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Economic growth and the composition of GDP

**Real GDP**

Year-over-year change

<table>
<thead>
<tr>
<th>Year</th>
<th>Avg 1965</th>
<th>1Q18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real GDP</td>
<td>3.3%</td>
<td>1.8%</td>
</tr>
</tbody>
</table>

**Components of GDP**

Nominal GDP, sum of last four quarters, AUD billions*

- 55.8% Consumption
- 23.7% Gov’t spending
- 11.5% Investment ex-housing
- 7.3% Housing
- 1.7% Net exports

Source: Australian Bureau of Statistics, FactSet, J.P. Morgan Asset Management. *Values may not sum to 100% due to rounding.

Consumer and business confidence

**Consumer sentiment and business confidence**

- **Z-score**

**Consumer sentiment and retail sales**

- **Year-over-year change**
- **3-month moving average**

Source: FactSet, Westpac, J.P. Morgan Asset Management; (Left) National Australia Bank; (Right) Australian Bureau of Statistics.

**Business investment**

Contribution to annual growth rate

- Total
- Non-mining
- Mining

**New capital expenditures**

% of GDP

- Residential
- Mining
- Non-residential
- Public engineering

**Capital expenditure intentions**

AUD billions, 5-year realisation ratio*

- Actual
- Forecasts


*Forecasts use latest estimates for capital expenditure intentions for the coming years and the average realisation ratio of those intentions for the past five years.

Inflation

Average 1Q19

<table>
<thead>
<tr>
<th>Index</th>
<th>Average</th>
<th>1Q19</th>
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<tbody>
<tr>
<td>Headline CPI*</td>
<td>3.6%</td>
<td>1.3%</td>
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<tr>
<td>Core CPI</td>
<td>3.7%</td>
<td>1.4%</td>
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<tr>
<td>Tradables</td>
<td>2.8%</td>
<td>0.4%</td>
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<tr>
<td>Non-tradables</td>
<td>4.3%</td>
<td>1.8%</td>
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</table>

Source: Australian Bureau of Statistics, FactSet, J.P. Morgan Asset Management. *CPI is the Consumer Price Index, core CPI is the average of the trimmed mean and weighted median measures of inflation. Tradables represent approximately 35% of the CPI basket and non-tradables 65%. Core goods CPI is goods CPI excluding volatile items. 

Unemployment and wages

**Unemployment and underemployment rates**
Seasonally adjusted

- **Unemployment rate**
- **Underemployment rate**

<table>
<thead>
<tr>
<th>Year</th>
<th>Unemployment Rate</th>
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<tbody>
<tr>
<td>1Q19</td>
<td>5.2%</td>
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<tr>
<td>May 2019</td>
<td>8.2%</td>
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</table>

**Wage growth**
Year-over-year change, excluding bonuses

<table>
<thead>
<tr>
<th>Year</th>
<th>Wage Growth</th>
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<tbody>
<tr>
<td>1Q18</td>
<td>2.4%</td>
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</table>

Employment intentions

Employment growth and employment intentions
Index, 2mma, advanced 4 months

Year-over-year change

Consumer finances

Household debt and savings rate
Percent of annualised household disposable income

Household debt service ratio
Interest payments to household disposable income, seasonally adjusted


Residential real estate prices

Source: RPD CoreLogic, J.P. Morgan Asset Management.

Residential real estate financing

**Mortgage lending**
3-month annualised growth rate

- Owner-occupier
- Investor

**Housing finance and house prices**
Change year-over-year

- Housing finance commitments (adv. 6 months, 3mma)
- House prices*

Source: Australian Bureau of Statistics, J.P. Morgan Asset Management; (Right) RPD CoreLogic.

*House price is the year-over-year change in the hedonic index for national dwelling prices. Past performance is not a reliable indicator of current and future results.

Residential real estate activity

**Private dwellings and economic growth**

- Year-over-year change
- Contribution to GDP
- Building approvals (adv. 3 months, 3mma)
- Private dwellings

**Auction clearance rate and house prices**

- 3-month moving average
- Change year-over-year
- Auction clearance rate (adv. 5 months)
- House prices*

Source: Australian Bureau of Statistics, FactSet, J.P. Morgan Asset Management; (Right) RPD CoreLogic.

*House price is the year-over-year change in the hedonic index for eight capital city aggregate dwelling prices. Past performance is not a reliable indicator of current and future results.

Terms of trade and commodity prices

Export / import prices  RBA commodity price index

Terms of trade  Commodity prices

Current account
% of nominal GDP

Exports by type
AUD billions, six-month moving average

Government finances

2019-20 Commonwealth budget
Budget, AUD billions*

**Total spending: $500.9bn**
- Other: $49bn (10%)
- Defence: $32bn (6%)
- Health: $82bn (16%)
- Non-defence: $158bn (32%)
- Social security: $180bn (36%)

**Total revenues: $513.8bn**
- Other: $61bn (12%)
- Excise: $45bn (9%)
- Sales: $71bn (14%)
- Corp: $102bn (19%)
- Income: $234bn (44%)

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<td>2.75%</td>
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<td>Unemployment</td>
<td>5.00%</td>
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<td>Inflation (CPI)</td>
<td>1.50%</td>
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<td>Wage price index</td>
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<td>2.75%</td>
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Commonwealth budget surplus/deficit
% of GDP, 2019-20 budget, end of fiscal year

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<td>2019-20: 0.4%</td>
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Commonwealth gross debt
2019-20 budget, end of fiscal year, AUD billions

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Source: Australian Treasury, J.P. Morgan Asset Management. *Figures may not sum due to rounding.

Real GDP growth
Year-over-year change

GDP growth accelerating
GDP growth decelerating
Near-term growth momentum*

Long-term growth momentum*

*Near-term growth momentum is the difference in percent growth in real GDP for the average of the last four quarters less the average of the four quarters a year ago. Long-term growth momentum is the difference in percent growth in real GDP for the average of the last four quarters less the average since 2Q 1990. Bubble size represents nominal GDP in USD.

Manufacturing and services PMI

Recession*


Manufacturing momentum

Global Purchasing Managers’ Index for manufacturing, quarterly

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Source: AIG, FactSet, Markit, J.P. Morgan Asset Management. Heatmap colours are based on PMI relative to the 50 level, which indicates acceleration or deceleration of the sector, for the time period shown. Heat map is based on quarterly averages, with the exception of the two most recent figures, which are single month readings. Data for Canada, Indonesia and Mexico are back-tested and filled in from December 2007 to November 2010 for Canada and May 2011 for Indonesia and Mexico due to lack of existing PMI figures for these countries. DM and EM represent developed markets and emerging markets, respectively.

Global capital expenditure

Capital goods imports and investment goods output

Global (ex-China) capital goods imports growth*

Investment Goods PMI – Output (adv. 7 months)

Global manufacturing PMI new orders

*Monthly capital imports growth data of 29 representative countries from both developed and emerging markets are aggregated into a global measure, weighted by nominal gross domestic product.


### Exports as a share of GDP

**Goods exports, 2018**

<table>
<thead>
<tr>
<th>Country</th>
<th>U.S.</th>
<th>European Union</th>
<th>China</th>
<th>EM ex-China</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
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U.S. trade policy

U.S. and China: Proposals and actions*
% of imports covered by tariffs

- Tariffs by U.S. on China
- Proposed
- Enacted

- Tariffs by China on the U.S.
- Proposed
- Enacted

Effective weighted average tariff**

Non-tariff barriers to trade***

Source: J.P. Morgan Asset Management; (Left and top right) Peterson Institute for International Economics, U.S. Commerce Department, U.S. International Trade Commission, Office of the U.S. Trade Representative (USTR), World Bank; (Bottom right) WTO. *Imported value of products from trading partner appearing on either the USTR or China Ministry of Commerce lists as a percent of total imports from that trading partner over the same period. **Value of imports-weighted average tariff for 2017, plus additional tariffs from trade actions in 2018 or 2019 related to U.S. trade disputes calculated as the additional tariffs collected as a result of each new action as a percent of total imports for that year. ***Barriers can take the form of health and safety regulations—sanitary production requirements or health and invasive species restrictions; technical barriers—minimum standards or certifications for products sold in a certain country; anti-dumping duties—taxes on imports to prevent other countries offloading excess supply at artificially cheap prices; countervailing duties—taxes on imports to offset subsidies received elsewhere.

Effects of protectionism

**U.S. imports**
All U.S. imports, June 2018 = 100

- 25% tariffs on US$16bn
- 10% tariffs on US$200bn
- Threatened increase from on US$200bn

**Distribution of tariffed goods across economic categories**
USD billion

- Capital goods
- Consumer goods
- Intermediate goods

**Plans to relocate production**
Of companies currently operating in China, % considering relocating to***

Source. J.P. Morgan Asset Management; (Top left and right) Office of the U.S. Trade Representative, U.S. International Trade Commission; (Bottom left) American Chamber of Commerce in China & Shanghai; (Right) United Nations.*Indian subcontinent grouped together in survey responses. **Analysis classifies each individual product the U.S. imports from China to the HTS-8 level that either appears on the 2018 & 2019 tariff lists published in the U.S. Federal Register or has been threatened with higher tariffs into its appropriate System of National Accounts group and aggregates these categories by value of imports in 2017—the last year without increased tariffs for which data was available. ***Survey allows for multiple responses so does not sum to 100%.

