Guide to China

3Q 2022
As of July 31, 2022
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APPENDIX: KEY FACTS ABOUT CHINA
Evolution of China’s economy

GDP size of China and U.S.
GDP size, billions, current prices, U.S. dollars

<table>
<thead>
<tr>
<th>Decade</th>
<th>China GDP ranking</th>
<th>China contribution to global growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980s</td>
<td>8</td>
<td>1%</td>
</tr>
<tr>
<td>1990s</td>
<td>8</td>
<td>21%</td>
</tr>
<tr>
<td>2000s</td>
<td>5</td>
<td>15%</td>
</tr>
<tr>
<td>2010s</td>
<td>2</td>
<td>32%</td>
</tr>
<tr>
<td>2020s</td>
<td>2</td>
<td>28%</td>
</tr>
<tr>
<td>2031</td>
<td>1</td>
<td>30%</td>
</tr>
</tbody>
</table>

Forecast*

Real GDP per capita and urbanization ratios
Constant prices, U.S. dollars, 1960 – 2030**

*2022 is a J.P. Morgan Asset Management estimate. 2023-2031 forecasts are based on the J.P. Morgan 2022 Long-term Capital Market Assumptions (LTCMA) estimates. Forecasts, projections and other forward-looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and serve as an indication of what may occur. Given the inherent uncertainties and risks associated with forecast, projections or other forward statements, actual events, results or performance may differ materially from those reflected or contemplated.**Includes forecasts for 2025 and 2030 based on the 2022 LTCMAs, the United Nations population projections and the United Nations World Urbanization Prospects: 2020 Revision. Guide to China. Data as of July 31, 2022.
The emergence of the middle class

Growth of the middle class
% of total population

- India, 883
- China, 453
- Rest of Asia, 133

Regional contribution middle class growth: 2020 to 2030
Millions of people

- Rest of Asia, 133
- China, 453
- India, 883

Estimates for regional contribution are from Kharas, Homi. The Unprecedented Expansion of the Global Middle Class, An Update. Brookings Institution, 2017. Middle class is defined as households with per capita incomes between $11 and $110 per person per day in 2011 PPP terms.
Forecasts, projections and other forward-looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and serve as an indication of what may occur. Given the inherent uncertainties and risks associated with forecasts, projections or other forward-looking statements, actual events, results or performance may differ materially from those reflected or contemplated.
Guided by China. Data are as of July 31, 2022.
Long-term growth potential

Contribution to potential growth
Percentage points, real growth rate

<table>
<thead>
<tr>
<th>Period</th>
<th>TFP</th>
<th>Labor</th>
<th>Capital</th>
<th>Potential GDP Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-2007</td>
<td>4.1</td>
<td>1.6</td>
<td>4.4</td>
<td>10.2</td>
</tr>
<tr>
<td>2008-2015</td>
<td>2.4</td>
<td>1.7</td>
<td>4.8</td>
<td>9.0</td>
</tr>
<tr>
<td>2016-2020</td>
<td>1.9</td>
<td>0.5</td>
<td>3.6</td>
<td>6.0</td>
</tr>
<tr>
<td>2021-2025</td>
<td>2.5</td>
<td>0.1</td>
<td>2.6</td>
<td>5.3</td>
</tr>
<tr>
<td>2026-2030</td>
<td>2.4</td>
<td>-0.1</td>
<td>2.0</td>
<td>4.4</td>
</tr>
</tbody>
</table>

TFP refers to total factor productivity and includes education. Forecasts, projections and other forward-looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and serve as an indication of what may occur. Given the inherent uncertainties and risks associated with forecast, projections or other forward statements, actual events, results or performance may differ materially from those reflected or contemplated.

Guide to China. Data are as of July 31, 2022.
Change in growth structure

Share of GDP by sector
% of nominal GDP

- Agriculture
- Manufacturing
- Services

2021: 39.4%
2021: 53.3%
2021: 7.2%

Contribution to GDP growth

### Contribution to real GDP growth

Year-over-year change

![Graph showing contribution to real GDP growth with data points for 1978 to 2018]

- **Gross capital formation (Investment)**: 3Q21: 0.4%, 4Q21: -0.5%, 1Q22: 1.3%, 2Q22: 0.3%
- **Consumption**: 3Q21: 0.7%, 4Q21: 1.1%, 1Q22: 3.3%, 2Q22: -0.8%
- **Net exports**: 3Q21: 3.8%, 4Q21: 3.4%, 1Q22: 0.2%, 2Q22: 1.0%
- **Total GDP**: 3Q21: 4.9%, 4Q21: 4.0%, 1Q22: 4.8%, 2Q22: 0.4%

**YTD 2022:** 2.5%

Importance of trade to China

Total exports and imports
% of GDP

Current account balance
% of GDP

Importance of Chinese trade to the world

China’s share of global trade
China exports and imports as % of world total, goods only

2021: 15%
2021: 12%

Share of world exports
Share of world imports

2021:

Exports
Trade balance
Imports

U.S.
Hong Kong
EU
ASEAN
India
UK
Canada
Japan
South Korea
Brazil
Taiwan

U.S.
$474
Hong Kong
$358
EU
$269
ASEAN
$112
India
$94
UK
$45
Canada
$30
Japan
-$38
South Korea
-$60
Brazil
-$64
Taiwan
-$194

Source: (Left) IMF; (Right) China Customs; J.P. Morgan Asset Management. Guide to China. Data are as of July 31, 2022.
Chinese consumer

Contribution to global consumption growth
Household consumption, constant U.S. dollars

- China
- U.S.
- Europe
- Rest of world

<table>
<thead>
<tr>
<th>Year</th>
<th>China</th>
<th>U.S.</th>
<th>Europe</th>
<th>Rest of world</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>18%</td>
<td>35%</td>
<td>7%</td>
<td>22%</td>
</tr>
<tr>
<td>2005</td>
<td>13%</td>
<td>26%</td>
<td>16%</td>
<td>11%</td>
</tr>
<tr>
<td>2010</td>
<td>7%</td>
<td>20%</td>
<td>11%</td>
<td>23%</td>
</tr>
<tr>
<td>2015</td>
<td>36%</td>
<td>38%</td>
<td>42%</td>
<td>26%</td>
</tr>
<tr>
<td>2019</td>
<td>25%</td>
<td>22%</td>
<td>35%</td>
<td>18%</td>
</tr>
</tbody>
</table>

China’s contribution to global spending on luxury goods
Chinese consumers, % of total, both domestic and overseas spending

- 2012: 19%
- 2018: 32%
- 2020: 35%
- 2025F*: 40%

China’s Singles’ Day vs. U.S. holiday sales
Gross merchandise value, U.S. dollar, billions

- Prime Day
- Cyber Monday
- Black Friday
- Thanksgiving Sat. & Sun.
- China Singles’ day

<table>
<thead>
<tr>
<th>Year</th>
<th>Prime Day</th>
<th>Cyber Monday</th>
<th>Black Friday</th>
<th>Thanksgiving Sat. &amp; Sun.</th>
<th>China Singles’ day</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>$10.2</td>
<td>$6.2</td>
<td>$4.2</td>
<td>$11.6</td>
<td>$28.5</td>
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<tr>
<td>2019</td>
<td>$11.6</td>
<td>$7.4</td>
<td>$4.2</td>
<td>$10.8</td>
<td>$35.7</td>
</tr>
<tr>
<td>2020</td>
<td>$14.5</td>
<td>$9.0</td>
<td>$10.4</td>
<td>$10.7</td>
<td>$44.8</td>
</tr>
<tr>
<td>2021</td>
<td>$14.5</td>
<td>$9.0</td>
<td>$10.4</td>
<td>$10.7</td>
<td>$40.0</td>
</tr>
</tbody>
</table>

China
U.S.
Europe
Rest of world

Source: (Left) World Bank; (Top right) McKinsey & Company “China Luxury Report 2019”; (Bottom right) Alibaba, Adobe Analytics, Amazon; J.P. Morgan Asset Management. Prime Day is an annual promotional event hosted by Amazon in late June (actual date varies by year). Singles’ Day occurs annually on November 11. Figure includes Alibaba’s Singles’ Day sales only. Forecasts, projections and other forward-looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and serve as an indication of what may occur. Given the inherent uncertainties and risks associated with forecast, projections or other forward statements, actual events, results or performance may differ materially from those reflected or contemplated. *Forecast based on McKinsey & Company “China Luxury Report 2019”. Guide to China. Data are as of July 31, 2022.
Household savings

Household savings rate
% household disposable income, latest*

- Japan: 4%
- UK: 7%
- U.S.: 8%
- Euro Area: 13%
- Mexico: 15%
- China: 36%

Social benefits to households**
In cash, % of GDP

- Euro Area (2000-2020)
- UK (2000-2020)
- Japan (2000-2020)
- China (2000-2020)

Household wealth by asset type
% of total, as of Dec. 2019

- Property
- Equity & mutual fund
- Cash & deposits
- Insurance & pension
- Other securities
- Others

Source: (Left) OECD; (Right) Goldman Sachs; J.P. Morgan Asset Management.

