 3M   | 6M  | 12M | 1M           | 3M   | 6M   | 12M  |
| MSCI ACWI    | -7%             | -10% | -1% | 3%  | -4%          | -7%  | -11% | -42% |
| S&P 500      | -7%             | -9%  | -1% | 8%  | -4%          | -12% | -12% | -28% |
| MSCI Europe  | -7%             | -10% | -2% | 2%  | -3%          | -8%  | -11% | -22% |
| TOPIX        | -6%             | -9%  | -7% | -2% | -4%          | -9%  | -7%  | -19% |
| MSCI EM      | -10%            | -14% | -8% | -2% | -6%          | -10% | -20% | -57% |
| Energy       | -7%             | -9%  | -4% | 3%  | 4%           | 7%   | 5%   | -22% |
| Materials    | -8%             | -10% | -4% | -2% | -1%          | -7%  | -9%  | -40% |
| Industrials  | -8%             | -10% | -2% | 3%  | 0%           | -7%  | -6%  | -38% |
| Cons. Disc.  | -7%             | -9%  | 3%  | 8%  | -3%          | -13% | -17% | -44% |
| Cons. Staple | -4%             | -4%  | 2%  | 2%  | 4%           | 5%   | 4%   | -4%  |
| Healthcare   | -4%             | -4%  | 4%  | 7%  | 2%           | 4%   | 2%   | -11% |
| Financials   | -9%             | -12% | -4% | -4% | -5%          | -11% | -10% | -38% |
| Tech.        | -9%             | -11% | 7%  | 19% | -10%         | -14% | -21% | -72% |
| Telecom      | -7%             | -5%  | 9%  | 10% | -6%          | -10% | -28% | -61% |
| Utilities    | -5%             | -3%  | 3%  | 3%  | 3%           | 3%   | 1%   | -18% |
| Large Cap    | -7%             | -9%  | 2%  | 5%  | -5%          | -8%  | -11% | -43% |
| Small Cap    | -7%             | -10% | 0%  | 4%  | -7%          | -11% | -13% | -42% |
| Growth       | -7%             | -7%  | 4%  | 8%  | -5%          | -9%  | -14% | -51% |
| Value        | -7%             | -10% | -1% | 2%  | -2%          | -5%  | -8%  | -32% |

Source: Bloomberg, Morgan Stanley Research; Note: Shows summary performance of episodes where S&P sold off by 10% or more. Data since 1950, or whenever history begins.

## Exhibit 22:

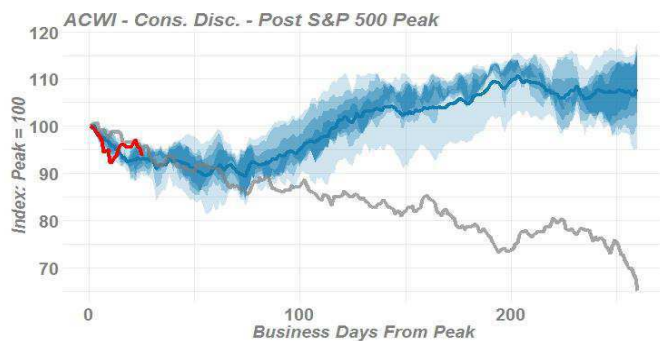
ACWI tends to recover six months after a bull correction, but sell-off continues in a bear market



Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

**Exhibit 23:**

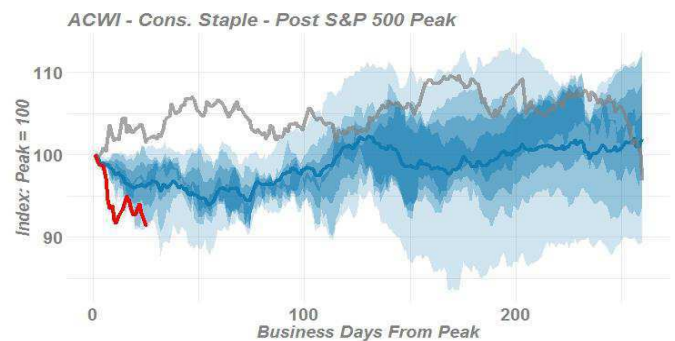
Consumer discretionary sees divergent performance in bull corrections versus bear markets



Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

**Exhibit 24:**

Consumer staples, on the other hand, is relatively resilient in both types of sell-offs



Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

## Credit

**Credit sees poor performance after equities peak, even in bull corrections where stocks have recovered from losses:** The exceptions are EUR HY and EM \$ credit, which have seen spreads tighten 12 months after bull corrections, although we'd note that history for

these two series are shorter. In both bull corrections and bear markets, HY tends to underperform IG. Cash outperforms in bull corrections, but underperforms CDS in bear markets, likely a function of a liquidity crunch in extreme sell-offs like 2008.

**Exhibit 25:**

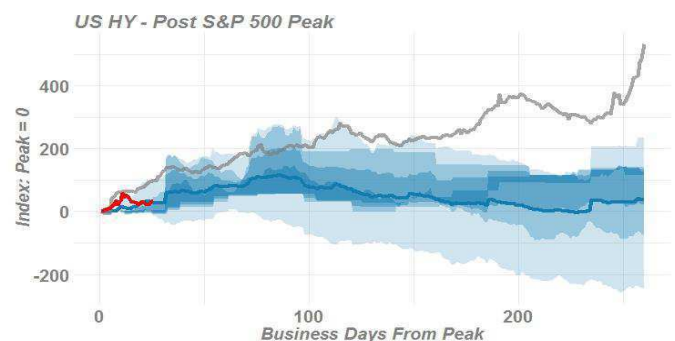
Credit performance 1-12 months from stock market peaks

| bp chg  | From S&P Peak   |     |     |      |              |     |     |     |
|---------|-----------------|-----|-----|------|--------------|-----|-----|-----|
|         | BULL CORRECTION |     |     |      | BEAR MARKETS |     |     |     |
|         | 1M              | 3M  | 6M  | 12M  | 1M           | 3M  | 6M  | 12M |
| US IG   | 11              | 16  | 21  | 17   | 23           | 56  | 84  | 201 |
| US HY   | 34              | 81  | 47  | 36   | 88           | 176 | 228 | 539 |
| US BBB  | 3               | 13  | 22  | 9    | 27           | 71  | 103 | 201 |
| US BB   | 38              | 60  | 32  | 26   | 72           | 146 | 100 | 336 |
| EUR IG  | 15              | 18  | 26  | 18   | 5            | 38  | 66  | 156 |
| EUR HY  | 42              | 8   | -68 | -105 | 30           | 175 | 301 | 810 |
| EUR BBB | 26              | 37  | 20  | -11  | 7            | 49  | 126 | 287 |
| EUR BB  | 34              | -24 | -81 | -119 | 38           | 99  | 92  | 484 |
| EM USD  | 31              | -9  | -28 | -80  | 33           | 78  | 118 | 415 |
| CDX IG  | 20              | 13  | 17  | 5    | 24           | 44  | 65  | 123 |
| CDX HY  | 121             | 83  | 110 | 61   | 84           | 97  | 97  | 97  |
| Main    | 24              | 23  | 33  | 27   | 18           | 31  | 63  | 94  |
| Xover   | 110             | 84  | 151 | 116  | 88           | 105 | 206 | 332 |

Source: Bloomberg, Morgan Stanley Research; Note: Shows summary performance of episodes where S&P sold off by 10% or more. Data since 1950, or whenever history begins.

**Exhibit 26:**

HY spreads continue to widen after equities peak in both bull corrections and bear markets



Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

## Bonds

**Bond yields tend to fall after equities peak, though faster in bear markets compared to bull corrections:** Another big difference between the two sell-off environments is in how the curve behaves

### Exhibit 27:

Rates performance 1-12 months from stock market tops

| bp chg      | From S&P Peak   |     |     |     |              |     |     |      |
|-------------|-----------------|-----|-----|-----|--------------|-----|-----|------|
|             | BULL CORRECTION |     |     |     | BEAR MARKETS |     |     |      |
|             | 1M              | 3M  | 6M  | 12M | 1M           | 3M  | 6M  | 12M  |
| UST 2Y      | 32              | -41 | 0   | 17  | -32          | -39 | -79 | -153 |
| DBR 2Y      | -13             | -22 | -34 | -11 | -5           | 15  | 1   | -62  |
| UKT 2Y      | -13             | -46 | -53 | -48 | -13          | -53 | -77 | -149 |
| JGB 2Y      | -3              | -7  | -2  | -5  | -10          | -11 | -11 | -27  |
| UST 10Y     | 14              | -22 | -11 | 9   | 5            | 5   | -12 | -23  |
| DBR 10Y     | -9              | -17 | -39 | -34 | -5           | -8  | -15 | -60  |
| UKT 10Y     | -7              | -28 | -69 | -69 | 0            | -21 | -18 | -65  |
| JGB 10Y     | 4               | -9  | -19 | -18 | -16          | -21 | -20 | -51  |
| UST-DBR 5Y  | 1               | -13 | 1   | -14 | -17          | -41 | -55 | -61  |
| UST-JGB 5Y  | -27             | -53 | -58 | -43 | -18          | -49 | -86 | -145 |
| UST-DBR 10Y | -6              | -20 | -12 | -10 | -16          | -36 | -56 | -66  |
| UST-JGB 10Y | -19             | -28 | -33 | -26 | -5           | -22 | -52 | -75  |
| US 2s10s    | -22             | 15  | -8  | -5  | 34           | 40  | 48  | 109  |
| US 10s30s   | -3              | 7   | 7   | -2  | 3            | 5   | 20  | 28   |

Source: Bloomberg, Morgan Stanley Research; Note: Shows summary performance of episodes where S&P sold off by 10% or more. Data since 1950, or whenever history begins.

## FX

Unlike other assets, FX doesn't seem to differentiate between bull corrections and bear markets – JPY and CHF strengthen against USD in both risk-off scenarios, underscoring their 'safe haven' status.

### Exhibit 29:

FX performance 1-12 months from equity market peaks

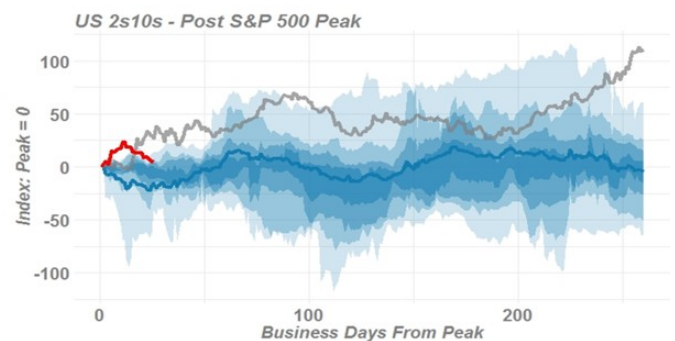
| % chg   | From S&P Peak   |      |      |      |              |      |      |      |
|---------|-----------------|------|------|------|--------------|------|------|------|
|         | BULL CORRECTION |      |      |      | BEAR MARKETS |      |      |      |
|         | 12M             | 6M   | 3M   | 1M   | 12M          | 6M   | 3M   | 1M   |
| DX      | 0%              | -2%  | -2%  | 0%   | 0%           | -1%  | -1%  | 4%   |
| EUR TWI | 1%              | 3%   | 3%   | 3%   | -1%          | 0%   | 0%   | 0%   |
| EUR/USD | 0%              | 2%   | 1%   | -3%  | -1%          | -1%  | -3%  | -9%  |
| GBP/USD | 0%              | 1%   | 2%   | 1%   | 1%           | 0%   | -2%  | -9%  |
| JPY/USD | 0%              | 4%   | 4%   | 7%   | 3%           | 6%   | 7%   | 2%   |
| AUD/USD | -2%             | -1%  | 0%   | 1%   | 1%           | 0%   | 0%   | -3%  |
| BRL/USD | -1%             | -2%  | -1%  | -6%  | 0%           | -2%  | 0%   | -24% |
| CAD/USD | -2%             | -1%  | 0%   | 1%   | 1%           | -1%  | 0%   | -2%  |
| CHF/USD | 1%              | 4%   | 2%   | 1%   | 1%           | 3%   | 5%   | 0%   |
| IDR/USD | 0%              | -8%  | -8%  | -11% | -4%          | -10% | -9%  | -19% |
| INR/USD | -2%             | -2%  | -3%  | -7%  | 0%           | 0%   | -1%  | -11% |
| KRW/USD | -3%             | -11% | -5%  | -5%  | 1%           | 0%   | -1%  | -14% |
| MXN/USD | -2%             | -3%  | -4%  | -5%  | -1%          | -5%  | -10% | -15% |
| MYR/USD | -1%             | -2%  | -1%  | 0%   | 0%           | 3%   | 3%   | 0%   |
| NOK/USD | -1%             | -1%  | 0%   | -2%  | -1%          | 1%   | 2%   | -6%  |
| RUB/USD | -4%             | -15% | -26% | -41% | 1%           | 1%   | 4%   | -3%  |
| ZAR/USD | 0%              | 3%   | 2%   | -1%  | 0%           | -2%  | -9%  | -23% |

Source: Bloomberg, Morgan Stanley Research; Note: Shows summary performance of episodes where S&P sold off by 10% or more. Data since 1950, or whenever history begins.

– while US 2s10s sees little change after a risk correction, the **curve tends to bull steepen materially in an equity bear market** (>100bp in the 12 months after S&P peaks).

### Exhibit 28:

US 2s10s tends to see bull steepening in bear markets, little change in bull corrections

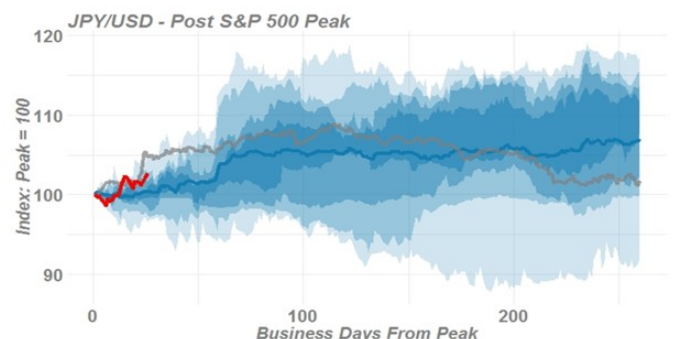


Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

EMFX also sells off in both equity bull corrections and bear markets, though more severely in the latter.

### Exhibit 30:

JPY – a winner in equity bull corrections, a winner in equity bear markets



Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

## Commodities

Crude and gold both do well after equity peaks, with copper a laggard in both sell-off scenarios, likely a function of lowered growth expectations. What's notable is that crude tends to see quite a bit of volatility in equity bull corrections, not fully recovering its uptrend until six months after equities peak.

### Exhibit 31:

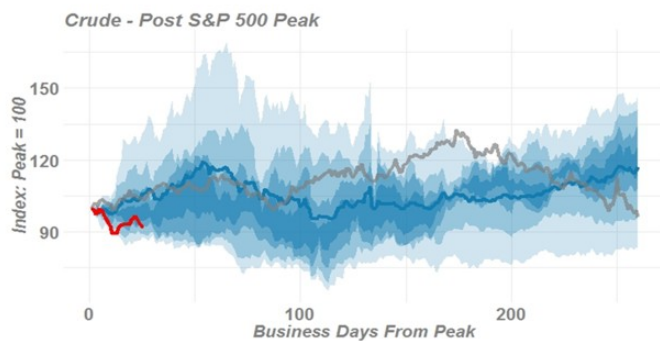
Commodities performance 1-12 months from stock market peaks

| % chg  | From S&P Peak   |     |     |     |              |     |     |      |
|--------|-----------------|-----|-----|-----|--------------|-----|-----|------|
|        | BULL CORRECTION |     |     |     | BEAR MARKETS |     |     |      |
|        | 1M              | 3M  | 6M  | 12M | 1M           | 3M  | 6M  | 12M  |
| Crude  | 1%              | 9%  | 2%  | 13% | 3%           | 11% | 11% | -3%  |
| Gold   | -1%             | 2%  | 5%  | 7%  | 2%           | 5%  | 10% | 3%   |
| Silver | -5%             | -5% | -7% | 5%  | 0%           | -5% | -4% | -15% |
| Copper | -4%             | -4% | -5% | -2% | -7%          | -4% | 10% | -19% |

Source: Bloomberg, Morgan Stanley Research; Note: Shows summary performance of episodes where S&P sold off by 10% or more. Data since 1950, or whenever history begins.

### Exhibit 32:

Crude tends to see some volatility in the six months after equity peaks



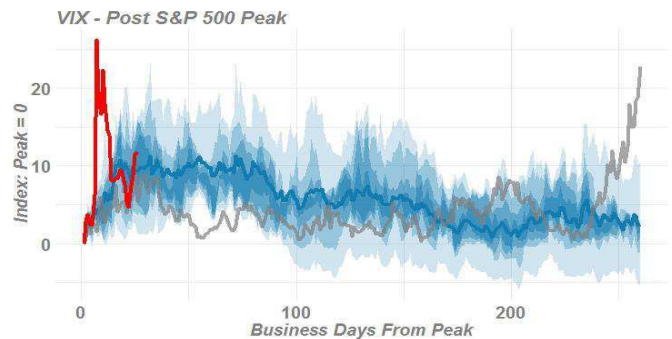
Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

## Volatility

Implied vol tends to rise after S&P peaks, and stay elevated over the subsequent 12 months. What's surprising is that VIX rises more after bull corrections than in bear markets, with the caveat being that we only have two episodes for the latter since 1990 when VIX begins. Also notable is how the spike in implied vol from the February 2018 equity drawdown stands out as an extreme, a function of the role vol products played in the sell-off.

