

Guide to Alternatives

1Q 2020 | As of February 29, 2020

J.P. Morgan

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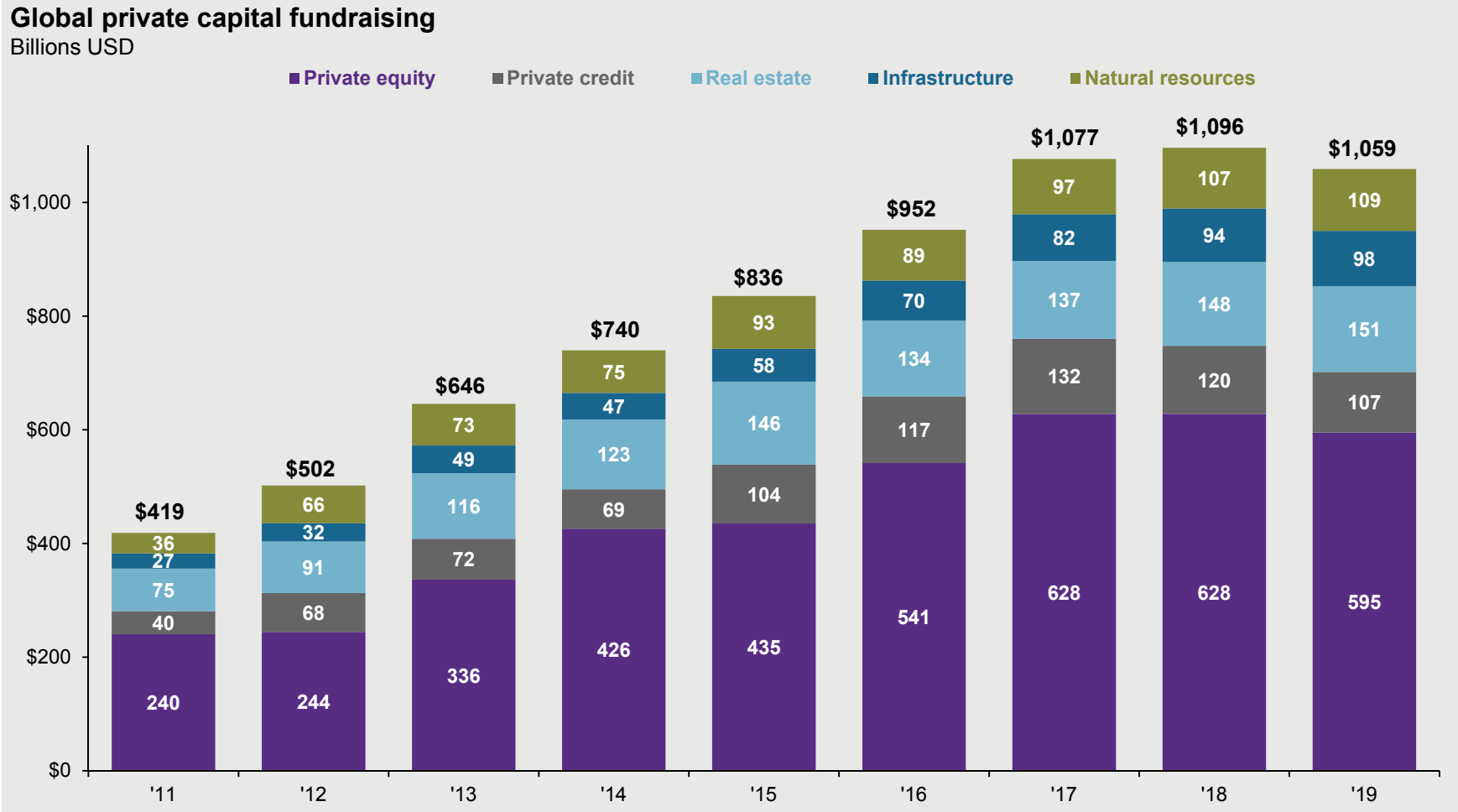
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Prepared by:

David Lebovitz, *Global Market Strategist*, Market Insights, J.P. Morgan Asset Management
Anita Sonawane, *Associate*, Alternatives Solutions Group, J.P. Morgan Asset Management
Tyler Voigt, CFA, *Associate*, Market Insights, J.P. Morgan Asset Management



Source: Preqin, HFRI, J.P. Morgan Asset Management.

Fundraising categories are provided by Preqin, and represent their estimate of annual capital raised in closed-end funds. Data may not sum to total due to rounding.

Data is based on availability as of February 29, 2020.

Public and private market correlations

10-years, quarterly returns

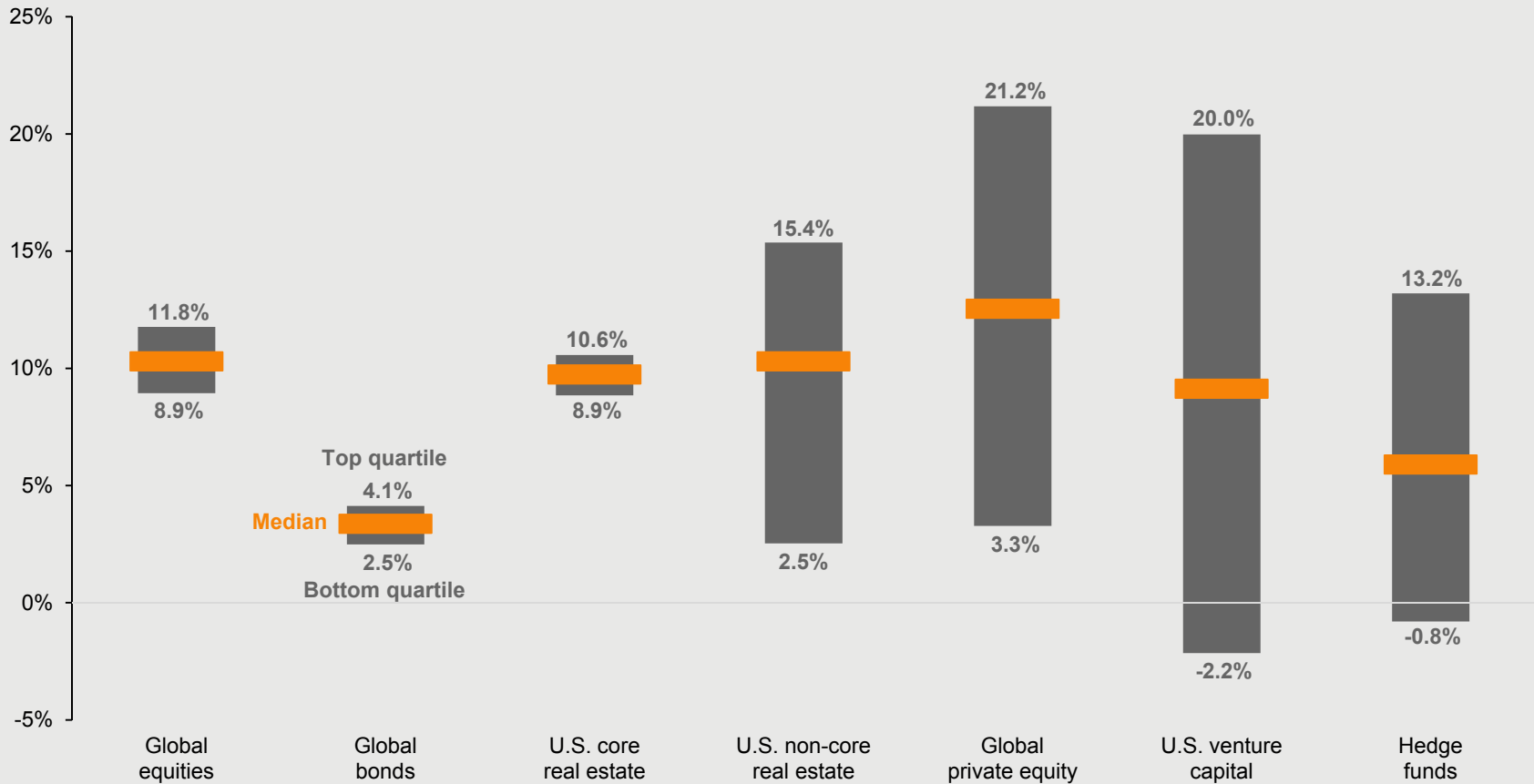
| 2009 - 2019 | | Global Bonds | Global Equities | U.S. Core RE | Europe Core RE | APAC Core RE | Global Core Infra | Direct Lending | Venture Capital | Private Equity | Equity Long/Short | Relative Value | Macro |
|--------------------|-------------------------------------|--------------|-----------------|--------------|----------------|--------------|-------------------|----------------|-----------------|----------------|-------------------|----------------|-------|
| Financial assets | Global Bonds | 1.0 | | | | | | | | | | | |
| | Global Equities | 0.3 | 1.0 | | | | | | | | | | |
| Global real estate | U.S. Core RE | -0.3 | -0.5 | 1.0 | | | | | | | | | |
| | Europe Core RE (Continental Europe) | -0.4 | -0.3 | 0.6 | 1.0 | | | | | | | | |
| | APAC Core RE | -0.3 | -0.4 | 0.8 | 0.7 | 1.0 | | | | | | | |
| Other real assets | Global Core Infra | -0.2 | -0.4 | 0.4 | 0.1 | 0.2 | 1.0 | | | | | | |
| Private markets | Direct Lending | 0.1 | 0.5 | -0.1 | -0.3 | -0.3 | 0.1 | 1.0 | | | | | |
| | Venture Capital | -0.2 | 0.2 | 0.2 | 0.4 | 0.1 | 0.1 | 0.2 | 1.0 | | | | |
| | Private Equity | 0.2 | 0.8 | -0.3 | -0.1 | -0.2 | -0.1 | 0.6 | 0.5 | 1.0 | | | |
| Hedge funds | Equity Long/Short | 0.2 | 1.0 | -0.4 | -0.3 | -0.4 | -0.3 | 0.6 | 0.3 | 0.9 | 1.0 | | |
| | Relative Value | 0.3 | 0.9 | -0.6 | -0.5 | -0.6 | -0.3 | 0.7 | 0.1 | 0.7 | 0.9 | 1.0 | |
| | Macro | 0.3 | 0.5 | -0.2 | 0.0 | -0.2 | -0.3 | 0.2 | 0.1 | 0.3 | 0.5 | 0.4 | 1.0 |

Source: MSCI, Bloomberg Barclays, NCREIF, Cliffwater, Burgiss, HFRI, J.P. Morgan Asset Management. RE – real estate. Global equities: MSCI AC World Index. Global Bonds: Bloomberg Barclays Global Aggregate Index. U.S. Core Real Estate: NCREIF Property Index – Open End Diversified Core Equity component. Europe Core Real Estate: IPD Global Property Fund Index – Continental Europe. Asia Pacific (APAC) Core Real Estate: IPD Global Property Fund Index – Asia-Pacific. Global infrastructure (Infra.): MSCI Global Quarterly Infrastructure Asset Index (equal-weighted blend). U.S. Direct Lending: Cliffwater Direct Lending Index. Global Private Equity: Cambridge Associates Global Private Equity Index. U.S. Venture Capital: Cambridge Associates U.S. Venture Capital Index. Hedge fund indices include equity long/short, relative value, and global macro and are all from HFRI. All correlation coefficients are calculated based on quarterly total return data for the period 06/30/09 – 09/30/19. Returns are denominated in USD.

Data is based on availability as of February 29, 2020.

Private and public manager dispersion

Based on returns over a 10 year window*



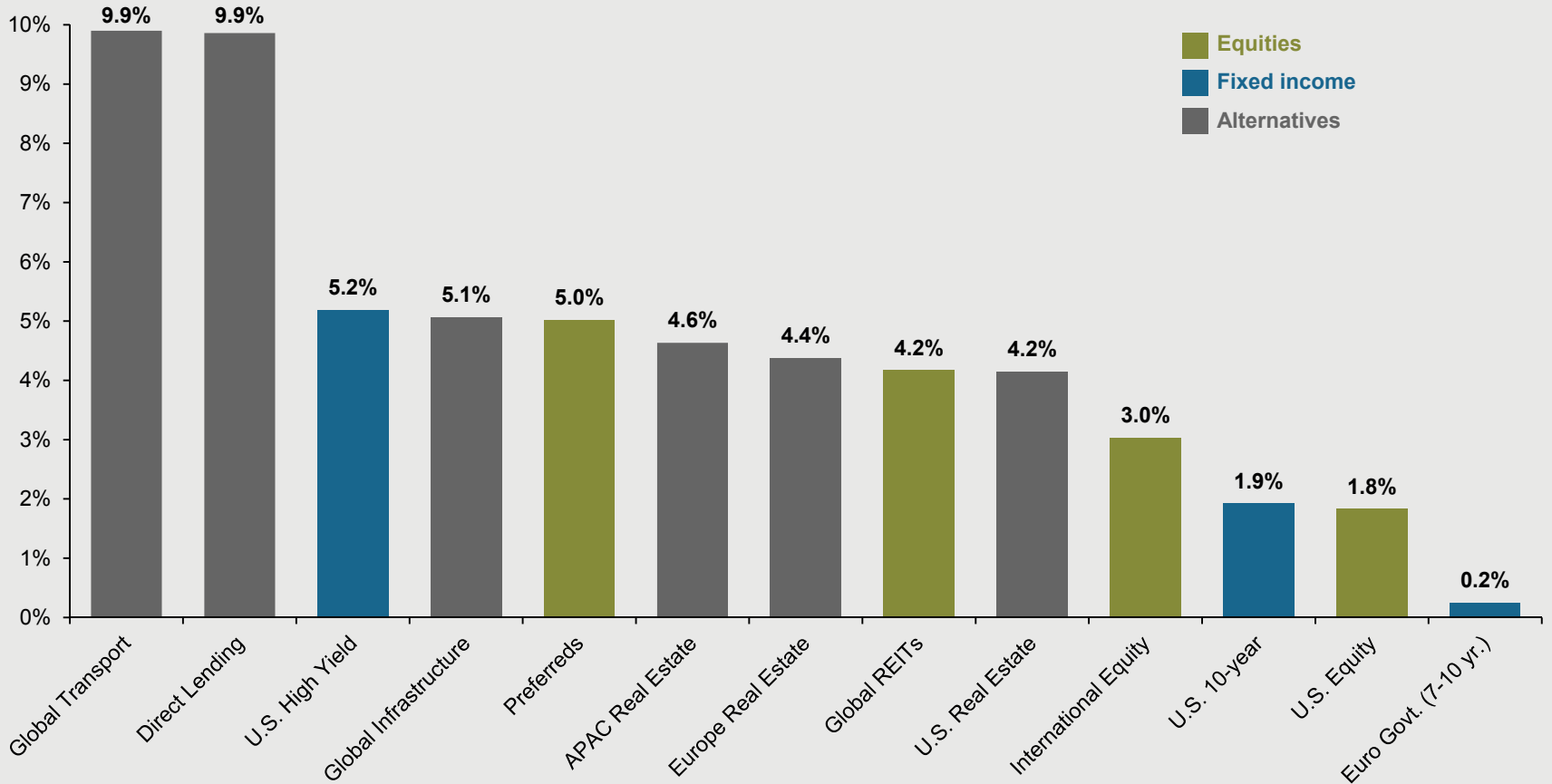
Sources: Lipper, NCREIF, Cambridge Associates, HFRI, J.P. Morgan Asset Management.

Global equities (large cap) and global bonds dispersion are based on the world large stock and world bond categories, respectively. *Manager dispersion is based on: 2Q 2009 – 2Q 2019 annual returns for global equities, global bonds and U.S. core real estate. Hedge funds are based on 4Q 2009 to 4Q 2019 annual returns. U.S. non-core real estate, U.S. private equity and U.S. venture capital are represented by the 10-year horizon internal rate of return (IRR) ending 2Q 2019.

Data is based on availability as of February 29, 2020.

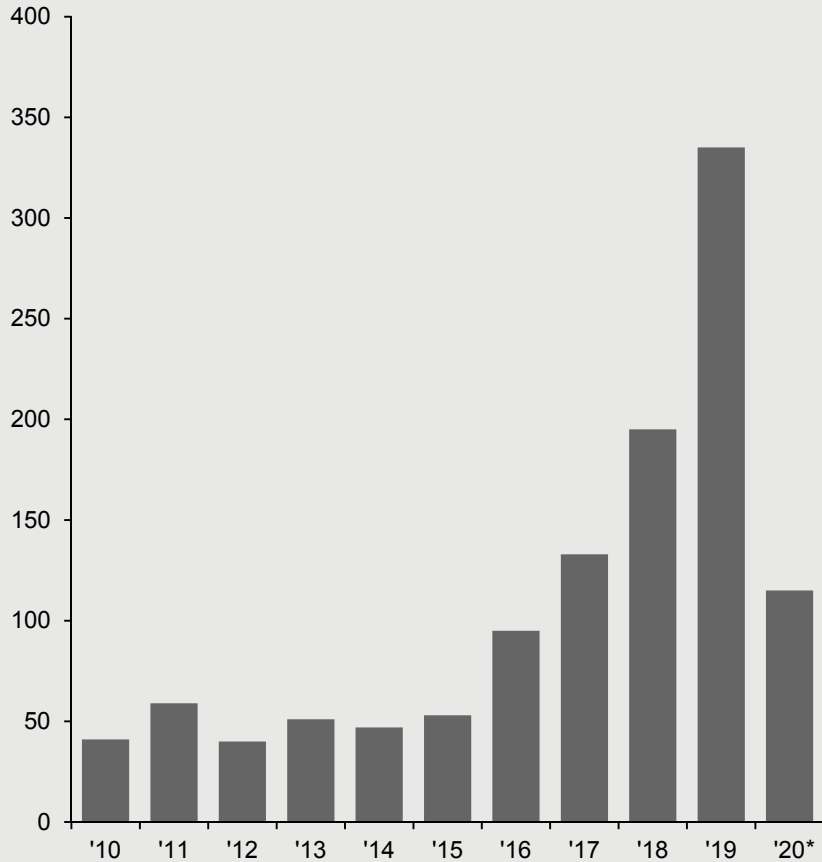
Asset class yields

Percent

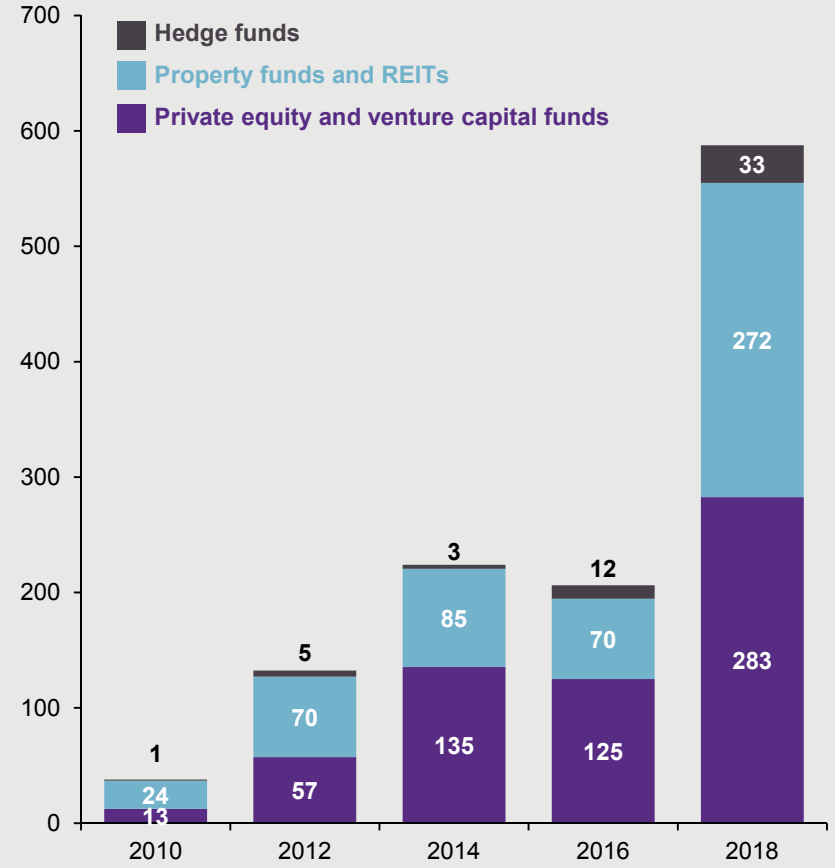


Source: BAML, Barclays, Bloomberg, Clarkson, Cliffwater, Drewry Maritime Consultants, Federal Reserve, FTSE, MSCI, NCREIF, FactSet, J.P. Morgan Asset Management. Yields are as of 12/31/2019, except Direct Lending, Global Infrastructure, EMEA, APAC and U.S. Real Estate (9/30/2019). Global Transport: Levered yields for transport assets calculated as the difference between charter rates (rental income), operating expenses, debt amortization and interest expenses, as a percentage of equity value. Yields for each of the sub-vessel types are calculated and respective weightings are applied to arrive at the current levered yields for Global Transportation; Preferreds: BAML Hybrid Preferred Securities; U.S. direct lending: Cliffwater Direct Lending Index; U.S. High Yield: Bloomberg US Aggregate Corporate High Yield; Global Infrastructure: MSCI Global Infrastructure Asset Index-Low risk; U.S. Real Estate: NCREIF-ODCE Index; Global REITs: FTSE NAREIT Global REITs; International Equity: MSCI AC World ex-U.S.; U.S. 10-year: 10-year U.S. Treasury yield; U.S. Equity: MSCI USA, Europe core real estate: IPD Global Property Fund Index – Continental Europe. Asia Pacific (APAC) core real estate: IPD Global Property Fund Index – Asia-Pacific. Euro Govt. (7-10 yr.): Bloomberg Barclays Euro Aggregate Government – Treasury (7-10Y).
Data is based on availability as of February 29, 2020.

ESG mentions on earnings calls
Russell 3000, number of mentions, annual



ESG incorporation by alternative investment funds
Billions USD



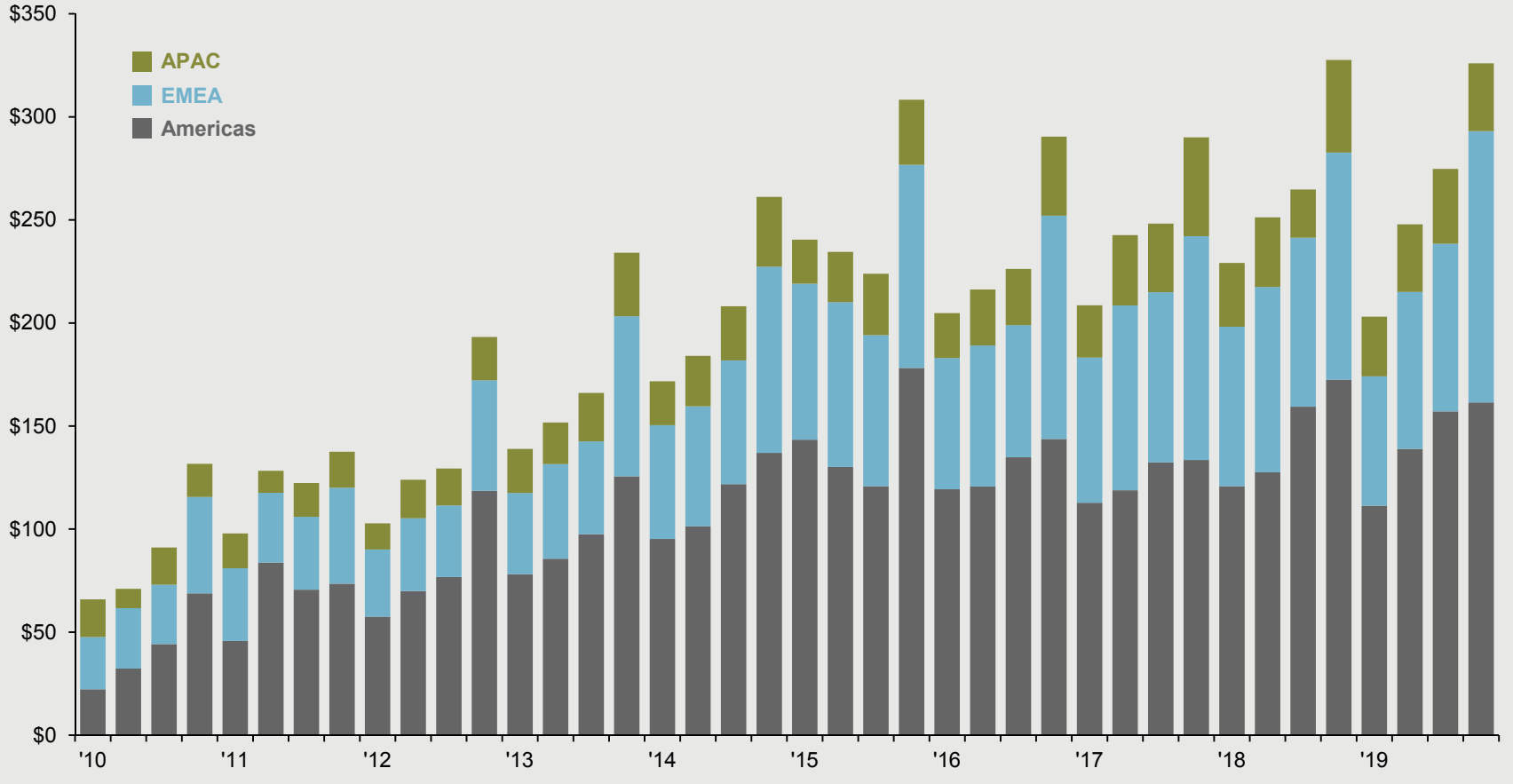
Source: US SIF Foundation, Company Reports, J.P. Morgan IDS Data Science Team, J.P. Morgan Asset Management.

