Guide to the Markets

Europe | 1Q 2019 | As of 31 December 2018
Global economy
4. Global growth
5. Global Purchasing Managers’ Index (PMI) for manufacturing
6. Global unemployment
7. Global inflation
8. Global core inflation
9. Global central bank policy
10. Global currencies
11. Global trade
12. Productivity and population growth
13. US GDP
14. US corporates
15. US consumer
16. US labour market
17. US inflation
18. US Federal Reserve policy rate
19. US debt
20. US focus: Fiscal policy and housing activity
21. Eurozone GDP
22. Eurozone corporates
23. Eurozone consumer
24. Eurozone labour market
25. Eurozone unemployment
26. Eurozone inflation
27. European Central Bank policy rate
28. Eurozone debt
29. Eurozone government debt
30. European politics
31. Eurozone focus: Business surveys and oil price impact
32. UK GDP
33. UK consumer
34. UK inflation
35. UK focus: Business expectations and investment intentions
36. Japan GDP
37. Japan inflation
38. China GDP
39. China debt
40. China inflation and policy rates
41. Emerging markets GDP and inflation
42. Emerging markets currencies and current account
43. Emerging markets structural dynamics
44. Emerging markets focus: China infrastructure and business surveys

Equities
45. Global equity earnings and valuations
46. US stock market
47. US earnings
48. US equity macro correlations
49. US equity valuations
50. US valuations and subsequent returns
51. Equities and interest rates
52. US bull and bear markets
53. Equity income
54. US sector returns and valuations
55. Europe earnings
56. Europe equity macro correlations
57. Europe equity market and currency
58. Europe equity valuations
59. Europe large, mid and small capitalisation equities
60. Europe sector returns and valuations
61. UK earnings
62. Japan earnings
63. Japan equity market and currency
64. Japan corporate governance
65. Emerging markets performance and earnings expectations
66. Emerging markets equity drivers
67. Emerging markets equity valuations and subsequent returns
68. Correlation and volatility
69. Equity focus: US corporate behaviour
70. World stock market returns

Fixed income
71. Fixed income yields and interest rate risk
72. Global government bond yields and inflation expectations
73. US yield curve
74. US investment-grade bonds
75. US high yield bonds
76. Europe and UK investment-grade bonds
77. Europe high yield bonds
78. Emerging markets bonds
79. Fixed income focus: Challenges in fixed income
80. Global fixed income spreads and returns

Other assets
81. Commodities
82. Gold
83. Stock-bond correlation and downside protection
84. Alternative investments
85. Sustainable investing
86. Asset markets in coming years

Investing principles
87. Life expectancy
88. Cash investments
89. The power of compounding
90. Annual returns and intra-year declines
91. Impact of being out of the market
92. US asset returns by holding period
93. Asset class returns (EUR)
Global growth

Real GDP growth
% change year on year

The Global Purchasing Managers’ Index (PMI) assesses the economic health of the manufacturing sector by surveying output and employment intentions. A score of 50 indicates that economic activity is neither expanding nor contracting, above 50 indicates expansion. The colours range from red to yellow to green, where red is below 50, yellow is at 50 and green is above 50. Quarterly averages are shown, except the two most recent monthly data points. Past performance is not a reliable indicator of current and future results. Guide to the Markets – Europe. Data as of 31 December 2018.
Global unemployment

Unemployment rates

%

- Eurozone
- UK
- US
- Japan

### Global inflation

#### 2016

<table>
<thead>
<tr>
<th></th>
<th>Dec</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
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<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
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<tbody>
<tr>
<td>Global</td>
<td>2,1</td>
<td>2,4</td>
<td>2,2</td>
<td>2,1</td>
<td>2,1</td>
<td>2,0</td>
<td>1,8</td>
<td>1,8</td>
<td>2,0</td>
<td>2,1</td>
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</tr>
<tr>
<td>Developed</td>
<td>1,5</td>
<td>1,9</td>
<td>2,1</td>
<td>1,8</td>
<td>1,9</td>
<td>1,6</td>
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<td>1,7</td>
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<td>1,8</td>
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<tr>
<td>Emerging</td>
<td>2,9</td>
<td>3,2</td>
<td>2,4</td>
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<td>2,6</td>
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<td>2,6</td>
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#### 2017

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<th>Feb</th>
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<th>Apr</th>
<th>May</th>
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<th>Aug</th>
<th>Sep</th>
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</thead>
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<tr>
<td>Global</td>
<td>1,8</td>
<td>2,3</td>
<td>2,2</td>
<td>2,2</td>
<td>2,4</td>
<td>2,6</td>
<td>2,7</td>
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<td>2,7</td>
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<td>2,8</td>
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<tr>
<td>Developed</td>
<td>1,8</td>
<td>1,8</td>
<td>1,9</td>
<td>1,8</td>
<td>2,2</td>
<td>2,3</td>
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<td>2,3</td>
<td>2,1</td>
<td>2,3</td>
<td>1,9</td>
<td></td>
</tr>
<tr>
<td>Emerging</td>
<td>2,5</td>
<td>3,2</td>
<td>2,8</td>
<td>2,7</td>
<td>2,8</td>
<td>3,1</td>
<td>3,3</td>
<td>3,3</td>
<td>3,6</td>
<td>3,7</td>
<td>3,3</td>
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#### 2018

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<th>Mar</th>
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<th>May</th>
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<td>Emerging</td>
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</tr>
</tbody>
</table>

### Source

- Figures are % change year on year. Heatmap colours are based on the respective central bank target inflation rates. Blue is below target, white is at target and red is above target. Past performance is not a reliable indicator of current and future results. *Guide to the Markets - Europe.* Data as of 31 December 2018.
Global core inflation

Source: Bank of Japan, BLS, Eurostat, ONS, Thomson Reuters Datastream, J.P. Morgan Asset Management. CPI is the Consumer Price Index. Core inflation for the US and Japan is defined as CPI excluding food and energy. Core inflation for the UK and the eurozone is defined as CPI less energy, food, alcohol and tobacco. Japan core CPI has been adjusted down by 2% from April 2014 to March 2015 to remove the estimated impact of the consumption tax hike over this period. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe. Data as of 31 December 2018.
Market expectations for policy rate

<table>
<thead>
<tr>
<th></th>
<th>Dec '18</th>
<th>Dec '19</th>
<th>Dec '20</th>
<th>Dec '21</th>
<th>Dec '22</th>
</tr>
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<tbody>
<tr>
<td>US</td>
<td></td>
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<tr>
<td>UK</td>
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<tr>
<td>Eurozone</td>
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<td>Japan</td>
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<tr>
<td>Switzerland</td>
<td></td>
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</tr>
</tbody>
</table>

Source: (Left) Bloomberg, J.P. Morgan Asset Management. Expectations are calculated using OIS forwards. (Right) Bank of England (BoE), Bank of Japan (BoJ), European Central Bank (ECB), Swiss National Bank (SNB), Thomson Reuters Datastream, US Federal Reserve (Fed), J.P. Morgan Asset Management. *Balance sheet forecast assumptions: BoE to have zero net asset purchases until the end of '19; BoJ to have an annualised net asset purchase pace of 30tn yen until the end of '19; ECB to have zero net asset purchases until the end of '19; SNB to have zero net asset purchases until the end of '19; Fed forecast is based on a monthly reduction of USD 50bn, depending on the monthly maturity schedule of the balance sheet. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe. Data as of 31 December 2018.
Real effective exchange rates
Index level rebased to 100 in 2010, broad real effective exchange rate (REER)

Exports of goods
% of GDP, 2017

<table>
<thead>
<tr>
<th>Country</th>
<th>US</th>
<th>China</th>
<th>EM ex-China</th>
<th>Eurozone</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Eurozone</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Canada</td>
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<tr>
<td>UK</td>
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<tr>
<td>Brazil</td>
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<tr>
<td>India</td>
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<tr>
<td>China</td>
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<tr>
<td>Russia</td>
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<tr>
<td>Mexico</td>
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<tr>
<td>Japan</td>
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<tr>
<td>Korea</td>
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</tbody>
</table>

Global export volumes
% change year on year, three-month moving average

Productivity and population growth

Drivers of US GDP growth
Average % change year on year

<table>
<thead>
<tr>
<th>Period</th>
<th>Growth in workers</th>
<th>Growth in real output per worker</th>
<th>Growth in real GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>'58-'67</td>
<td>4,5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>'68-'77</td>
<td>1,6%</td>
<td>3,2%</td>
<td>2,2%</td>
</tr>
<tr>
<td>'78-'87</td>
<td>1,9%</td>
<td>3,2%</td>
<td>1,3%</td>
</tr>
<tr>
<td>'88-'97</td>
<td>1,4%</td>
<td>3,0%</td>
<td>1,6%</td>
</tr>
<tr>
<td>'98-'07</td>
<td>1,1%</td>
<td>3,0%</td>
<td>1,9%</td>
</tr>
<tr>
<td>'08-'17</td>
<td>1,5%</td>
<td>0,5%</td>
<td>1,0%</td>
</tr>
</tbody>
</table>

Global working-age population growth
Annualised % change

Source: (Left) BEA, BLS, J.P. Morgan Asset Management. GDP drivers are calculated as the average annualised growth between 4Q of the first and last year.
(Right) United Nations (UN) Department of Economic and Social Affairs, J.P. Morgan Asset Management. Working-age population is defined as aged 15-69. Data from 2020 onwards are UN forecasts. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe.
Data as of 31 December 2018.
**Contribution to US real GDP growth and ISM manufacturing**

% change year on year (LHS); index level (RHS)

Source: BEA, ISM, Thomson Reuters Datastream, J.P. Morgan Asset Management. The Institute for Supply Management (ISM) survey assesses the economic health of the manufacturing sector by surveying output and employment intentions. A score of 50 indicates that economic activity is neither expanding nor contracting, above 50 indicates expansion. ISM data is shown with quarterly frequency. Past performance is not a reliable indicator of current and future results.

