



# Guide to Alternatives<sup>®</sup>

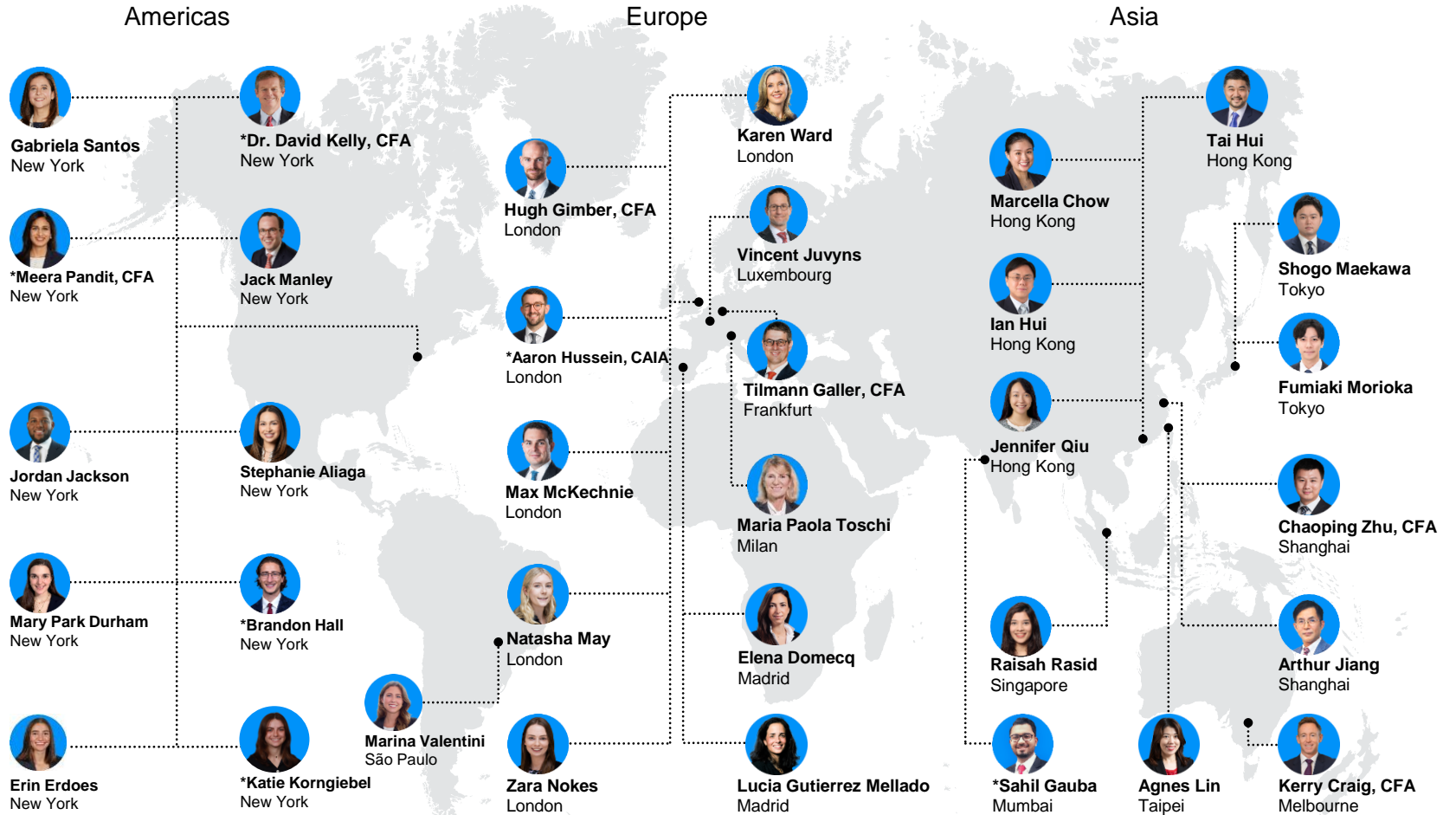
4Q 2024

As of November 30, 2024





# Global Market Insights Strategy Team



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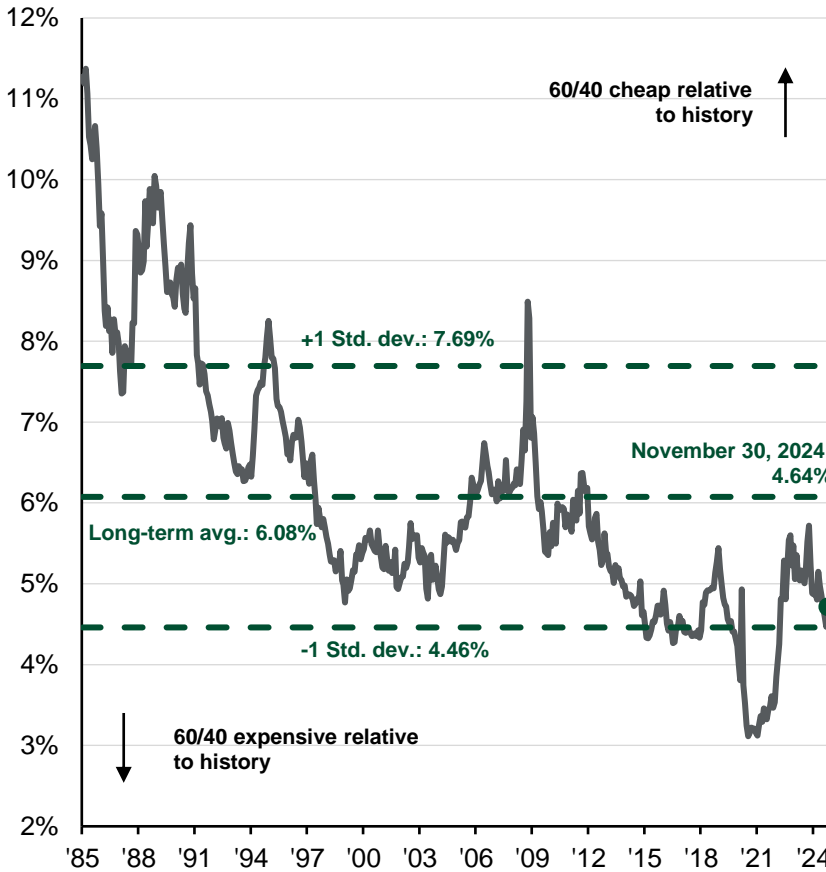


# Earnings/coupon yield and the 60/40

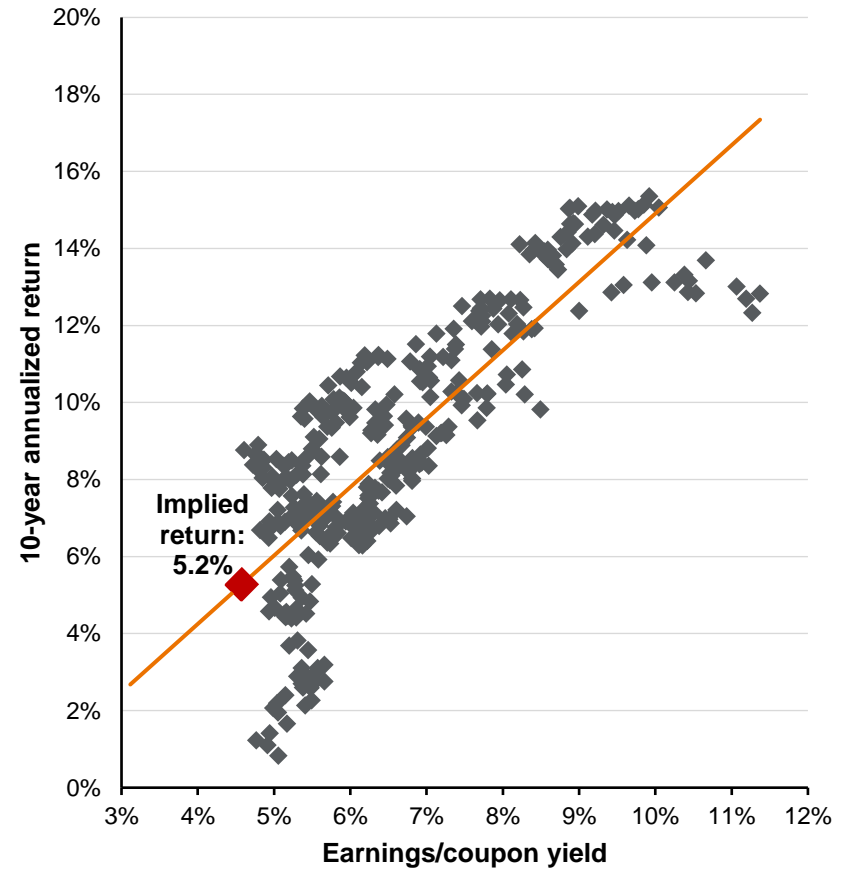
Alternatives in portfolios

### Earnings/coupon yield on a 60/40 portfolio

Blended S&P 500 forward E/P ratio and Bloomberg U.S. Agg. YTW



### 60/40 earnings/coupon yield and subsequent 10-year annualized returns: Jan. 1985 – Nov. 2014



Source: Standard & Poor's, Bloomberg, IBES, FactSet, Thomas Reuters J.P. Morgan Asset Management. Valuation is calculated by summing 60% weight to earnings yield on stocks (inverse of forward P/E) and a 40% weight to the yield-to-worst on the U.S. Aggregate. Earnings yield is the forward earnings yield (consensus analyst estimates of EPS over the next 12 months divided by price) as provided by IBES since December 1984 and by FactSet since January 2022. Percentages may not sum due to rounding. Returns are based on a 60% weighting in the S&P 500 Total Return Index and a 40% weighting in the U.S. Aggregate Total Return index. 60/40 is rebalanced annually. Returns are 120-month annualized total returns, measured monthly, beginning December 31, 1984. Data are based on availability as of November 30, 2024.

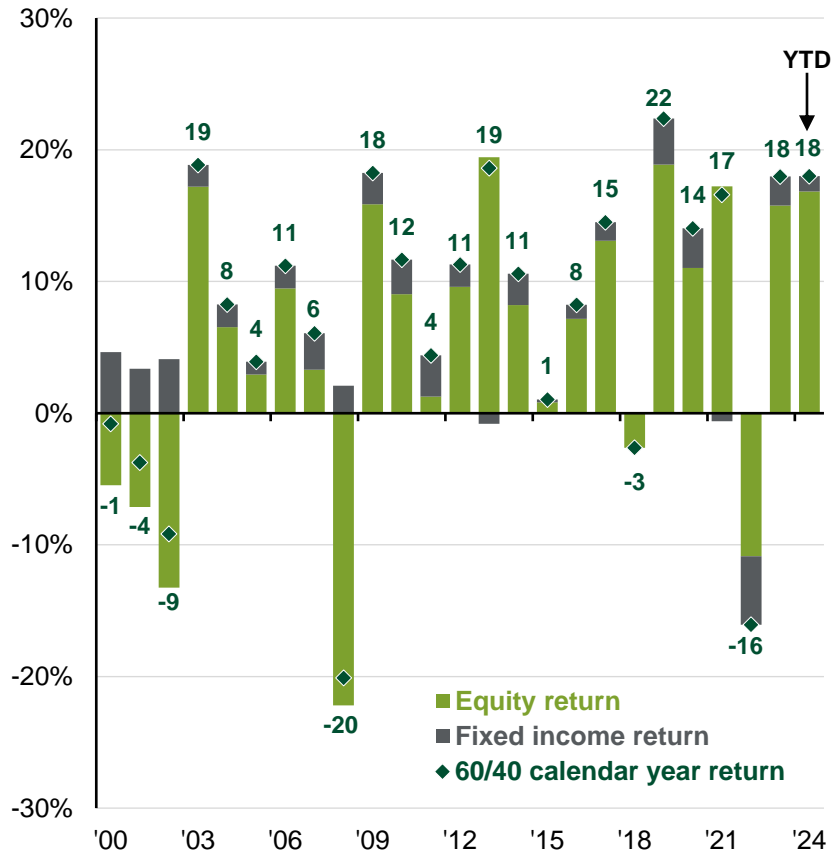


# 60/40 returns and stock-bond correlation

Alternatives in portfolios

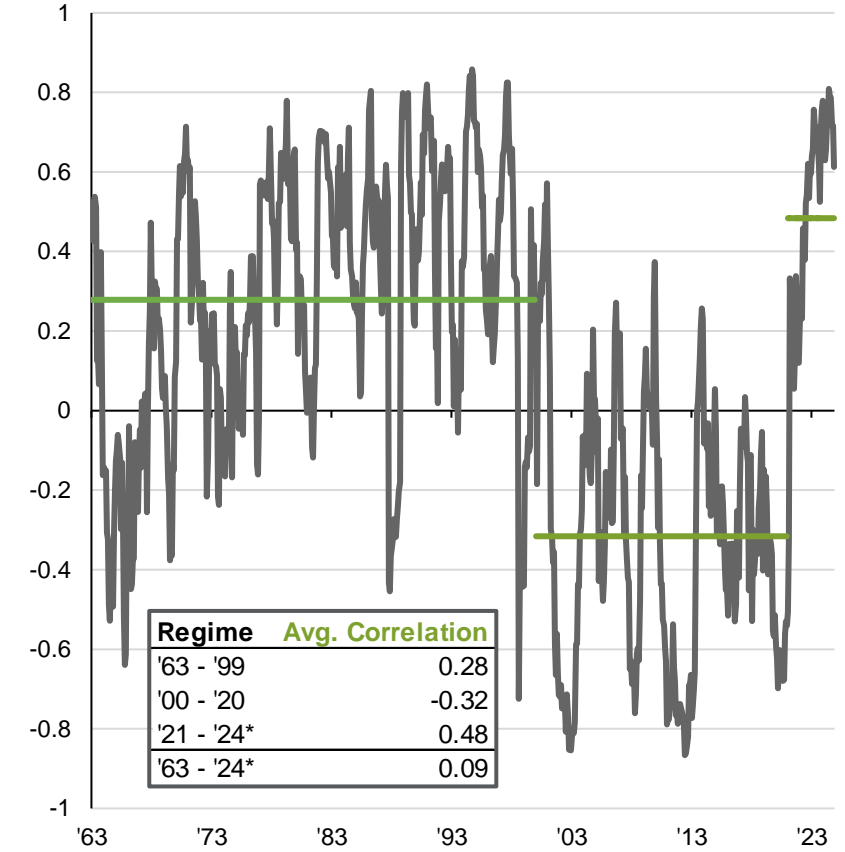
## 60/40 annual return decomposition

%, total return



## S&P 500 / U.S. 10-year Treasury correlation

Rolling 12-month correlation based on monthly total returns



Source: Bloomberg, Haver Analytics, FactSet, LSEG, Standard & Poor's, J.P. Morgan Asset Management.  
 (Left) The 60/40 portfolio is 60% invested in the S&P 500 Total Return Index and 40% invested in the Bloomberg U.S. Aggregate Total Return Index.  
 \*2024 correlations are through 3Q24.  
 Data are based on availability as of November 30, 2024.



# 60/40 portfolio income generation

Alternatives in portfolios

## 60/40 portfolio real yield

60/40 portfolio yield minus the y/y % change in core CPI, monthly



Source: Bloomberg, FactSet, Standard & Poor's, J.P. Morgan Asset Management. 60/40 portfolio nominal yield is calculated by taking the sum of the S&P 500's dividend yield and the yield-to-worst of the Bloomberg U.S. Aggregate multiplied by their respective weights in the portfolio. Analysis is based on month-end data. For the current month, we use the prior month's core CPI figures until the latest data are available. Data are based on availability as of November 30, 2024.

