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9. Brexit: The UK and the EU

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82. US asset returns by holding period
83. Asset class returns (GBP)
UK: GDP and inflation

Real GDP
% change quarter on quarter

Inflation
% change year on year

Source: (Left) FactSet, ONS, Bloomberg, J.P. Morgan Asset Management. Consensus forecasts are the Bloomberg contributor composite.
(Right) FactSet, ONS, J.P. Morgan Asset Management. *CPI is the Consumer Price Index. Core CPI is defined as CPI excluding food and energy.
UK labour market dynamics

**Productivity since the pre-crisis peak**
Index level, productivity per worker rebased to 100 as of Q4 2007

**Wage growth**
% change year on year

**UK unemployment rate and consumer confidence**
Index level (LHS); % (RHS)

UK growth monitor

Retail sales vs. consumer confidence
Standard deviations from average (LHS); % change year on year (RHS)

Manufacturing and services investment intentions
Index level

CBI Business optimism
Index

Industrial production
Index level, 1990=100

Source: (Top left) GFK, ONS, Thomson Reuters Datastream, J.P. Morgan Asset Management. Retail sales data is a six month moving average and consumer confidence data is a 6 month moving average z score (indicates how many standard deviations the data point is away from its mean). (Bottom left) CBI, Thomson Reuters Datastream, J.P. Morgan Asset Management. (Top right) Bank of England, Thomson Reuters Datastream, J.P. Morgan Asset Management. (Bottom right) ONS, Thomson Reuters Datastream, J.P. Morgan Asset Management. Light grey columns in all charts indicate recession. Guide to the Markets - UK. Data as of 31 December 2016.
**UK housing**

### Home prices
GBP 000s, regional average

- **London**
- **Wales**
- **South ex-London**
- **Scotland**
- **North**
- **Midlands**

**England annual average: 2011 – 2015**
- Homes built: 120,718
- New households: 213,000

### RICS price surveys vs. house prices
% net balance of respondents (LHS); % change year on year (RHS)

### Mortgage approvals and housing transactions
Thousands, seasonally adjusted

UK consumer finances

Lending to individuals: Secured and unsecured lending
%
seasonally adjusted, three-month annualised growth rate

Data as of 31 December 2016.
Brexit: The UK and the EU

Trade with the UK
% of GDP, 2015

UK exports to the EU
EU countries exports to the UK
Regions exports to the UK

UK trade balance with the EU
GBP billions

Goods
Services

### Global Purchasing Managers’ Index (PMI) for manufacturing


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<th>Emerging</th>
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**Lowest relative to 50 PMI**

**Highest relative to 50 PMI**

Source: FactSet, Markit, J.P. Morgan Asset Management.
Developed economy inflation

Average Jan 1993 to Dec 2008: 2.0%

Average Jan 2009 to Nov 2016: 1.2%

Headline inflation and forecasts


Nominal GDP and inflation outlook

Nominal GDP growth
Rebased to 100 at Q1 2008

Core inflation and forecasts
% change year on year

Global central bank policy

Market expectations for policy rate

<table>
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Percent of government bond market held by central banks

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Projection*
Fed funds long-run expectations

Market expectations of Fed funds rate

Source: Bloomberg, J.P. Morgan Asset Management. The lines show the market expectation for the path of interest rates at the stated date. Values shown are from the last day of the month. Guide to the Markets - UK. Data as of 31 December 2016.
Global supply dynamics

Labour productivity
% change year on year

DM pre-crisis average: 1.4%
DM post-crisis average: 0.2%

Medium-term GDP growth projections
% annual GDP growth for the next five years

Global population
% change year on year (LHS); % of population (RHS)


Developed market fiscal policy

**Change in deficit excluding debt interest**

- **% of potential GDP**
- **Tighter policy**
- **Looser policy**
- **Forecast**

**Developed economy government debt and interest expense**

- **% of GDP**
- **Forecast**

**2007 to 2016**

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<th>Change in gross debt (% of GDP)</th>
<th>Change in interest costs (% of GDP)</th>
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<tr>
<td>Eurozone</td>
<td>26.8</td>
<td>-0.58</td>
</tr>
<tr>
<td>UK</td>
<td>46.8</td>
<td>0.05</td>
</tr>
<tr>
<td>Japan</td>
<td>67.3</td>
<td>0.08</td>
</tr>
</tbody>
</table>

Source: (Left) OECD, J.P. Morgan Asset Management. Figures correspond to the estimated change in the primary balance or structural deficit excluding net interest payments as a share of GDP. *Forecasts from the OECD. (Right) IMF Fiscal Monitor October 2016, J.P. Morgan Asset Management. Government debt ratio is gross debt for all advanced economies in the G20. **Forecasts from the IMF. Guide to the Markets - UK. Data as of 31 December 2016.
Global currency trends

US dollar in historical perspective
Index level, broad real effective exchange rate (REER)

Average since 1973 | Nov 2016
--- | ---
US dollar index | 95.7 | 101.3

- 1973-1978: +52.7%
- 1978-1985: +21.8%
- 1985-1988: -29.5%
- 1988-1995: -7.1%
- 1995-2002: +34.2%
- 2002-2011: -28.9%
- 2011-2016: +26.2%

Trends in key currencies
Real effective exchange rate, rebased to 100 as of Jan 2016

US dollar vs. market rate expectations in the next 12 months
Index (LHS); basis points (RHS)

### Eurozone: GDP and inflation

#### Real GDP

<table>
<thead>
<tr>
<th>Year</th>
<th>Average since 1999</th>
<th>Q316</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.3%</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

**Source:** (Both charts) Eurostat, FactSet, J.P. Morgan Asset Management. *CPI is the Consumer Price Index. Core CPI is defined as CPI excluding food, energy, alcohol and tobacco. Guide to the Markets - UK. Data as of 31 December 2016.

#### Inflation

<table>
<thead>
<tr>
<th>Year</th>
<th>Average since 1999</th>
<th>Nov 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1.8%</td>
<td>0.6%</td>
</tr>
<tr>
<td></td>
<td>1.4%</td>
<td>0.8%</td>
</tr>
</tbody>
</table>
**Eurozone growth monitor**

**Change in unemployment and unemployment rate**
Thousands of people per three months (LHS); % rate (RHS)

**Retail sales and industrial production**
Index level

**Economic sentiment and GDP**
Index level (LHS); % change year on year (RHS)

Source: (All charts) Eurostat, Thomson Reuters Datastream, J.P. Morgan Asset Management. Light grey columns in all charts indicate recession.

**Eurozone recovery monitor**

**Contribution to eurozone GDP growth**

- Change in inventories
- Exports
- Investment
- Consumption
- Imports
- GDP

% change year on year

**Eurozone government expenditure**

% change year on year

**Gross fixed capital formation**

% of GDP, non-residential

**Eurozone credit conditions**

**Credit demand and eurozone GDP growth**
- Net % of banks reporting positive loan demand (LHS); % GDP growth (RHS)

**Bank loans to households and non-financial corporations**
- EUR billions, net lending flow, three-month moving average

**Corporate lending rates to smaller companies**
- % interest, non-financial corporations*

European Central Bank (ECB) policies

**ECB balance sheet: Assets**

<table>
<thead>
<tr>
<th>EUR trillions</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0</td>
</tr>
<tr>
<td>0.5</td>
</tr>
<tr>
<td>1.0</td>
</tr>
<tr>
<td>1.5</td>
</tr>
<tr>
<td>2.0</td>
</tr>
<tr>
<td>2.5</td>
</tr>
<tr>
<td>3.0</td>
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<tr>
<td>3.5</td>
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<tr>
<td>4.0</td>
</tr>
<tr>
<td>4.5</td>
</tr>
<tr>
<td>5.0</td>
</tr>
</tbody>
</table>

**ECB Dec 2016 forecasts**

<table>
<thead>
<tr>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPI inflation**</td>
<td>1.3</td>
<td>1.5</td>
</tr>
</tbody>
</table>

**Trade-weighted euro and EUR/USD**

Index level (LHS); price of euro in dollars (RHS)

Source: (Left) ECB, FactSet, J.P. Morgan Asset Management. *Balance sheet forecast does not include Targeted Longer Term Refinancing Operations (TLTRO). Expansion in balance sheet still to come assumes EUR 80bn per month expansion between now and March 2017 and EUR 60bn per month expansion between April 2017 and December 2017. **Inflation is Q4 to Q4 for each year. (Right) FactSet, J.P. Morgan Asset Management. Guide to the Markets - UK.