### Global Inflation

**Headline Consumer Prices**

Year-over-year change, quarterly

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<td>Brazil</td>
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<td>Mexico</td>
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<tr>
<td>Russia</td>
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<td>2.7%</td>
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<tr>
<td>Turkey</td>
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<td>19.5%</td>
<td>18.7%</td>
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<tr>
<td>South Africa</td>
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<td></td>
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<td></td>
<td></td>
<td>4.4%</td>
<td>4.5%</td>
</tr>
</tbody>
</table>

Source: Department of Statistics Malaysia, DGBAS, Eurostat, FactSet, Goskomstat of Russia, IBGE, India Ministry of Statistics & Programme Implementation, INEGI, J.P. Morgan Economics Research, Korean National Statistical Office, Melbourne Institute, Ministry of Commerce Thailand, Ministry of Internal Affairs & Communications Japan, National Bureau of Statistics China, Office for National Statistics UK, Statistics Indonesia, Statistics Institute Turkey, Statistics South Africa, U.S. Department of Labor, J.P. Morgan Asset Management. Quarterly averages, with the exception of the two most recent figures, which are single month readings, are shown. Colours are based on z-score of year-over-year inflation rate relative to each country’s own 10-year history where red (blue) indicates inflation above (below) long-run trend. EM represents emerging markets.

U.S.: GDP and inflation

Real GDP
Year-over-year change

<table>
<thead>
<tr>
<th>Year</th>
<th>Avg 1969</th>
<th>1Q 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real GDP</td>
<td>2.8%</td>
<td>3.2%</td>
</tr>
</tbody>
</table>

Source: FactSet, J.P. Morgan Asset Management; (Left) BEA; (Right) BLS.

Inflation
Year-over-year change

<table>
<thead>
<tr>
<th>Year</th>
<th>Avg 1999</th>
<th>May 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headline CPI*</td>
<td>2.2%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Core CPI</td>
<td>2.0%</td>
<td>2.0%</td>
</tr>
<tr>
<td>PCE</td>
<td>1.8%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Core PCE</td>
<td>1.7%</td>
<td>1.6%</td>
</tr>
</tbody>
</table>

Global economy
U.S.: Business cycle thermometer

U.S. business cycle indicators
Current percentile rank relative to range of data since 1990


*Percentile ranking applied in a reverse manner, where the lowest data point is ranked the highest, while the highest data point is ranked the lowest.

**U.S.: Consumer finances**

**Consumer balance sheet**
1Q19, USD trillions outstanding, not seasonally adjusted

- Total assets: $124.7tn
- Homes: 24%
- Other tangible: 5%
- Deposits: 9%
- Pension funds: 21%
- Other financial assets: 41%
- Total liabilities: $16.1tn
- Mortgages: 66%
- Other non-revolving: 1%
- Revolving*: 6%
- Auto loans: 7%
- Other liabilities: 9%
- Student debt: 10%

3Q07 Peak: $83.5tn
1Q09 Low: $71.0tn

Source: FactSet, FRB, J.P. Morgan Asset Management; (Top and bottom right) Bureau of Economic Analysis.
Data include households and nonprofit organisations. SA – seasonally adjusted.
*Revolving includes credit cards. Values may not sum to 100% due to rounding. **2Q19 figure for debt service ratio and household net worth are J.P. Morgan Asset Management estimates. Past performance is not a reliable indicator of current and future results.

**Household debt service ratio**
Debt payments as % of disposable personal income, SA

1Q80: 10.6%
1Q80: 10.6%
2Q19**: 9.9%

**Household net worth**
Not seasonally adjusted, USD trillions

3Q07: $69.1
3Q07: $69.1
2Q19: $110.0**

Source: FactSet, FRB, J.P. Morgan Asset Management; (Top and bottom right) Bureau of Economic Analysis.
Data include households and nonprofit organisations. SA – seasonally adjusted.
*Revolving includes credit cards. Values may not sum to 100% due to rounding. **2Q19 figure for debt service ratio and household net worth are J.P. Morgan Asset Management estimates. Past performance is not a reliable indicator of current and future results.

U.S.: Labour market

Unemployment rate and wage growth
Wages of production and non-supervisory workers, SA

Source: BLS, FactSet, J.P. Morgan Asset Management.
Eurozone: GDP and inflation

**Real GDP**
Contribution to real GDP growth, year-over-year change

<table>
<thead>
<tr>
<th>Year</th>
<th>Real GDP</th>
<th>Domestic demand</th>
<th>Net exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>07</td>
<td>-6%</td>
<td>-4%</td>
<td>-2%</td>
</tr>
<tr>
<td>09</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>11</td>
<td>4%</td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>13</td>
<td>2%</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>15</td>
<td>0%</td>
<td>2%</td>
<td>1%</td>
</tr>
<tr>
<td>17</td>
<td>2%</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>19</td>
<td>1%</td>
<td>0%</td>
<td>2%</td>
</tr>
</tbody>
</table>

**Inflation**
Year-over-year change

<table>
<thead>
<tr>
<th>Year</th>
<th>Headline CPI*</th>
<th>Core CPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>'99</td>
<td>1.8%</td>
<td>1.5%</td>
</tr>
<tr>
<td>'20</td>
<td>1.2%</td>
<td>1.0%</td>
</tr>
</tbody>
</table>

Eurozone: Growth indicators

Eurozone Purchasing Manufacturing Indices

- Italy composite PMI
- France composite PMI
- Eurozone new export orders

Retail sales and consumer confidence

Year-over-year change, 6MMA

Retail sales
Consumer confidence

Eurozone unemployment rate

Harmonised rate, seasonally adjusted

Japan: GDP and inflation

**Real GDP**

Year-over-year change

<table>
<thead>
<tr>
<th></th>
<th>Avg 1999</th>
<th>1Q 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real GDP</td>
<td>0.9%</td>
<td>0.9%</td>
</tr>
</tbody>
</table>

**Inflation**

Year-over-year change

<table>
<thead>
<tr>
<th></th>
<th>Avg 1999</th>
<th>May 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headline CPI*</td>
<td>0.1%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Core CPI</td>
<td>-0.2%</td>
<td>0.3%</td>
</tr>
</tbody>
</table>

Source: FactSet, J.P. Morgan Asset Management; (Left) Japanese Cabinet Office; (Right) Ministry of Internal Affairs and Communications.

*CPI is the consumer price index. Core CPI excludes food and energy prices.

China: GDP and inflation

Real GDP
Year-over-year change

-6%  -3%  0%  3%  6%  9%  12%  15%  18%  21%

Source: FactSet, NBS China, J.P. Morgan Asset Management. Latest Chinese GDP growth figure is 1Q 2019. *CPI is the Consumer Price Index. PPI is the Producer Price Index.

China: Growth indicators

Retail and online sales
Year-over-year change, 3-month moving average

Fixed asset investment
Year-over-year change, year to date

Source: CEIC, NBS China, J.P. Morgan Asset Management.

2018 and 2019 Chinese policy measures

**Fiscal policy stimulus**
- 1% point cut to Value-added tax (VAT) rate
- Special deductible items introduced in individual income tax
- Cuts in value-added tax rate
- Policy support for infrastructure investment**

**Monetary policy stimulus**
- 50bps targeted RRR* cut
- 100bps RRR cut
- 100bps RRR cut

**RMB 1.35 trillion in local government special bond issuance**

**RMB 1.39 trillion in local government bond issuance**

**Cuts in social security payments**

**Sector-specific tax breaks**

Source: Various news sources, J.P. Morgan Asset Management.

*RRR is the reserve requirement ratio or the amount of funds banks are required to hold for bank lending. **Under the new rules, some of the proceeds from local government special bond issuances can be used as equity capital and leveraged up with debt funding from financial institutions to amplify fiscal support for infrastructure investment.

China: Financial dynamics

**Chinese yuan**
Rebased January 2016 = 100

- **USD / CNY**
- **CFETS RMB Index***

**Key policy rates**
Per annum

- **Standing lending facility (7-day)**
- **Lending rate (1-year)**
- **Deposit rate (1-year)**

**Required reserve ratio**

Source: FactSet, J.P. Morgan Asset Management; (Left) J.P. Morgan Economics Research; (Top and bottom Right) CEIC, National Interbank Funding Center.

*CFETS RMB index is the China Foreign Exchange Trade System basket of 24 currencies traded against the Chinese renminbi.

Past performance is not a reliable indicator of current and future results.

China: Credit and lending

Credit impulse and new orders
% of nominal GDP, change year-over-year

Change from a year ago

Credit impulse (6mo. Adv.*)
Global composite PMI – new orders

Issuance of local government bonds
RMB millions

Total social financing
RMB billions
Year-over-year change, 3MMA

Source: CEIC, J.P. Morgan Asset Management; (Left) Markit; (Top right) China Central Depository & Clearing Co. Ltd; (Bottom left) People’s Bank of China.

*Credit impulse is change in the ratio of broad credit to rolling 12-month nominal GDP. **A special local government bond is issue to support the investment in a special infrastructure or public project.