### Exhibit 33:

Implied vol stays elevated 12 months after equity peaks – in both bull corrections and bear markets



Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

## What works in bull corrections, what works in bear markets

From our observations above, we can form some stylised facts about assets which perform well after equity bull corrections, and those which are most resilient/outperform in end-of-cycle bear markets:

### Bull corrections

- **Equities:** 5%+ drawdowns over a month tend to point to bull corrections rather than bear markets. The US leads in the 12 months after a bull correction peak, while EM and Japan underperform. Technology, telecom and consumer discretionary see the best recovery, and financials, materials and staples lag.
- **Credit:** EM \$ credit outperforms, but otherwise credit spreads tend to widen through the 12 months after equities experience bull corrections, even as stock markets recover over the same period.
- **Bonds:** Bond yields tend to fall after US equities peak, but moves are muted. UST-DBR and UST-JGB differentials also fall, and curves are largely unchanged.
- **FX:** Safe-haven currencies – USD, JPY and CHF – outperform while EMFX weakens after S&P peaks.
- **Commodities:** Crude and gold rally in the 12 months after US stocks see a bull correction; copper lags throughout the horizon.

### Bear markets

- **Equities:** Japan and Europe outperform in a bear market, with EM in particular seeing heavy average drawdowns 12 months after S&P peaks. Technology, telecom and consumer discretionary see the heaviest sell-off, while staples and health care are the most resilient.
- **Credit:** Credit spreads widen materially across the board in an equity bear market, with quality outperforming and cash underperforming CDS.
- **Bonds:** Nominal front-end yields fall rapidly after S&P sees cycle tops, leading the curve to bull steepen.
- **FX:** As with bull corrections, safe havens (USD, JPY and CHF) rally in an equity bear market, even as EMFX sells off.
- **Commodities:** Crude and gold outperform in an equity bear market, but the market remains volatile at least six months after S&P peaks.

# The recovery – what happens after equities trough?

What does a recovery from sell-offs look like? Which assets see the biggest bounce? Below we examine the types of returns assets tend to see after equities trough. We find that **while stocks see a material bounce (20-40% 12 months after a trough), there are clear winners and losers – Japan, Europe and utilities underperform** in both recoveries from bull corrections and bear markets, while technology has tended to do well in both scenarios. **Credit spreads tend to tighten** post S&P peaks, **yield curves bull steepen and copper rallies**. Notably, **USD** remains largely unchanged in a bull correction recovery, but **sells off against G10 FX and EMFX after stocks makes a bear market bottom**.

## Equities

**Equities post strong returns across the board after stocks bottom, with ACWI on average rallying by 20%+ 12 months after bull corrections, and 40%+ after bear market troughs.** That said, there are clear winners and losers. **In bull recoveries, US tends to outperform other regions while Japan lags;** sector-wise, utilities and materials tend to underperform while technology and consumer discretionary post the strongest returns. **In bear market recoveries, EM is the strongest region, followed by the US, while Japan underperforms once again;** financials and technology see the biggest bounceback, while low-beta sectors like health care, consumer staples and utilities underperform.

### Exhibit 34:

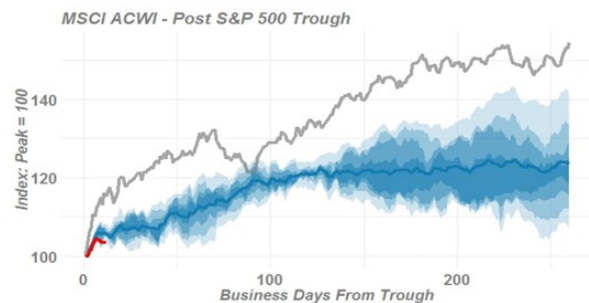
Stocks performance 1-12 months from stock market troughs

| % chg        | From S&P Trough |     |     |     |              |     |     |     |
|--------------|-----------------|-----|-----|-----|--------------|-----|-----|-----|
|              | BULL CORRECTION |     |     |     | BEAR MARKETS |     |     |     |
|              | 1M              | 3M  | 6M  | 12M | 1M           | 3M  | 6M  | 12M |
| MSCI ACWI    | 7%              | 12% | 18% | 21% | 16%          | 25% | 28% | 43% |
| S&P 500      | 8%              | 13% | 19% | 24% | 15%          | 21% | 25% | 35% |
| MSCI Europe  | 4%              | 9%  | 15% | 16% | 7%           | 11% | 19% | 28% |
| TOPIX        | 1%              | 5%  | 12% | 14% | 2%           | 10% | 12% | 20% |
| MSCI EM      | 5%              | 10% | 20% | 18% | 18%          | 31% | 33% | 57% |
| Energy       | 9%              | 10% | 13% | 21% | 9%           | 21% | 19% | 31% |
| Materials    | 5%              | 10% | 16% | 15% | 16%          | 31% | 33% | 53% |
| Industrials  | 6%              | 12% | 18% | 21% | 17%          | 27% | 30% | 48% |
| Cons. Disc.  | 7%              | 14% | 22% | 23% | 19%          | 25% | 28% | 47% |
| Cons. Staple | 5%              | 10% | 10% | 16% | 7%           | 12% | 14% | 26% |
| Healthcare   | 6%              | 12% | 14% | 22% | 8%           | 10% | 16% | 25% |
| Financials   | 7%              | 12% | 18% | 20% | 26%          | 40% | 46% | 60% |
| Tech.        | 8%              | 18% | 30% | 33% | 24%          | 33% | 35% | 58% |
| Telecom      | 8%              | 16% | 20% | 20% | 16%          | 22% | 22% | 30% |
| Utilities    | 6%              | 10% | 10% | 15% | 10%          | 16% | 19% | 27% |
| Large Cap    | 7%              | 14% | 18% | 21% | 16%          | 25% | 27% | 41% |
| Small Cap    | 5%              | 12% | 19% | 21% | 17%          | 29% | 34% | 57% |
| Growth       | 8%              | 14% | 20% | 22% | 14%          | 22% | 25% | 39% |
| Value        | 6%              | 12% | 17% | 21% | 19%          | 29% | 32% | 47% |

Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Data since 1950, or whenever history begins.

### Exhibit 35:

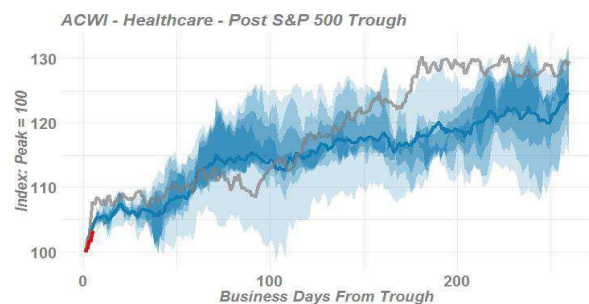
ACWI rallies 40%+ after bear market troughs, 20%+ after bull corrections



Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

### Exhibit 36:

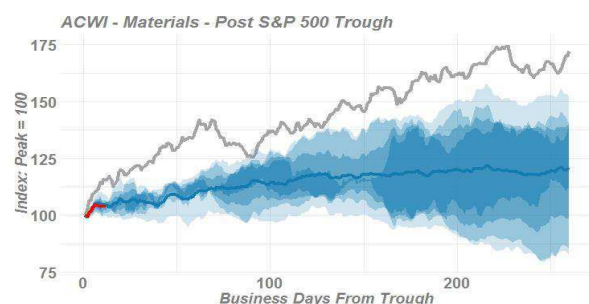
Health care sees similar return profiles in recoveries from both bull corrections and bear markets



Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

### Exhibit 37:

Materials see wide divergence between recoveries from bull correction and bear markets



Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

## Credit

Credit tends to tighten after equities trough, materially so after bear markets. Across both recoveries from bull corrections and bear markets, HY and EM outperform IG, as does CDS over cash. The caveat is that US HY spread data only cover the last two bear markets – the

### Exhibit 38:

Credit performance 1-12 months from stock market troughs

| bp chg  | From S&P Trough |      |      |      |              |      |       |       |
|---------|-----------------|------|------|------|--------------|------|-------|-------|
|         | BULL CORRECTION |      |      |      | BEAR MARKETS |      |       |       |
|         | 1M              | 3M   | 6M   | 12M  | 1M           | 3M   | 6M    | 12M   |
| US IG   | -5              | -5   | -19  | -13  | -26          | -152 | -208  | -266  |
| US HY   | -38             | -58  | -111 | -69  | -130         | -484 | -572  | -812  |
| US BBB  | -3              | 1    | -21  | -20  | 0            | -169 | -249  | -332  |
| US BB   | -38             | -52  | -85  | -75  | -86          | -259 | -351  | -511  |
| EUR IG  | -25             | -14  | -35  | -39  | -18          | -97  | -146  | -185  |
| EUR HY  | -111            | -146 | -253 | -185 | -141         | -565 | -776  | -1120 |
| EUR BBB | -65             | -58  | -108 | -125 | -24          | -121 | -194  | -258  |
| EUR BB  | -114            | -131 | -223 | -216 | -89          | -526 | -756  | -979  |
| EM USD  | -64             | -80  | -134 | -155 | -130         | -315 | -390  | -528  |
| CDX IG  | -21             | -21  | -46  | -40  | -75          | -138 | -141  | -180  |
| CDX HY  | -131            | -136 | -240 | -272 | -576         | -939 | -1043 | -1384 |
| Main    | -30             | -26  | -53  | -49  | -46          | -101 | -115  | -134  |
| Xover   | -125            | -84  | -190 | -242 | -220         | -456 | -536  | -734  |

Source: Bloomberg, Morgan Stanley Research; Note: Shows summary performance of episodes where S&P sold off by 10% or more. Data since 1950, or whenever history begins.

## Bonds

**Bond yields tend to fall after equities trough**, although in recoveries from bear markets, yields tend to start to rise six months after stocks bottom. The UST curve tends to bull steepen in recoveries – more so after corrections than bear markets. Also notable is that

### Exhibit 40:

Rates performance 1-12 months from equity market troughs

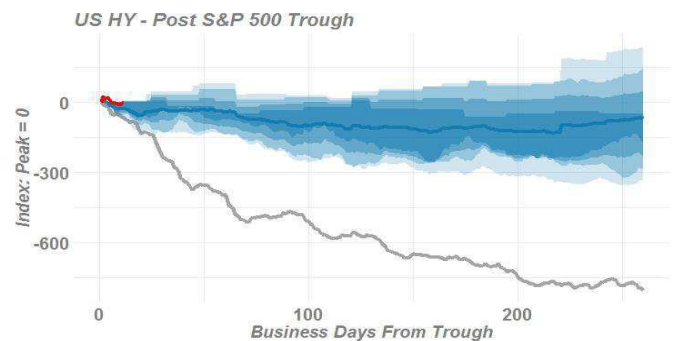
| bp chg      | From S&P Trough |     |     |     |              |     |     |     |
|-------------|-----------------|-----|-----|-----|--------------|-----|-----|-----|
|             | BULL CORRECTION |     |     |     | BEAR MARKETS |     |     |     |
|             | 1M              | 3M  | 6M  | 12M | 1M           | 3M  | 6M  | 12M |
| UST 2Y      | -60             | -71 | -52 | -6  | -22          | -80 | -74 | -13 |
| DBR 2Y      | -7              | -10 | -4  | 2   | 10           | 5   | -36 | -39 |
| UKT 2Y      | -7              | -18 | -3  | -26 | 18           | 14  | -28 | 31  |
| JGB 2Y      | -10             | -10 | -10 | -31 | 2            | -1  | -7  | -10 |
| UST 10Y     | -36             | -35 | -14 | 11  | -22          | -58 | -32 | 9   |
| DBR 10Y     | -11             | -19 | -13 | -25 | 22           | 36  | 10  | 6   |
| UKT 10Y     | -17             | -42 | -38 | -57 | 18           | 38  | 28  | 65  |
| JGB 10Y     | -12             | -20 | 9   | -20 | -4           | -10 | -23 | -16 |
| UST-DBR 5Y  | 0               | 2   | 25  | -9  | -8           | 47  | 48  | 87  |
| UST-JGB 5Y  | -3              | -14 | 10  | -12 | 6            | 68  | 43  | 51  |
| UST-DBR 10Y | 3               | -1  | 25  | 1   | -8           | 38  | 35  | 70  |
| UST-JGB 10Y | 4               | 1   | 4   | -3  | 5            | 36  | 57  | 73  |
| US 2s10s    | 25              | 38  | 44  | 28  | 0            | 23  | 32  | 14  |
| US 10s30s   | 11              | 9   | 6   | 4   | -2           | 5   | 12  | 8   |

Source: Bloomberg, Morgan Stanley Research; Note: Shows summary performance of episodes where S&P sold off by 10% or more. Data since 1950, or whenever history begins.

dot-com bubble and the credit crisis – with the latter being an outlier in terms of how much spreads widened out, partly explaining the dramatic spread tightening during the recovery shown in **Exhibit 39**.

### Exhibit 39:

US HY spreads tighten materially after bear market bottoms

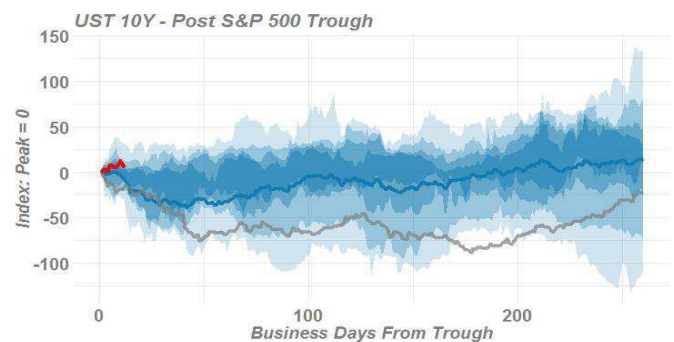


Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

after equities trough/early-cycle, UST-DBR and UST-JGB differentials start to widen, while they remain relatively unchanged in the recoveries from bull corrections.

### Exhibit 41:

Yields continue to fall after stocks finds a floor in both bull corrections and bear markets



Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

## FX

**USD tends to sell off after stocks trough in a bear market**, in contrast to the currency strengthening slightly in the recovery from a bull correction. In fact, as risk-aversion falls after equities bottom in a bear market, EMFX tends to rally, as do EUR and JPY.

### Exhibit 42:

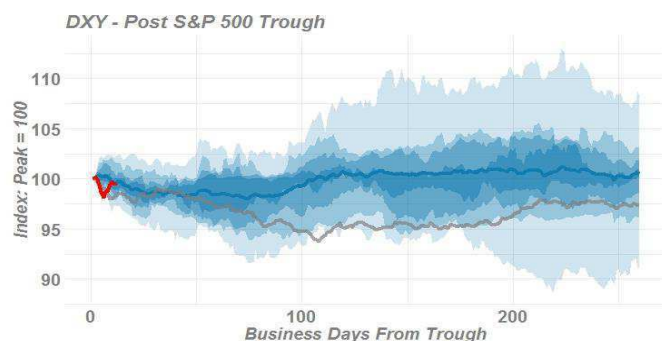
FX performance 1-12 months from equities trough

| % chg   | From S&P Trough |      |      |      |              |     |      |      |
|---------|-----------------|------|------|------|--------------|-----|------|------|
|         | BULL CORRECTION |      |      |      | BEAR MARKETS |     |      |      |
|         | 1M              | 3M   | 6M   | 12M  | 1M           | 3M  | 6M   | 12M  |
| DX      | -1%             | -2%  | 0%   | 1%   | -2%          | -3% | -5%  | -3%  |
| EUR TWI | 1%              | 1%   | -1%  | 1%   | 1%           | 2%  | 4%   | 4%   |
| EUR/USD | 2%              | 2%   | -1%  | -3%  | 2%           | 3%  | 5%   | 2%   |
| GBP/USD | 1%              | 2%   | 0%   | -1%  | 2%           | 3%  | 2%   | -2%  |
| JPY/USD | 0%              | 2%   | 1%   | 4%   | 1%           | 1%  | 6%   | 7%   |
| AUD/USD | 2%              | 4%   | 3%   | 4%   | 3%           | 6%  | 12%  | 13%  |
| BRL/USD | 3%              | 5%   | -4%  | -5%  | 9%           | 18% | 23%  | 30%  |
| CAD/USD | 1%              | 2%   | 2%   | 2%   | 2%           | 5%  | 7%   | 10%  |
| CHF/USD | 1%              | 1%   | 0%   | -1%  | 2%           | 4%  | 6%   | 4%   |
| IDR/USD | 2%              | -11% | -9%  | -7%  | 2%           | 10% | 9%   | 17%  |
| INR/USD | 0%              | -1%  | -1%  | -5%  | 1%           | 1%  | 1%   | -2%  |
| KRW/USD | -1%             | -4%  | 0%   | 1%   | 5%           | 7%  | 7%   | 12%  |
| MXN/USD | 1%              | 1%   | 1%   | -4%  | -17%         | -3% | -29% | -25% |
| MYR/USD | 1%              | -1%  | 1%   | 1%   | 1%           | 1%  | 3%   | 0%   |
| NOK/USD | 2%              | 1%   | -1%  | -1%  | 2%           | 3%  | 6%   | 2%   |
| RUB/USD | -6%             | -11% | -13% | -29% | 3%           | 6%  | 7%   | 11%  |
| ZAR/USD | 2%              | 4%   | 3%   | -1%  | 6%           | 10% | 13%  | 17%  |

Source: Bloomberg, Morgan Stanley Research; Note: Shows summary performance of episodes where S&P sold off by 10% or more. Data since 1950, or whenever history begins.