Data as of 31 December 2016.
Europe 2017 political timeline

- **22-29 January** France
  Socialist presidential primaries

- **31 March** UK
  “Deadline” for formal activation of Article 50

- **7 May** France
  Second round of the presidential election

- **24 January** Italy
  Court decision on “Italicum” electoral reform

- **15 March** Netherlands
  General election

- **23 April** France
  First round of the presidential election

- **11-18 June** France
  Legislative election

- **October** Germany
  Latest date for election

- **September** Spain
  Possible Catalonia independence referendum

Support for populist parties

Survey results: *Do you support the euro?*

% answering “yes” as of November 2016

US: GDP and inflation

Real GDP
% change quarter on quarter, SAAR

<table>
<thead>
<tr>
<th>Average since 1999</th>
<th>Q316</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real GDP</td>
<td>1.8%</td>
</tr>
</tbody>
</table>

Average

Components of nominal GDP
Q316

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Consumption</td>
<td>68.7%</td>
</tr>
<tr>
<td>Government</td>
<td>17.6%</td>
</tr>
<tr>
<td>Investment ex-housing</td>
<td>12.4%</td>
</tr>
<tr>
<td>Housing</td>
<td>3.7%</td>
</tr>
<tr>
<td>Net exports</td>
<td>-2.4%</td>
</tr>
</tbody>
</table>

Inflation
% change year on year

<table>
<thead>
<tr>
<th></th>
<th>Average since 1999</th>
<th>Nov 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headline CPI*</td>
<td>2.2%</td>
<td>1.7%</td>
</tr>
<tr>
<td>Core CPI</td>
<td>2.0%</td>
<td>2.1%</td>
</tr>
</tbody>
</table>

Source: (Left) BEA, FactSet, J.P. Morgan Asset Management. (Right) BLS, FactSet, J.P. Morgan Asset Management. SAAR is seasonally adjusted annual rate.

*CPI is the Consumer Price Index. Core CPI is defined as CPI excluding food and energy. Guide to the Markets - UK. Data as of 31 December 2016.
US Federal Reserve outlook

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

- Federal funds rate
- US Fed FOMC forecasts median
- US Fed FOMC forecasts range
- Market expectations on 31 Dec 2016
- FOMC long-run projection

FOMC December 2016 forecasts*

<table>
<thead>
<tr>
<th></th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in real GDP, Q4 to Q4</td>
<td>2.1</td>
<td>2.0</td>
<td>1.9</td>
</tr>
<tr>
<td>Unemployment rate, Q4</td>
<td>4.6</td>
<td>4.5</td>
<td>4.5</td>
</tr>
<tr>
<td>PCE inflation, Q4 to Q4</td>
<td>1.9</td>
<td>2.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Long run

US labour market

Unemployment rate and wage growth
%

- Nov 2016: 4.6%
- 50-yr average: 6.1%
- 50-yr average: 4.2%
- Nov 2016: 2.4%

Productivity and wage growth
%

- '98 '00 '02 '04 '06 '08 '10 '12 '14 '16
- Productivity
- Wage growth

Employee compensation and profitability
%

- '59 '64 '69 '74 '79 '84 '89 '94 '99 '04 '09 '14
- Employee compensation
- Corporate profits

US growth monitor

Corporate profits, business investment and employment growth

% change year on year

Recession

Initial jobless claims vs. consumer confidence
Jobless claims in thousands (LHS); index level (RHS)

Housing starts and Conference Board Leading Economic Index
Index level (LHS); thousands (RHS)

Source: (All charts) Thomson Reuters Datastream, J.P. Morgan Asset Management. Light grey columns in all charts indicate recessions determined by NBER.

US consumer finances

Household net worth
USD billions, SAAR

Household debt service ratio and savings rate
% of disposable personal income, seasonally adjusted

Consumer balance sheet
USD trillions outstanding, not seasonally adjusted, Q316

Long-term drivers of US economic growth

Growth in US working age population
% increase in civilian non-institutional population ages 16-64

- '55-'64: 1.2%
- '65-'74: 1.9%
- '75-'84: 1.5%
- '85-'94: 1.0%
- '95-'04: 1.3%
- '05-'14: 0.7%
- '15-'24: 0.4%

Forecast

Drivers of US GDP growth
Average year on year % change

- Growth in workers
- Growth in real output per worker
- Growth in real GDP

Growth in investment in structures and equipment
Non-residential fixed assets, year on year % change

Source: (Top left) Census Bureau, DOD, DOJ, J.P. Morgan Asset Management. *Forecast by J.P. Morgan Asset Management (Bottom left) BEA BLS, J.P. Morgan Asset Management. (Right) BEA, BLS, J.P. Morgan Asset Management. GDP drivers are calculated as the average annualised growth between Q4 of the first and last year. Future working age population is calculated as the total estimated number of Americans from the Census Bureau, controlled for military enrollment, growth in institutionalised population and demographic trends. Guide to the Markets – UK. Data as of 31 December 2016.
US fiscal policy

**US budget surplus/deficit**

<table>
<thead>
<tr>
<th>Year</th>
<th>% of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>'65</td>
<td>-12.5%</td>
</tr>
<tr>
<td>'70</td>
<td>-4.2%</td>
</tr>
<tr>
<td>'75</td>
<td>0%</td>
</tr>
<tr>
<td>'80</td>
<td>8%</td>
</tr>
<tr>
<td>'85</td>
<td>2.5%</td>
</tr>
<tr>
<td>'90</td>
<td>-1%</td>
</tr>
<tr>
<td>'95</td>
<td>0.5%</td>
</tr>
<tr>
<td>'00</td>
<td>0%</td>
</tr>
<tr>
<td>'05</td>
<td>-0.2%</td>
</tr>
<tr>
<td>'10</td>
<td>0.1%</td>
</tr>
<tr>
<td>'15</td>
<td>0%</td>
</tr>
</tbody>
</table>

**Recession**

2015: -2.5%

**US public investment**

<table>
<thead>
<tr>
<th>Year</th>
<th>% of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>'65</td>
<td>6%</td>
</tr>
<tr>
<td>'70</td>
<td>4%</td>
</tr>
<tr>
<td>'75</td>
<td>2%</td>
</tr>
<tr>
<td>'80</td>
<td>0%</td>
</tr>
<tr>
<td>'85</td>
<td>-2%</td>
</tr>
<tr>
<td>'90</td>
<td>-4%</td>
</tr>
<tr>
<td>'95</td>
<td>-6%</td>
</tr>
<tr>
<td>'00</td>
<td>-8%</td>
</tr>
<tr>
<td>'05</td>
<td>-10%</td>
</tr>
<tr>
<td>'10</td>
<td>-12%</td>
</tr>
<tr>
<td>'15</td>
<td>-14%</td>
</tr>
</tbody>
</table>

**US federal net debt**

<table>
<thead>
<tr>
<th>Year</th>
<th>% of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>'40</td>
<td>120%</td>
</tr>
<tr>
<td>'48</td>
<td>100%</td>
</tr>
<tr>
<td>'56</td>
<td>80%</td>
</tr>
<tr>
<td>'64</td>
<td>60%</td>
</tr>
<tr>
<td>'72</td>
<td>40%</td>
</tr>
<tr>
<td>'80</td>
<td>20%</td>
</tr>
<tr>
<td>'88</td>
<td>0%</td>
</tr>
<tr>
<td>'96</td>
<td>-20%</td>
</tr>
<tr>
<td>'04</td>
<td>-40%</td>
</tr>
<tr>
<td>'12</td>
<td>-60%</td>
</tr>
<tr>
<td>'20</td>
<td>-80%</td>
</tr>
</tbody>
</table>

Source: (Left) Haver, US Congressional Budget Office, J.P. Morgan Asset Management. Light grey columns in all charts indicate recessions determined by NBER
Japan: GDP and inflation

### Real GDP growth

<table>
<thead>
<tr>
<th>Year</th>
<th>Average since 1999</th>
<th>Q316</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real GDP</td>
<td>0.2%</td>
<td>0.3%</td>
</tr>
</tbody>
</table>

### Inflation

<table>
<thead>
<tr>
<th>Component</th>
<th>Average since 1999</th>
<th>Nov 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headline CPI*</td>
<td>0.0%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Core CPI</td>
<td>-0.3%</td>
<td>0.1%</td>
</tr>
<tr>
<td>CPI less food &amp; consumption tax</td>
<td>-0.1%</td>
<td>-0.4%</td>
</tr>
</tbody>
</table>

Source: (Left) FactSet, Japan Statistics Bureau & Statistics Centre, J.P. Morgan Asset Management. (Right) Bloomberg, FactSet, Japan Ministry of Internal Affairs & Communications, J.P. Morgan Asset Management. *CPI is the Consumer Price Index. Core CPI is defined as CPI excluding food and energy.