## World equity market returns

<table>
<thead>
<tr>
<th>Year</th>
<th>AUD</th>
<th>U.S.</th>
<th>Asia ex JP</th>
<th>Japan</th>
<th>EM</th>
<th>Portfolios</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>57.4%</td>
<td>13.1%</td>
<td>21.2%</td>
<td>53.6%</td>
<td>24.3%</td>
<td>13.2%</td>
</tr>
<tr>
<td>2010</td>
<td>13.1%</td>
<td>2.1%</td>
<td>21.7%</td>
<td>32.4%</td>
<td>13.7%</td>
<td>12.3%</td>
</tr>
<tr>
<td>2011</td>
<td>2.1%</td>
<td>21.2%</td>
<td>19.7%</td>
<td>25.6%</td>
<td>13.2%</td>
<td>35.9%</td>
</tr>
<tr>
<td>2012</td>
<td>32.4%</td>
<td>19.7%</td>
<td>13.7%</td>
<td>13.2%</td>
<td>35.9%</td>
<td>6.2%</td>
</tr>
<tr>
<td>2013</td>
<td>24.3%</td>
<td>13.2%</td>
<td>35.9%</td>
<td>6.2%</td>
<td>Australia</td>
<td>19.7%</td>
</tr>
<tr>
<td>2014</td>
<td>13.2%</td>
<td>35.9%</td>
<td>6.2%</td>
<td>Australia</td>
<td>19.7%</td>
<td>10.3%</td>
</tr>
<tr>
<td>2015</td>
<td>35.9%</td>
<td>6.2%</td>
<td>Australia</td>
<td>19.7%</td>
<td>10.3%</td>
<td>15.1%</td>
</tr>
<tr>
<td>2016</td>
<td>6.2%</td>
<td>Australia</td>
<td>19.7%</td>
<td>10.3%</td>
<td>15.1%</td>
<td>4.4%</td>
</tr>
<tr>
<td>2017</td>
<td>19.7%</td>
<td>10.3%</td>
<td>15.1%</td>
<td>4.4%</td>
<td>8.0%</td>
<td>8.0%</td>
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<tr>
<td>2018</td>
<td>8.0%</td>
<td>8.0%</td>
<td>8.0%</td>
<td>8.0%</td>
<td>Japan</td>
<td>7.9%</td>
</tr>
<tr>
<td>YTD</td>
<td>Japan</td>
<td>7.9%</td>
<td>8.0%</td>
<td>8.0%</td>
<td>8.0%</td>
<td>12.2%</td>
</tr>
<tr>
<td>2Q19</td>
<td>8.0%</td>
<td>12.2%</td>
<td>8.0%</td>
<td>8.0%</td>
<td>12.2%</td>
<td>10.5%</td>
</tr>
</tbody>
</table>

Source: FactSet, MSCI, Standard & Poor’s, TOPIX, J.P. Morgan Asset Management. Annualised return (Ann.) and volatility (Vol.) covers the period 2009 to 2018. Volatility is based on local currency returns. Small Cap: S&P ASX Small Ordinaries; Asia ex JP: MSCI AC Asia ex Japan; EM: MSCI EM Index; Europe: MSCI Europe Index; Japan: TOPIX first section; Australia: ASX 200 Index; U.S.: S&P 500 Index. Hypothetical portfolio (for illustrative purposes only and should not be taken as a recommendation): 20% U.S.; 30% Australia; 15% EM; 15% Europe; 10% Japan; 10% small cap. All indices are total returns. Past performance is not a reliable indicator of current and future results.

Global equities: Sources of return

Total return, AUD

2018

2019

U.S. World Australia Japan EM Europe

Currency effect
Multiples*
Dividends
EPS growth
Total return

Source: FactSet, MSCI, Standard & Poor’s, J.P. Morgan Asset Management.
All return values are MSCI indices except the U.S. and Australia, which are the S&P 500 and ASX 200, respectively. *Multiple expansion is based on the forward P/E ratio and EPS growth outlook is based on NTMA earnings estimates. Chart is for illustrative purposes only. Past performance is not indicative of future results.

Global equities: Earnings revisions and valuations

Net EPS revisions: Global indices
13-week moving average

Global valuations
Current and 20-year historical valuations*

Source: Bloomberg Finance L.P., FactSet, MSCI, Standard & Poor’s, J.P. Morgan Asset Management. *Valuations refer to NTMA P/E for Europe, U.S., Japan, Australia and developed markets (world) and P/B for emerging markets. Valuation and earnings charts use MSCI indices for all regions/countries, except for the U.S. and Australia, which are the S&P 500 and ASX 200, respectively. Valuations for Australia start in 1999. **Australia refers to the period from August in the year stated to the following year. Past performance is not a reliable indicator of current and future results.

Australia ASX 200 at inflection points

As of 30 June 2019, the ASX 200 Index was at 6,619, with a P/E ratio of 16.4x. Past performance is not a reliable indicator of current and future results.

### ASX 200 Index

<table>
<thead>
<tr>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>Index level</td>
<td>3,498</td>
<td>6,829</td>
<td>6,619</td>
</tr>
<tr>
<td>P/E ratio (fwd)</td>
<td>16.5x</td>
<td>16.4x</td>
<td>16.4x</td>
</tr>
<tr>
<td>Dividend yield</td>
<td>3.0%</td>
<td>3.7%</td>
<td>4.5%</td>
</tr>
<tr>
<td>10-year Tsy</td>
<td>6.3%</td>
<td>6.3%</td>
<td>1.3%</td>
</tr>
</tbody>
</table>

### Returns

- **31 Dec 1996:** Total return: +77%, Index level: 2,425
- **7 Mar 2002:** Total return: +207%, Index level: 3,498, P/E = 16.5x
- **13 Mar 2003:** Total return: -20%, Index level: 2,700, P/E = 12.6x
- **10 Mar 2009:** Total return: -50%, Index level: 3,185, P/E = 15.7x
- **01 Nov 2007:** Total return: +226%, Index level: 6,829, P/E = 16.4x

### Additional Notes

- Source: FactSet, Standard & Poor's, 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. Dividend yield is based on current data. Return calculations shown in green are based on the total return index. Past performance is not a reliable indicator of current and future results.
ASX 200 Index: Forward P/E ratio

<table>
<thead>
<tr>
<th>Valuation measure</th>
<th>Description</th>
<th>30 Jun 2019</th>
<th>Avg*</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/E</td>
<td>Forward P/E</td>
<td>16.4x</td>
<td>14.2x</td>
</tr>
<tr>
<td>Div. Yield</td>
<td>Dividend yield</td>
<td>4.4%</td>
<td>4.7%</td>
</tr>
<tr>
<td>P/B</td>
<td>Price-to-book</td>
<td>2.0x</td>
<td>2.0x</td>
</tr>
<tr>
<td>P/CF</td>
<td>Price-to-cash flow</td>
<td>12.0x</td>
<td>9.7x</td>
</tr>
<tr>
<td>EY Spread</td>
<td>EY minus corp bond yield</td>
<td>3.8%</td>
<td>1.7%</td>
</tr>
</tbody>
</table>

Source: FactSet, Standard & Poor’s, J.P. Morgan Asset Management. Price to earnings is price divided by consensus analyst estimates of earnings per share for the next 12 months. Dividend yield is calculated as the next 12-month consensus dividend divided by most recent price. Price-to-book ratio is the price divided by book value per share. Price-to-cash flow is price divided by NTM cash flow. EY minus corporate bond yield is the forward earnings yield (consensus analyst estimates of EPS over the next 12 months divided by price) less the yield on the AusBond Credit (5-10y) Index. *Average dates vary due to data availability, start date is 31 December 1999 except for P/B, which is January 2001, and EY spread, which is October 2003. Past performance is not a reliable indicator of current and future results.

ASX 200 earnings and performance
Index level, analyst estimates of the next 12 months of earnings, AUD

Net EPS revisions: Australia macro sectors
13-week moving average

Source: FactSet, Standard & Poor's, J.P. Morgan Asset Management. Past performance is not a reliable indicator of current and future results.