US future capex intentions and business investment

Index level (LHS); % change year on year (RHS)

Future capex intentions

Business investment

US consumer confidence

Index level

US house prices relative to income

Index level

US labour market

**US unemployment rate and wage growth**

<table>
<thead>
<tr>
<th>Year</th>
<th>Unemployment</th>
<th>Wage growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>3.7%</td>
<td>3.2%</td>
</tr>
</tbody>
</table>

US inflation

US headline and core inflation
% change year on year

<table>
<thead>
<tr>
<th></th>
<th>Average since 2000</th>
<th>November 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headline CPI</td>
<td>2,2%</td>
<td>2,2%</td>
</tr>
<tr>
<td>Core CPI</td>
<td>2,0%</td>
<td>2,2%</td>
</tr>
</tbody>
</table>

US core goods and services inflation
% change year on year

<table>
<thead>
<tr>
<th></th>
<th>Average since 2000</th>
<th>November 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Services CPI</td>
<td>2,8%</td>
<td>2,7%</td>
</tr>
<tr>
<td>Core goods CPI</td>
<td>0,0%</td>
<td>0,2%</td>
</tr>
</tbody>
</table>

Source: (All charts) BLS, Thomson Reuters Datastream, J.P. Morgan Asset Management. CPI is the Consumer Price Index. Core CPI is defined as CPI excluding food and energy. Core goods CPI is defined as goods CPI excluding food and energy. Past performance is not a reliable indicator of current and future results.

Federal funds policy rate expectations
% Fed funds rate, FOMC and market expectations

FOMC December 2018 forecasts* (%)

<table>
<thead>
<tr>
<th></th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in real GDP, 4Q to 4Q</td>
<td>3.0</td>
<td>2.3</td>
<td>2.0</td>
<td>1.8</td>
</tr>
<tr>
<td>Unemployment rate, 4Q</td>
<td>3.7</td>
<td>3.5</td>
<td>3.6</td>
<td>3.8</td>
</tr>
<tr>
<td>PCE inflation, 4Q to 4Q</td>
<td>1.9</td>
<td>1.9</td>
<td>2.1</td>
<td>2.1</td>
</tr>
</tbody>
</table>

US debt

**US debt to GDP ratios**

- % of nominal GDP

**US debt service ratios**

- % of disposable income

Source: (All charts) Bank for International Settlements, Thomson Reuters Datastream, J.P. Morgan Asset Management. Debt refers to gross debt. For the household sector, gross disposable income is the amount of money that all of the individuals in the household sector have available for spending or saving after income distribution measures (for example, taxes, social contributions and benefits) have taken effect. For the non-financial corporate sector, gross disposable income is essentially akin to gross operating surplus before dividends or interest is paid. Periods of “recession” are defined using US National Bureau of Economic Research (NBER) business cycle dates. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe. Data as of 31 December 2018.
**US focus: Fiscal policy and housing activity**

**Contribution of fiscal spending to US real GDP growth**

% points contribution to real GDP, quarter on quarter annualised

**US housing starts and NAHB housing market index**

Thousands, annualised (LHS); index level (RHS)

Contribution to eurozone real GDP growth and composite PMI
% change year on year (LHS); index level (RHS)

Source: Eurostat, Markit, Thomson Reuters Datastream, J.P. Morgan Asset Management. PMI is Purchasing Managers’ Index where a score of 50 indicates that economic activity is neither expanding nor contracting, above 50 indicates expansion. PMI data is shown with quarterly frequency. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe. Data as of 31 December 2018.
Eurozone future capex intentions and business investment

Index level, 4Q moving average (LHS); % change year on year (RHS)

Data as of 31 December 2018.
Eurozone consumer confidence

Index level

Recession

Eurozone house prices relative to income

Index level

Spain
France
Italy
Germany


Eurozone labour market

Eurozone unemployment rate and wage growth

% wage growth is year on year

Germany, France, Italy and Spain unemployment rates

Eurozone headline and core inflation

% change year on year

<table>
<thead>
<tr>
<th></th>
<th>Average since 2000</th>
<th>November 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headline CPI</td>
<td>1,7%</td>
<td>1,9%</td>
</tr>
<tr>
<td>Core CPI</td>
<td>1,4%</td>
<td>1,0%</td>
</tr>
</tbody>
</table>

Source: (All charts) Eurostat, Thomson Reuters Datastream, J.P. Morgan Asset Management. CPI is the Consumer Price Index. Core CPI is defined as CPI less energy, food, alcohol and tobacco. Core goods CPI is defined as goods CPI less energy, alcohol and tobacco. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe. Data as of 31 December 2018.

Eurozone core goods and services inflation

% change year on year

<table>
<thead>
<tr>
<th></th>
<th>Average since 2000</th>
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<tr>
<td>Core goods CPI</td>
<td>0,6%</td>
<td>0,4%</td>
</tr>
</tbody>
</table>
The Eurozone economy has experienced growth driven by internal demand, with the recent expansion being supported by the low interest rates set by the European Central Bank (ECB). This has not only helped to support real GDP growth, but also to keep unemployment rates relatively low. Over the next few years, economists think that this trend will continue. The future of the Eurozone economy will be greatly influenced by the recent shifts in global trade and the impact that these will have on international demand. European Central Bank (ECB) policymakers have been monitoring these developments closely and will respond accordingly, if necessary. ECB policymaker Gertjan Vlieghe has expressed his concern about the risk of global economic over-stimulating. Vlieghe has also mentioned that global trade tensions have the potential to dampen global growth. However, there have been some positive developments on the trade front. The US and China have reached a phase one trade deal, which is expected to benefit the global economy. This is a positive sign for the Eurozone economy, as global trade is important for the region.

Eurozone debt

Eurozone debt to GDP ratios
% of nominal GDP

Source: (All charts) Bank for International Settlements, Thomson Reuters Datastream, J.P. Morgan Asset Management. Debt refers to gross debt. Debt service ratios are a GDP-weighted average of France, Germany, Italy and Spain. For the household sector, gross disposable income is the amount of money that all of the individuals in the household sector have available for spending or saving after income distribution measures (for example, taxes, social contributions and benefits) have taken effect. For the non-financial corporate sector, gross disposable income is essentially akin to gross operating surplus before dividends or interest is paid. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe. Data as of 31 December 2018.
France, Germany, Italy and Spain government debt to GDP

% of nominal GDP

European politics

Eurozone real GDP levels
Index level rebased to 100 in 1999

Survey results: Do you support the euro?
% answering “yes”

Eurozone focus: Business surveys and oil price impact

Eurozone PMIs
Index level

France composite PMI
Italy composite PMI
Eurozone manufacturing PMI: New export orders

Eurozone consumption and Brent oil price
% change quarter on quarter (LHS); oil price in euros (RHS inverted)

Consumption
Brent oil in EUR (inverted)

UK GDP

Contribution to UK real GDP growth and composite PMI

% change year on year (LHS); index level (RHS)

Source: Markit, ONS, Thomson Reuters Datastream, J.P. Morgan Asset Management. PMI is Purchasing Managers’ Index where a score of 50 indicates that economic activity is neither expanding nor contracting, above 50 indicates expansion. PMI data is shown with quarterly frequency. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe. Data as of 31 December 2018.
UK consumer confidence
Index level, 3-month moving average

Recession

UK house prices relative to income
Index level


Data as of 31 December 2018.
UK inflation

**UK headline and core inflation**

<table>
<thead>
<tr>
<th>% change year on year</th>
<th>Average since 2000</th>
<th>November 2018</th>
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</thead>
<tbody>
<tr>
<td>Headline CPI</td>
<td>2.1%</td>
<td>2.3%</td>
</tr>
<tr>
<td>Core CPI</td>
<td>1.7%</td>
<td>1.8%</td>
</tr>
</tbody>
</table>

**UK core goods and services inflation**

<table>
<thead>
<tr>
<th>% change year on year</th>
<th>Average since 2000</th>
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</thead>
<tbody>
<tr>
<td>Services CPI</td>
<td>3.4%</td>
<td>2.5%</td>
</tr>
<tr>
<td>Core goods CPI</td>
<td>-0.8%</td>
<td>0.9%</td>
</tr>
</tbody>
</table>

Source: (All charts) ONS, Thomson Reuters Datastream, J.P. Morgan Asset Management. CPI is the Consumer Price Index. Core CPI is defined as CPI less energy, food, alcohol and tobacco. Core goods CPI is defined as goods CPI less energy, food, alcohol and tobacco. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe. Data as of 31 December 2018.
UK focus: Business expectations and investment intentions

UK manufacturing and services expectations

Index level

Contribution to Japan real GDP growth and composite PMI
% change year on year (LHS); index level (RHS)

Source: Japan Cabinet Office, Markit, Thomson Reuters Datastream, J.P. Morgan Asset Management. PMI is Purchasing Managers’ Index where a score of 50 indicates that economic activity is neither expanding nor contracting, above 50 indicates expansion. PMI data is shown with quarterly frequency. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe. Data as of 31 December 2018.
Japan inflation