Japan: Abenomics and the economy

Wage growth
% change year on year, three-month moving average

- Core CPI*
- Nominal wage growth

Bank lending and job-to-applicant ratio
% lending growth year on year (LHS); ratio of number of jobs to applicants (RHS)

Japanese yen effective exchange rate
Index level

*CPI is the Consumer Price Index. Core CPI is defined as CPI excluding food and energy. (Bottom left) FactSet, J.P. Morgan Asset Management. NIRP stands for negative interest rate policy. (Right) Bloomberg, J.P. Morgan Asset Management. Guide to the Markets - UK. Data as of 31 December 2016.
China: GDP, inflation and policy rate

Real GDP growth
% change year on year

GDP growth
Investment
Consumption
Net exports

Inflation
% change year on year

Headline CPI* 2.3%
Core CPI 1.9%
Headline PPI** 3.3%

Policy rate and reserve ratio requirement (RRR)***
% policy rate on one-year renminbi deposits (LHS); % RRR (RHS)

Source: (Left and top right) FactSet, National Bureau of Statistics of China, 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. (Bottom right) FactSet, People’s Bank of China (PBoC), J.P. Morgan Asset Management. ***Average RRR for large and small banks. Guide to the Markets - UK. Data as of 31 December 2016.
China economic indicators

China industrial production and retail sales
% change year on year, three-month moving average

Fixed asset investment (FAI)
% change year on year

Central government fiscal deficit
% of GDP

China home prices
% change year on year

China financial dynamics

**Public, household and non-financial corporate debt**

% of GDP, Q216

- **Public debt**
- **Non-financial corporation debt**
- **Household debt**

**Chinese renminbi**

Rebased index level (LHS); price of a dollar in RMB (RHS)

**China foreign exchange reserves and external debt**

USD trillions

**Source:** (Left) BIS, J.P. Morgan Asset Management. Household and NFC debt is market value. Government debt is gross and nominal value, except for Korea which is market value due to data limitations. All series adjusted for breaks by the BIS. (Top right) BIS, FactSet, J.P. Morgan Asset Management. (Bottom right) FactSet, People’s Bank of China, J.P. Morgan Asset Management. *Guide to the Markets - UK.* Data as of 31 December 2016.
Emerging market adjustments

**EM currencies vs. US dollar**

% from fair value, relative to US dollar

Globalisation and trade

Export of goods

% of GDP, 2015

US

Eurozone

Canada

Brazil

India

China

Russia

Mexico

Japan

Korea


Number of global discriminatory trade measures


World trade growth

Index level, 2005 = 100

<table>
<thead>
<tr>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>GBP</td>
<td>38.2%</td>
<td>1.3%</td>
<td>59.4%</td>
<td>30.5%</td>
<td>2.9%</td>
<td>17.3%</td>
<td>30.5%</td>
<td>20.8%</td>
<td>18.2%</td>
<td>35.1%</td>
<td>9.1%</td>
<td>12.0%</td>
</tr>
<tr>
<td>Local</td>
<td>38.0%</td>
<td>-40.6%</td>
<td>62.8%</td>
<td>24.4%</td>
<td>2.1%</td>
<td>19.7%</td>
<td>35.8%</td>
<td>13.7%</td>
<td>12.1%</td>
<td>14.5%</td>
<td>3.8%</td>
<td>6.9%</td>
</tr>
<tr>
<td>MSCI EM</td>
<td>37.5%</td>
<td>-12.8%</td>
<td>53.6%</td>
<td>23.7%</td>
<td>0.9%</td>
<td>17.2%</td>
<td>29.9%</td>
<td>11.7%</td>
<td>7.3%</td>
<td>33.5%</td>
<td>8.1%</td>
<td>11.0%</td>
</tr>
<tr>
<td>S&amp;P 500</td>
<td>33.6%</td>
<td>-37.0%</td>
<td>67.2%</td>
<td>15.6%</td>
<td>1.5%</td>
<td>20.0%</td>
<td>32.4%</td>
<td>7.7%</td>
<td>1.4%</td>
<td>12.0%</td>
<td>6.1%</td>
<td>6.4%</td>
</tr>
<tr>
<td>Small Cap</td>
<td>15.5%</td>
<td>-18.3%</td>
<td>28.9%</td>
<td>22.9%</td>
<td>-2.2%</td>
<td>13.4%</td>
<td>26.3%</td>
<td>8.7%</td>
<td>5.9%</td>
<td>33.1%</td>
<td>5.2%</td>
<td>8.9%</td>
</tr>
<tr>
<td>HDY Equity</td>
<td>6.8%</td>
<td>-34.4%</td>
<td>-18.3%</td>
<td>22.9%</td>
<td>14.4%</td>
<td>24.2%</td>
<td>6.7%</td>
<td>2.8%</td>
<td>10.1%</td>
<td>11.0%</td>
<td>2.7%</td>
<td>5.1%</td>
</tr>
<tr>
<td>Portfolio</td>
<td>13.3%</td>
<td>11.2%</td>
<td>-19.1%</td>
<td>27.3%</td>
<td>19.5%</td>
<td>13.0%</td>
<td>24.7%</td>
<td>8.4%</td>
<td>5.9%</td>
<td>32.4%</td>
<td>5.0%</td>
<td>8.6%</td>
</tr>
<tr>
<td>HDY Equity</td>
<td>7.9%</td>
<td>4.7%</td>
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<td>27.3%</td>
<td>18.7%</td>
<td>11.6%</td>
<td>18.7%</td>
<td>7.6%</td>
<td>2.2%</td>
<td>27.4%</td>
<td>4.9%</td>
<td>8.5%</td>
</tr>
<tr>
<td>Portfolio</td>
<td>7.4%</td>
<td>11.2%</td>
<td>-23.9%</td>
<td>23.2%</td>
<td>17.3%</td>
<td>-8.0%</td>
<td>16.2%</td>
<td>7.5%</td>
<td>10.8%</td>
<td>16.8%</td>
<td>4.6%</td>
<td>5.2%</td>
</tr>
<tr>
<td>FTSE 100</td>
<td>7.4%</td>
<td>7.4%</td>
<td>-23.9%</td>
<td>23.2%</td>
<td>17.3%</td>
<td>-11.9%</td>
<td>16.0%</td>
<td>0.9%</td>
<td>6.4%</td>
<td>7.0%</td>
<td>0.2%</td>
<td>4.7%</td>
</tr>
<tr>
<td>S&amp;P 500</td>
<td>3.7%</td>
<td>5.5%</td>
<td>-28.3%</td>
<td>19.3%</td>
<td>12.6%</td>
<td>-13.9%</td>
<td>16.8%</td>
<td>0.9%</td>
<td>2.7%</td>
<td>3.7%</td>
<td>3.4%</td>
<td>6.0%</td>
</tr>
<tr>
<td>Small Cap</td>
<td>-0.6%</td>
<td>-3.8%</td>
<td>-33.9%</td>
<td>12.6%</td>
<td>12.1%</td>
<td>-16.5%</td>
<td>10.0%</td>
<td>3.2%</td>
<td>19.7%</td>
<td>0.8%</td>
<td>5.9%</td>
<td>1.0%</td>
</tr>
<tr>
<td>TOPIX</td>
<td>-6.8%</td>
<td>-11.1%</td>
<td>-35.2%</td>
<td>5.7%</td>
<td>-17.6%</td>
<td>2.8%</td>
<td>4.1%</td>
<td>0.0%</td>
<td>19.1%</td>
<td>19.1%</td>
<td>-1.4%</td>
<td>5.2%</td>
</tr>
</tbody>
</table>