### Exhibit 43:

USD weakens after stocks bottom in bear markets



Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

## Commodities

Copper stands out as an outperformer after equity market troughs in both bull corrections and bear markets. The divergence is staggering though – **on average copper rises by ~15% in 12 months after a bull correction, and by ~50% after a bear market bottom.**

We see a similar divergence in crude, likely a function of the improving growth expectations early in the cycle after equity markets trough.

### Exhibit 44:

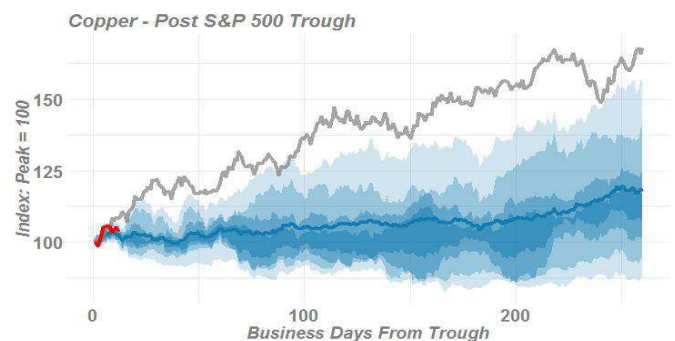
Commodities performance 1-12 months from equity market troughs

| % chg  | From S&P Trough |     |     |     |              |     |     |     |
|--------|-----------------|-----|-----|-----|--------------|-----|-----|-----|
|        | BULL CORRECTION |     |     |     | BEAR MARKETS |     |     |     |
|        | 1M              | 3M  | 6M  | 12M | 1M           | 3M  | 6M  | 12M |
| Crude  | 0%              | -5% | -9% | 6%  | -4%          | 8%  | 9%  | 13% |
| Gold   | 0%              | 8%  | 7%  | 9%  | 5%           | 6%  | 11% | 7%  |
| Silver | 2%              | 11% | 12% | 19% | 6%           | 11% | 20% | 17% |
| Copper | 2%              | 3%  | 5%  | 13% | 14%          | 22% | 32% | 49% |

Source: Bloomberg, Morgan Stanley Research; Note: Shows summary performance of episodes where S&P sold off by 10% or more. Data since 1950, or whenever history begins.

### Exhibit 45:

Copper rips higher after equity bear markets end



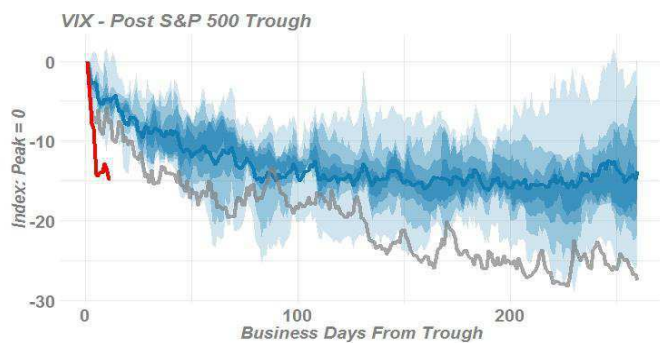
Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

## VIX

Volatility tends to normalise more quickly after bear market troughs than bull correction bottoms, with VIX on average falling by 10pts after the latter and 25pts after the former 12 months after stocks bottom. The recovery in VIX since S&P's February sell-off trough is all the more impressive in this context.

### Exhibit 46:

Volatility tends to normalise quickly after equity bear markets end



Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of episodes where S&P sold off by 10% or more. Dark blue line is mean for bull corrections, each band represents decile starting at 10% to 90%. Grey line is mean for bear markets. Red line is February 2018 sell-off. Data since 1950, or whenever history begins.

## Positioning for recoveries: Bull corrections versus bear markets

From our observations above, we can form some stylised facts about assets which outperform after equities trough from bull corrections, or end-of-cycle bear markets:

### Bull correction recoveries

- **Equities:** Global stocks on average see a 20%+ rally 12 months after S&P troughs. US outstrips Japan and Europe. Technology and consumer discretionary lead, utilities, materials and staples underperform. Little differentiation between market caps and styles.
- **Credit:** Spreads tighten; HY and EM outperform IG.
- **Bonds:** Yields fall, the curve bull steepens.
- **FX:** USD strengthens slightly/largely unchanged 12 months after equities trough.
- **Commodities:** Silver and copper see strong returns after equities trough, oil performance mixed.

### Bear market recoveries

- **Equities:** Global stocks on average see a 40%+ rally 12 months after S&P troughs. EM leads, while Japan and Europe lag. Financials and technology outperform, while staples and health care underperform. Small cap over large cap, value over growth.
- **Credit:** Spreads tighten; HY and EM outperform IG.
- **Bonds:** Yields fall initially, but not uniformly, with rates starting to rise about 6-9 months after equities bottom; the curve bull steepens and UST-DBR and UST-JGB differentials widen.
- **FX:** USD weakens after bear market troughs, EMFX rallies strongly as risk appetite and growth returns.
- **Commodities:** Copper rips higher, likely driven by renewed growth hopes.

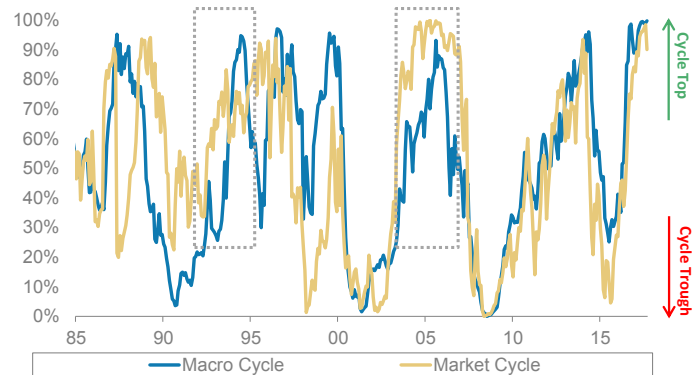
# When a cycle end doesn't mean the \*cycle\* ends...

Our analysis has so far focused on equities making a cyclical top, bringing about the end of bull markets. What's useful to remember is that **the end of a stocks bull market doesn't necessarily correlate to the end of the business cycle.**

In **Exhibit 47**, we show the 'market cycle' (includes US large-cap and small-cap stocks, EM equities, US IG and HY, EM credit, yield curve, commodities and VIX) compared to the 'macro cycle' (including US GDP, inflation, PMIs, IP, consumer confidence and employment data), both scaled versus their five-year trend. While the macro and market cycles *mostly* move together, they don't always peak or trough at the same time. In the late 1980s, mid-1990s, 2006/07 and 2014, risk assets peaked before the business cycle peaked; in the late 1990s, macro peaked first. It means that a potential large global equity drawdown/risk sell-off *and* the narrative of synchronous growth (see [Global Macro Briefing: The Fundamentals Are Fine](#), February 14, 2018) are not mutually exclusive events.

## Exhibit 47:

While risk assets and business cycle tend to move together, they have not always peaked or troughed at the same time



Source: Bloomberg, Morgan Stanley Research; Note: 'Macro cycle' shows percentile of average 5Y Zs for US GDP, inflation, PMIs, IP, consumer confidence and employment data. 'Market cycle' shows percentile of average 5Y Zs for S&P 500, Russell 2000, MSCI EM, US IG and HY spreads, EM \$ credit spreads, UST 2s10s curve, GSCI Energy and VIX.

## Exhibit 48:

Change in growth and inflation 1-12 months before and after S&P market peaks

| Real GDP Y% (US)       |               |                    |     |      |     |               |     |      |      |
|------------------------|---------------|--------------------|-----|------|-----|---------------|-----|------|------|
|                        | Level at Peak | Run Up to S&P Peak |     |      |     | From S&P Peak |     |      |      |
|                        |               | 12M                | 6M  | 3M   | 1M  | 1M            | 3M  | 6M   | 12M  |
| ALL S&P 10%+ DRAWDOWNS |               |                    |     |      |     |               |     |      |      |
| Average                | 4.0           | 1.4                | 0.9 | 0.1  | 0.1 | 0.1           | 0.0 | -0.2 | -1.2 |
| Median                 | 3.7           | 0.6                | 0.2 | -0.1 | 0.0 | 0.0           | 0.1 | -0.3 | -1.2 |
| BULL CORRECTIONS       |               |                    |     |      |     |               |     |      |      |
| Average                | 3.6           | 1.0                | 0.9 | 0.2  | 0.1 | 0.2           | 0.0 | 0.0  | 0.0  |
| Median                 | 3.0           | 0.2                | 0.0 | 0.0  | 0.0 | 0.0           | 0.0 | 0.0  | 0.4  |
| BEAR MARKETS           |               |                    |     |      |     |               |     |      |      |
| Average                | 4.2           | 0.6                | 0.8 | 0.3  | 0.0 | 0.3           | 0.3 | -0.2 | -2.2 |
| Median                 | 4.2           | 0.1                | 0.6 | -0.1 | 0.0 | 0.0           | 1.0 | -0.1 | -2.1 |

| Headline CPI Y% (US)   |               |                    |     |     |     |               |     |     |     |
|------------------------|---------------|--------------------|-----|-----|-----|---------------|-----|-----|-----|
|                        | Level at Peak | Run Up to S&P Peak |     |     |     | From S&P Peak |     |     |     |
|                        |               | 12M                | 6M  | 3M  | 1M  | 1M            | 3M  | 6M  | 12M |
| ALL S&P 10%+ DRAWDOWNS |               |                    |     |     |     |               |     |     |     |
| Average                | 3.9           | 0.3                | 0.3 | 0.2 | 0.2 | 0.2           | 0.3 | 0.4 | 0.7 |
| Median                 | 2.9           | 0.3                | 0.4 | 0.2 | 0.2 | 0.1           | 0.3 | 0.4 | 0.6 |
| BULL CORRECTIONS       |               |                    |     |     |     |               |     |     |     |
| Average                | 4.4           | 0.6                | 0.7 | 0.3 | 0.2 | 0.2           | 0.3 | 0.4 | 0.6 |
| Median                 | 2.5           | 0.4                | 0.7 | 0.2 | 0.2 | 0.2           | 0.2 | 0.0 | 0.2 |
| BEAR MARKETS           |               |                    |     |     |     |               |     |     |     |
| Average                | 4.2           | 1.4                | 0.7 | 0.4 | 0.2 | 0.0           | 0.2 | 0.3 | 0.6 |
| Median                 | 3.6           | 2.0                | 0.8 | 0.4 | 0.2 | 0.0           | 0.3 | 0.6 | 0.2 |

Source: Bloomberg, Morgan Stanley Research; Note: Shows summary of growth and inflation changes in episodes where S&P sold off by 10% or more. Data since 1950; Note: A 'bull correction' is defined as an episode where an equity market has seen a 10% or greater drawdown, but recovers to the prior peak within 12 months, a 'bear market' when stocks sell off 20% or more, with no recovery within 12 months, and a 'correction' as all the other big sell-offs which don't fall into either category.

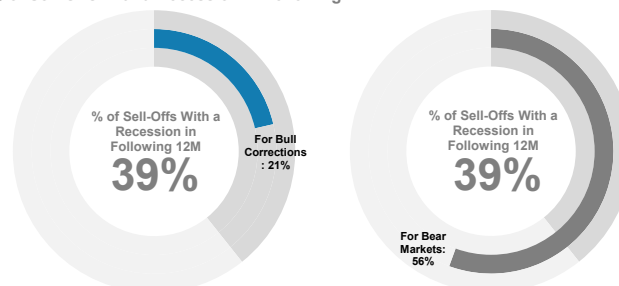
This is borne out when we look at the macro environment around large equity sell-offs, once again focusing on S&P 500 as a benchmark as we have the longest history. In the run-up to an S&P peak, we have historically seen stronger growth 6-12 months before the peak. It is after the peak where growth differences between bull corrections and bear markets lie. **Growth has historically peaked around six months after S&P peaks in a bear market but remained stable 6-12 months after S&P peaks in a bull correction.** On the other hand, inflation has on average remained strong going in and out of S&P peaks (**Exhibit 48**).

We also look at how S&P market peaks have historically lined up with the onset of a recession. Again, **S&P usually peaks first before the start of a recession, be it a bull correction or a bear market.** However, the proportion of sell-offs followed by a recession in 12 months differs materially between bull corrections (21%) and bear markets (56%) (**Exhibit 49**). In other words, there is a lower probability of a recession occurring in the next 12 months in a bull correction than a bear market.

#### Exhibit 49:

There is a one in five chance of a recession occurring in the next 12 months in an S&P bull correction

% of Sell-Offs With a Recession in Following 12M



Source: Morgan Stanley Research; Note: This is based on S&P 10%+ drawdowns and NBER US recessions across history. Data since 1950.

# The late-cycle rotation roadmap

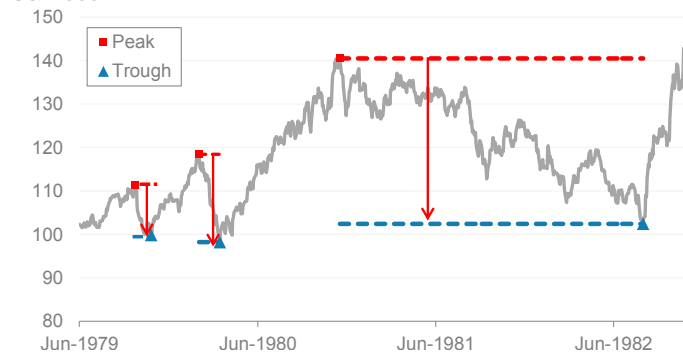
Bull corrections leading into a final rally to a cycle top and the start of a bear market is a common pattern in late-cycles – we saw it in the early-to-mid-1980s ([Exhibit 50](#) and [Exhibit 51](#)), the dot-com cycle ([Exhibit 52](#)) and the financial crisis ([Exhibit 53](#)). In fact, for ACWI, all four of the bear markets since 1987 have followed 5%+ draw-

downs in within 12 months. For the 16 S&P bear markets since 1927, 14 saw a 5%+ drawdown and correction before stocks top out for the cycle. **Not all corrections are followed by bear markets – but almost all bear markets have been preceded by corrections.**