Environmental, social and governance (ESG). 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 and other forward statements, actual events, results or performance may differ materially from those reflected or contemplated. *2020 ESG mentions are YTD.

Data is based on availability as of February 29, 2020.

Global real estate investment

Billions USD



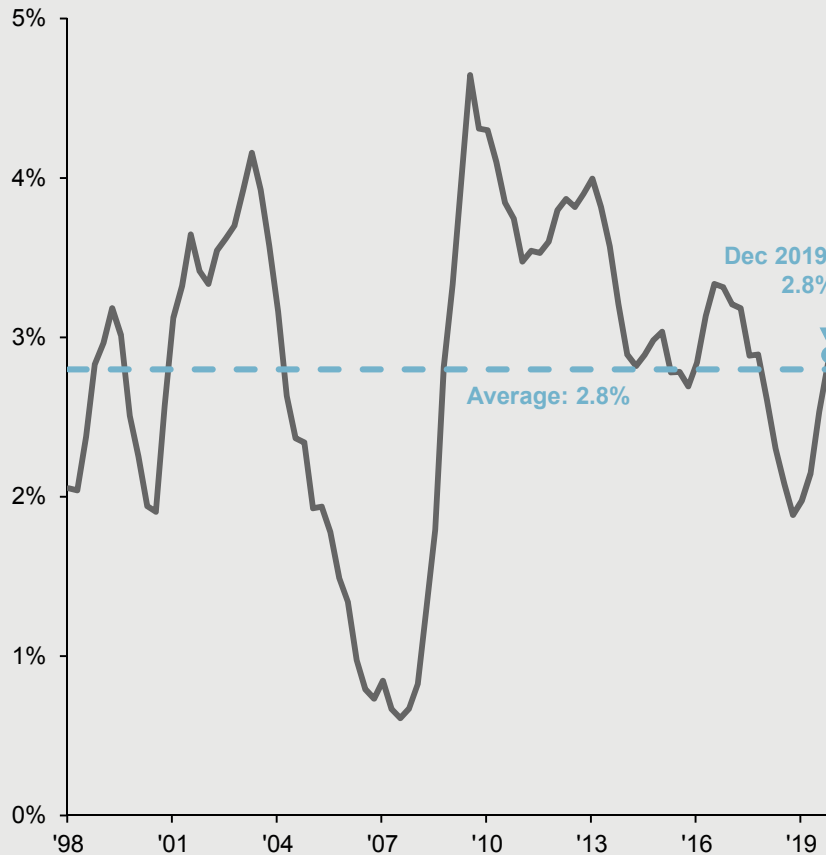
Sources: CBRE Research, RCA (Americas), J.P. Morgan Asset Management.

APAC is Asia Pacific. EMEA is Europe, Middle East and Africa.

Data is based on availability as of February 29, 2020.

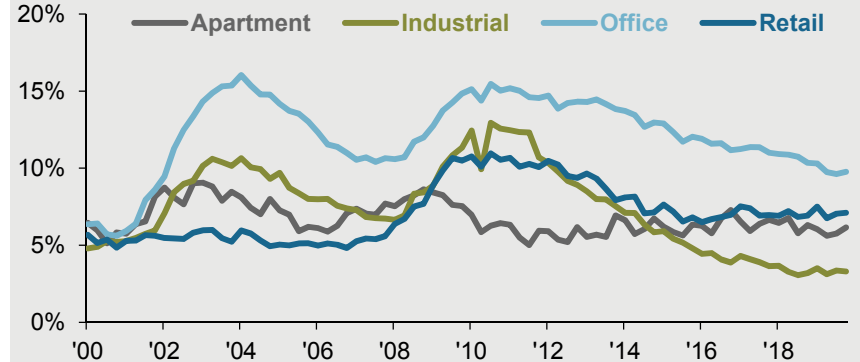
U.S. real estate cap rate spreads

Transactions based, spread to 10y UST, 4-quarter rolling average



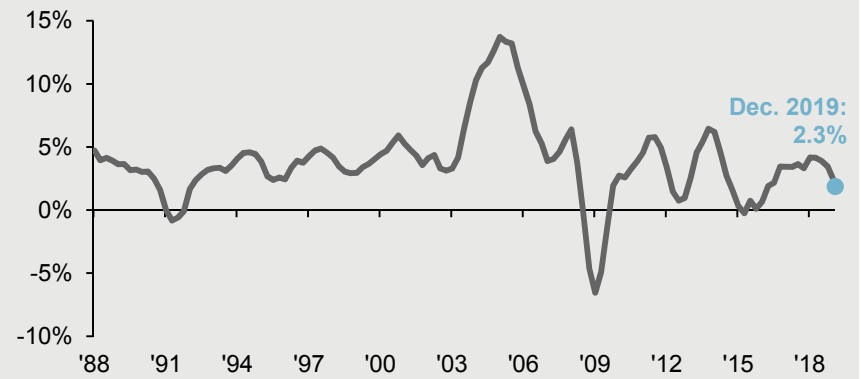
U.S. vacancy rates by property type

Percent



U.S. real estate construction costs

Nonresidential fixed investment in structures, price index, y/y % chg.



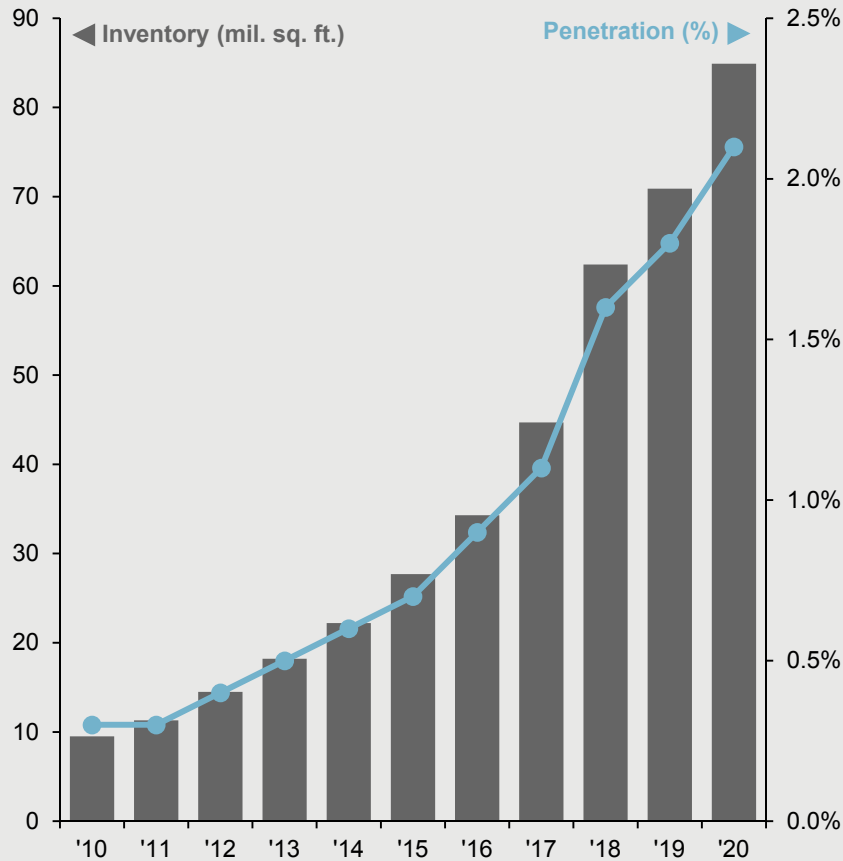
Source: NCREIF, Federal Reserve, BLS, FactSet, J.P. Morgan Asset Management.

The cap rate, which is computed as the net operating income over sales price, is the rate of return on a real estate investment property.

Data is based on availability as of February 29, 2020.

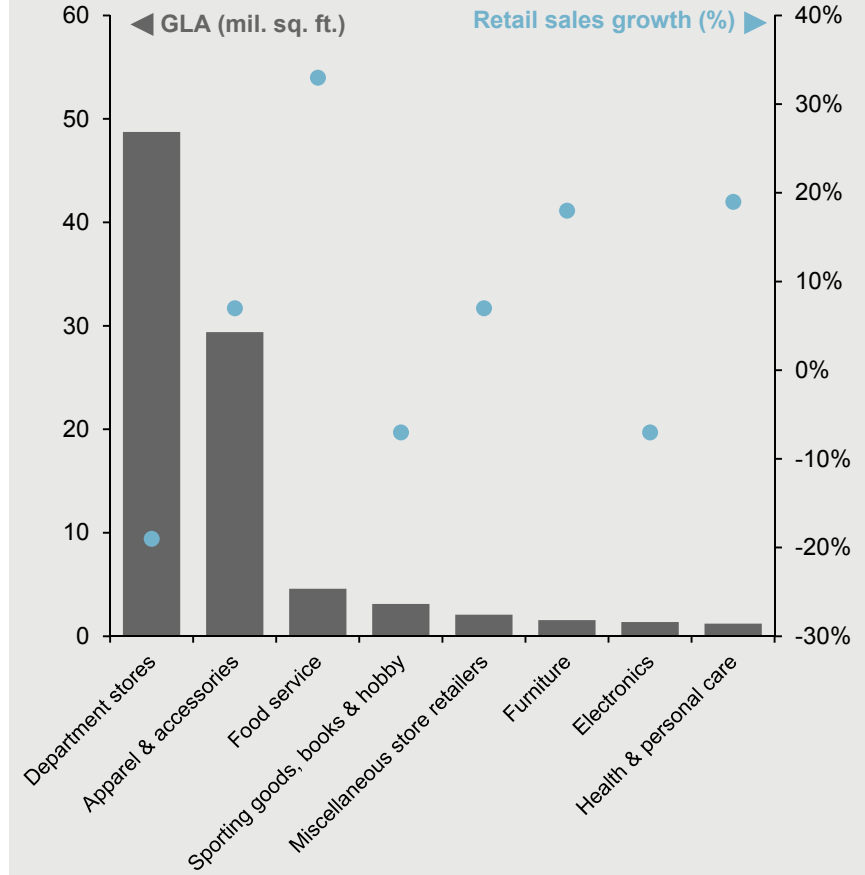
Flexible office space: Inventory and penetration

Millions of square feet, % penetration



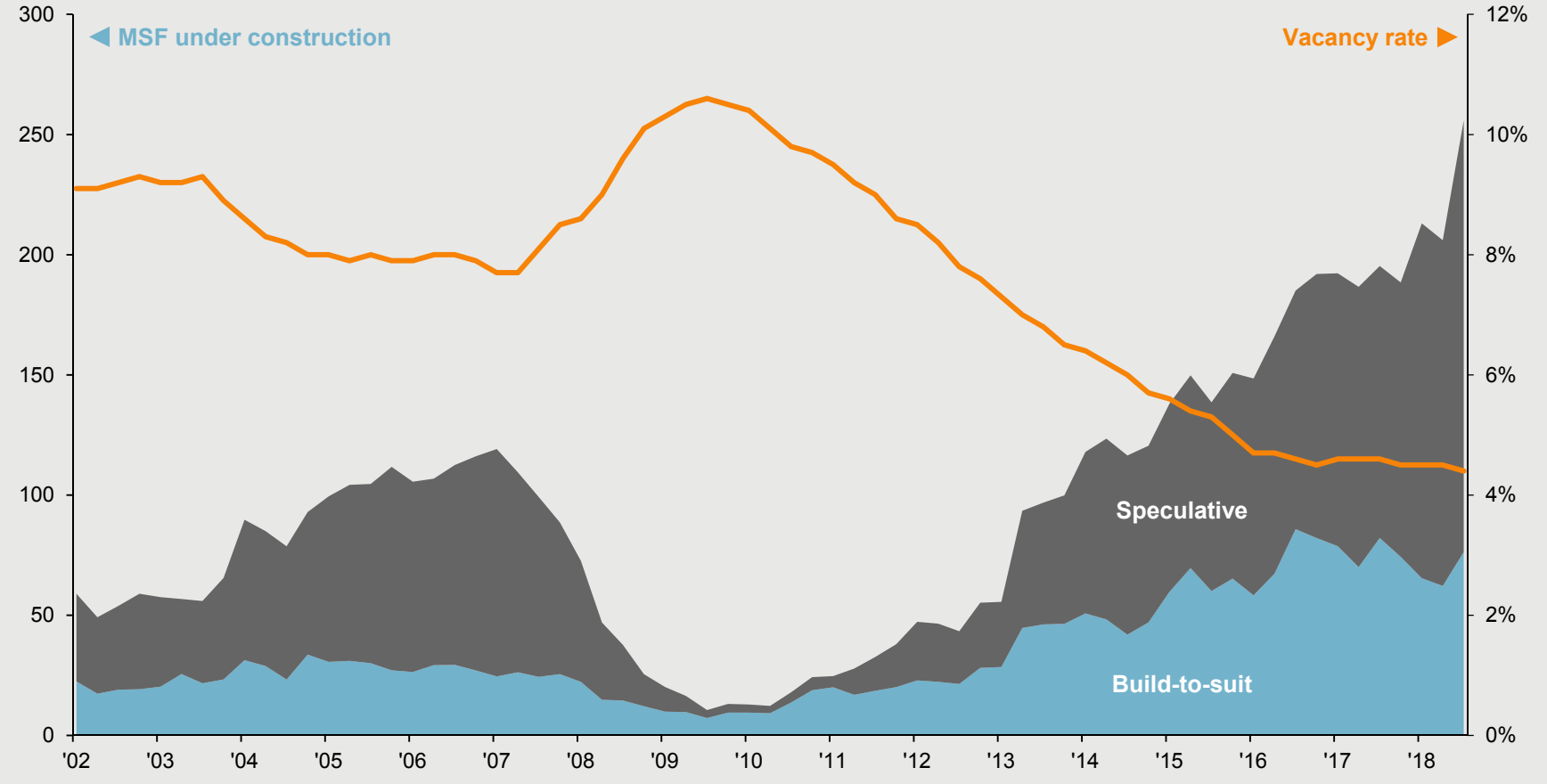
Mall leasing and retail sales growth

Gross leasable area, 2014-2019 retail sales growth



Sources: CBRE, Census Bureau, J.P. Morgan Asset Management.
 2020 data on inventory and penetration is an estimate. Gross leasable area (GLA) data is as of 2017.
 Data is based on availability as of February 29, 2020.

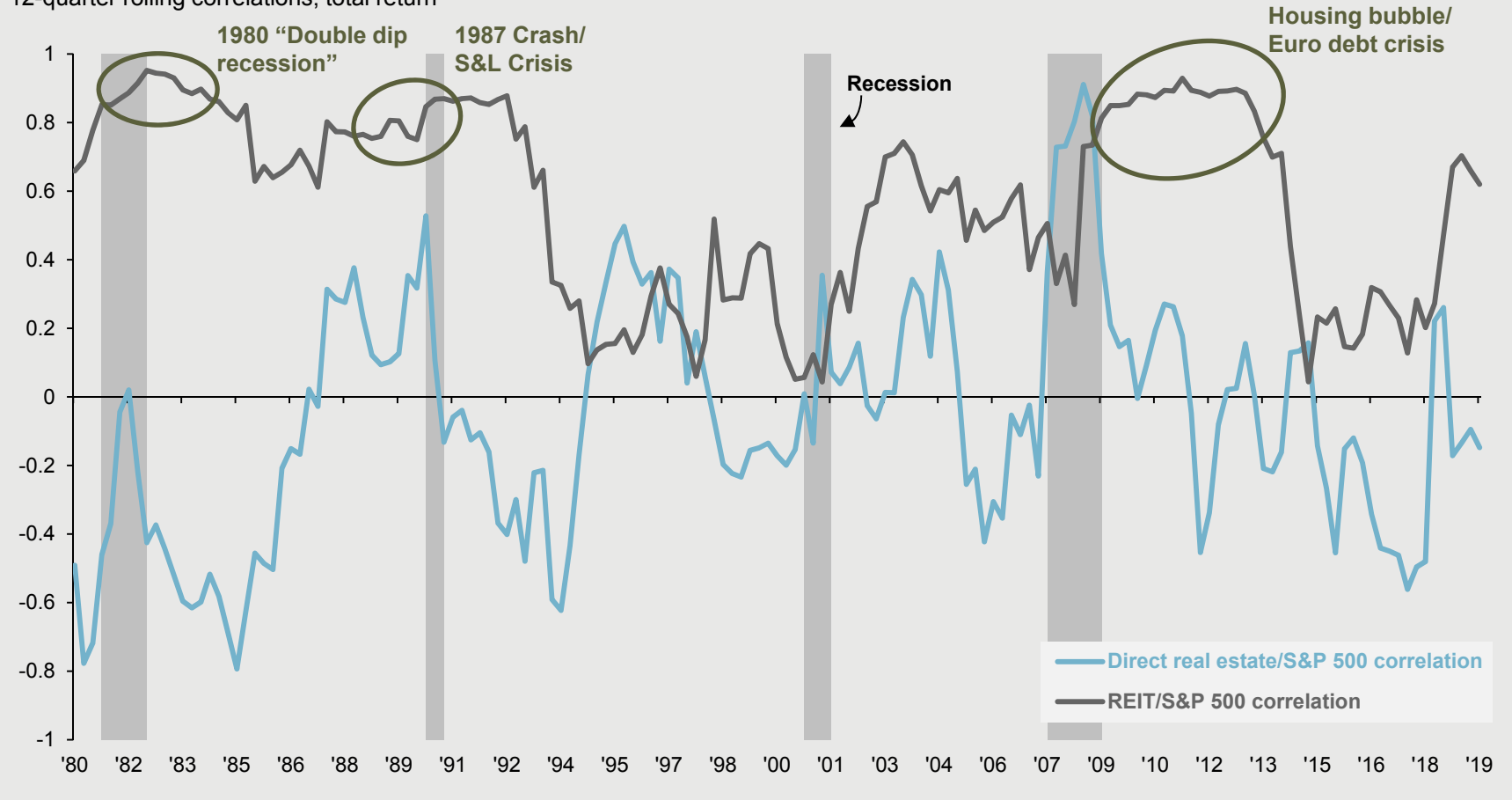
U.S. warehouse space under construction
Millions of square feet (MSF), vacancy rate



Sources: CBRE Econometric Advisors, J.P. Morgan Asset Management.
Data is based on availability as of February 29, 2020.

U.S. REITs, real estate, and equities

12-quarter rolling correlations, total return

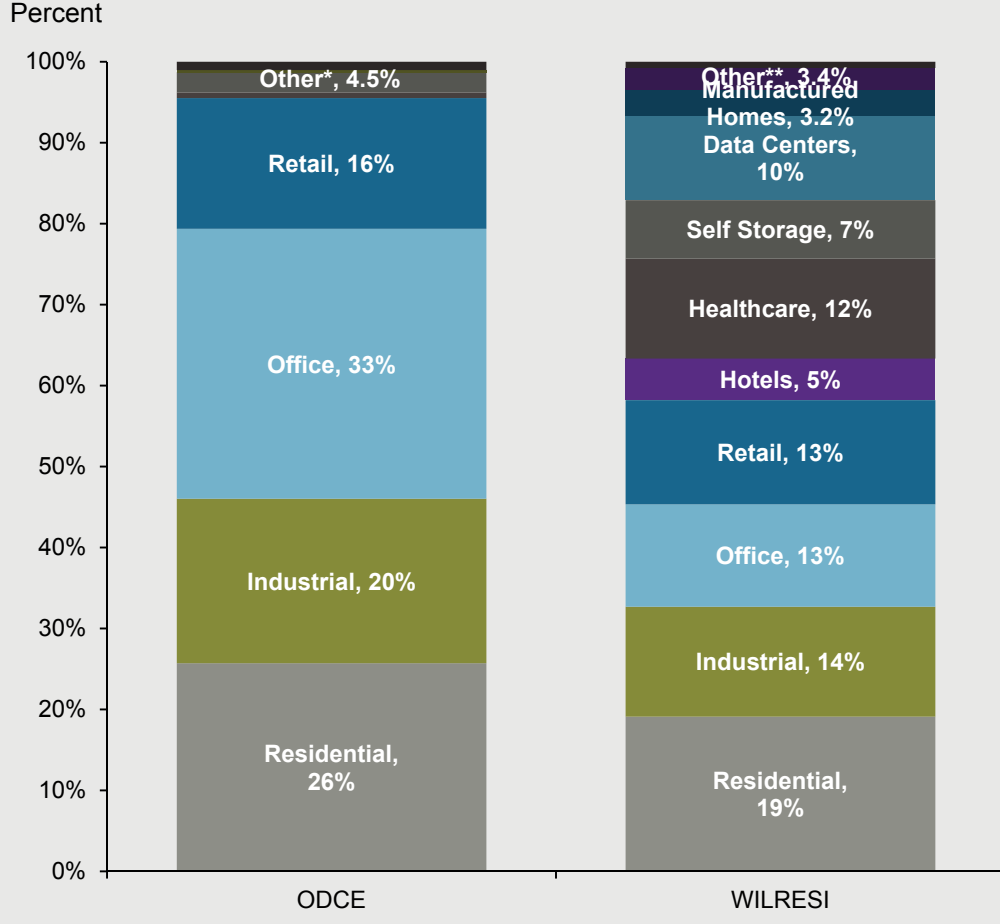


Source: NAREIT, NCREIF, Standard & Poor's, FactSet, J.P. Morgan Asset Management.

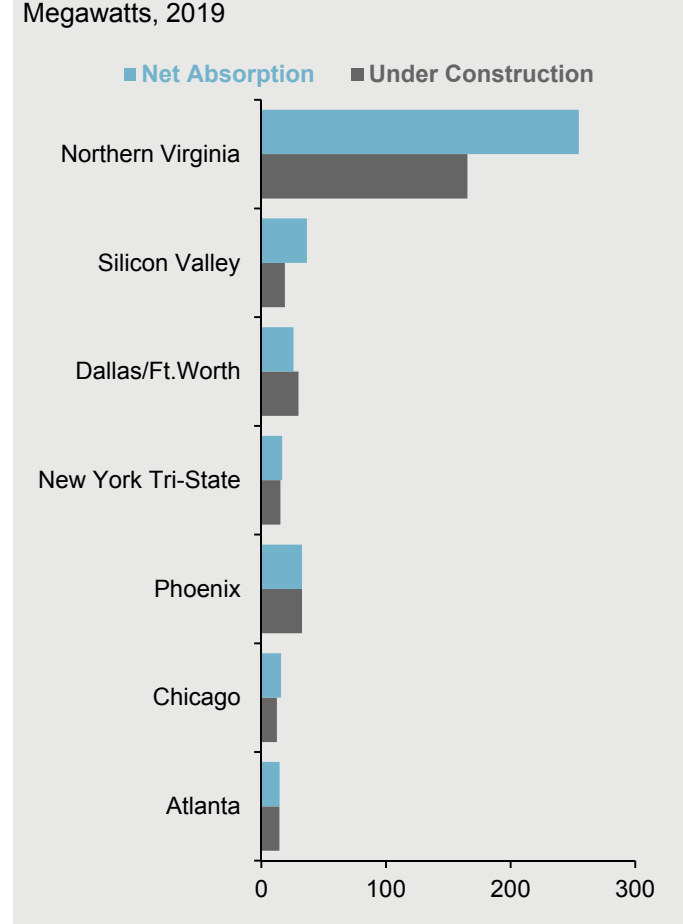
Real estate investment trusts (REITs). Indices do not include fees or operating expenses and are not available for actual investment. Past performance is not necessarily a reliable indicator for current and future performance.

Data is based on availability as of February 29, 2020.

Composition of U.S. private and public real estate indices



Data centers absorption and construction



Source: NCREIF, Wilshire, CISCO, J.P. Morgan Asset Management.

ODCE is the NCREIF Fund Index – Open End Diversified Core Equity, which is a benchmark for U.S. core real estate. WILRESI is Wilshire US Real Estate Securities Index, which is a benchmark for U.S. REITs. *Other in ODCE consists of hotels, healthcare, self-storage and land. **Other in WILRESI consists of single-family homes among additional property types.

Megawatts indicates data center energy capacity.

Data is based on availability as of February 29, 2020.