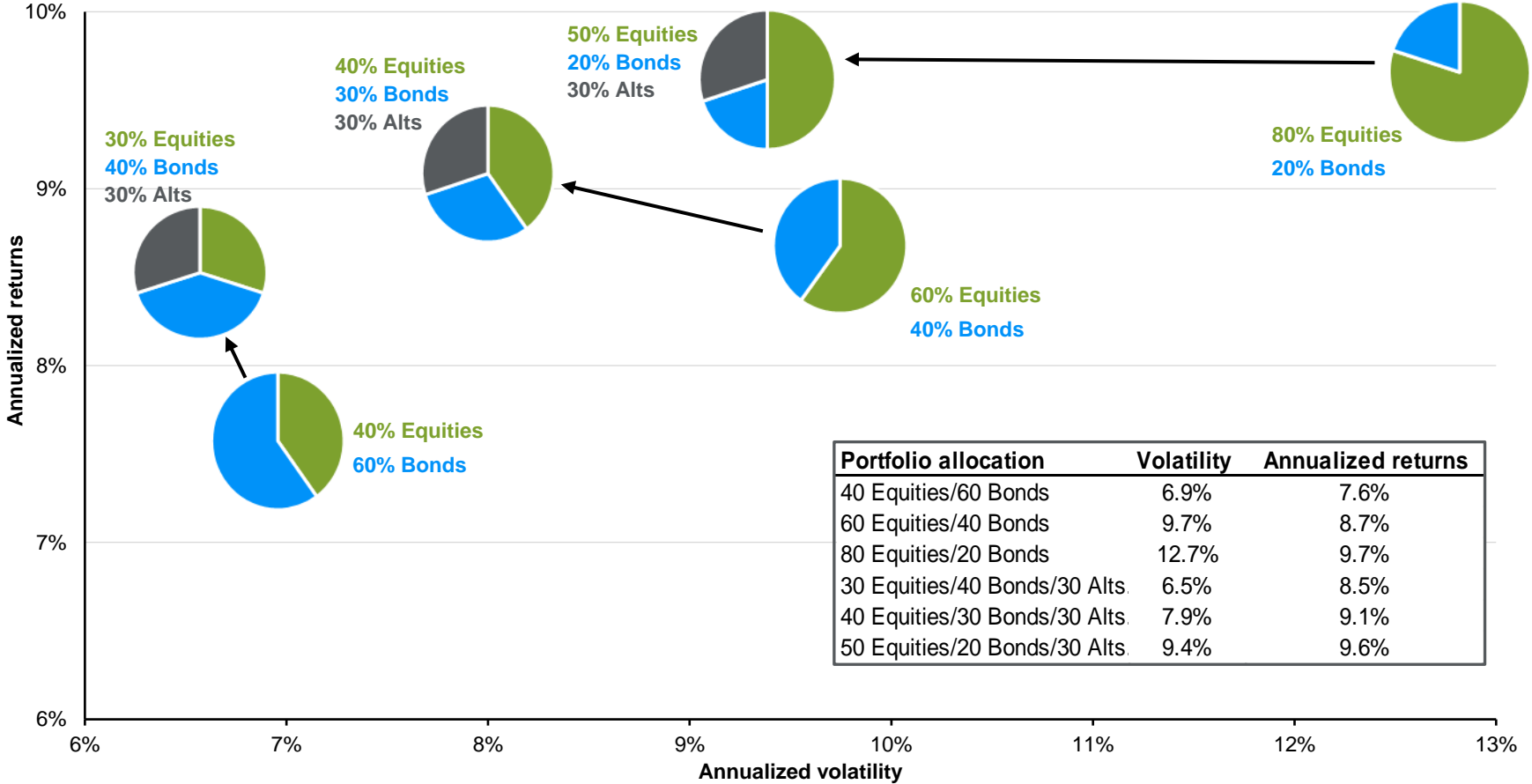


# Portfolio diversification

Alternatives in portfolios

## Alternatives and portfolio risk/return

Annualized volatility and returns, 1Q90 – 2Q24



Source: Bloomberg, Burgiss, HFRI, NCREIF, Standard & Poor's, FactSet, J.P. Morgan Asset Management. Alts include hedge funds, real estate, and private equity, with each receiving an equal weight. Portfolios are rebalanced at the start of the year. Equities are represented by the S&P 500 Total Return Index. Bonds are represented by the Bloomberg U.S. Aggregate Total Return Index. Volatility calculated as the annualized standard deviation of quarterly returns. Data are based on availability as of November 30, 2024.

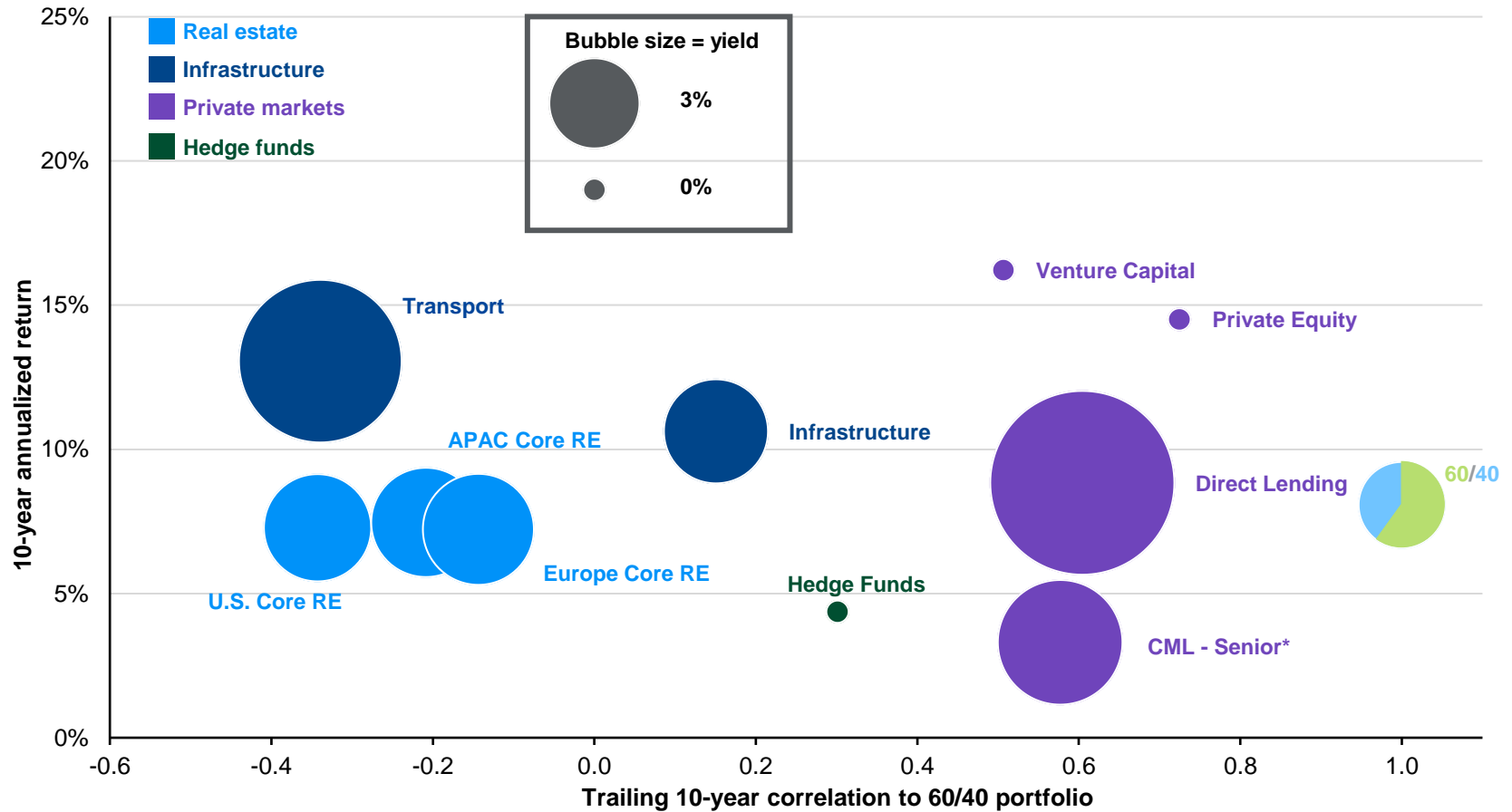


# Alternatives: Correlations, returns and yields

Alternatives in portfolios

## Correlations, returns and yields

10-year correlations and 10-year annualized total returns, 3Q14 – 2Q24



Source: Burgiss, Cliffwater, Gilberto-Levy, HFRI, MSCI, NCREIF, FactSet, J.P. Morgan Asset Management. Correlations are based on quarterly returns over the past 10 years from 3Q14-2Q24. A 60/40 portfolio is comprised of 60% stocks and 40% bonds. Stocks are represented by the S&P 500 Total Return Index. Bonds are represented by the Bloomberg U.S. Aggregate Total Return Index. 10-year annualized returns are calculated from 1Q14-4Q23. Indices and data used for alternative asset class returns and yields are as described on pages 12, 13, and 17 of the *Guide to Alternatives*. Yields are based on latest available data as described on page 12 of the *Guide to Alternatives*. \*CML is commercial mortgage loans. Data are based on availability as of November 30, 2024.



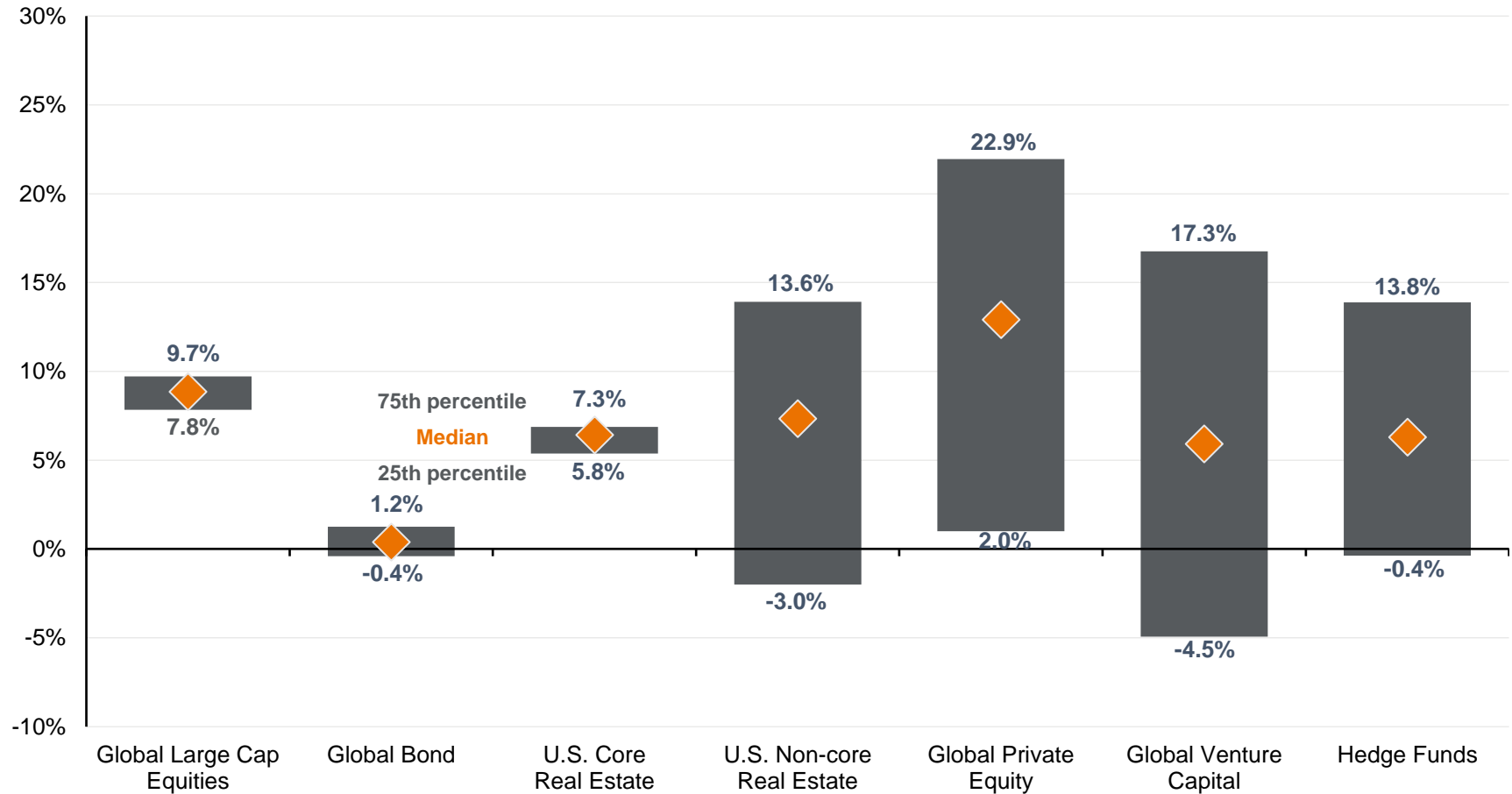


# Alternatives and manager selection

Alternatives in portfolios

## Public and private manager dispersion

Based on returns from 4Q14 – 3Q24\*



Source: Burgiss, NCREIF, Morningstar, PivotalPath, J.P. Morgan Asset Management.

Global Large Cap Equities and Global Bond are based on the Morningstar Global Large Stock Blend and Global Bond (not hedged) categories respectively. \*Manager dispersion is based on annual returns over a 10-year period ending 3Q 2024 for Hedge Funds, U.S. Core Real Estate, Global Large Cap Equities and Global Bond. U.S. Non-core Real Estate, Global Private Equity and Global Venture Capital are represented by the 10-year internal rate of return (IRR) ending 2Q 2024.

Data are based on availability as of November 30, 2024.