Source: FactSet, MSCI, Standard & Poor’s, TOPIX, J.P. Morgan Asset Management. Annualized return covers the period 2007 to 2016. HDY Equity: MSCI AC World High Dividend Yield Index; Small Cap: MSCI Europe Small Cap Index. Hypothetical portfolio (for illustrative purposes only and should not be taken as a recommendation): 20% FTSE 100; 20% S&P 500; 15% EM; 10% Euro ex-UK; 10% Asia ex-Japan; 10% TOPIX; 10% HDY Equity and 5% small cap. All indices are total return. Guide to the Markets - UK. Data as of 31 December 2016.
## European sector returns and valuations

### MSCI Europe Index

<table>
<thead>
<tr>
<th></th>
<th>Financials*</th>
<th>Health care</th>
<th>Cons. staples</th>
<th>Cons. disc.</th>
<th>Industrials</th>
<th>Materials</th>
<th>Energy</th>
<th>Telecom</th>
<th>Utilities</th>
<th>Tech</th>
<th>Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>20.4%</td>
<td>12.8%</td>
<td>13.8%</td>
<td>10.8%</td>
<td>12.8%</td>
<td>8.2%</td>
<td>7.8%</td>
<td>4.2%</td>
<td>3.5%</td>
<td>4.2%</td>
<td>100%</td>
</tr>
<tr>
<td>Growth</td>
<td>3.8%</td>
<td>20.6%</td>
<td>27.1%</td>
<td>12.3%</td>
<td>15.5%</td>
<td>8.9%</td>
<td>0.9%</td>
<td>2.5%</td>
<td>0.6%</td>
<td>7.5%</td>
<td>100%</td>
</tr>
<tr>
<td>Value</td>
<td>36.2%</td>
<td>5.6%</td>
<td>12.2%</td>
<td>9.5%</td>
<td>10.2%</td>
<td>7.6%</td>
<td>14.2%</td>
<td>5.8%</td>
<td>6.3%</td>
<td>1.2%</td>
<td>100%</td>
</tr>
</tbody>
</table>

### Returns

- **Since market peak**
  - Q416: -27.8%
  - 2016: -27.8%

- **Since market low**
  - Q416: 18.8%
  - 2016: 18.1%

### Valuation Ratios

<table>
<thead>
<tr>
<th></th>
<th>Forward P/E ratio</th>
<th>Trailing P/E ratio</th>
<th>Dividend yield</th>
</tr>
</thead>
<tbody>
<tr>
<td>Europe</td>
<td>1.00x</td>
<td>1.00x</td>
<td>1.00x</td>
</tr>
<tr>
<td>15-year</td>
<td>1.00x</td>
<td>1.00x</td>
<td>1.00x</td>
</tr>
</tbody>
</table>

Source: FactSet, MSCI, J.P. Morgan Asset Management. All calculations are total return in local currency, not annualised. *Financials no longer includes real estate which is now a separate section making up 2.6% of the MSCI Europe Value index and 0.5% of the MSCI Europe growth index. It is not included in the chart due to a lack of historical data for the sector. **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. Guide to the Markets - UK. Data as of 31 December 2016.
MSCI Europe ex-UK earnings and performance
Index level, next 12 months’ earnings estimates (LHS); index level (RHS)

MSCI Europe ex-UK 12-month EPS growth and real GDP growth
% change year on year

MSCI Europe ex-UK banks relative performance vs. German 10-year yields
Rebased to 100 in 2009 (LHS); % (RHS)

MSCI Europe ex-UK equity valuations

MSCI Europe ex-UK forward P/E ratio

x, multiple

- 31 Dec 2016: 14.9x
- Average: 13.6x

MSCI Europe ex-UK cyclically adjusted P/E ratio

x, adjusted using trailing 10-year average inflation-adjusted earnings

- 31 Dec 2016: 17.0x
- Average: 19.4x

Dividend yield and 10-year bond yield

% yield

- 31 Dec 2016: 3.5%
- 31 Dec 2016: 0.2%

Source: (Top left) FactSet, J.P. Morgan Asset Management. Forward P/E ratio is a bottom-up calculation based on the most recent price data divided by consensus estimates for earnings in the next 12 months and is provided by FactSet Market Aggregates. (Bottom left) FactSet, MSCI, J.P. Morgan Asset Management. (Right) FactSet, MSCI, Tullet Prebon, J.P. Morgan Asset Management. Guide to the Markets - UK. Data as of 31 December 2016.
UK FTSE All-Share at inflection points

Source: FTSE, Thomson Reuters Datastream, Tullett Prebon, J.P. Morgan Asset Management. Local currency returns. P/E ratios are forward P/E ratios. Forward P/E ratio is a bottom-up calculation based on the most recent price data divided by the mean consensus estimates for earnings in the next 12 months and is provided by FactSet Market Aggregates. Return calculations shown in green are based on the total return index. Guide to the Markets - UK. Data as of 31 December 2016.
FTSE All-Share earnings and performance
Index level, next 12 months’ earnings estimates (LHS); index level (RHS)

Source of UK company revenues
% of revenues

Dividend yield and ex-energy dividend yield
% yield

Source: (Left) Thomson Reuters Datastream, FTSE, J.P. Morgan Asset Management. EPS is earnings per share. (Top right) Citi, MSCI, J.P. Morgan Asset Management. (Bottom right) J.P. Morgan Economic Research, J.P. Morgan Asset Management. UK is MSCI UK, Japan is Topix, Eurozone is Euro Stoxx 50, US is S&P 500.

UK equities post-referendum

Trade-weighted GBP vs. FTSE 100

FTSE 100 vs. FTSE 250 valuations

Relative price-to-book value

Earnings upgrades by region

% balance in analyst upgrades, net EPS upgrades

UK FTSE All-Share equity valuations

**Forward P/E ratio**
- x, multiple
- 31 Dec 2016: 14.4x
- Average: 13.8x

**FTSE All-Share Shiller CAPE**
- x, adjusted using trailing 10-year average inflation-adjusted earnings
- 30 Nov 2016: 13.2x
- Average: 17.0x

**Dividend yield and 10-year Gilt yield**
- % yield
- Dividend yield: 31 Dec 2016: 4.1%
- 10-year Gilt yield: 31 Dec 2016: 1.2%

Source: (Top left) FactSet, FTSE, Tullett Prebon, J.P. Morgan Asset Management. Forward P/E ratio is a bottom-up calculation based on the most recent price data divided by consensus estimates for earnings in the next 12 months and is provided by FactSet Market Aggregates. (Bottom left) FTSE, Goldman Sachs, J.P. Morgan Asset Management. (Right) FactSet, FTSE, J.P. Morgan Asset Management. Guide to the Markets - UK. Data as of 31 December 2016.
### S&P 500 Index

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Index level</td>
<td>1,527</td>
<td>1,565</td>
<td>2,239</td>
</tr>
<tr>
<td>P/E ratio (fwd)</td>
<td>27.3x</td>
<td>15.8x</td>
<td>16.9x</td>
</tr>
<tr>
<td>Dividend yield</td>
<td>1.1%</td>
<td>1.7%</td>
<td>2.1%</td>
</tr>
<tr>
<td>US 10-year</td>
<td>6.2%</td>
<td>4.6%</td>
<td>2.4%</td>
</tr>
</tbody>
</table>

Source: FactSet, Standard & Poor’s, Tullett Prebon, J.P. Morgan Asset Management. The P/E ratios are forward P/E ratios. Forward P/E ratio is a bottom-up calculation based on the most recent price data divided by the mean consensus estimates for earnings in the next 12 months and is provided by FactSet Market Aggregates. Return calculations shown in green are based on the total return index. Guide to the Markets - UK. Data as of 31 December 2016.
**S&P 500 earnings and performance**