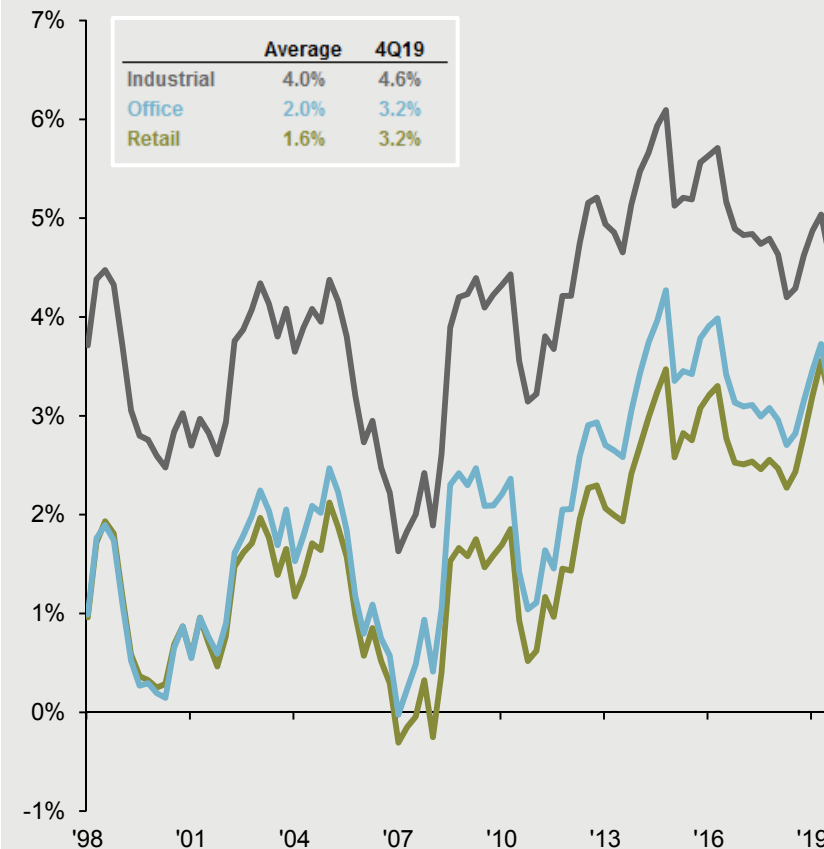
Real estate

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2010-2019 | |
|------------------|-------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| | | | | | | | | | | | Ann. | Vol. |
| Apartments | 47.0% | Self Storage | Industrial | Mfgd. Homes | Mfgd. Homes | Self Storage | Industrial | Mfgd. Homes | Mfgd. Homes | Mfgd. Homes | Mfgd. Homes | Industrial |
| | 47.0% | 35.2% | 31.3% | 10.5% | 46.2% | 40.6% | 30.7% | 24.9% | 11.4% | 49.1% | 22.9% | 20.9% |
| Regional Malls | 34.6% | Regional Malls | Regional Malls | Self Storage | Apartments | Mfgd. Homes | Mfgd. Homes | Industrial | Health Care | Industrial | Self Storage | Shopping Centers |
| | 34.6% | 22.0% | 28.2% | 9.5% | 39.6% | 25.6% | 14.2% | 20.6% | 7.6% | 48.7% | 16.8% | 17.9% |
| Shopping Centers | 30.8% | Mfgd. Homes | Shopping Centers | Industrial | Health Care | Apartments | Office | All Equity | Apartments | Office | Industrial | Regional Malls |
| | 30.8% | 20.4% | 25.0% | 7.4% | 33.3% | 16.5% | 13.2% | 8.7% | 3.7% | 31.4% | 16.3% | 16.8% |
| Self Storage | 29.3% | Apartments | Health Care | Office | Regional Malls | Shopping Centers | All Equity | Office | Self Storage | All Equity | Apartments | Health Care |
| | 29.3% | 15.1% | 20.4% | 5.6% | 32.6% | 4.7% | 8.6% | 5.2% | 2.9% | 28.7% | 14.4% | 16.1% |
| All Equity | 27.9% | Health Care | Self Storage | Shopping Centers | Self Storage | Regional Malls | Health Care | Self Storage | Industrial | Apartments | All Equity | Self Storage |
| | 27.9% | 13.6% | 19.9% | 5.0% | 31.4% | 4.2% | 6.4% | 3.7% | -2.5% | 26.3% | 12.6% | 16.0% |
| Mfgd. Homes | 27.0% | All Equity | All Equity | All Equity | Shopping Centers | All Equity | Shopping Centers | Apartments | All Equity | Shopping Centers | Health Care | Office |
| | 27.0% | 8.3% | 19.7% | 2.9% | 30.0% | 2.8% | 3.7% | 3.7% | -4.0% | 25.0% | 10.1% | 15.2% |
| Health Care | 19.2% | Shopping Centers | Office | Regional Malls | All Equity | Industrial | Apartments | Health Care | Regional Malls | Health Care | Office | Mfgd. Homes |
| | 19.2% | -0.7% | 14.2% | -1.0% | 28.0% | 2.6% | 2.9% | 0.9% | -7.0% | 21.2% | 9.1% | 14.1% |
| Industrial | 18.9% | Office | Mfgd. Homes | Apartments | Office | Office | Regional Malls | Regional Malls | Office | Self Storage | Shopping Centers | All Equity |
| | 18.9% | -0.8% | 7.1% | -6.2% | 25.9% | 0.3% | -5.2% | -2.7% | -14.5% | 13.7% | 8.6% | 13.4% |
| Office | 18.4% | Industrial | Apartments | Health Care | Industrial | Health Care | Self Storage | Shopping Centers | Shopping Centers | Regional Malls | Regional Malls | Apartments |
| | 18.4% | -5.2% | 6.9% | -7.1% | 21.0% | -7.2% | -8.1% | -11.4% | -14.5% | -9.1% | 8.4% | 13.3% |

Sources: FTSE NAREIT, FactSet, J.P. Morgan Asset Management.
 All indices are from FTSE NAREIT. Mfgd. Homes represents manufactured homes.
 Data is based on availability as of February 29, 2020.

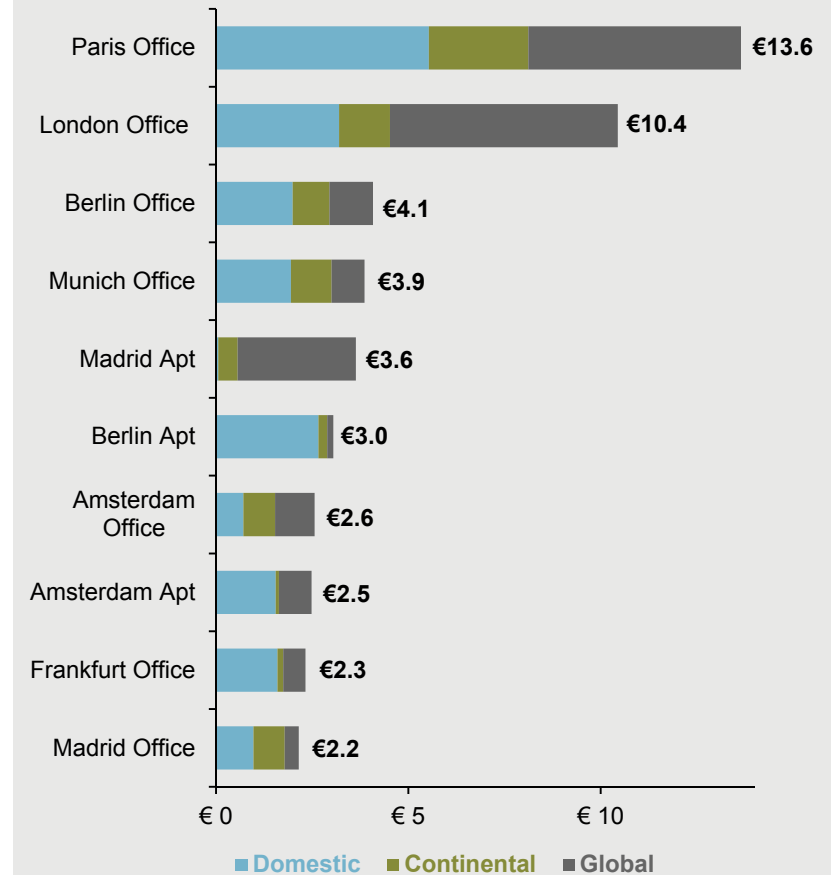
EU-15 property spreads by sector

Spread to Euro Govt. (7-10 yr.)



Capital flows by location and property type

3Q 2019, Billions EUR



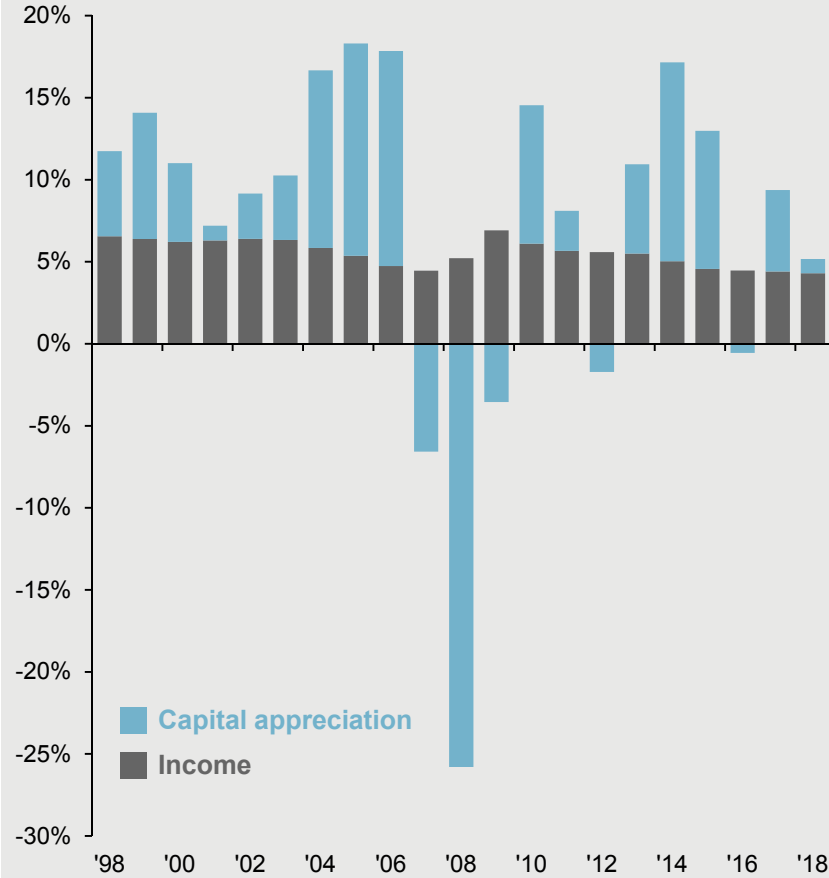
Sources: RCA, CBRE, J.P. Morgan Asset Management.

EU-15 is Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, and the United Kingdom. Apt is apartment.

Data is based on availability as of February 29, 2020.

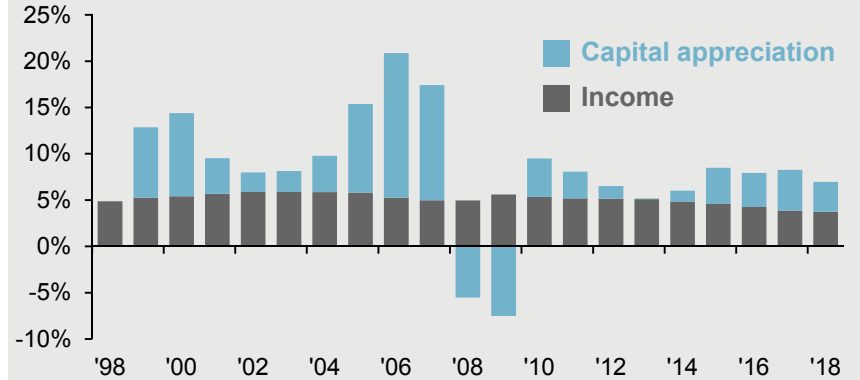
U.K. property returns

Annual returns from income and capital appreciation



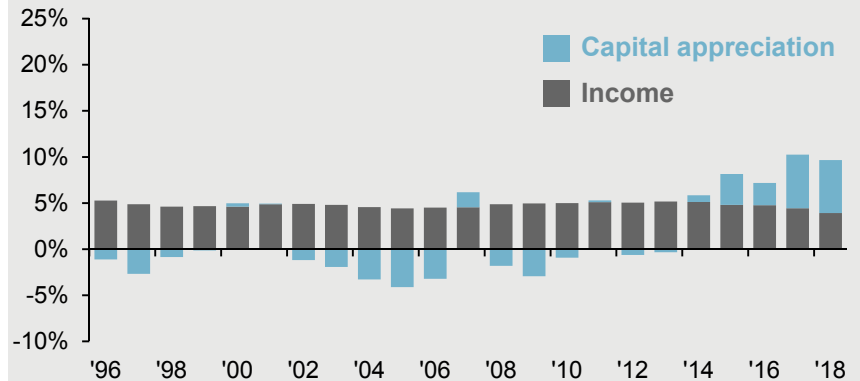
France property returns

Annual returns from income and capital appreciation



Germany property returns

Annual returns from income and capital appreciation



Sources: MSCI, J.P. Morgan Asset Management.

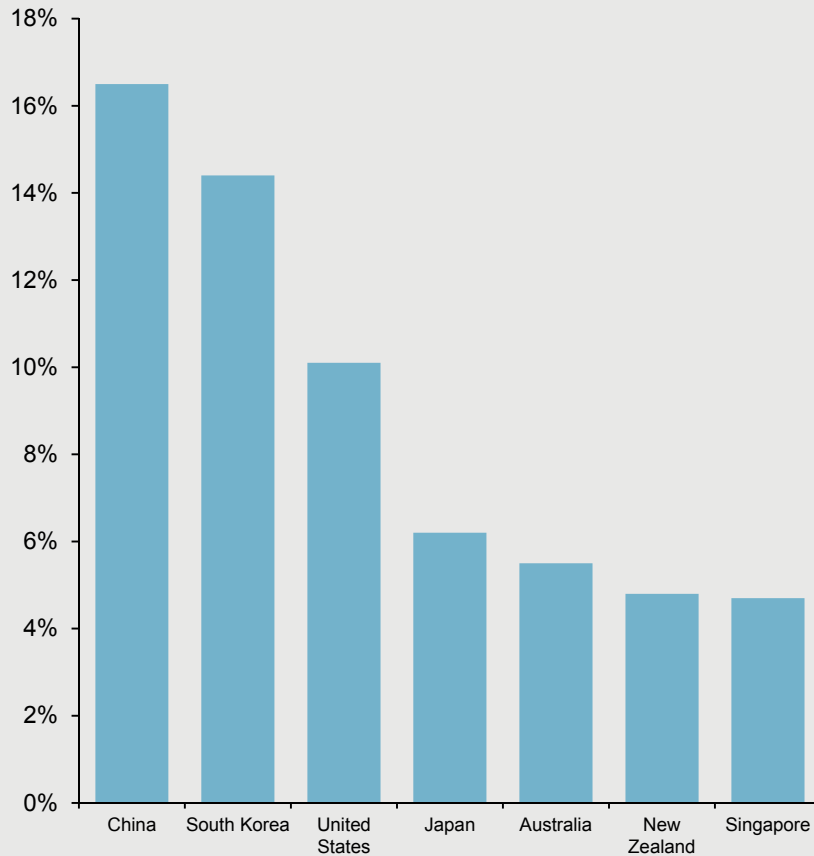
All returns are based on the respective MSCI IPD Global Property Index, and show one-year returns from income and capital appreciation.

Past performance is not indicative of future results. Alternative investments carry more risk than traditional investments and are recommended only for long-term investment. Some alternative investments may be highly leveraged and rely on speculative investments that can magnify the potential for loss or gain. Diversification does not guarantee investment returns or eliminate the risk of loss.

Data is based on availability as of February 29, 2020.

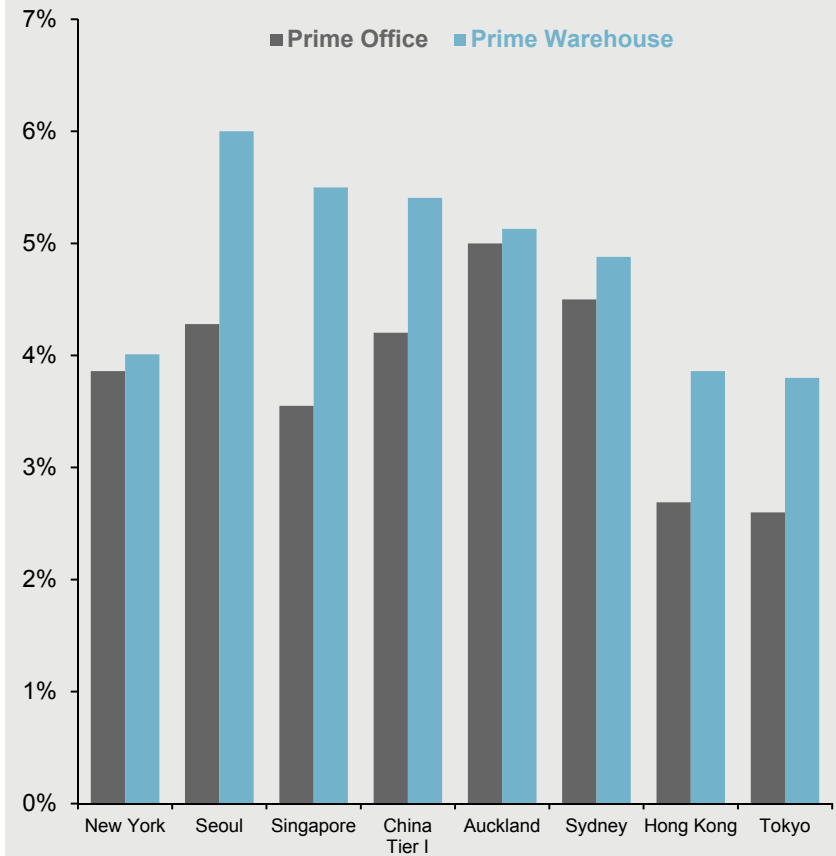
APAC online retail sales

Percent of total retail sales

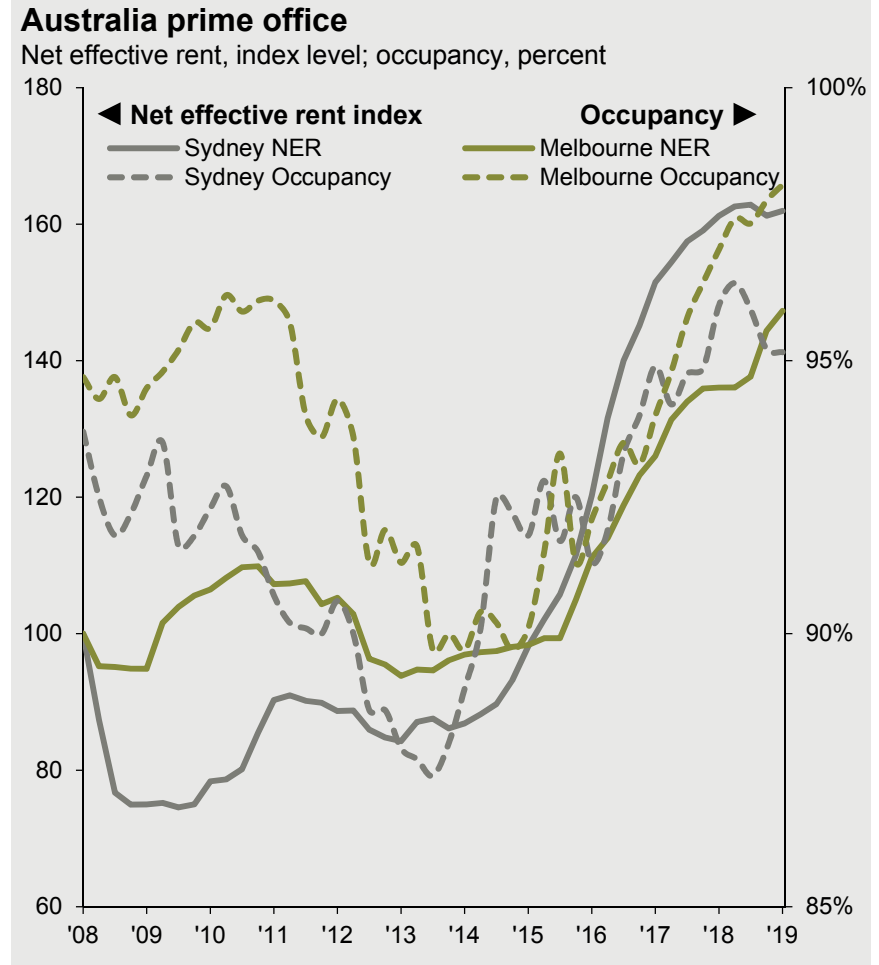
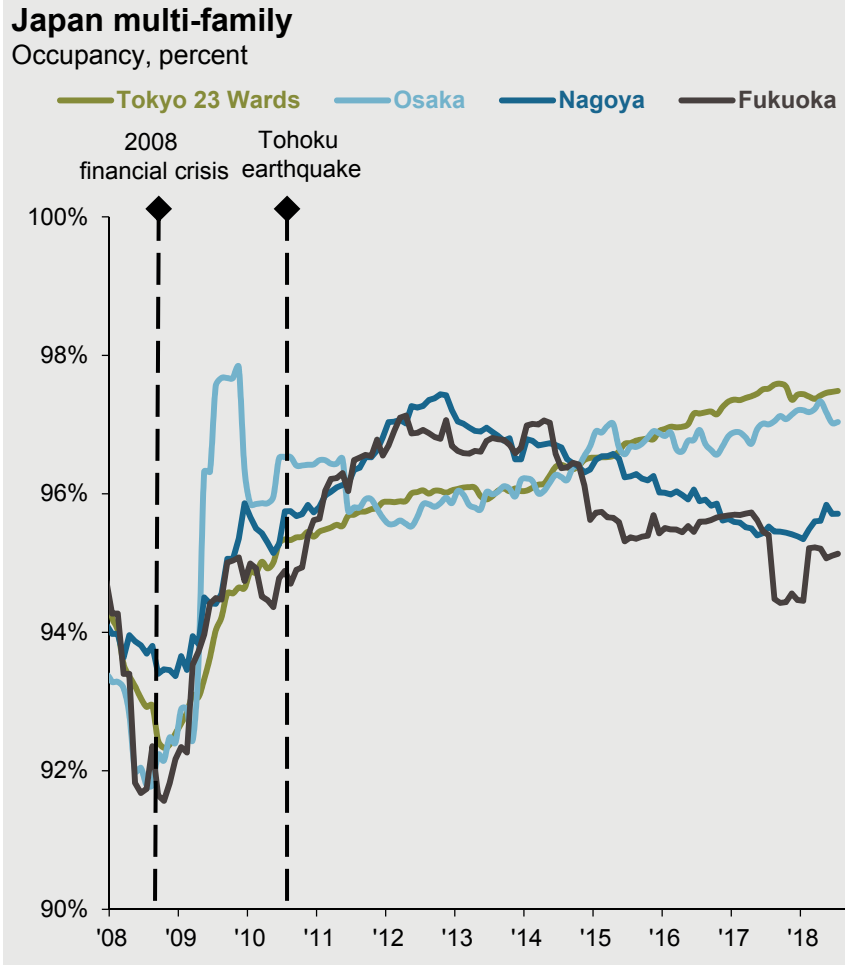


APAC office and industrial pricing

Yields



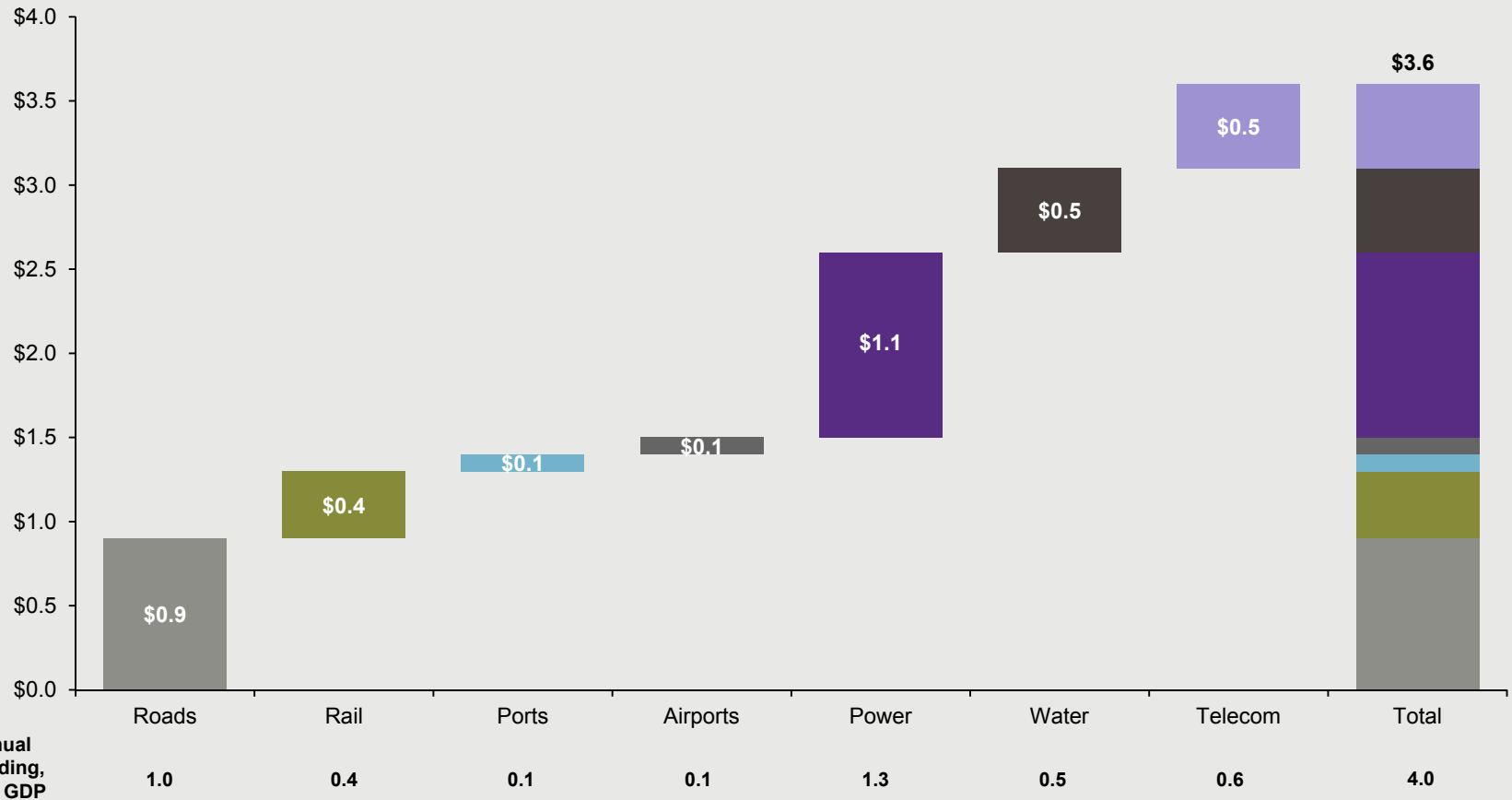
Sources: Oxford Economics, Jones Lang LaSalle REIS, CBRE, J.P. Morgan Asset Management.
Data is based on availability as of February 29, 2020.