Guide to China. Data are as of July 31, 2022.
China’s share of pre-tax national income

Top 10%’s ownership of national income and wealth*


Guide to China: Data are as of July 31, 2022.
Demographic trends

### Total population

**Billion people**

<table>
<thead>
<tr>
<th>Year</th>
<th>Total population</th>
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</thead>
<tbody>
<tr>
<td>'90</td>
<td>1.0</td>
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<tr>
<td>'95</td>
<td>1.1</td>
</tr>
<tr>
<td>'00</td>
<td>1.2</td>
</tr>
<tr>
<td>'05</td>
<td>1.3</td>
</tr>
<tr>
<td>'10</td>
<td>1.4</td>
</tr>
<tr>
<td>'15</td>
<td>1.5</td>
</tr>
<tr>
<td>'20</td>
<td>1.6</td>
</tr>
</tbody>
</table>

**Forecast**

### Crude birth and death rate

**Per 1,000 people**

<table>
<thead>
<tr>
<th>Year</th>
<th>Birth rate</th>
<th>Death rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>'80</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>'85</td>
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<td>5</td>
<td>5</td>
</tr>
<tr>
<td>'45</td>
<td>5</td>
<td>5</td>
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<tr>
<td>'50</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>

**Forecast**

Source: United Nations-World Population Prospects 2022, United Nations-World Urbanization Prospects 2018, J.P. Morgan Asset Management. Forecasts, projections and other forward-looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and serve as an indication of what may occur. Given the inherent uncertainties and risks associated with forecast, projections or other forward statements, actual events, results or performance may differ materially from those reflected or contemplated. Guide to China. Data are as of July 31, 2022.
Technological progress

**Patent applications**

# of PCT patent filings*

<table>
<thead>
<tr>
<th>Year</th>
<th>United States</th>
<th>Japan</th>
<th>Germany</th>
<th>China</th>
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</thead>
<tbody>
<tr>
<td>'96</td>
<td>10,000</td>
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<tr>
<td>'01</td>
<td>20,000</td>
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<td>'06</td>
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<tr>
<td>'11</td>
<td>40,000</td>
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</tr>
<tr>
<td>'16</td>
<td>50,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>'21</td>
<td>60,000</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


**Research and development**

Expenditures as % of GDP

<table>
<thead>
<tr>
<th>Year</th>
<th>United States</th>
<th>Japan</th>
<th>Germany</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>'96</td>
<td>0%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>'01</td>
<td>1%</td>
<td></td>
<td></td>
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<tr>
<td>'06</td>
<td>2%</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>'11</td>
<td>3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>'16</td>
<td>4%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>'21</td>
<td>5%</td>
<td></td>
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</tr>
</tbody>
</table>


"GTM | GTC | 15"
China’s self-sufficiency rate for key technologies

Current self-sufficiency rate amongst different technology products

Percentage points

Higher technology entry barrier

Self-sufficiency rate

Technology entry barrier

- ERP software
- Cloud IaaS
- PCB
- Wafer fabrication (non-advanced)
- Office software
- Robotics
- Inverter
- Laser generator
- IC assembly & testing
- Speed reducer
- Wafer cleaning Eq.
- CMOS image sensor
- Power IC
- RF IC
- IC substrate
- CPU
- Lithography Eq.
- Etching Eq.
- Wafer fabrication (advanced)
- Software related
- Industrial products
- Semiconductors/ integrated circuit related

Source: J.P. Morgan Asset Management.
ERP = Enterprise resource planning; IaaS = Infrastructure as a Service; IC = Integrated circuit; PCB = Printed circuit board; RF IC = Radio frequency integrated circuit. Based on J.P. Morgan Asset Management’s estimates as of July 31, 2022. Forecasts, projections and other forward-looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and serve as an indication of what may occur. Given the inherent uncertainties and risks associated with forecast, projections or other forward statements, actual events, results or performance may differ materially from those reflected or contemplated.

Guide to China. Data are as of July 31, 2022.
Emission targets and energy mix

Greenhouse gas emission targets
Billion tonnes/year, CO2 equivalent

China’s energy mix
% of primary energy

Source: J.P. Morgan Asset Management; (Left) Climate Action Tracker. Current policy forecast is the post-Covid forecast provided by Climate Action Tracker. (Right) BP Energy Outlook 2022. Forecast is based on BP’s scenario for global net-zero emissions by 2050. Forecasts, projections and other forward-looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and serve as an indication of what may occur. Given the inherent uncertainties and risks associated with forecast, projections or other forward statements, actual events, results or performance may differ materially from those reflected or contemplated. *Renewables include wind, solar, geothermal, biomass, biogas and biofuels. Guide to China. Data are as of July 31, 2022.
China’s GDP per capita vs. Five Year Plans (FYP)
Nominal, U.S. dollars

10th FYP:
- 7% GDP growth
- Boost international competitiveness
- Balance external position

11th FYP:
- Quantitative targets
- 7.5% annual GDP growth
- Increase services’ share in GDP and employment
- Create 45mn jobs

12th FYP:
- Rebalance to consumption from investment
- Shift coastal cities from manufacturing to R&D and services
- Expand highways and highspeed railways
- Prudent monetary policy and curb housing prices

13th FYP:
- Innovation
- Environment
- Supranational
- Reform one-child policy
- New urbanization

14th FYP:
- Expand domestic demand while keeping development of external sectors
- Improve self-sufficiency of key technologies and products
- Promote common prosperity
- Environmental protection

Forecast*

Source: IMF-World Economic Outlook, J.P. Morgan Asset Management.
Forecasts, projections and other forward-looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and serve as an indication of what may occur. Given the inherent uncertainties and risks associated with forecast, projections or other forward statements, actual events, results or performance may differ materially from those reflected or contemplated.

*Nominal GDP per capita forecast from the IMF.
Guide to China. Data are as of July 31, 2022.
China’s recent regulations within different sectors

### Policy Principles
- **China’s State Council Committee encourages regulators to establish more transparent and predictable policies** (03/2022)
- **CCP’s Politburo advocated to stabilize growth, with supports to infrastructure investment, property market and internet platforms** (04/2022)

### Property
- Three red-line rules introduced to restrict borrowing for developers that breached 3 debt criteria: (1) total liabilities/asset ratio >70%; (2) net gearing >100%; and (3) cash to short-term debt ratio of 1 (08/2020)
- Central government issued guidance to monitor the property sector; Local governments tighten purchase restrictions measures (07/2021)
- PBoC pledges to support homebuyers and promote healthy development of the real estate market (12/2021). Local level easing measures were introduced, for example, home purchase restrictions were loosened while down payment ratios were lowered in various cities (01/2022 – 03/2022)
- China State Council approves the set up of a fund to support distressed property developers. Initial fund size is set at USD 11.8 billion, but may rise to USD 44 billion, and will be used to buy and complete construction projects (07/2022)

### Education
- Policy aimed at reducing burdens of students and families is issued: New regulations on after-school tutoring industry include: (1) companies can only be registered as non-profit organizations; (2) approvals for new companies were banned; and (3) illegal for companies to receive foreign investment/ raise capital/ go public. (07/2021)
- State Council announced measures that includes ramping up coal capacity, raising tariffs so as to tackle power shortages (10/2021)
- After the power shortage in 3Q21, the government tuned down the pace of coal reduction by stressing that “coal is still the key power source in China” (12/2021)
- The National Development and Reform Committee released the Energy Development Plan for “14th Five-Year”, with more visibility on nuclear and hydropower development (03/2022)

### Internet
- Enhance data security: Didi was banned from app stores due to violation of personal data collection and usage (07/2021). Didi fined for breaching data security laws (07/2022)
- Antitrust: Internet giants such as Alibaba, Meituan and Tencent were fined on monopolistic practices (04/2021 – 07/2022)
- Social responsibility and labor rights matters: Instructions on food delivery platforms’ responsibility to protect delivery riders’ interests were released so as to address social security and labor rights matters (07/2021 – 09/2021); Food delivery platforms were guided to lower the service fees they charged to meal vendors (02/2022)
- Gaming: Online gaming companies will be banned from offering minors (those under age 18) access to games during weekdays (08/2021). China resumes gaming license approval (04/2022)
- Live streaming platforms: Tighten scrutiny on marketing activities; Enhance control of account registration; Crackdown on tax evasion; Cap consumer spend on virtual tipping (03/2022)

### Health Care
- Government expanded the scope of centralized pharmaceutical procurement in order to cap the cost of public health care (10/2021)

### Source:
Various news sources, J.P. Morgan Asset Management.
PBoC: People’s Bank of China. SAMR: State Administration for Market Regulation oversees all manner of market controls, including regulating anti-competition behavior, intellectual property rights, drug safety supervision and issuance of business licenses, etc. The companies/securities above are shown for illustrative purposes only. Their inclusion should not be interpreted as a recommendation to buy or sell. Guide to China. Data are as of July 31, 2022.
China capital market opening

Foreign investor investments into onshore Chinese equities and bonds
Foreign investor outstanding holdings, USD billion

<table>
<thead>
<tr>
<th>Date</th>
<th>Key capital market developments in China</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/2002</td>
<td>China opens its domestic stock market via Qualified Foreign Institutional Investor program</td>
</tr>
<tr>
<td>11/2014</td>
<td>Launch of Shanghai North and Southbound Stock Connect*</td>
</tr>
<tr>
<td>07/2015</td>
<td>China allows foreign central banks, international financial organizations and sovereign wealth funds to enter domestic bond market</td>
</tr>
<tr>
<td>12/2016</td>
<td>Launch of Shenzhen North and Southbound Stock Connect*</td>
</tr>
<tr>
<td>06/2017</td>
<td>MSCI announces plan to include China A-shares in global indices</td>
</tr>
<tr>
<td>07/2017</td>
<td>Launch of Northbound Bond Connect**</td>
</tr>
<tr>
<td>09/2018</td>
<td>FTSE Russell announces plans to include China A-shares in global indices</td>
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<tr>
<td>01/2019</td>
<td>Bloomberg announces inclusion of Chinese RMB denominated bonds into global indices</td>
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<tr>
<td>09/2019</td>
<td>China lifts quota for QFI*** programs</td>
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<tr>
<td>10/2020</td>
<td>Launch of ETF cross listing in Shenzhen</td>
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<tr>
<td>06/2021</td>
<td>Launch of ETF cross listing in Shanghai</td>
</tr>
<tr>
<td>09/2021</td>
<td>Launch of Southbound Bond Connect**</td>
</tr>
<tr>
<td>07/2022</td>
<td>Launch of ETF Connect</td>
</tr>
<tr>
<td>01/2023</td>
<td>Proposed launch of Swap Connect</td>
</tr>
<tr>
<td>01/2023</td>
<td>Proposed launch of Swap Connect</td>
</tr>
</tbody>
</table>

Source: CEIC, China Central Depository and Clearing (CCDC), China Securities Regulatory Commission, Hong Kong Exchanges and Clearing Limited, Hong Kong Monetary Authority, PBoC, Shanghai Clearing House (SCH), State Administration of Foreign Exchange, Wind and J.P. Morgan Asset Management. Bond holdings and inflows are based on data provided by CCDC and SCH. Equity holdings and inflows are based on data provided by the PBoC. *Stock Connect is a cross-border channel that connects the Shanghai Stock Exchange and Shenzhen Stock Exchange to the Hong Kong Stock Exchange. It allows qualified mainland Chinese investors to access eligible Hong Kong shares (Southbound) as well as Hong Kong and overseas investors to trade eligible A-shares (Northbound) subject to a certain amount of daily quota. **Bond Connect is a mutual market access scheme that allows international and Chinese investors to trade in each others credit markets. ***QFI (Qualified Foreign Investors) refers to the program, which was first launched in 2002, that allows specified licensed international investors to participate in mainland China’s stock exchanges.