### Australia sector returns

<table>
<thead>
<tr>
<th>Equities</th>
<th>ASX 200 weight</th>
<th>Growth</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financials</td>
<td>32.0%</td>
<td>27.3%</td>
<td>48.4%</td>
</tr>
<tr>
<td>Materials</td>
<td>18.9%</td>
<td>6.5%</td>
<td>29.0%</td>
</tr>
<tr>
<td>Health Care</td>
<td>8.5%</td>
<td>18.8%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Industrials</td>
<td>8.3%</td>
<td>11.4%</td>
<td>1.5%</td>
</tr>
<tr>
<td>Real Estate</td>
<td>7.5%</td>
<td>9.0%</td>
<td>6.4%</td>
</tr>
<tr>
<td>Cons. Discr.</td>
<td>6.0%</td>
<td>5.1%</td>
<td>6.1%</td>
</tr>
<tr>
<td>Cons. Staples</td>
<td>5.5%</td>
<td>9.3%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Energy</td>
<td>5.3%</td>
<td>6.9%</td>
<td>4.8%</td>
</tr>
<tr>
<td>Comm. Services</td>
<td>3.8%</td>
<td>0.9%</td>
<td>2.4%</td>
</tr>
<tr>
<td>Tech</td>
<td>2.3%</td>
<td>1.1%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Utilities</td>
<td>1.9%</td>
<td>3.7%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Australia</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>2Q19</th>
<th>YTD</th>
<th>Since Market Peak (November 2007)</th>
<th>Since Market Low (March 2009)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financials</td>
<td>10.9</td>
<td>17.5</td>
<td>66.2</td>
<td>305.7</td>
</tr>
<tr>
<td>Materials</td>
<td>7.5</td>
<td>26.6</td>
<td>23.9</td>
<td>133.8</td>
</tr>
<tr>
<td>Health Care</td>
<td>10.7</td>
<td>17.6</td>
<td>361.7</td>
<td>417.4</td>
</tr>
<tr>
<td>Industrials</td>
<td>8.5</td>
<td>21.2</td>
<td>45.4</td>
<td>349.4</td>
</tr>
<tr>
<td>Real Estate</td>
<td>4.1</td>
<td>19.0</td>
<td>23.7</td>
<td>384.9</td>
</tr>
<tr>
<td>Cons. Discr.</td>
<td>5.4</td>
<td>18.7</td>
<td>38.6</td>
<td>278.6</td>
</tr>
<tr>
<td>Cons. Staples</td>
<td>5.9</td>
<td>11.4</td>
<td>108.7</td>
<td>198.2</td>
</tr>
<tr>
<td>Energy</td>
<td>-0.3</td>
<td>15.0</td>
<td>-5.5</td>
<td>17.8</td>
</tr>
<tr>
<td>Comm. Services</td>
<td>12.7</td>
<td>31.8</td>
<td>69.5</td>
<td>135.9</td>
</tr>
<tr>
<td>Tech</td>
<td>3.9</td>
<td>25.5</td>
<td>247.1</td>
<td>313.1</td>
</tr>
<tr>
<td>Utilities</td>
<td>1.9</td>
<td>13.7</td>
<td>132.2</td>
<td>309.3</td>
</tr>
<tr>
<td>Australia</td>
<td>8.0</td>
<td>19.7</td>
<td>63.1</td>
<td>225.9</td>
</tr>
</tbody>
</table>

<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></td>
<td>15-yr avg.</td>
<td>15-yr avg.</td>
<td>15-yr avg.</td>
</tr>
<tr>
<td>Financials</td>
<td>14.1x</td>
<td>13.3x</td>
<td>5.7%</td>
</tr>
<tr>
<td>Materials</td>
<td>12.5x</td>
<td>29.9x</td>
<td>1.7%</td>
</tr>
<tr>
<td>Health Care</td>
<td>24.5x</td>
<td>16.2x</td>
<td>4.7%</td>
</tr>
<tr>
<td>Industrials</td>
<td>16.3x</td>
<td>20.0x</td>
<td>4.5%</td>
</tr>
<tr>
<td>Real Estate</td>
<td>19.5x</td>
<td>22.4x</td>
<td>2.8%</td>
</tr>
<tr>
<td>Cons. Discr.</td>
<td>21.8x</td>
<td>14.7x</td>
<td>3.8%</td>
</tr>
<tr>
<td>Cons. Staples</td>
<td>13.0x</td>
<td>16.0x</td>
<td>4.3%</td>
</tr>
<tr>
<td>Energy</td>
<td>17.9x</td>
<td>37.6x</td>
<td>1.4%</td>
</tr>
<tr>
<td>Comm. Services</td>
<td>36.0x</td>
<td>21.2x</td>
<td>5.2%</td>
</tr>
<tr>
<td>Tech</td>
<td>21.9x</td>
<td>16.0x</td>
<td>4.5%</td>
</tr>
<tr>
<td>Utilities</td>
<td>16.4x</td>
<td>20.6x</td>
<td>5.7%</td>
</tr>
<tr>
<td>Australia</td>
<td>14.0x</td>
<td>15.1x</td>
<td>4.6%</td>
</tr>
</tbody>
</table>

Source: FactSet, Standard & Poor’s, J.P. Morgan Asset Management. All calculations are total returns in local currency not annualised. Growth and value indices are sub-sets of the ASX 200 Index. Since market peak represents period 1 November 2007 to the end of the last quarter. Since market low is the period 10 March 2009 to the end of the last quarter. Past performance is not a reliable indicator of current and future results. Guide to the Markets – Australia. Data as of 30 June 2019.
VIX breaks 35 in six months** | Related event | S&P 500 Performance | VIX returns to long-term average*** (days)
---|---|---|---
1 | 6-Aug-90 Recession – oil price shock and rate hikes | -3.0% | -4.2% | -5.9% | 16.8% | 218
2 | 30-Oct-97 Asian crisis | -1.7% | 7.5% | 9.1% | 21.6% | 113
3 | 27-Aug-98 Long-Term Capital Management | -3.8% | 0.6% | 13.8% | 29.3% | 309
4 | 17-Sep-01 Recession – collapse of dot-com bubble | -4.9% | 2.9% | 9.2% | -15.9% | 172
5 | 15-Jul-02 Enron accounting scandal | -0.4% | 1.3% | -8.3% | 9.0% | 304
6 | 17-Sep-08 Recession – global financial crisis | -4.7% | -14.8% | -21.8% | -7.9% | 476
7 | 7-May-10 Greece bailout package, austerity imposed | -1.5% | -5.0% | 1.0% | 21.2% | 157
8 | 8-Aug-11 European debt crisis, U.S. credit downgrade | -6.7% | 5.9% | 12.7% | 25.2% | 165
9 | 24-Aug-15 Chinese yuan devaluation | -3.9% | 2.1% | 10.2% | 15.5% | 44
10 | 5-Feb-18 Bond market re-pricing growth and rate hikes | -4.1% | 3.4% | 0.9% | 3.4% | 9
11 | 24-Dec-18 Global growth and market liquidity fears | -2.7% | 12.4% | 19.0% | NA | 18

** The VIX-CBOE Volatility Index measures market expectations of near-term volatility conveyed by S&P 500 Index (SPX) option prices. **First day when VIX breaks 35; subsequent spikes above 35 within the next six months are not included. ***Number of days for VIX to return to its long-term average of 19.3 after initial VIX spikes above 35.

Source: FactSet, J.P. Morgan Asset Management.

U.S. S&P 500 at inflection points

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>2,942</td>
</tr>
<tr>
<td>P/E ratio (fwd)</td>
<td>24.4x</td>
<td>14.8x</td>
<td>16.7x</td>
</tr>
<tr>
<td>Dividend yield</td>
<td>1.0%</td>
<td>1.7%</td>
<td>1.9%</td>
</tr>
<tr>
<td>10-year Tsy</td>
<td>6.2%</td>
<td>4.6%</td>
<td>2.0%</td>
</tr>
</tbody>
</table>

Source: Compustat, FactSet, Standard & Poor's, J.P. Morgan Asset Management. Forward price-to-earnings 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, and is provided by FactSet Market Aggregates. Returns calculations shown in green are based on total return index. Past performance is not a reliable indicator of current and future results.

Source: Compustat, FactSet, Standard & Poor’s, J.P. Morgan Asset Management. EPS levels are based on operating earnings per share. Earnings estimates are Standard & Poor’s consensus analyst expectations. Past performance is not a reliable indicator of current and future results.

S&P 500 announced buybacks
Value of buybacks, $bn

Corporate spending
Value of deals announced, $tn, private non-residential fixed investment, y/y

Source: Bloomberg LLP, Compustat, FactSet, Standard & Poor's, J.P. Morgan Asset Management.
M&A activity is the quarterly value of official announced transactions, and capital expenditures are private non-residential fixed domestic investment. Buybacks are based on company announcements year to date. Past performance is not a reliable indicator of current and future results.

### Characteristics of recessions and related stock market declines

<table>
<thead>
<tr>
<th>Recessions</th>
<th>Peak Quarter</th>
<th>Trough Quarter</th>
<th>% Decline</th>
<th>Peak date</th>
<th>Trough date</th>
<th>% Decline</th>
<th>Commodity Spike</th>
<th>Aggressive Fed</th>
<th>Extreme valuations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Recess of 1949</td>
<td>4Q48</td>
<td>4Q49</td>
<td>-1.5%</td>
<td>6/15/1948</td>
<td>6/13/1949</td>
<td>-21%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Recess of 1953</td>
<td>2Q53</td>
<td>2Q54</td>
<td>-2.4%</td>
<td>1/5/1953</td>
<td>9/14/1953</td>
<td>-15%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Recess of 1958</td>
<td>3Q57</td>
<td>2Q58</td>
<td>-3.0%</td>
<td>8/2/1956</td>
<td>10/22/1957</td>
<td>-22%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 Recess of 1960-61</td>
<td>2Q60</td>
<td>1Q61</td>
<td>-0.1%</td>
<td>8/3/1959</td>
<td>10/25/1960</td>
<td>-14%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Recess of 1969-70</td>
<td>4Q69</td>
<td>4Q70</td>
<td>-0.2%</td>
<td>11/29/1968</td>
<td>5/25/1970</td>
<td>-36%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Recess of 1973-75</td>
<td>4Q73</td>
<td>1Q75</td>
<td>-3.1%</td>
<td>1/11/1973</td>
<td>10/3/1974</td>
<td>-48%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 Recess of 1981-82</td>
<td>3Q81</td>
<td>4Q82</td>
<td>-2.5%</td>
<td>11/28/1980</td>
<td>8/12/1982</td>
<td>-27%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Early 1990s recession</td>
<td>3Q90</td>
<td>1Q91</td>
<td>-1.4%</td>
<td>7/16/1990</td>
<td>10/11/1990</td>
<td>-20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 Early 2000s recession</td>
<td>1Q01</td>
<td>4Q01</td>
<td>-0.4%</td>
<td>3/24/2000</td>
<td>10/9/2002</td>
<td>-49%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 Great Recession</td>
<td>4Q07</td>
<td>2Q09</td>
<td>-4.0%</td>
<td>10/9/2007</td>
<td>3/9/2009</td>
<td>-57%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Non-recession Bear Markets**

<p>| | | | | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
</table>

**Average**

<p>| | | | | | | | | | |</p>
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<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Source:** FactSet, NBER, Robert Shiller, Standard & Poor's, J.P. Morgan Asset Management.