Sources: Association of Real Estate Securitization, Japan Property Index, Jones Lang LaSalle, J.P. Morgan Asset Management.
 Data is based on availability as of February 29, 2020.

Average annual infrastructure need

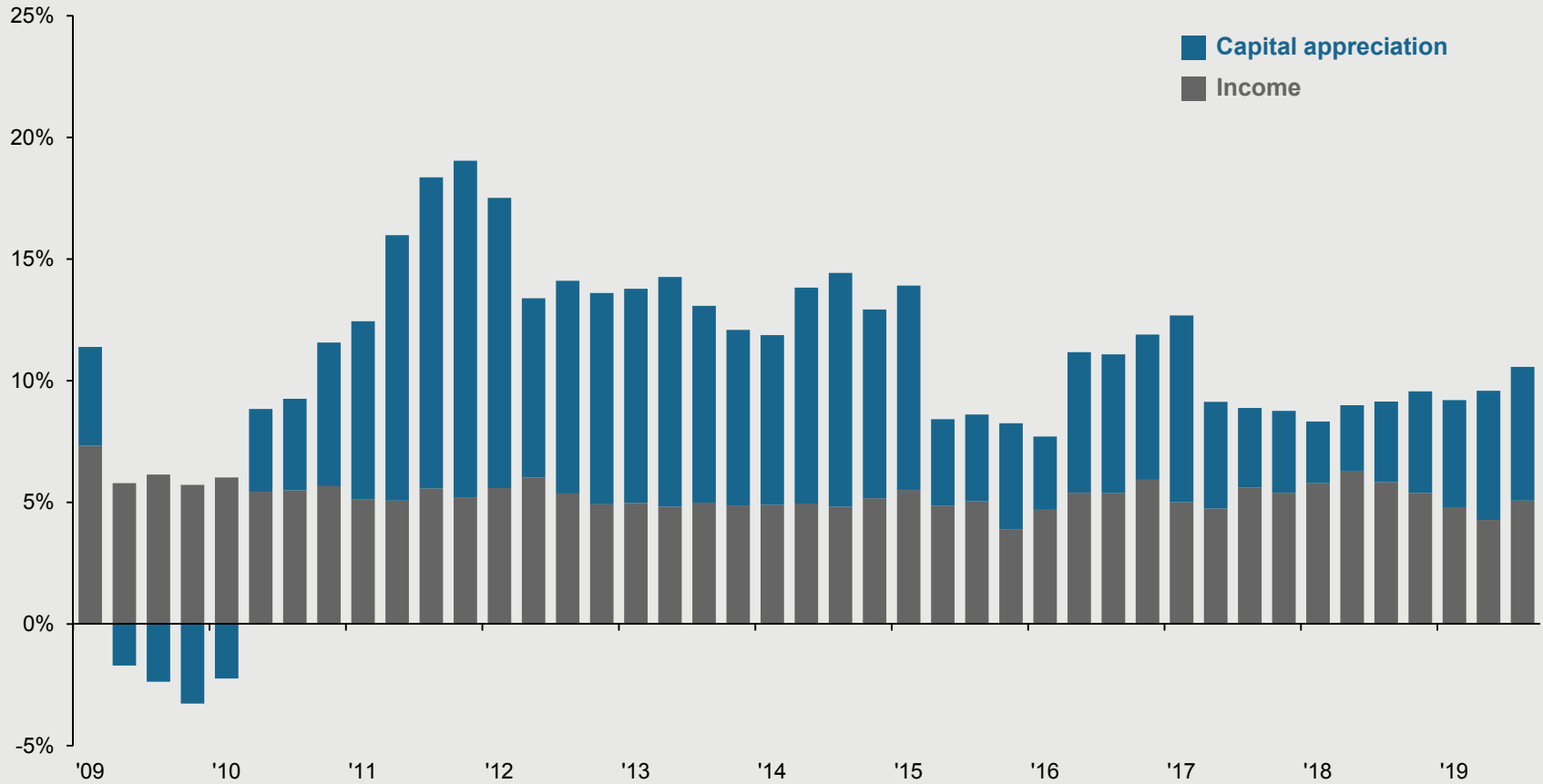
USD trillions, constant 2017 dollars



Source: McKinsey Global Institute, J.P. Morgan Asset Management.
Data is based on availability as of February 29, 2020.

Global core infrastructure returns

Rolling 4-quarter returns from income and capital appreciation



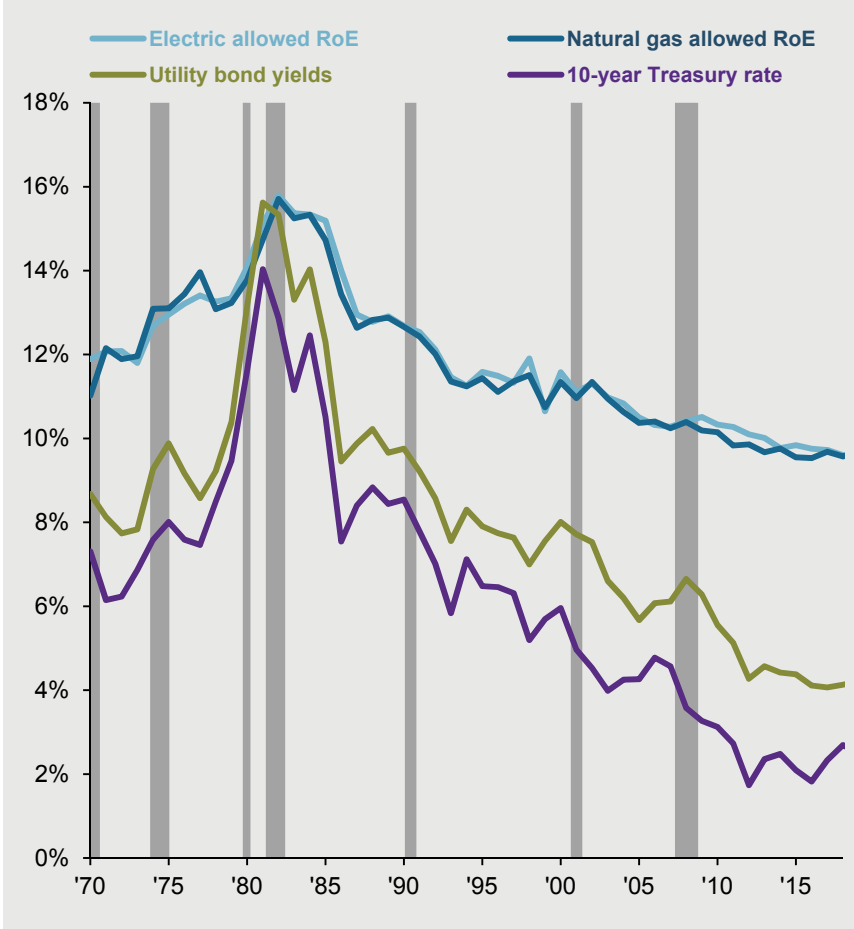
Source: MSCI, J.P. Morgan Asset Management.

Infrastructure returns represented by the "low risk" category of the MSCI Global Quarterly Infrastructure Asset Index. Data show rolling one-year returns from income and capital appreciation. The chart shows the full index history, beginning in the first quarter of 2009.

Past performance is not indicative of future results. Alternative investments carry more risk than traditional investments and are recommended only for long-term investment. Some alternative investments may be highly leveraged and rely on speculative investments that can magnify the potential for loss or gain. Diversification does not guarantee investment returns or eliminate the risk of loss.

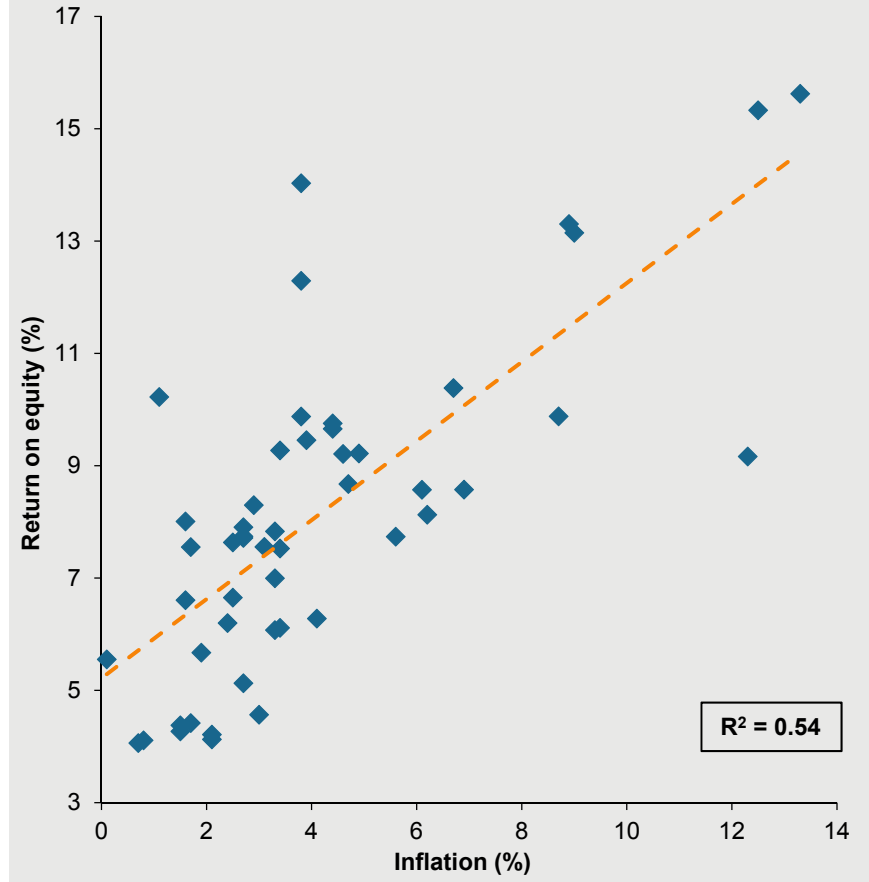
Data is based on availability as of February 29, 2020.

U.S. utilities' average allowed RoE and interest rates



U.S. utilities' return on equity and inflation

RoE (2-year lagged), CPI % change vs. prior year, 1980-2018



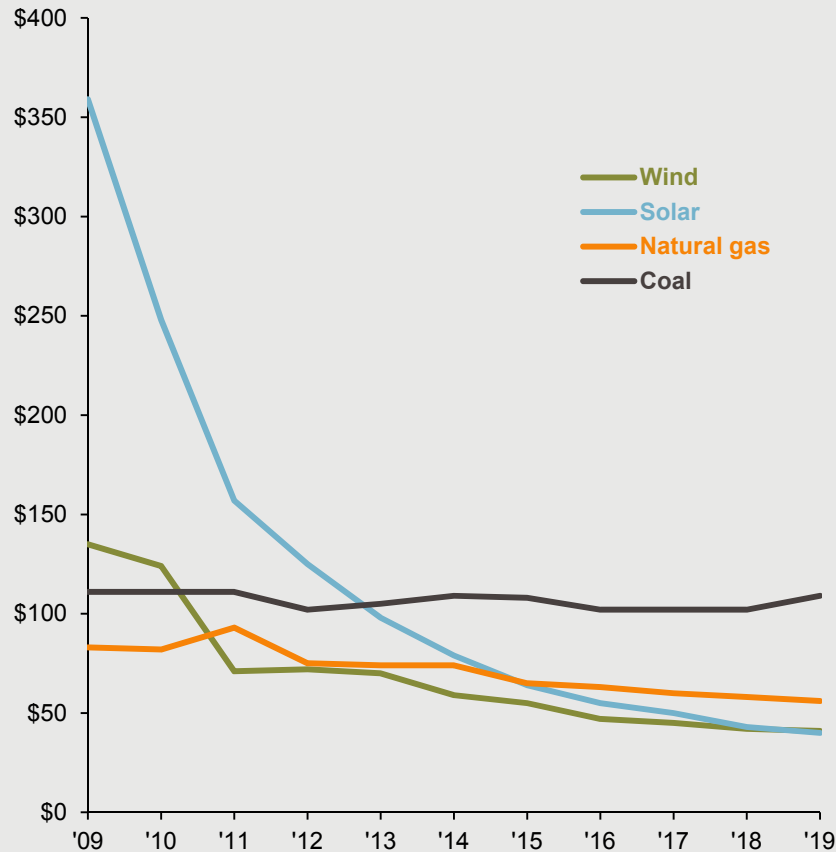
Source: America's Electric Utilities, Moody's, SNL.com, Bloomberg, BLS, JPMAM Global Alternatives Research, J.P. Morgan Asset Management.

RoE is return on equity, which is the amount of net income returned as a percentage of shareholders' equity. Average cost of debt is represented by the trailing 6-month average of Moody's utilities yields. Grey bars denote recessions

Data is based on availability as of February 29, 2020.

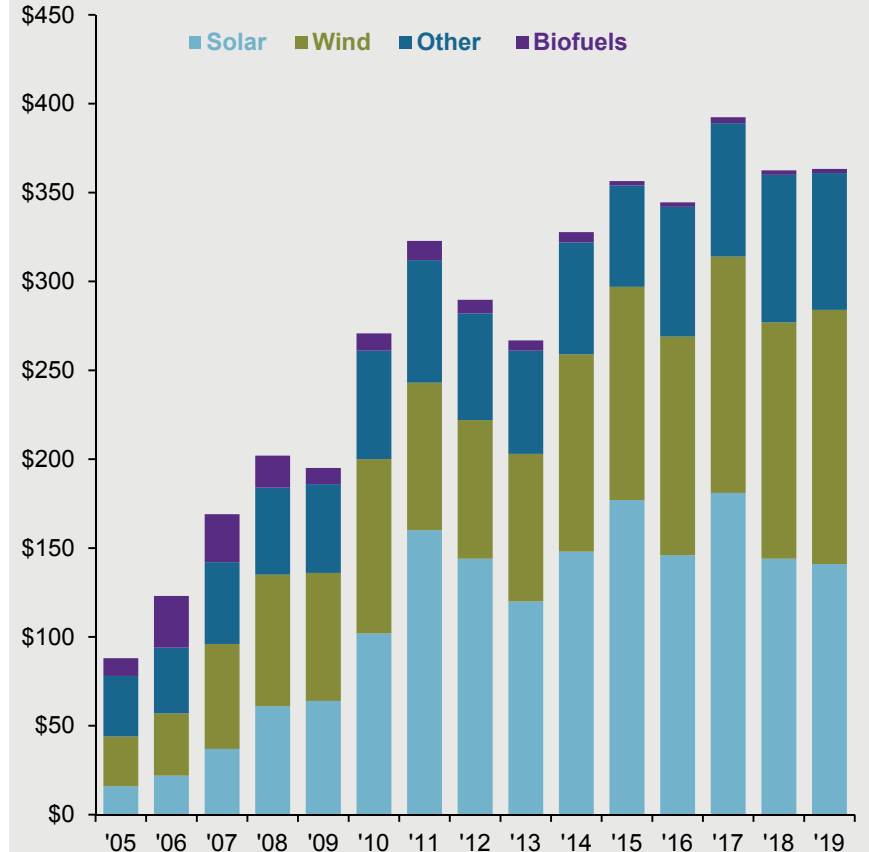
Cost of wind, solar, natural gas and coal

Mean LCOE*, dollar per megawatt hour



Global new investment in clean energy

Billions USD

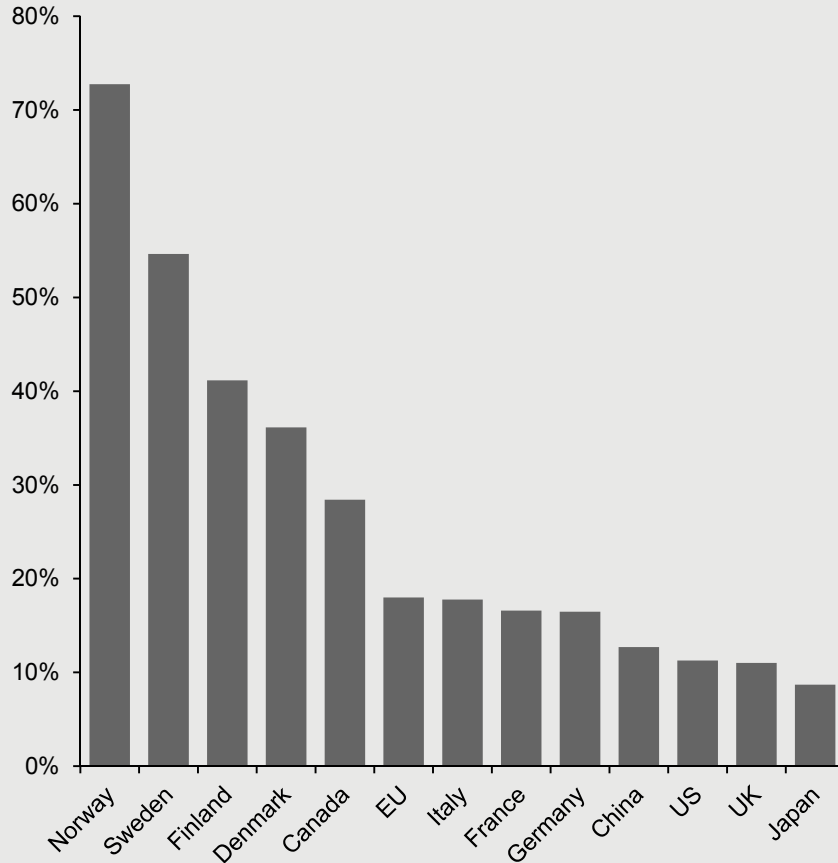


Source: Lazard, Bloomberg, J.P. Morgan Asset Management.

*LCOE is levelized cost of energy, the net present value of the unit-cost of electricity over the lifetime of a generating asset. It is often taken as a proxy for the average price that the generating asset must receive in a market to break even over its lifetime.

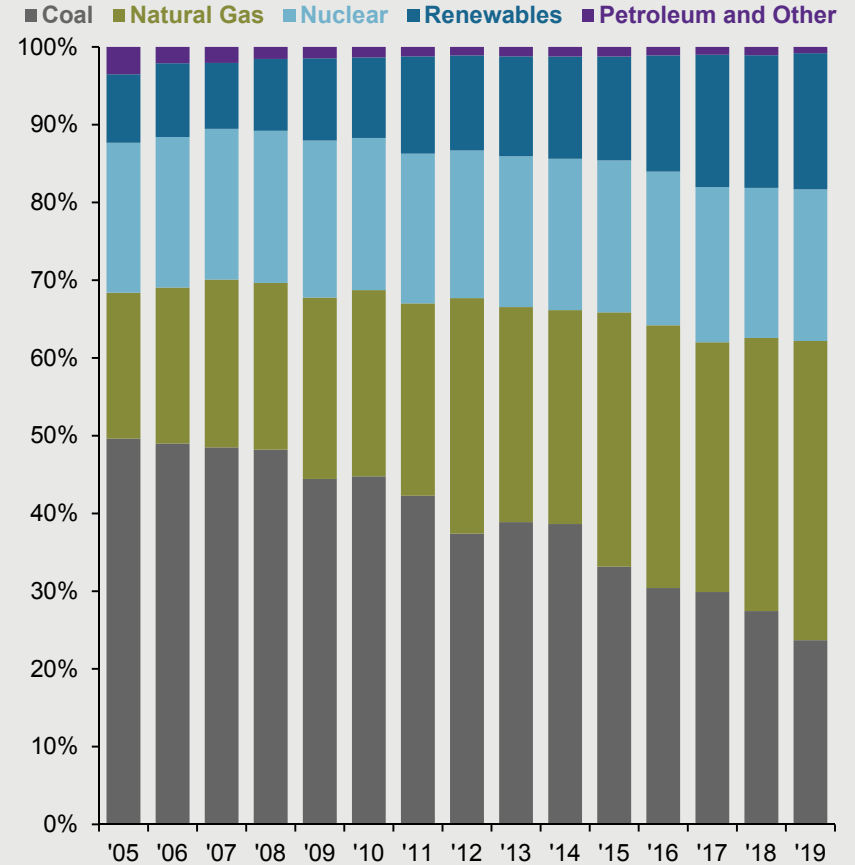
Data is based on availability as of February 29, 2020.

Share of energy from renewable sources
% of total energy, 2018



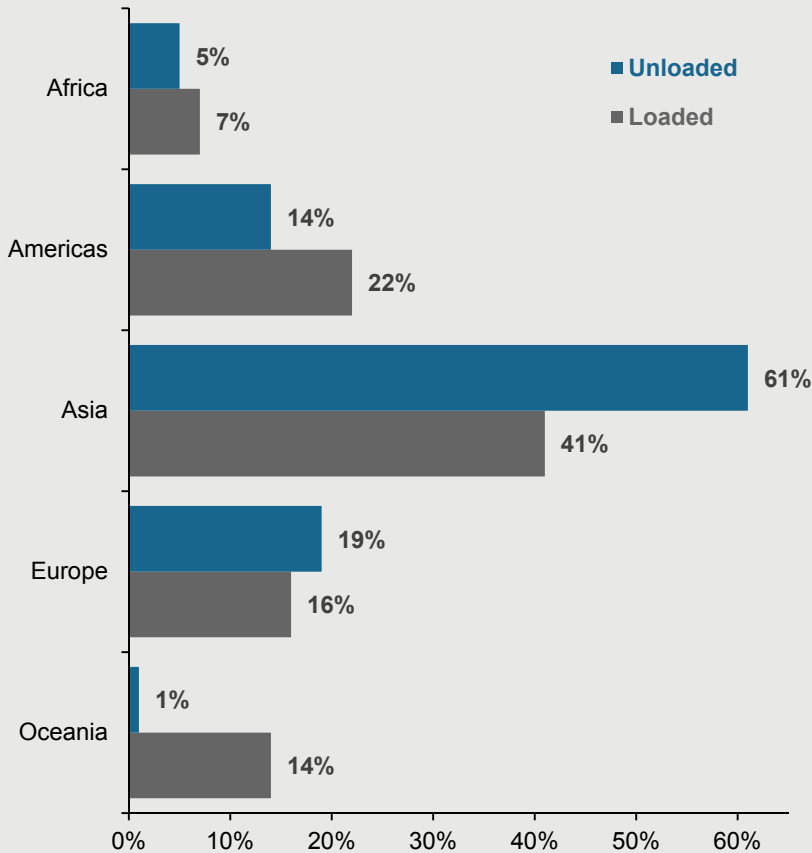
Source: Eurostat, METI, BP Statistical, EIA, J.P. Morgan Asset Management.
Renewables consists of wind, hydropower, solar, biomass and geothermal.
Data is based on availability as of February 29, 2020.

U.S. electricity generation by major source
Percent



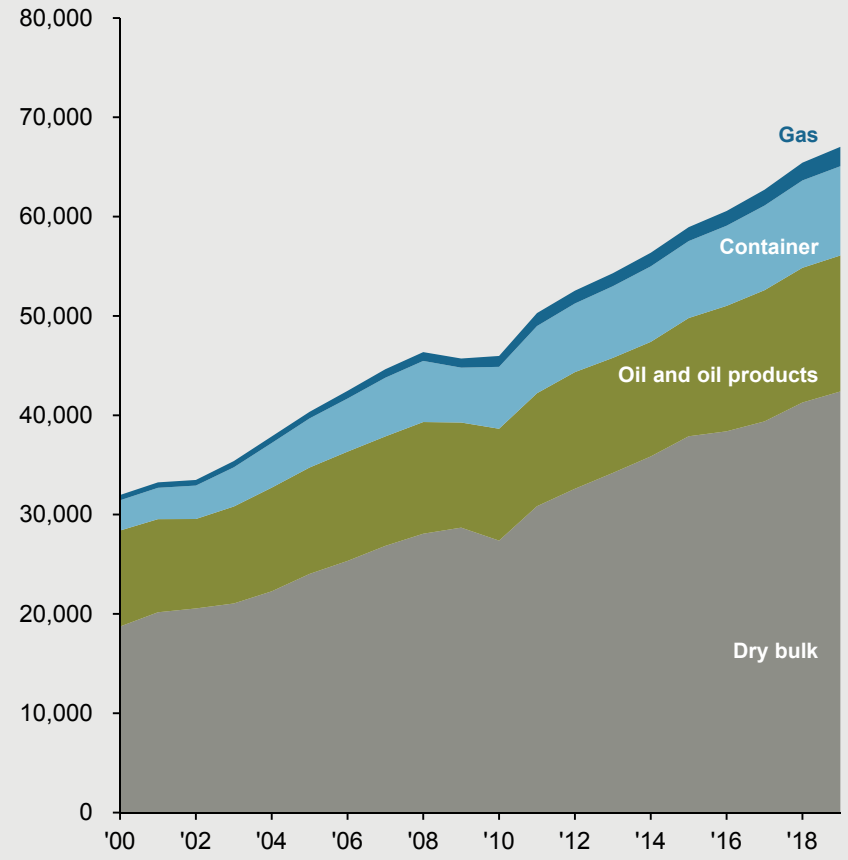
International shipping trade by region

Percent share in world tonnage, percent



World seaborne trade by product

Estimated trillion ton miles

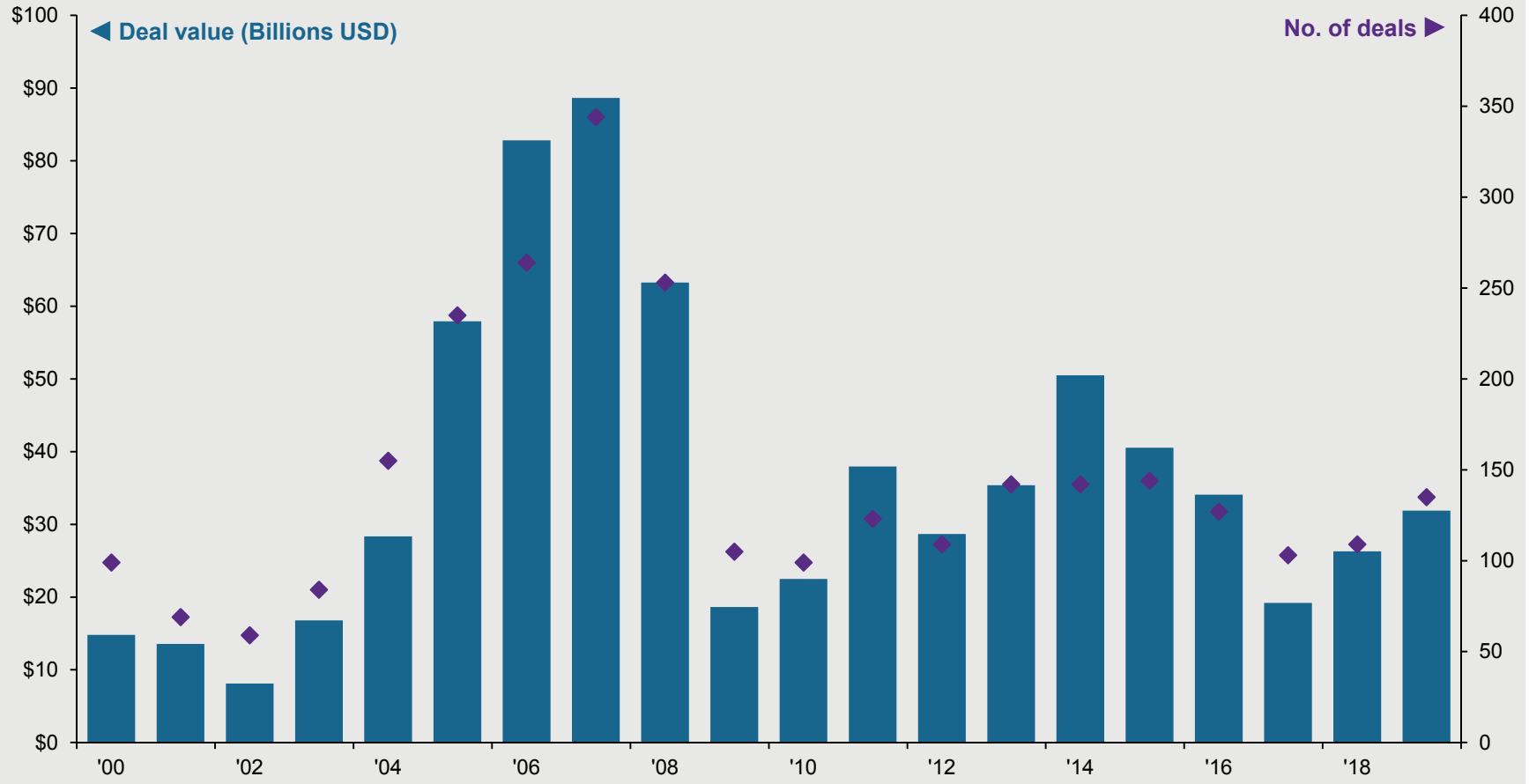


Source: UNCTAD, Clarksons, J.P. Morgan Asset Management.