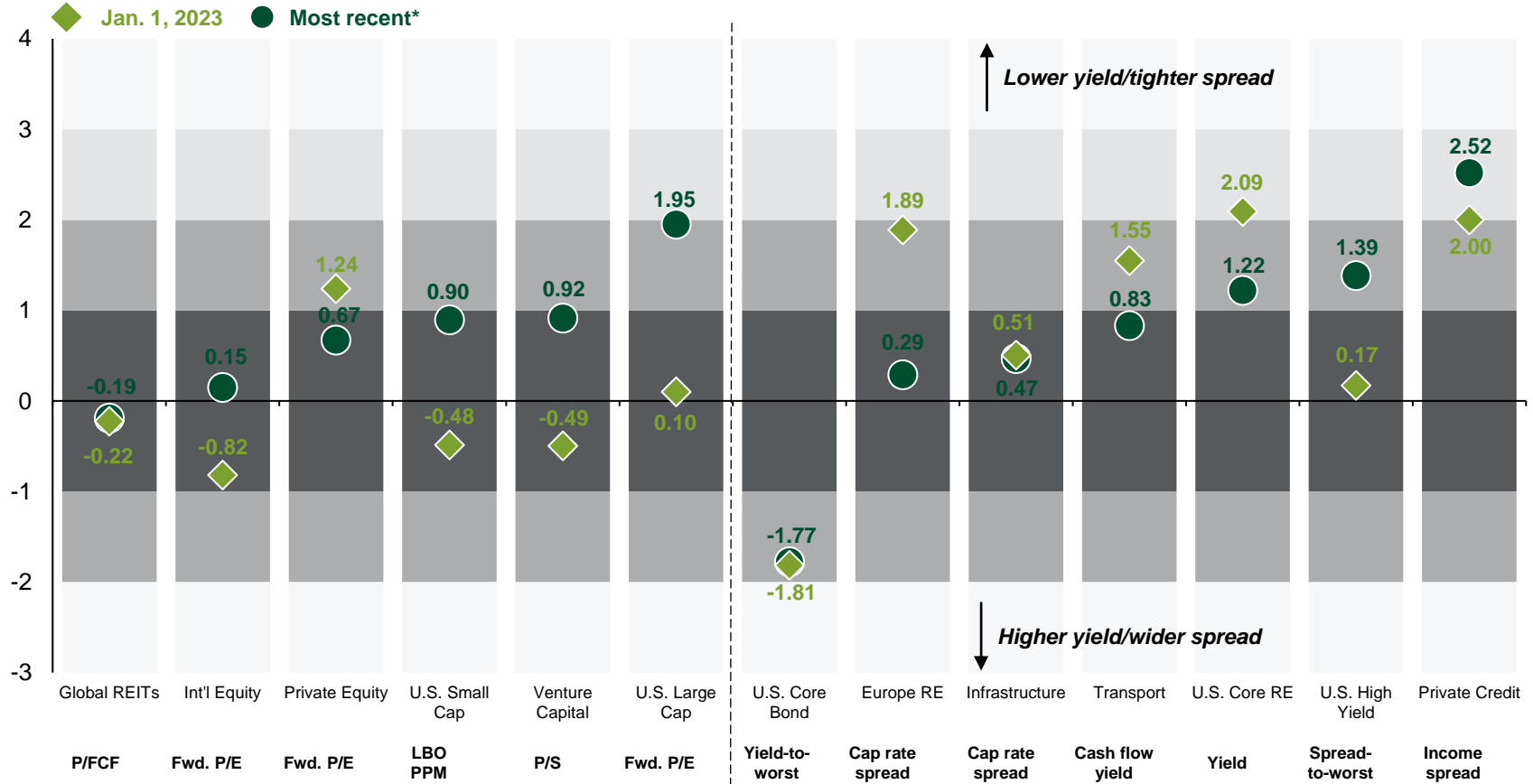


# Valuations monitor

Alternatives in portfolios

## Asset class valuations

Z-scores based on average valuations since March 2009\*



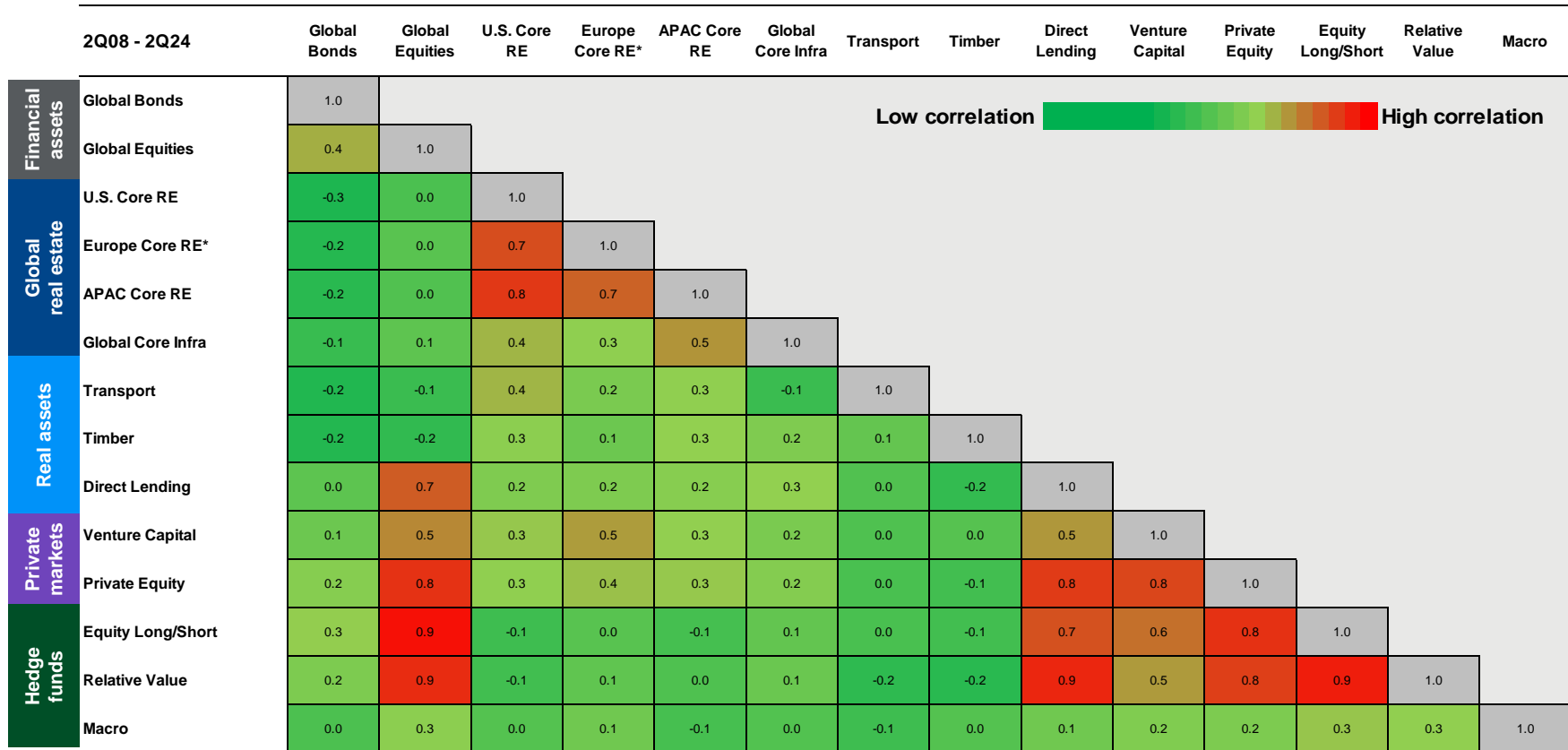
Source: Burgiss, Cliffwater, FactSet, Jay Ritter, Cordell Eminent Scholar, Eugene F. Brigham Department of Finance, Insurance, Real Estate Warrington College of Business, University of Florida, LCD, PitchBook, MSCI, NCREIF, RCA, J.P. Morgan Markets, J.P. Morgan Asset Management. All alternative asset classes valuation measures are quarterly, except VC, which is annual. Public market asset class valuations are monthly. Equity valuations are measured using next twelve months price-to-earnings ratios. Fixed income valuations are measured using yield-to-worst and spread-to-worst. Global REITs valuations are measured using price-to-free cash (P/FCF) flow multiples. Real estate valuations are measured using the spread between transaction-based cap rates and the yield on the appropriate 10-year government bond. Private equity valuations are determined using leveraged buyout purchase price multiples (LBO PPM). Private credit valuations are measured using the spread between quarterly income returns and 3-month SOFR (LIBOR pre-2019). VC valuations measured using the median VC-backed IPO price-to-sales (P/S) ratio. Infrastructure valuations are measured using 12-month trailing infrastructure income returns. \*VC average valuation is since 12/31/2009. Global REITs average valuation is since 1/31/2010. Data are based on availability as of November 30, 2024.



# Public and private market correlations

Alternatives in portfolios

## Public and private market correlations Quarterly returns



Source: Bloomberg, Burgiss, Cliffwater, FTSE, HFRI, MSCI, NCREIF, J.P. Morgan Asset Management. \*Europe Core RE includes continental Europe. Private Equity and Venture Capital are time weighted returns from Burgiss. RE – real estate. Global equities: MSCI AC World Index. Global Bonds: Bloomberg Global Aggregate Index. Global REITs: FTSE EPRA NAREIT Global REITs Index. U.S. Core Real Estate: NCREIF Property Index – Open End Diversified Core Equity component. Europe Core Real Estate: MSCI Global Property Fund Index – Continental Europe. Asia Pacific (APAC) Core Real Estate: MSCI Global Property Fund Index – Asia-Pacific. Global infrastructure (Infra): MSCI Global Private Infrastructure Asset Index. U.S. Direct Lending: Cliffwater Direct Lending Index. Timber: NCREIF Timberland Property Index (U.S.). Hedge fund indices are from HFRI. Transport: returns are derived from a J.P. Morgan Asset Management index. All correlation coefficients are calculated based on quarterly total return data for the period 6/30/2008 to 6/30/2024. Returns are denominated in USD.

Data are based on availability as of November 30, 2024.

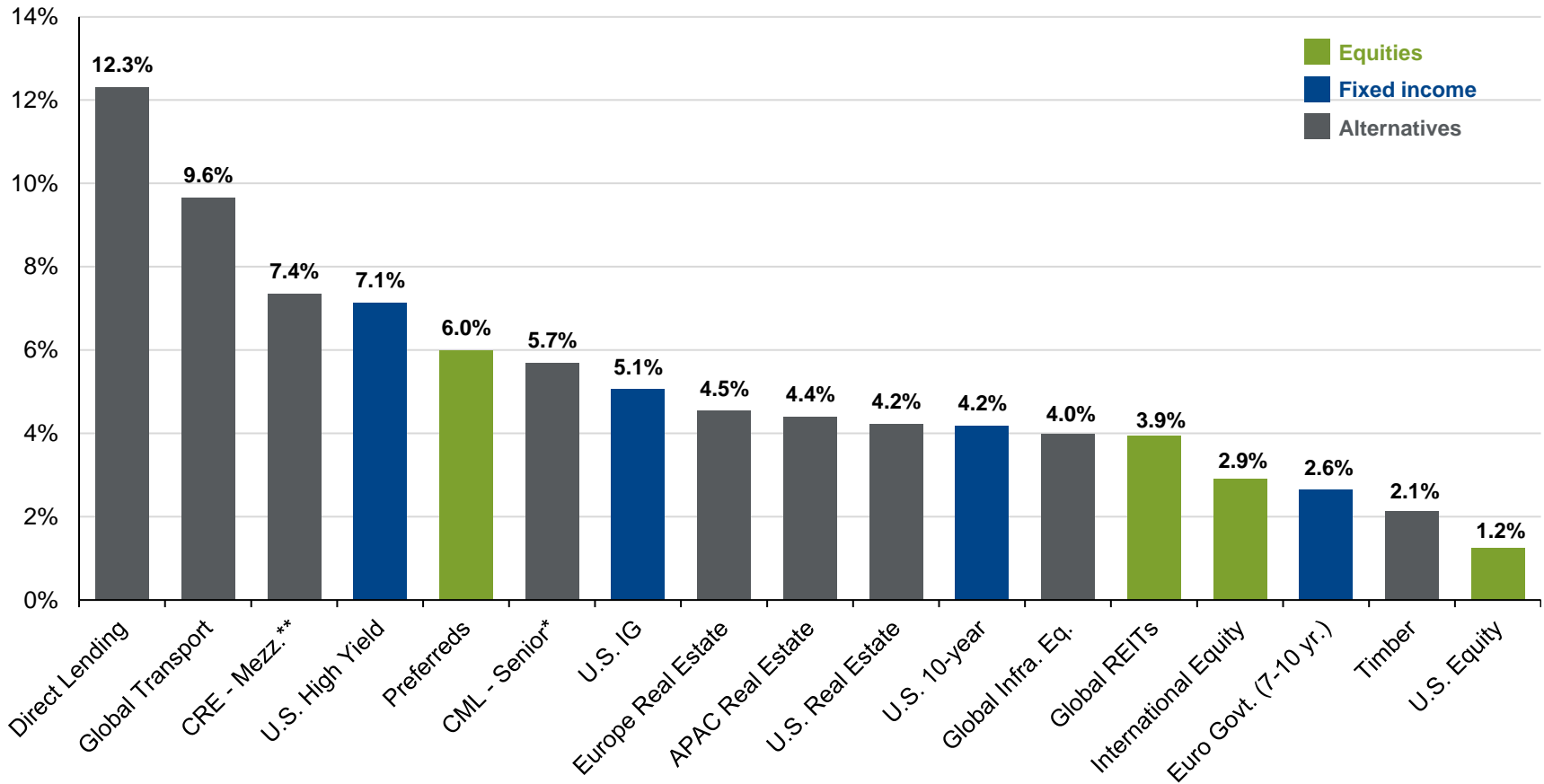


# Yield alternatives

Alternatives in portfolios

## Asset class yields

Percent



Source: BAML, Bloomberg, Clarkson, Cliffwater, Drewry Maritime Consultants, Federal Reserve, FTSE, MSCI, NCREIF, FactSet, Wells Fargo J.P. Morgan Asset Management. \*CML is commercial mortgage loans. \*\*CRE - Mezz is mezzanine commercial real estate debt. Equities and fixed income yields are as of 11/30/2024. Alternative yields are as of 6/30/2024, except Global Transport and Timber, which are as of 9/30/2024; CRE - Mezz, which is as of 11/30/2024; and CML - Senior, which is as of 9/30/2024. CML - Senior: Market-capitalization weighted average for all mortgages in the Gilberto-Levy Commercial Mortgage Index. Mezzanine commercial mortgage loans yield is derived from a J.P. Morgan Survey and U.S. Treasuries of a similar duration. 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, and are based on a historical 15-year average. 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; Direct Lending: Cliffwater Direct Lending Index; U.S. High Yield: Bloomberg U.S. Aggregate Corporate High Yield; Global Infrastructure: MSCI Global Private Infrastructure Asset 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 Real Estate: Market weighted-avg. of MSCI Global Property Fund Indices - U.K. & Cont. Europe; U.S. and Asia Pacific (APAC) core real estate: MSCI Global Property Fund Index . Euro Govt. (7-10 yr.): Bloomberg Euro Aggregate Government - Treasury (7-10Y); Timber: NCREIF Timberland Index (U.S.) - EBITDA Return. Data are based on availability as of November 30, 2024.