**Japan headline and core inflation**

<table>
<thead>
<tr>
<th>% change year on year</th>
<th>Average since 2000</th>
<th>November 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headline CPI</td>
<td>0.1%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Core CPI</td>
<td>-0.1%</td>
<td>0.3%</td>
</tr>
</tbody>
</table>

**Headline inflation target**

Source: (All charts) Japan Ministry of Internal Affairs & Communications, Thomson Reuters Datastream, J.P. Morgan Asset Management. CPI is the Consumer Price Index. Core CPI is defined as CPI excluding food and energy. Core goods CPI is defined as goods CPI excluding food and energy. Increase in Japan inflation measures between 2014 and 2016 can be attributed to the impact of the consumption tax hike over this period. Past performance is not a reliable indicator of current and future results. *Guide to the Markets - Europe*. Data as of 31 December 2018.
China GDP

Contribution to China real GDP growth
% change year on year

<table>
<thead>
<tr>
<th>3Q 2018</th>
<th>2019 consensus forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP growth</td>
<td>6.5%</td>
</tr>
<tr>
<td>Investment</td>
<td></td>
</tr>
<tr>
<td>Consumption</td>
<td></td>
</tr>
<tr>
<td>Net exports</td>
<td></td>
</tr>
</tbody>
</table>


China debt to GDP ratios

% of nominal GDP

- Non-financial corporates
- Government
- Households

Source: (Left) Bank for International Settlements, Thomson Reuters Datastream, J.P. Morgan Asset Management. Debt refers to gross debt. (Right) People’s Bank of China (PBoC), J.P. Morgan Asset Management. The broad credit measure consists of all reported bank claims on the domestic economy, plus bankers’ acceptances, entrusted loans, trust loans, new net corporate bond and non-financial equity financing, issuance of asset-backed securities and interbank loans. Total social financing is a measure of total funds provided to the economy, tabulated from bank loans to individuals and corporations, as well as equity and bond financing to non-financial corporations. RMB bank lending is the sum of all bank-reported claims on domestic borrowers. Past performance is not a reliable indicator of current and future results.

China inflation and policy rates

**China inflation**

% change year on year

<table>
<thead>
<tr>
<th></th>
<th>Average since 2007</th>
<th>November 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headline CPI*</td>
<td>2.8%</td>
<td>2.2%</td>
</tr>
<tr>
<td>Core CPI</td>
<td>1.3%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Headline PPI**</td>
<td>1.2%</td>
<td>2.7%</td>
</tr>
</tbody>
</table>

**China interbank rate and reserve requirement ratio (RRR)**

% rate

Source: (Left) Bloomberg, Thomson Reuters Datastream, J.P. Morgan Asset Management. *CPI is the Consumer Price Index. Core CPI is defined as CPI excluding food and energy. **PPI is the Producer Price Index. (Right) PBoC, Thomson Reuters Datastream, J.P. Morgan Asset Management. Average RRR for large and small banks. SHIBOR is the 3-month interbank rate. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe.

Data as of 31 December 2018.
Emerging markets GDP and inflation

Source: (All charts) IMF, national statistics agencies, J.P. Morgan Securities Research, J.P. Morgan Asset Management. Other EM countries are China, India, Malaysia, Mexico, Philippines, Poland, Romania, Thailand, Turkey, Vietnam. Commodity countries are Argentina, Brazil, Chile, Colombia, Indonesia, Kazakhstan, Peru, Russia, South Africa, Venezuela. GDP and inflation aggregates are calculated using a GDP-weighted average. Forecasts are from J.P. Morgan Securities Research. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe. Data as of 31 December 2018.
Emerging markets currencies and current account

**EM currencies vs. US dollar**

- % from fair value, relative to US dollar
- EM currencies expensive relative to USD

**EM current account balance**

- % of GDP
- EM current account balance improving

Source: (Left) J.P. Morgan Asset Management. Fair value is based on nominal exchange rates relative to PPP exchange rates and adjusted for GDP per capita.
Emerging markets structural dynamics

Urbanisation and economic growth
Urbanisation rates, %, and GDP per capita, USD, 1960-2017


Share of global real GDP

Emerging markets focus: China infrastructure and business surveys

**China fixed asset investment: Infrastructure**
% change year on year, three-month moving average

**China manufacturing PMI: New orders**
Index level

Global equity earnings and valuations

Global earnings per share
NTM EUR earnings per share estimates, rebased to 100 in Jan 2009

Global forward price-to-earnings ratios
x, multiple

Data as of 31 December 2018.
S&P 500 earnings and performance

Next 12 months’ earnings per share estimates (LHS); index level (RHS)

S&P 500 earnings per share growth

% change year on year

Source: (All charts) IBES, Standard & Poor’s, Thomson Reuters Datastream, J.P. Morgan Asset Management. EPS is earnings per share. Expected earnings growth and delivered earnings growth are calculated using IBES consensus estimates for next 12 months’ EPS and last 12 months’ EPS, respectively. Year on year growth rates are calculated using year-end data. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe. Data as of 31 December 2018.
US equity macro correlations

**Leading economic indicator vs. S&P 500 performance**

Index level

- S&P 500 index level
- Leading economic indicator
- Recession

**Initial jobless claims vs. S&P 500 performance**

Index level (LHS); thousands, three-month moving average (RHS)

- S&P 500 index level
- Initial jobless claims

US equity valuations

S&P 500 forward P/E ratio

<table>
<thead>
<tr>
<th>Valuation measure</th>
<th>Average since 1990</th>
<th>Latest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shiller cyclically-adjusted P/E ratio</td>
<td>25.7x</td>
<td>29.0x</td>
</tr>
<tr>
<td>P/B ratio</td>
<td>2.9x</td>
<td>2.9x</td>
</tr>
</tbody>
</table>

US valuations and subsequent returns

Forward P/E ratios and subsequent 1-year returns

Forward P/E ratios and subsequent 10-year returns

Equities and interest rates

US Fed funds rate and equities/government bonds relative performance
% (LHS); relative total return index level, rebased to 100 in 1997 (RHS)

## Characteristics of past bear and bull markets*

<table>
<thead>
<tr>
<th>Market corrections</th>
<th>Bear markets</th>
<th>Bull markets</th>
<th>Return before peak</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Market peak</strong></td>
<td><strong>Bear return</strong></td>
<td><strong>Duration (months)</strong></td>
<td><strong>Bull start date</strong></td>
</tr>
<tr>
<td>1 Crash of 1929 – excessive leverage, irrational exuberance</td>
<td>Sep 1929</td>
<td>-86%</td>
<td>33</td>
</tr>
<tr>
<td>2 1937 Fed Tightening – premature policy tightening</td>
<td>Mar 1937</td>
<td>-60%</td>
<td>63</td>
</tr>
<tr>
<td>3 Post WWII crash – post-war demobilisation, recession fears</td>
<td>May 1946</td>
<td>-30%</td>
<td>37</td>
</tr>
<tr>
<td>4 Flash crash of 1962 – flash crash, Cuban Missile Crisis</td>
<td>Dec 1961</td>
<td>-28%</td>
<td>7</td>
</tr>
<tr>
<td>5 Tech crash of 1970 – economic overheating, civil unrest</td>
<td>Nov 1968</td>
<td>-36%</td>
<td>18</td>
</tr>
<tr>
<td>6 Stagflation – OPEC oil embargo</td>
<td>Jan 1973</td>
<td>-48%</td>
<td>21</td>
</tr>
<tr>
<td>7 Volcker Tightening – campaign against inflation</td>
<td>Nov 1980</td>
<td>-27%</td>
<td>21</td>
</tr>
<tr>
<td>8 1987 crash – programme trading, overheating markets</td>
<td>Aug 1987</td>
<td>-34%</td>
<td>3</td>
</tr>
<tr>
<td>9 Tech bubble – extreme valuations, “dot com” boom/bust</td>
<td>Mar 2000</td>
<td>-49%</td>
<td>31</td>
</tr>
<tr>
<td>10 Global Financial Crisis – leverage/housing, Lehman collapse</td>
<td>Oct 2007</td>
<td>-57%</td>
<td>17</td>
</tr>
</tbody>
</table>

**MEDIAN**

- -42\% | 21 | 158\% | 61 | 27\% | 39\% |

---

* A bear market represents a 20% or more decline from the previous market high using a monthly frequency; a bull market represents a 20% increase from a market trough. Periods of “recession” are defined using US National Bureau of Economic Research (NBER) business cycle dates. Chart and table show price return. Median values are calculated excluding data from current cycle.