## Exhibit 50:

Bull corrections before bear market – '80-'82

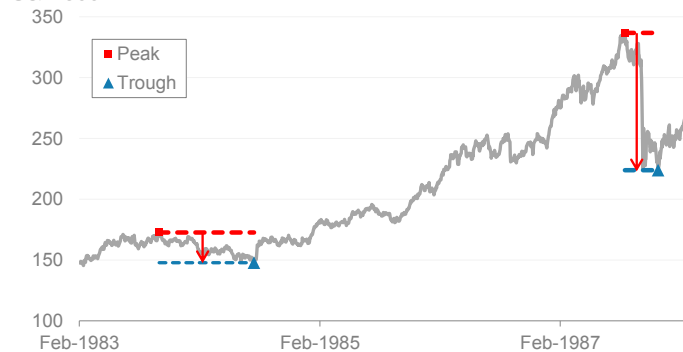
### S&P 500



## Exhibit 51:

Bull correction before bear market – '83-'87

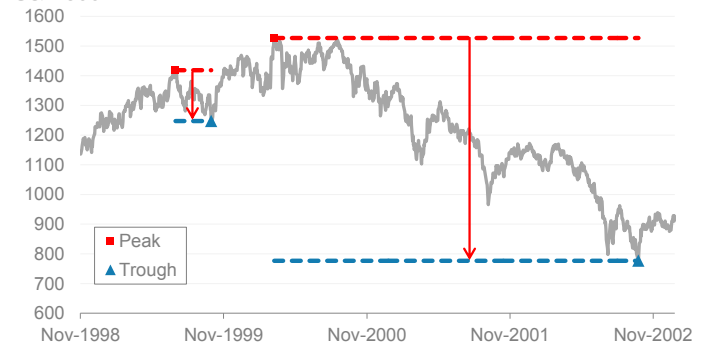
### S&P 500



## Exhibit 52:

Bull correction before bear market – '98-'02

### S&P 500



## Exhibit 53:

Bull correction before bear market – '07-'09

### S&P 500



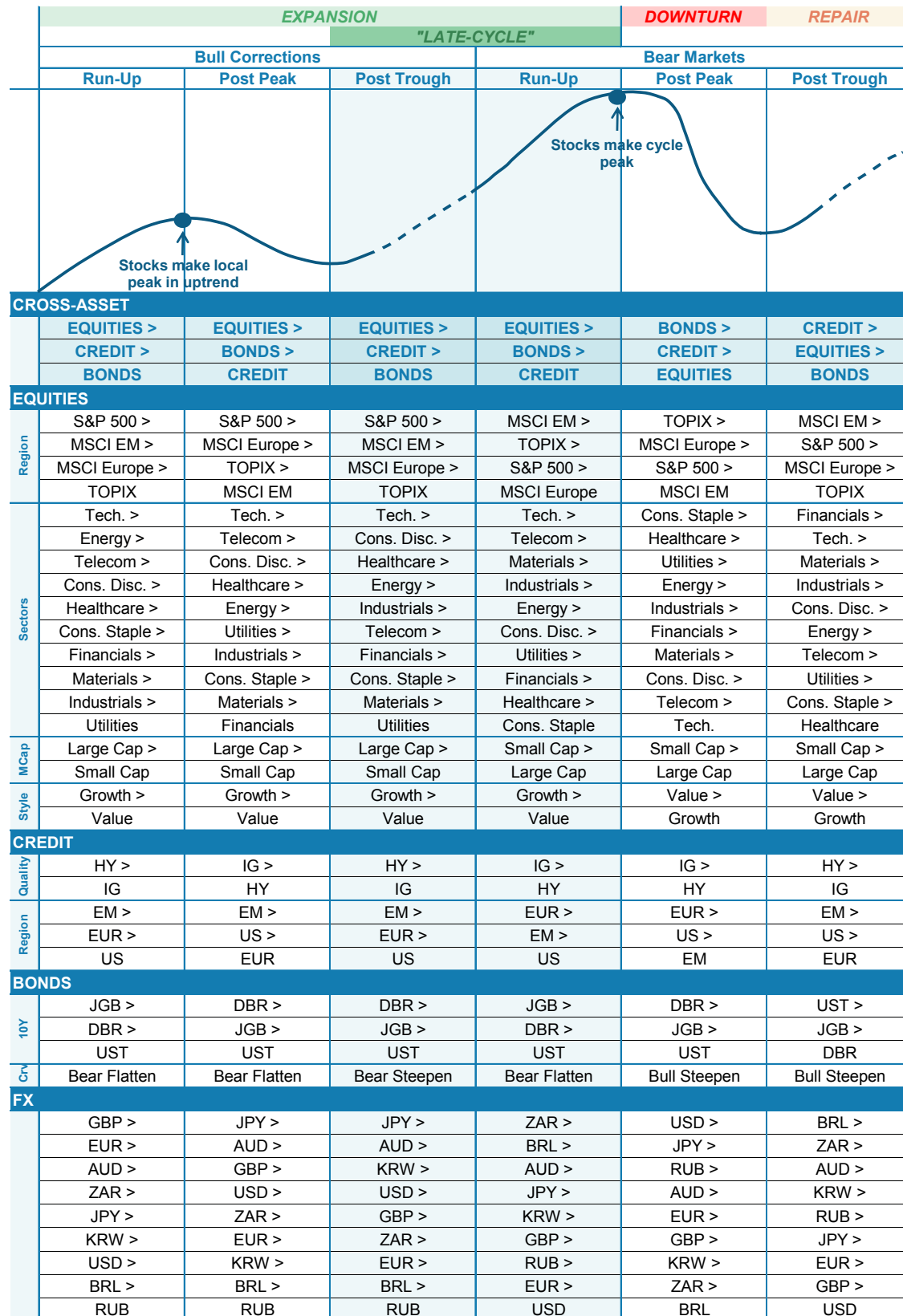
## The stylised roadmap

This gives us a useful 'roadmap' for asset/sector rotation going into late-cycle. We've already examined the stylised allocation across Expansion, Downturn, Repair and Recovery, and below we follow a similar approach, focusing on late-cycle, the tricky hand-off between optimism and exuberance to doubt and despair. In **Exhibit 54**, we summarise the asset and sector rankings based on historical performance across six phases – 1) Run-up to bull correction; 2) Bull correction; 3) Recovery from bull correction; 4) Run-up to cycle top; 5) Bear market; and 6) Recovery from bear market. Of course, valuations, policy cycle, market technicals, etc. will also be factors impacting performance and allocation, but we believe that the roadmap below serves as a useful first step in thinking about rotation late-cycle. What's notable:

1. **Run-up to bull correction – equities > credit > bonds:** Orderly rally. Stocks on uptrend, with US outperforming. Technology and energy lead. Credit tightens, with HY and EM outperforming IG and DM. Front-end bonds sell-off and curve bear flattens. G10 FX strengthens versus USD.
2. **Bull correction – equities > bonds > credit:** Shock. Extreme equity drawdown over one month, but recovers typically within six months, with US leading. Credit spreads start to widen. Bond yields fall, but moves are muted. Safe-haven FX rallies, EMFX sells off.
3. **Recovery from bull correction – equities > credit > bonds:** Renewed hope. Stocks see 20%+ rally 12 months after local trough, with US outperforming. Technology and consumer discretionary lead, utilities and staples lag. Credit spread tighten. Yields continue to fall, with the front end rallying, leading the curve to bear flatten.
4. **Run-up to cycle top – equities > bonds > credit:** Exuberance. Equities up 20% in the last 12 months into peak, with EM outperforming. Technology leads, staples and health care underperform. Nominal yields rise significantly, and the curve bear flattens. Credit spreads widen across the board, with HY and EM underperforming. Yields rise materially, with US 2Y up ~140bp 12 months into an equities cycle top, and the curve bear flattens. EMFX rallies hard and USD weakens in risk-on environment. Crude rips higher.
5. **Bear market – bonds > credit > equities:** Doubt and despair. Stocks sell off over a prolonged period. Japan and Europe outperform EM and US. Technology, telecom and consumer discretionary underperform, staples and health care outperform. Credit sees significant widening across the board. Nominal yields fall rapidly, and the curve bull steepens. USD and gold reign supreme.
6. **Recovery from bear market – credit > equities > bonds:** Green shoots as cheap valuations and growth expectations drive risk assets higher. Credit outperforms as spreads normalise, with HY and EM outperforming. Stocks bounce back, with EM, small cap and value leading. Bond yields fall initially, but start to rise again as growth expectations pick up; the curve bull steepens. USD sells off and copper rallies hard.

**Exhibit 54:**

Stylised asset rankings in late-cycle – cross-asset and equities



For equities, rankings based on price returns in local currency. For credit and bonds, based on spread/ yield change. For FX, price returns. Curve is based on UST 2s10s. Based on 12-month performance into and out of peaks/troughs. Sector, market cap and style based on MSCI ACWI.

## Sequencing around equity cycle peaks

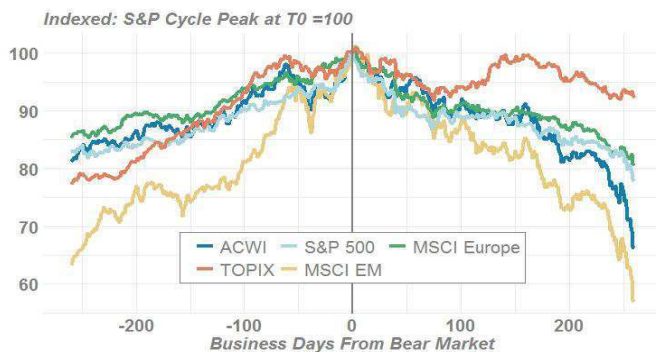
While the above serve as a good guide for preferences at various stages of a late-cycle bull market, we can do one better and examine the *timing* of assets and sector peak/troughs before equities make a cyclical top.

In [Exhibit 55](#) to [Exhibit 63](#), we show the average trends for the major assets 12 months into and out of S&P cyclical peaks, using all data available. The caveat here is that for some of these series, data only go back 2-3 cycles, but it's a start. A few observations:

- Equities – regions peak together, more differentiation among global sectors:** MSCI Europe, TOPIX and MSCI EM have on average peaked within 1-2 days of an S&P 500 peak, although Japanese stocks are more resilient post-peak. Style-wise, value has typically peaked before growth, while there's little differentiation with market cap. Sector-wise, staples have been the earliest to peak, energy the last.

### Exhibit 55:

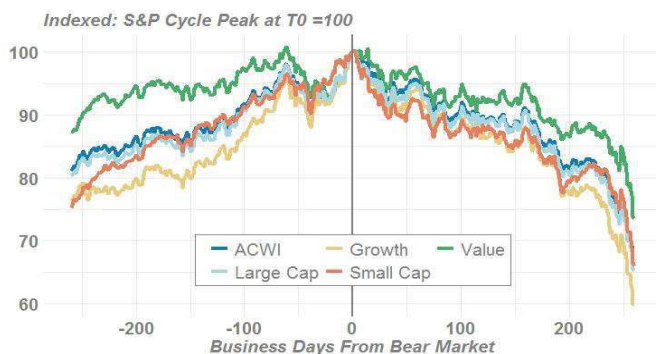
Regional equities have tended to peak together with S&P



Source: Bloomberg, Morgan Stanley Research

### Exhibit 56:

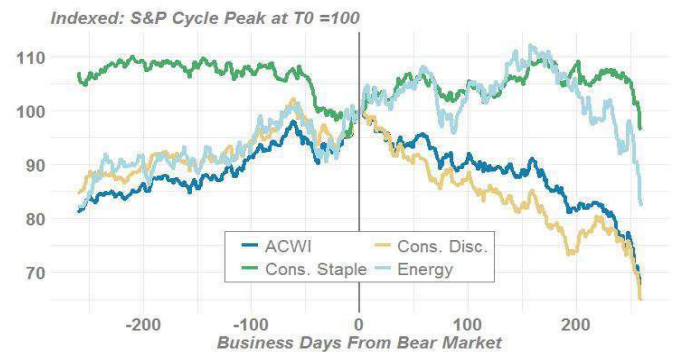
Style and market cap: Global value have tended to peak before growth; little differentiation in market cap



Source: Bloomberg, Morgan Stanley Research

### Exhibit 57:

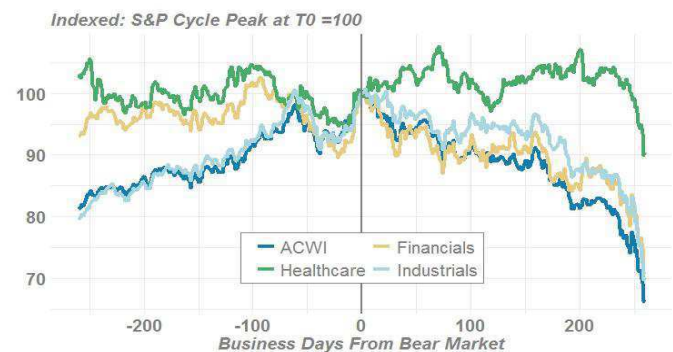
Sectors: Global consumer discretionary have tended to peak before S&P, energy after



Source: Bloomberg, Morgan Stanley Research

### Exhibit 58:

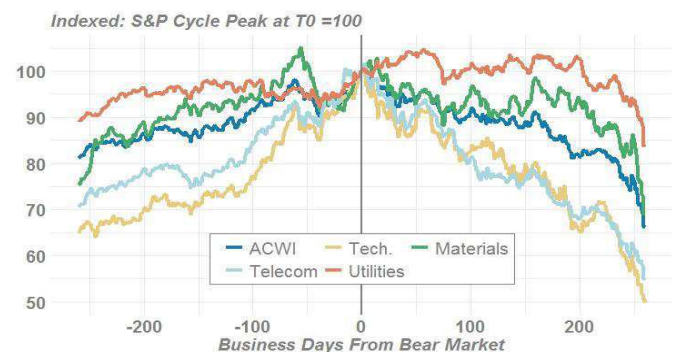
Sectors: Global financials historically peaked before S&P, health care stays relatively resilient throughout



Source: Bloomberg, Morgan Stanley Research

### Exhibit 59:

Sectors: Global materials tended to peak before, and utilities after S&P



Source: Bloomberg, Morgan Stanley Research

- **Credit – spreads trough ~6-12 months before equities peak:** As we've noted in the past, credit tends to trough before S&P peaks, and we see this for EUR credit and EM credit in **Exhibit 60** and **Exhibit 61** too. The data also support our argument that credit has poor risk/reward in this part of the cycle – both IG and HY spreads start widening before equities peak, with little participation in the last leg of the risk rally, and spreads continue widening after equities peak, fully participating in the bear market risk sell-off (see Cross-Asset Dispatches: Our Cycle Models: The Late Cycle Playbook, May 30, 2017).
- **Bonds – US real yields peak ~3M before bear markets:** US real yields and G4 ex US nominal yields tend to peak before equities make a cyclical top. However, US nominal yields have tended to peak much later, nearly a year after an S&P bear market starts.
- **FX – USD and EUR make peaks before equities do:** EUR has tended to peak about six months before stocks make a cyclical top, weakening throughout after. USD shows a stranger trend, making peaks before and after bear markets.

**Exhibit 60:**

Both US and EUR IG tended to trough ~6-12 months before equities peak



Source: Bloomberg, Morgan Stanley Research

**Exhibit 61:**

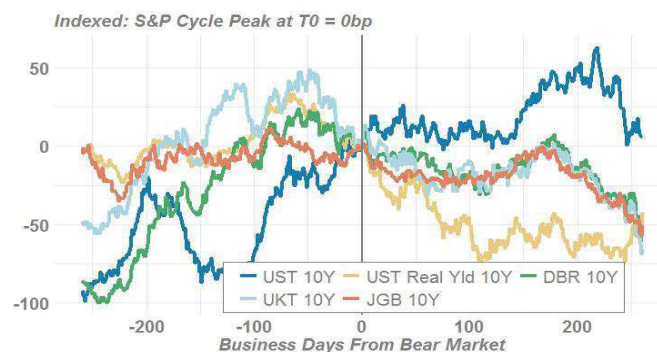
Similarly, HY and EM credit typically troughs ~3-6 months before stocks make cyclical peaks



Source: Bloomberg, Morgan Stanley Research

**Exhibit 62:**

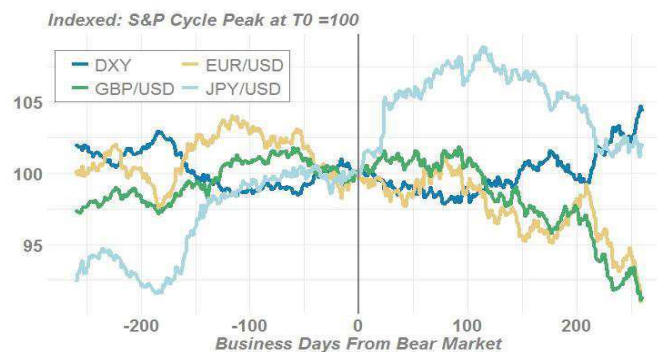
US real yields have usually peaked before equities, even as nominal yields peak much later



Source: Bloomberg, Morgan Stanley Research

**Exhibit 63:**

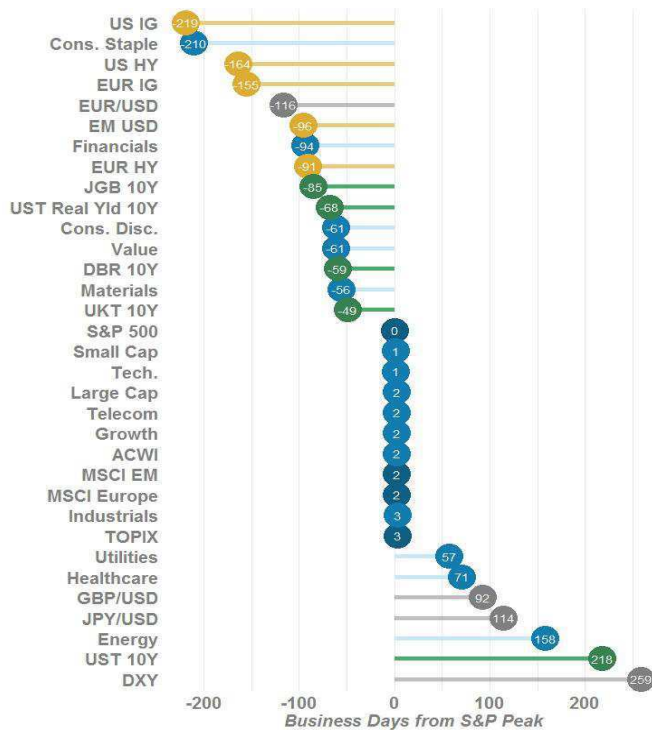
EUR on average peaked before stocks make cyclical tops, JPY/USD peaked nearly six months after



Source: Bloomberg, Morgan Stanley Research

**Exhibit 64:**

Typical sequencing around stocks cyclical tops – credit spreads and staples peak first, followed by real yields



Source: Bloomberg, Morgan Stanley Research; Note: Yellow indicates credit, blue indicates equities, green shows bonds, grey shows FX. Numbers indicate average number of days asset peaks/troughs before S&P. Sectors, styles and market cap all based on ACWI.

We summarise the sequencing of major assets' peak/troughs around S&P 500 bear markets in [Exhibit 64](#). What's clear and notable is that credit (denoted by yellow) in general tends to be the first to 'crack', providing a bearish market signal 3-12 months in advance. The next asset to follow tends to be government bond yields, which on average peak about three months before ACWI and S&P 500 do.

# Which assets look most consistent with a late-cycle market?

What does the rotation roadmap tell us about valuations now? In our analysis below, we look at the trailing six-month and trailing 12-month performance across the major assets, and compare them to the six-month and 12-month returns one usually sees in the run-up to bull market peaks.

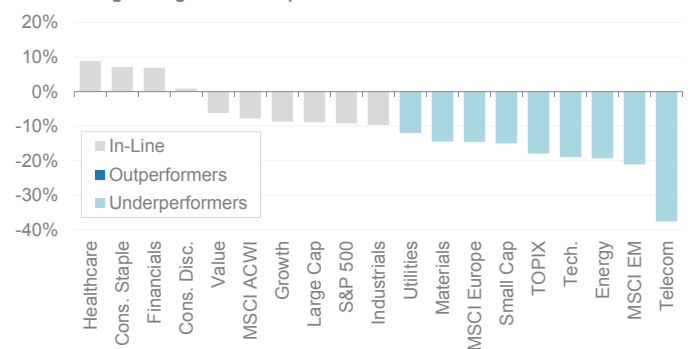
## Equities

**EM and Europe are two regions which look the most inconsistent with late-cycle** – their typical 12-month performance going into an equity market top tends to be a lot stronger than what we've seen in the past year. Similarly, **telecom, technology and energy trailing performances have lagged the most compared to what's usually witnessed in late bull markets.** On the other hand, financials and staples have had stronger runs in the last 6-12 months than is usually seen in late-cycle. All other sectors and regions seem consistent with the markets being very late-cycle.

### Exhibit 65:

EM and European equities have lagged the usual performance seen around later innings of bull markets...