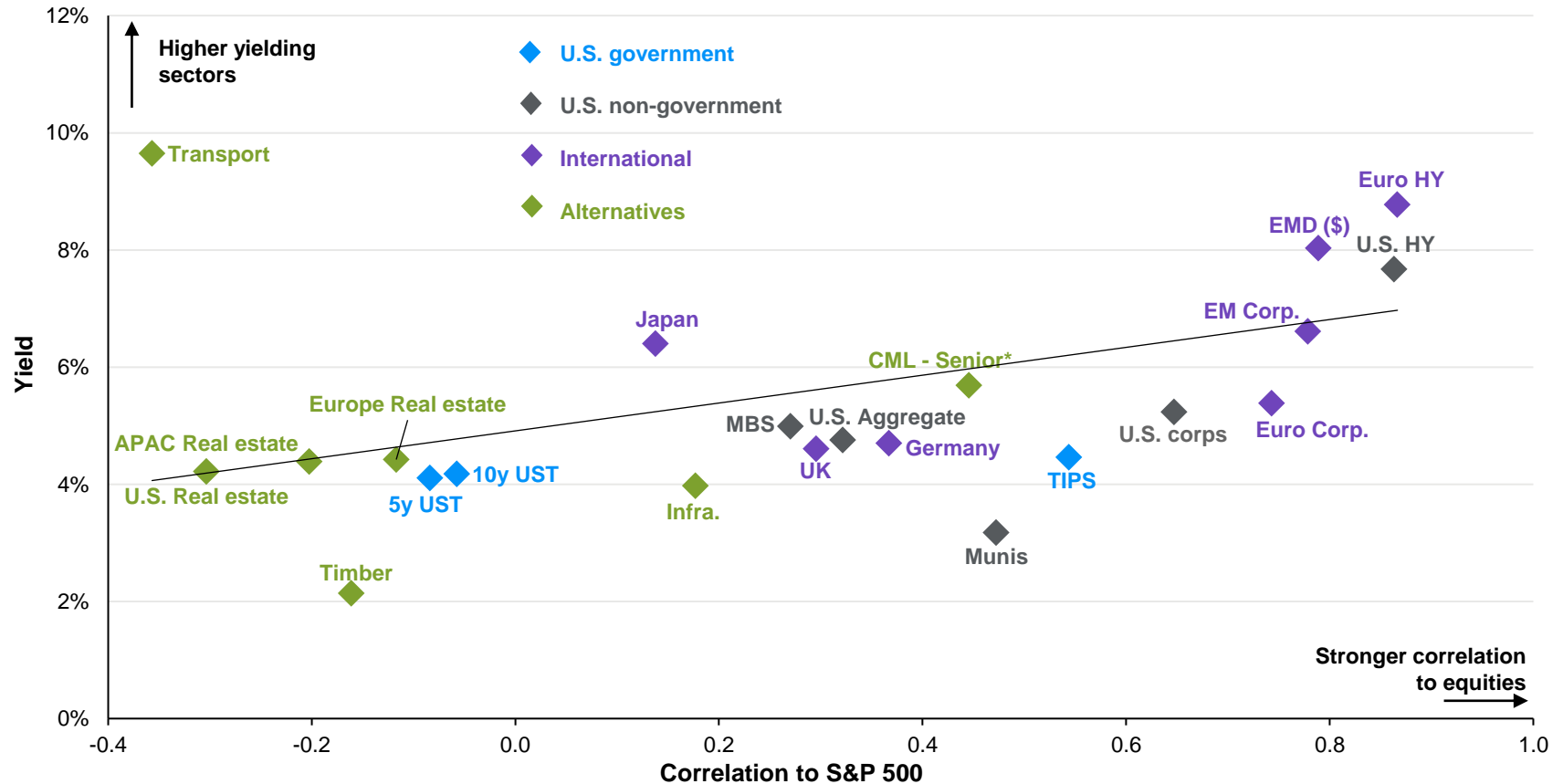


# Yields and equity market correlations

Alternatives in portfolios

## Equity market correlations and yields\*

Last 12 months



Source: Bloomberg, Gilberto-Levy, NCREIF, MSCI, FactSet, ICE, J.P. Morgan Asset Management. \*CML is commercial mortgage loans. Fixed income shown above are represented by Bloomberg indices except for EMD and ABS – U.S. Aggregate; MBS: U.S. Aggregate Securitized - MBS; U.S. corps: U.S. Corporates; Munis: Municipal Bond; U.S. HY: Corporate High Yield; TIPS: Treasury Inflation-Protected Securities (TIPS); Floating Rate: U.S. Floating Rate; Convertibles: U.S. Convertibles Composite; ABS: J.P. Morgan ABS Index; EMD (\$): J.P. Morgan EMBIG Diversified Index; EMD (LCL): J.P. Morgan GBI EM Global Diversified Index; EM Corp: J.P. Morgan CEMBI Broad Diversified Index; Euro Corp.: Euro Aggregate Corporate Index; Euro HY: Pan-European High Yield Index; Europe Real Estate: Market weighted-avg. of MSCI Global Property Fund Indices - U.K. & Cont. Europe; U.S. and APAC Real Estate: MSCI Global Property Index; Global infra.: MSCI Global Private Infrastructure Asset Index (equal weighted blend); U.S. Direct Lending: Cliffwater Direct Lending Index; Timber: NCREIF Timberland Property Index (U.S.); Transport returns and yield are derived from a J.P. Morgan Asset Management index; CML - Senior: Gilberto-Levy Commercial Mortgage Performance Aggregate Index. Convertibles yield is based on the U.S. portion of the Bloomberg Global Convertibles. Country yields are represented by the global aggregate for each country. Yield and return information based on bellwethers for Treasury securities. Correlations are based on quarterly returns over the past 10 years through 6/30/2024 unless stated otherwise. All non-alternative yields are as of 11/30/2024. Alternative yields are as described on page 12 of the *Guide to Alternatives*. \*Yields are adjusted for the cost for the cost of hedging back to USD on non-USD denominated securities. Data are based on availability as of November 30, 2024.

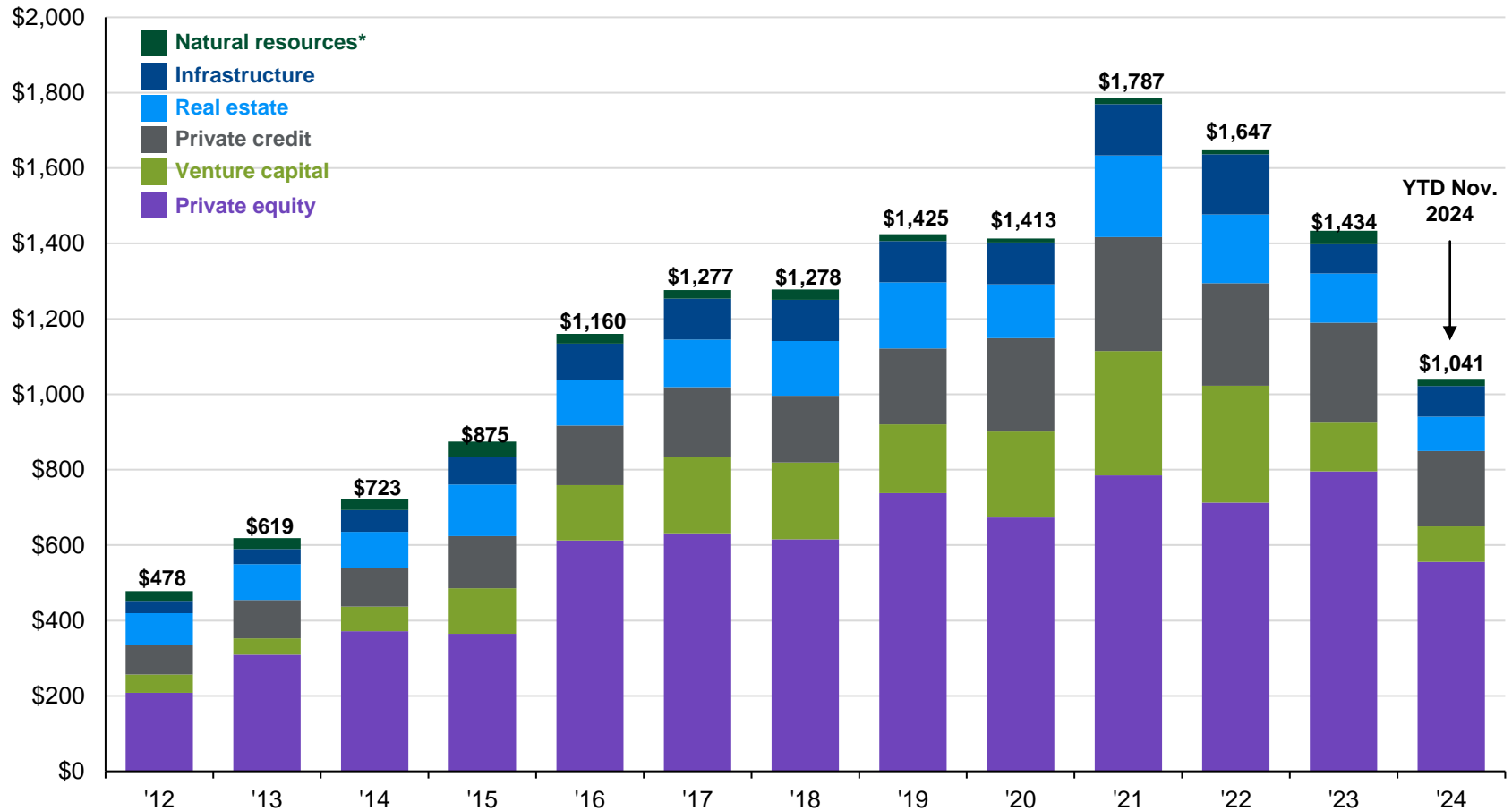


# Alternatives fundraising

Alternatives in portfolios

## Global private capital fundraising

USD billions



Source: Preqin, J.P. Morgan Asset Management. Fundraising categories are provided by Preqin and represent their estimate of annual capital raised in closed-end funds. \*Natural resources includes energy, timberland, agriculture and farmland, metals and mining, water, and diversified business. Data may not sum to total due to rounding. Data are based on availability as of November 30, 2024.

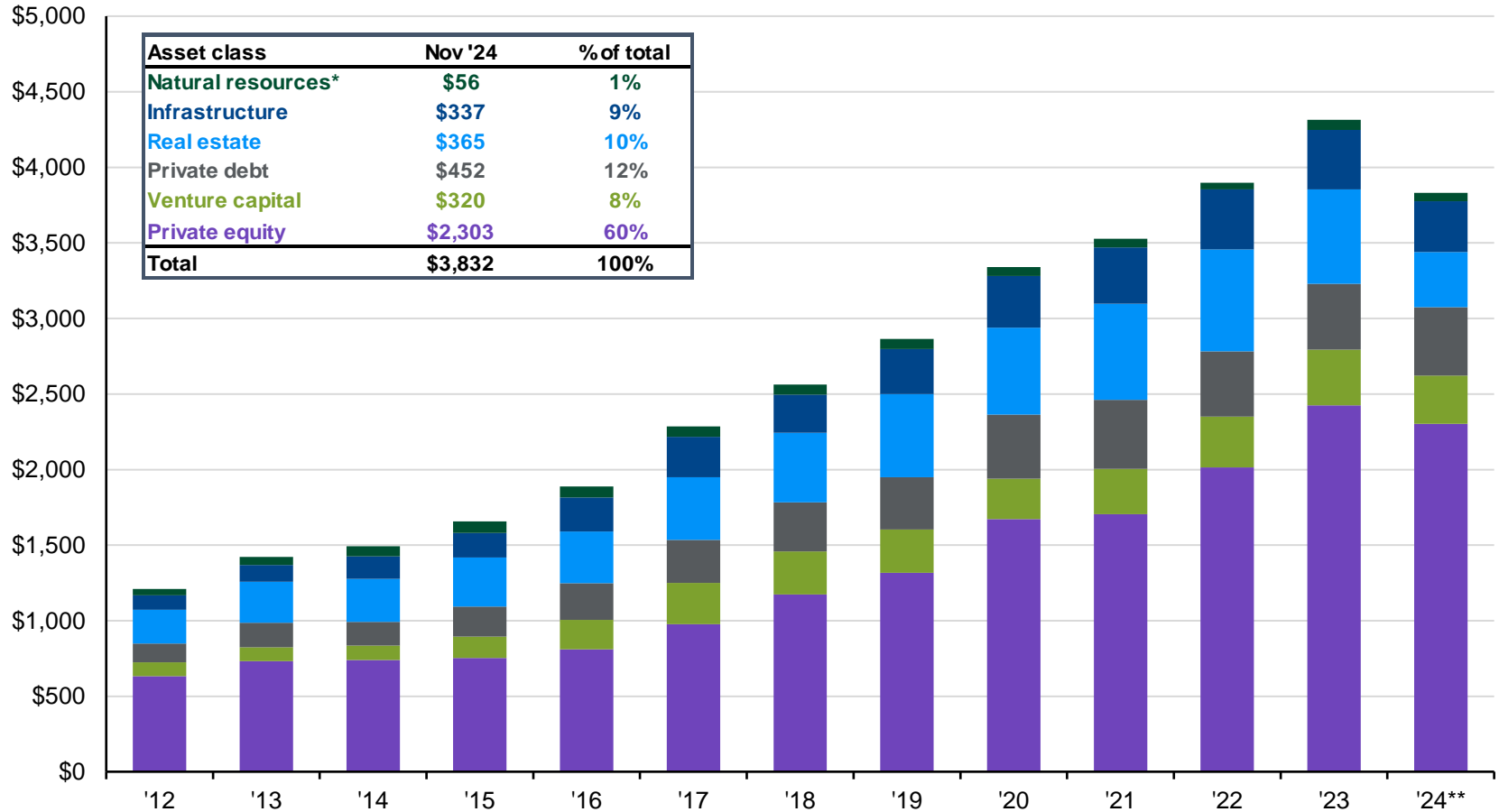


# Alternatives dry powder

Alternatives in portfolios

## Global dry powder by asset class

Total committed but uninvested LP capital, USD billions, end of period



Source: Preqin, J.P. Morgan Asset Management. Dry powder refers to committed but uninvested capital. Fundraising categories are provided by Preqin. \*Natural resources includes energy, timberland, agriculture and farmland, metals and mining, water, and diversified business. \*\*Data updated through November 30, 2024. Percentages may not sum to 100 due to rounding. Data are based on availability as of November 30, 2024.

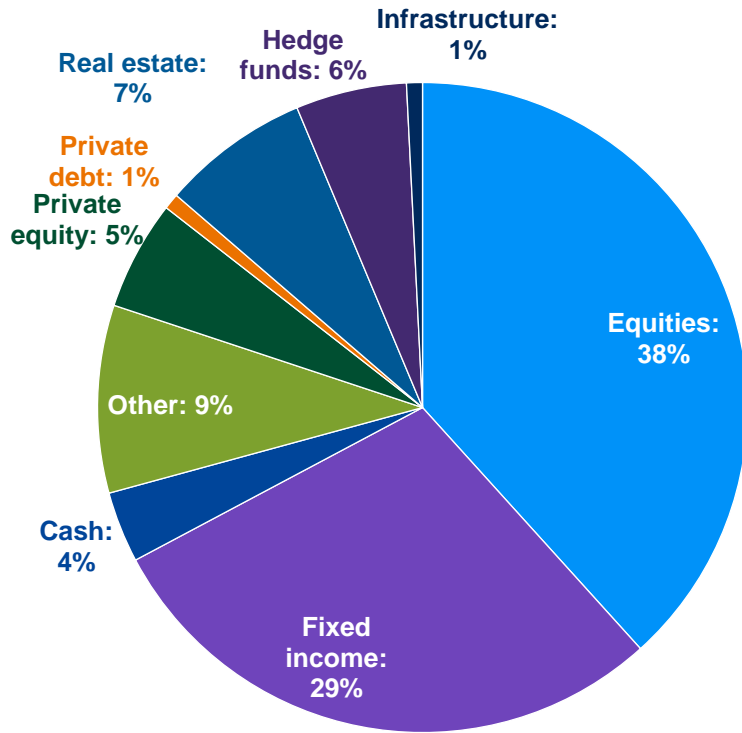


# Investor positioning

Alternatives in portfolios

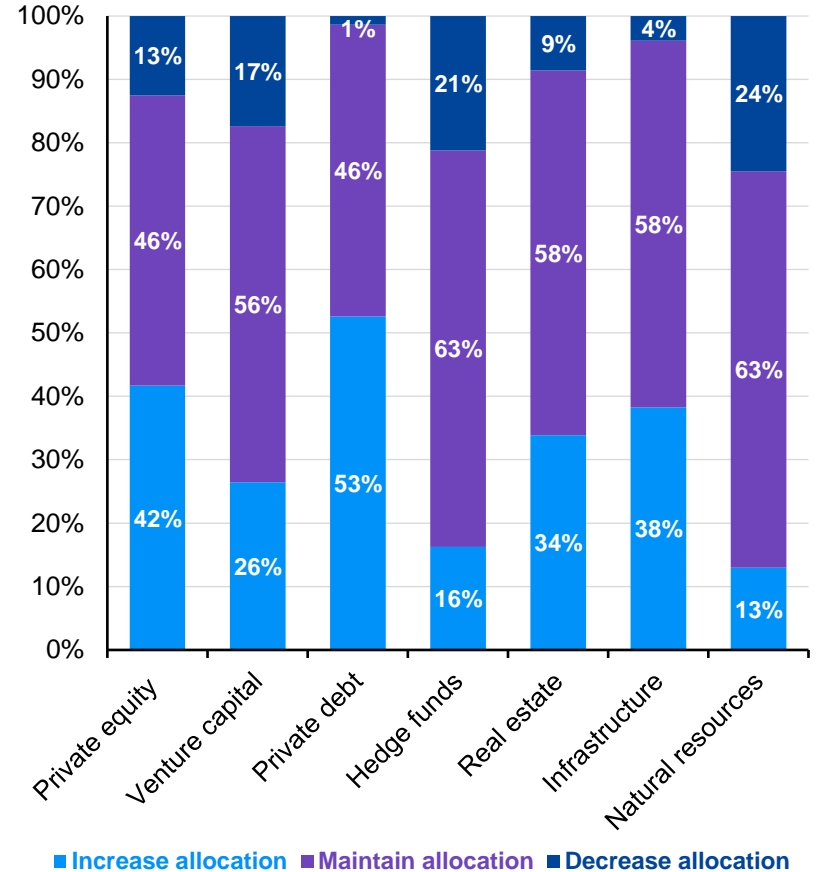
## Institutional investor asset allocation

Average allocation by asset class, 2023



## Investor long term plans to allocate to alternatives

Share of investors



Source: Preqin, J.P. Morgan Asset Management.  
 (Left) Data sourced from Preqin's 2024 Institutional Allocation Study. Simple average allocation is calculated using data across 4,255 investors representing \$21.1tn in AUM. (Right) Preqin H2 2024 Investor Outlook. Data are based on availability as of November 30, 2024.