Dry product consists of coal, ore, soybeans and bulk trade.

Data is based on availability as of February 29, 2020.

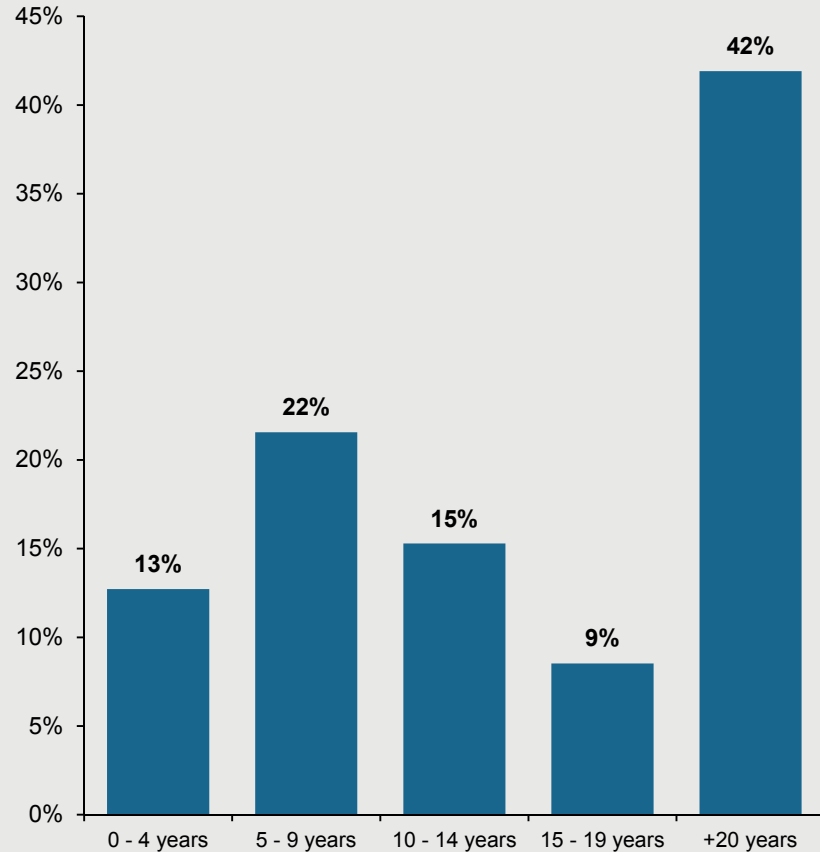
Shipping loans volume



Source: Dealogic, UNCTAD, J.P. Morgan Asset Management.
 Data is based on availability as of February 29, 2020.

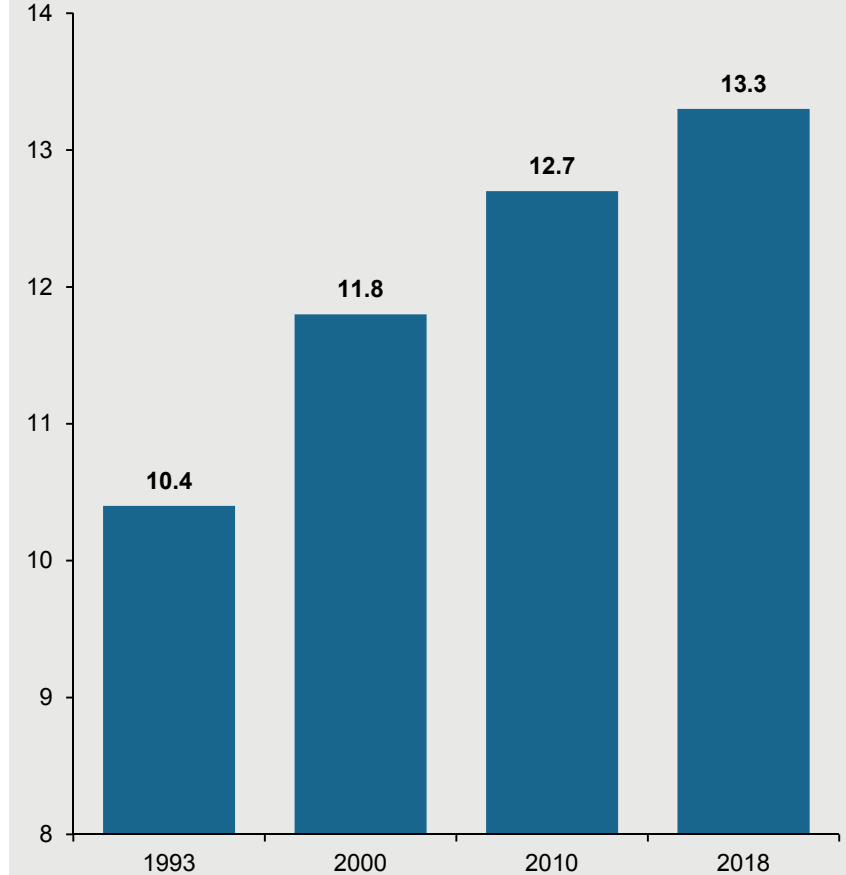
Age distribution of global shipping fleet

Percent



Average age of U.S. commercial aircraft

Years

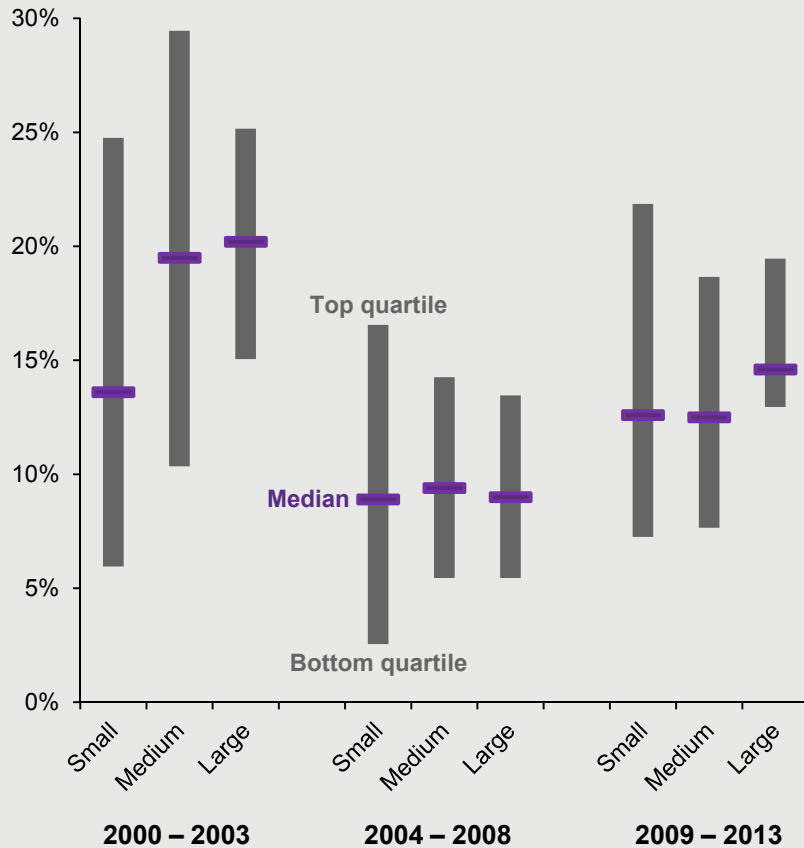


Source: UNCTAD, U.S. Bureau of Transportation Statistics, J.P. Morgan Asset Management.

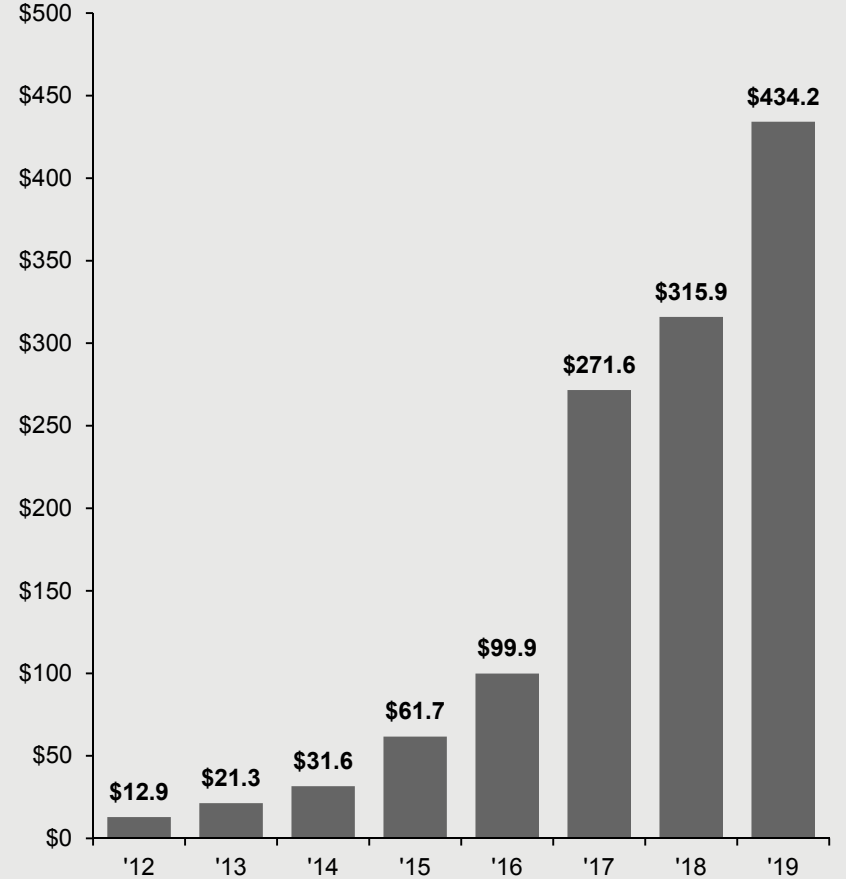
Numbers may not sum to 100% due to rounding.

Data is based on availability as of February 29, 2020.

Private equity IRRs
By size bucket and vintage



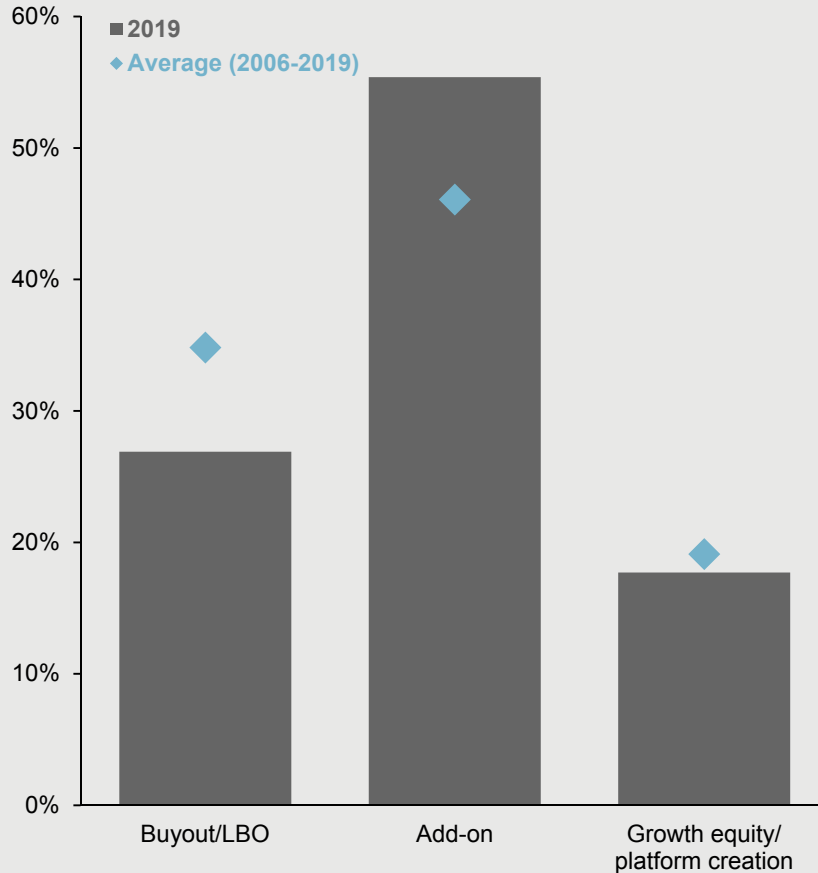
Private equity dry powder
Billions USD, by vintage year



Source: Pitchbook, J.P. Morgan Asset Management.
Data is based on availability as of February 29, 2020.

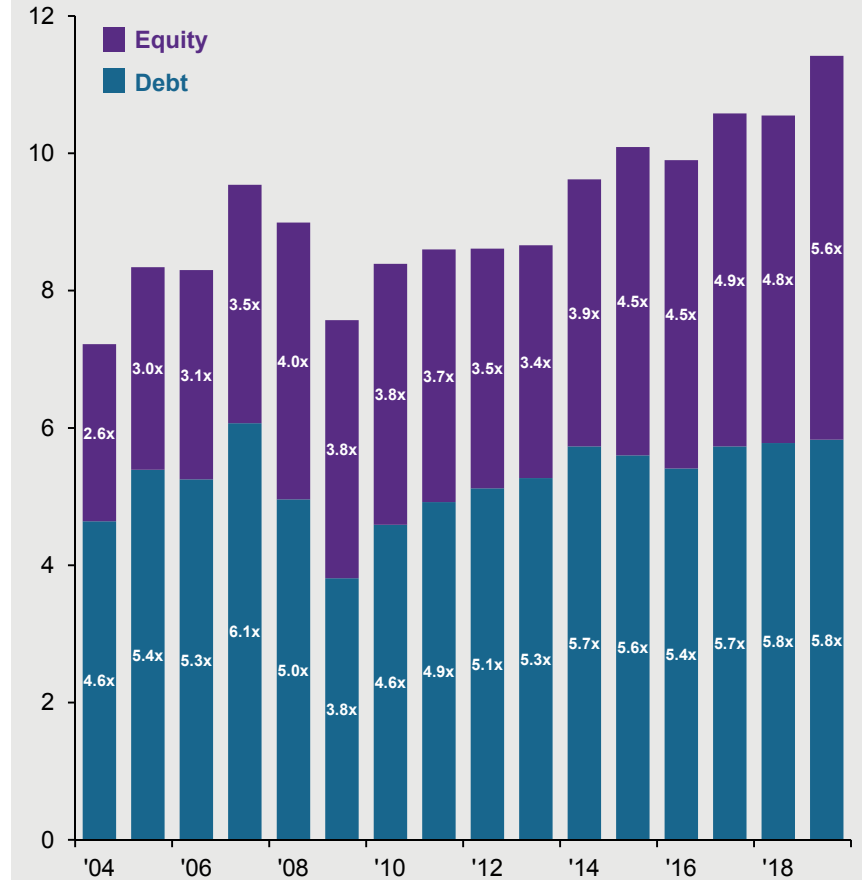
Global private equity deals

Share of total



U.S. LBOs: purchase price multiples

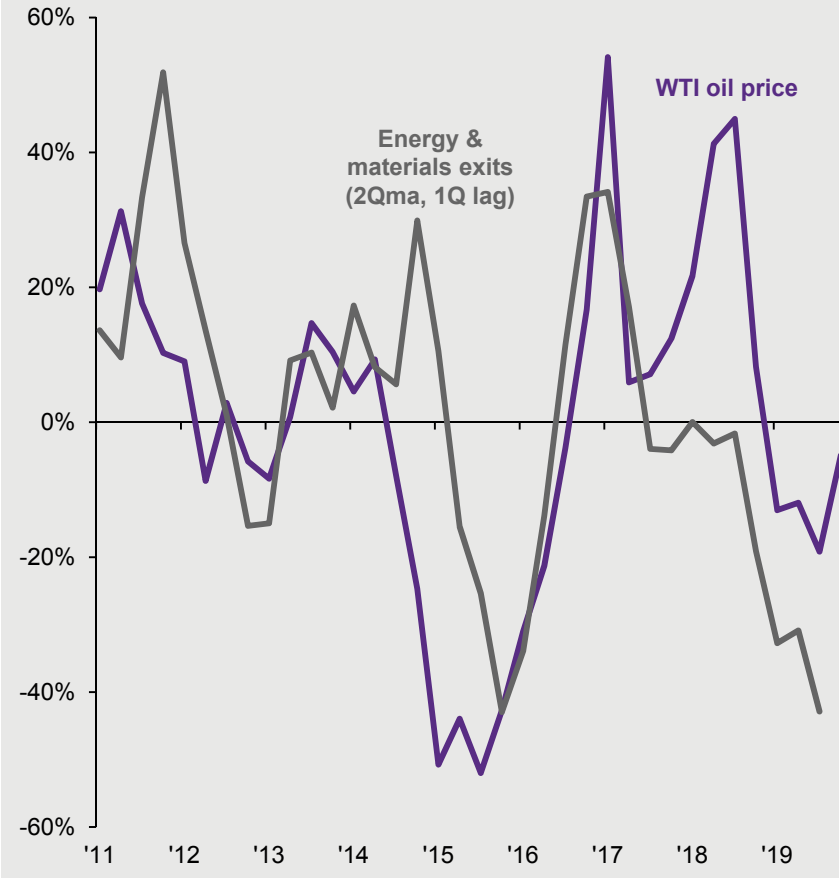
Equity and debt over trailing EBITDA



Source: Pitchbook, S&P LCD, J.P. Morgan Asset Management.
Data is based on availability as of February 29, 2020.

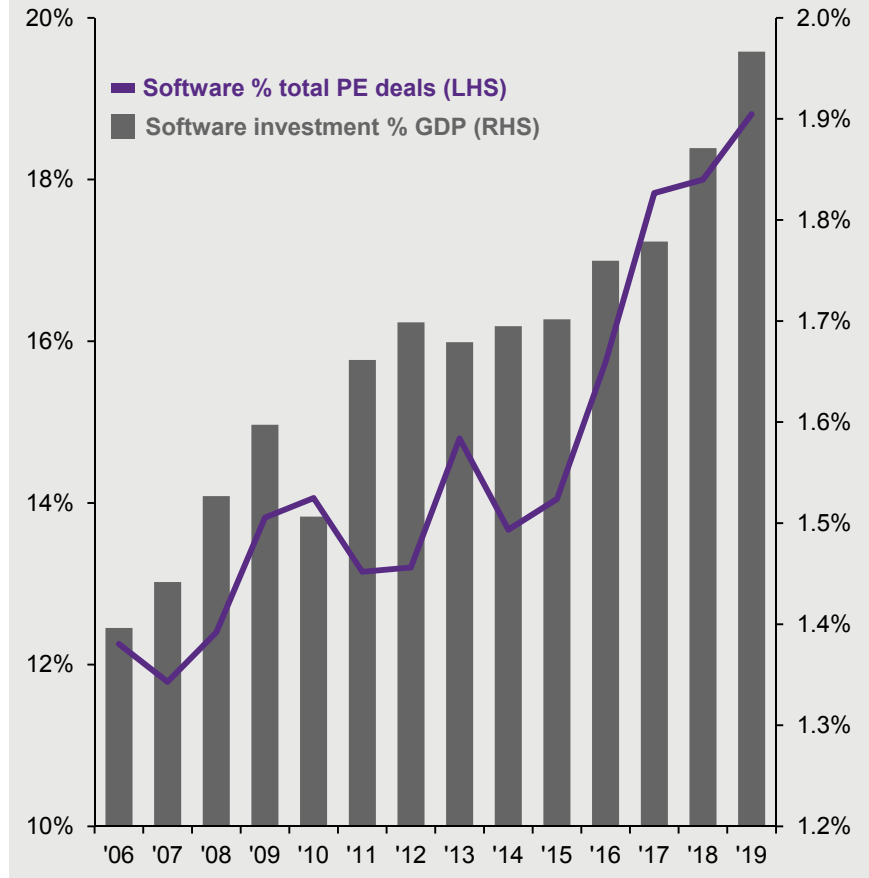
Oil prices and natural resource exits

Energy & materials exit count, WTI oil price, y/y % change



Software investment and private equity

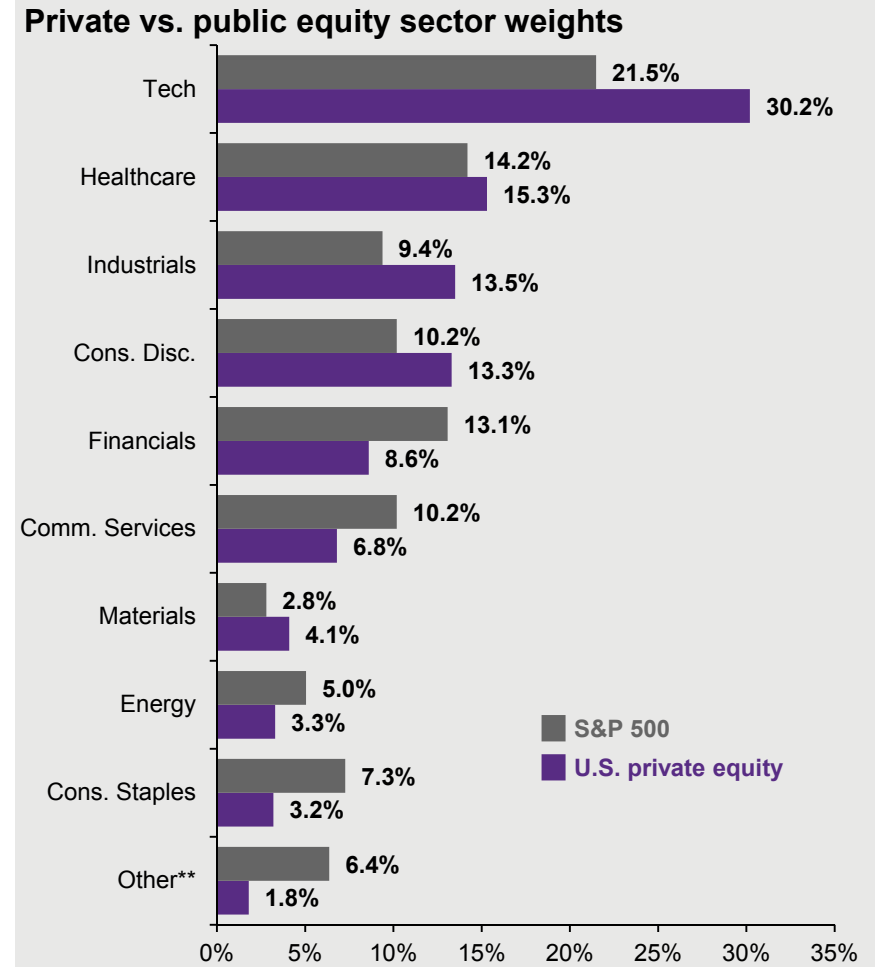
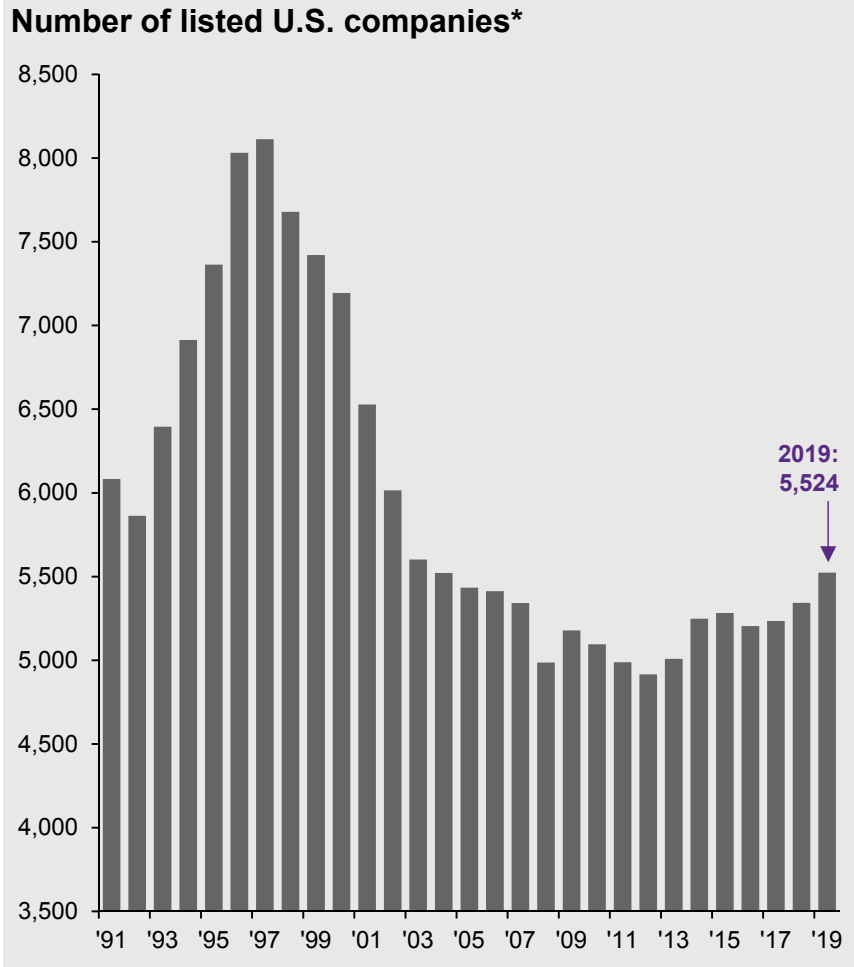
% U.S. PE deals targeting software companies, software inv. % GDP



Sources: BEA, Pitchbook, FactSet, J.P. Morgan Asset Management.