*Guide to China. Data are as of July 31, 2022.*
China’s housing market in global context

China and U.S. residential real estate investment
USD billions and % of nominal GDP

Price to income ratios for major cities around the globe
Ratio of median apartment prices to median family disposable income, years of income, as of Jun. 2022


Guide to China. Data are as of July 31, 2022.
China–U.S. economic relations

U.S. voters who feel “cold” towards China*
% of U.S. voters who have an unfavorable opinion of China

- Democrat/Lean Democrat
- Republican/Lean Republican
- Total

<table>
<thead>
<tr>
<th>Year</th>
<th>Democrats/Lean Democrats</th>
<th>Republicans/Lean Republicans</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>38%</td>
<td>61%</td>
<td>79%</td>
</tr>
<tr>
<td>2021</td>
<td>46%</td>
<td>67%</td>
<td>72%</td>
</tr>
</tbody>
</table>

Plans to move production out of China in the next 3 years
Of companies with production capacity in China, % considering moving**

- Not planning to move
- Move 1-10%
- Move 11-20%
- Move 21-30%
- Move over 30%
- Move all production

<table>
<thead>
<tr>
<th>Year</th>
<th>Not planning to move</th>
<th>Move 1-10%</th>
<th>Move 11-20%</th>
<th>Move 21-30%</th>
<th>Move over 30%</th>
<th>Move all production</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>11%</td>
<td>8%</td>
<td>3%</td>
<td>4%</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>2005</td>
<td>8%</td>
<td>11%</td>
<td>8%</td>
<td>3%</td>
<td>4%</td>
<td>2%</td>
</tr>
<tr>
<td>2007</td>
<td>3%</td>
<td>4%</td>
<td>2%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2009</td>
<td>2%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2011</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2013</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2015</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2017</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>2019</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Foreign direct investment
USD billions

- U.S. FDI into China
- China FDI into U.S.

<table>
<thead>
<tr>
<th>Year</th>
<th>U.S. FDI into China</th>
<th>China FDI into U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>'03</td>
<td>-10</td>
<td>-15</td>
</tr>
<tr>
<td>'05</td>
<td>-5</td>
<td>-10</td>
</tr>
<tr>
<td>'07</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>'09</td>
<td>-10</td>
<td>-15</td>
</tr>
<tr>
<td>'11</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>'13</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>'15</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>'17</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>'19</td>
<td>5</td>
<td>10</td>
</tr>
</tbody>
</table>

Source: FactSet, J.P. Morgan Asset Management; (Top left) Pew Research Center; (Bottom left) U.S. Census Bureau, (Right) The American Chamber of Commerce in Shanghai. *Pew Research Center survey of U.S. adults conducted February 2021. "Cold" refers to ratings of 0-49 on a feeling thermometer. Thermometer was asked as: "We’d like to get your feelings toward some different countries in the world on a ‘feeling thermometer.’ A rating of 0 degrees = cold/negative as possible, a rating of 100 degrees = warm/positive as possible and a rating of 50 = neutral/indifferent. How do you feel about China?". **Survey was conducted between June 15 and July 15, 2021. Responses were received from 125 companies. Guide to China. Data are as of July 31, 2022.
COVID-19: Cases and vaccinations

**Confirmed new cases**
7-day moving average

**Covid-19 vaccine rollout**
Total vaccine doses administered per 100 people

**Source:** Our World in Data, Johns Hopkins University, J.P. Morgan Asset Management.
Vaccine doses are counted as single doses, and may not equal the total number of people vaccinated, depending on the specific dose regime.
*Guide to China.* Data are as of July 31, 2022.
COVID-19: Mobility and supply chain disruptions

New COVID-19 cases* and Chinese airline mobility
Cases** (log scale)  Index for flights: 2019 average =100

New COVID-19 cases* and road transport freight volume
Cases** (log scale)  Road transport freight volume (billions of tons)

Source: (Left) Our World in Data, OAG Schedules Analyzer, Oxford University; (Right) Wind, J.P. Morgan Asset Management.

*COVID-19 cases incorporates both domestic confirmed and asymptomatic cases. Confirmed cases are infections with imagological changes to the patients’ lungs. Asymptomatic cases are patients with positive PCR testing results and/or mild symptoms, while without imagological changes in lungs. **Secondary axes use logarithmic scale. Cases peaked at 29,317 on April 13, 2022.

Guide to China: Data are as of July 31, 2022.
Purchasing Managers’ Index

Manufacturing PMIs
Index

Services PMIs
Index


In both PMI series, the reading above 50 represents expansion in activities compared with the previous month, while the reading below 50 means economic activities are weaker on a monthly basis. Caixin/Markit PMI surveys 500 mainly small and medium sized enterprises, while the NBS PMI surveys 3,000 companies, including state-owned enterprises, and is biased toward large-sized enterprises.

Guide to China. Data are as of July 31, 2022.
Keqiang Index

Components of Keqiang Index

Source: China Electricity Council, National Bureau of Statistics of China, People's Bank of China, Wind, J.P. Morgan Asset Management. Keqiang index = railway cargo volume * 25% + industrial electricity consumption * 40% + outstanding mid- to long-term loan * 35%, all the components are based on Year-over-year change. The index was created based on Premier Li Keqiang’s preferred three economic indicators for China’s cyclical position. Guide to China. Data are as of July 31, 2022.
Fixed asset investment

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

<table>
<thead>
<tr>
<th>Year</th>
<th>Real estate</th>
<th>Manufacturing</th>
<th>Infrastructure (excl. electricity)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jun. 2022</td>
<td>-5.4%</td>
<td>10.4%</td>
<td>7.1%</td>
</tr>
</tbody>
</table>

Aggregate 6.1%
Public 9.2%
Private 3.5%

Consumption

Retail sales
Year-over-year change

Automobile sales
Millions of units, saar

Guide to China. Data are as of July 31, 2022.
Chinese consumer sentiment

PBOC depositor survey*  
Percentage among respondents

*The PBOC depositor survey is conducted quarterly by China’s central bank to gauge consumers’ sentiment. The surveys are randomly distributed to 20,000 depositors at 400 bank branches in 50 cities and measure the participant’s plans to increase spending (as opposed to saving or investing). The income sentiment index is composed with the same diffusion index methodology as the PMI, in which a reading above 50 signifies an improvement in income while a reading below 50 suggests a decline in income.  
Guide to China. Data are as of July 31, 2022.
Measure of unemployment

Urban registered unemployment rate*
Quarterly

Urban survey unemployment rate
Monthly


(Left) The urban registered unemployment rate is calculated using a range of unemployed workers. It only covers job seekers who are registered with the local governments’ employment service department. It was discontinued in 2021. (Right) The urban survey unemployment rate includes a much wider definition of unemployed workers than the registered unemployment rate. The urban survey unemployment rate began in 2018 and it is now the major indicator used by policymakers for unemployment.

Guide to China. Data are as of July 31, 2022.
China e-commerce

Online share of goods sales
% of total goods sales, year-to-date

Online goods sales breakdown
Year-over-year change, year-to-date

Property market

Property prices and land sales
Year-over-year % change

Structure of bank loans
Outstanding loans, % of nominal GDP

Source: CEIC, National Bureau of Statistics of China, People’s Bank of China, J.P. Morgan Asset Management. Forecasts, projections, estimates and other forward-looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and serve as an indication of what may occur. Given the inherent uncertainties and risks associated with forecast, projections or other forward-looking statements, actual events, results or performance may differ materially from those reflected or contemplated.

Guide to China. Data are as of July 31, 2022.
Foreign trade

Goods trade
Year-over-year change, 3-month moving average

Balance of trade
USD billions, 3-month moving average

Source: CEIC, China Customs, J.P. Morgan Asset Management. 
Guide to China. Data are as of July 31, 2022.
China/U.S. trade relationship

**China/U.S. trade tensions**
Good export value in USD, rolling 12 months, June 2018 = 100

- U.S. & China impose 25% tariffs on $34B of goods
- U.S. imposes 10% tariffs on $200B/China 5-10% on $60B
- U.S. proposes increase from 10% to 25% on $200B
- U.S. proposes 10% tariffs on $300B/China proposal on $75B

**Phase I trade agreement progress**
Chinese import data, USD billions, as of Dec. 2021

- U.S. & China impose 25% tariffs on $34B of goods
- First-stage trade agreement signed
- China exports to U.S.
- China imports from U.S.

Inflation

Consumer price index
Year-over-year change

<table>
<thead>
<tr>
<th>Year-over-year change</th>
<th>Jun. 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headline CPI</td>
<td>2.5%</td>
</tr>
<tr>
<td>Core CPI</td>
<td>1.0%</td>
</tr>
<tr>
<td>Food inflation (RHS)</td>
<td>2.9%</td>
</tr>
</tbody>
</table>

Producer price index
Year-over-year change

<table>
<thead>
<tr>
<th>Year-over-year change</th>
<th>Jun. 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headline PPI</td>
<td>6.1%</td>
</tr>
<tr>
<td>Producer goods</td>
<td>7.5%</td>
</tr>
<tr>
<td>Consumer goods</td>
<td>1.7%</td>
</tr>
</tbody>
</table>

Central bank operations: Liquidity injections

Liquidity injections by the PBoC
RMB billions, net injection

*Open market operation (OMO) includes reverse repo, repo and central bank bill issuance by the People’s Bank of China. **Monetary policy tools include short-term liquidity operations (SLO), standing liquidity facility (SLF), medium-term liquidity facility (MLF) and pledged supplementary lending (PSL).