# Alternative asset class returns

Alternatives in portfolios

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	YTD '24*	2014-2023	
											Ann.	Vol.**
Venture Capital 26.0%	Transport 16.2%	Infra. 14.2%	Private Equity 23.0%	Venture Capital 21.3%	Venture Capital 20.4%	Venture Capital 58.4%	Venture Capital 49.7%	Transport 23.5%	Transport 16.0%	Transport 12.2%	Venture Capital 16.2%	Venture Capital 13.2%
Infra. 13.9%	Infra. 15.5%	Transport 13.4%	Transport 20.2%	Infra. 11.6%	Private Equity 16.8%	Private Equity 24.1%	Private Equity 37.6%	Infra. 9.6%	Direct Lending 12.1%	Hedge Funds 8.5%	Private Equity 14.5%	Transport 10.2%
U.S. Core RE 12.5%	Venture Capital 15.0%	Private Equity 12.2%	Venture Capital 14.7%	Europe Core RE 9.9%	Infra. 11.5%	Asset Allocation 12.0%	U.S. Core RE 22.2%	U.S. Core RE 7.5%	Private Equity 9.7%	Direct Lending 5.7%	Transport 13.1%	Private Equity 8.5%
Europe Core RE 12.3%	U.S. Core RE 15.0%	Direct Lending 11.2%	Infra. 12.2%	APAC Core RE 9.3%	Europe Core RE 9.4%	Transport 10.6%	Asset Allocation 19.3%	APAC Core RE 6.8%	Infra. 7.9%	Infra. 5.0%	Infra. 10.6%	U.S. Core RE 5.5%
Asset Allocation 11.2%	Europe Core RE 12.8%	APAC Core RE 10.4%	Asset Allocation 12.2%	Private Equity 9.0%	Asset Allocation 9.2%	Hedge Funds 8.9%	Transport 18.8%	Direct Lending 6.3%	CML - Senior* 5.6%	Asset Allocation 3.2%	Asset Allocation 9.6%	Hedge Funds 5.4%
Private Equity 9.8%	APAC Core RE 11.8%	U.S. Core RE 8.8%	APAC Core RE 11.5%	Asset Allocation 8.7%	Direct Lending 9.0%	CML - Senior* 6.3%	Europe Core RE 14.2%	Europe Core RE 4.6%	Hedge Funds 4.5%	Private Equity 2.4%	Direct Lending 8.8%	Europe Core RE 4.2%
Direct Lending 9.6%	Asset Allocation 10.3%	Asset Allocation 8.5%	Europe Core RE 9.8%	U.S. Core RE 8.3%	CML - Senior* 8.1%	Direct Lending 5.5%	Hedge Funds 13.9%	Asset Allocation 2.4%	Asset Allocation 3.4%	Europe Core RE 1.5%	APAC Core RE 7.5%	CML - Senior* 4.0%
APAC Core RE 9.4%	Private Equity 9.0%	Europe Core RE 8.1%	Direct Lending 8.6%	Direct Lending 8.1%	APAC Core RE 6.6%	Europe Core RE 4.8%	Direct Lending 12.8%	Private Equity -1.6%	Venture Capital -2.2%	CML - Senior* 1.4%	U.S. Core RE 7.3%	Infra. 3.4%
CML - Senior* 7.4%	Direct Lending 5.5%	Hedge Funds 3.2%	Hedge Funds 8.5%	Transport 7.7%	Hedge Funds 5.6%	U.S. Core RE 1.2%	APAC Core RE 11.8%	Hedge Funds -2.8%	APAC Core RE -2.3%	Venture Capital 0.8%	Europe Core RE 7.2%	Asset Allocation 3.0%
Transport 6.9%	CML - Senior* 2.7%	CML - Senior* 2.9%	U.S. Core RE 7.6%	CML - Senior* 2.6%	U.S. Core RE 5.3%	APAC Core RE 0.3%	Infra. 10.5%	CML - Senior* -9.0%	Europe Core RE -4.9%	APAC Core RE -2.3%	Hedge Funds 4.4%	Direct Lending 2.9%
Hedge Funds 4.3%	Hedge Funds -0.2%	Venture Capital 0.6%	CML - Senior* 5.7%	Hedge Funds -1.2%	Transport -0.5%	Infra. 0.2%	CML - Senior* 1.9%	Venture Capital -20.6%	U.S. Core RE -12.0%	U.S. Core RE -2.8%	CML - Senior* 3.3%	APAC Core RE 2.7%

Source: Burgiss, Cliffwater, Gilberto-Levy, HFRI, MSCI, NCREIF, FactSet, J.P. Morgan Asset Management. \*CML is commercial mortgage loans. CML - Senior: Gilberto-Levy Commercial Mortgage Performance Index. Private Equity and Venture Capital are internal rates of return from Burgiss. Hedge funds: HFRI Fund Weighted Composite. Transport returns are derived from a J.P. Morgan Asset Management index. U.S. Core RE: NCREIF Property Index - Open End Diversified Core Equity component. Europe Core Real Estate: MSCI Global Property Fund Index - Continental Europe. Asia Pacific (APAC) Core Real Estate: MSCI Global Property Fund Index - Asia-Pacific. Direct Lending: Cliffwater Direct Lending Index. Global infrastructure (Infra.): MSCI Global Private Infrastructure Asset Index. Commercial Mortgage Loans: Gilberto-Levy Commercial Mortgage Performance Index. The "Asset Allocation" portfolio assumes an evenly weighted portfolio consisting of the above alternatives. Annualized return (Ann.) and volatility (Vol.) represents the period from 3/31/2014 to 12/31/2023. \*2024 data is through June 30, 2024. \*\*Volatility calculated as the annualized standard deviation of quarterly returns. Data are based on availability as of November 30, 2024.

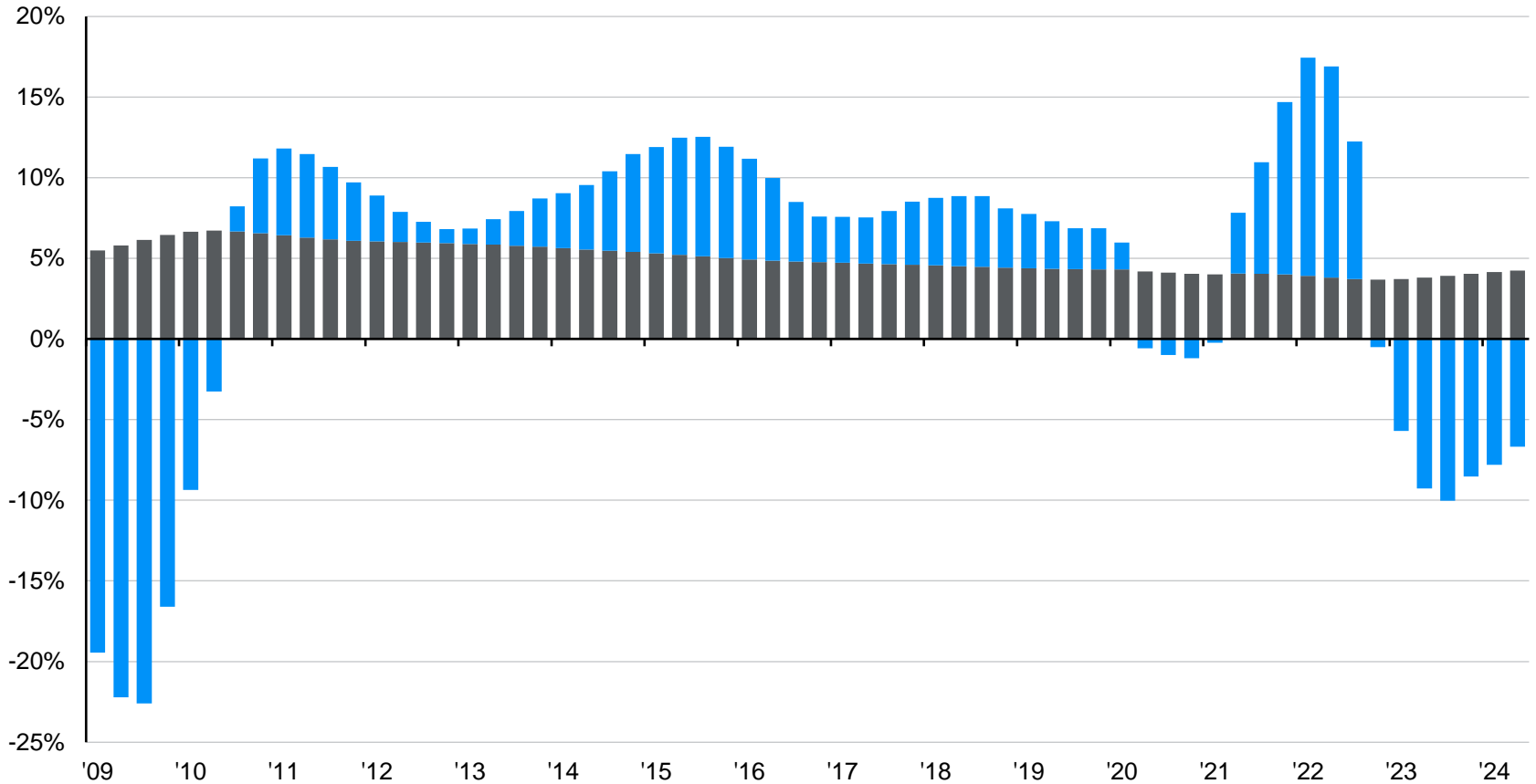


# Sources of global private real estate returns

Real estate

## Global private real estate returns

Rolling 4-quarter returns from income and capital appreciation



Source: MSCI, J.P. Morgan Asset Management.  
 Real Estate returns represented by the MSCI Global Property Fund Index. Data show rolling four-quarter returns from income and capital appreciation. The chart shows the full index history, beginning in 1Q09, and ending in 1Q24. 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 are based on availability as of November 30, 2024.

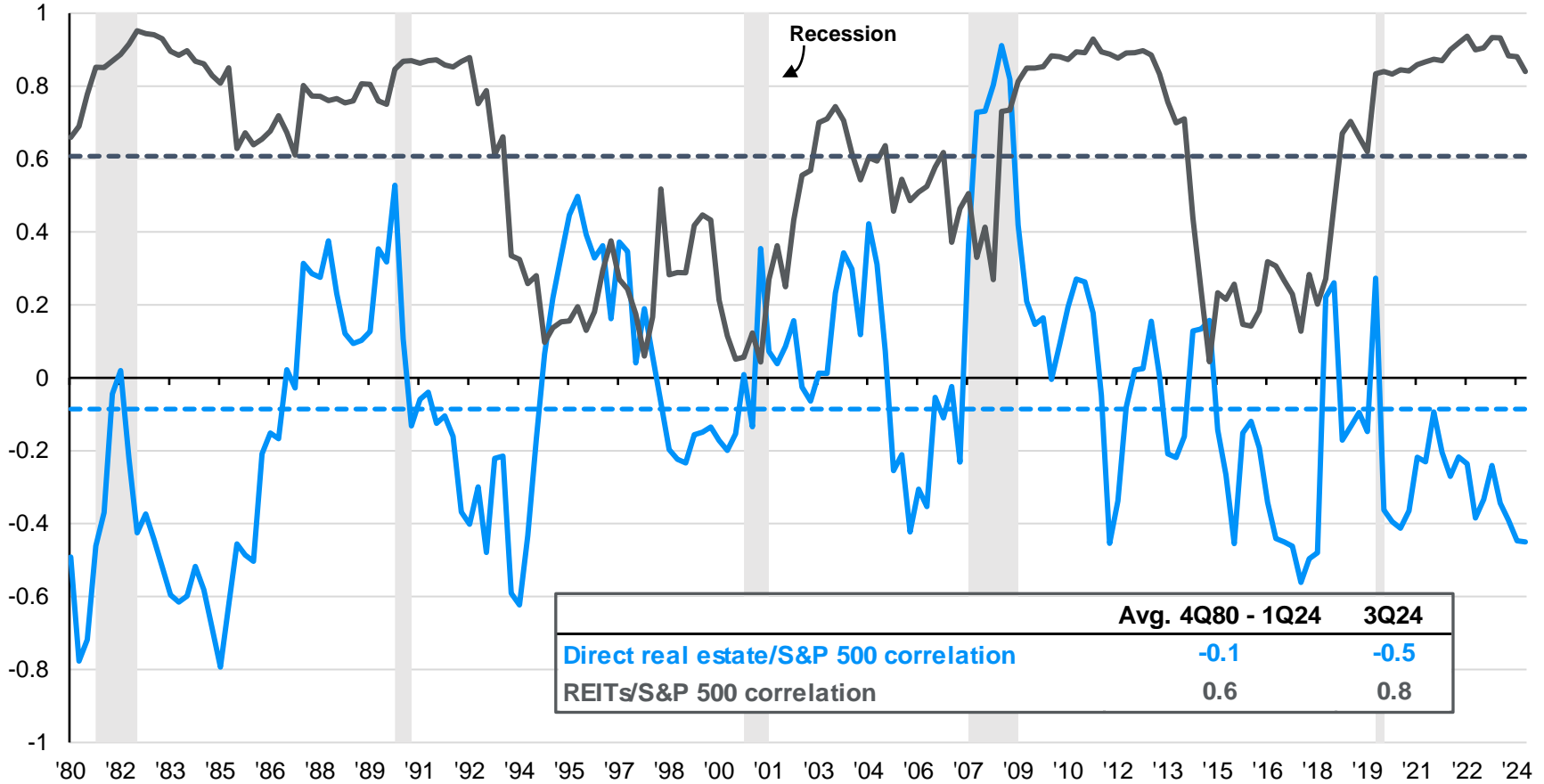


# U.S. REITs and direct real estate

Real estate

## U.S. REITs, direct 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 are based on availability as of November 30, 2024.