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

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

Thousands, four-week moving average (LHS); index level (RHS)

**Earnings per share (EPS) growth**

% change year on year

**US S&P 500 equity valuations**

**Dividend yield and 10-year Treasury yield**

- **Dividend yield**: 31 Dec 2016: 2.1%
- **10-year Treasury**: 31 Dec 2016: 2.4%

**Forward P/E ratio**

- **31 Dec 1999**: 27.0x
- **31 Dec 2016**: 16.9x
- **Average**: 16.5x

**S&P 500 Shiller cyclically adjusted P/E**

- **31 Dec 2016**: 28.3x
- **Average**: 16.7x

Source: (Left) FactSet, IBES, Moody's, Standard & Poor's, J.P. Morgan Asset Management. (Top right) FactSet, Standard & Poor's, J.P. Morgan Asset Management. Forward P/E ratio is a bottom-up calculation based on the most recent price data divided by consensus estimates for earnings in the next 12 months and is provided by FactSet Market Aggregates. (Bottom right) FactSet, Robert Shiller, J.P. Morgan Asset Management. Guide to the Markets - UK. Data as of 31 December 2016.
Equity markets and reflation

S&P 500 average P/E ratio in various inflation environments

1872-2016

**MSCI USA index used for both banks and consumer staples indices. Guide to the Markets - UK. Data as of 31 December 2016.

US bond yield vs. value/growth performance*
Relative index level (LHS); % (RHS)

US bond yield vs. banks/staples performance**
Relative index level (LHS); % (RHS)

**MSCI USA index used for both banks and consumer staples indices. Guide to the Markets - UK. Data as of 31 December 2016.
**Characteristics of past bear and bull markets**

<table>
<thead>
<tr>
<th>Bear markets</th>
<th>Macro environment</th>
<th>Bull markets</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Market peak</strong></td>
<td><strong>Bear return (months)</strong></td>
<td><strong>Duration (months)</strong></td>
</tr>
<tr>
<td>Sep 1929</td>
<td>-86%</td>
<td>33</td>
</tr>
<tr>
<td>Mar 1937</td>
<td>-60</td>
<td>63</td>
</tr>
<tr>
<td>May 1946</td>
<td>-30</td>
<td>37</td>
</tr>
<tr>
<td>Dec 1961</td>
<td>-28</td>
<td>7</td>
</tr>
<tr>
<td>Nov 1968</td>
<td>-36</td>
<td>18</td>
</tr>
<tr>
<td>Jan 1973</td>
<td>-48</td>
<td>21</td>
</tr>
<tr>
<td>Nov 1980</td>
<td>-27</td>
<td>21</td>
</tr>
<tr>
<td>Aug 1987</td>
<td>-34</td>
<td>3</td>
</tr>
<tr>
<td>Mar 2000</td>
<td>-49</td>
<td>31</td>
</tr>
<tr>
<td>Oct 2007</td>
<td>-57</td>
<td>17</td>
</tr>
<tr>
<td>Current cycle</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

**Average** | – | -45% | 25 | – | – | – | – | 154% | 54 |

Source: FactSet, NBER, Robert Shiller, Standard & Poor’s, J.P. Morgan Asset Management. *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. “Commodity spike” is defined as significant rapid upward moves in oil prices. Periods of “extreme valuations” are those where S&P 500 last 12 months’ P/E levels were approximately two standard deviations above long-run averages. “Aggressive Fed tightening” is defined as US Federal Reserve monetary tightening that was unexpected and significant in magnitude. Guide to the Markets - UK. Data as of 30 September 2016.
Correlations between weekly equity returns and interest rate movements

Rolling two-year correlation of weekly returns of the S&P 500, MSCI Europe Index and the 2-year Treasury yield, 1983-2016

Positive relationship between yield movements and equity returns

Negative relationship between yield movements and equity returns

Japanese equities performance and drivers

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

**TOPIX vs. JPY/USD**
Index level (LHS); price of US dollar in yen (RHS)

**Listed companies’ dividend pay-out and share buybacks**
Yen trillions

Developed market equity valuations by country

Source: FactSet, MSCI, J.P. Morgan Asset Management. Each valuation index shows an equally weighted composite of four metrics: price to forward earnings (P/E), price to forward book value (P/B), price to forward cash flow (P/CF) and price to forward dividends. Results are then normalised using means and average variability since 2004 (inception of series). The grey bars represent valuation index variability relative to that of the All Country World Index (ACWI).

DM Index is the MSCI The World Index. Guide to the Markets - UK. Data as of 31 December 2016.
Emerging market equity valuations by country

How to interpret this chart

- Expensive relative to own history
- Expensive relative to world
- Cheap relative to own history
- Cheap relative to world

Guide to the Markets - UK.

Data as of 31 December 2016.

Emerging markets

<table>
<thead>
<tr>
<th>Country</th>
<th>Current composite index</th>
<th>Current</th>
<th>Average since 2004</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Forward P/E</td>
<td>Forward P/B</td>
<td>Forward P/CF</td>
</tr>
<tr>
<td>Russia</td>
<td>6.2x</td>
<td>0.7x</td>
<td>3.7x</td>
</tr>
<tr>
<td>Brazil</td>
<td>-11.0</td>
<td>1.4</td>
<td>7.4</td>
</tr>
<tr>
<td>Taiwan</td>
<td>-12.7</td>
<td>1.6</td>
<td>7.9</td>
</tr>
<tr>
<td>Korea</td>
<td>-10.0</td>
<td>1.0</td>
<td>5.2</td>
</tr>
<tr>
<td>China</td>
<td>11.1</td>
<td>1.3</td>
<td>7.1</td>
</tr>
<tr>
<td>EM</td>
<td>11.9</td>
<td>1.4</td>
<td>7.2</td>
</tr>
<tr>
<td>S. Africa</td>
<td>13.8</td>
<td>1.9</td>
<td>10.9</td>
</tr>
<tr>
<td>ACWI</td>
<td>15.7</td>
<td>2.0</td>
<td>9.8</td>
</tr>
<tr>
<td>Mexico</td>
<td>16.4</td>
<td>2.3</td>
<td>7.9</td>
</tr>
<tr>
<td>India</td>
<td>15.8</td>
<td>2.5</td>
<td>10.8</td>
</tr>
</tbody>
</table>

Source: FactSet, MSCI, J.P. Morgan Asset Management. Each valuation index shows an equally weighted composite of four metrics: price to forward earnings (P/E), price to forward book value (P/B), price to forward cash flow (P/CF) and price to forward dividends. Results are then normalised using means and average variability since 2004 (Inception of series). The grey bars represent valuation index variability relative to that of the All Country World Index (ACWI).

MSCI Emerging Markets Index: Price-to-book ratio

- Average: 1.79x
- 31 Dec 2016: 1.51x
- +2.0 std. dev.
- -2.0 std. dev.

MSCI Emerging Markets Index: Price-to-book and returns

Price-to-book ratio and next 5-year annualised % price return*


Emerging markets: Investment drivers

EM vs. DM growth and equity performance
% next 12 months' growth estimates (LHS); index level (RHS)

EM minus DM GDP growth

EM growth & equity outperformance

EM growth & equity underperformance

EM growth & equity relative performance and commodities

EM equity relative performance and commodities

MSCI EM relative to MSCI DM

Bloomberg Commodity Index

Relative EM / DM equity performance and USD REER
Equity performance rebased to 100 at 1993 (LHS); index level (RHS)

MSCI EM / MSCI DM

USD REER (inverted)

Emerging markets: Flows, earnings and income

**Total non-resident flows into EM assets**

USD billion

- EM debt
- EM equities

2010-2014 average: $23bn

**EM earnings expectations by region**

Consensus EPS for next 12 months, local currency, rebased to 100 in 2006

**Number of companies yielding greater than 3% by region**

Constituents of the MSCI All Country World Index

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emerging markets</td>
<td>337</td>
</tr>
<tr>
<td>Europe</td>
<td>200</td>
</tr>
<tr>
<td>US</td>
<td>122</td>
</tr>
<tr>
<td>Japan</td>
<td>40</td>
</tr>
</tbody>
</table>

Source: (Left) IIF, J.P. Morgan Asset Management. (Top right and bottom right) FactSet, MSCI, J.P. Morgan Asset Management. EPS is earnings per share.