Guide to China. Data are as of July 31, 2022.
Central bank operations: policy rates

Key policy rates
Per annum

<table>
<thead>
<tr>
<th>Policy rate</th>
<th>Description</th>
<th>Jul. 31, 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loan prime rate</td>
<td>New benchmark lending rate, ceiling of interest rate corridor</td>
<td>3.7%</td>
</tr>
<tr>
<td>Medium-term lending facility</td>
<td>Most representative money market tool</td>
<td>2.9%</td>
</tr>
<tr>
<td>Interbank repo</td>
<td>Interbank market rate</td>
<td>1.7%</td>
</tr>
<tr>
<td>Deposit rate</td>
<td>Floor of interest rate corridor</td>
<td>1.5%</td>
</tr>
</tbody>
</table>

Source: CEIC, People’s Bank of China (PBoC), National Interbank Funding Center, J.P. Morgan Asset Management.

*Starting from August 20, 2019, the PBoC releases a monthly 1-year and 5-year loan prime rate (LPR) based on quotes from 18 banks. For this new monthly quote, banks are required to submit them in the form of open market operation rates (especially MLF) plus a margin to the national interbank lending center. The central bank requests all commercial banks to reference the finalized LPR to price their new lending and use LPR as the benchmark rate in floating rate loan contracts going forward. Guide to China. Data are as of July 31, 2022.
Central bank operations: reserve requirements

Reserve requirement ratio

Source: CEIC, People’s Bank of China (PBoC), J.P. Morgan Asset Management.
Large banks are six major banks in China, including Industrial and Commercial Bank of China, Agricultural Bank of China, Bank of China, China Construction Bank, Bank of Communications, Postal Savings Bank of China. The other banks are categorized as small- and medium-sized banks. PBoC sets favorable required reserve ratio for banks which have met specific criteria, such as loans to small and medium-sized enterprises and agricultural sectors. These measures have significantly brought down the actual RRR for banks. According to the PBoC, after the latest RRR cut on April 25, 2022, the realized weighted average RRR is 8.1% (December 15, 2021: 8.4%).

Guide to China. Data are as of July 31, 2022.
Credit conditions

Credit cycles
Percentage points, credit growth – nominal GDP growth, 3-month moving average

Credit growth measures the year-over-year growth of outstanding total social financing. *Wenzhou SME crisis refers to the wave of bankruptcies and funding problems faced by a large number of SMEs in Wenzhou in 2011. **LGFV refers to local government financing vehicle. Guide to China. Data are as of July 31, 2022.
Credit impulse and commodity prices

Credit impulse and industrial metals’ prices
% of nominal GDP, year-over-year change

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

Bloomberg industrial metals index

Credit impulse

Credit impulse measures the year-over-year change in credit flow (net flow of total social financing) as a percentage of nominal GDP. Guide to China. Data are as of July 31, 2022.
Fiscal policy

Fiscal revenues and expenditures*
Year-over-year change, 3-month moving average

Pace of central and local government bond issuance
Year-to-date issuance as % of full-year quota

<table>
<thead>
<tr>
<th>Year</th>
<th>Quota (RMB trillion)</th>
<th>% of quota filled</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>8.5</td>
<td>98%</td>
</tr>
<tr>
<td>2021</td>
<td>7.2</td>
<td>97%</td>
</tr>
<tr>
<td>Jun. 2022</td>
<td>7.0</td>
<td>67%</td>
</tr>
</tbody>
</table>

Source: CEIC, Ministry of Finance of China, J.P. Morgan Asset Management; (Bottom left) J.P. Morgan Economic Research. *Fiscal revenues include taxes, government funds, which are mostly derived from local government land sales, and other government revenues. Fiscal expenditures include government spending of funds raised from taxes, government funds and general bond issuance. **Actual deficit = fiscal revenues - fiscal expenditures (as shown in top left chart). Budget deficit = actual deficit adjusted with the fiscal stability fund. Augmented deficit is an estimate of all the fiscal resources used by the government to support economic growth, i.e. fiscal balance plus investment via local government financing vehicles, policy banks and other channels. Forecasts, projections and other forward-looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and serve as an indication of what may occur. Given the inherent uncertainties and risks associated with forecast, projections or other forward statements, actual events, results or performance may differ materially from those reflected or contemplated.

Yuan exchange rates

Chinese yuan exchange rates
Price levels

*CFETS CNY Index data available as of December 2015.
Guide to China. Data are as of July 31, 2022.
Yuan and FX reserves

USD/CNY and change in FX reserves

Chinese currency in global perspective

Currency weights in IMF’s SDR basket

- U.S. Dollar: 43%
- Euro: 29%
- Chinese Yuan: 12%
- Japanese Yen: 8%
- Pound Sterling: 7%

Global central bank reserve manager holdings

% of total

SDR refers to the IMF’s Special Drawing Rights basket.
Guide to China. Data are as of July 31, 2022.
Size of Chinese and global equity markets

Stock exchange market capitalizations
Trillions of U.S. dollars, 2021

NYSE & Nasdaq: $52.2
Shanghai & Shenzhen: $14.4
Japan: $6.5
Hong Kong: $5.4
London: $3.8

Stock exchange market capitalizations
Trillions of U.S. dollars

### Types of and access to Chinese equities

<table>
<thead>
<tr>
<th>Share class</th>
<th>Definition</th>
<th>Currency</th>
<th>Foreign investor access</th>
<th>Indices</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Onshore</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A-shares</td>
<td>Securities incorporated in Mainland China, listed on the Shanghai or Shenzhen Stock Exchange</td>
<td>RMB</td>
<td>No restrictions</td>
<td>MSCI China, SZSE Composite Index, Shanghai Composite Index, CSI 300</td>
</tr>
<tr>
<td>B-shares</td>
<td>Securities incorporated in Mainland China, listed on the Shanghai or Shenzhen Stock Exchange</td>
<td>USD (Shanghai), HKD (Shenzhen)</td>
<td>No restrictions</td>
<td>MSCI China</td>
</tr>
<tr>
<td><strong>Offshore</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H-shares</td>
<td>Securities incorporated in Mainland China, listed on the Hong Kong Stock Exchange</td>
<td>HKD</td>
<td>No restrictions</td>
<td>Hang Seng Index, MSCI China</td>
</tr>
<tr>
<td>Red-chips</td>
<td>Securities of state-owned companies incorporated outside Mainland China, listed on the Hong Kong Stock Exchange</td>
<td>HKD</td>
<td>No restrictions</td>
<td>MSCI China</td>
</tr>
<tr>
<td>P-chips</td>
<td>Securities of non-government owned companies incorporated outside Mainland China, listed on Hong Kong Stock Exchange</td>
<td>HKD</td>
<td>No restrictions</td>
<td>MSCI China</td>
</tr>
<tr>
<td>Overseas (N and S-shares)</td>
<td>Securities (including ADRs) listed on foreign exchanges such as the Nasdaq and NYSE (N-shares), and Singapore Exchange (S-shares)</td>
<td>USD, SGD</td>
<td>No restrictions</td>
<td>MSCI China</td>
</tr>
</tbody>
</table>

### Market capitalization and constituents by market

#### MSCI indices, as of Jul. 2022

- **A-shares**: $1,885 billion, 495 constituents
- **B-shares**: $6 billion, 4 constituents
- **H-shares**: $448 billion, 79 constituents
- **Red-chips**: $120 billion, 33 constituents
- **P-chips**: $973 billion, 80 constituents
- **Overseas**: $190 billion, 24 constituents

**Source:** MSCI, J.P. Morgan Asset Management.  
*Guide to China. Data are as of July 31, 2022.*
Chinese initial public offerings

Includes Shanghai, Shenzhen, Hong Kong, and ADRs

IPO breakdown by sector
Share of current market value, 2016-2022 YTD

<table>
<thead>
<tr>
<th>Sectors</th>
<th>% of market value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer</td>
<td>32.4%</td>
</tr>
<tr>
<td>Industrial</td>
<td>17.3%</td>
</tr>
<tr>
<td>Financials</td>
<td>17.3%</td>
</tr>
<tr>
<td>Comm.</td>
<td>12.7%</td>
</tr>
<tr>
<td>Tech</td>
<td>9.5%</td>
</tr>
<tr>
<td>Materials</td>
<td>4.7%</td>
</tr>
<tr>
<td>Energy</td>
<td>3.7%</td>
</tr>
<tr>
<td>Diversified</td>
<td>1.3%</td>
</tr>
<tr>
<td>Utilities</td>
<td>1.2%</td>
</tr>
</tbody>
</table>

IPO breakdown by share type
Share of current market value, 2016-2022 YTD

Source: Bloomberg, J.P. Morgan Asset Management.
Guide to China. Data are as of July 31, 2022.
Chinese stocks listed in the U.S.