Equity income

S&P 500 total return index: Dividends and capital appreciation
%

0 10 20


Equities

Sources of income
%

0 2 4 6 8

Eurozone average inflation: 1.9% (12 months to November 2018)

### US sector returns and valuations

#### S&P 500 Index

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>S&amp;P 500 weight</td>
<td>13.3%</td>
<td>2.7%</td>
<td>3.0%</td>
<td>9.2%</td>
<td>9.9%</td>
<td>20.1%</td>
<td>5.3%</td>
<td>10.1%</td>
<td>15.5%</td>
<td>7.4%</td>
<td>3.3%</td>
<td>100%</td>
</tr>
<tr>
<td>Russell Growth weight</td>
<td>4.4%</td>
<td>1.8%</td>
<td>2.3%</td>
<td>11.8%</td>
<td>15.1%</td>
<td>31.5%</td>
<td>0.8%</td>
<td>11.9%</td>
<td>14.3%</td>
<td>6.0%</td>
<td>0.0%</td>
<td>100%</td>
</tr>
<tr>
<td>Russell Value weight</td>
<td>22.5%</td>
<td>4.1%</td>
<td>4.9%</td>
<td>7.4%</td>
<td>5.2%</td>
<td>9.3%</td>
<td>9.3%</td>
<td>7.3%</td>
<td>15.7%</td>
<td>7.8%</td>
<td>6.5%</td>
<td>100%</td>
</tr>
</tbody>
</table>

#### Performance since 4Q 2018 and 2018

- **4Q 2018**:
  - -13.1% Financials
  - -12.3% Materials
  - -3.8% Real Estate
  - -17.3% Industrials
  - -16.4% Cons. Discr.
  - -17.3% Tech
  - -23.8% Energy
  - -13.2% Comm. Services*
  - -8.7% Health Care
  - -5.2% Cons. Staples
  - 1.4% Utilities
  - -13.5% S&P 500

- **2018**:
  - -13.0% Financials
  - -14.7% Materials
  - -2.2% Real Estate
  - -13.3% Industrials
  - 0.8% Cons. Discr.
  - -0.3% Tech
  - -18.1% Energy
  - -12.5% Comm. Services*
  - 6.5% Health Care
  - -8.4% Cons. Staples
  - 4.1% Utilities
  - -4.4% S&P 500

#### Performance since market peak and low

- **Since market peak**:
  - 3.3% Financials
  - 50.7% Materials
  - 63.7% Real Estate
  - 85.3% Industrials
  - 212.4% Cons. Discr.
  - 198.2% Tech
  - -4.8% Energy
  - 35.1% Comm. Services*
  - 195.7% Health Care
  - 147.9% Cons. Staples
  - 98.8% Utilities
  - 103.7% S&P 500

- **Since market low**:
  - 463.7% Financials
  - 259.0% Materials
  - 506.9% Real Estate
  - 409.3% Industrials
  - 623.1% Cons. Discr.
  - 524.7% Tech
  - 74.4% Energy
  - 158.0% Comm. Services*
  - 376.7% Health Care
  - 247.7% Cons. Staples
  - 248.0% Utilities
  - 355.2% S&P 500

#### Beta to S&P 500

<table>
<thead>
<tr>
<th>Sector</th>
<th>4Q 2018</th>
<th>2018</th>
<th>Forward P/E ratio</th>
<th>Average since 1996</th>
<th>Trailing P/E ratio</th>
<th>Average since 1996</th>
<th>Dividend yield</th>
<th>Average since 1996</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financials</td>
<td>1.41</td>
<td>1.27</td>
<td>1.12</td>
<td>1.25</td>
<td>1.12</td>
<td>1.02</td>
<td>0.91*</td>
<td>0.78</td>
</tr>
<tr>
<td>Materials</td>
<td>10.4x</td>
<td>13.5x</td>
<td>16.5x</td>
<td>13.6x</td>
<td>18.3x</td>
<td>15.1x</td>
<td>13.7x</td>
<td>15.7x</td>
</tr>
<tr>
<td>Real Estate</td>
<td>12.8x</td>
<td>13.9x</td>
<td>15.3x</td>
<td>16.2x</td>
<td>17.8x</td>
<td>20.4x</td>
<td>17.5x</td>
<td>18.2x*</td>
</tr>
<tr>
<td>Industrials</td>
<td>11.4x</td>
<td>14.3x</td>
<td>17.1x</td>
<td>15.0x</td>
<td>20.1x</td>
<td>16.1x</td>
<td>14.7x</td>
<td>16.6x</td>
</tr>
<tr>
<td>Cons. Discr.</td>
<td>15.4x</td>
<td>16.6x</td>
<td>16.3x</td>
<td>18.0x</td>
<td>20.3x</td>
<td>23.9x</td>
<td>21.2x</td>
<td>20.2x*</td>
</tr>
<tr>
<td>Tech</td>
<td>11,4x</td>
<td>13,9x</td>
<td>15,3x</td>
<td>16,2x</td>
<td>17,8x</td>
<td>20,4x</td>
<td>17,5x</td>
<td>18,2x*</td>
</tr>
<tr>
<td>Energy</td>
<td>12,8x</td>
<td>13,9x</td>
<td>15,3x</td>
<td>16,2x</td>
<td>17,8x</td>
<td>20,4x</td>
<td>17,5x</td>
<td>18,2x*</td>
</tr>
<tr>
<td>Comm. Services*</td>
<td>2,6%</td>
<td>2,5%</td>
<td>3,8%</td>
<td>2,3%</td>
<td>1,5%</td>
<td>1,9%</td>
<td>3,9%</td>
<td>1,7%</td>
</tr>
<tr>
<td>Health Care</td>
<td>2,3%</td>
<td>2,6%</td>
<td>4,4%</td>
<td>2,1%</td>
<td>1,5%</td>
<td>0,9%</td>
<td>2,4%</td>
<td>1,7%*</td>
</tr>
<tr>
<td>Cons. Staples</td>
<td>2,3%</td>
<td>2,6%</td>
<td>4,4%</td>
<td>2,1%</td>
<td>1,5%</td>
<td>0,9%</td>
<td>2,4%</td>
<td>1,7%*</td>
</tr>
<tr>
<td>Utilities</td>
<td>2,3%</td>
<td>2,6%</td>
<td>4,4%</td>
<td>2,1%</td>
<td>1,5%</td>
<td>0,9%</td>
<td>2,4%</td>
<td>1,7%</td>
</tr>
<tr>
<td>S&amp;P 500</td>
<td>2,3%</td>
<td>2,6%</td>
<td>4,4%</td>
<td>2,1%</td>
<td>1,5%</td>
<td>0,9%</td>
<td>2,4%</td>
<td>1,7%</td>
</tr>
</tbody>
</table>

Source: FactSet, Russell Investment Group, Standard & Poor’s, J.P. Morgan Asset Management. All calculations are cumulative total return in USD, not annualised, including dividends for the stated period. *Communication Services (formerly Telecom) averages are based on five years of backtested data by JPMAM. **Since market peak** represents period 9 October 2007 to end of last quarter. ***Since market low** represents period 9 March 2009 to end of last quarter. Forward P/E ratio is a bottom-up calculation based on the most recent S&P 500 Index price, divided by consensus estimates for earnings in the next 12 months (NTM), and is provided by FactSet Market Aggregates. Trailing P/E ratios are bottom-up values defined as month-end price divided by the last 12 months of available reported earnings from brokers. Dividend yield is calculated as the next 12-month consensus dividend divided by most recent price. Averages are since 1996 due to data availability. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe. Data as of 31 December 2018.
MSCI Europe earnings and performance
Next 12 months' earnings per share estimates (LHS); index level (RHS)

MSCI Europe earnings per share growth
% change year on year

Source: (All charts) IBES, MSCI, Thomson Reuters Datastream, J.P. Morgan Asset Management. EPS is earnings per share. Expected earnings growth and delivered earnings growth are calculated using IBES consensus estimates for next 12 months' EPS and last 12 months' EPS, respectively. Year on year growth rates are calculated using year-end data. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe.
Data as of 31 December 2018.
Europe equity macro correlations

MSCI Europe and composite PMI
Index level

MSCI Europe and consumer confidence
Index level

Europe equity market and currency

**MSCI Europe vs. the euro**
Index level (LHS); US dollars per euro (RHS)

Europe equity valuations

MSCI Europe forward P/E ratio

<table>
<thead>
<tr>
<th>Valuation measure</th>
<th>Average since 1990</th>
<th>Latest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cyclically-adjusted P/E ratio</td>
<td>19.4x</td>
<td>16.4x</td>
</tr>
<tr>
<td>P/B ratio</td>
<td>2.1x</td>
<td>1.6x</td>
</tr>
</tbody>
</table>

Average: 14.4x

31 December 2018: 12.0x

MSCI Europe large, mid and small cap performance
Index level, rebased to 100 in 2000


<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>MSCI Europe weight</td>
<td>18,9%</td>
<td>13,1%</td>
<td>14,1%</td>
<td>9,1%</td>
<td>12,8%</td>
<td>7,5%</td>
<td>8,3%</td>
<td>5,3%</td>
<td>4,2%</td>
<td>5,2%</td>
<td>100%</td>
</tr>
<tr>
<td>Growth weight</td>
<td>4,2%</td>
<td>16,0%</td>
<td>24,7%</td>
<td>12,0%</td>
<td>20,7%</td>
<td>6,9%</td>
<td>1,9%</td>
<td>2,7%</td>
<td>1,1%</td>
<td>9,3%</td>
<td>100%</td>
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<tr>
<td>Value weight</td>
<td>33,6%</td>
<td>10,2%</td>
<td>3,5%</td>
<td>6,2%</td>
<td>5,0%</td>
<td>8,1%</td>
<td>14,8%</td>
<td>8,0%</td>
<td>7,4%</td>
<td>1,0%</td>
<td>100%</td>
</tr>
<tr>
<td>4Q 2018</td>
<td>-13,6</td>
<td>-6,5</td>
<td>-7,1</td>
<td>-14,5</td>
<td>-15,1</td>
<td>-14,6</td>
<td>-14,2</td>
<td>4,5</td>
<td>2,0</td>
<td>-15,8</td>
<td>-11,2</td>
</tr>
<tr>
<td>2018</td>
<td>-18,6</td>
<td>-0,7</td>
<td>-8,9</td>
<td>-13,7</td>
<td>-12,5</td>
<td>-13,4</td>
<td>0,8</td>
<td>-8,4</td>
<td>4,0</td>
<td>-6,6</td>
<td>-10,0</td>
</tr>
<tr>
<td>Since market peak***</td>
<td>-34,6</td>
<td>111,5</td>
<td>127,0</td>
<td>69,0</td>
<td>35,0</td>
<td>17,9</td>
<td>45,0</td>
<td>41,6</td>
<td>12,7</td>
<td>34,9</td>
<td>28,0</td>
</tr>
<tr>
<td>Since market low****</td>
<td>188,7</td>
<td>208,5</td>
<td>226,2</td>
<td>279,1</td>
<td>235,6</td>
<td>176,7</td>
<td>110,5</td>
<td>104,1</td>
<td>90,1</td>
<td>241,1</td>
<td>179,2</td>
</tr>
</tbody>
</table>