Equity income

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

% average annualised returns

1926-1929 13.9% 4.7% -5.3%
1930s 5.4% 3.0% 1940s 13.6% 6.0%
1950s 5.1% 4.4% 1960s 1.6% 3.3%
1970s 12.6% 4.2% 1980s 4.4% 2.5%
1990s 15.3% -2.7% 2000s 1.8% 4.0%
2010-2016 10.5% 5.8%
1926-2016 0.3 1.1 2.6 2.6 2.6 3.8 4.1 5.6 6.1

FTSE indices: Price vs. total return*

Index level, rebased to 100 at December 1999


Guides to the Markets - UK. Data as of 31 December 2016.
## Global fixed income: Yields and returns

### Fixed income sector returns

<table>
<thead>
<tr>
<th>YTM (%)</th>
<th>Size (GBP bns)</th>
<th>Duration (years)</th>
<th>10-year Gilt</th>
<th>10-year UST</th>
</tr>
</thead>
<tbody>
<tr>
<td>US HY</td>
<td>6.5</td>
<td>1,070</td>
<td>3.9</td>
<td>-0.11</td>
</tr>
<tr>
<td>EM Debt</td>
<td>6.1</td>
<td>274</td>
<td>6.7</td>
<td>0.01</td>
</tr>
<tr>
<td>Euro HY</td>
<td>3.8</td>
<td>207</td>
<td>3.2</td>
<td>-0.14</td>
</tr>
<tr>
<td>US Corporate IG</td>
<td>3.4</td>
<td>3,971</td>
<td>7.3</td>
<td>0.38</td>
</tr>
<tr>
<td>Portfolio</td>
<td>2.9</td>
<td>-</td>
<td>9.0</td>
<td>0.45</td>
</tr>
<tr>
<td>UK IG</td>
<td>2.6</td>
<td>353</td>
<td>8.7</td>
<td>0.47</td>
</tr>
<tr>
<td>US Treasury</td>
<td>1.9</td>
<td>5,579</td>
<td>6.0</td>
<td>0.51</td>
</tr>
<tr>
<td>UK Gilts</td>
<td>1.5</td>
<td>1,199</td>
<td>11.4</td>
<td>0.62</td>
</tr>
<tr>
<td>Infl Linked</td>
<td>-1.8</td>
<td>627</td>
<td>22.9</td>
<td>0.48</td>
</tr>
</tbody>
</table>

### Source


---

### Guide to the Markets - UK

Data as of 31 December 2016.
Fixed income interest rate risk

**Current and historical yields for selected indices**

% yield, fluctuations over the last 10 years*

*Historical yield range is based on the last 10 years of data, with the exception of local currency emerging markets debt, which is based on eight years, due to data availability.

Source: (Both charts) Barclays, Bloomberg, FactSet, J.P. Morgan Asset Management.

**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

For illustrative purposes only. Change in bond price is calculated using both duration and convexity, with the exception of Convertibles, which is historical change.

Guide to the Markets - UK.

Data as of 31 December 2016.

Fixed income sectors shown are provided by Barclays and are represented by: Treasury UK: Barclays Sterling Aggregate Gilts; Floating rate: Barclays US Floating Rate Notes (BBB); IG credit: Barclays Global Aggregate – Corporates; High yield: Barclays Global High Yield; Convertibles: Bloomberg Barclays Credit/Rate Sensitive; EMD sovereign USD: Barclays Emerging Markets – Sovereigns; EMD corporate (S): Barclays Emerging Markets – Corporates; EMD sovereign (LC): Barclays Emerging Market Local Currency Government.
Inflation implications for fixed income

10-year breakeven inflation

%  

UK  
US  
Germany

Breakdown of US Treasury yield increases

Change in yield, %

10-year US breakeven inflation change
10-year US real treasury yield change

US Treasury and inflation-linked bond returns

% total return

US 10-year Treasury return
US 10-year TIPS (inflation-linked) return

Liquidity risks

US corporate debt outstanding and dealer inventories
USD billions

US investment-grade corporate bond trades
USD millions (LHS); # of trades (RHS)

Factors affecting bond liquidity during Taper Tantrum
Index level, relative liquidity performance

Source: (Left) Federal Reserve Bank of New York, SIFMA, J.P. Morgan Asset Management. US corporate debt outstanding is the Barclays US Corporate Investment Grade. (Top right) TRACE, J.P. Morgan Asset Management. (Bottom right) Markit, IMF, J.P. Morgan Asset Management. The chart shows the contribution of each factor to a non-financial corporate bond’s liquidity performance during the Taper Tantrum episode. Liquidity is measured using Markit’s liquidity score, which is a composite index of market liquidity. The effects are normalised by the average change in liquidity (as per liquidity score) in the period. “Depth of market” is the ability for the market on a security to absorb larger buy and sell orders before a single order moves the price on the security. Guide to the Markets - UK.

Data as of 31 December 2016.
Historical yields of government bonds

10-year bond yields

- US
- UK
- Germany
- Japan

- Fall of Berlin Wall 1989
- Black Friday 1987
- Britain leaves European Exchange Rate Mechanism 1992
- Asian currency crisis 1997
- Dot com bubble Feb 2000
- 9/11 attacks 2001
- Fed QE 2008
- Fed QE2 2010
- BoE QE 2009
- Fed QE3 2012
- ECB QE 2015
- US election 2016
- Brexit vote 2016

Yield to maturity of government bonds

% yield

- US
- UK
- Japan
- Germany

US yield curve
% 10-year yield minus 2-year yield

Recession

Global government bond yields
% of BofA/Merrill Lynch Global Government Bond Index

- Yield below 1%
- Yield below 0%

Global investment-grade bonds

**Investment-grade spreads**
Basis points, option-adjusted spread over local government bond yield

**US IG leverage measures**
x, leverage (LHS); x, interest coverage ratio (RHS)

**US cumulative net investment-grade bond issuance**
USD billions


*Leverage is debt to earnings before interest, tax, depreciation and amortisation (EBITDA). **Interest coverage ratio is EBITDA over interest expense.

Global investment-grade bond market

Market capitalisation by duration bucket

% of total in each currency

- 1-3 years
- 3-7 years
- 7-10 years
- +10 years

Cumulative number of issuers

% of total index issuers

US high yield spreads and defaults
% Fed funds rate and defaults (LHS); basis points, spread over 10-year US Treasury (RHS)

<table>
<thead>
<tr>
<th>Asset class</th>
<th>Average since 1986</th>
<th>Latest</th>
</tr>
</thead>
<tbody>
<tr>
<td>HY spread – bps (RHS)</td>
<td>561</td>
<td>449</td>
</tr>
<tr>
<td>HY defaults (LHS)</td>
<td>4.0%</td>
<td>3.6% total index</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14.6% energy</td>
</tr>
</tbody>
</table>

Source: (Top) Credit Suisse, J.P. Morgan Economic Research, US Treasury, J.P. Morgan Asset Management. HY index is the J.P. Morgan Domestic High Yield 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. (Bottom left) J.P. Morgan Economic Research, J.P. Morgan Asset Management. (Bottom right) J.P. Morgan Economic Research, J.P. Morgan Asset Management. *Leverage is net debt to earnings before interest, tax, depreciation and amortisation (EBITDA). **Interest coverage ratio is EBITDA over interest expense. Guide to the Markets - UK. Data as of 31 December 2016.
European high yield bonds

European high yield: Spread to worst and default rates
% defaults (LHS); basis points, spread (RHS)

Default rate 2002: 34%

European high yield issuance by credit rating
EUR billions

2016 €58.3bn

Asian high yield earnings and revenue growth
% change year on year


Emerging market debt

% yield

EM sovereign (local currency)
EM corporate (USD)
EM sovereign (USD)

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

-1
0
1
2
3
4
5

Developed markets
Emerging markets

Cumulative emerging market debt flows
USD millions, 2016

Data as of 31 December 2016.