T12M PX Chg vs Avg 12M Run-Up to Bear Market

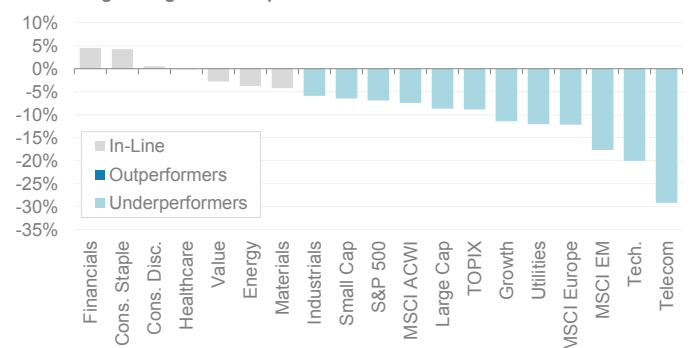


Source: Bloomberg, Morgan Stanley Research

### Exhibit 66:

...while staples and financials have seen stronger performance than is usual late-cycle

T6M PX Chg vs Avg 6M Run-Up to Bear Market



Source: Bloomberg, Morgan Stanley Research

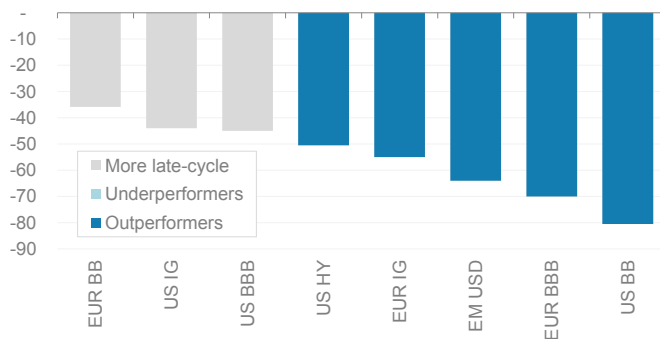
## Credit

Interestingly, **most of credit looks out of line with a late bull market environment, having outperformed materially over the last 12 months versus what's usually seen in the run-up to equity**

### Exhibit 67:

All credit markets in general look out of line with a run-up to a stock cycle peak

T12M Sprd Chg vs Avg 12M Run-Up to Bear Market (bp)



Source: Bloomberg, Morgan Stanley Research

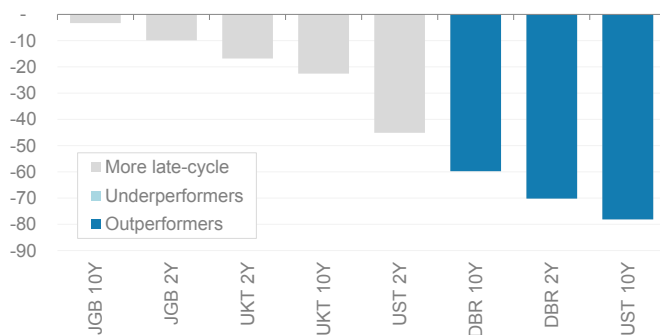
## Bonds

Similar to credit, **bond yields have mostly outperformed compared to the typical late-bull market environment**. Notably, DBR and UST 10Y have seen yield change over 12 months that's signifi-

### Exhibit 69:

DBR 2Y and UST 10Y yield change has been lower than the usual late-cycle environment looking at trailing 12-month performance...

T12M Yld Chg vs Avg 12M Run-Up to Bear Market (bp)



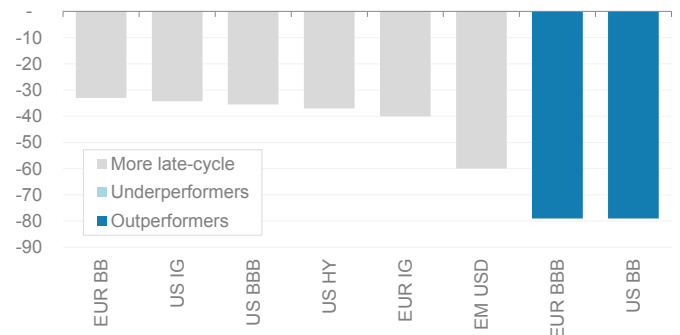
Source: Bloomberg, Morgan Stanley Research

**tops**. Notably, US BB and EUR BBB credit outperformance has been the most extreme, meaning that they also more vulnerable in a late bull market.

### Exhibit 68:

HY and EM credit have outperformed the most versus late-cycle

T6M Sprd Chg vs Avg 6M Run-Up to Bear Market (bp)



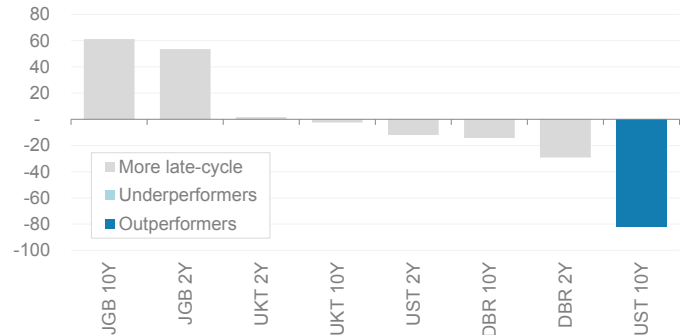
Source: Bloomberg, Morgan Stanley Research

cantly lower than what's usually seen in the run-up to stock market tops.

### Exhibit 70:

...and a similar picture looking at trailing six-month yield changes – UST 10Y has outperformed

T6M Yld Chg vs Avg 6M Run-Up to Bear Market (bp)



Source: Bloomberg, Morgan Stanley Research

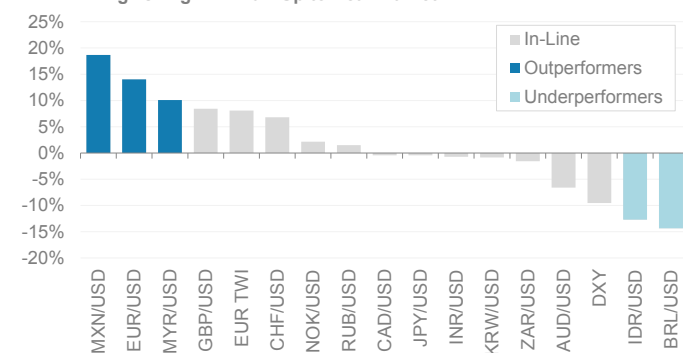
## FX

USD tends to weaken into the end of the cycle, but the 12% decline in DXY we've seen in the last 12 months is an extreme move. This means that USD crosses such as versus **EUR, GBP, MYR and MXN have outperformed versus the usual late-cycle playbook.** At the

### Exhibit 71:

MXN, EUR, IDR and BRL look the most out of line with a late-cycle environment

T12M PX Chg vs Avg 12M Run-Up to Bear Market



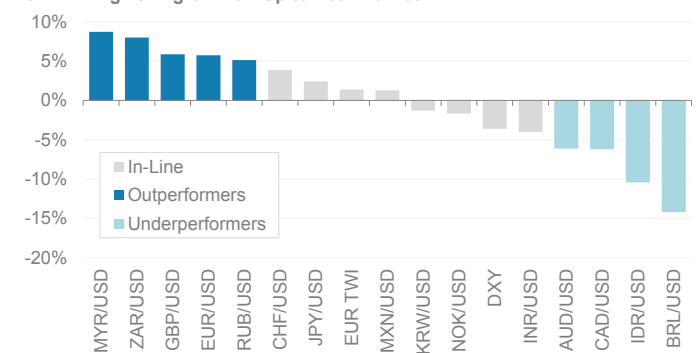
Source: Bloomberg, Morgan Stanley Research

other end of the spectrum, BRL and IDR have weakened more than is usual in the run-up to equity tops. Most other currencies are consistent with a late-bull market backdrop.

### Exhibit 72:

Most other currencies' trailing performance has been consistent with a late-bull backdrop

T6M PX Chg vs Avg 6M Run-Up to Bear Market



Source: Bloomberg, Morgan Stanley Research

## Commodities

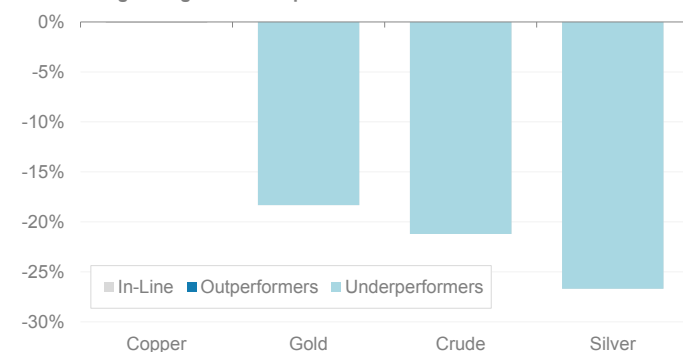
Commodity performance over the last 12 months has been mixed and unlike what's usually seen in the run-up to equity cycle highs. Crude,

gold and silver's trailing 12-month performance have all been weaker than is expected in a late-bull market environment.

### Exhibit 73:

Crude and precious metals last 12 months have lagged performance usually seen in the run-up to stock market tops...

T12M PX Chg vs Avg 12M Run-Up to Bear Market

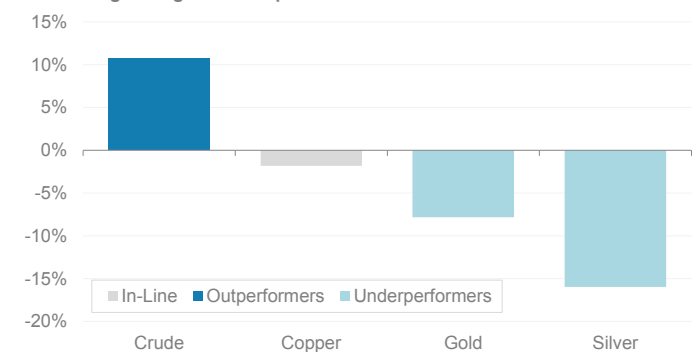


Source: Bloomberg, Morgan Stanley Research

### Exhibit 74:

...although the picture looks more mixed looking at six-month performance

T6M PX Chg vs Avg 6M Run-Up to Bear Market



Source: Bloomberg, Morgan Stanley Research

# Appendix: Equity sell-offs

## Exhibit 75:

ACWI – 10%+ drawdowns in history

| Peak Date           | Trough Date | Business Days | Peak | Trough | Drawdown | Run Up |      | From Peak |      |      |      | From Trough |     |     |     | Type            |
|---------------------|-------------|---------------|------|--------|----------|--------|------|-----------|------|------|------|-------------|-----|-----|-----|-----------------|
|                     |             |               |      |        |          | 1M     | 12M  | 1M        | 3M   | 6M   | 12M  | 1M          | 3M  | 6M  | 12M |                 |
| 17-Apr-91           | 19-Aug-91   | 89            | 131  | 117    | -11%     | 2%     | 10%  | -4%       | -6%  | -2%  | -5%  | 8%          | 9%  | 10% | 3%  | Correction      |
| 06-Jan-92           | 08-Apr-92   | 68            | 135  | 117    | -13%     | 9%     | 22%  | -3%       | -10% | -7%  | -9%  | 8%          | 6%  | 3%  | 16% | Correction      |
| 31-Jul-97           | 12-Nov-97   | 75            | 242  | 217    | -11%     | 4%     | 29%  | -8%       | -9%  | -4%  | 8%   | 3%          | 12% | 20% | 16% | Bull Correction |
| 20-Jul-98           | 05-Oct-98   | 56            | 274  | 216    | -21%     | 7%     | 16%  | -9%       | -12% | 1%   | 12%  | 18%         | 28% | 33% | 37% | Bull Correction |
| 27-Mar-00           | 09-Oct-02   | 663           | 349  | 169    | -51%     | 8%     | 23%  | -5%       | -6%  | -11% | -27% | 14%         | 15% | 10% | 35% | Bear Market     |
| 28-Nov-02           | 12-Mar-03   | 75            | 201  | 171    | -15%     | 7%     | -15% | -5%       | -10% | 2%   | 18%  | 8%          | 25% | 30% | 50% | Bull Correction |
| 09-May-06           | 13-Jun-06   | 26            | 349  | 305    | -13%     | 5%     | 26%  | -10%      | -6%  | 2%   | 14%  | 4%          | 9%  | 19% | 29% | Bull Correction |
| 13-Jul-07           | 16-Aug-07   | 25            | 415  | 367    | -11%     | 5%     | 32%  | -8%       | 2%   | -7%  | -18% | 6%          | 10% | 0%  | -8% | Correction      |
| 31-Oct-07           | 09-Mar-09   | 354           | 428  | 173    | -60%     | 3%     | 22%  | -5%       | -14% | -10% | -47% | 22%         | 43% | 60% | 74% | Bear Market     |
| 15-Apr-10           | 05-Jul-10   | 58            | 318  | 266    | -16%     | 4%     | 44%  | -10%      | -10% | 0%   | 8%   | 11%         | 14% | 25% | 30% | Bull Correction |
| 02-May-11           | 04-Oct-11   | 112           | 358  | 272    | -24%     | 4%     | 16%  | -4%       | -7%  | -13% | -8%  | 13%         | 12% | 23% | 23% | Bear Market     |
| 28-Oct-11           | 25-Nov-11   | 21            | 319  | 279    | -13%     | 12%    | 1%   | -9%       | 0%   | 3%   | 3%   | 7%          | 19% | 8%  | 18% | Bull Correction |
| 19-Mar-12           | 04-Jun-12   | 56            | 337  | 291    | -14%     | 3%     | 1%   | -3%       | -9%  | 0%   | 7%   | 9%          | 11% | 14% | 26% | Bull Correction |
| 21-May-15           | 11-Feb-16   | 191           | 443  | 353    | -20%     | 1%     | 6%   | -1%       | -8%  | -7%  | -12% | 11%         | 12% | 19% | 24% | Bear Market     |
| SUMMARY STATS - ALL |             |               |      |        |          |        |      |           |      |      |      |             |     |     |     |                 |
| Average             |             | 134           |      |        | -21%     | 5%     | 17%  | -6%       | -8%  | -4%  | -4%  | 5%          | 9%  | 10% | 25% |                 |
| Median              |             | 72            |      |        | -14%     | 4%     | 19%  | -5%       | -8%  | -3%  | -1%  | 5%          | 6%  | 14% | 29% |                 |
| Bull Corrections    |             |               |      |        |          |        |      |           |      |      |      |             |     |     |     |                 |
| Average             |             | 52            |      |        | -14%     | 6%     | 15%  | -8%       | -8%  | 1%   | 10%  | 9%          | 17% | 21% | 29% |                 |
| Median              |             | 56            |      |        | -14%     | 5%     | 16%  | -9%       | -9%  | 1%   | 8%   | 8%          | 14% | 20% | 29% |                 |
| Bear Markets        |             |               |      |        |          |        |      |           |      |      |      |             |     |     |     |                 |
| Average             |             | 330           |      |        | -39%     | 4%     | 17%  | -4%       | -9%  | -10% | -24% | 15%         | 21% | 28% | 39% |                 |
| Median              |             | 273           |      |        | -38%     | 3%     | 19%  | -4%       | -7%  | -10% | -19% | 13%         | 14% | 21% | 30% |                 |

Source: Bloomberg, Morgan Stanley Research; Note: A 'bull correction' is defined as an episode where an equity market has seen a 10% or greater drawdown, but recovers to the prior peak within 12 months, a 'bear market' when stocks sell off 20% or more, with no recovery within 12 months, and a 'correction' as all the other big sell-offs which don't fall into either category.