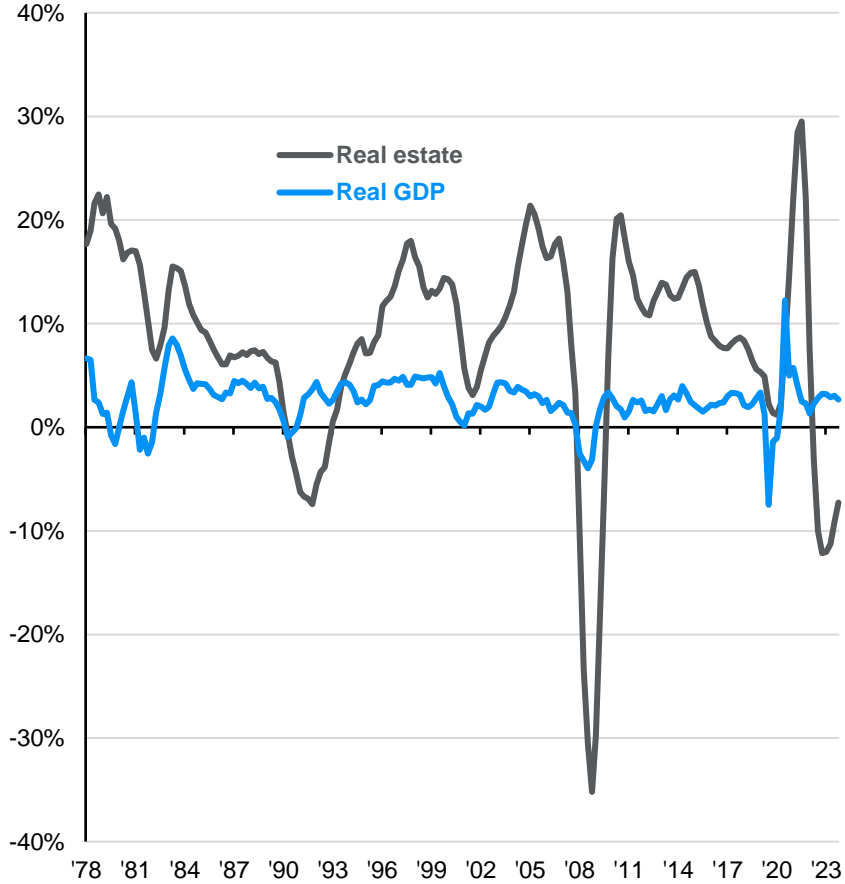


# U.S. real estate, GDP and inflation

Real estate

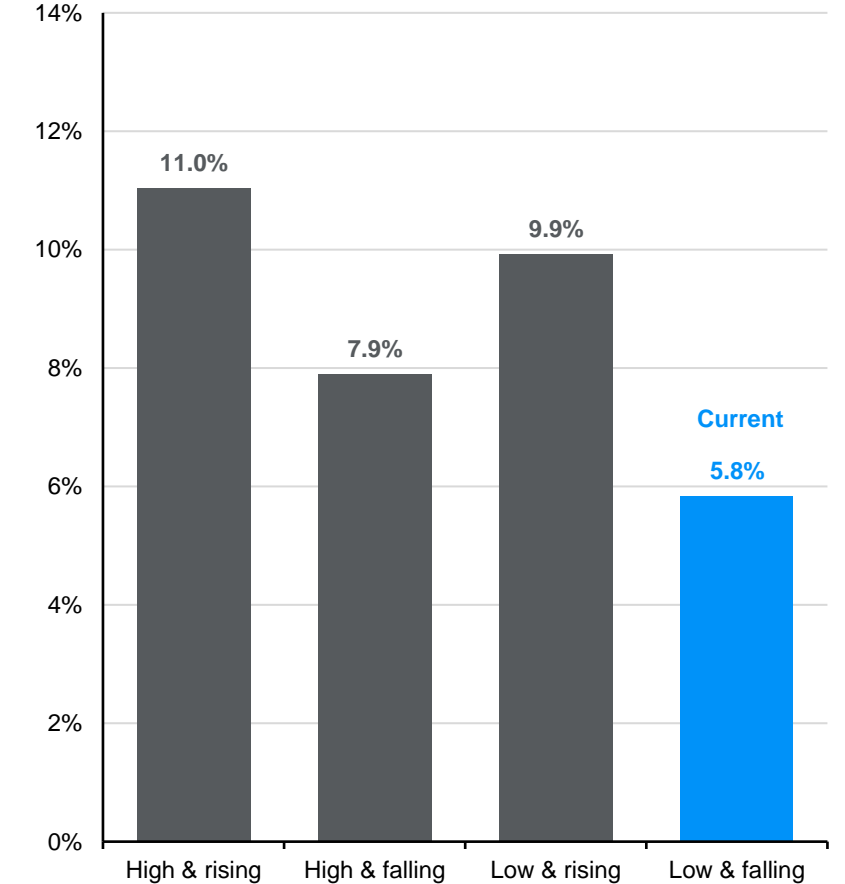
### Private real estate returns and real GDP growth

4Q78 – 3Q24, Real GDP SA, NCREIF ODCE Index, y/y %



### Private real estate returns in different inflationary regimes

4Q78 – 3Q24, quarterly, headline CPI, NCREIF ODCE Index, y/y %



Source: BEA, BLS, FactSet, NCREIF, J.P. Morgan Asset Management. NFI-ODCE is short for NCREIF Fund Index - Open End Diversified Core Equity Fund Index. It is a capitalization-weighted, gross of fee, time-weighted return index. Real estate performance is measured using total returns. "High" inflation is defined as any year-over-year headline CPI reading above the historical median, while "low" inflation is defined as any year-over-year headline CPI reading below the historical median. The median y/y headline CPI for period between 4Q78 – 3Q24 is 2.84%. Data is based on availability as of November 30, 2024.



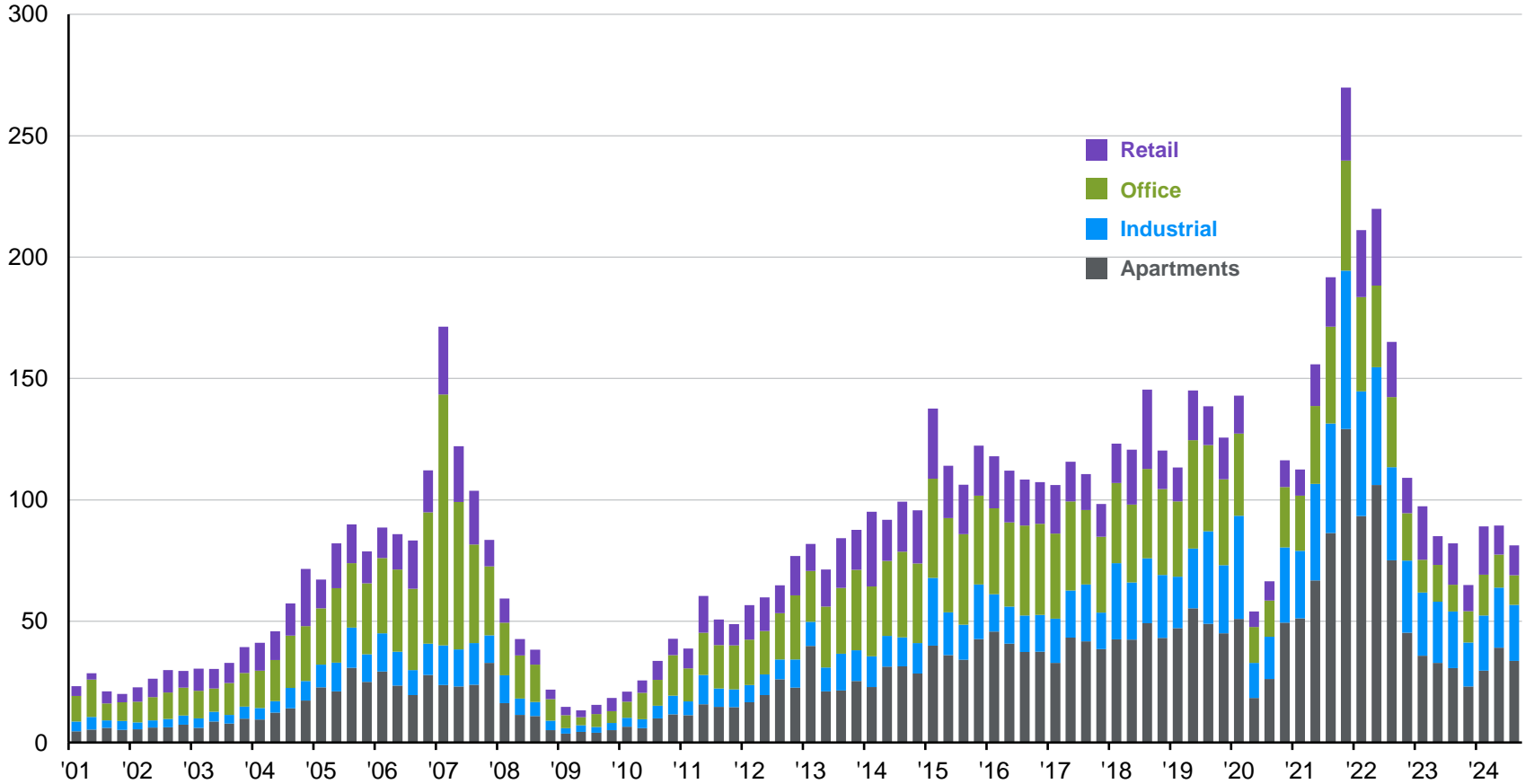
# U.S. real estate: Transaction volumes

GTA MI 21

Real estate

## U.S. real estate transaction volumes

USD billions, seasonally adjusted, 1Q01 – 3Q24



Source: RCA, J.P. Morgan Asset Management. Data are based on availability as of November 30, 2024.

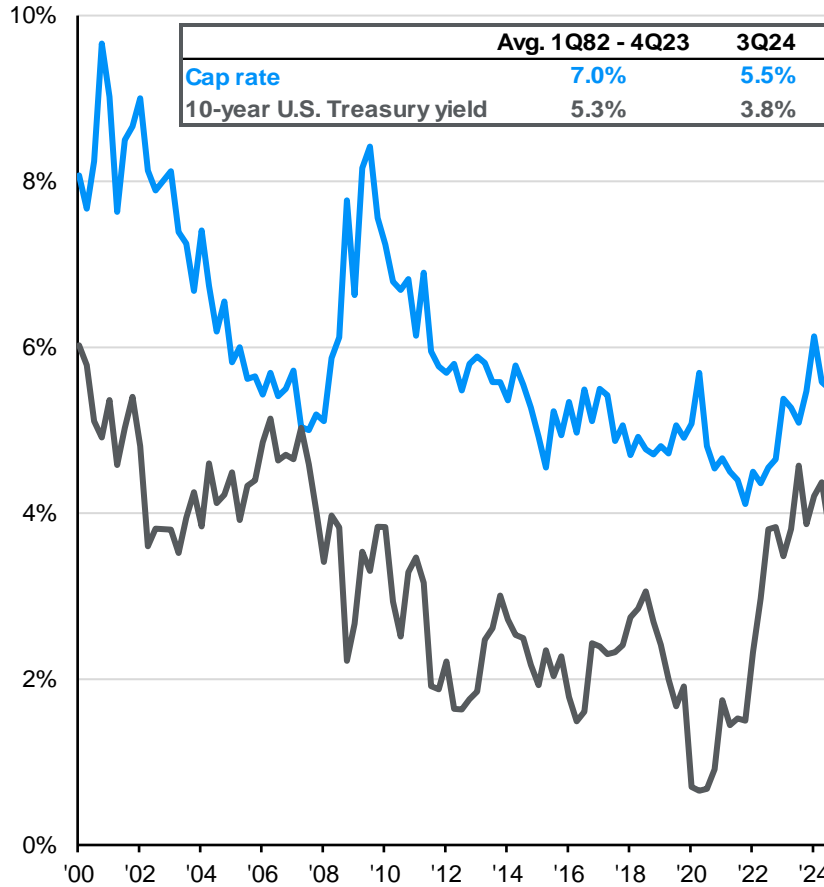


# U.S. real estate: Cap rates and spreads

Real estate

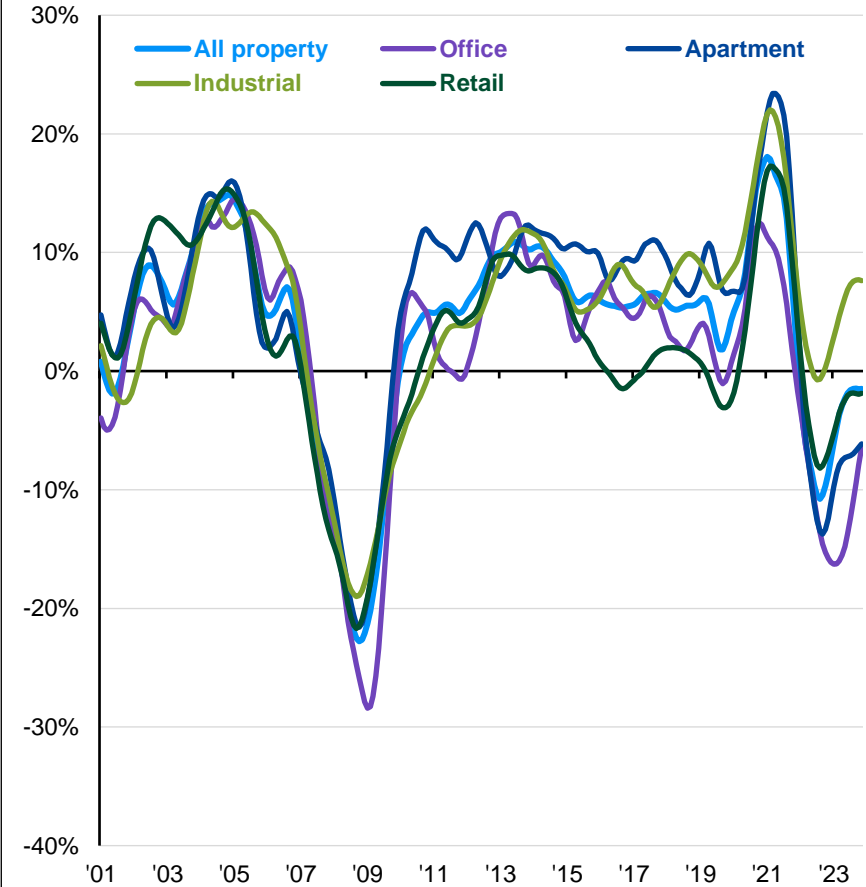
## U.S. real estate cap rates and interest rates

Transaction based, 10-year U.S. Treasury yield



## U.S. commercial real estate property prices

Y/y % change



Source: Apollo Global Management, Bloomberg, MSCI, NCREIF, LSEG Datastream, J.P. Morgan Asset Management.  
 The cap rate is calculated as the net operating income over sales price. It is transaction based and value weighted. The RCA Commercial Property Price Indices are transaction based indices that measure property prices at a national level.  
 Data are based on availability as of November 30, 2024.