Source: (Left) FactSet, J.P. Morgan Economic Research, J.P. Morgan Asset Management. (Top right) FactSet, J.P. Morgan Asset Management. (Bottom right) J.P. Morgan Economic Research, J.P. Morgan Asset Management. EM sovereign (local currency) is the J.P. Morgan GBI-EM; EM sovereign (USD) is the J.P. Morgan EMBI+; EM corporate (USD) is the J.P. Morgan CEMBI. Blend is flows into funds with all three EMD sub-types. Guide to the Markets - UK.

J.P.Morgan
Asset Management
Commodities

Commodity prices
Index level, rebased to 100 at Dec 2010

China's imports of key commodities
Millions of metric tonnes

Bloomberg Commodity Index weights
Livestock 6% Industrial metals 17%
Energy 31% Precious metals 15%
Crops 31%

Gross fixed capital formation in commodity industry
Index level, rebased to 100 at Jan 1995

Oil market drivers

**Crude oil prices**
USD per barrel

- Brent crude
- 2016 change: +58.9%

**US rig count vs. oil inventories***
Thousands of barrels (LHS); rigs (RHS)

- Inventories
- Rigs

**Global oil supply and demand**
Millions of barrels per day

- Supply
- Demand
- Forecast

---

Gold market dynamics

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

Risk-adjusted returns and downside protection

Risk-adjusted returns of a 50/50 portfolio
Sharpe ratio of a portfolio of 50% global equities and 50% global bonds*

3-year Sharpe ratio
5-year Sharpe ratio

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, 2001-2015

Source: (Left) MSCI, J.P. Morgan Asset Management. *The equity index is the MSCI World (EUR hedged) and the bond index is the JPMorgan Global Bond index (EUR hedged). The portfolio is rebalanced monthly. Sharpe ratio is calculated as (Return - Risk free rate) / Volatility. (Top right) Bloomberg, J.P. Morgan Asset Management. (Bottom right) Barclays, Thomson Reuters Datastream, Hedge Fund Research, Standard & Poor’s, J.P. Morgan Asset Management. **HFRI FW is Hedge Fund Research Index Fund Weighted. ***US bonds is the Barclays US Aggregate Bond Index. Downside protection refers to attempting to minimise the impact of any falls in the underlying investments. Guide to the Markets - UK. Data as of 31 December 2016.
Alternative strategies

Manager dispersion: Public and private markets*

Manager dispersion is based on the time period from 31 December 2009 through 31 December 2014, except for private equity, which is based on the five-year period ending 31 March 2014 due to returns being reported with a lag.

Public vs. private equity returns

Public vs. private equity returns, %, MSCI AC World total return vs. Global Buyout & Growth Equity Index**

Infrastructure returns

Infrastructure returns, %, OECD allowed RoE over cost of debt

## Correlation of returns (GBP)

### 10-year correlations

<table>
<thead>
<tr>
<th></th>
<th>FTSE 100</th>
<th>S&amp;P 500</th>
<th>MSCI Europe ex-UK</th>
<th>MSCI Japan</th>
<th>MSCI Asia ex-Japan</th>
<th>MSCI EM</th>
<th>UK Gilts</th>
<th>EM debt</th>
<th>High yield bonds</th>
<th>Global bonds</th>
<th>Cmdty</th>
<th>Hedge funds</th>
<th>Real estate</th>
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<tbody>
<tr>
<td>FTSE 100</td>
<td>1.00</td>
<td>0.80</td>
<td>0.92</td>
<td>0.57</td>
<td>0.78</td>
<td>0.83</td>
<td>-0.27</td>
<td>0.11</td>
<td>0.70</td>
<td>-0.19</td>
<td>0.45</td>
<td>0.71</td>
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<tr>
<td>S&amp;P 500</td>
<td>0.73</td>
<td>1.00</td>
<td>0.75</td>
<td>0.64</td>
<td>0.62</td>
<td>0.61</td>
<td>-0.12</td>
<td>0.29</td>
<td>0.35</td>
<td>0.03</td>
<td>0.30</td>
<td>0.41</td>
<td>-0.17</td>
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<tr>
<td>MSCI Europe ex-UK</td>
<td>0.83</td>
<td>0.64</td>
<td>1.00</td>
<td>0.57</td>
<td>0.77</td>
<td>0.78</td>
<td>-0.25</td>
<td>0.16</td>
<td>0.60</td>
<td>-0.06</td>
<td>0.33</td>
<td>0.61</td>
<td>-0.27</td>
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<tr>
<td>MSCI Japan</td>
<td>0.85</td>
<td>0.69</td>
<td>0.81</td>
<td>1.00</td>
<td>0.49</td>
<td>0.43</td>
<td>-0.09</td>
<td>0.33</td>
<td>0.13</td>
<td>0.19</td>
<td>0.17</td>
<td>0.19</td>
<td>-0.16</td>
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<tr>
<td>MSCI Asia ex-Japan</td>
<td>0.85</td>
<td>0.69</td>
<td>0.73</td>
<td>0.81</td>
<td>1.00</td>
<td>0.96</td>
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<td>0.21</td>
<td>0.65</td>
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<td>0.31</td>
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<td>0.49</td>
<td>0.73</td>
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<tr>
<td>UK Gilts</td>
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<td>0.29</td>
<td>0.01</td>
<td>-0.07</td>
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<td>0.23</td>
<td>1.00</td>
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<td>0.05</td>
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<td>High yield bonds</td>
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<td>0.41</td>
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<td>Global bonds</td>
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<td>0.90</td>
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<td>1.00</td>
<td>-0.10</td>
<td>-0.64</td>
<td>0.00</td>
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<tr>
<td>Cmdty</td>
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<td>0.30</td>
<td>0.34</td>
<td>0.15</td>
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<td>0.10</td>
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<td>0.36</td>
<td>1.00</td>
<td>0.45</td>
<td>-0.05</td>
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<tr>
<td>Hedge funds</td>
<td>0.32</td>
<td>0.19</td>
<td>0.50</td>
<td>0.50</td>
<td>0.37</td>
<td>0.28</td>
<td>0.30</td>
<td>0.11</td>
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<td>1.00</td>
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<td>Real estate</td>
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<td>-0.08</td>
<td>-0.62</td>
<td>-0.16</td>
<td>1.00</td>
</tr>
</tbody>
</table>

### 3-year correlations


Data as of 31 December 2016.
Asset markets in coming decades

Past and expected returns
% per year

<table>
<thead>
<tr>
<th>Asset Class</th>
<th>Return in past decade</th>
<th>Expected return in next decade</th>
</tr>
</thead>
<tbody>
<tr>
<td>EM equity</td>
<td>8%</td>
<td>6%</td>
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<tr>
<td>Private equity</td>
<td>6%</td>
<td>5%</td>
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<tr>
<td>UK large cap</td>
<td>4%</td>
<td>4%</td>
</tr>
<tr>
<td>Eurozone large cap</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>EM local currency debt</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>UK core direct real estate</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>US large cap</td>
<td>1%</td>
<td>1%</td>
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<tr>
<td>Global direct infrastructure</td>
<td>0%</td>
<td>0%</td>
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<tr>
<td>Diversified hedge funds</td>
<td>0%</td>
<td>0%</td>
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<tr>
<td>Commodities</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>UK investment grade corporates</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>UK cash</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>UK gilts</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>World government bonds</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>UK government inflation linked</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Source: (Left) 2017 Long-term capital market assumptions, J.P. Morgan Multi-Asset Solutions, J.P. Morgan Asset Management, October 2016. Returns are in GBP.
(Right) Diminishing returns: Why investors may need to lower their sights by McKinsey Global Institute, J.P. Morgan Asset Management. “European” comprises data from 14 Western European countries, including the UK. For historical fixed-income returns McKinsey utilised the Dimson-Marsh-Staunton Global Returns database, which targets a bond duration of 20 years. Future returns show ranges across a set of countries, and are based on ten-year bonds; numbers reflect the range between the low-end of McKinsey’s slow-growth scenario and the high end of their growth-recovery scenario.