*A bear market is defined as a 20% or more decline from the previous market high. The related market return is the peak to trough return over the cycle. Periods of “Recession” are defined using NBER business cycle dates. “Commodity spikes” are defined as movement in oil prices of over 100% over an 18-month period. 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, or time periods where equity market valuations appeared expensive given the broader macroeconomic environment. “Aggressive Fed Tightening” is defined as Federal Reserve monetary tightening that was unexpected and/or significant in magnitude.

European earnings vs. the euro
Last 12 months’ earnings per share

Stoxx 50 yearly earnings trend
EPS rebased to 100 in January of each year

Source: FactSet, J.P. Morgan Asset Management; (Left) STOXX; (Right) MSCI.
Japan: Earnings and the Japanese yen

**Profits and return on equity**

- Corporate profit % GDP
- MSCI Japan ROE

**Japanese yen and the stock market**

- Nikkei 225 Index
- USD / JPY

Source: FactSet, J.P. Morgan Asset Management; (Left) Japan Cabinet Office, MSCI; (Right) Nikkei. Past performance is not a reliable indicator of current and future results.

Emerging markets equities: Valuations and returns

MSCI Emerging Markets Index: Price-to-book ratio

Source: FactSet, MSCI, J.P. Morgan Asset Management. Past performance is not a reliable indicator of current and future results.

Emerging markets equities: Relative performance

**EM vs. DM growth and equity performance**
Monthly, consensus expectations for GDP growth in 12 months

- EM less DM GDP growth
- EM growth & equity outperformance
- EM growth & equity underperformance

**EM equity relative performance and commodity prices**
Rebased 1997 = 100

**EM equity relative performance and the USD**
Rebased to 100 in 1993

Source: FactSet, MSCI, J.P. Morgan Asset Management; (Left) J.P. Morgan Economic Research; (Top right) Bloomberg Finance L.P.

*REER is the real effective exchange rate. Past performance is not a reliable indicator of current and future results.

China: Equities snapshot

Corporate earnings
Next 12-month consensus EPS, USD, indexed to January 2013

MSCI A-share inclusion
China’s share in selected emerging market indicators

Foreign investors’ holdings of onshore Chinese equities
RMB trillions

Stock Connect monthly net flow
HKD billions

Source: J.P. Morgan Asset Management; (Top and bottom left) FactSet, MSCI; (Bottom left) Bloomberg Finance L.P.; (Top right) Bloomberg, MSCI, World Bank; (Bottom right) CEIC, Hong Kong Exchanges and Clearing Limited. The CSI 300 represents onshore Chinese A-share large cap equities. MSCI China represents primarily offshore listed Chinese equities and the onshore equities included in MSCI benchmarks.*Share of EM GDP is for 2018 and is calculated as Chinese nominal GDP in USD as a percentage of all emerging markets within the MSCI EM index.**Share of EM market cap is for 2018 and is calculated as China’s market capitalisation of listed domestic companies as a percentage of all emerging markets’ capitalisation of listed domestic companies within the MSCI EM index.***Currently, an index inclusion factor (IIF) of 5% is applied to China A Large Cap securities. By November 2019, the inclusion factor will be 20% for China A large Cap, ChiNext Large Cap and China A Mid Cap (including eligible ChiNext shares). 100% A share inclusion is shown for illustrative purposes only. Guide to the Markets – Australia. Data as of 30 June 2019.
<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yield Duration U.S. Australia</td>
<td>6.18% 8.0 Yrs 0.30 0.15</td>
<td>6.07 4.2 -0.19 -0.25</td>
<td>2.69</td>
<td>2.45 6.7 0.27 0.09</td>
<td>1.96 3.6 0.60 0.85</td>
<td>1.92 6.4 0.99 0.78</td>
<td>1.21 6.6 0.76 0.99</td>
<td>0.31 1.1 0.69 0.51</td>
</tr>
</tbody>
</table>

Central bank policy rates

Central bank key policy rates

<table>
<thead>
<tr>
<th>Target rates</th>
<th>Policy rate</th>
<th>Deposit rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>RBA</td>
<td>1.25%</td>
<td>1.25%</td>
</tr>
<tr>
<td>U.S. Fed</td>
<td>2.50%</td>
<td>2.40%</td>
</tr>
<tr>
<td>ECB</td>
<td>0.00%</td>
<td>-0.40%</td>
</tr>
<tr>
<td>BoJ</td>
<td>-0.10%</td>
<td>-0.10%</td>
</tr>
</tbody>
</table>

Source: J.P. Morgan Asset Management; (Left) Bank of Japan, European Central Bank, FactSet, Reserve Bank of Australia, U.S. Federal Reserve; (Right) Bloomberg Finance L.P. *Covers the 10 largest developed market central banks by assets.

Central bank asset purchases
12-month rolling bond purchases by G4 central banks*, USD billions


*New purchases of bonds are based on period to period changes in average holdings during the quarter across various asset purchase programs as reported by each respective G4 central bank (the Bank of England, the Bank of Japan, the European Central Bank and the U.S. Federal Reserve), announced purchase plans of these central banks and J.P. Morgan Asset Management projections, converted to common currency by average quarterly exchange rates.


*Other assets include Federal agency debt securities, central bank liquidity swaps, repurchase agreements, foreign currency denominated assets, gold, special drawing rights and net portfolio holdings of Maiden Lane LLC. **Other liabilities include capital, treasury general account, deposits from foreign banks, reverse repurchase agreements. ***U.S. Federal Reserve balance sheet assets are projected to decrease until the end of September 2019, in line with the Fed's announced plans. After this point, total assets are projected to remain constant, while holdings of mortgage-backed securities continue to be reduced, and Treasury holdings increased to maintain the size of total assets. MBS pay down projections are J.P. Morgan Economic Research forecasts. Other assets and liabilities are held constant over the forecast period. Liabilities are assumed to increase in proportion and inverse to the reduction in balance sheet assets.

Cash investments

Term deposits and interest rates
AUD, billions

$800
$700
$600
$500
$400
$300
$200
$100
$0

'90 '95 '00 '05 '10 '15 '16 '17 '18

Term deposits
1-year rate
12%
10%
8%
6%
4%
2%
0%

1-year term deposit, $10,000

U.S. and Australian bank funding costs
3-month LIBOR and BBSW spread over OIS*, basis points

Australia (BBSW)
U.S. (LIBOR)

Source: FactSet, ICAP Plc, Reserve Bank of Australia, J.P. Morgan Asset Management. *LIBOR is the London Interbank Offer Rate, BBSW is the Bank Bill Swap Rate and they represent the rate at which banks lend to each other. The OIS is the overnight banks swap and is the rate at which central banks offer cash to the market. The spread between the bank funding rate and the OIS indicates how difficult it is for banks to acquire funding. Past performance is not a reliable indicator of current and future results.

U.S.: Yield curve inversion and recessions

Yield curve spread
10-year less 2-year U.S. Treasury*

<table>
<thead>
<tr>
<th>Date of first inversion prior to recession</th>
<th>Time to recession</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 April 1968</td>
<td>19 months</td>
</tr>
<tr>
<td>9 March 1973</td>
<td>7 months</td>
</tr>
<tr>
<td>18 August 1978</td>
<td>16 months</td>
</tr>
<tr>
<td>12 September 1980</td>
<td>9 months</td>
</tr>
<tr>
<td>13 December 1988</td>
<td>18 months</td>
</tr>
<tr>
<td>2 February 2000</td>
<td>12 months</td>
</tr>
<tr>
<td>8 June 2006</td>
<td>17 months</td>
</tr>
<tr>
<td>Average</td>
<td>14 months</td>
</tr>
</tbody>
</table>

### Nominal and real 10-year Treasury yields

<table>
<thead>
<tr>
<th>Year</th>
<th>Avg. 1970-2018</th>
<th>30 Jun 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal</td>
<td>7.92%</td>
<td>1.32%</td>
</tr>
<tr>
<td>Real yield*</td>
<td>2.68%</td>
<td>0.02%</td>
</tr>
</tbody>
</table>

**30 Jun 1982:** 16.40%

Nominal 10-year Treasury yield

Real 10-year Treasury yield


Past performance is not a reliable indicator of current and future results.