WTI oil price is a quarterly average. Software investment is represented by nonresidential fixed investment in software.

Data is based on availability as of February 29, 2020.



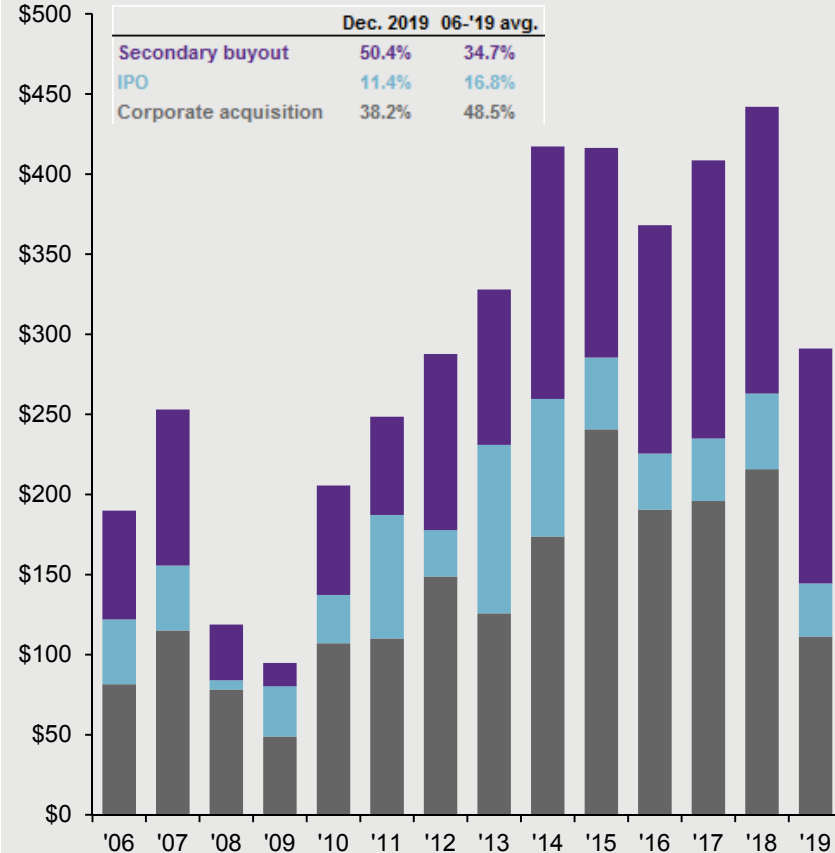
Sources: Cambridge Associates, World Federation of Exchanges, Standard & Poor's, J.P. Morgan Asset Management.

*Number of listed U.S. companies is represented by the sum of number of companies listed on the NYSE and the NASDAQ.**Other includes real estate and utilities. Percentages may not sum due to rounding .

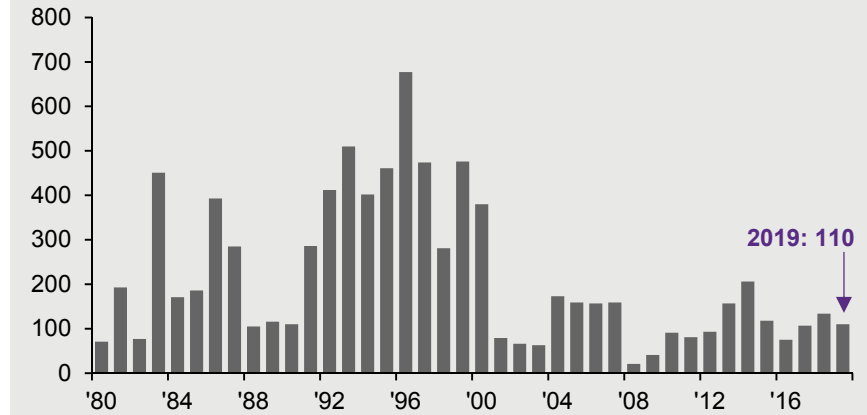
Data is based on availability as of February 29, 2020.

Private equity exits by type

Billions USD

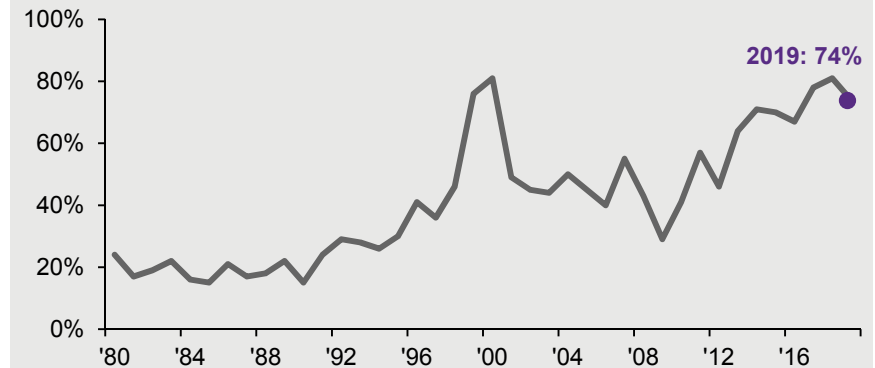


Number of IPOs



U.S. IPOs with negative earnings

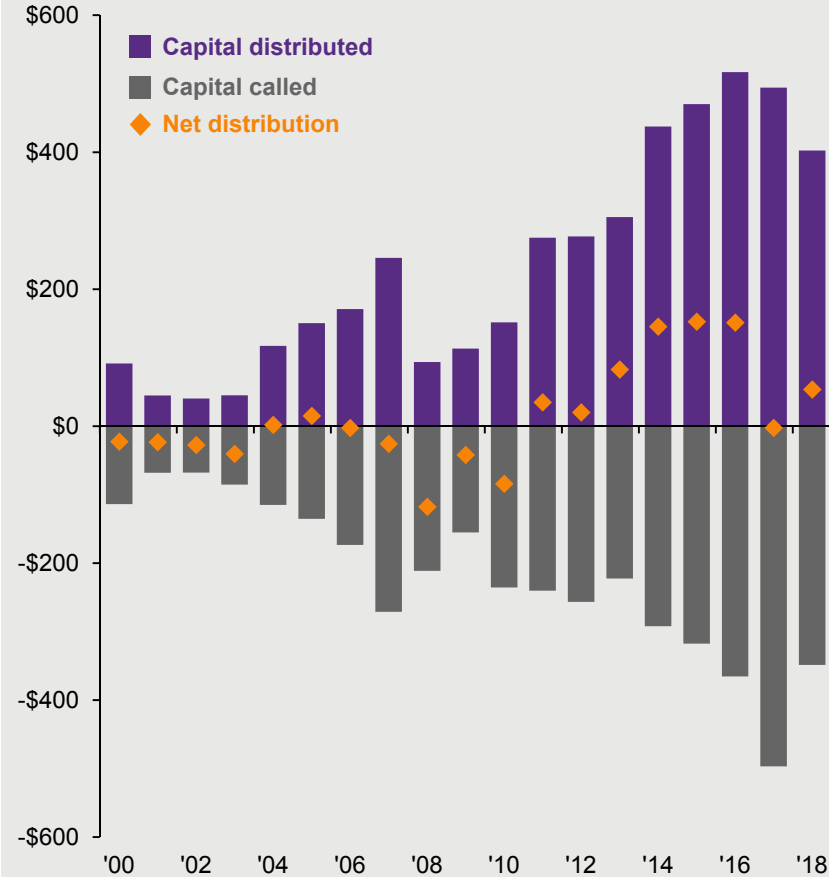
Percent of all initial public offerings that year



Sources: Pitchbook, Jay Ritter, University of Florida, J.P. Morgan Asset Management.
Data is based on availability as of February 29, 2020.

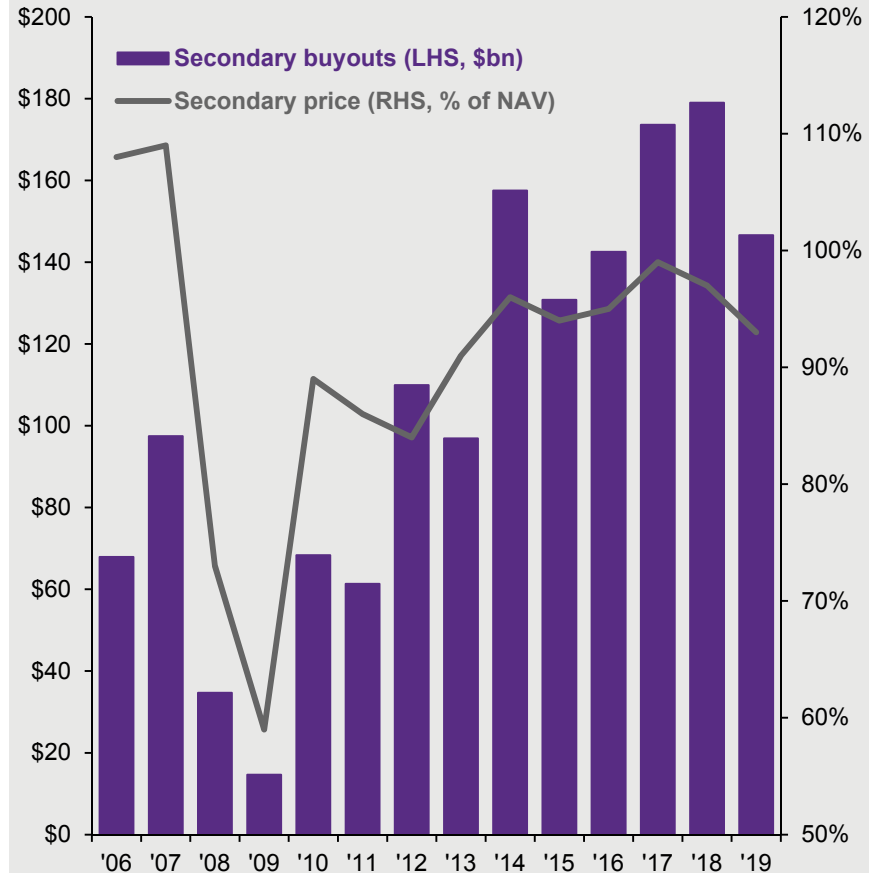
Global capital calls and distributions

Billions USD



Secondary market transaction volume and pricing

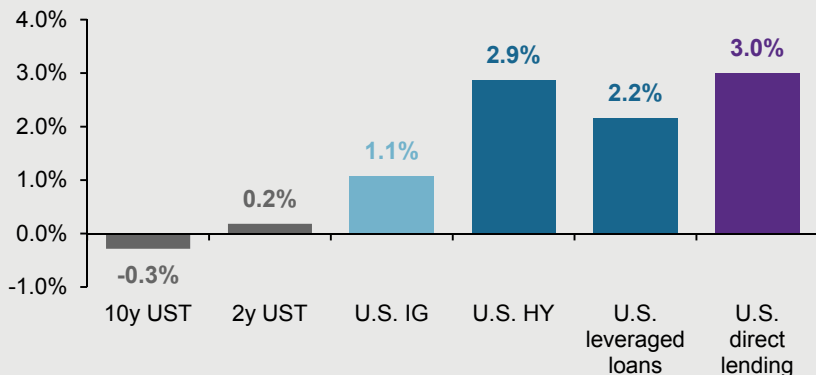
Secondary buyouts by year, \$bn, percent of net asset value (NAV)



Sources: Preqin, Greenhill, London Business School, Pitchbook, J.P. Morgan Asset Management.
Data is based on availability as of February 29, 2020.

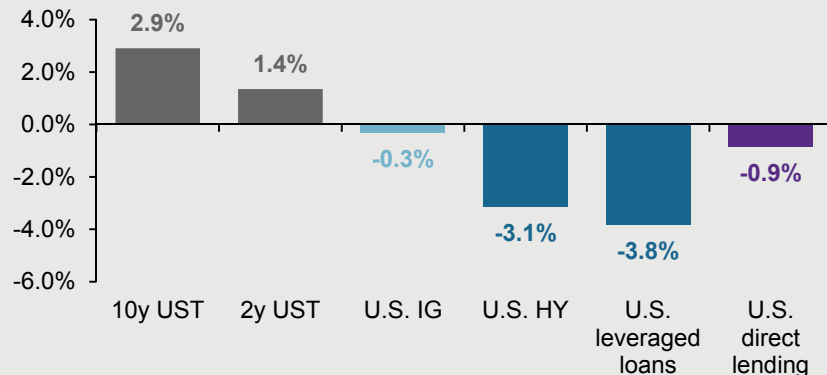
Expansion

Manufacturing ISM > 50 and rising



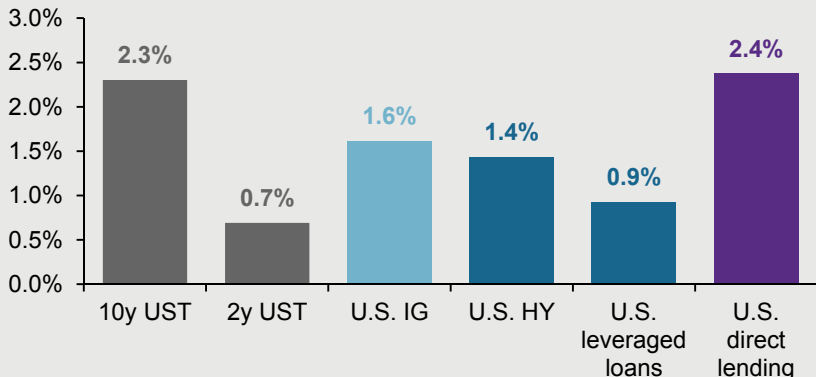
Recession

Manufacturing ISM < 50 and falling



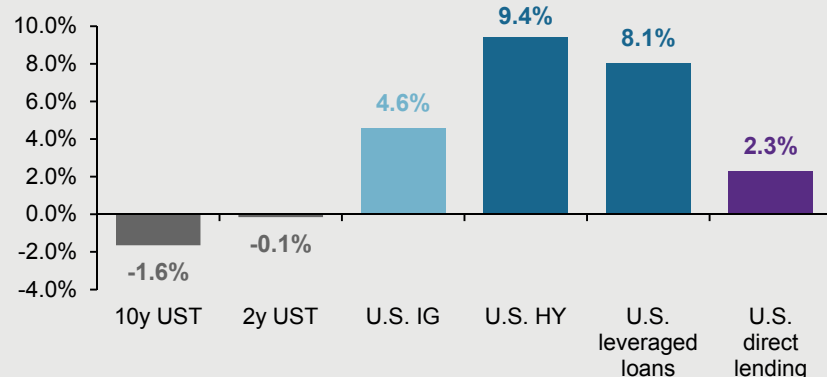
Late cycle cooling

Manufacturing ISM > 50 and falling



Turnaround

Manufacturing ISM < 50 and rising



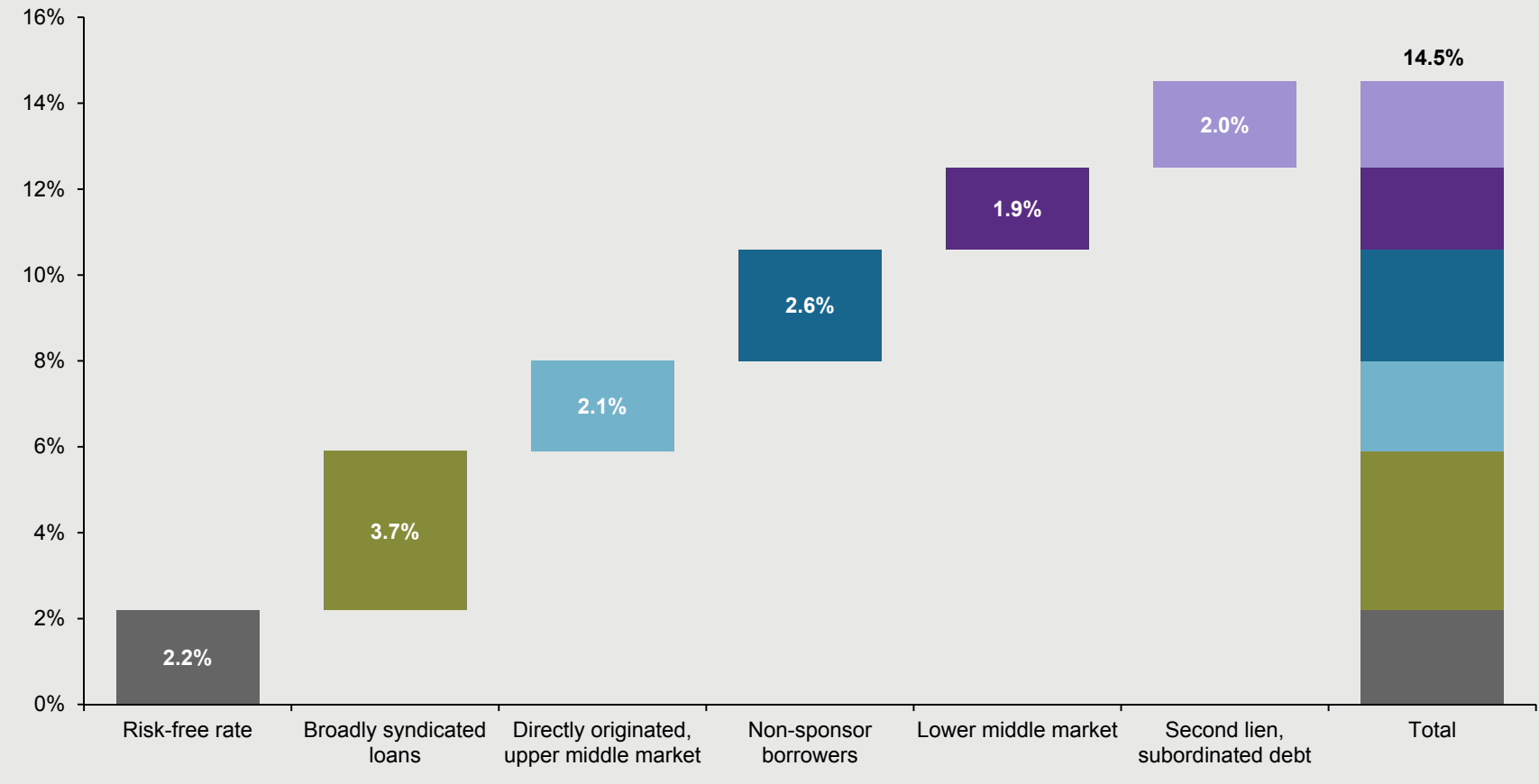
Source: Institute for Supply Management, Bloomberg, Barclays, Credit Suisse, Cliffwater, J.P. Morgan Asset Management.

The ISM Manufacturing Index is a nationwide survey of purchasing executives. A reading greater than 50 indicates increased economic activity and a reading less than 50 indicates decreased economic activity. 10y UST: Bloomberg Barclays U.S. Treasury Bellwethers (10y), 2y UST: Bloomberg Barclays U.S. Treasury Bellwethers (2y), U.S. IG: Bloomberg Barclays U.S. Aggregate Corporate Investment Grade, U.S. HY: Bloomberg Barclays U.S. Aggregate Corporate High Yield, U.S. leveraged loans: Credit Suisse Leveraged Loan Index, U.S. direct lending: Cliffwater Direct Lending Index. All returns are from 12/31/2004 through 12/31/2019, except for U.S. direct lending which is through 9/30/2019.

Data is based on availability as of February 29, 2020.

Direct U.S. middle market loans risk premiums

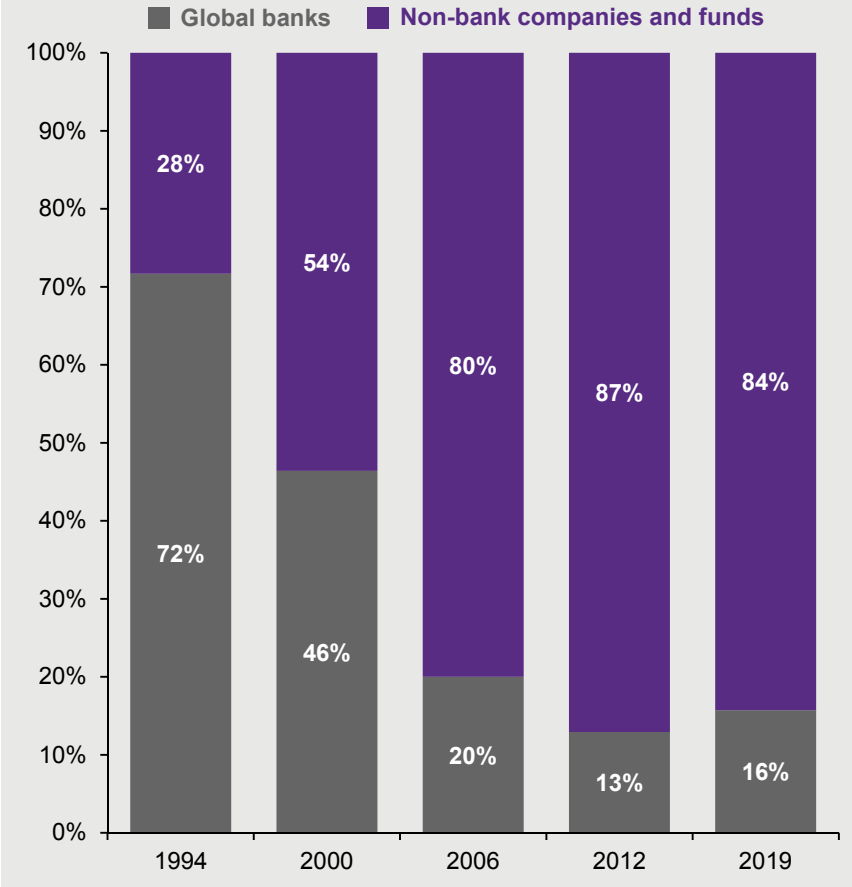
Percent



Source: Cliffwater, J.P. Morgan Asset Management.
 Data is based on availability as of February 29, 2020.