Chinese stocks listed on U.S. exchanges
USD billion

<table>
<thead>
<tr>
<th>Year</th>
<th>Aggregate market cap of ADRs</th>
<th>Total number of ADRs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>$500</td>
<td>0</td>
</tr>
<tr>
<td>2007</td>
<td>$1,000</td>
<td>50</td>
</tr>
<tr>
<td>2008</td>
<td>$1,500</td>
<td>100</td>
</tr>
<tr>
<td>2009</td>
<td>$2,000</td>
<td>150</td>
</tr>
<tr>
<td>2010</td>
<td>$2,500</td>
<td>200</td>
</tr>
<tr>
<td>2011</td>
<td>$3,000</td>
<td>250</td>
</tr>
<tr>
<td>2012</td>
<td>$3,500</td>
<td>300</td>
</tr>
<tr>
<td>2013</td>
<td>$4,000</td>
<td>350</td>
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<td>2014</td>
<td>$4,500</td>
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<tr>
<td>2015</td>
<td>$5,000</td>
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<td>2016</td>
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<td>2017</td>
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<tr>
<td>2018</td>
<td>$6,500</td>
<td>600</td>
</tr>
<tr>
<td>2019</td>
<td>$7,000</td>
<td>650</td>
</tr>
<tr>
<td>2020</td>
<td>$7,500</td>
<td>700</td>
</tr>
<tr>
<td>2021</td>
<td>$8,000</td>
<td>750</td>
</tr>
<tr>
<td>2022</td>
<td>$8,500</td>
<td>800</td>
</tr>
</tbody>
</table>

Chinese stock performance by listing
Price index, Jan. 2002 = 100, USD, monthly

- S&P China Select ADR Index
- Shanghai Shenzhen CSI 300 Index

*Chinese ADRs: American depositary receipts that represent shares of U.S.-listed Chinese companies. Past performance is not indicative of current or future results.
Guide to China. Data are as of July 31, 2022.
Sector composition of offshore and onshore equities

Sector weights
% of index market capitalization

State-owned enterprise representation in key stock indices

Hang Seng Composite Index (HSCI)
SOE % of sector and % of overall index market capitalization

- Energy: 98%
- Comm. Service: 92%
- Financials: 70%
- Materials: 58%
- Industrials: 52%
- Utilities: 43%
- HSCI: 40%
- Real Estate: 31%
- Cons. Staples: 23%
- Health Care: 7%
- Cons. Disc: 4%
- Info Tech: 3%

CSI 300 Index
SOE % of sector and % of overall index market capitalization

- Energy: 100%
- Comm. Service: 100%
- Financials: 89%
- Materials: 85%
- Industrials: 70%
- Utilities: 63%
- HSCI: 48%
- Real Estate: 45%
- Cons. Staples: 38%
- Health Care: 22%
- Cons. Disc: 17%

Source: China Securities Index, Hang Seng Index, Wind, J.P. Morgan Asset Management.
SOE refers to state-owned enterprise, as defined by controlling stake owned by central and/or local governments and/or their subsidiaries.
Guide to China: Data are as of July 31, 2022.
Market structure of offshore vs. onshore equities

Average daily turnover
U.S. dollars, billions, 2021

<table>
<thead>
<tr>
<th>Location</th>
<th>Average Daily Turnover</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hong Kong</td>
<td>$17.6</td>
</tr>
<tr>
<td>Shanghai &amp; Shenzhen</td>
<td>$166.6</td>
</tr>
<tr>
<td>U.S.</td>
<td>$405.3</td>
</tr>
</tbody>
</table>

Participation by type of investor
% of total trading value, latest*

- **Individual investors**
  - Shanghai: 82%
  - Hong Kong: 20%
  - U.S.: 18%

- **Institutional investors**
  - Shanghai: 80%

Annual returns and intra-year declines

MSCI China intra-year declines vs. calendar year returns
Local currency, average intra-year drops of -30.0% (median: -25.2%) and annual returns positive in 15 of 29 years of an average of 5.5%

Source: FactSet, MSCI, J.P. Morgan Asset Management.
Returns are based on price index only and do not include dividends. Intra-year drops refers to the largest market drops from a peak to a trough during the year. For illustrative purposes only. Returns are calendar year returns from 1993 to 2021 for the MSCI China.
Guide to China. Data are as of July 31, 2022.
Chinese equity market corrections and subsequent performance

Previous vs. current Chinese equity market corrections
MSCI China

Source: Bloomberg, J.P. Morgan Asset Management.
Chinese market performance is based on the MSCI China price index only and do not include dividends.
The periods above were chosen to illustrate particular market moving events in China and the recovery 4, 12, and 26 weeks after market trough. The April 2011 to September 2011 period represents a period in which global fears were heightened due to China’s perceived growth slowdown. Fears culminated in a dramatic market sell-off in August 2011. The May 2015 to February 2016 period represents the currency crisis in China. The January 2018 to October 2018 represents the beginning of the default cycle. The February 2021 to March 2022 period represents the recent regulatory tightening campaign in China. Past performance is not indicative of current or future results.

Guide to China. Data are as of July 31, 2022.
Reform cycle policy principles

<table>
<thead>
<tr>
<th>Year(s)</th>
<th>Principle</th>
<th>Policy Tool</th>
<th>Sectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>Macro economic control</td>
<td>Interest rate and RRR hike, administrative power</td>
<td>Real estate, steel, auto, power plants, cement, glass and other industries with excessive capacity and/or high energy consumption. Cut export tariff return for high energy-consuming and heavy-pollution products.</td>
</tr>
<tr>
<td>2008</td>
<td>Economic stabilization</td>
<td>Infrastructure investment, interest rate and RRR cuts, fiscal expansion</td>
<td>Highway, railway, airports, real estate</td>
</tr>
<tr>
<td>2010-2011</td>
<td>Property market control</td>
<td>Credit control and purchase control in property market</td>
<td>Real estate</td>
</tr>
<tr>
<td>2015-2018</td>
<td>Supply-side reform</td>
<td>Monetary policy, administrative power</td>
<td>Traditional sectors (property market, steel, coal, cement, glass), local government financing</td>
</tr>
<tr>
<td>2021-2022</td>
<td>Limit monopoly power</td>
<td>Regulations, monetary policy</td>
<td>Internet, education, health care, real estate, energy</td>
</tr>
</tbody>
</table>

MSCI China price index

Introduction of policy reforms

Chinese equity market dispersion

**Share type dispersion**
Price index, USD terms, 100 = Jan. 2021

**Sector dispersion**
Price index, USD terms, 100 = Jan. 2021


The Hang Seng Tech Index represents the 30 largest technology companies listed in Hong Kong that have high business exposure to innovative technology themes. The MSCI China Semiconductors Index is composed of large and mid-cap stocks across China. All securities in the index are classified in the Semiconductors and Semiconductor Equipment Industry Group (within the Information Technology sector) according to the Global Industry Classification Standard. The MSCI China Apparel and Luxury Goods Index is composed of large and mid-cap stocks across China. All securities in the index are classified as Apparel and Luxury Goods as according to the Global Industry Classification Standard.

Guideto China. Data are as of July 31, 2022.
## Chinese equities: Valuations

### MSCI China: Forward P/E ratio

<table>
<thead>
<tr>
<th>Index</th>
<th>Valuation measure</th>
<th>Latest</th>
<th>Average</th>
<th>Std. dev. over-/under-valued</th>
<th>Time period</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSCI China</td>
<td>Forw ard P/E</td>
<td>10.9x</td>
<td>11.8x</td>
<td>-0.4</td>
<td>20-year</td>
</tr>
<tr>
<td>MSCI China</td>
<td>Price to book</td>
<td>1.4x</td>
<td>1.9x</td>
<td>-0.6</td>
<td>20-year</td>
</tr>
<tr>
<td>MSCI China</td>
<td>Dividend yield</td>
<td>2.6%</td>
<td>2.5%</td>
<td>-0.1</td>
<td>20-year</td>
</tr>
<tr>
<td>Hang Seng China Enterprises (H-shares)</td>
<td>Forw ard P/E</td>
<td>8.8x</td>
<td>10.3x</td>
<td>-0.4</td>
<td>15-year</td>
</tr>
<tr>
<td>CSI 300 (A-shares)</td>
<td>Forw ard P/E</td>
<td>13.4x</td>
<td>15.2x</td>
<td>-0.3</td>
<td>15-year</td>
</tr>
<tr>
<td>ChiNext</td>
<td>Forw ard P/E</td>
<td>35.6x</td>
<td>36.0x</td>
<td>0.0</td>
<td>10-year</td>
</tr>
<tr>
<td>SME Board</td>
<td>Forw ard P/E</td>
<td>20.0x</td>
<td>23.6x</td>
<td>-0.7</td>
<td>5-year</td>
</tr>
</tbody>
</table>

Source: Bloomberg, MSCI, J.P. Morgan Asset Management.
Guide to China. Data are as of July 31, 2022.
Chinese equities: Relative valuations vs. U.S. equities

**MSCI China: Price-to-earnings relative to U.S.**
MSCI China vs. S&P 500 Indices, next 12 months

- Average: -22%
- Jul. 2022: -38%
- -1 Std. dev.: -41%
- +1 Std. dev.: -3%

**MSCI China Tech: Price-to-earnings relative to U.S.**
MSCI China Technology vs. S&P 500 Technology subsectors, next 12 months

- Average: 31%
- Jul. 2022: -32%
- +1 Std. dev.: 75%
- -1 Std. dev.: -12%

Source: MSCI, Standard & Poor’s, FactSet, J.P. Morgan Asset Management.
Guide to China. Data are as of July 31, 2022.
China: Sector earnings and valuations

Earnings growth of MSCI China*
Earnings per share, year-over-year change, consensus estimates

<table>
<thead>
<tr>
<th>Sector</th>
<th>Weight (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy</td>
<td>3.7</td>
</tr>
<tr>
<td>Real estate</td>
<td>21.7</td>
</tr>
<tr>
<td>Comm. Services</td>
<td>2.3</td>
</tr>
<tr>
<td>Financials</td>
<td>100.0</td>
</tr>
<tr>
<td>MSCI China</td>
<td>14.2</td>
</tr>
<tr>
<td>Materials</td>
<td>34.8</td>
</tr>
<tr>
<td>Tech.</td>
<td>4.2</td>
</tr>
<tr>
<td>Industrials</td>
<td>6.1</td>
</tr>
<tr>
<td>Health Care</td>
<td>4.4</td>
</tr>
<tr>
<td>Utilities</td>
<td>5.7</td>
</tr>
<tr>
<td>Cons. Staples</td>
<td>1.2</td>
</tr>
<tr>
<td>Cons. Discr.</td>
<td>1.8</td>
</tr>
</tbody>
</table>

MSCI China price-to-earnings
Forward P/E ratios

Source: FactSet, MSCI, J.P. Morgan Asset Management. *Sector indices used are from the MSCI China Index. Consensus estimates used are calendar year estimates from FactSet. Past performance is not a reliable indicator of current and future results. **Data for the forward price-to-earnings ratio in the real estate and health care sectors begin from 30/09/16 and 30/06/09, respectively. 