**Exhibit 76:**

S&amp;P – 10%+ drawdowns in history

| Peak Date                  | Trough Date | Business Days | Peak | Trough | Drawdown | Run Up |      | From Peak |      |      |      | From Trough |     |     |     | Type            |
|----------------------------|-------------|---------------|------|--------|----------|--------|------|-----------|------|------|------|-------------|-----|-----|-----|-----------------|
|                            |             |               |      |        |          | 1M     | 12M  | 1M        | 3M   | 6M   | 12M  | 1M          | 3M  | 6M  | 12M |                 |
| 12-Jun-50                  | 17-Jul-50   | 26            | 19   | 17     | -14%     | 6%     | 43%  | -13%      | -4%  | 2%   | 11%  | 10%         | 18% | 28% | 30% | Bull Correction |
| 05-Jan-53                  | 14-Sep-53   | 181           | 27   | 23     | -15%     | 4%     | 12%  | -1%       | -8%  | -9%  | -6%  | 4%          | 9%  | 17% | 37% | Correction      |
| 23-Sep-55                  | 11-Oct-55   | 13            | 46   | 41     | -11%     | 7%     | 41%  | -7%       | 0%   | 7%   | 2%   | 10%         | 8%  | 17% | 13% | Bull Correction |
| 02-Aug-56                  | 22-Oct-57   | 319           | 50   | 39     | -22%     | 5%     | 17%  | -4%       | -6%  | -10% | -4%  | 4%          | 6%  | 10% | 32% | Bear Market     |
| 03-Aug-59                  | 25-Oct-60   | 322           | 61   | 52     | -14%     | 2%     | 27%  | -3%       | -5%  | -8%  | -9%  | 7%          | 16% | 25% | 30% | Correction      |
| 12-Dec-61                  | 26-Jun-62   | 141           | 73   | 52     | -28%     | 2%     | 28%  | -5%       | -3%  | -22% | -14% | 9%          | 9%  | 20% | 34% | Bear Market     |
| 22-Aug-62                  | 23-Oct-62   | 45            | 60   | 53     | -11%     | 5%     | -12% | -3%       | 2%   | 10%  | 19%  | 14%         | 22% | 30% | 36% | Bull Correction |
| 09-Feb-66                  | 07-Oct-66   | 173           | 94   | 73     | -22%     | 1%     | 9%   | -6%       | -7%  | -12% | -7%  | 10%         | 12% | 22% | 33% | Bear Market     |
| 25-Sep-67                  | 05-Mar-68   | 117           | 98   | 88     | -10%     | 5%     | 25%  | -3%       | -2%  | -9%  | 5%   | 7%          | 14% | 13% | 13% | Bull Correction |
| 29-Nov-68                  | 26-May-70   | 388           | 108  | 69     | -36%     | 4%     | 15%  | -4%       | -9%  | -5%  | -13% | 7%          | 17% | 22% | 44% | Bear Market     |
| 28-Apr-71                  | 23-Nov-71   | 150           | 105  | 90     | -14%     | 5%     | 28%  | -5%       | -7%  | -10% | 2%   | 12%         | 17% | 22% | 29% | Bull Correction |
| 11-Jan-73                  | 03-Oct-74   | 451           | 120  | 62     | -48%     | 1%     | 17%  | -3%       | -6%  | -12% | -23% | 17%         | 13% | 31% | 35% | Bear Market     |
| 15-Jul-75                  | 16-Sep-75   | 46            | 96   | 82     | -14%     | 6%     | 15%  | -10%      | -7%  | 0%   | 11%  | 9%          | 8%  | 23% | 27% | Bull Correction |
| 21-Sep-76                  | 06-Mar-78   | 380           | 108  | 87     | -19%     | 5%     | 27%  | -7%       | -3%  | -6%  | -11% | 3%          | 15% | 19% | 13% | Correction      |
| 12-Sep-78                  | 14-Nov-78   | 46            | 107  | 92     | -14%     | 3%     | 11%  | -2%       | -10% | -7%  | 0%   | 4%          | 7%  | 6%  | 11% | Bull Correction |
| 05-Oct-79                  | 07-Nov-79   | 24            | 111  | 100    | -10%     | 5%     | 7%   | -9%       | -4%  | -8%  | 16%  | 8%          | 16% | 7%  | 32% | Bull Correction |
| 13-Feb-80                  | 27-Mar-80   | 32            | 118  | 98     | -17%     | 7%     | 20%  | -11%      | -10% | 4%   | 8%   | 8%          | 18% | 31% | 39% | Bull Correction |
| 28-Nov-80                  | 12-Aug-82   | 445           | 141  | 102    | -27%     | 10%    | 32%  | -4%       | -7%  | -6%  | -11% | 19%         | 38% | 44% | 58% | Bear Market     |
| 10-Oct-83                  | 24-Jul-84   | 207           | 173  | 148    | -14%     | 3%     | 28%  | -5%       | -2%  | -10% | -6%  | 13%         | 13% | 19% | 30% | Correction      |
| 25-Aug-87                  | 04-Dec-87   | 74            | 337  | 224    | -34%     | 9%     | 33%  | -5%       | -27% | -21% | -24% | 16%         | 19% | 19% | 21% | Bear Market     |
| 09-Oct-89                  | 30-Jan-90   | 82            | 360  | 323    | -10%     | 3%     | 29%  | -6%       | -2%  | -5%  | -13% | 3%          | 3%  | 10% | 4%  | Correction      |
| 16-Jul-90                  | 11-Oct-90   | 64            | 369  | 295    | -20%     | 2%     | 11%  | -8%       | -18% | -15% | 4%   | 8%          | 6%  | 28% | 29% | Bull Correction |
| 07-Oct-97                  | 27-Oct-97   | 15            | 983  | 877    | -11%     | 6%     | 40%  | -5%       | -2%  | 13%  | 0%   | 9%          | 9%  | 24% | 22% | Bull Correction |
| 17-Jul-98                  | 31-Aug-98   | 32            | 1187 | 957    | -19%     | 7%     | 30%  | -7%       | -11% | 5%   | 20%  | 6%          | 22% | 29% | 38% | Bull Correction |
| 16-Jul-99                  | 15-Oct-99   | 66            | 1419 | 1247   | -12%     | 7%     | 20%  | -5%       | -12% | 3%   | 6%   | 14%         | 17% | 9%  | 10% | Bull Correction |
| 24-Mar-00                  | 09-Oct-02   | 664           | 1527 | 777    | -49%     | 12%    | 19%  | -3%       | -6%  | -5%  | -25% | 15%         | 17% | 11% | 33% | Bear Market     |
| 28-Nov-02                  | 11-Mar-03   | 74            | 939  | 801    | -15%     | 6%     | -18% | -6%       | -11% | 1%   | 13%  | 9%          | 23% | 28% | 42% | Bull Correction |
| 09-Oct-07                  | 09-Mar-09   | 370           | 1565 | 677    | -57%     | 8%     | 16%  | -6%       | -11% | -13% | -36% | 22%         | 39% | 50% | 68% | Bear Market     |
| 23-Apr-10                  | 02-Jul-10   | 51            | 1217 | 1023   | -16%     | 4%     | 41%  | -12%      | -9%  | -3%  | 10%  | 10%         | 12% | 23% | 31% | Bull Correction |
| 29-Apr-11                  | 03-Oct-11   | 112           | 1364 | 1099   | -19%     | 3%     | 15%  | -1%       | -5%  | -6%  | 3%   | 13%         | 14% | 29% | 31% | Bull Correction |
| 21-May-15                  | 11-Feb-16   | 191           | 2131 | 1829   | -14%     | 2%     | 13%  | 0%        | -4%  | -2%  | -4%  | 10%         | 13% | 20% | 26% | Correction      |
| 26-Jan-18                  | 08-Feb-18   | 10            | 2873 | 2581   | -10%     | 7%     | 25%  | NA        | NA   | NA   | NA   | NA          | NA  | NA  | NA  | ?               |
| <b>SUMMARY STATS - ALL</b> |             |               |      |        |          |        |      |           |      |      |      |             |     |     |     |                 |
| Average                    |             | 166           |      |        | -20%     | 5%     | 21%  | -5%       | -7%  | -5%  | -2%  | 4%          | 6%  | 10% | 32% |                 |
| Median                     |             | 97            |      |        | -15%     | 5%     | 20%  | -5%       | -6%  | -6%  | 0%   | 4%          | 7%  | 15% | 37% |                 |
| <b>Bull Corrections</b>    |             |               |      |        |          |        |      |           |      |      |      |             |     |     |     |                 |
| Average                    |             | 57            |      |        | -14%     | 5%     | 20%  | -7%       | -7%  | -1%  | 8%   | 9%          | 15% | 22% | 27% |                 |
| Median                     |             | 46            |      |        | -14%     | 5%     | 20%  | -6%       | -7%  | 1%   | 7%   | 9%          | 15% | 23% | 30% |                 |
| <b>Bear Markets</b>        |             |               |      |        |          |        |      |           |      |      |      |             |     |     |     |                 |
| Average                    |             | 336           |      |        | -36%     | 6%     | 21%  | -4%       | -9%  | -12% | -18% | 13%         | 19% | 26% | 40% |                 |
| Median                     |             | 370           |      |        | -34%     | 5%     | 17%  | -4%       | -7%  | -12% | -14% | 15%         | 17% | 22% | 34% |                 |

Source: Bloomberg, Morgan Stanley Research; Note: A 'bull correction' is defined as an episode where an equity market has seen a 10% or greater drawdown, but recovers to the prior peak within 12 months, a 'bear market' when stocks sell off 20% or more, with no recovery within 12 months, and a 'correction' as all the other big sell-offs which don't fall into either category.

**Exhibit 77:**

MSCI Europe – 10%+ drawdowns in history

| Peak Date                  | Trough Date | Business Days | Peak | Trough | Drawdown | Run Up |      | From Peak |      |      |      | From Trough |     |     |     | Type            |
|----------------------------|-------------|---------------|------|--------|----------|--------|------|-----------|------|------|------|-------------|-----|-----|-----|-----------------|
|                            |             |               |      |        |          | 1M     | 12M  | 1M        | 3M   | 6M   | 12M  | 1M          | 3M  | 6M  | 12M |                 |
| 05-Feb-76                  | 27-Oct-76   | 190           | 100  | 80     | -20%     | 2%     | 28%  | -2%       | -2%  | -8%  | -9%  | 5%          | 13% | 16% | 23% | Bear Market     |
| 08-Oct-79                  | 28-Mar-80   | 125           | 112  | 99     | -11%     | 5%     | 7%   | -11%      | -10% | -9%  | 3%   | 3%          | 10% | 15% | 20% | Bull Correction |
| 24-Apr-81                  | 28-Sep-81   | 112           | 124  | 106    | -15%     | 5%     | 23%  | -5%       | -6%  | -12% | -1%  | 3%          | 9%  | 13% | 17% | Correction      |
| 03-May-84                  | 23-Jul-84   | 58            | 198  | 176    | -11%     | 4%     | 22%  | -5%       | -7%  | 2%   | 16%  | 9%          | 13% | 24% | 35% | Bull Correction |
| 22-Apr-86                  | 22-Jul-86   | 66            | 355  | 318    | -10%     | 5%     | 56%  | -3%       | -10% | -5%  | 3%   | 10%         | 6%  | 11% | 28% | Bull Correction |
| 05-Oct-87                  | 10-Nov-87   | 27            | 415  | 271    | -35%     | 3%     | 22%  | -30%      | -31% | -26% | -19% | 3%          | 7%  | 14% | 29% | Bear Market     |
| 08-Sep-89                  | 27-Oct-89   | 36            | 452  | 403    | -11%     | 2%     | 40%  | -3%       | -3%  | -4%  | -14% | 4%          | 8%  | 5%  | -8% | Correction      |
| 18-Jul-90                  | 16-Jan-91   | 131           | 461  | 348    | -24%     | 3%     | 8%   | -12%      | -20% | -24% | -7%  | 14%         | 25% | 24% | 23% | Bear Market     |
| 02-Sep-91                  | 23-Dec-91   | 81            | 443  | 392    | -11%     | 2%     | 12%  | -2%       | -9%  | -1%  | -13% | 9%          | 9%  | 10% | 10% | Correction      |
| 11-May-92                  | 25-Aug-92   | 77            | 459  | 377    | -18%     | 8%     | 7%   | -3%       | -14% | -10% | 1%   | 8%          | 11% | 20% | 38% | Bull Correction |
| 02-Feb-94                  | 09-Mar-95   | 287           | 613  | 511    | -17%     | 4%     | 37%  | -6%       | -8%  | -8%  | -14% | 4%          | 11% | 16% | 25% | Correction      |
| 03-Oct-97                  | 28-Oct-97   | 18            | 1001 | 877    | -12%     | 6%     | 46%  | -9%       | -1%  | 22%  | -8%  | 6%          | 15% | 34% | 22% | Correction      |
| 20-Jul-98                  | 08-Oct-98   | 59            | 1317 | 907    | -31%     | 9%     | 41%  | -8%       | -23% | -8%  | -1%  | 20%         | 37% | 39% | 39% | Bear Market     |
| 04-Sep-00                  | 12-Mar-03   | 658           | 1623 | 676    | -58%     | 7%     | 26%  | -7%       | -10% | -16% | -27% | 17%         | 28% | 35% | 50% | Bear Market     |
| 09-May-06                  | 13-Jun-06   | 26            | 1417 | 1244   | -12%     | 1%     | 31%  | -11%      | -6%  | 4%   | 13%  | 5%          | 10% | 18% | 28% | Bull Correction |
| 01-Jun-07                  | 09-Mar-09   | 462           | 1644 | 714    | -57%     | 3%     | 24%  | -1%       | -6%  | -6%  | -15% | 16%         | 30% | 47% | 60% | Bear Market     |
| 15-Apr-10                  | 05-Jul-10   | 58            | 1189 | 1005   | -15%     | 4%     | 37%  | -10%      | -9%  | -3%  | 0%   | 11%         | 10% | 17% | 18% | Bull Correction |
| 16-Feb-11                  | 22-Sep-11   | 157           | 1230 | 918    | -25%     | 3%     | 14%  | -7%       | -3%  | -18% | -11% | 12%         | 10% | 21% | 22% | Bear Market     |
| 27-Oct-11                  | 24-Nov-11   | 21            | 1066 | 935    | -12%     | 9%     | -7%  | -8%       | 1%   | 0%   | 4%   | 9%          | 18% | 6%  | 19% | Bull Correction |
| 16-Mar-12                  | 04-Jun-12   | 57            | 1135 | 965    | -15%     | 3%     | -1%  | -5%       | -11% | 0%   | 10%  | 9%          | 13% | 18% | 29% | Bull Correction |
| 22-May-13                  | 24-Jun-13   | 24            | 1301 | 1150   | -12%     | 9%     | 32%  | -10%      | -4%  | 3%   | 7%   | 10%         | 13% | 16% | 23% | Bull Correction |
| 10-Jun-14                  | 16-Oct-14   | 93            | 1428 | 1263   | -12%     | 3%     | 17%  | -4%       | -1%  | -3%  | 4%   | 9%          | 9%  | 25% | 11% | Bull Correction |
| 10-Apr-15                  | 11-Feb-16   | 220           | 1593 | 1202   | -25%     | 5%     | 18%  | -4%       | -6%  | -11% | -17% | 13%         | 9%  | 17% | 24% | Bear Market     |
| 20-Apr-16                  | 27-Jun-16   | 49            | 1387 | 1245   | -10%     | 3%     | -12% | -4%       | -1%  | 2%   | 10%  | 11%         | 11% | 18% | 28% | Bull Correction |
| <b>SUMMARY STATS - ALL</b> |             |               |      |        |          |        |      |           |      |      |      |             |     |     |     |                 |
| Average                    |             | 129           |      |        | -20%     | 5%     | 22%  | -7%       | -8%  | -6%  | -4%  | 5%          | 3%  | 7%  | 13% |                 |
| Median                     |             | 72            |      |        | -15%     | 4%     | 22%  | -6%       | -7%  | -5%  | -1%  | 4%          | 3%  | 8%  | 10% |                 |
| <b>Bull Corrections</b>    |             |               |      |        |          |        |      |           |      |      |      |             |     |     |     |                 |
| Average                    |             | 59            |      |        | -13%     | 5%     | 17%  | -7%       | -7%  | -2%  | 6%   | 9%          | 11% | 17% | 25% |                 |
| Median                     |             | 58            |      |        | -12%     | 4%     | 17%  | -5%       | -7%  | 0%   | 4%   | 9%          | 11% | 18% | 28% |                 |
| <b>Bear Markets</b>        |             |               |      |        |          |        |      |           |      |      |      |             |     |     |     |                 |
| Average                    |             | 238           |      |        | -34%     | 4%     | 23%  | -9%       | -13% | -15% | -13% | 13%         | 20% | 27% | 34% |                 |
| Median                     |             | 174           |      |        | -28%     | 3%     | 23%  | -7%       | -8%  | -14% | -13% | 13%         | 19% | 22% | 26% |                 |

Source: Bloomberg, Morgan Stanley Research; Note: A 'bull correction' is defined as an episode where an equity market has seen a 10% or greater drawdown, but recovers to the prior peak within 12 months, a 'bear market' when stocks sell off 20% or more, with no recovery within 12 months, and a 'correction' as all the other big sell-offs which don't fall into either category.