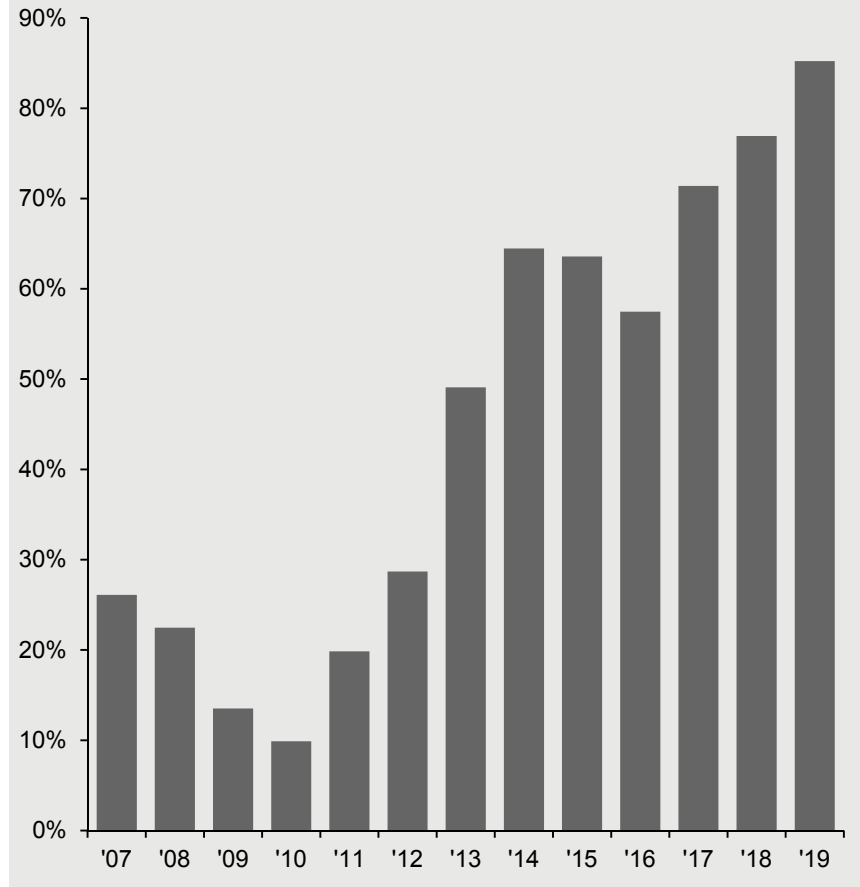
U.S. leveraged loan market participants

Share of total market, percent



Covenant-lite loan issuance

Percent of U.S. issuance in institutional leveraged loans



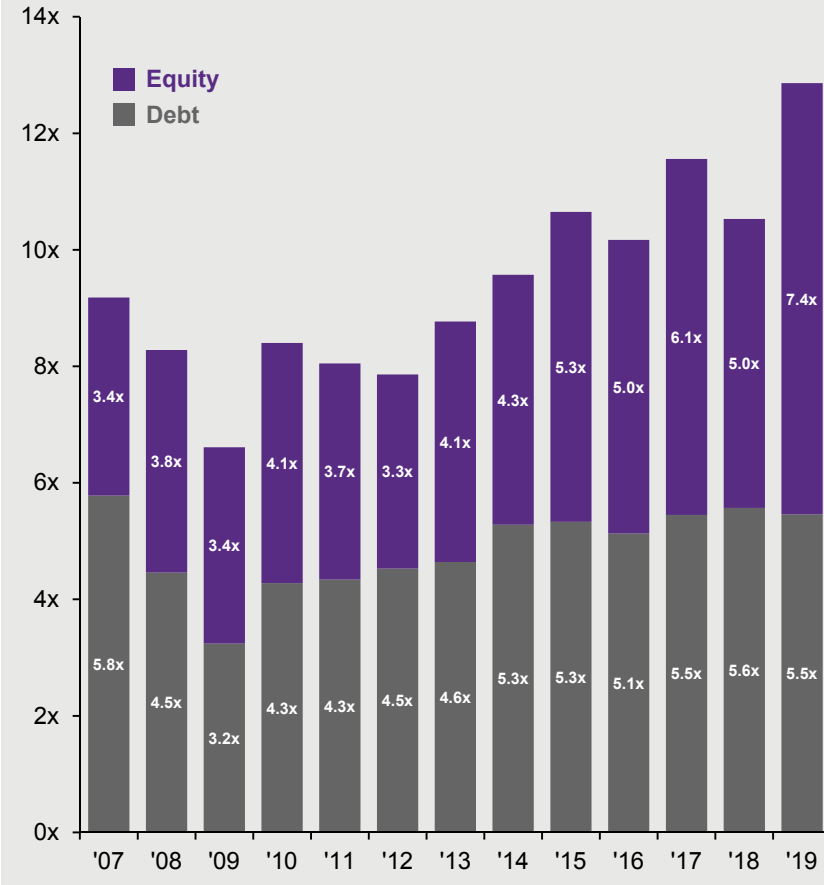
Source: Ares, S&P LCD, J.P. Morgan Asset Management.

Covenant-lite loans are a type of financing that is issued with fewer restrictions on the borrower with regard to collateral, level of income, and loan payment terms, and fewer protections for the lender, including financial maintenance tests that measure the debt-service capabilities of the borrower.

Data is based on availability as of February 29, 2020.

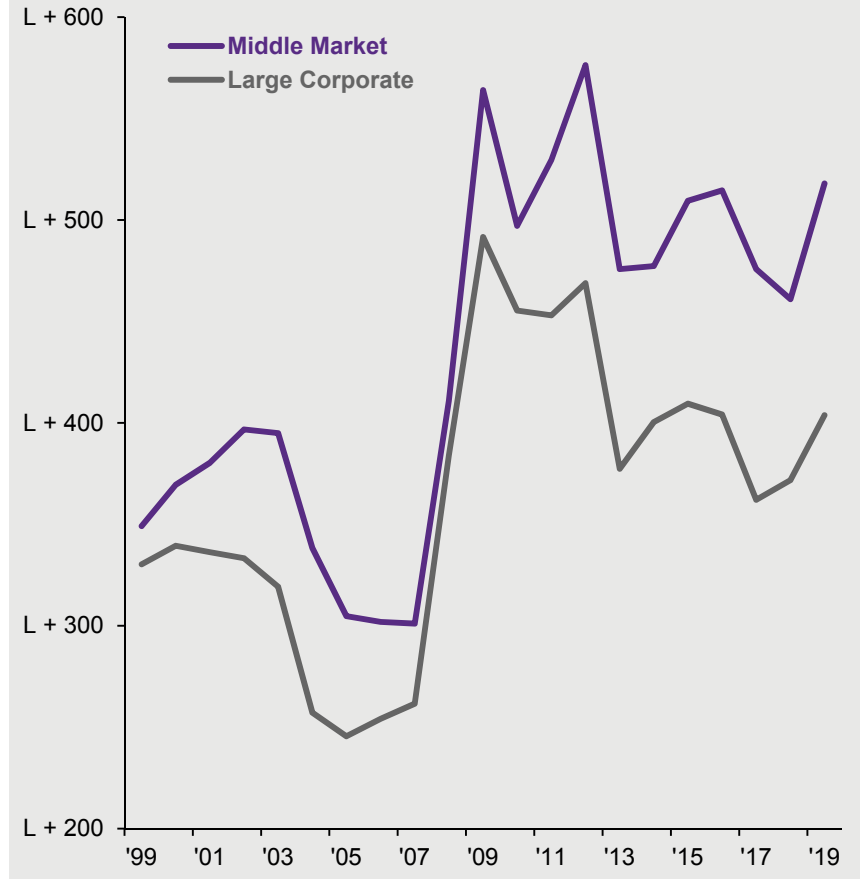
U.S. middle market LBOs: purchase price multiples

Deals ≤ \$50M EBITDA



U.S. middle market and large corporate lending spreads

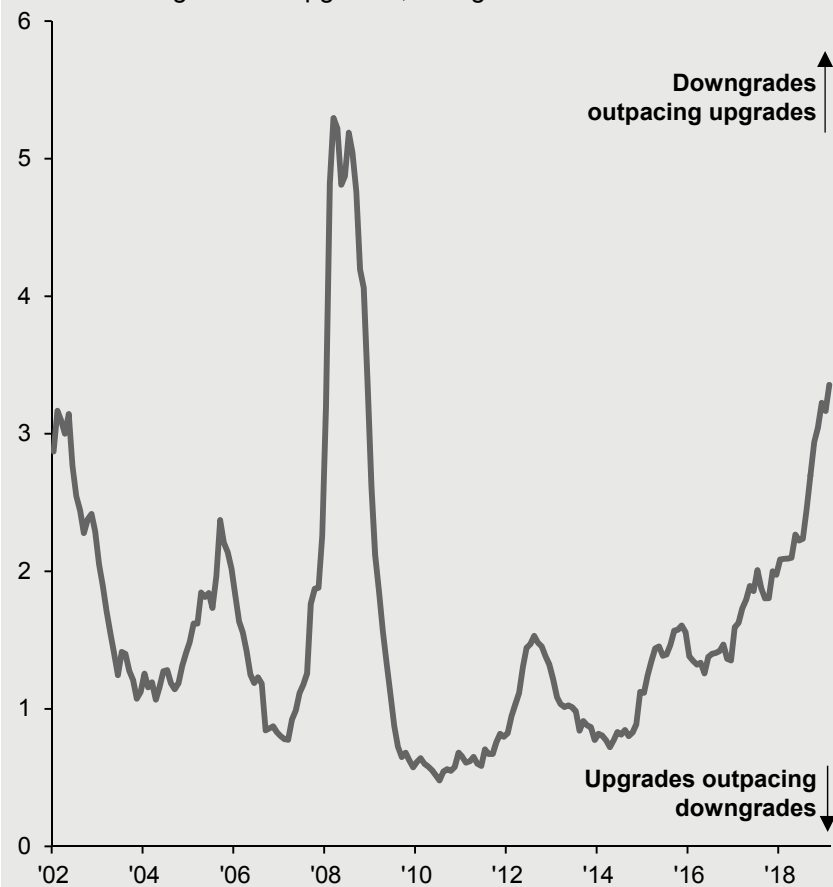
Based on 3-month U.S. dollar LIBOR



Source: S&P LCD, J.P. Morgan Asset Management.
Data is based on availability as of February 29, 2020.

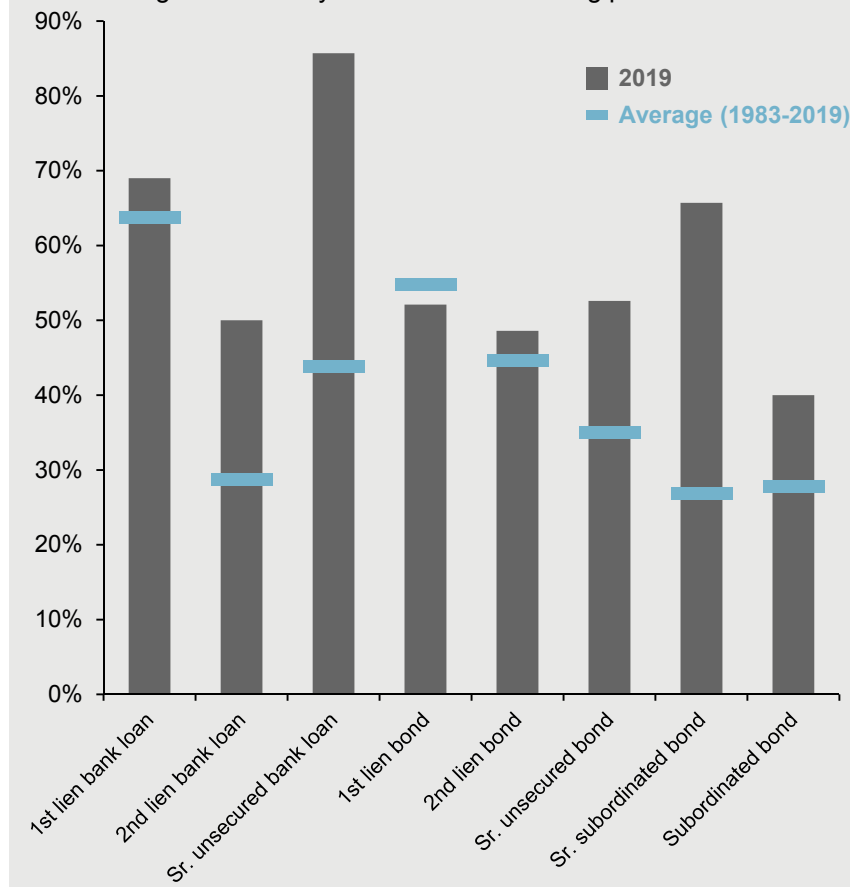
Leveraged loan downgrades and upgrades

Ratio of downgrades to upgrades, rolling 12 months



Average corporate debt recovery rates

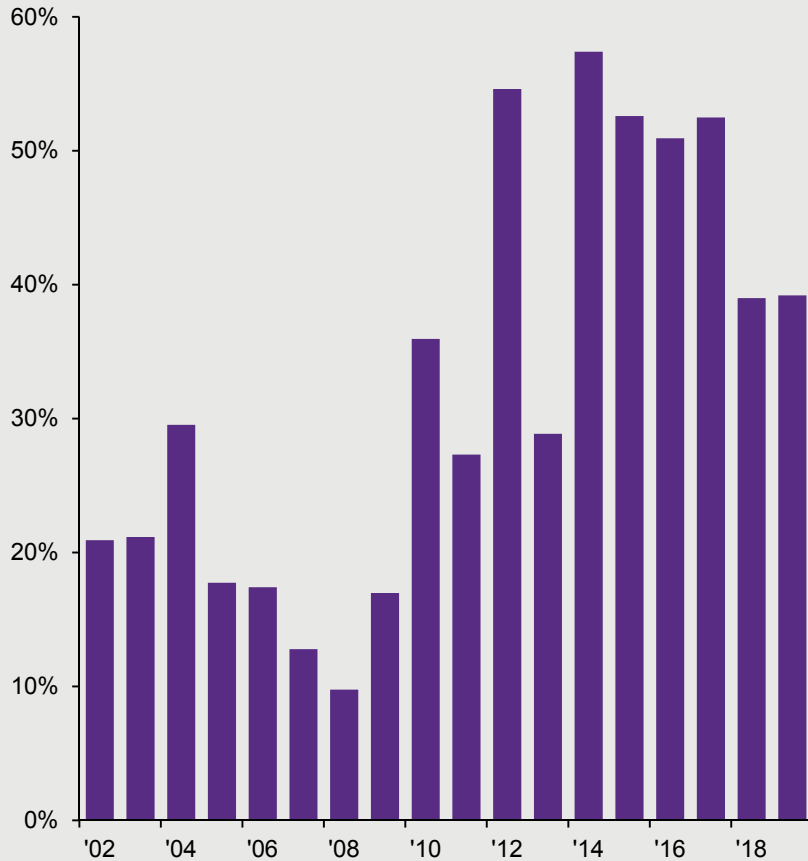
Volume weighted recovery rates based on trading prices



Source: S&P LCD, Moody's, J.P. Morgan Asset Management.
Data is based on availability as of February 29, 2020.

U.S. LBOs volume by type: Sponsor-to-sponsor

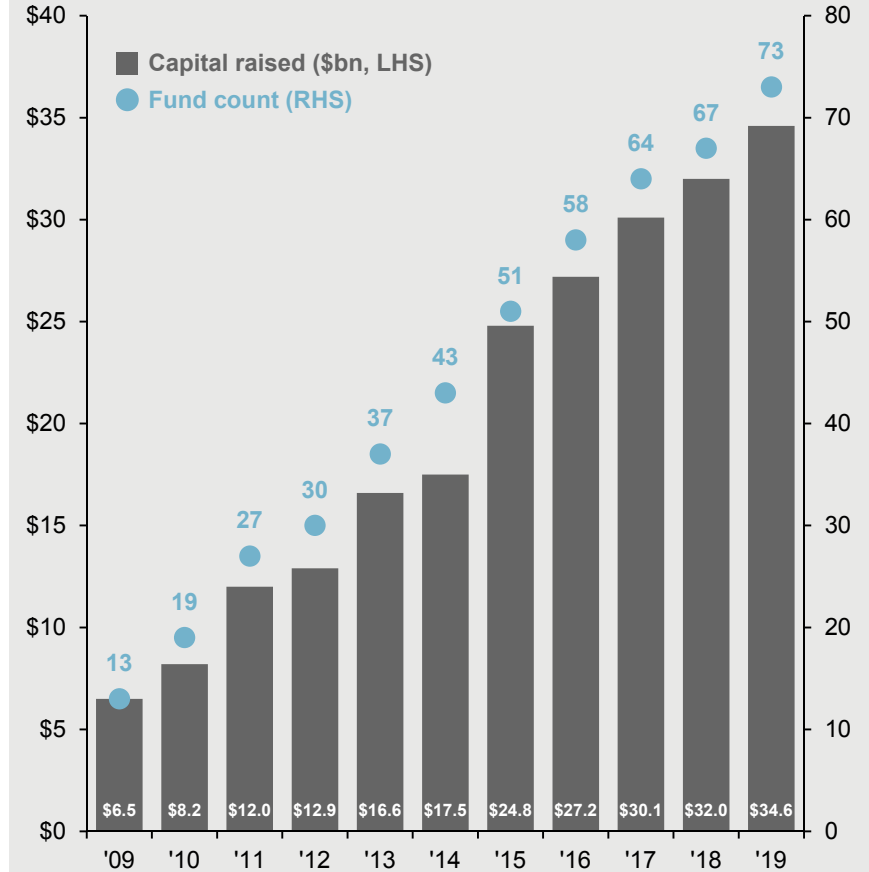
Percent



Source: S&P LCD, Pitchbook, J.P. Morgan Asset Management.
Data is based on availability as of February 29, 2020.

Private debt fundraising by first time funds

Cumulative capital raised and fund count



| 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2010-2019 | |
|----------------------------|-----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|-----------------------------|----------------------------|----------------------------|----------------------------|
| | | | | | | | | | | Ann. | Vol. |
| Global Equities 13.2% | Global Bonds 5.6% | Global Equities 16.8% | Global Equities 23.4% | Global Macro 5.6% | Eq. Market Neutral 4.3% | Distressed 15.1% | Global Equities 24.6% | Merger Arbitrage 3.3% | Global Equities 27.3% | Global Equities 9.4% | Global Equities 13.2% |
| Distressed 12.1% | Merger Arbitrage 1.5% | Relative Value 10.6% | Equity Long/Short 14.3% | Global Equities 4.7% | Merger Arbitrage 3.3% | Global Equities 8.5% | Equity Long/Short 13.3% | Relative Value -0.4% | Equity Long/Short 13.7% | Relative Value 5.2% | Equity Long/Short 8.0% |
| Relative Value 11.4% | Relative Value 0.1% | Distressed 10.1% | Distressed 14.0% | Relative Value 4.0% | Relative Value -0.3% | Relative Value 7.7% | HFRI Composite 8.6% | Eq. Market Neutral -1.0% | HFRI Composite 10.4% | Equity Long/Short 4.7% | Distressed 6.6% |
| Equity Long/Short 10.5% | Distressed -1.8% | Equity Long/Short 7.4% | HFRI Composite 9.1% | Eq. Market Neutral 3.1% | Equity Long/Short -1.0% | Equity Long/Short 5.5% | Global Bonds 7.4% | Global Bonds -1.2% | Relative Value 7.4% | Distressed 4.5% | HFRI Composite 5.5% |
| HFRI Composite 10.2% | Eq. Market Neutral -2.1% | HFRI Composite 6.4% | Relative Value 7.1% | HFRI Composite 3.0% | HFRI Composite -1.1% | HFRI Composite 5.4% | Distressed 6.3% | Distressed -1.7% | Global Bonds 6.8% | HFRI Composite 4.0% | Global Bonds 5.1% |
| Global Macro 8.1% | Global Macro -4.2% | Global Bonds 4.3% | Eq. Market Neutral 6.5% | Equity Long/Short 1.8% | Global Macro -1.3% | Merger Arbitrage 3.6% | Relative Value 5.1% | Global Macro -4.1% | Merger Arbitrage 6.8% | Merger Arbitrage 3.6% | Relative Value 3.8% |
| Global Bonds 5.5% | HFRI Composite -5.3% | Eq. Market Neutral 3.0% | Merger Arbitrage 4.7% | Merger Arbitrage 1.7% | Global Equities -1.8% | Eq. Market Neutral 2.2% | Eq. Market Neutral 4.9% | HFRI Composite -4.7% | Global Macro 6.5% | Eq. Market Neutral 2.6% | Global Macro 3.7% |
| Merger Arbitrage 4.6% | Global Equities -6.9% | Merger Arbitrage 2.8% | Global Macro -0.4% | Global Bonds 0.6% | Global Bonds -3.2% | Global Bonds 2.1% | Merger Arbitrage 4.3% | Equity Long/Short -7.1% | Distressed 2.9% | Global Bonds 2.5% | Eq. Market Neutral 2.7% |
| Eq. Market Neutral 2.9% | Equity Long/Short -8.4% | Global Macro -0.1% | Global Bonds -2.6% | Distressed -1.4% | Distressed -8.1% | Global Macro 1.0% | Global Macro 2.2% | Global Equities -8.9% | Eq. Market Neutral 2.3% | Global Macro 1.3% | Merger Arbitrage 2.3% |

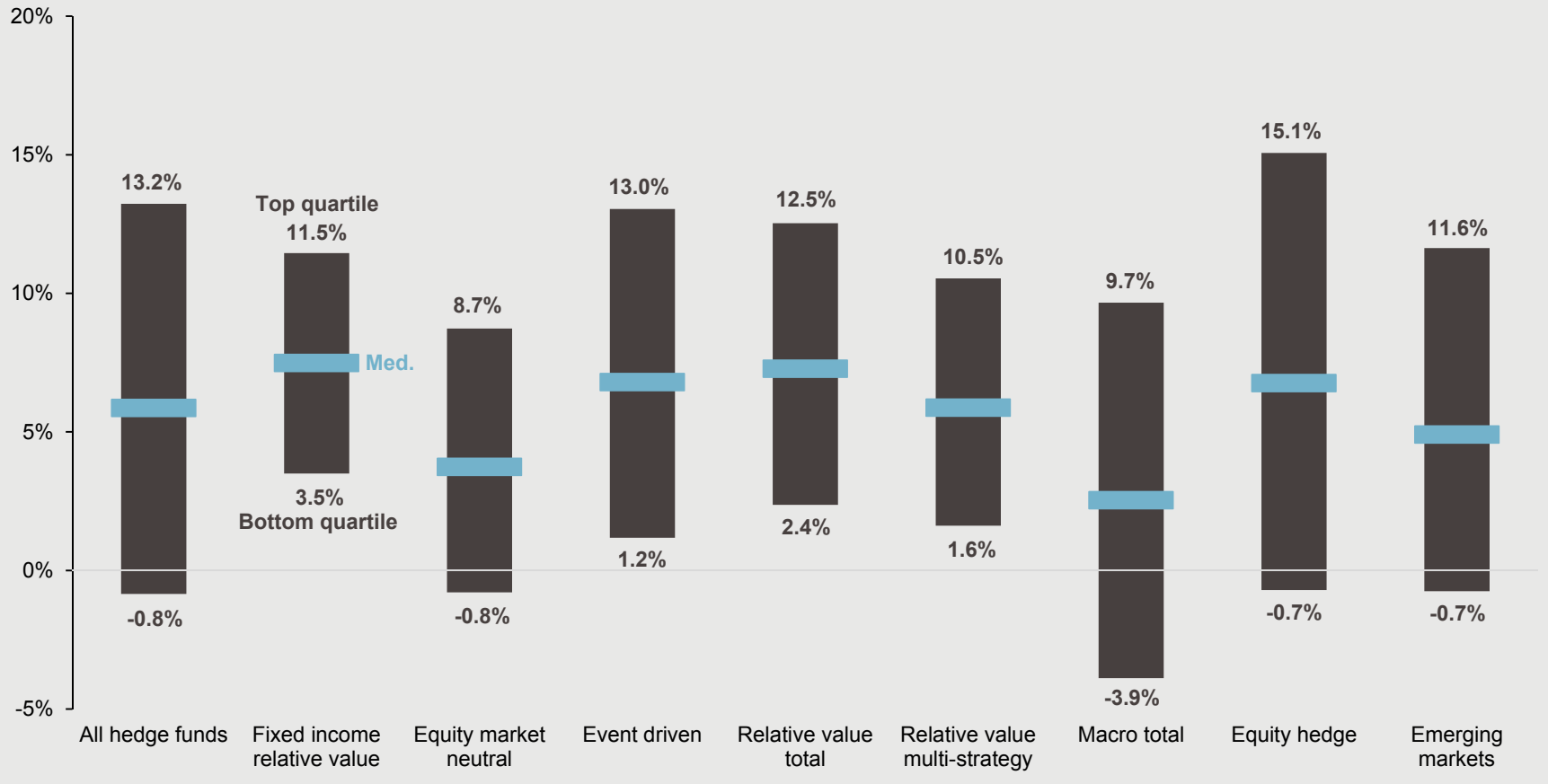
Source: MSCI, Bloomberg Barclays, HFRI, FactSet, J.P. Morgan Asset Management.

Global equities reflect the MSCI AC World Index and global bonds reflect the Bloomberg Barclays Global Aggregate Index. All hedge fund returns are from HFRI. HFRI Composite: HFRI FW Composite Index. Returns may fluctuate as hedge fund reporting occurs on a lag. Please see disclosure pages for index definitions.

Data is based on availability as of February 29, 2020.