**Source:** MSCI, Thomson Reuters Datastream, J.P Morgan Asset Management. All calculations are total return in local currency, not annualised. Technology and Communication Services have forward and trailing P/E averages since 2005 due to data availability. *Financials no longer includes real estate, which is now a separate section making up 2.3% of the MSCI Europe Value index and 0.6% of the MSCI Europe growth index. It is not included in the chart due to a lack of historical data for the sector.**Telecommunication Services was renamed as Communication Services in December 2018 and reconstituted along with Technology and Consumer Discretionary sectors. ***“Since market peak” represents period 9 October 2007 to end of latest quarter. ****“Since market low” represents period 9 March 2009 to end of latest quarter. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe. Data as of 31 December 2018.
UK earnings

FTSE All-Share earnings and performance
Next 12 months’ earnings per share estimates (LHS); index level (RHS)

FTSE All-Share earnings per share growth
% change year on year

Source: (All charts) FTSE, IBES, Thomson Reuters Datastream, J.P. Morgan Asset Management. EPS is earnings per share. Expected earnings growth and delivered earnings growth are calculated using IBES consensus estimates for next 12 months’ EPS and last 12 months’ EPS, respectively. Year on year growth rates are calculated using year-end data. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe.

Data as of 31 December 2018.
Japan earnings

TOPIX earnings and performance
Index level, next 12 months’ earnings estimates (LHS); index level (RHS)

TOPIX index level
TOPIX EPS

Source: (All charts) IBES, Thomson Reuters Datastream, TOPIX, J.P. Morgan Asset Management. EPS is earnings per share. Expected earnings growth and delivered earnings growth are calculated using IBES consensus estimates for next 12 months’ EPS and last 12 months’ EPS, respectively. Year on year growth rates are calculated using year-end data, which is on 31 March for Japan, with the calendar year continuing until 31 March of the following year. Past performance is not a reliable indicator of current and future results. *Guide to the Markets - Europe.* Data as of 31 December 2018.
Japan equity market and currency

TOPIX vs. the yen
Index level (LHS); Japanese yen per US dollar (RHS)

Japan corporate profits and return on equity

% of GDP (LHS); % (RHS)


Data as of 31 December 2018.
Emerging markets performance and earnings expectations

**EM vs. DM growth and equity performance**

- EM minus DM GDP growth
- EM growth & equity outperformance

<table>
<thead>
<tr>
<th>'97</th>
<th>'99</th>
<th>'01</th>
<th>'03</th>
<th>'05</th>
<th>'07</th>
<th>'09</th>
<th>'11</th>
<th>'13</th>
<th>'15</th>
<th>'17</th>
<th>'19</th>
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</tr>
</tbody>
</table>


**EM earnings expectations by region**

Consensus EPS for next 12 months, US dollar, rebased to 100 in 2006

- EM Asia
- EM Europe
- EM Latin America

MSCI EM / MSCI DM

Equities
Emerging markets equity drivers

**EM equity relative performance and commodities**
Relative index level rebased to 100 in 1997 (LHS); index level (RHS)

- MSCI EM / MSCI DM
- CRB Commodity Index

- EM equity outperformance & commodity prices rising

**Relative EM / DM equity performance and USD REER**
Relative index level rebased to 100 in 1997 (LHS); index level (RHS)

- MSCI EM / MSCI DM
- USD REER (inverted)

- EM equity outperformance & USD weakening

Emerging markets equity valuations and subsequent returns

MSCI EM price-to-book ratio

- Average: 1.8x
- 31 December 2018: 1.5x

MSCI EM price-to-book ratio and subsequent 10-year returns

- %, annualised total return*
- Current level

Source: (All charts) MSCI, Thomson Reuters Datastream, J.P. Morgan Asset Management. *Dots represent monthly data points since 1996, which is earliest available.
MSCI EM index returns are in USD. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe.
Data as of 31 December 2018.
Correlation and volatility

Cross country equity index correlation
% rolling six-month average pairwise correlations

VIX volatility index
Index level, implied volatility of S&P 500 Index based on options pricing


Data as of 31 December 2018.
**Equity focus: US corporate behaviour**

### S&P 500: Announced share buybacks

USD billions, cumulative

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<th>200</th>
<th>300</th>
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</table>

Source: (Left) Bloomberg, Compustat, FactSet, Standard & Poor’s, J.P. Morgan Asset Management. Buybacks are based on company announcements year to date.

### S&P 500: Uses of cash

USD billions

- **Share buybacks**
- **Dividends**
- **Acquisitions**
- **Research & development**
- **Capital expenditure**

Data as of 31 December 2018.
### World stock market returns

**Source:** MSCI, Standard & Poor's, Thomson Reuters Datastream, TOPIX, J.P. Morgan Asset Management. Annualised return covers the period 2009 to 2018. HDY Equity: MSCI AC World High Dividend Yield Index; Small Cap: MSCI The World Small Cap Index. Hypothetical portfolio (for illustrative purposes only and should not be taken as a recommendation): 30% Europe; 20% S&P 500; 15% EM; 10% Asia ex-Japan; 10% TOPIX; 10% HDY equity and 5% small cap. All indices are total return. Past performance is not a reliable indicator of current and future results. *Guide to the Markets - Europe.* Data as of 31 December 2018.

<table>
<thead>
<tr>
<th>Year</th>
<th>EUR</th>
<th>Local</th>
<th>10-yr ann.</th>
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</thead>
<tbody>
<tr>
<td>2009</td>
<td>73.5% MSCI EM 62.8%</td>
<td>67.2% Asia ex-Jp 67.2%</td>
<td>15.4% US S&amp;P 500 13.1%</td>
</tr>
<tr>
<td>2010</td>
<td>35.4% Small Cap 24.4%</td>
<td>28.3% Asia ex-Jp 15.6%</td>
<td>40.2% Small Cap 14.0%</td>
</tr>
<tr>
<td>2011</td>
<td>35.4% US S&amp;P 500 21.1%</td>
<td>3.5% HDY Equity 1.5%</td>
<td>40.2% Small Cap 14.0%</td>
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<tr>
<td>2012</td>
<td>20.8% Asia ex-Jp 19.7%</td>
<td>18.1% Europe 16.4%</td>
<td>27.5% MSCI EM 14.4%</td>
</tr>
<tr>
<td>2013</td>
<td>27.2% Small Cap 35.8%</td>
<td>26.7% US S&amp;P 500 32.4%</td>
<td>16.8% MSCI EM 17.4%</td>
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<tr>
<td>2014</td>
<td>29.5% US S&amp;P 500 13.7%</td>
<td>19.7% Asia ex-Jp 7.7%</td>
<td>21.5% TOPIX 54.4%</td>
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<td>2015</td>
<td>29.5% US S&amp;P 500 13.7%</td>
<td>12.9% US S&amp;P 500 1.4%</td>
<td>16.5% Small Cap 6.8%</td>
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<td>2016</td>
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<td>15.3% US S&amp;P 500 12.0%</td>
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<td>2017</td>
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<td>4Q18</td>
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<td>-6.8% HDY Equity -7.7%</td>
<td>-6.9% Portfolio -9.1%</td>
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<tr>
<td>10-yr ann.</td>
<td>15.4% US S&amp;P 500 13.1%</td>
<td>14.7% Small Cap 13.0%</td>
<td>12.6% Asia ex-Jp 10.5%</td>
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<th>Local</th>
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<td>2009</td>
<td>37.6% Portfolio 35.8%</td>
<td>34.0% HDY Equity 30.2%</td>
<td>11.8% HDY Equity 10.3%</td>
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<tr>
<td>2010</td>
<td>23.9% TOPIX 1.0%</td>
<td>23.1% US S&amp;P 500 15.1%</td>
<td>32.6% Europe 28.6%</td>
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<td>2011</td>
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<td>-7.5% Europe -8.8%</td>
<td>32.6% Europe 28.6%</td>
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<td>2012</td>
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<td>20.9% Portfolio 11.1%</td>
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<td>15.3% Portfolio 23.6%</td>
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<td>16.2% HDY Equity 8.7%</td>
<td>15.3% Portfolio 8.2%</td>
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<tr>
<td>2015</td>
<td>14.3% HDY Equity 13.1%</td>
<td>8.3% Portfolio 1.9%</td>
<td>11.8% MSCI EM 5.6%</td>
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<tr>
<td>2016</td>
<td>10.1% Portfolio 9.0%</td>
<td>10.9% Europe 13.7%</td>
<td>8.2% HDY Equity 6.4%</td>
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<tr>
<td>2017</td>
<td>-9.1% Small Cap -12.2%</td>
<td>-9.4% TOPIX -16.0%</td>
<td>-8.9% Asia ex-Jp -8.9%</td>
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<td>2018</td>
<td>-10.2% Portfolio -11.5%</td>
<td>-11.3% Europe -11.2%</td>
<td>12.1% US S&amp;P 500 -13.5%</td>
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<tr>
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<td>16.2% HDY Equity 8.0%</td>
<td>-14.3% Asia ex-Jp -14.6%</td>
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<td>13.6% HDY Equity 14.0%</td>
<td>-1.1% Asia ex-Jp 6.2%</td>
<td>-15.4% MSCI EM -12.5%</td>
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<tr>
<td>2012</td>
<td>13.6% HDY Equity 14.0%</td>
<td>10.1% TOPIX 10.3%</td>
<td>5.9% MSCI EM 3.8%</td>
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<td>2013</td>
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<td>2015</td>
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<td>2016</td>
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<td>-9.9% MSCI EM -9.7%</td>
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<td>-13.3% TOPIX -17.6%</td>
<td>-16.3% Small Cap -17.5%</td>
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<tr>
<td>2018</td>
<td>8.9% HDY Equity 8.2%</td>
<td>-8.9% Europe 8.2%</td>
<td>8.0% TOPIX 7.9%</td>
</tr>
</tbody>
</table>
**Fixed income yields and interest rate risk**