## Onshore equities: Sector performance

<table>
<thead>
<tr>
<th>Sector</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2Q '22</th>
<th>YTD '2022</th>
<th>10-yr. ('11-'21) annualized</th>
<th>Forward P/E</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Return (%)</td>
<td>Volatility (%)</td>
<td>2020</td>
<td>2021</td>
<td>YTD '2022</td>
<td>2022</td>
<td>2021</td>
<td>2020</td>
<td>2021</td>
</tr>
<tr>
<td>Con. staples</td>
<td>31.2</td>
<td>-15.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>15.9</td>
<td>29.2</td>
</tr>
<tr>
<td>Utilities</td>
<td>61.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13.5</td>
<td>26.7</td>
</tr>
<tr>
<td>Financials</td>
<td>17.1</td>
<td>-19.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>44.5</td>
<td>39.0</td>
</tr>
<tr>
<td>Telecom</td>
<td>8.0</td>
<td>-20.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>35.3</td>
<td>32.7</td>
</tr>
<tr>
<td>Materials</td>
<td>6.9</td>
<td>-25.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>26.7</td>
<td>30.8</td>
</tr>
<tr>
<td>Health Care</td>
<td>5.9</td>
<td>-27.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>24.7</td>
<td>29.3</td>
</tr>
<tr>
<td>Energy</td>
<td>3.7</td>
<td>-28.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>38.4</td>
<td>33.8</td>
</tr>
<tr>
<td>All A-Share</td>
<td>3.7</td>
<td>-33.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>30.8</td>
<td>28.3</td>
</tr>
<tr>
<td>Con. disc.</td>
<td>2.1</td>
<td>-33.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>18.0</td>
<td>16.0</td>
</tr>
<tr>
<td>IT</td>
<td>-1.5</td>
<td>-34.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>13.9</td>
<td>15.1</td>
</tr>
<tr>
<td>Utilities</td>
<td>-6.2</td>
<td>-34.6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7.6</td>
<td>8.7</td>
</tr>
<tr>
<td>Industrials</td>
<td>-6.8</td>
<td>-34.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>6.0</td>
<td>7.0</td>
</tr>
</tbody>
</table>


*Annual returns are total returns based on CSI all share index and CSI all share sector indices. Past performance is not a reliable indicator of current and future results.

Guide to China. Data are as of July 31, 2022.
**China equities: Growth vs. value**

**Growth vs. value valuations**
MSCI China growth/value fwd. P/E ratio

- Growth expensive relative to value
- Growth cheap relative to value

-1 Std. dev.: 1.5
Average: 2.7
+1 Std. dev.: 4.0

**Growth vs. value relative performance**
MSCI China growth/value performance, Jan. 2006 = 100

- Growth outperforming value
- Growth underperforming value

Source: FactSet, MSCI, J.P. Morgan Asset Management.
*Growth is the MSCI China Growth index and value is the MSCI China Value index. Past performance is not a reliable indicator of current and future results.
Guide to China. Data are as of July 31, 2022.
Chinese private equity markets

**Number of unicorns by city***
Hurun Global Unicorn Index 2021, top 10 cities

<table>
<thead>
<tr>
<th>City</th>
<th># of Unicorns</th>
<th>% of total valuation</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Francisco</td>
<td>151</td>
<td>9%</td>
</tr>
<tr>
<td>Beijing</td>
<td>91</td>
<td>5%</td>
</tr>
<tr>
<td>New York</td>
<td>85</td>
<td>4%</td>
</tr>
<tr>
<td>Shanghai</td>
<td>71</td>
<td>3%</td>
</tr>
<tr>
<td>Shenzhen</td>
<td>32</td>
<td>2%</td>
</tr>
<tr>
<td>London</td>
<td>31</td>
<td>2%</td>
</tr>
<tr>
<td>Bengaluru</td>
<td>28</td>
<td>2%</td>
</tr>
<tr>
<td>Hangzhou</td>
<td>22</td>
<td>2%</td>
</tr>
<tr>
<td>Paris</td>
<td>18</td>
<td>1%</td>
</tr>
<tr>
<td>Berlin</td>
<td>17</td>
<td>1%</td>
</tr>
</tbody>
</table>

**Venture capital fundraising**
Capital raised, % of global total

U.S.: 66%
China: 7%

**China venture capital exits**
Exit value (U.S. dollar, billions) and count

Source: (Left) Hurun Research Institute; (Right) KPMG, PitchBook, J.P. Morgan Asset Management.

*Unicorns defined as companies worth at least a billion dollars and not yet listed on a public exchange. Unicorn valuations are a snapshot of November 30, 2021. Venture capital fundraising and exits based on KPMG’s 4Q21 Venture Pulse Report – Asia.
Guide to China. Data are as of July 31, 2022.
MSCI Emerging Markets Index: Inclusion of China A-Shares

August 2011
China: 17%

Pre A-Share Inclusion

May 2019
China: 32%

A-Share inclusion begins

July 2022
China: 32%

20% A-Share inclusion (Current)

Onshore equities: Market opening

Foreign investors' holdings of onshore Chinese equities
RMB trillions

China’s weight in selected indicators
% of total

Source: J.P. Morgan Asset Management; (Left) CEIC, People's Bank of China, Shanghai Stock Exchange, Shenzhen Stock Exchange; (Right) Bloomberg, MSCI, World Bank. Share of EM GDP is for 2020 and is calculated as Chinese nominal GDP in U.S. dollars as a percentage of all emerging markets within the MSCI EM index and as a percentage of the global GDP. Share of EM market cap is for 2020 and is calculated as China’s market capitalization of listed domestic companies as a percentage of all emerging markets’ capitalization of listed domestic companies within the MSCI EM index and as a percentage of global market capitalization. *Currently, an index inclusion factor (IIF) of 20% is applied to China A Large Cap, ChiNext Large Cap and China A Mid Cap (including eligible ChiNext shares) within MSCI ACWI and MSCI EM Index. 100% A-share inclusion is shown for illustrative purposes only.

Guide to China. Data are as of July 31, 2022.
Correlation between A-shares and global equities

Efficient frontier
MSCI All Country World and China A-shares

<table>
<thead>
<tr>
<th>Correlation</th>
<th>S&amp;P 500</th>
<th>MSCI ACWI</th>
<th>MSCI EM</th>
<th>MSCI EAFE</th>
<th>MSCI China</th>
<th>CSI 300</th>
</tr>
</thead>
<tbody>
<tr>
<td>S&amp;P 500</td>
<td>1.00</td>
<td>0.98</td>
<td>0.77</td>
<td>0.89</td>
<td>0.57</td>
<td>0.40</td>
</tr>
<tr>
<td>MSCI ACWI</td>
<td>0.98</td>
<td>1.00</td>
<td>0.83</td>
<td>0.94</td>
<td>0.64</td>
<td>0.44</td>
</tr>
<tr>
<td>MSCI EM</td>
<td>0.77</td>
<td>0.83</td>
<td>1.00</td>
<td>0.87</td>
<td>0.85</td>
<td>0.56</td>
</tr>
<tr>
<td>MSCI EAFE</td>
<td>0.89</td>
<td>0.94</td>
<td>0.87</td>
<td>1.00</td>
<td>0.67</td>
<td>0.42</td>
</tr>
<tr>
<td>MSCI China</td>
<td>0.57</td>
<td>0.64</td>
<td>0.85</td>
<td>0.67</td>
<td>1.00</td>
<td>0.70</td>
</tr>
<tr>
<td>CSI 300</td>
<td>0.40</td>
<td>0.44</td>
<td>0.56</td>
<td>0.42</td>
<td>0.70</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Source: MSCI, J.P. Morgan Asset Management; (Left) FactSet, China Securities Index, Standard & Poor’s.
Correlations are based on monthly price return data in U.S. dollar terms for the period 08/31/2007-07/31/2022.
The efficient frontier returns and volatility are based on the J.P. Morgan 2022 Long-term Capital Market Assumptions (LTCMA) estimates.
Guide to China. Data are as of July 31, 2022.
Global investor positioning in Chinese assets

China net foreign portfolio investment
USD billions, 6-month moving average, latest available

% of investors with no China A-share exposure


Guide to China. Data are as of July 31, 2022.
Global revenue exposure to China

**MSCI China**
- China: 88%
- Europe: 3%
- Asia ex-China: 4%
- Other: 3%
- U.S.: 3%

**MSCI Emerging Markets**
- China: 36%
- U.S.: 9%
- Europe: 7%
- Asia ex-China & Japan: 23%
- Other: 23%
- Japan: 2%

**MSCI All Country World excluding U.S.**
- China: 16%
- U.S.: 17%
- Europe: 22%
- Japan: 9%
- Other: 22%
- Asia ex-China & Japan: 13%

**S&P 500**
- U.S.: 60%
- Europe: 14%
- China: 7%
- Japan: 3%
- Other: 11%
- Asia ex-China & Japan: 5%

Debt and bond markets by country

Bond market size in value and as a % of GDP
USD trillions, % of nominal 2021 GDP, as of 2Q22

Debt and bonds as a % of GDP
Total market value of total debt and bonds*, % of nominal 2021 GDP

Source: BIS, Bloomberg Finance LP., IMF, World Federation of Exchanges, J.P. Morgan Asset Management. Debt valuation is as of 4Q21, bond valuation is as of July 31, 2022. Bond market outstanding refers to the total U.S. dollar value of bonds (corporate and government) in the market and does not reflect mandatory prepayment. The difference in Japan’s government borrowing in debt and in bonds is due to the differing valuation dates. *Government bonds include onshore listed central and local government bonds for all countries. Corporate debt is borrowing by non-financial corporations; Corporate bonds are all onshore listed corporate bonds. Household borrowing is only accounted for in total debt as individuals do not issue bonds.