Life expectancy

Probability of reaching ages 80 and 90
% probability, persons aged 65, by gender and combined couple

**Cash investments**

### Income generated by £100,000 in a three-month bank deposit

GBP (LHS); % change year on year (RHS)

- **2007:** £6,000

### Total return of £1 in real terms

GBP, log scale for total returns

- **Annualised real returns**
  - **1899–2015**
    - Equities: 5.1%
    - Bonds: 1.5%
    - Cash: 0.8%
  - **2000–2016**
    - Equities: 1.0%
    - Bonds: 3.1%
    - Cash: -0.3%

- **Dec 2016:** £610

The power of compounding

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

GBP

£353,803

£639,199

Starting at age 25

Starting at age 35

£5,000 investment with/without income reinvested

GBP, FTSE All-Share returns

£88,396

£28,357

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, FTSE, J.P. Morgan Asset Management. Based on FTSE All-Share index and assumes no charges.

 Despite average intra-year drops of 15.8% (median 12.6%), annual returns are positive in 22 of 31 years.

Source: FactSet, FTSE, 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 1986 to 2016. Guide to the Markets - UK. Data as of 31 December 2016.
Impact of being out of the market

Returns of FTSE All-Share
GBP, value of a £10,000 investment between 1996 and 2016 with annualised return (%)

- Fully invested: 7.4%
- Missed 10 best days: 4.2%
- Missed 30 best days: 0.2%
- Missed 50 best days: -2.9%

Initial investment

Source: FactSet, FTSE, J.P. Morgan Asset Management. For illustrative purposes only. Assumes all income is reinvested; returns calculated daily over the time period assuming no return on each of the specified number of best days. Guide to the Markets - UK. Data as of 31 December 2016.
Range of equity and bond total returns
% annualised total returns, 1950-2016

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 November 2016 and include dividends. Guide to the Markets - UK. Data as of 31 December 2016.
Source: Barclays, Bloomberg, FactSet, FTSE, MSCI, J.P. Morgan Economic Research, J.P. Morgan Asset Management. Annualised return covers the period from 2007 to 2016. Vol. is the standard deviation of annual returns. Govt bonds: Barclays Global Aggregate Government Treasuries; HY bonds: Barclays Global High Yield; EMD: JP Morgan EMBI+; IG bonds: Barclays Global Aggregate – Corporates; Cmdty: Bloomberg UBS Commodity; REITS: FTSE NAREIT All REITS; DM Equities: MSCI World; EME: MSCI EM; Hedge funds: Credit Suisse/Tremont Hedge Fund; Cash: JP Morgan Cash United Kingdom (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. Returns are unhedged, total return, in GBP. Guide to the Markets - UK. Data as of 31 December 2016.
All indexes are unmanaged and an individual cannot invest directly in an index. Index returns do not include fees or expenses. The S&P 500 Index® is widely regarded as the best single gauge of the U.S. equities market. This world-renowned index includes a representative sample of 500 leading companies in leading industries of the U.S. economy. Although the S&P 500 Index® focuses on the large-cap segment of the market, with approximately 75% coverage of U.S. equities, it is also an ideal proxy for the total market. An investor cannot invest directly in an index. The S&P 400 Mid Cap Index® is representative of 400 stocks in the mid-range sector of the domestic stock market, representing all major industries.

The Russell 3000 Index® measures the performance of the 3,000 largest U.S. companies based on total market capitalization. The Russell 1000 Index® measures the performance of the 1,000 largest companies in the Russell 3000. The Russell 1000 Growth Index® measures the performance of those Russell 1000 companies with higher price-to-book ratios and higher forecasted growth values. The Russell 1000 Value Index® measures the performance of those Russell 1000 companies with lower price-to-book ratios and lower forecasted growth values.

The Russell Midcap Index® measures the performance of the 800 smallest companies in the Russell 1000 Index. The Russell Midcap Growth Index® measures the performance of those Russell Midcap companies with higher price-to-book ratios and higher forecasted growth values. The Russell Midcap Value Index® measures the performance of those Russell Midcap companies with lower price-to-book ratios and lower forecasted growth values. The Russell 2000 Index® measures the performance of the 2,000 smallest companies in the Russell 3000 Index. The Russell 2000 Growth Index® measures the performance of those Russell 2000 companies with higher price-to-book ratios and higher forecasted growth values. The Russell 2000 Value Index® measures the performance of those Russell 2000 companies with lower price-to-book ratios and lower forecasted growth values.

The Russell Top 200 Index® measures the performance of the largest cap segment of the U.S. equity universe. It includes approximately 200 of the largest securities based on a combination of their market cap and current index membership and represents approximately 68% of the U.S. market.

The MSCI® EAFE (Europe, Australia, Far East) Net Index is recognized as the pre-eminent benchmark in the United States to measure international equity performance. It comprises 21 MSCI country indexes, representing the developed markets outside of North America. The MSCI Emerging Markets IndexSM is a free float-adjusted market capitalization index that is designed to measure equity market performance in the global emerging markets. As of June 2007, the MSCI Emerging Markets Index consisted of the following 25 emerging market country indexes: Argentina, Brazil, Chile, China, Colombia, Czech Republic, Egypt, Hungary, India, Indonesia, Israel, Jordan, Korea, Malaysia, Mexico, Morocco, Pakistan, Peru, Philippines, Poland, Russia, South Africa, Taiwan, Thailand, and Turkey.

The MSCI All Country World Index® is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of all developed and emerging markets. As of June 2008 the MSCI ACHI consisted of 45 country indexes comprising 23 developed and 22 emerging market country indexes. The MSCI Small Cap IndexSM is designed to measure Small Cap universe as all listed securities that have a market capitalization in the range of US$300-1,500 million.

The MSCI All Country Pacific ex-Japan Index® is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of the developed and emerging markets in the Pacific Region. The MSCI All Country Asia Pacific ex-Japan Index® consists of the following 11 developed and emerging market countries: Australia, China, Hong Kong, Indonesia, Japan, Korea, Malaysia, New Zealand, Philippines, Singapore, Taiwan, and Thailand.

The MSCI China Index® is an unmanaged index considered representative of stocks of China. The MSCI KOKUSAI IndexSM 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 indexes: 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 IndexSM 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)SM 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 MSCI Value and Growth IndicesSM cover the full range of developed, emerging and All Country MSCI Equity indexes. 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. Country Value/Growth indices are then aggregated into regional Value/Growth indices. Prior to May 30, 2003, the indices used Price/Book (PBV) ratios to divide the standard MSCI country indices into value and growth indices. All securities were classified as either “value” securities (low PBV/ securities) or “growth” securities (high PBV/ securities), relative to each MSCI country index. The following MSCI Total Return IndicesSM 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 company, but does not include tax credits. The MSCI Europe IndexSM 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 indexes: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

The MSCI Pacific IndexSM 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.

The Credit Suisse/Tremont Hedge Fund IndexSM 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 4,500 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 NAREIT Property IndexSM 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 IndexSM is designed to provide the most comprehensive assessment of overall industry performance, and includes all tax-exempt real estate investment trusts (REITs) that are listed on the NYSE, the American Stock Exchange or 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 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 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 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 Barclays Euro-Aggregate Index consists of bonds 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 Barclays Global Aggregate Corporate Index consists of corporate issues in Europe, the US, and Asia-Pacific regions.

The 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 Barclays Emerging Markets 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 Barclays MBS Index covers the mortgage-backed pass-through securities of Ginnie Mae, Freddie Mac, and others. 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 Barclays Corporate Bond Index is the Corporate component of the U.S. Credit Index.

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

The J.P. Morgan EMBI Global Index includes U.S. dollar denominated Brady bonds, Eurobonds, traded loans and local market debt instruments issued by sovereigns and quasi-sovereign entities.

The Li Keqiang Index is a composite measure composed of China's electricity production, financial institution loans and railway freight.

The Euro Stoxx 600 Index represents large, mid and small capitalization companies across 18 European countries.

The JPMorgan GBII-EM Global Diversified 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 (CEMEI) 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 CEMI 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 Barclays U.S. Dollar Floating Rate Note (FIN) 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 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.
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Unless otherwise stated, all data as of 31 December 2016 or most recently available.

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