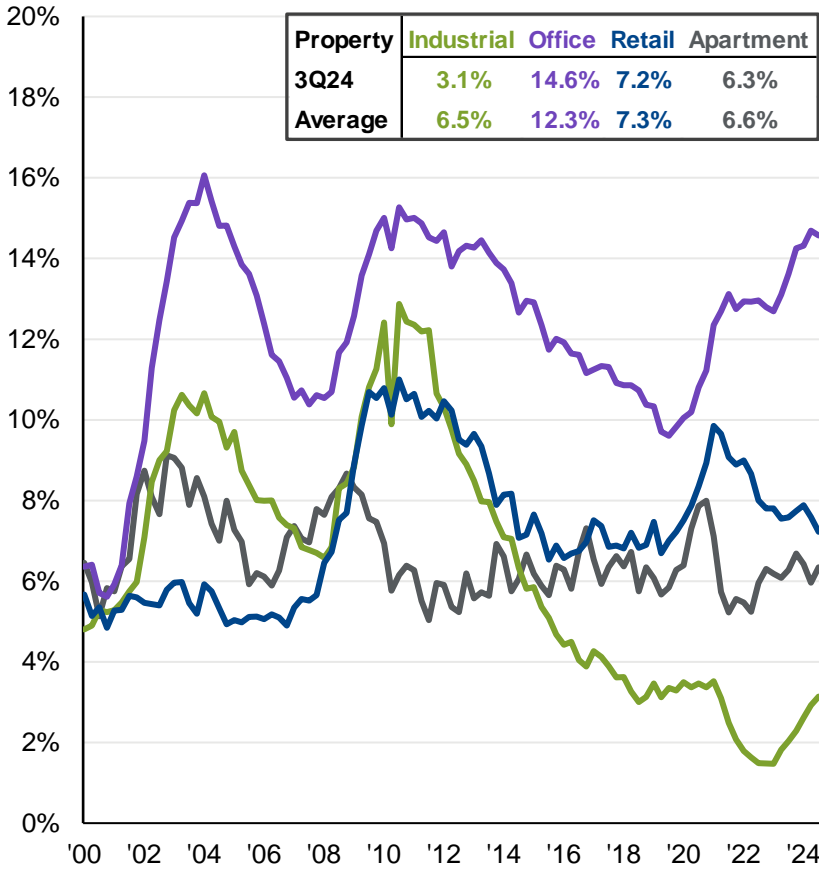


# U.S. real estate: Vacancy rates and NOI growth

Real estate

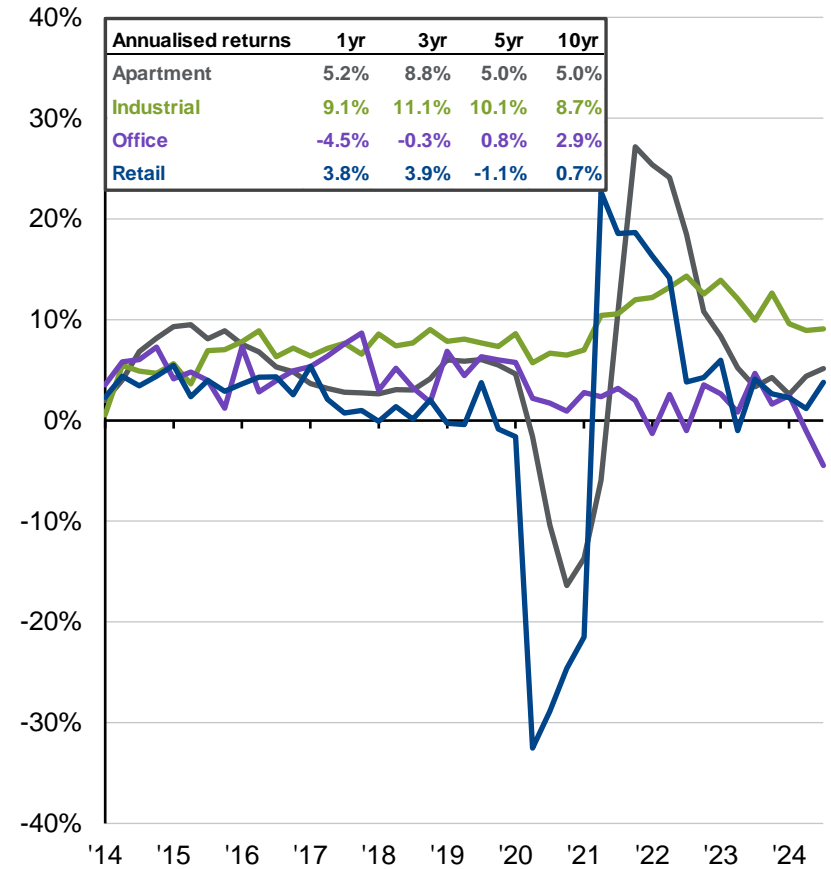
## U.S. vacancy rates by property type

Percent, 1Q00 – 3Q24



## Net operating income growth by property type

Year-on-year, 1Q13 – 3Q24



Source: NCREIF, J.P. Morgan Asset Management. Annualised returns are calculated to 3Q24. Data are based on availability as of November 30, 2024.

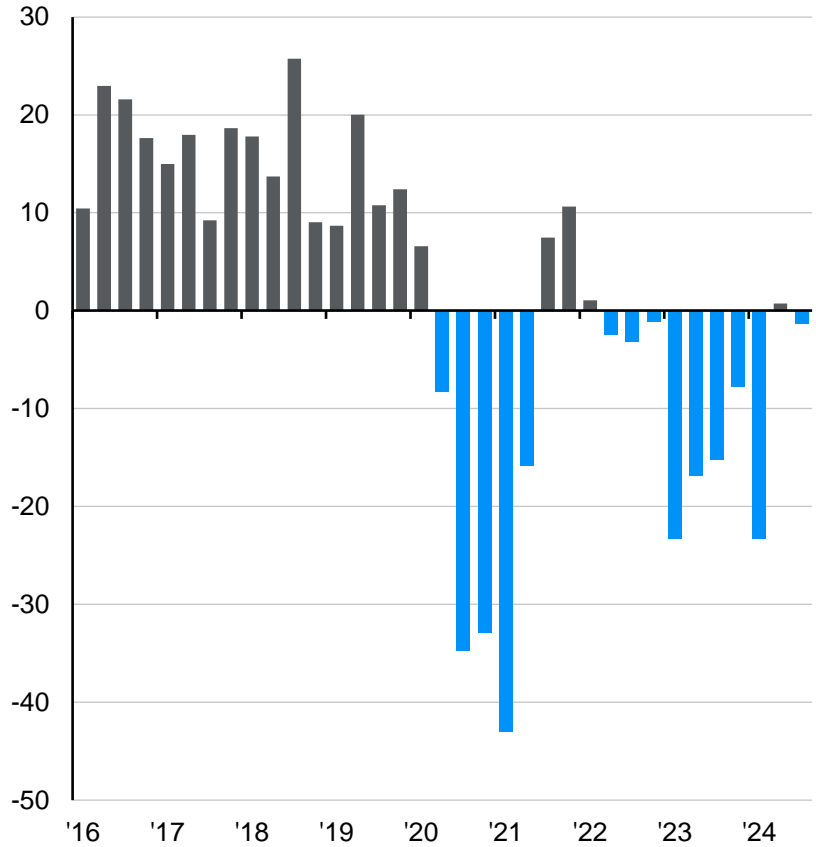


# U.S. real estate: Office leasing activity

Real estate

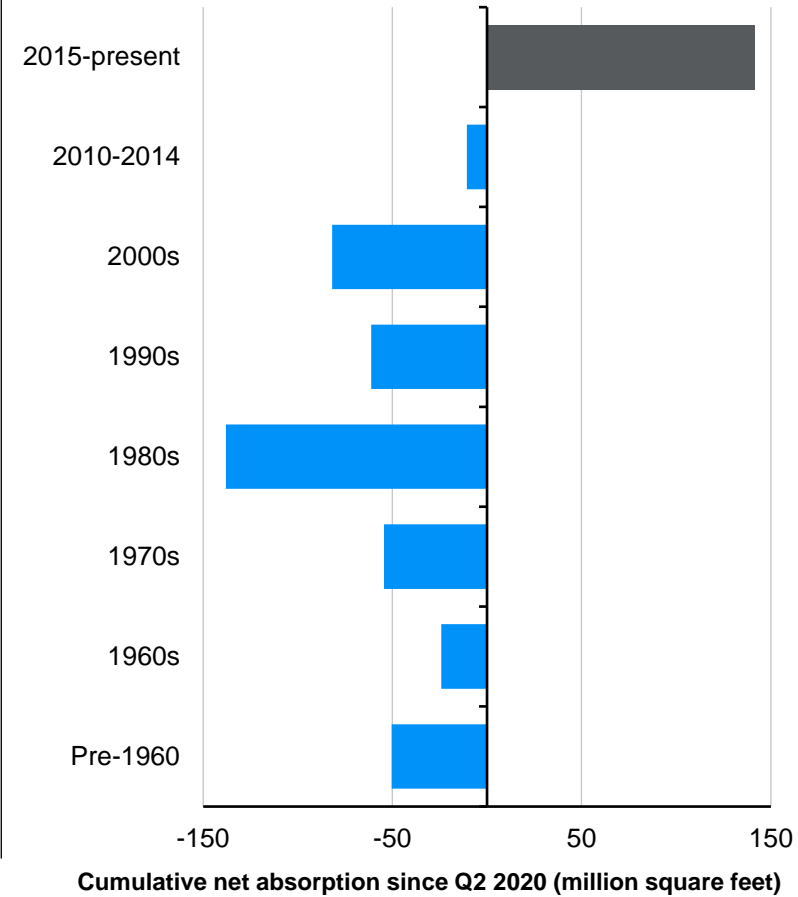
### U.S. office net absorption

In million square feet, 1Q16 – 3Q24



### Net absorption by building vintage

Year built



Source: J.P. Morgan Asset Management; (Left) CoStar; (Right) JLL, "U.S. Office Market Dynamics, November 2024". Data are based on availability as of November 30, 2024.



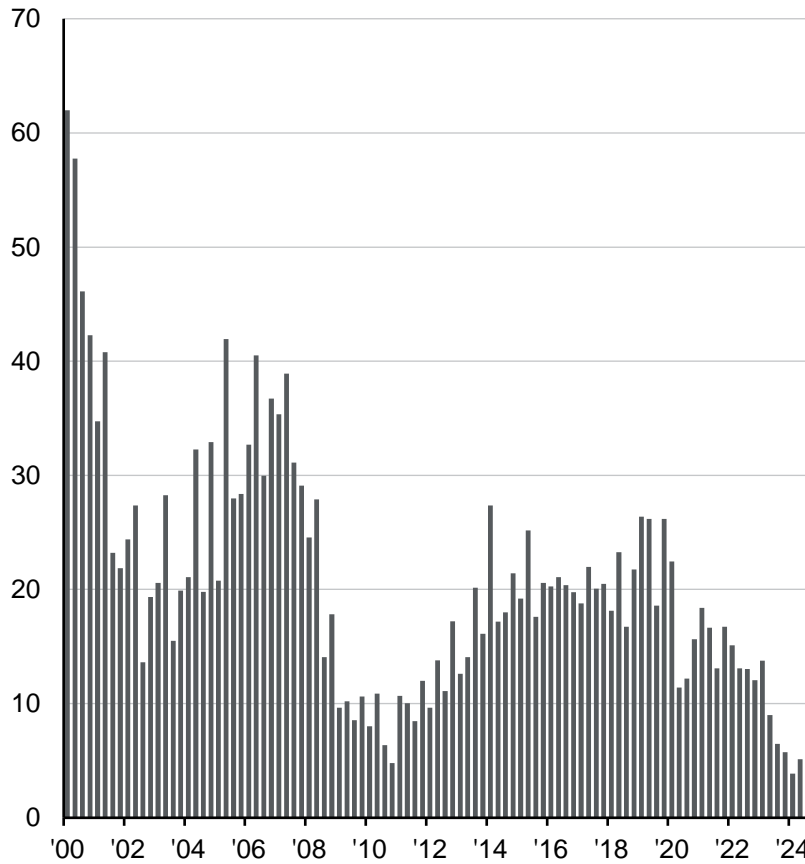


# U.S. real estate: Office supply

Real estate

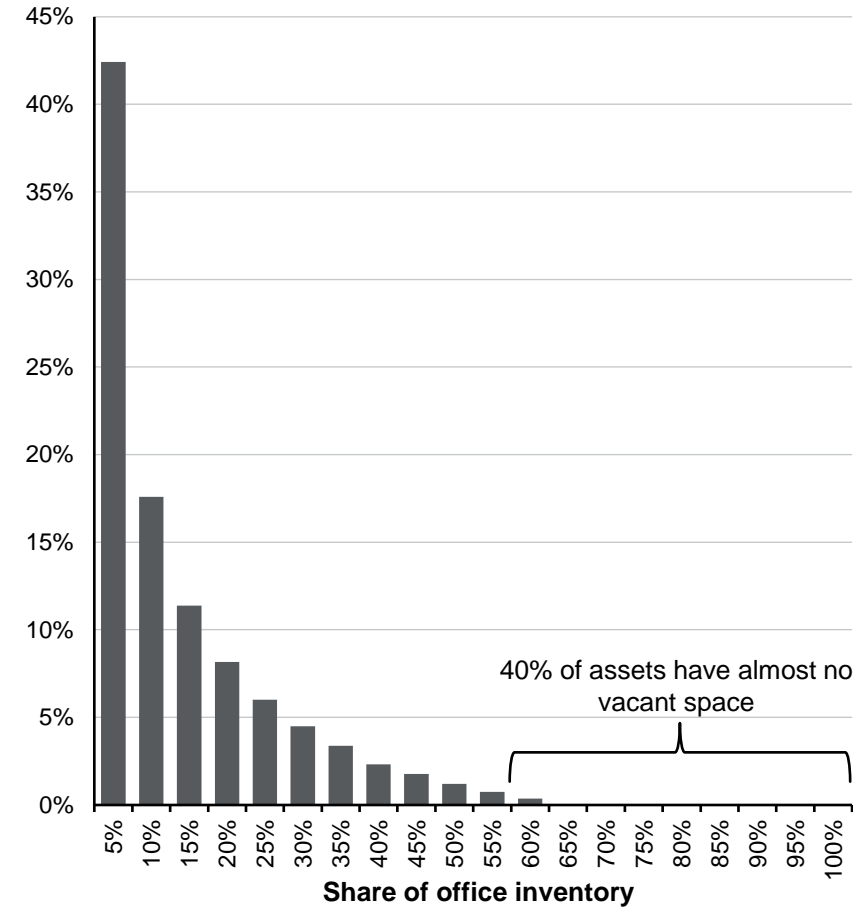
## U.S. office construction starts

In million square feet, 1Q00 – 3Q24



## Office vacancy concentration

Share of vacant space



Source: J.P. Morgan Asset Management; (Left) CoStar; (Right) JLL, "U.S. Office Market Dynamics, November 2024". Data are based on availability as of November 30, 2024.

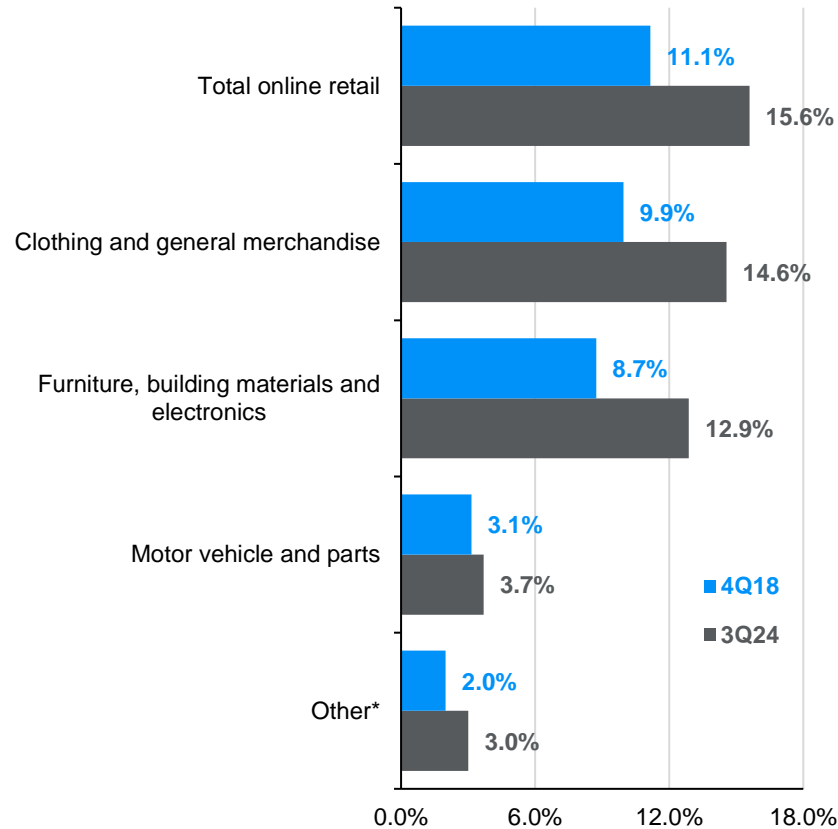


# U.S. real estate: Retail

Real estate

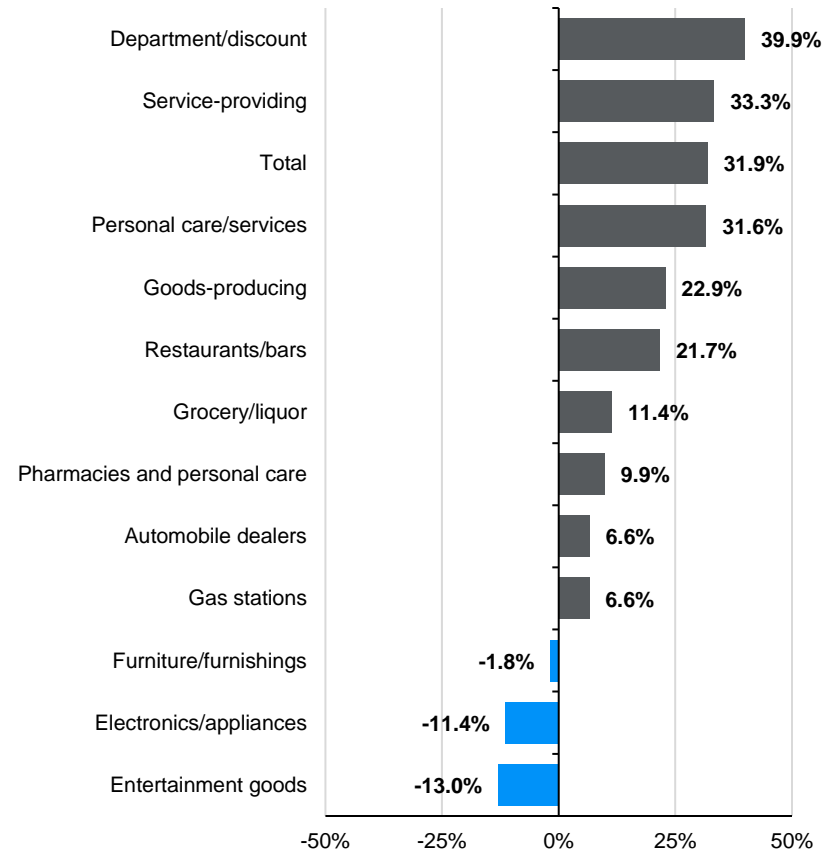
### U.S. online retail sales by segment

% of total retail sales by segment, NSA



### Change in number of physical retail establishments

1Q14 – 1Q24



Source: Bureau of Labor Statistics, U.S. Census Bureau, J.P. Morgan Asset Management. \*Other includes food, health and entertainment. Data are based on availability as of November 30, 2024.