Hedge fund manager dispersion

Based on returns from 4Q 2009 – 4Q 2019



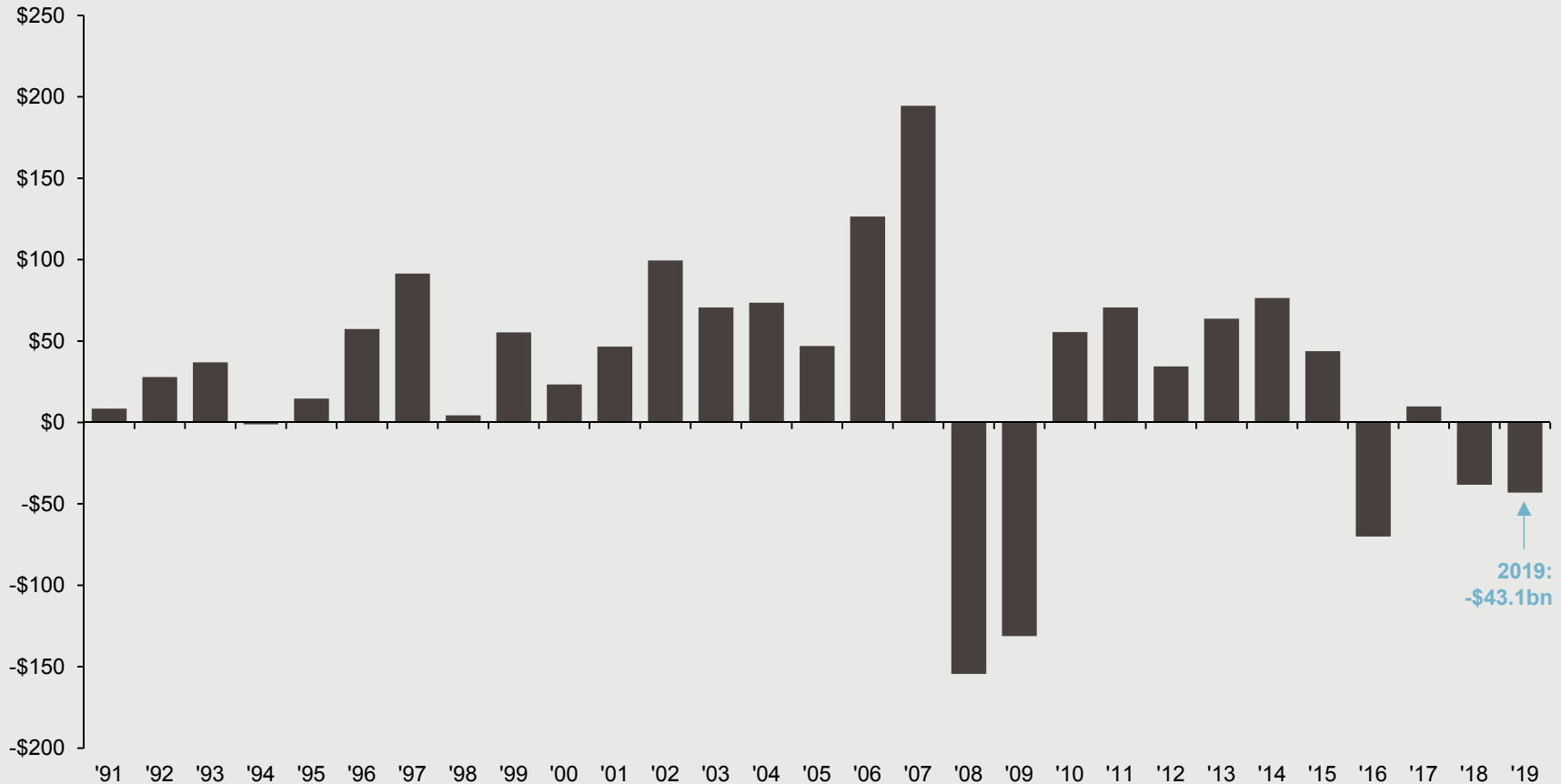
Sources: HFRI, J.P. Morgan Asset Management.

Manager dispersion is based on: 4Q 2009 to 4Q 2019 monthly returns for hedge funds. Blue bar denotes median. All hedge funds: Fund Weighted Composite Index, Equity market neutral: Equity hedge – equity market neutral, Event-driven: Event-Driven (Total), Relative value: Relative Value (Total), Relative value multi-strategy: Relative Value Multi-Strategy, Macro total: Macro (Total), Equity hedge: Equity Hedge (Total), Emerging markets: Emerging Markets Global.

Data is based on availability as of February 29, 2020.

Hedge fund net asset flow

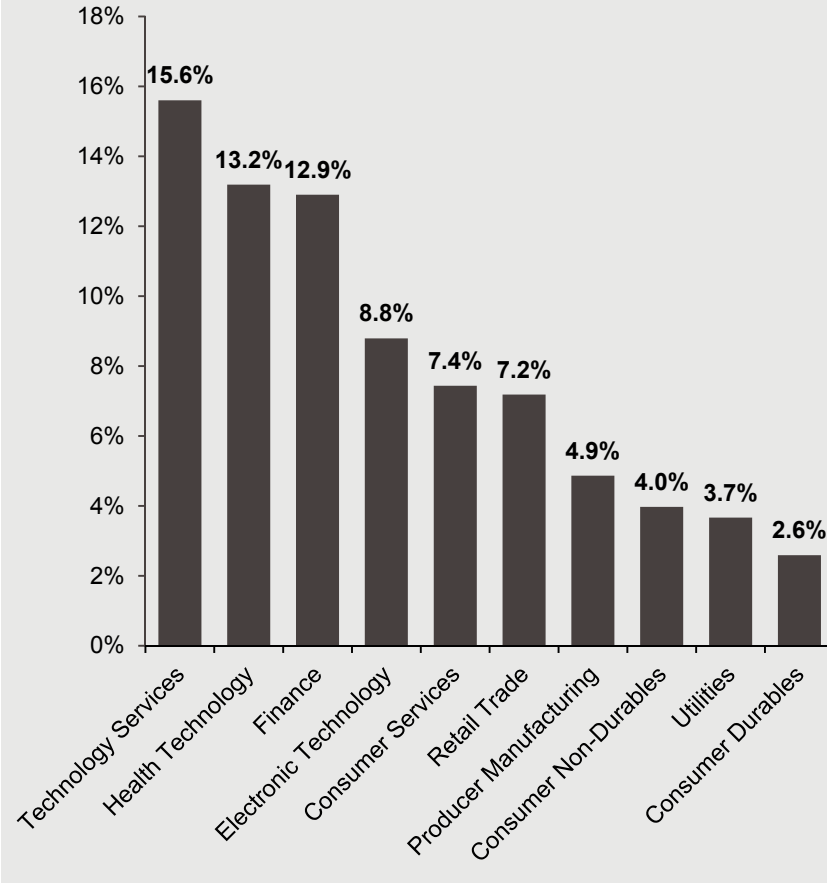
Billions USD



Sources: HFRI, J.P. Morgan Asset Management.
Data is based on availability as of February 29, 2020.

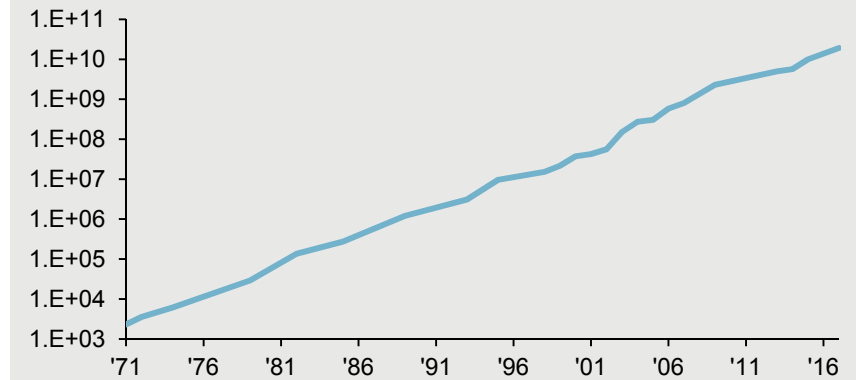
Sector exposure of top 50 hedge funds

% of total portfolio



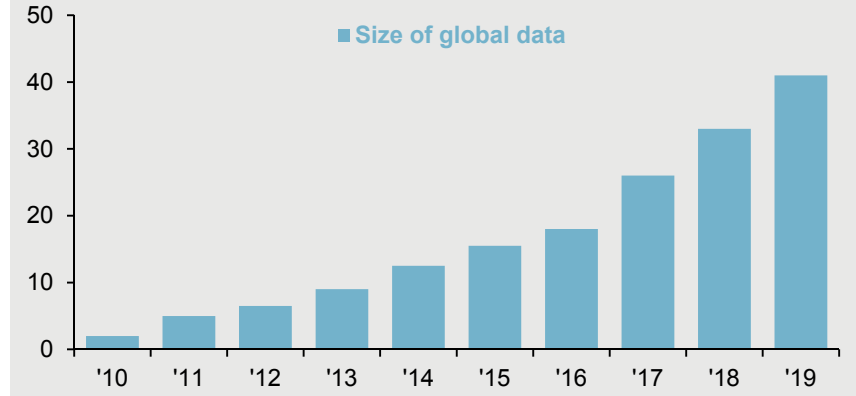
Computing power: transistors per microprocessor

Log



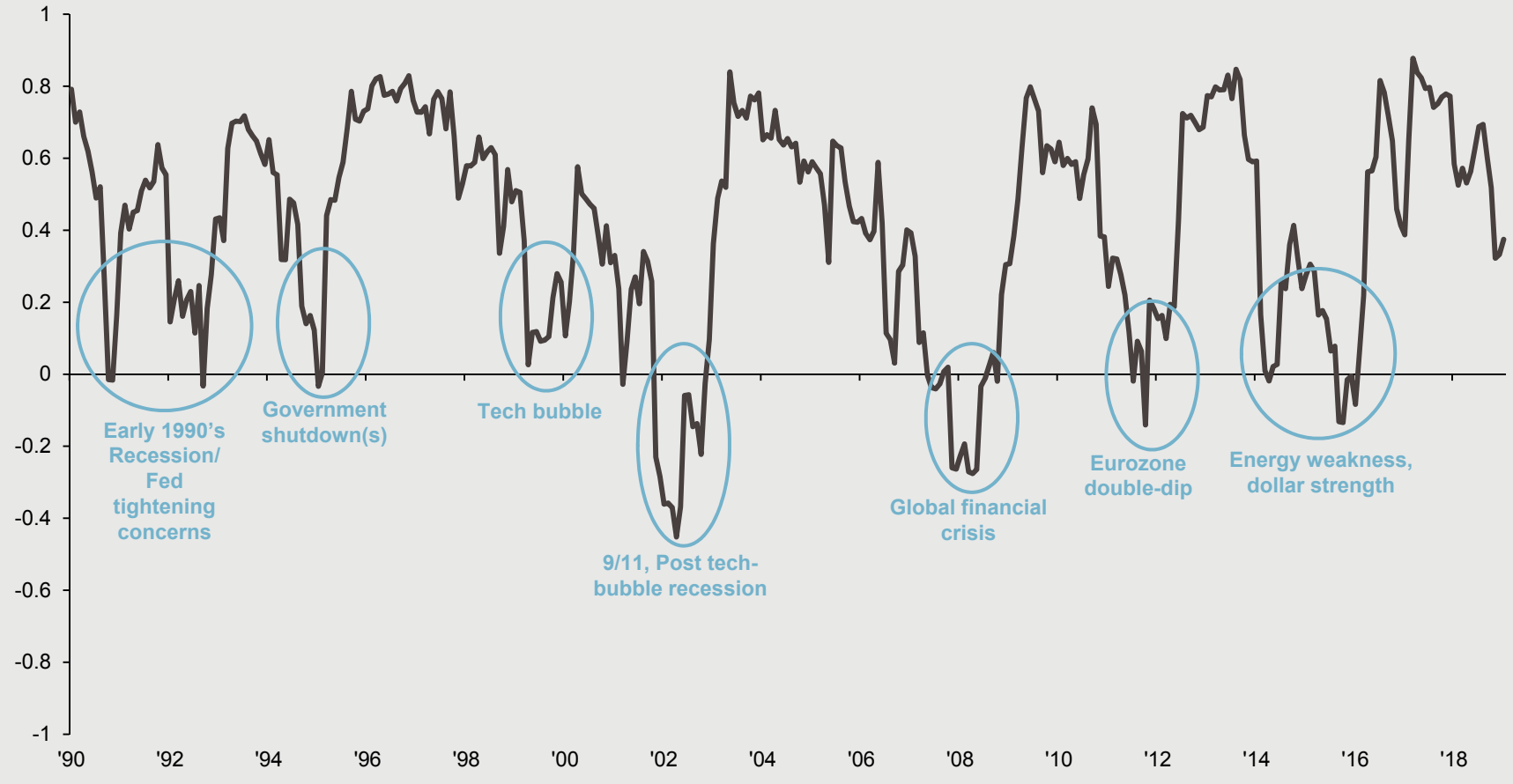
Global data size

Zettabytes



Sources: FactSet, Our World in Data, IDC, J.P. Morgan Asset Management.
 Zettabyte is a measure of digital information storage. One zettabyte is equivalent to a billion terabytes.
 Data is based on availability as of February 29, 2020.

Hedge fund correlation with a 60/40 stock-bond portfolio*
1990 – present, monthly



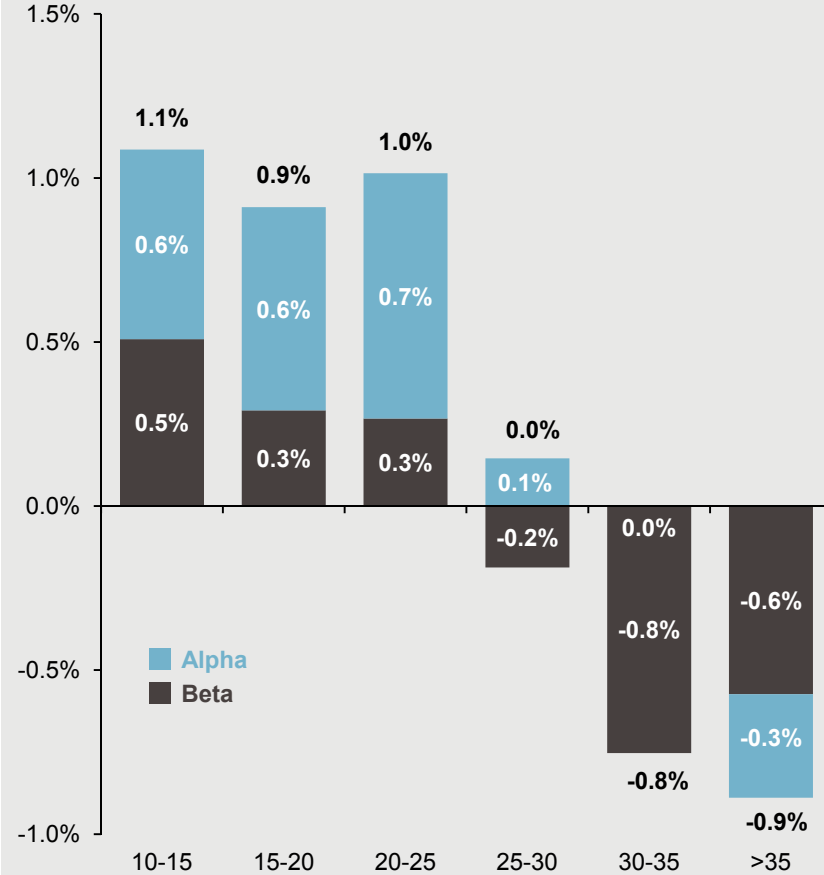
Sources: HFRI, Standard & Poor's, Bloomberg, Barclays, FactSet, J.P. Morgan Asset Management.

*60/40 portfolio is 60% S&P 500 and 40% Bloomberg Barclays U.S. Aggregate. Hedge funds are represented by HFRI Macro.

Data is based on availability as of February 29, 2020.

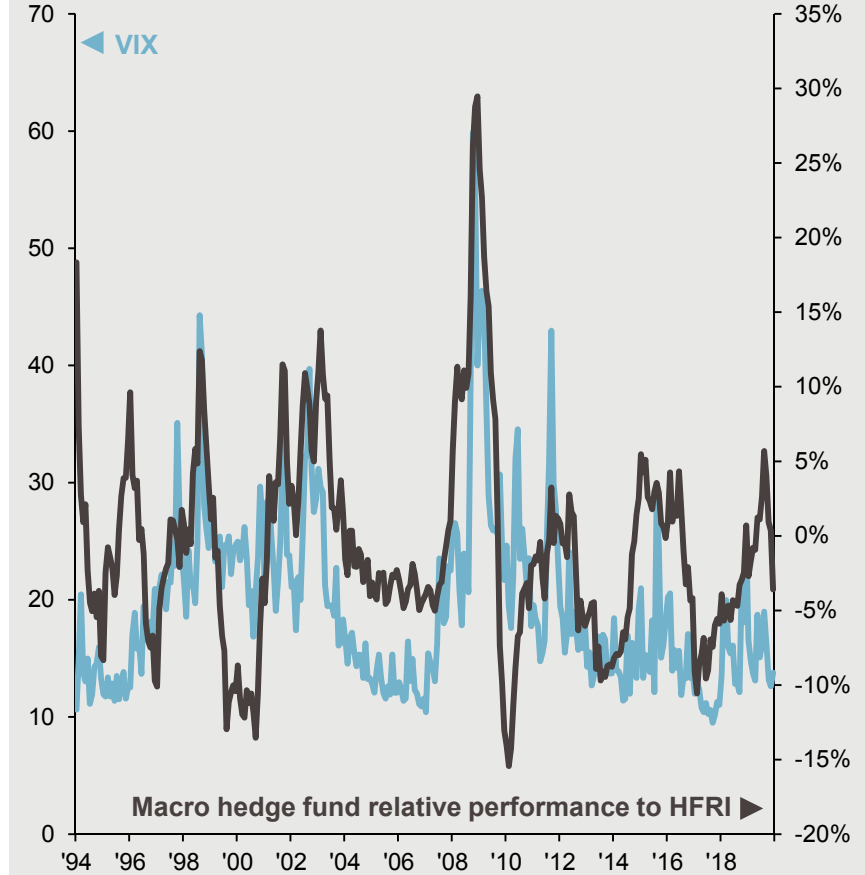
Hedge funds and volatility

Average monthly hedge fund returns by VIX level, 1990 - present



Macro hedge fund relative performance & volatility

VIX index level, y/y change in rel. perf. of HFRI Macro index



Source: HFRI, CBOE, MSCI, FactSet, J.P. Morgan Asset Management.
 Historical beta is based on regression analysis, where the HFRI is the dependent variable and the MSCI AC World Index is the independent variable.
 Monthly VIX reading is an average. Numbers may not sum to 100% due to rounding.
 Data is based on availability as of February 29, 2020.

Alpha – Is the difference between an investment's return and its expected return, given its level of beta.

Accredited investor – Defined by Rule 501 of Regulation D, an individual (i.e. non-corporate) "accredited investor" is either a natural person who has individual net worth, or joint net worth with the person's spouse, that exceeds \$1 million at the time of the purchase OR a natural person with income exceeding \$200,000 in each of the two most recent years or joint income with a spouse exceeding \$300,000 for those years and a reasonable expectation of the same income level in the current year. For the complete definition of accredited investor, see the SEC website.

Capital commitment – A Limited Partner's obligation to provide a specific amount of capital to a Closed-end Fund (defined below) for investments. The Capital Commitment is "drawn down" or "called" over time, meaning a portion of the commitment must be wired to the Closed-end Fund by a set date.

Capital called – The amount of capital wired to a fund that is "drawn down" over time as the General Partner selects investments.

Carried interest (aka incentive fee) – A fee paid to a fund manager for generating returns over a benchmark; calculated as a percentage of investment profits over a hurdle rate and charged in addition to a management fee. In Private Equity, carried interest (typically up to 20% of the profits) becomes payable once the investors have achieved repayment of their original investment in the fund, plus a defined hurdle rate.

Catch-up – This is a common term of the private equity partnership agreement. Once the general partner provides its limited partners with their preferred return, if any, it then typically enters a catch-up period in which it receives the majority or all of the profits until the agreed upon profit-split, as determined by the carried interest, is reached.

Clawback – A clawback obligation represents the general partner's promise that, over the life of the fund, the managers will not receive a greater share of the fund's distributions than they bargained for. Generally, this means that the general partner may not keep distributions representing more than a specified percentage (e.g., 20%) of the fund's cumulative profits, if any. When triggered, the clawback will require that the general partner return to the fund's limited partners an amount equal to what is determined to be "excess" distributions.

Closed-end fund – A fund that has a finite capital raising period and stated term (i.e. 5 years, 10 years, etc.). Clients will have the ability to commit to the fund during the set fundraising period, after which point the fund will be closed to new investors. Unlike an open-ended fund, there is limited flexibility on when a client may invest and there is no liquidity/redemptions. Clients who invest are obligated to remain in the fund for the duration of the term; they will be required to fulfill capital calls during the stated commitment period and will receive periodic distributions based on underlying monetization of investments.

Commitment period – The period of time within which the fund can make investments as established in the Limited Partnership Agreement ("LPA"), meaning the governing document, for the fund.

Direct co-investment – An investment made directly in a single underlying asset of a fund. Example: The General Partner elects to invest in an operating company alongside a fund.

Dispersion – Difference between the best-performing and worst-performing strategies.

Distressed – A financial instrument in a company that is near or is currently going through bankruptcy. This usually results from a company's inability to meet its financial obligations. As a result, these financial instruments have suffered a substantial reduction in value. Distressed securities can include common and preferred shares, bank debt, trade claims (goods owed) and corporate bonds.

Distributions – The total proceeds distributed by the fund to the Limited Partners, which may include both return of capital and gain distributions.

General partner – The managing partner of a Limited Partnership. The General Partner is managed by the asset management team responsible for making fund investments (i.e., the intermediary between investors with capital and businesses seeking capital to grow).

Gross IRR – The dollar-weighted internal rate of return, before management fees and carried interest generated by the fund.

Hedge Fund strategies:

Relative Value/Arbitrage involves the simultaneous purchase and sale of similar securities to exploit pricing differentials. Strategies in this sector offer potential to generate consistent returns while minimizing directional risk.

Opportunistic/Macro strategies involve investments in a wide variety of strategies and instruments, which often have a directional stance based on the manager's global macroeconomic views.

Long/Short (L/S) Equity involves long and/or short positions in equity securities deemed to be under- or overvalued, respectively. Exposures to sectors, geographies, and market capitalizations are often flexible and will change over time.

Merger Arbitrage/Event Driven strategies invest in opportunities created by significant corporate transactions and events which tend to alter a company's financial structure or operating strategy.

Distressed Securities invests in debt and equity securities of firms in reorganization or bankruptcy.

High watermark – The highest peak in value that an investment fund has reached. This term is often used in the context of fund manager compensation. For example, a \$1,000,000 investment is made in year 1 and the fund declines by 50%, leaving \$500,000 in the fund. In year 2, the fund returns 100%, bringing the investment value back to \$1,000,000. If a fund has a high watermark, it will not take incentive fees on the return in year 2, since the investment has never grown. The fund will only take incentive fees if the investment grows above the initial level of \$1,000,000.

Hurdle rate – The rate of return that the fund manager must meet before collecting incentive fees.

Internal rate of return (IRR) – The dollar-weighted internal rate of return. This return considers the daily timing of cash flows and cumulative fair stated value, as of the end of the reported period.

J-Curve effect – Occurs when funds experience negative returns for the first several years. This is a common experience, as the early years of the fund include capital drawdowns and an investment portfolio that has yet to mature. If the fund is well managed, it will eventually recover from its initial losses and the returns will form a J-curve: losses in the beginning dip down below the initial value, and later returns show profits above the initial level.

K-1 – Tax document issued for an investment in partnership interests to report your share of income, deductions and credits. (Note that Private Investments generally issue a Schedule K-1 instead of a Form 1099 for tax reporting. K-1s may at times be issued later than 1099s, requiring investors to file for an extension).

Limited partner – An investor in a Limited Partnership, which is a form of legal entity used for certain hedge funds, private equity funds and real estate funds.

Management fee – Fee paid to a fund manager for managing the fund; typically calculated as a percentage of assets under management.

Mezzanine finance – Loan finance that is half-way between equity and secured debt, either unsecured or with junior access to security. A mezzanine fund is a fund focusing on mezzanine financing.

Multiple of Invested Capital (MOIC) – Calculation performed by adding the remaining (reported) value and the distributions received (cash out) and subsequently dividing that amount by the total capital contributed (cash in).

Net asset value (NAV) – This is the current fair stated value for each of the investments, as reported by the administrator of the fund.

Net IRR – The dollar-weighted internal rate of return, net of management fees and carried interest generated by the fund. This return considers the daily timing of all cash flows and the cumulative fair stated value, as of the end of the reported period.

Open-ended fund – As it relates to private alternatives (not mutual fund structure), an open-ended fund is a fund that has no stated term or maturity and allows clients to invest and redeem on an ongoing basis. The frequency of investments (aka subscriptions) and / or redemptions may vary. Redemptions from open-ended private alternative funds generally require advance notice in writing.

Pari Passu – At an equal rate or pace, without preference.

Portfolio company – A business entity that has secured at least one round of financing from one or more private equity funds. A company in which a given fund has invested.

Post-money valuation – The valuation of a company immediately after the most recent round of financing. For example, a venture capitalist may invest \$3.5 million in a company valued at \$2 million “pre-money” (before the investment was made). As a result, the startup will have a post money valuation of \$5.5 million.

Pre-money valuation – The valuation of a company prior to a round of investment. This amount is determined by using various calculation methods, such as multiples to earnings or comparable to other private and/or public companies.

Preferred return – Also known as Hurdle Rate.

Private equity – Equity capital invested in a private company through a negotiated process.

Primary investment – An investment made in a newly formed limited partnership.

Real estate investment trust (REITs) – Stocks listed on an exchange that represent an interest in a pool of real estate properties.

Realized value – The amount of capital extracted from an investment.

Reported/remaining value – The current stated value for each of the investments in a fund, as reported by the General Partner of the fund.

Return on equity (RoE) - Amount of net income returned as a percentage of shareholders' equity.

Secondary market investment – The buying and selling of pre-existing investor commitments.

Seed money – The first round of capital for a start-up business. Seed money usually takes the structure of a loan or an investment in preferred stock or convertible bonds, although sometimes it is common stock. Seed money provides startup companies with the capital required for their initial development and growth. Angel investors and early-stage venture capital funds often provide seed money.

Tax documents – See K-1.

Total value – The combination of market value and realized value of an investment. Shows the total worth of an investment.

Unfunded commitment – Money that has been committed to an investment but not yet transferred to the General Partner.

Venture capital – A specialized form of private equity, characterized chiefly by high-risk investment in new or young companies following a growth path in technology and other value-added sectors.

Vintage year – The year of fund formation and first draw-down of capital.

Write-down – A reduction in the value of an investment.

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