**Current and historical yields for selected indices**

% yield, fluctuations over the last 10 years*

How to interpret this chart

- **Max**
- **Average**
- **Current**
- **Min**

**Illustration of the impact a 1% rise in local interest rates may have on selected indices**

% change, assumes a parallel shift in the yield curve and spreads are maintained

- **Price return**
- **Total return**

Source: (All charts) Thomson Reuters Datastream, J.P. Morgan Asset Management.

*Historical yield range is based on the last 10 years of data.

Fixed income sectors shown are:

- Euro Gov.: 1-3 Years
- Euro Gov.: 10+ Years
- US Treasury: All Years
- Euro Inv. Grade
- US Inv. Grade
- Euro High Yield
- US High Yield
- Global Convertibles
- EMD (USD Sov.)
- EMD (Local Sov.)


For illustrative purposes only. Change in bond price is calculated using both duration and convexity, with the exception of Convertibles, which is historical change. Past performance is not a reliable indicator of current and future results.

Guide to the Markets - Europe.
Data as of 31 December 2018.
Global government bond yields and inflation expectations

Nominal 10-year government bond yields

% yield

US
UK
Germany

10-year government bond breakeven inflation rates

% yield

UK
US
Germany


Yield curve inversion and recession
Number of months from

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<tr>
<th>Yield curve inversion date</th>
<th>Curve inversion to S&amp;P 500 peak before recession</th>
<th>S&amp;P 500 peak to start of recession</th>
<th>Curve inversion to recession</th>
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<td>Sep '80</td>
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<td>Dec '88</td>
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<td>May '98</td>
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<td>Median</td>
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<td>Average</td>
<td>17</td>
<td>5</td>
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US investment-grade spread
% option-adjusted spread over local government bond yield

31 Dec 2018: 1,5%

US investment-grade leverage measures
x, leverage (LHS); x, interest coverage ratio (RHS)

US high yield spread and defaults

Latest

- Default rate (LHS): 1.8%
- Spread (RHS): 5.3%

Source: (Left) BofA/Merrill Lynch, J.P. Morgan Securities Research, J.P. Morgan Asset Management. HY spread is using the BofA/Merrill Lynch US High Yield Constrained index. Default rates are defined as the par value percentage of the total market trading at or below 50% of par value and include any Chapter 11 filing, prepackaged filing or missed interest payments. (Right) J.P. Morgan Economic Research, J.P. Morgan Asset Management. Net leverage is net debt divided by earnings before interest, tax, depreciation and amortisation (EBITDA). Interest coverage ratio is EBITDA divided by interest expense. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe. Data as of 31 December 2018.
Europe and UK investment-grade bonds

Euro and UK investment-grade spreads
% option-adjusted spread over local government bond yield

Euro investment-grade leverage measures
x, leverage (LHS); x, interest coverage ratio (RHS)

Europe high yield bonds

European high yield spread and defaults
%

<table>
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<th>Year</th>
<th>Default rate (LHS)</th>
<th>Spread (RHS)</th>
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<td>00</td>
<td>34%</td>
<td>5.1%</td>
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</table>

Source: (Left) BofA/Merrill Lynch, Thomson Reuters Datastream, J.P. Morgan Asset Management. Spread to worst is BofA/Merrill Lynch Euro Non-Financial High Yield Constrained. Default rates are reported by JPMAM GFICC Quantitative Research Group. Defaults are defined as a bond rated as Ca or lower. The calculation universe is based on par value percentage of the BofA ML Global High Yield Index (HW00) that is covered by Moody’s and filtered for EUR Developed Markets Ex-Financial. (Right) J.P. Morgan Securities Research, J.P. Morgan Asset Management. Net leverage is net debt divided by earnings before interest, tax, depreciation and amortisation (EBITDA). Interest coverage ratio is EBITDA divided by interest expense. Past performance is not a reliable indicator of current and future results.

Real 10-year government bond yields
% yield, local currency

Developed markets
Emerging markets

Brazil  
India  
Indonesia  
Russia  
South Africa  
Mexico  
Malaysia  
China  
US  
Japan  
UK  
Germany

Corporate and sovereign EMD spreads
% spread over 10-year US Treasury

Average since 2008  Latest

EM sovereigns local 4.2% 4.5%
EM sovereigns USD 3.6% 4.4%
EM corporates USD 3.6% 3.6%

Fixed income focus: Challenges in fixed income

European 10-year government bond spreads over Germany

% spread

-1 0 1 2 3 4 5 6 7

'03 '04 '05 '06 '07 '08 '09 '10 '11 '12 '13 '14 '15 '16 '17 '18 '19

Italy
Spain
France

US investment-grade rating breakdown

Market value of index as % of US nominal GDP

% of index

AAA 5% 2%
AA 12% 8%
A 50% 39%
BBB 33% 51%

Credit rating Dec 2008 Dec 2018

Global fixed income spreads and returns

### Fixed income spreads

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<td>Euro IG</td>
<td>1.5</td>
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<td>1.5</td>
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<td>1.5</td>
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<tr>
<td>US IG</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.1%</td>
<td>0.1%</td>
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<td>UK IG</td>
<td>1.8</td>
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<td>EMD (USD Gov.)</td>
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<td>US HY</td>
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### Fixed income returns

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</thead>
<tbody>
<tr>
<td>€: 12.8%</td>
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<td>13.2%</td>
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<td>EM Debt LCL:</td>
<td>1.2%</td>
<td>1.2%</td>
<td>1.2%</td>
<td>1.2%</td>
<td>1.2%</td>
<td>1.2%</td>
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<tr>
<td>US HY</td>
<td>21.0%</td>
<td>17.5%</td>
<td>6.1%</td>
<td>0.9%</td>
<td>2.6%</td>
<td>11.0%</td>
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<td>Euro HY</td>
<td>6.1%</td>
<td>6.1%</td>
<td>6.1%</td>
<td>6.1%</td>
<td>6.1%</td>
<td>6.1%</td>
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<td>9.9%</td>
<td>2.7%</td>
<td>2.7%</td>
<td>2.7%</td>
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<td>4.2%</td>
<td>4.2%</td>
<td>4.2%</td>
<td>4.2%</td>
</tr>
<tr>
<td>US HY</td>
<td>11.6%</td>
<td>11.6%</td>
<td>11.6%</td>
<td>11.6%</td>
<td>11.6%</td>
<td>11.6%</td>
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<tr>
<td>EM Debt</td>
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<td>11.0%</td>
<td>11.0%</td>
<td>11.0%</td>
<td>11.0%</td>
</tr>
<tr>
<td>US Treas.</td>
<td>1.5%</td>
<td>1.5%</td>
<td>1.5%</td>
<td>1.5%</td>
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<td>1.5%</td>
</tr>
<tr>
<td>US Treas.</td>
<td>9.9%</td>
<td>9.9%</td>
<td>9.9%</td>
<td>9.9%</td>
<td>9.9%</td>
<td>9.9%</td>
</tr>
<tr>
<td>EM Debt</td>
<td>7.8%</td>
<td>7.8%</td>
<td>7.8%</td>
<td>7.8%</td>
<td>7.8%</td>
<td>7.8%</td>
</tr>
</tbody>
</table>

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Commodities

**WTI crude oil price and US rig count**
USD/barrel (LHS); number of rigs (RHS)

**Metal prices**
Index level, rebased to 100 in Jan 2007

Gold

Gold vs. real US 10-year Treasury yields
$ per Troy ounce (LHS), % inverted (RHS)

Gold price
$ per Troy ounce

Stock-bond correlation and downside protection

Rolling six-month stock and bond correlations
Of total return on US equities (S&P 500) and US Treasuries (10-yr)

Hedge fund returns in different market environments
% average total return in up and down months, 2001-present

Alternative investments

US infrastructure returns
% allowed return on equity over cost of debt

<table>
<thead>
<tr>
<th>Year</th>
<th>5 years</th>
<th>10 years</th>
<th>15 years</th>
<th>20 years</th>
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</thead>
<tbody>
<tr>
<td>1970</td>
<td>10.0</td>
<td>6.4</td>
<td>8.8</td>
<td>5.8</td>
</tr>
<tr>
<td>1975</td>
<td>14.8</td>
<td>10.0</td>
<td>14.4</td>
<td>12.4</td>
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</tbody>
</table>

Environmental, social and governance considerations

**Environmental**
- Carbon emissions
- Water & waste
- Biodiversity

**Social**
- Labour management
- Health & product safety
- Privacy & data security

**Governance**
- Management & oversight
- Board composition
- Ownership & pay

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**Global equities**

Price index

- MSCI ACWI ESG Leaders
- MSCI ACWI

Source: MSCI, Thomson Reuters Datastream, J.P. Morgan Asset Management. Both MSCI ACWI and MSCI ACWI ESG Leaders are in USD, rebased to 100 at the inception of the ESG Leaders index. MSCI ACWI ESG Leaders is a capitalisation-weighted price index that provides exposure to companies with high Environmental, Social and Governance (ESG) rankings relative to their sector peers and excludes companies with involvement in alcohol, gambling, tobacco, nuclear power and weapons. ESG rankings are given to companies based on the MSCI framework. The MSCI ESG Leaders index aims to target the sector weights of the underlying indices to limit systematic risk introduced by the ESG selection process. Past performance is not a reliable indicator of current and future results.