The U.S. Federal Reserve outlook

Federal funds rate expectations
FOMC and market expectations for the fed funds rate


FOMC June 2019 forecasts
Percent

<table>
<thead>
<tr>
<th></th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>Long Run</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in real GDP, 4Q to 4Q</td>
<td>2.1</td>
<td>2.0</td>
<td>1.8</td>
<td>1.9</td>
</tr>
<tr>
<td>Unemployment rate, 4Q</td>
<td>3.6</td>
<td>3.7</td>
<td>3.8</td>
<td>4.2</td>
</tr>
<tr>
<td>PCE inflation, 4Q to 4Q</td>
<td>1.5</td>
<td>1.9</td>
<td>2.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>


Fixed income interest rate risk

Impact of a 1% rise in interest rates
Assumes a parallel shift in the yield curve and steady spreads

-6.6% -5.4% -1.8% -0.8%
-5.7% -4.6%
-11.1%
-0.1% 3.1%
-6.7% -4.3% -4.0%
-7.7% -2.3%
-6.7% -2.4%
-4.2% -1.5%


Global investment-grade bonds

Option-adjusted spreads, basis points

<table>
<thead>
<tr>
<th>Average</th>
<th>30 Jun 19</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S.</td>
<td>158bps</td>
</tr>
<tr>
<td></td>
<td>115bps</td>
</tr>
<tr>
<td>Europe</td>
<td>129</td>
</tr>
<tr>
<td></td>
<td>112</td>
</tr>
<tr>
<td>Australia</td>
<td>128</td>
</tr>
<tr>
<td></td>
<td>108</td>
</tr>
</tbody>
</table>

Source: J.P. Morgan Asset Management; (Left and bottom right) Bloomberg Barclays, FactSet; (Left) BofA Merrill Lynch; (Top right) J.P. Morgan Securities.

*Leverage is net debt to earnings before interest, tax, depreciation and amortisation (EBITDA). **Interest coverage is EBITDA over interest expense. Past performance is not a reliable indicator of current and future results.

**U.S.: Asset-backed securities**

**Consumer sector delinquency***

90+ days, % of outstanding balances

<table>
<thead>
<tr>
<th>Debt balance (US trillion)**</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Student</td>
<td>1.49</td>
</tr>
<tr>
<td>Credit card</td>
<td>0.85</td>
</tr>
<tr>
<td>Auto</td>
<td>1.28</td>
</tr>
<tr>
<td>Mortgage</td>
<td>9.24</td>
</tr>
<tr>
<td>Total</td>
<td>13.67</td>
</tr>
</tbody>
</table>

**Asset-backed security duration and yield***

<table>
<thead>
<tr>
<th>Yield Duration</th>
<th>Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.0%</td>
<td>3.4</td>
</tr>
<tr>
<td>2.5%</td>
<td>3.2</td>
</tr>
<tr>
<td>2.0%</td>
<td>3.0</td>
</tr>
<tr>
<td>1.5%</td>
<td>2.8</td>
</tr>
<tr>
<td>1.0%</td>
<td>2.6</td>
</tr>
<tr>
<td>0.5%</td>
<td>2.4</td>
</tr>
</tbody>
</table>

**Mortgage originations by credit score**

USD billions

- > 760
- 720 – 759
- 660 – 719
- 620 – 659
- < 620

Source: FactSet, J.P. Morgan Asset Management; (Top right) Bloomberg Finance L.P.; (Bottom left) Federal Reserve Bank of New York.

*Delinquency rate is defined as loans at least 90 days late or more with repayments. **Sectors not shown but included in the total figure are Revolving Home Equity and Others. ***Asset-backed securities as represented by the Bloomberg Barclays U.S. Aggregate Securitized ABS index.

U.S.: High yield bonds

U.S. high yield spread and default rate

<table>
<thead>
<tr>
<th>Asset class</th>
<th>Average since 1986</th>
<th>Latest</th>
</tr>
</thead>
<tbody>
<tr>
<td>HY spread (RHS)</td>
<td>568bps</td>
<td>461bps</td>
</tr>
<tr>
<td>HY default (LHS)</td>
<td>3.8%</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

Earnings growth

EBITDA, year-over-year change

U.S. high yield leverage measures

Net leverage* and interest coverage ratio**

Source: J.P. Morgan Economic Research, J.P. Morgan Asset Management. 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. Spreads indicated are benchmark yield to worst less comparable maturity Treasury yields. Yield to worst is defined as the lowest potential yield that can be received on a bond without the issue actually defaulting and reflects the possibility of the bond being called at an unfavourable time for the holder. *Net leverage is net debt divided by adjusted earnings before interest, tax, depreciation and amortisation (EBITDA). **Interest coverage ratio is EBITDA over interest expense. Past performance is not a reliable indicator of current and future results.

Emerging market debt

Emerging market yields

Yield to maturity

<table>
<thead>
<tr>
<th></th>
<th>Average</th>
<th>30 Jun 19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sovereign (USD)</td>
<td>6.23%</td>
<td>6.18%</td>
</tr>
<tr>
<td>Sovereign (LCL)</td>
<td>6.69%</td>
<td>5.68%</td>
</tr>
<tr>
<td>Corporate (USD)</td>
<td>6.18%</td>
<td>5.24%</td>
</tr>
</tbody>
</table>

Source: J.P. Morgan Asset Management; (Left) J.P. Morgan Securities Research; (Right) FactSet, Tullet Prebon. Real yield is calculated by using nominal yield less current CPI for the respective countries. Sector yields based on J.P. Morgan GBI-EM (EM sovereign (local currency)), J.P. Morgan EMBI+ (EM sovereign (USD)), J.P. Morgan CEMBI (EM corporate (USD)). Past performance is not a reliable indicator of current and future results.

Oil consumption and production

**Crude oil production per day**

Monthly change, thousand barrels

- Iran, Libya & Venezuela
- U.S.
- OPEC (- Iran, Libya, Venezuela) & Russia
- Global

**Price of oil**

Brent crude, nominal prices, USD / barrel

- Jul 2008: $145.65
- Jun 2014: $115.60
- 30 Jun 2019: $64.64
- Dec 2008: $34.27

**U.S. crude oil inventories and rig count**

- Inventories (incl. SPR)
- Active rigs

Source: FactSet, J.P. Morgan Asset Management; (Top left) U.S. Energy Information Administration; (Bottom left) Baker Hughes, U.S. Department of Energy.

*Weekly U.S. crude oil and petroleum ending inventory includes strategic petroleum reserve, and active rig count represents both natural gas and oil rigs.

Commodities

**Commodity prices**
RBA commodity indices

<table>
<thead>
<tr>
<th>Index weights</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bulk commodities</td>
<td>50.5%</td>
</tr>
<tr>
<td>Rural commodities</td>
<td>14.7%</td>
</tr>
<tr>
<td>Base metals</td>
<td>5.6%</td>
</tr>
<tr>
<td>Other resources*</td>
<td>29.2%</td>
</tr>
<tr>
<td>Index</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

**Iron ore: Chinese port inventories and days of supply**

- Inventories at port
- Days of supply

**Chinese implied steel demand growth**
Year-over-year change


Iron ore price and FX

Source: FactSet, J.P. Morgan Asset Management; (Left) Commodity Research Bureau; (Right) Tullett Prebon. Past performance is not a reliable indicator of current and future results.

Global currencies

Currency deviation from 10-year average in real effective exchange rate* terms
Number of standard deviations away from average


*The real trade-weighted exchange rate index is the weighted average of a country’s currency relative to a basket of other major currencies adjusted for the effects of inflation. The weights are determined by comparing the relative trade balances, in terms of one country’s currency, with other countries within the basket. Past performance is not a reliable indicator of current and future results.

Source: FactSet, Federal Reserve, J.P. Morgan Asset Management; (Left) U.S. Bureau of Economic Analysis; (Right) BIS, Federal Reserve, Tullett Prebon.

*Interest rate differential is the difference between the 10-year U.S. Treasury yield and a basket of the 10-year yields of each of the countries included in the Federal Reserve’s Broad Nominal Trade-Weighted Index (except Chile, Saudi Arabia and Venezuela due to data limitations), weighted by each country’s share of total global debt securities outstanding. Past performance is not a reliable indicator of current and future results.

Asset class performance during S&P 500 peak to trough periods

Total returns, local currency

Source: Barclays, Bloomberg Finance L.P., FactSet, J.P. Morgan Economic Research, MSCI, Standard & Poor's, J.P. Morgan Asset Management. Based on MSCI World (DM equities), MSCI EM (EM equities), Bloomberg Barclays U.S. Aggregate Credit High Yield Corporate Index (U.S. High yield), Bloomberg Barclays U.S. Aggregate Corporate Index (U.S. Investment grade), Bloomberg Barclays U.S. Aggregate Treasuries (U.S. Treasuries), DXY Index (U.S. dollar). Peak to trough periods for the S&P 500 are 25/08/87-04/12/87, 16/07/90-11/10/90, 24/03/00-09/10/02 and 09/10/07-09/03/09. For the 1987 period, the ASX All Ordinaries price index is used.