**Exhibit 78:**

TOPIX – 10%+ drawdowns in history

| Peak Date           | Trough Date | Business Days | Peak | Trough | Drawdown | Run Up |      | From Peak |      |      |      | From Trough |     |     |     | Type            |
|---------------------|-------------|---------------|------|--------|----------|--------|------|-----------|------|------|------|-------------|-----|-----|-----|-----------------|
|                     |             |               |      |        |          | 1M     | 12M  | 1M        | 3M   | 6M   | 12M  | 1M          | 3M  | 6M  | 12M |                 |
| 04-Feb-53           | 15-Nov-54   | 464           | 42   | 27     | -36%     | 26%    | 119% | -19%      | -23% | -17% | -26% | 6%          | 20% | 14% | 37% | Bear Market     |
| 21-Jan-57           | 27-Dec-57   | 245           | 55   | 43     | -21%     | 6%     | 40%  | -5%       | -2%  | -17% | -16% | 8%          | 10% | 21% | 41% | Bear Market     |
| 30-Nov-59           | 21-Dec-59   | 16            | 90   | 78     | -13%     | 4%     | 57%  | -11%      | -2%  | -1%  | 19%  | 11%         | 15% | 16% | 33% | Bull Correction |
| 03-May-60           | 02-Jun-60   | 23            | 99   | 86     | -13%     | 6%     | 44%  | -13%      | -2%  | 9%   | 19%  | 12%         | 20% | 25% | 35% | Bull Correction |
| 14-Jul-61           | 30-Oct-62   | 338           | 127  | 83     | -34%     | 8%     | 30%  | -6%       | -22% | -19% | -20% | 21%         | 26% | 46% | 23% | Bear Market     |
| 10-May-63           | 15-Jul-65   | 570           | 123  | 81     | -34%     | 1%     | 22%  | -3%       | -15% | -20% | -22% | 11%         | 16% | 30% | 32% | Bear Market     |
| 31-May-67           | 11-Dec-67   | 139           | 118  | 99     | -16%     | 5%     | 8%   | -1%       | -10% | -14% | -5%  | 3%          | 5%  | 17% | 31% | Correction      |
| 02-Oct-68           | 12-Nov-68   | 30            | 143  | 127    | -11%     | 9%     | 36%  | -7%       | -9%  | 1%   | 11%  | 3%          | 11% | 19% | 28% | Bull Correction |
| 08-Apr-70           | 09-Dec-70   | 176           | 186  | 147    | -21%     | 2%     | 28%  | -11%      | -15% | -17% | -4%  | 3%          | 16% | 29% | 26% | Bear Market     |
| 13-Aug-71           | 24-Aug-71   | 8             | 208  | 168    | -19%     | 3%     | 31%  | -13%      | -16% | 2%   | 46%  | 7%          | 8%  | 30% | 84% | Bull Correction |
| 24-Jan-73           | 09-Oct-74   | 446           | 422  | 252    | -40%     | 10%    | 102% | -6%       | -19% | -9%  | -25% | 5%          | 7%  | 27% | 21% | Bear Market     |
| 02-Jul-75           | 29-Sep-75   | 64            | 333  | 289    | -13%     | 4%     | 1%   | -5%       | -13% | -3%  | 7%   | 10%         | 11% | 17% | 22% | Bull Correction |
| 29-Sep-77           | 24-Nov-77   | 41            | 391  | 350    | -10%     | 1%     | 9%   | -4%       | -7%  | 4%   | 11%  | 4%          | 9%  | 17% | 26% | Bull Correction |
| 17-Aug-81           | 17-Aug-82   | 262           | 604  | 512    | -15%     | 2%     | 27%  | -7%       | -6%  | -6%  | -15% | 4%          | 10% | 15% | 31% | Correction      |
| 02-Apr-84           | 24-Jul-84   | 82            | 877  | 750    | -14%     | 14%    | 43%  | -1%       | -10% | -6%  | 14%  | 9%          | 14% | 24% | 39% | Bull Correction |
| 20-Aug-86           | 22-Oct-86   | 46            | 1583 | 1320   | -17%     | 14%    | 55%  | -9%       | -10% | 10%  | 32%  | 8%          | 27% | 64% | 49% | Bull Correction |
| 11-Jun-87           | 04-Jan-88   | 148           | 2259 | 1690   | -25%     | 4%     | 71%  | -11%      | -9%  | -17% | -2%  | 13%         | 27% | 27% | 39% | Bear Market     |
| 18-Dec-89           | 18-Aug-92   | 697           | 2885 | 1103   | -62%     | 6%     | 27%  | -6%       | -19% | -17% | -38% | 23%         | 11% | 17% | 53% | Bear Market     |
| 04-Sep-92           | 17-Nov-92   | 53            | 1420 | 1221   | -14%     | 17%    | -19% | -9%       | -8%  | -11% | 20%  | 9%          | 6%  | 30% | 27% | Bull Correction |
| 03-Sep-93           | 29-Nov-93   | 62            | 1699 | 1350   | -20%     | 2%     | 20%  | -4%       | -14% | -4%  | -3%  | 6%          | 21% | 24% | 10% | Bear Market     |
| 13-Jun-94           | 13-Jun-95   | 262           | 1713 | 1193   | -30%     | 4%     | 3%   | -3%       | -7%  | -12% | -30% | 11%         | 22% | 28% | 40% | Bear Market     |
| 26-Jun-96           | 15-Oct-98   | 602           | 1722 | 980    | -43%     | 4%     | 43%  | -7%       | -7%  | -15% | -10% | 13%         | 9%  | 37% | 57% | Bear Market     |
| 07-Feb-00           | 18-Dec-02   | 748           | 1755 | 816    | -54%     | 9%     | 61%  | -5%       | -3%  | -16% | -28% | 5%          | -3% | 10% | 21% | Bear Market     |
| 20-Oct-03           | 19-Nov-03   | 23            | 1106 | 953    | -14%     | 3%     | 24%  | -14%      | -3%  | 7%   | 0%   | 6%          | 10% | 16% | 17% | Correction      |
| 14-Apr-04           | 17-May-04   | 24            | 1218 | 1054   | -13%     | 8%     | 54%  | -10%      | -5%  | -8%  | -3%  | 11%         | 3%  | 7%  | 7%  | Correction      |
| 07-Apr-06           | 13-Jun-06   | 48            | 1784 | 1458   | -18%     | 11%    | 48%  | -2%       | -12% | -8%  | -4%  | 6%          | 9%  | 12% | 20% | Correction      |
| 26-Feb-07           | 12-Mar-09   | 534           | 1817 | 701    | -61%     | 5%     | 10%  | -6%       | -5%  | -13% | -25% | 21%         | 34% | 37% | 33% | Bear Market     |
| 12-Jun-09           | 13-Jul-09   | 22            | 951  | 852    | -10%     | 7%     | -31% | -9%       | 0%   | -7%  | -9%  | 13%         | 5%  | 10% | 1%  | Correction      |
| 26-Aug-09           | 27-Nov-09   | 68            | 976  | 811    | -17%     | 5%     | -20% | -5%       | -15% | -8%  | -17% | 13%         | 10% | 8%  | 7%  | Correction      |
| 15-Apr-10           | 04-Jun-12   | 558           | 999  | 696    | -30%     | 6%     | 20%  | -8%       | -14% | -16% | -15% | 12%         | 5%  | 12% | 58% | Bear Market     |
| 22-May-13           | 13-Jun-13   | 17            | 1276 | 1044   | -18%     | 11%    | 77%  | -14%      | -12% | -3%  | -10% | 15%         | 13% | 19% | 19% | Correction      |
| 08-Jan-14           | 14-Apr-14   | 69            | 1306 | 1133   | -13%     | 4%     | 49%  | -9%       | -12% | -3%  | 4%   | 4%          | 12% | 10% | 40% | Bull Correction |
| 25-Sep-14           | 17-Oct-14   | 17            | 1346 | 1177   | -13%     | 5%     | 10%  | -7%       | 6%   | 17%  | 6%   | 18%         | 16% | 35% | 28% | Bull Correction |
| 10-Aug-15           | 12-Feb-16   | 135           | 1691 | 1196   | -29%     | 7%     | 35%  | -11%      | -6%  | -18% | -23% | 15%         | 10% | 11% | 29% | Bear Market     |
| 22-Apr-16           | 24-Jun-16   | 46            | 1408 | 1204   | -14%     | 3%     | -13% | -6%       | -6%  | -3%  | 6%   | 9%          | 12% | 28% | 34% | Bull Correction |
| 23-Jan-18           | 14-Feb-18   | 17            | 1911 | 1703   | -11%     | 4%     | 27%  | NA        | NA   | NA   | NA   | NA          | NA  | NA  | NA  | ?               |
| SUMMARY STATS - ALL |             |               |      |        |          |        |      |           |      |      |      |             |     |     |     |                 |
| Average             |             | 197           |      |        | -23%     | 7%     | 32%  | -8%       | -10% | -7%  | -4%  | 10%         | 13% | 23% | 31% |                 |
| Median              |             | 69            |      |        | -18%     | 5%     | 29%  | -7%       | -9%  | -8%  | -4%  | 9%          | 11% | 19% | 31% |                 |
| Bull Corrections    |             |               |      |        |          |        |      |           |      |      |      |             |     |     |     |                 |
| Average             |             | 41            |      |        | -14%     | 7%     | 25%  | -8%       | -7%  | 1%   | 16%  | 9%          | 13% | 26% | 37% |                 |
| Median              |             | 44            |      |        | -13%     | 4%     | 33%  | -8%       | -9%  | 0%   | 13%  | 9%          | 12% | 25% | 34% |                 |
| Bear Markets        |             |               |      |        |          |        |      |           |      |      |      |             |     |     |     |                 |
| Average             |             | 399           |      |        | -36%     | 7%     | 42%  | -7%       | -12% | -15% | -19% | 11%         | 15% | 25% | 35% |                 |
| Median              |             | 446           |      |        | -34%     | 6%     | 30%  | -6%       | -14% | -17% | -22% | 11%         | 16% | 27% | 33% |                 |

Source: Bloomberg, Morgan Stanley Research. Note: A 'bull correction' is defined as an episode where an equity market has seen a 10% or greater drawdown, but recovers to the prior peak within 12 months, a 'bear market' when stocks sell off 20% or more, with no recovery within 12 months, and a 'correction' as all the other big sell-offs which don't fall into either category.

**Exhibit 79:**

MSCI EM – 10%+ drawdowns in history

| Peak Date           | Trough Date | Business Days | Peak | Trough | Drawdown | Run Up |      | From Peak |      |      |      | From Trough |     |     |      | Type            |
|---------------------|-------------|---------------|------|--------|----------|--------|------|-----------|------|------|------|-------------|-----|-----|------|-----------------|
|                     |             |               |      |        |          | 1M     | 12M  | 1M        | 3M   | 6M   | 12M  | 1M          | 3M  | 6M  | 12M  |                 |
| 19-Feb-90           | 02-Apr-90   | 31            | 239  | 194    | -19%     | 7%     | 72%  | -13%      | -5%  | -5%  | -5%  | 9%          | 22% | 0%  | 23%  | Correction      |
| 01-Aug-90           | 16-Jan-91   | 121           | 257  | 175    | -32%     | 8%     | 50%  | -14%      | -26% | -23% | 1%   | 27%         | 42% | 42% | 71%  | Bull Correction |
| 17-Apr-92           | 24-Aug-92   | 92            | 354  | 286    | -19%     | 5%     | 43%  | -3%       | -9%  | -18% | -4%  | 1%          | 6%  | 13% | 36%  | Correction      |
| 11-Feb-94           | 09-May-94   | 62            | 564  | 454    | -19%     | 6%     | 75%  | -9%       | -18% | -4%  | -21% | 9%          | 18% | 24% | 2%   | Correction      |
| 16-Sep-94           | 09-Mar-95   | 125           | 587  | 396    | -33%     | 5%     | 44%  | -2%       | -12% | -29% | -19% | 10%         | 21% | 19% | 22%  | Bear Market     |
| 13-Jul-95           | 15-Nov-95   | 90            | 496  | 425    | -14%     | 5%     | 0%   | -3%       | -7%  | -3%  | 0%   | 6%          | 17% | 19% | 12%  | Bull Correction |
| 09-Jul-97           | 10-Sep-98   | 307           | 571  | 236    | -59%     | 6%     | 14%  | -4%       | -12% | -32% | -40% | 8%          | 27% | 35% | 72%  | Bear Market     |
| 07-Jan-99           | 14-Jan-99   | 6             | 317  | 283    | -11%     | 7%     | -16% | -7%       | 10%  | 34%  | 53%  | 6%          | 27% | 49% | 80%  | Bull Correction |
| 05-Jul-99           | 18-Oct-99   | 76            | 431  | 387    | -10%     | 14%    | 28%  | -8%       | -9%  | 15%  | 4%   | 10%         | 36% | 13% | -7%  | Bull Correction |
| 10-Feb-00           | 21-Sep-01   | 422           | 531  | 246    | -54%     | 7%     | 78%  | -6%       | -19% | -20% | -31% | 9%          | 24% | 43% | 15%  | Bear Market     |
| 18-Apr-02           | 10-Oct-02   | 126           | 364  | 255    | -30%     | 4%     | 12%  | -2%       | -10% | -25% | -19% | 13%         | 18% | 11% | 58%  | Bear Market     |
| 15-Jan-03           | 11-Mar-03   | 40            | 308  | 270    | -12%     | 4%     | -3%  | -9%       | -4%  | 14%  | 51%  | 5%          | 21% | 43% | 80%  | Bull Correction |
| 12-Apr-04           | 17-May-04   | 26            | 497  | 396    | -20%     | 6%     | 74%  | -15%      | -14% | -3%  | 11%  | 5%          | 7%  | 27% | 36%  | Bull Correction |
| 28-Feb-05           | 18-Apr-05   | 36            | 589  | 526    | -11%     | 10%    | 21%  | -8%       | -6%  | 2%   | 34%  | 3%          | 11% | 18% | 55%  | Bull Correction |
| 08-May-06           | 13-Jun-06   | 27            | 882  | 665    | -25%     | 8%     | 60%  | -18%      | -14% | -6%  | 13%  | 10%         | 14% | 32% | 52%  | Bull Correction |
| 22-Feb-07           | 05-Mar-07   | 8             | 944  | 844    | -11%     | 4%     | 20%  | -2%       | 6%   | 10%  | 22%  | 12%         | 23% | 29% | 36%  | Bull Correction |
| 23-Jul-07           | 16-Aug-07   | 19            | 1163 | 957    | -18%     | 9%     | 59%  | -13%      | 6%   | -8%  | -10% | 15%         | 32% | 19% | 3%   | Correction      |
| 29-Oct-07           | 27-Oct-08   | 261           | 1338 | 454    | -66%     | 11%    | 66%  | -10%      | -19% | -11% | -66% | 13%         | 14% | 39% | 113% | Bear Market     |
| 06-Jan-09           | 02-Mar-09   | 40            | 607  | 475    | -22%     | 22%    | -50% | -12%      | 1%   | 24%  | 67%  | 22%         | 69% | 77% | 100% | Bull Correction |
| 11-Jan-10           | 08-Feb-10   | 21            | 1028 | 894    | -13%     | 7%     | 86%  | -11%      | 1%   | -7%  | 11%  | 11%         | 8%  | 14% | 26%  | Bull Correction |
| 15-Apr-10           | 25-May-10   | 29            | 1048 | 856    | -18%     | 6%     | 62%  | -10%      | -9%  | 8%   | 13%  | 11%         | 14% | 27% | 31%  | Bull Correction |
| 02-May-11           | 04-Oct-11   | 112           | 1206 | 831    | -31%     | 3%     | 20%  | -3%       | -5%  | -18% | -15% | 17%         | 13% | 27% | 21%  | Bear Market     |
| 28-Oct-11           | 25-Nov-11   | 21            | 1010 | 877    | -13%     | 13%    | -9%  | -10%      | 1%   | 1%   | -2%  | 5%          | 22% | 3%  | 14%  | Correction      |
| 02-Mar-12           | 04-Jun-12   | 67            | 1080 | 882    | -18%     | 5%     | -5%  | -2%       | -17% | -12% | -2%  | 8%          | 8%  | 14% | 13%  | Correction      |
| 03-Jan-13           | 24-Jun-13   | 123           | 1083 | 883    | -18%     | 7%     | 16%  | -1%       | -6%  | -15% | -8%  | 9%          | 15% | 12% | 18%  | Correction      |
| 22-Oct-13           | 05-Feb-14   | 77            | 1045 | 917    | -12%     | 3%     | 5%   | -4%       | -7%  | -3%  | -6%  | 5%          | 10% | 15% | 7%   | Correction      |
| 03-Sep-14           | 21-Jan-16   | 362           | 1101 | 689    | -37%     | 3%     | 17%  | -9%       | -10% | -11% | -28% | 9%          | 24% | 27% | 30%  | Bear Market     |
| 26-Jan-18           | 09-Feb-18   | 11            | 1273 | 1143   | -10%     | 11%    | 39%  | NA        | NA   | NA   | NA   | NA          | NA  | NA  | NA   | ?               |
| SUMMARY STATS - ALL |             |               |      |        |          |        |      |           |      |      |      |             |     |     |      |                 |
| Average             |             | 98            |      |        | -23%     | 7%     | 31%  | -8%       | -8%  | -5%  | 0%   | 10%         | 21% | 26% | 38%  |                 |
| Median              |             | 65            |      |        | -19%     | 6%     | 24%  | -8%       | -9%  | -6%  | -2%  | 9%          | 18% | 24% | 30%  |                 |
| Bull Corrections    |             |               |      |        |          |        |      |           |      |      |      |             |     |     |      |                 |
| Average             |             | 43            |      |        | -17%     | 8%     | 28%  | -10%      | -6%  | 5%   | 23%  | 11%         | 24% | 32% | 48%  |                 |
| Median              |             | 33            |      |        | -14%     | 7%     | 24%  | -10%      | -7%  | 5%   | 13%  | 10%         | 19% | 28% | 44%  |                 |
| Bear Markets        |             |               |      |        |          |        |      |           |      |      |      |             |     |     |      |                 |
| Average             |             | 245           |      |        | -44%     | 6%     | 36%  | -5%       | -12% | -21% | -31% | 11%         | 20% | 29% | 47%  |                 |
| Median              |             | 261           |      |        | -37%     | 5%     | 20%  | -4%       | -12% | -20% | -28% | 10%         | 21% | 27% | 30%  |                 |

Source: Bloomberg, Morgan Stanley Research; Note: A 'bull correction' is defined as an episode where an equity market has seen a 10% or greater drawdown, but recovers to the prior peak within 12 months, a 'bear market' when stocks sell off 20% or more, with no recovery within 12 months, and a 'correction' as all the other big sell-offs which don't fall into either category.