### Asset markets in coming years

#### Past and expected returns

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Return since 2009</th>
<th>Expected return in coming 10-15 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM equity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>US private equity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eurozone large cap</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Japan equity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EM local currency debt</td>
<td></td>
<td></td>
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<tr>
<td>UK large cap</td>
<td></td>
<td></td>
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<tr>
<td>Global infrastructure</td>
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<tr>
<td>US core real estate</td>
<td></td>
<td></td>
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<tr>
<td>US high yield bonds hedged</td>
<td></td>
<td></td>
</tr>
<tr>
<td>US large cap</td>
<td></td>
<td></td>
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<tr>
<td>European high yield bonds</td>
<td></td>
<td></td>
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<tr>
<td>Diversified hedge funds hedged</td>
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<tr>
<td>Euro government bonds</td>
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<tr>
<td>World government bonds</td>
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<td>Commodities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Euro cash</td>
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</tbody>
</table>

Source: 2019 Long-Term Capital Market Assumptions, November 2018, J.P. Morgan Multi-Asset Solutions, J.P. Morgan Asset Management. Returns are nominal and in euros. Past returns are calculated from the start of 2009 up to 3Q 2018, or the most recent available data. The projections in the chart above are based on J.P. Morgan Asset Management's (JPMAM) proprietary long-term capital market assumptions (10-15 years) for returns of major asset classes. The resulting projections include only the benchmark return associated with the portfolio and do not include alpha from the underlying product strategies within each asset class. The assumptions are presented for illustrative purposes only. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe. Data as of 31 December 2018.
Probability of reaching ages 80 and 90
% probability, persons aged 65, by gender and combined couple

- **Men**
- **Women**
- **Couple – at least one lives to specified age**

Cash investments

Income generated by €100,000 in a three-month bank deposit
EUR (LHS); % change year on year (RHS)

Total return of $1 in real terms
USD, log scale, total returns

Annualised real returns
1899–2018 2000–2018
Equities 6,5% 3,6%
Bonds 2,1% 4,3%
Cash 0,6% -0,6%

The power of compounding

€5,000 invested annually with 5% growth per year

- Starting at age 25
- Starting at age 35

€5,000 investment with/without income reinvested

- With dividends reinvested
- Without dividends reinvested

Source: (Left) J.P. Morgan Asset Management. For illustrative purposes only, assumes all income reinvested, actual investments may incur higher or lower growth rates and charges. (Right) Bloomberg, MSCI, J.P. Morgan Asset Management. Based on MSCI Europe index and assumes no charges. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe. Data as of 31 December 2018.
Despite average intra-year drops of 15.4% (median 12.1%), annual returns are positive in 30 of 39 years.

Source: MSCI, Thomson Reuters Datastream, J.P. Morgan Asset Management. Returns are based on local price only and do not include dividends. Intra-year decline refers to the largest market fall from peak to trough within a short time period during the calendar year. Returns shown are calendar years from 1980 to 2018. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe. Data as of 31 December 2018.
Impact of being out of the market

Returns of MSCI Europe
EUR, value of a €10.000 investment from 2004 to 2018 with annualised total return (%)

- Fully invested: 5.3%
- Missed 10 best days: 0.5%
- Missed 30 best days: -4.1%
- Missed 50 best days: -7.7%

Initial investment

Source: Bloomberg, MSCI, J.P. Morgan Asset Management. Investment outcomes based on total return. For illustrative purposes only. Returns calculated daily over the time period assuming no return on each of the specified number of best days. Past performance is not a reliable indicator of current and future results.

Range of equity and bond total returns
% annualised total returns, 1950-present

Source: Strategas/Ibbotson, J.P. Morgan Asset Management. Large cap equity represents the S&P 500 Composite and Bonds represents the Strategas/Ibbotson US Government Bond Index and US Long-term Corporate Bond Index. Returns shown are per annum and are calculated based on monthly returns from 1950 to latest available and include dividends. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe.

Data as of 31 December 2018.
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>DM Equities</td>
<td>73.5%</td>
<td>36.4%</td>
<td>12.1%</td>
<td>18.3%</td>
<td>21.9%</td>
<td>44.8%</td>
<td>13.9%</td>
<td>17.7%</td>
<td>21.0%</td>
<td>4.6%</td>
<td>3.8%</td>
<td>14.6%</td>
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<tr>
<td>REITS</td>
<td>54.4%</td>
<td>27.5%</td>
<td>10.3%</td>
<td>17.8%</td>
<td>3.3%</td>
<td>20.2%</td>
<td>12.8%</td>
<td>15.1%</td>
<td>8.1%</td>
<td>1.3%</td>
<td>0.8%</td>
<td>13.2%</td>
</tr>
<tr>
<td>HY bonds</td>
<td>26.7%</td>
<td>24.9%</td>
<td>9.9%</td>
<td>16.9%</td>
<td>2.7%</td>
<td>20.1%</td>
<td>11.0%</td>
<td>14.9%</td>
<td>1.7%</td>
<td>0.4%</td>
<td>1.2%</td>
<td>15.1%</td>
</tr>
<tr>
<td>Govt bonds</td>
<td>25.4%</td>
<td>22.8%</td>
<td>7.8%</td>
<td>16.7%</td>
<td>2.1%</td>
<td>17.5%</td>
<td>8.4%</td>
<td>13.5%</td>
<td>0.7%</td>
<td>-0.1%</td>
<td>1.0%</td>
<td>13.5%</td>
</tr>
<tr>
<td>DM Equities</td>
<td>24.2%</td>
<td>20.1%</td>
<td>6.6%</td>
<td>14.7%</td>
<td>0.2%</td>
<td>16.2%</td>
<td>7.7%</td>
<td>12.6%</td>
<td>0.2%</td>
<td>-1.9%</td>
<td>9.9%</td>
<td>10.9%</td>
</tr>
<tr>
<td>REITS</td>
<td>23.5%</td>
<td>19.8%</td>
<td>1.7%</td>
<td>10.7%</td>
<td>-1.3%</td>
<td>13.9%</td>
<td>7.4%</td>
<td>11.4%</td>
<td>-0.3%</td>
<td>1.4%</td>
<td>1.5%</td>
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<tr>
<td>IG bonds</td>
<td>15.5%</td>
<td>19.8%</td>
<td>1.2%</td>
<td>9.5%</td>
<td>-4.0%</td>
<td>13.2%</td>
<td>7.3%</td>
<td>10.3%</td>
<td>-1.7%</td>
<td>-1.1%</td>
<td>1.2%</td>
<td>9.5%</td>
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<tr>
<td>Hedge Funds</td>
<td>15.2%</td>
<td>13.3%</td>
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<td>1.9%</td>
<td>-1.8%</td>
<td>1.9%</td>
<td>1.9%</td>
<td>6.4%</td>
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<tr>
<td>Govt bonds</td>
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<td>13.2%</td>
<td>-5.8%</td>
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<td>11.8%</td>
<td>0.1%</td>
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<td>-5.8%</td>
<td>-3.6%</td>
<td>-5.9%</td>
</tr>
<tr>
<td>IG bonds</td>
<td>2.3%</td>
<td>12.5%</td>
<td>-10.4%</td>
<td>0.3%</td>
<td>-10.6%</td>
<td>0.3%</td>
<td>-4.9%</td>
<td>4.7%</td>
<td>-6.9%</td>
<td>-6.8%</td>
<td>-3.0%</td>
<td>6.8%</td>
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<tr>
<td>Govt bonds</td>
<td>-0.6%</td>
<td>2.1%</td>
<td>-15.4%</td>
<td>-2.6%</td>
<td>-13.4%</td>
<td>-5.5%</td>
<td>-16.1%</td>
<td>-0.1%</td>
<td>-10.7%</td>
<td>-9.9%</td>
<td>-11.9%</td>
<td>-1.9%</td>
</tr>
</tbody>
</table>

Source: Barclays, Bloomberg, FTSE, MSCI, J.P. Morgan Economic Research, Thomson Reuters Datastream, J.P. Morgan Asset Management. Annualised return covers the period from 2009 to 2018. Vol. is the standard deviation of annual returns. Govt bonds: Bloomberg Barclays Global Aggregate Government Treasuries; HY bonds: Bloomberg Barclays Global Aggregate Corporate; DM Equities: MSCI EM; Hedge funds: HFRI Global Hedge Fund Index; Cash: JP Morgan Cash Index EUR (3M). Hypothetical portfolio (for illustrative purposes only and should not be taken as a recommendation): 30% DM equities; 10% EM equities; 15% IG bonds; 12.5% government bonds; 7.5% HY bonds; 5% EMD; 5% commodities; 5% cash; 5% REITS and 5% hedge funds. All returns except Hedge Funds are unhedged. All returns are total return, in EUR. Past performance is not a reliable indicator of current and future results. Guide to the Markets - Europe. Data as of 31 December 2018.
The MSCI KOKUSAI Index is a free float-adjusted market capitalization index that is designed to measure the equity market performance of developed markets excluding Japan. The MSCI KOKUSAI Index consists of the following 23 developed market country indices: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Israel, Italy, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, the United Kingdom, and the United States.