Correlation and diversification

Correlations between stocks and sovereign bonds
Weekly rolling correlation of U.S. equities and sovereign bond returns*

Portfolio returns: Equities vs. equity and fixed income blend
Total returns**

Source: Bloomberg LLP, FactSet, Standard & Poor’s, J.P. Morgan Asset Management;
*Rolling six-month pairwise correlations between weekly returns in U.S. equities (S&P 500) and U.S. bonds (Bloomberg Barclays U.S. Aggregate Government Treasuries).
**Portfolio is combination of ASX 200 total return index and Bloomberg Barclays Ausbond Composite (+0Y) Index and is rebalanced annually.

## Asset class returns (AUD)

<table>
<thead>
<tr>
<th>Year</th>
<th>Equity</th>
<th>REITs</th>
<th>Global FI</th>
<th>Equity</th>
<th>REITs</th>
<th>Global FI</th>
<th>Equity</th>
<th>REITs</th>
<th>Global FI</th>
<th>Equity</th>
<th>REITs</th>
<th>Global FI</th>
<th>Equity</th>
<th>REITs</th>
<th>Global FI</th>
<th>Equity</th>
<th>REITs</th>
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<th>Equity</th>
<th>REITs</th>
<th>Global FI</th>
<th>Equity</th>
<th>REITs</th>
<th>Global FI</th>
<th>Equity</th>
<th>REITs</th>
<th>Global FI</th>
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</thead>
<tbody>
<tr>
<td>2005</td>
<td>EM 43.8%</td>
<td>REITS 33.2%</td>
<td>EM 25.5%</td>
<td>Global FI 32.0%</td>
<td>EM 38.8%</td>
<td>Aus. FI 6.0%</td>
<td>Aus. FI 11.4%</td>
<td>REITS 32.2%</td>
<td>EM 47.8%</td>
<td>REITS 14.0%</td>
<td>EM 13.9%</td>
<td>REITS 27.3%</td>
<td>EM 27.5%</td>
<td>Global FI 9.8%</td>
<td>REITS 19.9%</td>
<td>Aus. FI 8.0%</td>
<td>EM 8.8%</td>
<td>REITS 16.3%</td>
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<tr>
<td>2006</td>
<td>Aus. Equity 22.8%</td>
<td>EM 24.2%</td>
<td>Aus. Equity 16.1%</td>
<td>Aus. FI 14.9%</td>
<td>Aus. Equity 37.0%</td>
<td>Cash 4.7%</td>
<td>Global FI 5.6%</td>
<td>Aus. Equity 20.3%</td>
<td>EM 15.3%</td>
<td>DM Equity 12.1%</td>
<td>EM 13.9%</td>
<td>REITS 5.7%</td>
<td>Aus. Equity 19.7%</td>
<td>Aus. FI 4.5%</td>
<td>EM 17.8%</td>
<td>Port. 4.7%</td>
<td>Aus. FI 7.4%</td>
<td>Aus. Equity 12.8%</td>
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<tr>
<td>2007</td>
<td>EM 17.6%</td>
<td>EM 23.4%</td>
<td>Cash 6.8%</td>
<td>Cash 7.6%</td>
<td>Port. 12.6%</td>
<td>Cash 5.0%</td>
<td>EM Equity 17.1%</td>
<td>Port. 16.2%</td>
<td>Port. 10.8%</td>
<td>Global FI 8.9%</td>
<td>Aus. Equity 11.8%</td>
<td>Aus. Equity 11.8%</td>
<td>DM Equity 2.0%</td>
<td>Port. 13.0%</td>
<td>DM Equity 7.2%</td>
<td>Port. 11.1%</td>
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<tr>
<td>2008</td>
<td>Port. 16.2%</td>
<td>Port. 14.6%</td>
<td>Port. 14.6%</td>
<td>Port. 15.6%</td>
<td>Cash 3.5%</td>
<td>Port. 1.7%</td>
<td>Port. -1.8%</td>
<td>DM Equity 15.1%</td>
<td>EM Equity 13.4%</td>
<td>Global FI 10.0%</td>
<td>Port. 5.1%</td>
<td>DM Equity 8.7%</td>
<td>Port. 9.2%</td>
<td>DM Equity 2.0%</td>
<td>Port. 13.0%</td>
<td>DM Equity 7.2%</td>
<td>Port. 11.1%</td>
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<td></td>
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<tr>
<td>2009</td>
<td>REITS 15.5%</td>
<td>DM Equity 12.3%</td>
<td>Aus. FI 3.5%</td>
<td>DM Equity -24.9%</td>
<td>REITS 3.3%</td>
<td>Aus. FI 1.6%</td>
<td>DM Equity -2.0%</td>
<td>Port. 14.7%</td>
<td>DM Equity 13.0%</td>
<td>Global FI 9.8%</td>
<td>Aus. FI 2.6%</td>
<td>Port. 7.9%</td>
<td>DM Equity 5.1%</td>
<td>Cash 1.9%</td>
<td>EM Equity 11.1%</td>
<td>Global FI 4.6%</td>
<td>Aus. FI 5.7%</td>
<td>Port. 9.1%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>Aus. FI 5.8%</td>
<td>Cash 6.0%</td>
<td>DM Equity -1.6%</td>
<td>Aus. Equity -38.4%</td>
<td>Aus. FI 1.7%</td>
<td>REITS 0.4%</td>
<td>DM Equity -5.0%</td>
<td>Aus. FI 7.7%</td>
<td>REITS 6.6%</td>
<td>EM Equity 7.3%</td>
<td>Aus. Equity 2.6%</td>
<td>Aus. FI 2.9%</td>
<td>Port. 1.9%</td>
<td>Port. 1.9%</td>
<td>Aus. FI 6.6%</td>
<td>Aus. FI 3.1%</td>
<td>Port. 15.5%</td>
<td>DM Equity 12.3%</td>
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<td></td>
</tr>
<tr>
<td>2011</td>
<td>Cash 5.7%</td>
<td>Aus. FI 3.1%</td>
<td>Global FI -1.7%</td>
<td>EM Equity -41.0%</td>
<td>DM Equity 1.4%</td>
<td>DM Equity -1.4%</td>
<td>DM Equity -10.5%</td>
<td>Cash 4.0%</td>
<td>Cash 2.9%</td>
<td>Cash 2.3%</td>
<td>Cash 2.6%</td>
<td>Cash 1.7%</td>
<td>Global FI -2.8%</td>
<td>Global FI 5.9%</td>
<td>EM Equity 2.0%</td>
<td>Cash 4.1%</td>
<td>Cash 2.7%</td>
<td>Global FI 3.8%</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>2012</td>
<td>Global FI 2.1%</td>
<td>REITS -7.7%</td>
<td>Global FI -0.8%</td>
<td>REITS -55.2%</td>
<td>Global FI -17.1%</td>
<td>Global FI -7.4%</td>
<td>Global FI -18.2%</td>
<td>Global FI 3.0%</td>
<td>Aus. FI 2.0%</td>
<td>Cash 2.7%</td>
<td>EM Equity -3.9%</td>
<td>Cash 2.1%</td>
<td>Global FI -0.6%</td>
<td>EM Equity -4.7%</td>
<td>Cash 1.0%</td>
<td>Cash 0.4%</td>
<td>Global FI 3.8%</td>
<td>Cash 0.5%</td>
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</tr>
</tbody>
</table>
Annual returns and intra-year declines

ASX 200 index intra-year declines vs. calendar year returns

Despite average intra-year drops of 13.9% (median 11.7%), annual returns are positive in 18 out of 25 years*

Source: FactSet, MSCI, J.P. Morgan Asset Management. Returns are based on price only and exclude dividends. Intra-year decline refers to the largest market fall from peak to trough in a short period of time during the calendar year. *Returns are shown for calendar years from 1994 to 2018. Past performance is not a reliable indicator of current and future results.

The power of compounding

$5,000 invested annually with 5% growth per year
AUD

$5,000 invested annually with 5% growth per year
AUD

One-off $5,000 investment with/without income reinvested
AUD, MSCI Australia returns

Source: FactSet, MSCI, J.P. Morgan Asset Management. Past performance is not a reliable indicator of current and future results.

Life expectancy

Probability of reaching ages 80 and 90
Persons aged 65, by gender, and combined by couple

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

80 years:
- Men: 68%
- Women: 78%
- Couple: 93%

90 years:
- Men: 37%
- Women: 24%
- Couple: 52%

**Range of equity, bond and blended total returns**

Annual total returns, 1950-2018

<table>
<thead>
<tr>
<th>1-yr rolling</th>
<th>5-yr rolling</th>
<th>10-yr rolling</th>
<th>20-yr rolling</th>
</tr>
</thead>
<tbody>
<tr>
<td>-39%</td>
<td>-2%</td>
<td>-1%</td>
<td>17%</td>
</tr>
<tr>
<td>-3%</td>
<td>-2%</td>
<td>1%</td>
<td>12%</td>
</tr>
<tr>
<td>28%</td>
<td>23%</td>
<td>16%</td>
<td>14%</td>
</tr>
<tr>
<td>47%</td>
<td>33%</td>
<td>16%</td>
<td>6%</td>
</tr>
<tr>
<td>43%</td>
<td>1%</td>
<td>16%</td>
<td>1%</td>
</tr>
<tr>
<td>50/50 portfolio</td>
<td>21%</td>
<td>16%</td>
<td>5%</td>
</tr>
</tbody>
</table>


J.P. Morgan Asset Management - Index Definitions

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 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 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 50% 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 Index® 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 indices: 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 ACWI (All Country World Index) Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets. As of June 2009 the MSCI ACWI consisted of 45 country indices comprising 23 developed and 22 emerging market country indices.