Guide to China. Data are as of July 31, 2022.
Bond market and yields by country

Debt by country
% GDP, includes government and corporate debt
- Japan
- China
- UK
- U.S.
- Korea
- Germany
- Mexico

Yields by country
Government and corporate bond indices
- Mexico
- China
- U.S.
- Korea
- Japan
- Germany

Source: BIS, Bloomberg, FactSet, J.P. Morgan Asset Management.
Country yields are provided by Bloomberg and are represented by the global aggregate for each country, except for U.S. which is based on Bloomberg U.S. Aggregate. Yield is not guaranteed. Positive yield does not imply positive return.
Guide to China. Data are as of July 31, 2022.
## Credit ratings by country

Evolution of China's sovereign rating and selected 10-year government bond yields, local currency

<table>
<thead>
<tr>
<th>S&amp;P Rating</th>
<th>10-year bond yield, Jul. 2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAA</td>
<td>Germany 0.85</td>
</tr>
<tr>
<td>AA+</td>
<td>U.S. 2.64</td>
</tr>
<tr>
<td>AA</td>
<td>Korea 3.13</td>
</tr>
<tr>
<td>AA-</td>
<td>UK 1.89</td>
</tr>
<tr>
<td>A+</td>
<td>Japan 0.18</td>
</tr>
<tr>
<td>A</td>
<td>China 2.77</td>
</tr>
<tr>
<td>A-</td>
<td>Spain 1.98</td>
</tr>
<tr>
<td>BBB+</td>
<td>Mexico 8.59</td>
</tr>
<tr>
<td>BBB</td>
<td>Italy 3.08</td>
</tr>
<tr>
<td>BBB-</td>
<td>India 7.32</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>12/92</th>
<th>05/96</th>
<th>07/99</th>
<th>02/04</th>
<th>07/05</th>
<th>07/06</th>
<th>07/08</th>
<th>12/10</th>
<th>09/17</th>
</tr>
</thead>
</table>

Bond market in China

China's three different bond markets
As of July 2022

Onshore RMB (CNY) market*
- Value: USD$7.7 trillion (the largest)
- Average credit rating: A+
- Average yield-to-maturity: 2.67%

Offshore foreign currency market**
- Value: USD$464 billion (the middle)
- Average credit rating: A
- Average yield-to-maturity: 7.28%

Offshore RMB (CNH) market***
- Value: USD$25 billion (the smallest)
- Average credit rating: A+
- Average yield-to-maturity: 3.49%

China's onshore bond market by type of issuer
USD trillions, as of June 30, 2022

- Central Gov. $2.2
- Policy Bank $2.6
- Regional Gov. $1.9
- Other Gov. Related $0.2
- Finance $0.4
- Industrials $0.1
- Utility $0.0

Counted as government debt, officially

*FTSE Chinese (Onshore CNY) Broad Bond Index is used as a proxy for China onshore universe statistics. **J.P. Morgan Asia Credit Index (JACI) China is used as a proxy for Chinese foreign currency-issued bond universe statistics. ***FTSE Dim Sum (Offshore CNY) Bond Index is used as a proxy for China offshore universe statistics. Guide to China. Data are as of July 31, 2022.
Onshore government bond yields

Onshore government bond yields
% per annum

Onshore government yield curve
% per annum

Source: J.P. Morgan Asset Management; (Left) Bloomberg Finance L.P; (Right) ChinaBond.
Onshore corporate credit

Credit spread of onshore corporate bonds
Basis points

Market structure of outstanding credit*

- Unrated
  - 26 trillion yuan (45%)
- AAA- to AAA+
  - 26 trillion yuan (44%)
- A- to AA+
  - 6 trillion yuan (10%)
- B and below
  - 0.2 trillion yuan (0.3%)

Value of defaults in onshore market
RMB billion

*Credit rating in Chinese onshore bond market may be inflated, given the absence of international rating agencies. Guide to China. Data are as of July 31, 2022.
Chinese offshore credit spreads and bond market returns

Chinese offshore corporate credit spreads
Basis points, daily

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</thead>
<tbody>
<tr>
<td>Global Bonds</td>
<td>7.4%</td>
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<tr>
<td>China Agg</td>
<td></td>
<td>3.5%</td>
<td></td>
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<tr>
<td>China Real Estate HY</td>
<td>14.9%</td>
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<tr>
<td>China Agg</td>
<td></td>
<td></td>
<td>9.8%</td>
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<tr>
<td>China Govt.</td>
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<tr>
<td>China Agg</td>
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<tr>
<td>China Govt.</td>
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<tr>
<td>ChinaHY</td>
<td>6.5%</td>
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<tr>
<td>China IG</td>
<td>0.5%</td>
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<tr>
<td>Asian Bonds</td>
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<tr>
<td>China Real Estate HY</td>
<td></td>
<td>12.7%</td>
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<tr>
<td>China Govt.</td>
<td>3.0%</td>
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<tr>
<td>China Agg</td>
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<tr>
<td>China Govt.</td>
<td>9.3%</td>
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<tr>
<td>China Agg</td>
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<tr>
<td>China Govt.</td>
<td>8.4%</td>
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<tr>
<td>ChinaAgg</td>
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<tr>
<td>China Govt.</td>
<td>5.8%</td>
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</table>

5 yr. avg.  Jul. 31, 2022

Global Bonds 7.4%  China Agg 3.5%  China Real Estate HY 14.9%  China Agg 9.8%  China Govt. 8.7%  China Agg -3.0%  China Agg 6.2%

China Real Estate HY 7.1%  China Govt. 3.0%  China HY 12.7%  China Govt. 9.3%  China Agg 8.4%  China Govt. -3.2%  China Govt. 5.8%

China HY 6.5%  China IG 0.5%  Asian Bonds 11.3%  Global Bonds 9.2%  China IG -0.1%  China IG -8.5%  China IG 4.3%

China Agg 6.2%  Asian Bonds -0.8%  China IG 10.2%  China Real Estate HY 8.7%  Asian Bonds -2.4%  Asian Bonds -10.5%  Asian Bonds 4.0%

Asian Bonds 5.8%  Global Bonds -1.2%  Global Bonds 6.8%  China HY 7.5%  Global Bonds -4.7%  Global Bonds -12.1%  Global Bonds 3.5%

China Govt. 5.0%  China Real Estate HY -3.1%  China Agg 3.4%  China IG 6.6%  China HY -26.3%  China HY -33.7%  China HY -0.8%

China IG 4.4%  China HY -4.2%  China Govt. 2.8%  Asian Bonds 6.3%  China Real Estate HY -37.2%  China Real Estate HY -53.1%  China Real Estate HY -1.9%

Left graph indices used are: Bloomberg Asia ex-Japan USD Credit China High Yield (China HY) and Bloomberg Asia ex-Japan USD Credit China IG (China IG). Right graph based on Bloomberg China Aggregate Index (China Agg), Chinese Central Government Bonds Index (China Govt.), Bloomberg Asia ex-Japan China High Yield Credit (China HY), Bloomberg Asia ex-Japan China Investment Grade Credit Index (China IG), Markit Asia ex-Japan China High Yield Real Estate Credit (China Real Estate HY), J.P. Morgan Asia Credit Index (JACI) (USD Asian Bonds), Bloomberg Global Aggregate (USD Global Bonds). Returns in U.S. dollars. 5 year annualized returns are from December 31, 2016 to December 31, 2021. Past performance is not a reliable indicator of current and future results.
Guide to China: Data are as of July 31, 2022.

*Based on J.P. Morgan CEMBI Broad Index (USD EMD corporates), J.P. Morgan EMBIG Broad Diversified Index (USD EMD sovereigns), J.P. Morgan GBI-EM Global Diversified Index (Local EMD sovereigns), Bloomberg Global Aggregate (Global Aggregate).*

*Guide to China. Data are as of July 31, 2022.*
Returns and volatility of Chinese bonds

Return and volatility of government bonds
Annualized total return and volatility, Aug. 2012 – Jul. 2022

<table>
<thead>
<tr>
<th>Bond Type</th>
<th>Annualized Return</th>
<th>Annualized Volatility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chinese Central Gov. Bonds (CNY)</td>
<td>4.0%</td>
<td>2.8%</td>
</tr>
<tr>
<td>Chinese Central Gov. Bonds (USD)</td>
<td>3.4%</td>
<td>3.9%</td>
</tr>
<tr>
<td>U.S. Treasuries</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Return of Chinese bonds versus Asia benchmarks
Annualized total return, Aug. 2017 – Jul. 2022

<table>
<thead>
<tr>
<th>Bond Type</th>
<th>China</th>
<th>Asia Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate Credit (USD)</td>
<td>-0.5%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Corporate Credit (Local ccy)</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Government Debt (Local ccy)</td>
<td>1.9%</td>
<td>4.7%</td>
</tr>
</tbody>
</table>

Source: Bloomberg Finance L.P., J.P. Morgan Asset Management; (Right) CSI, J.P. Morgan Economics Research, WIND.
Central government bonds and U.S. Treasury bonds returns are unhedged and calculated for the period between 08/31/2012 and 07/31/2022. Volatility calculated based on monthly price changes. Chinese and benchmark bond returns shown are calculated for the time period between 08/31/2017 and 07/31/2022. Indices used are: JACI (Asia USD corporate credit), CSI 3-5 year Corporate Bond Index & Bloomberg Aggregate Corporate 3-5 Year (Asia local ccy corporate credit) and JADE (Asia local ccy gov. debt).
Guide to China. Data are as of July 31, 2022.
Diversification benefits of Chinese bonds

Correlation between Chinese and global government bonds
Total return index in U.S. dollars*, 12-month rolling correlations of monthly return

Average: 0.32

<table>
<thead>
<tr>
<th>Country</th>
<th>Correlation to Global Aggregate Treasuries</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>0.24</td>
</tr>
<tr>
<td>India</td>
<td>0.24</td>
</tr>
<tr>
<td>South Africa</td>
<td>0.33</td>
</tr>
<tr>
<td>Mexico</td>
<td>0.37</td>
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<tr>
<td>U.S.</td>
<td>0.47</td>
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<tr>
<td>UK</td>
<td>0.45</td>
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<tr>
<td>Italy</td>
<td>0.49</td>
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<tr>
<td>Japan</td>
<td>0.60</td>
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<tr>
<td>Germany</td>
<td>0.64</td>
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</tbody>
</table>