The Nikkei 225 Index is a price-weighted average of the 225 top-rated Japanese companies listed in the first section of the Tokyo Stock Exchange.

The Tokyo Price Index (TOPIX) is a capitalization-weighted index lists all firms that are considered to be under the first section on the TSE, which groups all of the large firms on the exchange into one pool. The second section groups all of the remaining smaller firms.

The FTSE 100 Index is an index of the 100 largest companies (by market capitalization) in the United Kingdom.

The FTSE All Share Index is an index of the 630 largest companies (by market capitalization) in the United Kingdom.

The FTSE 100 Value Index is an index of the 100 largest companies (by market capitalization) in the United Kingdom. The FTSE Value/Growth Indices cover the full range of developed, emerging and All Country MSCI Equity indices. As of the close of May 30, 2003, MSCI implemented an enhanced methodology for the MSCI Global Value and Growth Indices, adopting a two dimensional framework for style segmentation in which value and growth securities are categorized using different attributes - three for value and five for growth including forward-looking variables. The objective of the index design is to divide constituents of an underlying MSCI Standard Country Index into a value index and a growth index, each targeting 50% of the free float adjusted market capitalization of the underlying country index. Value/Growth indices are then aggregated into regional Value/Growth indices. Prior to May 30, 2003, the indices used Price/Book Value (P/BV) ratios to divide the standard MSCI country indices into value and growth indices. All securities were classified as either "value" securities (low P/BV securities) or "growth" securities (high P/BV securities), relative to each MSCI country index. The following MSCI Total Return Indices are calculated with gross dividends:

- This series approximates the maximum possible dividend reinvestment. The amount reinvested is the dividend distributed to individuals resident in the country of the business, but does not include tax credits.

- The MSCI Europe Index is a free float-adjusted market capitalization index that is designed to measure developed market equity performance in Europe. As of June 2007, the MSCI Europe Index consisted of the following 16 developed market country indices: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

- The MSCI Pacific Index is a free float-adjusted market capitalization index that is designed to measure equity market performance in the Pacific region. As of June 2007, the MSCI Pacific Index consisted of the following 5 Developed market countries: Australia, Hong Kong, Japan, New Zealand, and Singapore.

- Credit Suisse/Tremont Hedge Fund Index is compiled by Credit Suisse Tremont Index, LLC. It is an asset-weighted hedge fund index and includes only funds, as opposed to separate accounts. The Index uses the Credit Suisse/Tremont database, which tracks over 4500 funds, and consists only of funds with a minimum of US$50 million under management, a 12-month track record, and audited financial statements. It is calculated and rebalanced on a monthly basis, and shown net of all performance fees and expenses. It is the exclusive property of Credit Suisse Tremont Index, LLC.

- The NCREIF Property Index is a quarterly time series composite total rate of return measure of investment performance of a very large pool of individual commercial real estate properties acquired in the private market for investment purposes only. All properties in the NPI have been acquired, at least in part, on behalf of tax-exempt institutional investors - the great majority being pension funds. As such, all properties are held in a fiduciary environment.

- The NAREIT EQUITY REIT Index is designed to provide the most comprehensive assessment of overall industry performance, and includes all tax-qualified real estate investment trusts (REITs) that are listed on the NYSE, the American Stock Exchange of the NASDAQ National Market List.
The Dow Jones Industrial Average measures the stock performance of 30 leading blue-chip U.S. companies.

The Dow Jones-UBS Commodity Index is composed of futures contracts on physical commodities and represents twenty two separate commodities traded on U.S. exchanges, with the exception of aluminum, nickel, and zinc.

West Texas Intermediate (WTI) is underlying commodity in the New York Mercantile Exchange’s oil futures contracts.

The S&P GSCI Index is a composite index of commodity sector returns representing an unleveraged, long-only investment in commodity futures that is broadly diversified across the spectrum of commodities. The returns are calculated on a fully collateralized basis with full reinvestment.

The Bloomberg Barclays U.S. Aggregate Index represents securities that are SEC-registered, taxable, and dollar denominated. The index covers the U.S. investment grade fixed rate bond market, with index components for government and corporate securities, mortgage pass-through securities, and asset-backed securities.

This U.S. Treasury Index is a component of the U.S. Government index.

The Bloomberg Barclays High Yield Index covers the universe of fixed rate, non-investment grade debt. Pay-in-kind (PIK) bonds, Eurobonds, and debt issues from countries designated as emerging markets (e.g., Argentina, Brazil, Venezuela, etc.) are excluded, but Canadian and global bonds (SEC registered) of issuers in non-EMG countries are included.

The Bloomberg Barclays 1-3 Month U.S. Treasury Bill Index includes all publicly issued zero-coupon U.S. Treasury Bills that have a remaining maturity of less than 3 months and more than 1 month, are rated investment grade, and have $250 million or more of outstanding face value.

The Bloomberg Barclays Euro-Aggregate Index consists of bond issued in the euro or the legacy currencies of the sovereign countries participating the European Monetary Union (EMU).

The Global Bond Index Emerging Market Broad Diversified Index (GBI-EM) is a comprehensive global local emerging markets index, and consists of liquid, fixed-rate, domestic currency government bonds.

The Bloomberg Barclays Global Aggregate Corporate Index consists of corporate index issues in Europe, the US and Asia-Pacific regions.

The Bloomberg Barclays Global High Yield Index is an unmanaged index considered representative of fixed rate, non-investment-grade debt of companies in the U.S., developed markets and emerging markets.

The Bloomberg Barclays Emerging Markets Index includes USD-denominated debt from emerging markets in the following regions: Americas, Europe, Middle East, Africa, and Asia. As with other fixed income benchmarks provided by Barclays Capital, the index is rules-based, which allows for an unbiased view of the marketplace and easy replicability.

The Bloomberg Barclays MBS Index covers the mortgage-backed pass-through securities of Ginnie Mae, Fannie Mae, and Freddie Mac. Aggregate components must have a weighted average maturity of at least one year, must have $250 million par amount outstanding, and must be fixed rate mortgages.

The Bloomberg Barclays Corporate Bond Index is the Corporate component of the U.S. Credit index.

The Bloomberg Barclays TIPS Index consists of Inflation-Protection securities issued by the U.S. Treasury.

The J.P. Morgan EMBI Global Index consists of regularly traded, liquid fixed-rate, domestic currency government bonds to which international investors can gain exposure. The weightings among the countries are more evenly distributed within this index.

The JPMorgan Corporate Emerging Markets Bond Index (CEMBI): The CEMBI tracks total returns of US dollar-denominated debt instruments issued by corporate entities in Emerging Markets countries, and consists of an investable universe of corporate bonds. Both indices are also available in Diversified version.

The JPMorgan CEMBI Index is a USD denominated external debt index tracking bond issued by sovereigns and quasi-sovereigns in the developing nations.

The J.P. Morgan Domestic High Yield Index is designed to mirror the investable universe of the U.S. dollar domestic high yield corporate debt market.

The CS/Tremont Equity Market Neutral Index takes both long and short positions in stocks with the aim of minimizing exposure to the systematic risk of the market (i.e. a beta of zero).

The CS/Tremont Multi-Strategy Index consists of funds that allocate capital based on perceived opportunities among several hedge fund strategies. Strategies adopted in a multi-strategy fund may include, but are not limited to, convertible bond arbitrage, equity long/short, statistical arbitrage and merger arbitrage.

The Bloomberg Barclays U.S. Dollar Floating Rate Note (FRN) Index provides a measure of the U.S. dollar denominated floating rate note market.

*Market Neutral returns for November 2008 are estimates by J.P. Morgan Funds Market Strategy, and are based on a December 8, 2008 published estimate for November returns by CS/Tremont in which the Market Neutral returns were estimated to be +0.85% (with 69% of all CS/Tremont constituents having reported return data). Presumed to be excluded from the November return are three funds, which were later marked to $0 by CS/Tremont in connection with the Bernard Madoff scandal. J.P. Morgan Funds believes this distortion is not an accurate representation of returns in the category. CS/Tremont later published a finalized November return of -40.56% for the month, reflecting this mark-down. CS/Tremont assumes no responsibility for these estimates.

The Office of National Statistics (ONS) Index is a mix-adjusted average housing price index. The index is calculated monthly using mortgage financed transactions from the Regulated Mortgage Survey by the Council of Mortgage Lenders.

The Nationwide House Price Index is a mix adjusted index constructed from Nationwide lending data across the UK.

The Halifax House Price Index is constructed from mortgage data derived from Halifax lending data across the UK.

The MSCI AC World High Dividend Yield Index is composed of those securities that have higher-than-average dividend yield within its parent index, a track record of consistent dividend payments and the capacity to sustain future dividend payments.
J.P. Morgan Asset Management: Risks and disclosures

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Unless otherwise stated, all data as of 31 December 2018 or most recently available.

Guide to the Markets - Europe

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