# Macro event calendar – next two weeks

## Exhibit 80:

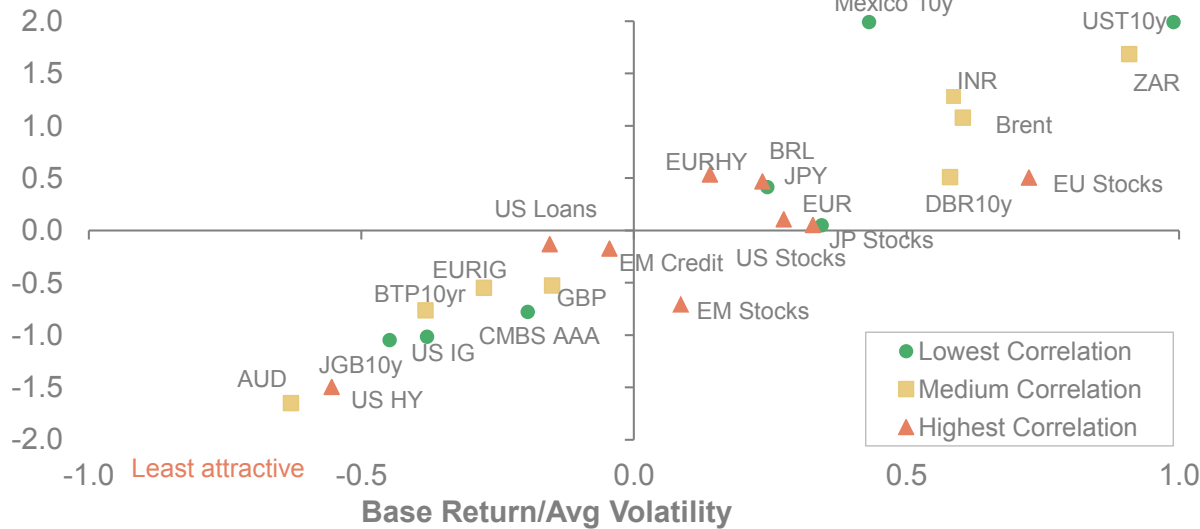
Key global events over the next two weeks, with Morgan Stanley forecasts where applicable

| Date        | Time (Ldn) | Region | Event   | Ref. Period | MS forecast | Market  | Previous |
|-------------|------------|--------|---|-------------|-------------|---------|----------|
| 5-Mar       | 01:45      | CNY    | PMI Composite                                   | Feb         |             |         | 53.7     |
| 5-Mar       | 09:00      | EUR    | PMI Services                                    | Feb F       |             |         | 56.7     |
| 5-Mar       | 09:30      | GBP    | PMI Services                                    | Feb         |             | 53.2    | 53       |
| 5-Mar       | 09:30      | GBP    | PMI Composite                                   | Feb         |             |         | 53.5     |
| 5-Mar       | 15:00      | USD    | ISM Non-Manufacturing Composite                 | Feb         |             | 58.5    | 59.9     |
| 6-Mar       | 12:30      | USD    | Fed's Dudley (voter) spks                       |             |             |         |          |
| 6-Mar       | 15:00      | USD    | Factory Orders                                  | Jan         |             | -0.4%   | 1.7%     |
| 6-Mar       | 15:00      | USD    | Durable Goods Orders                            | Jan F       |             |         | -3.7%    |
| 6-Mar       | 22:30      | USD    | Fed's Brainard (voter) spks (Monetary Policy)   |             |             |         |          |
| 7-Mar       | N/A        | CNY    | Foreign Reserves                                | Feb         |             |         | 3161.5B  |
| 7-Mar       | 05:00      | JPY    | Leading Index CI                                | Jan P       |             |         | 107.4    |
| 7-Mar       | 10:00      | EUR    | Eurozone GDP (QoQ)                              | 4Q F        |             |         | 0.6%     |
| 7-Mar       | 13:00      | USD    | Fed's Bostic (voter) spks (Economic Outlook)    |             |             |         |          |
| 7-Mar       | 13:15      | USD    | ADP Employment Change                           | Feb         |             | 195k    | 234k     |
| 7-Mar       | 13:20      | USD    | Fed's Dudley (voter) spks (Puerto Rico Economy) |             |             |         |          |
| 7-Mar       | 13:30      | USD    | Trade Balance                                   | Jan         |             | -52.5B  | -53.1B   |
| 7-Mar       | 23:50      | JPY    | Current Account Balance                         | Jan         |             | ¥481.1B | ¥797.2B  |
| 8-Mar       | N/A        | CNY    | Trade Balance                                   | Feb         |             |         | \$20.35B |
| 8-Mar       | N/A        | CNY    | Exports (YoY)                                   | Feb         |             |         | 11.1%    |
| 8-Mar       | 07:00      | EUR    | German Factory Orders (MoM)                     | Jan         |             |         | 3.8%     |
| 8-Mar       | 12:45      | EUR    | ECB Rates Decision                              |             | 0.00%       |         | 0%       |
| 8-Mar       | 12:45      | EUR    | ECB Deposit Facility Rate                       |             | -0.40%      |         | -0.4%    |
| 8-Mar       | 13:30      | EUR    | ECB Press Conference                            |             |             |         |          |
| 9-Mar       | N/A        | JPY    | BoJ Rates Decision                              |             | -0.10%      |         | -0.1%    |
| 9-Mar       | 00:00      | JPY    | Labor Cash Earnings (YoY)                       | Jan         |             | 0.6%    | 0.9%     |
| 9-Mar       | 01:30      | CNY    | PPI (YoY)                                       | Feb         |             | 3.8%    | 4.3%     |
| 9-Mar       | 06:30      | JPY    | BoJ Press Conference                            |             |             |         |          |
| 9-Mar       | 07:00      | EUR    | German Industrial Production (MoM)              | Jan         |             |         | -0.6%    |
| 9-Mar       | 09:30      | GBP    | Trade Balance                                   | Jan         |             | -3300m  | -4896m   |
| 9-Mar       | 13:30      | USD    | Change in Nonfarm Payrolls                      | Feb         | 210k        | 195k    | 200k     |
| 9-Mar       | 13:30      | USD    | Unemployment Rate                               | Feb         | 4.1%        | 4%      | 4.1%     |
| 9-Mar       | 13:30      | USD    | Average Hourly Earnings (YoY)                   | Feb         | 2.9%        | 2.9%    | 2.9%     |
| 03/10-03/15 | N/A        | CNY    | M2 (YoY)  | Feb         |             | 8.9%    | 8.6%     |
| 03/10-03/15 | N/A        | CNY    | New Yuan Loans                                  | Feb         |             | 800B    | 2900B    |
| 13-Mar      | 12:30      | USD    | CPI (YoY)                                       | Feb         |             |         | 2.1%     |
| 13-Mar      | 23:50      | JPY    | BoJ Minutes                                     | Jan-23      |             |         |          |
| 14-Mar      | 02:00      | CNY    | Fixed Assets Ex Rural YTD (YoY)                 | Feb         |             | 7%      | 7.2%     |
| 14-Mar      | 12:30      | USD    | Retail Sales Advance (MoM)                      | Feb         |             | 0.4%    | -0.3%    |
| 14-Mar      | 12:30      | USD    | Retail Sales Ex Auto (MoM)                      | Feb         |             | 0.5%    | 0%       |
| 16-Mar      | 04:30      | JPY    | Industrial Production (MoM)                     | Jan F       |             |         | -6.6%    |
| 16-Mar      | 10:00      | EUR    | CPI Core (YoY)                                  | Feb F       |             |         | 1%       |
| 16-Mar      | 10:00      | EUR    | CPI (YoY)                                       | Feb F       |             |         | 1.2%     |
| 16-Mar      | 13:15      | USD    | Industrial Production (MoM)                     | Feb         |             | 0.2%    | -0.1%    |
| 16-Mar      | 13:15      | USD    | Capacity Utilization                            | Feb         |             | 77.6%   | 77.5%    |
| 16-Mar      | 14:00      | USD    | Univ. of Michigan Confidence                    | Mar P       |             | 99.5    | 99.9     |

Source: Morgan Stanley Research forecasts, Bloomberg. Note: P = Preliminary, F = Final.

# Asset class forecasts and risk/reward

## Skew (Bull+Bear)/Avg Vol



### Exhibit 81:

Morgan Stanley key market forecasts

|                          | As of Mar 01, 2018 | Q4 2018 Forecast |       |       |
|--------------------------|--------------------|------------------|-------|-------|
|                          |                    | Bear             | Base  | Bull  |
| <b>Equities</b>          |                    |                  |       |       |
| S&P 500                  | 2,678              | 2,300            | 2,750 | 3,000 |
| MSCI Europe              | 1,554              | 1,180            | 1,700 | 1,960 |
| Topix                    | 1,740              | 1,190            | 1,820 | 2,240 |
| MSCI EM                  | 1,192              | 740              | 1,185 | 1,420 |
| <b>FX</b>                |                    |                  |       |       |
| USD/JPY                  | 106                | 90               | 101   | 116   |
| EUR/USD                  | 1.23               | 1.16             | 1.30  | 1.37  |
| GBP/USD                  | 1.38               | 1.27             | 1.38  | 1.46  |
| AUD/USD                  | 0.78               | 0.65             | 0.72  | 0.76  |
| USD/INR                  | 65.2               | 62.0             | 65.0  | 69.0  |
| USD/ZAR                  | 11.9               | 10.0             | 10.8  | 12.0  |
| USD/BRL                  | 3.25               | 2.90             | 3.25  | 3.70  |
| <b>Rates (% percent)</b> |                    |                  |       |       |
| UST 10yr                 | 2.81               | 3.25             | 1.95  | 1.25  |
| DBR 10yr                 | 0.64               | 1.05             | 0.50  | 0.40  |
| UKT 10yr                 | 1.47               | 2.75             | 1.55  | 1.00  |
| JGB 10yr                 | 0.04               | 0.45             | 0.20  | 0.03  |
| <b>Credit (bps)</b>      |                    |                  |       |       |
| US IG                    | 102                | 195              | 140   | 83    |
| US HY                    | 379                | 840              | 554   | 328   |
| EUR IG                   | 34                 | 70               | 50    | 30    |
| EUR HY                   | 300                | 400              | 325   | 210   |
| Italy 10yr               | 130                | 180              | 180   | 180   |
| EM Sovs                  | 318                | 500              | 370   | 260   |
| US CMBS                  | 68                 | 125              | 85    | 65    |
| <b>Commodities</b>       |                    |                  |       |       |
| Brent                    | 62                 | 64.5             | 72.5  | 82.5  |

Source: Markit, MSCI, Bloomberg, The Yield Book, Morgan Stanley Research forecasts

### Exhibit 82:

12m return and risk forecasts

| Asset                         | 12m Return |           |           | Volatility     |            | Return/Risk          |
|-------------------------------|------------|-----------|-----------|----------------|------------|----------------------|
|                               | Bear Case  | Base Case | Bull Case | Option Implied | LT Average | Base case Return/Vol |
| <b>Equities</b>               |            |           |           |                |            |                      |
| S&P 500                       | -12%       | 4.6%      | 14%       | 13%            | 20%        | 0.28                 |
| MSCI Europe                   | -21%       | 12.8%     | 30%       | 15%            | 20%        | 0.72                 |
| Topix                         | -30%       | 6.5%      | 31%       | 16%            | 23%        | 0.33                 |
| MSCI EM                       | -36%       | 1.7%      | 21%       | 19%            | 21%        | 0.09                 |
| <b>FX</b>                     |            |           |           |                |            |                      |
| JPY/USD                       | -11%       | 2.4%      | 15%       | 8.9%           | 11.0%      | 0.24                 |
| EUR/USD                       | -8%        | 3.1%      | 9%        | 7.5%           | 10.3%      | 0.34                 |
| GBP/USD                       | -9%        | -1.4%     | 4%        | 9.1%           | 10.1%      | -0.15                |
| AUD/USD                       | -17%       | -7.4%     | -3%       | 9.1%           | 14.5%      | -0.63                |
| INR/USD                       | -1%        | 4.4%      | 9%        | 6.9%           | 7.8%       | 0.60                 |
| ZAR/USD                       | 4%         | 15.0%     | 24%       | 14.8%          | 18.2%      | 0.91                 |
| BRL/USD                       | -8%        | 3.7%      | 16%       | 13.8%          | 17.6%      | 0.24                 |
| <b>Rates</b>                  |            |           |           |                |            |                      |
| UST 10yr                      | -0.3%      | 9.9%      | 16.4%     | 6.0%           | 7.1%       | 1.50                 |
| DBR 10yr                      | -1.4%      | 3.0%      | 4.1%      | 4.9%           | 5.4%       | 0.58                 |
| UKT 10yr                      | -7.6%      | 1.7%      | 6.6%      | 5.9%           | 6.1%       | 0.28                 |
| JGB 10yr                      | -2.9%      | -0.9%     | 0.5%      | 1.8%           | 2.9%       | -0.38                |
| <b>Credit (Excess Return)</b> |            |           |           |                |            |                      |
| US IG                         | -5.8%      | -1.5%     | 2.4%      | 3.9%           | 2.7%       | -0.45                |
| US HY                         | -13.9%     | -3.6%     | 4.2%      | 5.9%           | 7.1%       | -0.55                |
| EUR IG                        | -1.5%      | -0.5%     | 0.5%      | 0.9%           | 2.6%       | -0.27                |
| EUR HY                        | -2.0%      | 0.8%      | 5.0%      | 5.4%           | 5.9%       | 0.14                 |
| Italy 10yr                    | -2.7%      | -2.7%     | -2.7%     | 4.7%           | 9.2%       | -0.38                |
| EM Sovs                       | -8.2%      | -0.3%     | 7.2%      | 4.9%           | 6.7%       | -0.04                |
| US CMBS                       | -4.3%      | -0.8%     | 0.9%      | 2.0%           | 6.5%       | -0.19                |
| <b>Commodities</b>            |            |           |           |                |            |                      |
| Brent                         | 5%         | 17.6%     | 34%       | 25%            | 35%        | 0.59                 |

Source: Note: Brent returns are vs the forward.

Source: Bloomberg, Morgan Stanley Research forecasts

# Morgan Stanley long-run returns forecasts

## Exhibit 83:

Morgan Stanley 10-year expected return forecasts across asset classes

|                                  | 10Y Nominal Expected Rtns |            |              |               |        |         | Risk Premium |        |         |
|----------------------------------|---------------------------|------------|--------------|---------------|--------|---------|--------------|--------|---------|
|                                  | Current                   | (A) Income | (B) Earnings | (C) Repricing | LT Avg | Z-score | Current      | LT Avg | Z-score |
| <b>EQUITIES</b>                  |                           |            |              |               |        |         |              |        |         |
| S&P                              | 5.3                       | 2.6        | 4.5          | -1.7          | 6.4    |         | 2.0          | 2.4    |         |
| MSCI Europe                      | 6.2                       | 3.0        | 5.0          | -1.9          | 6.9    |         | 4.5          | 3.0    |         |
| MSCI UK                          | 7.8                       | 2.8        | 7.5          | -2.4          | 7.3    |         | 5.5          | 2.7    |         |
| MSCI Japan                       | 6.4                       | 2.5        | 0.5          | 3.3           | 5.9    |         | 5.5          | 4.0    |         |
| MSCI EM                          | 9.4                       | 2.6        | 7.1          | -0.4          | 10.1   |         | 6.0          | 5.9    |         |
| <b>REITS</b>                     |                           |            |              |               |        |         |              |        |         |
| US REITs                         | 6.5                       | 3.9        | 2.1          | 0.4           | 8.1    |         | 3.2          | 4.0    |         |
| <b>GOV'T BONDS</b>               |                           |            |              |               |        |         |              |        |         |
| Global Tsy G7                    | 2.2                       | 1.2        | 1.0          | 0.0           | 3.2    |         | 0.1          | 1.2    |         |
| UST 5Y                           | 3.1                       | 2.6        | 0.5          | 0.0           | 3.5    |         | 1.0          | 1.4    |         |
| UST 10Y                          | 3.2                       | 2.8        | 0.4          | 0.0           | 3.9    |         | 1.1          | 1.9    |         |
| DBR 5Y                           | 0.5                       | 0.0        | 0.5          | 0.0           | 2.8    |         | -0.8         | 1.3    |         |
| DBR 10Y                          | 1.3                       | 0.6        | 0.7          | 0.0           | 3.5    |         | 0.0          | 2.0    |         |
| UKT 5Y                           | 1.6                       | 1.1        | 0.5          | 0.0           | 3.7    |         | -1.4         | 0.9    |         |
| UKT 10Y                          | 2.2                       | 1.4        | 0.8          | 0.0           | 4.5    |         | -0.8         | 1.7    |         |
| JGB 5Y                           | 0.3                       | -0.1       | 0.4          | 0.0           | 1.0    |         | -0.2         | 1.0    |         |
| JGB 10Y                          | 0.9                       | 0.1        | 0.8          | 0.0           | 1.9    |         | 0.3          | 1.9    |         |
| <b>FIXED INCOME &amp; CREDIT</b> |                           |            |              |               |        |         |              |        |         |
| USD Agg                          | 3.1                       | 3.1        | -            | 0.1           | 4.0    |         | -0.1         | 0.3    |         |
| USD IG                           | 3.5                       | 3.7        | -            | 0.2           | 4.7    |         | 0.2          | 0.7    |         |
| USD HY                           | 3.5                       | 6.1        | -            | 2.6           | 6.1    |         | 0.3          | 2.4    |         |
| USD BBB                          | 3.7                       | 4.0        | -            | 0.3           | 5.2    |         | 0.4          | 1.1    |         |
| USD BB                           | 3.7                       | 6.1        | -            | 2.3           | 6.3    |         | 0.6          | 2.5    |         |
| EUR Agg                          | 1.7                       | 0.7        | 1.1          | 0.1           | 4.0    |         | 0.7          | 0.9    |         |
| EUR IG                           | 0.7                       | 0.8        | -            | 0.1           | 3.6    |         | 0.1          | 0.7    |         |
| EUR HY                           | 1.0                       | 2.9        | -            | 1.9           | 6.4    |         | 0.5          | 3.6    |         |
| EUR BBB                          | 1.7                       | 1.0        | 0.9          | 0.2           | 4.8    |         | 1.2          | 1.9    |         |
| EUR BB                           | 1.2                       | 2.3        | -            | 1.1           | 5.8    |         | 0.7          | 2.9    |         |
| <b>EM \$ CREDIT</b>              |                           |            |              |               |        |         |              |        |         |
| Global                           | 4.9                       | 5.7        | 0.0          | 0.7           | 7.0    |         | 1.7          | 2.9    |         |
| Asia                             | 5.1                       | 4.5        | 0.7          | 0.1           | 6.7    |         | 1.8          | 2.7    |         |
| Europe                           | 4.1                       | 4.9        | 0.0          | 0.7           | 6.9    |         | 0.9          | 3.0    |         |
| Latam                            | 5.6                       | 6.4        | 0.0          | 0.7           | 7.6    |         | 2.3          | 3.5    |         |

Source: Bloomberg, Morgan Stanley Research forecasts

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