Appendix: Key facts about China

**Basics**
- **Official name:** People’s Republic of China (PRC)
- **Formation:** c. 2070 B.C. (first pre-imperial dynasty)
- **Founding of the State:** 1949

**Demographics**
- **Population:** 1.4 billion (2020)
- **56 ethnic groups, with the majority of the population (92%) being Han**
- **Official language:** Mandarin
- **Median age:** 38.4 (2020)

**Geography**
- **Capital:** Beijing
- **Largest cities by population:** Shanghai, Beijing, Tianjin, Guangzhou, Shenzhen, Wuhan
- **Land area:** 9.7 million sq. km or 3.7 million sq. mi

**Economy**
- **Type:** Socialist market economy
- **Nominal GDP:** US$14.72 trillion (2020)
- **Nominal GDP per capita:** $10,500 (2020)
- **Gini coefficient:** 0.47 (2019)

**Government**
- **Ruling party:** Chinese Communist Party (CCP)
- **General Secretary of CCP, President of PRC:** Xi Jinping
- **Premier of PRC:** Li Keqiang
- **Legislative body:** National People’s Congress (NPC)

The General Secretary of the CCP is elected by the Party Congress every 5 years. The President of PRC and the Premier of PRC are elected by the NPC every 5 years. The Premier has a two term limit while the President of the PRC and the General Secretary of the CCP have no term limit.

**Central Bank**
The central bank is the **People’s Bank of China (PBOC)**
- **Target/goal:** Maintain stability of the value of the currency and promote economic growth through tools such as open market operations, reserve requirement ratios, interest rates and lending facilities to banks
- **Policy:** Mix of quantity and price control

**Currency**
- **Renminbi (RMB) or Chinese Yuan (¥)** is the official currency

In foreign exchange markets:
- **CNY** is the onshore RMB traded within China, managed by the PBOC
- **CNH** is the offshore currency traded outside of China at a free-floating rate

**Equity markets**
- **Size:** $12.4 trillion (2021)

The **onshore market** is comprised of Chinese companies listed in Shanghai and Shenzhen stock exchanges

The **offshore market** is comprised of Chinese companies listed in the Hong Kong Stock Exchange and overseas

**Fixed income markets**
- **Size:** $13.0 trillion (2021)

**Onshore bonds** are listed in Mainland Chinese exchanges and denominated in CNY

**Offshore bonds** or “dim sum bonds” are primarily traded in Hong Kong and denominated in CNH

**Offshore foreign currency bonds** are traded in Hong Kong dollars, U.S. dollars or euros.
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.

Equities:
The S&P 500 Index is widely regarded as the best single gauge of the U.S. equities market. The index includes a representative sample of 500 leading companies in leading industries of the U.S. economy. The S&P 500 Index focuses on the large-cap segment of the market; however, since it includes a significant portion of the total value of the market, it also represents the 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 Europe Index is a free float-adjusted market capitalization index that is designed to measure developed market equity performance in Europe. As of June 2007, the MSCI Europe Index consisted of the following 16 developed market country indexes: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.
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 ACWI ex USA Index captures large and mid cap representation across 22 of 23 Developed Markets (DM) countries (excluding the US) and 27 Emerging Markets (EM) countries*. With 2,387 constituents, the index covers approximately 85% of the global equity opportunity set outside the US.
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 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 China Index captures large and mid cap representation across China A share and B share lists, Red chips and P chips. With 148 constituents, the index covers about 84% of this China equity universe. The MSCI China Index was launched on December 31, 1992.
The MSCI China A Index captures large and mid cap representation across China securities listed on the Shanghai and Shenzhen exchanges. The index covers only those securities that are accessible through “Stock Connect”. The index is designed for international investors and is calculated using China A Stock Connect listings based on the offshore RMB exchange rate (CNH).
The MSCI China Growth Index captures large and mid cap securities exhibiting overall growth style characteristics across the Chinese equity markets. The growth investment style characteristics for index construction are defined using five variables: long-term forward EPS growth rate, short-term forward EPS growth rate, current internal growth rate and long-term historical EPS growth trend and long-term historical sales per share growth trend.
The MSCI China Value Index captures large and mid-cap Chinese securities exhibiting overall value style characteristics. The value investment style characteristics for index construction are defined using three variables: book value to price, 12-month forward earnings to price and dividend yield.
The Shanghai Stock Exchange Composite Index is a capitalization-weighted index. The index tracks the daily price performance of all A-shares and B-shares listed on the Shanghai Stock Exchange. The index was developed on December 19, 1990 with a base value of 100.
The China Shenzhen Composite Index is an actual market-cap weighted index that tracks the stock performance of all the A-share and B-share lists on Shenzhen Stock Exchange. The index was developed on April 3, 1991 with a base price of 100.
The Hang Seng Index ("HSI") is the most widely quoted gauge of the Hong Kong stock market. It includes the largest and most liquid stocks listed on the Main Board of the Stock Exchange of Hong Kong. Stocks are free-float adjusted for investability representation, and a 10% capping is applied to avoid single stock domination. The index was developed on November 24, 1989 with a base price of 100.
The Shanghai Shenzhen CSI 300 Index ("CSI Index") is a free-float weighted index that consists of 300 A-share stocks listed on the Shanghai or Shenzhen Stock Exchanges. The Index has been calculated since April 8, 2005, with a base value of 1000 on 12/31/2004.
The SZSE Composite Index is a stock market index of Shenzhen Stock Exchange. It includes all companies listed on the exchange.
The Hang Seng China Enterprises Index ("HSCEI") serves as a benchmark that reflects the overall performance of Mainland securities listed in Hong Kong. The index comprises the largest and most liquid Mainland securities listed in Hong Kong. Stocks are free-float-adjusted for investibility representation, with a 10% capping to avoid single stock domination. The index was launched on August 8, 1994.
The SME Index comprises the 100 largest and most liquid A-share stocks listed and trading on the SME Board Market. The index aims to reflect the performance of the Small and Medium Enterprise (SME) Board level. The index is free-float, with a base date of May 31, 2010.
The ChiNext Index comprises the 100 largest and most liquid A-share stocks listed and trading on the ChiNext Market of the Shenzhen Stock Exchange. The index aims to reflect the performance of the ChiNext Market level. The index free-float-capitalization-weighted. The index has a base value of 1000 on May 31, 2010.

Fixed income:
The Bloomberg Global Aggregate Index is a flagship measure of global investment grade debt from twenty-four local currency markets. This multi-currency benchmark includes treasury, government-related, corporate and securitized fixed-rate bonds from both developed and emerging markets issuers.
The J.P. Morgan GBI EM Global Diversified tracks the performance of local currency debt issued by emerging market governments, whose debt is accessible by most of the international investor base.
The J.P. Morgan Emerging Markets Bond Index Global Diversified (EMBI Global Diversified) tracks total returns for U.S. dollar-denominated debt instruments issued by emerging market sovereign and quasi-sovereign entities: Brady bonds, loans, Eurobonds. The index limits the exposure of some of the larger countries.
The FTSE Chinese (Onshore CNY) Broad Bond Index measures the performance of a subset of bonds from the FTSE Chinese (Onshore CNY) Broad Bond Index (CNYBB) which tracks onshore Chinese yuan-denominated fixed-rate governments, agencies, and corporations debt issued in mainland China. The index includes bonds that are traded on the China Interbank Bond Market (CIBM).
The J.P. Morgan Asia Credit Index Core (JACI Core) consists of liquid U.S.-dollar denominated debt instruments issued out of Asia ex-Japan. The JACI Core is based on the composition and established methodology of the J.P. Morgan Asia Credit Index (JACI), which is market capitalization weighted. JACI Core includes the most liquid bonds from the JACI by requiring a minimum $350 million in notional outstanding and a minimum remaining maturity of 2 years. JACI Core also implements a country diversification methodology. Historical returns and statistics for the JACI Core are available from December 30, 2005.
J.P. Morgan Asset Management: Index Definitions

Fixed income cont.: The J.P. Morgan Asia Diversified (JADE) Indices track local currency government bonds issued by countries within the Asia region (excluding Japan). The two main composite series are the JADE Broad and the JADE Global which provide Diversified exposure to the countries within the region. The JADE Global excludes countries with capital controls and those not accessible by foreign investors. Launched in March 2016, the JADE Broad/Global indices have daily historical index levels and statistics starting from Dec 31, 2004.

The Bloomberg Global Aggregate - Corporate Index is a flagship measure of global investment grade, fixed-rate corporate debt. This multi-currency benchmark includes bonds from developed and emerging markets issuers within the industrial, utility and financial sectors.

The Bloomberg Global Treasury Index tracks fixed-rate, local currency government debt of investment grade countries, including both developed and emerging markets. The index represents the treasury sector of the Global Aggregate Index and contains issues from 37 countries denominated in 24 currencies.

The CSI Corporate Bond Index selects eligible corporate bonds listed at Shanghai Stock Exchange and Shenzhen Stock Exchange, with remaining term to final maturity over 1 year. The index was launched on June 9, 2003 and is based at 100 to Dec 31, 2002.

Other asset classes:
The Bloomberg Industrial Metals Subindex is composed of futures contracts on aluminum, copper, nickel and zinc. It reflects the return of underlying commodity futures price movements only. It is quoted in USD.

Definitions:
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.

Bonds are subject to interest rate risks. Bond prices generally fall when interest rates rise. The price of equity securities may rise, or fall because of changes in the broad market or changes in a company's financial 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.

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 can raise or lower returns. Also, some markets may not be as politically and economically stable as other nations. Investments in emerging markets can be more volatile. The normal risks of international investing 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.

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.

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. Investing 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.

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Unless otherwise stated, all data are as of July 31, 2022 or most recently available.

Guide to China

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