The MSCI Small Cap IndicesSM target 40% of the eligible Small Cap universe within each industry group, within each country. MSCI defines the Small Cap universe as all listed securities that have a market capitalization in the range of USD200-1,500 million.

The MSCI Value and Growth IndicesSM 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-floating-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 IndicesSM are calculated with gross dividends:

The MSCI EAFE® 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 EAFE 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 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.

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 NFI-ODCE, short for NCREIF Fund Index - Open End Diversified Core Equity, is an index of investment returns reporting on both a historical and current basis the results of 33 open-end commingled funds pursuing a core investment strategy, some of which have performance histories dating back to the 1970s. The NFI-ODCE Index is capitalization-weighted and is reported gross of fees. Measurement is time-weighted.

The NAREIT EQUITY RETI 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 or the NASDAQ National Market List.

The Dow Jones Industrial Average measures the stock performance of 30 leading blue-chip U.S. companies.

The Bloomberg 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.
All indexes are unmanaged and an individual cannot invest directly in an index. Index returns do not include fees or expenses.

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. Individual components qualify for inclusion in the index on the basis of liquidity and are weighted by their respective world production quantities.

The Barclays Capital 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. These major sectors are subdivided into more specific indexes that are calculated and reported on a regular basis.

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

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

The Barclays Capital 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. Original issue zeroes, step-up coupon structures, and 144As are also included.

The Barclays Capital 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. In addition, the securities must be denominated in U.S. dollars and must be fixed rate and non-convertible.

The Barclays Capital General Obligation Bond Index is a component of the Barclays Capital Municipal Bond Index. To be included in the index, bonds must be general obligation bonds rated investment-grade (Baaj/Baa3 or higher) by at least two of the following ratings agencies: Moody’s, S&P, Fitch. If only two of the three agencies rate the security, the lower rating is used to determine index eligibility. If only one of the three agencies rates a security, the rating must be investment-grade. They must have an outstanding par value of at least $7 million and be issued as part of a transaction of at least $75 million. The bonds must be fixed rate, have a dated-date after December 31, 1990, and must be at least one year from their maturity date. Remarketed issues, taxable municipal bonds, bonds with floating rates, and derivatives are excluded from the benchmark.

The Barclays Capital Revenue Bond Index is a component of the Barclays Capital Municipal Bond Index. To be included in the index, bonds must be revenue bonds rated investment-grade (Baaj/Baa3 or higher) by at least two of the following ratings agencies: Moody’s, S&P, Fitch. If only two of the three agencies rate the security, the lower rating is used to determine index eligibility. If only one of the three agencies rates a security, the rating must be investment-grade. They must have an outstanding par value of at least $7 million and be issued as part of a transaction of at least $75 million. The bonds must be fixed rate, have a dated-date after December 31, 1990, and must be at least one year from their maturity date. Remarketed issues, taxable municipal bonds, bonds with floating rates, and derivatives are excluded from the benchmark.

The Barclays High Yield Municipal Index includes bonds rated Ba1 or lower or non-rated bonds using the middle rating of Moody’s, S&P and Fitch.

Municipal Bond Index: To be included in the index, bonds must be rated investment-grade (Baaj/Baa3 or higher) by at least two of the following ratings agencies: Moody’s, S&P, Fitch. If only two of the three agencies rate the security, the lower rating is used to determine index eligibility. If only one of the three agencies rates a security, the rating must be investment-grade. They must have an outstanding par value of at least $7 million and be issued as part of a transaction of at least $75 million. The bonds must be fixed rate, have a dated-date after December 31, 1990, and must be at least one year from their maturity date. Remarketed issues, taxable municipal bonds, bonds with floating rates, and derivatives are excluded from the benchmark.

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

The Barclays Capital 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 sovereign and quasi-sovereign entities.

The J.P. Morgan Domestic High Yield Corporate Bond 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 (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 price of equity securities may rise, or fall because of changes in the broad market or changes in a company’s financial
c condition, sometimes rapidly or unpredictably. These price movements may result from factors affecting individual
companies, sectors or industries, or the securities market as a whole, such as changes in economic or political conditions.
Equity securities are subject to “stock market risk” meaning that stock prices in general may decline over short or extended
periods of time. Small-capitalization investing typically carries more risk than investing in well-established "blue-chip" companies since
smaller companies generally have a higher risk of failure. Historically, smaller companies’ stock has experienced a greater
degree of market volatility than the average stock.
Mid-capitalization investing typically carries more risk than investing in well-established "blue-chip" companies. Historically, mid-cap companies’ stock has experienced a greater degree of market volatility than the average stock.
Real estate investments may be subject to a higher degree of market risk because of concentration in a specific industry,
sector or geographical sector. Real estate investments may be subject to risks including, but not limited to, declines in the
value of real estate, risks related to general and economic conditions, changes in the value of the underlying property owned
by the trust and defaults by borrower.
International investing involves a greater degree of risk and increased volatility. Changes in currency exchange rates and
differences in accounting and taxation policies outside the U.S. can raise or lower returns. Also, some overseas markets may
not be as politically and economically stable as the United States and other nations.
Investments in emerging markets can be more volatile. As mentioned above, the normal risks of investing in foreign
countries are heightened when investing in emerging markets. In addition, the small size of securities markets and the low
trading volume may lead to a lack of liquidity, which leads to increased volatility. Also, emerging markets may not provide
adequate legal protection for private or foreign investment or private property.
Investments in commodities may have greater volatility than investments in traditional securities, particularly if the
instruments involve leverage. The value of commodity-linked derivative instruments may be affected by changes in overall
market movements, commodity index volatility, changes in interest rates, or factors affecting a particular industry or
commodity, such as drought, floods, weather, livestock disease, embargoes, tariffs and international economic, political and
regulatory developments. Use of leveraged commodity-linked derivatives creates an opportunity for increased return but, at
the same time, creates the possibility for greater loss.
Investing in alternative assets involves higher risks than traditional investments and is suitable only for sophisticated
investors. Alternative investments involve greater risks than traditional investments and should not be deemed a complete
investment program. They are not tax efficient and an investor should consult with his/her tax advisor prior to investing.
Alternative investments have higher fees than traditional investments and they may also be highly leveraged and engage in
speculative investment techniques, which can magnify the potential for investment loss or gain. The value of the investment
may fall as well as rise and investors may get back less than they invested.
Derivatives may be riskier than other types of investments because they may be more sensitive to changes in economic or
market conditions than other types of investments and could result in losses that significantly exceed the original investment.
The use of derivatives may not be successful, resulting in investment losses, and the cost of such strategies may reduce
investment returns.
Price to forward earnings is a measure of the price-to-earnings ratio (P/E) using forecasted earnings. Price to book value
compares a stock’s market value to its book value. Price to cash flow is a measure of the market’s expectations of a firm’s
future financial health. Price to dividends is the ratio of the price of a share on a stock exchange to the dividends per share
paid in the previous year, used as a measure of a company’s potential as an investment.

There is no guarantee that the use of long and short positions will succeed in limiting an investor’s exposure to domestic
stock market movements, capitalization, sector swings or other risk factors. Using long and short selling strategies may have
higher portfolio turnover rates. Short selling involves certain risks, including additional costs associated with covering short
positions and a possibility of unlimited loss on certain short sale positions.
The HFRI Monthly Indices (HFRI) are equally weighted performance indexes, utilized by numerous hedge fund managers
as a benchmark for their own hedge funds. The HFRI are broken down into 4 main strategies, each with multiple substrategies. All single-manager HFRI index constituents are included in the HFRI Fund Weighted Composite, which accounts for over 2,200 funds listed on the internal HFRI Database.

Equity Market Neutral Strategies employ sophisticated quantitative techniques of analyzing price data to ascertain
information about future price movement and relationships between securities, select securities for purchase and sale.
Equity Market Neutral Strategies typically maintain characteristic net equity market exposure no greater than 10% long or
short.
Distressed Restructuring Strategies employ an investment process focused on corporate fixed income instruments,
primarily on corporate credit instruments of companies trading at significant discounts to their value at issuance or obliged
(par value) at maturity as a result of either formal bankruptcy proceeding or financial market perception of near term
proceedings.
Merger Arbitrage Strategies which employ an investment process primarily focused on opportunities in equity and related
equity instruments of companies which are currently engaged in a corporate transaction.
Global Macro Strategies trade a broad range of strategies in which the investment process is predicated on movements in
underlying economic variables and the impact these have on equity, fixed income, hard currency and commodity markets.
Relative Value Strategies maintain positions in which the investment thesis is predicated on realization of a valuation
discrepancy in the relationship between a pair of securities.
The Cambridge Associates LLC U.S. Private Equity Index® is an end-to-end calculation based on data compiled from
1,052 U.S. private equity funds (buyout, growth equity, private equity energy and mezzanine funds), including fully liquidated
partnerships, formed between 1986 and 2013.
The Alerian MLP Index is a composite of the 50 most prominent energy Master Limited Partnerships (MLPs) that provides
investors with an unbiased, comprehensive benchmark for the asset class.
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