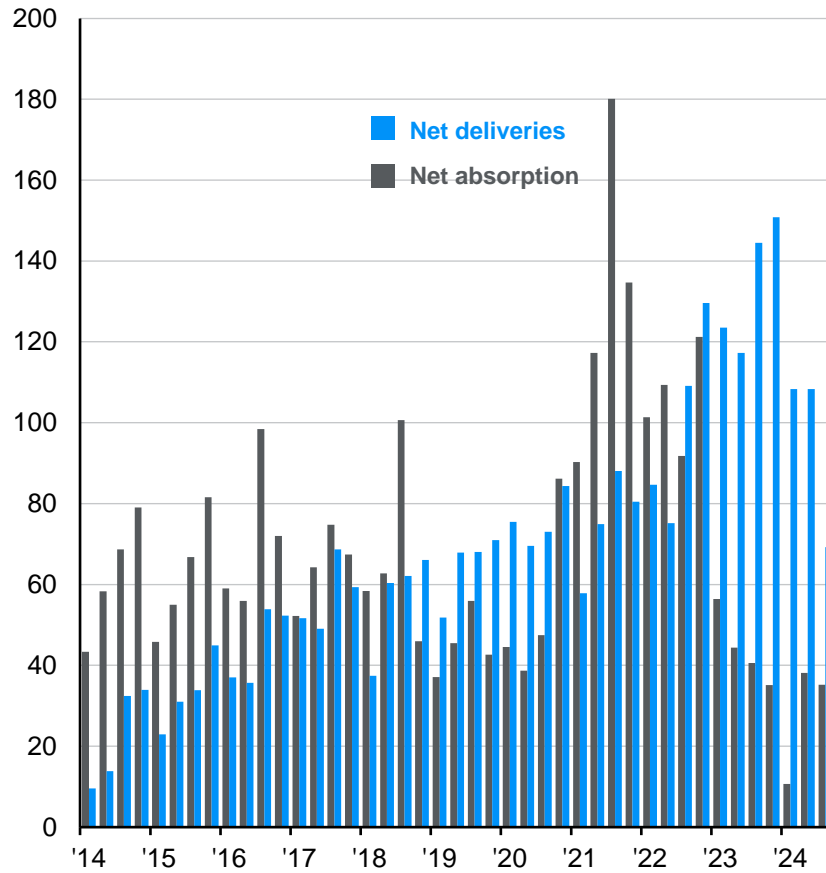


# U.S. real estate: Industrial

Real estate

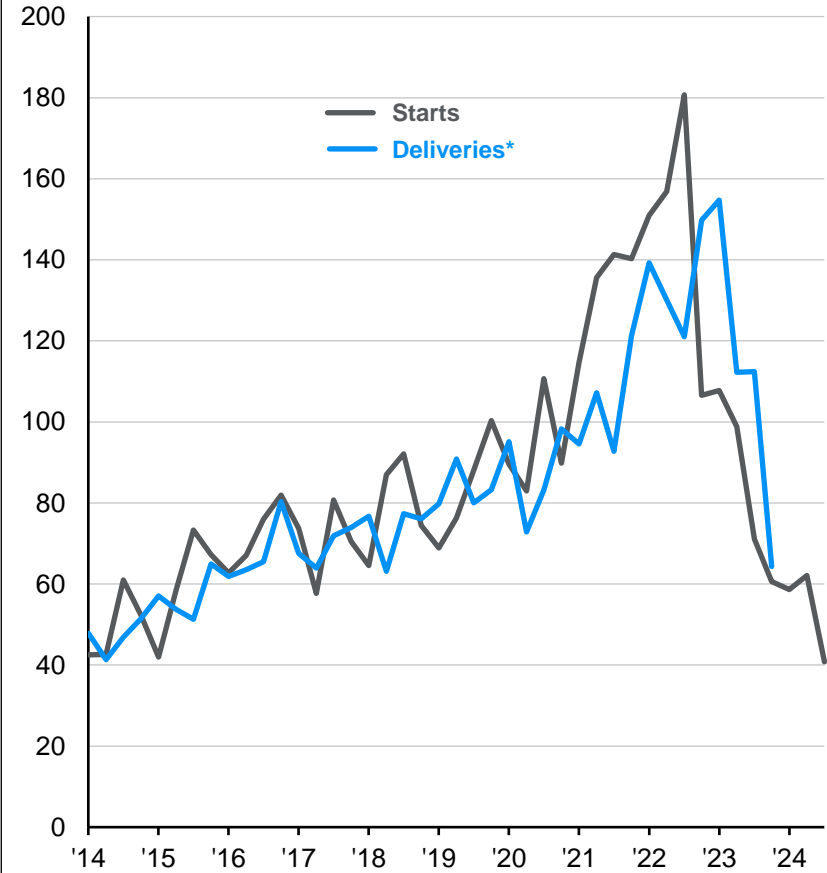
## U.S. industrial absorption and deliveries

In million square feet, 1Q14 – 3Q24



## U.S. industrial construction starts and deliveries

In million square feet, 1Q14 – 3Q24



Source: CoStar, J.P. Morgan Asset Management. \*Deliveries are gross and lagged three quarters. Data are based on availability as of November 30, 2024.

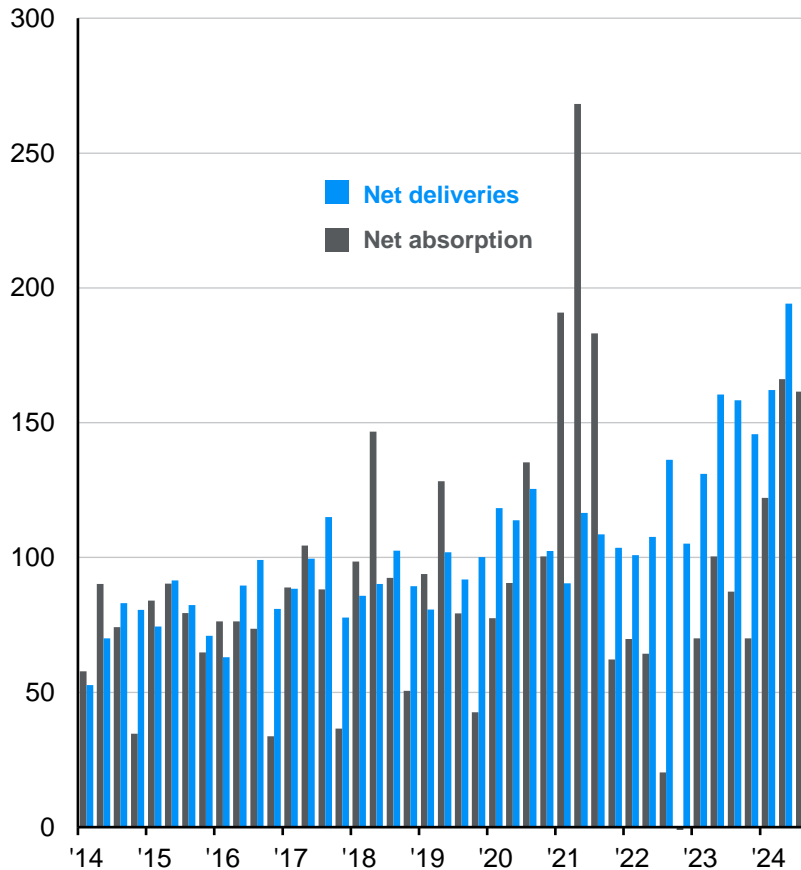


# U.S. real estate: Multifamily

Real estate

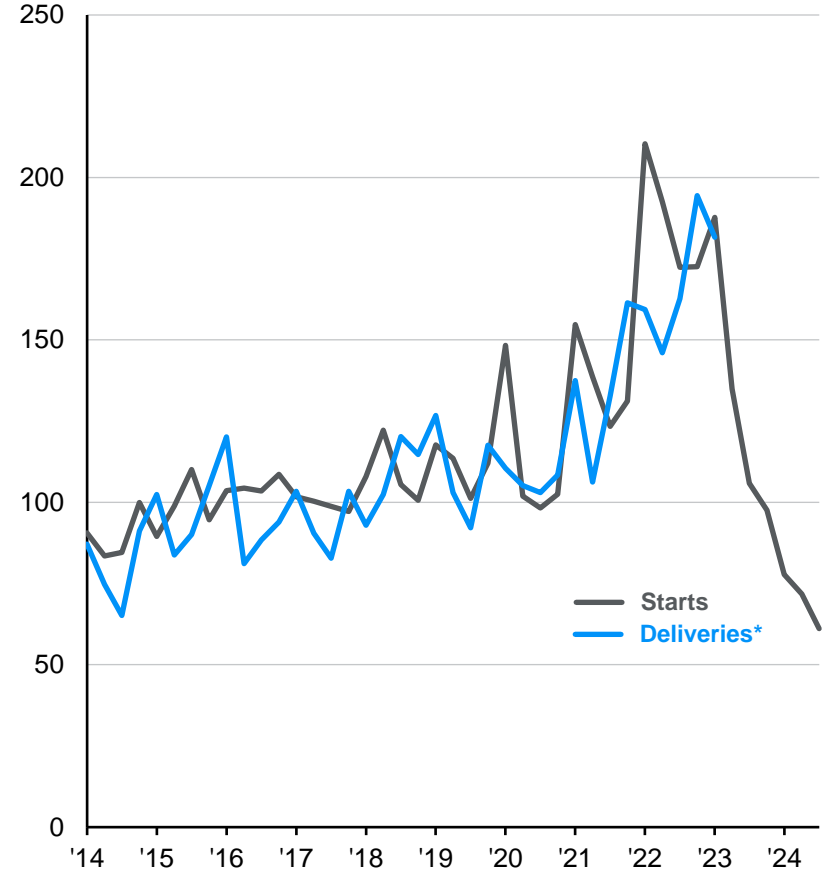
## U.S. multifamily absorption and deliveries

Thousand units, 1Q14 – 3Q24



## U.S. multifamily construction starts and deliveries

Thousand units, 1Q14 – 3Q24



Source: CoStar, J.P. Morgan Asset Management. \*Deliveries are gross and lagged six quarters. Data are based on availability as of November 30, 2024.

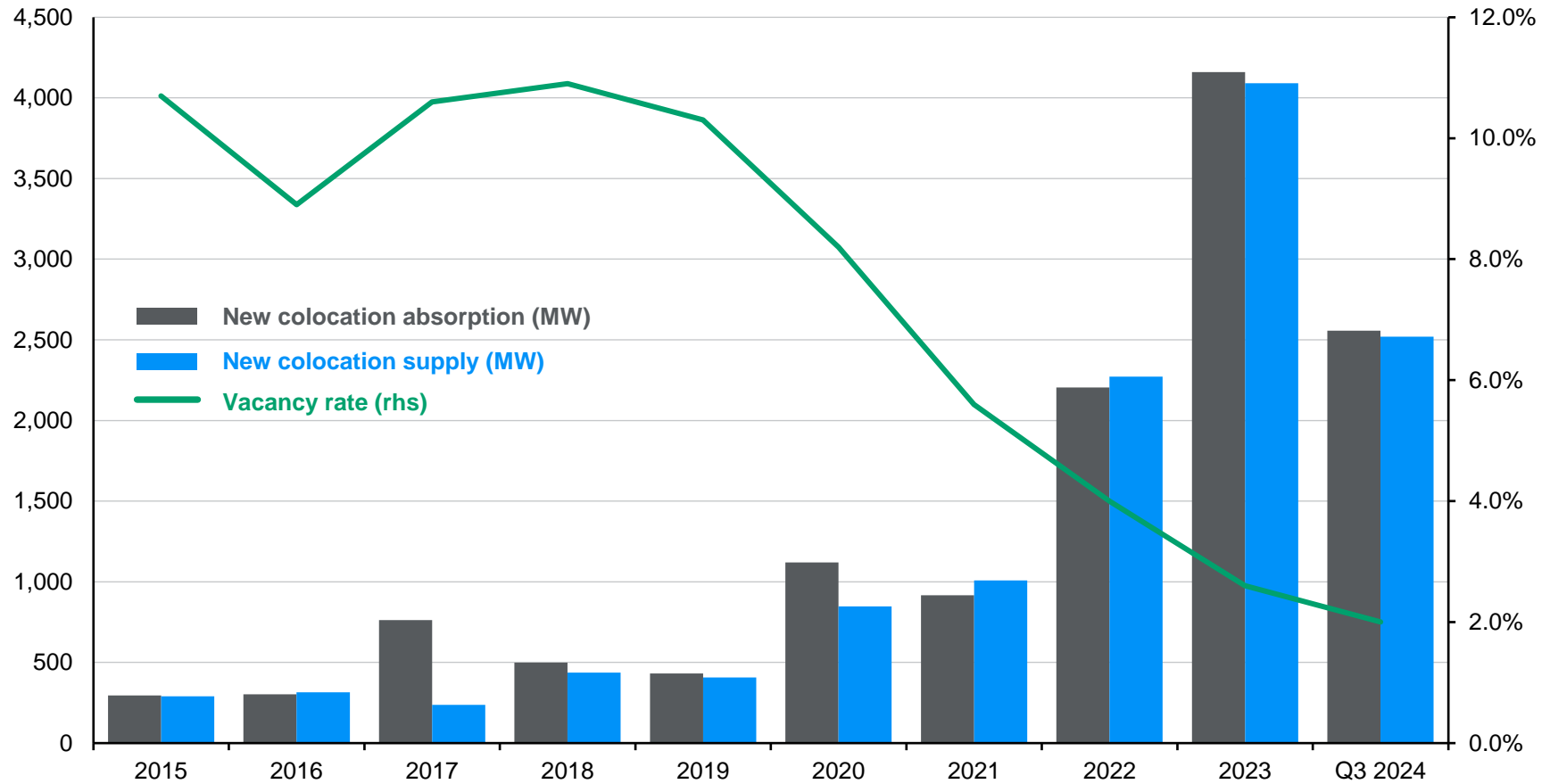


# U.S. real estate: Data centers

Real estate

### U.S. data center absorption and supply

Megawatts (MW)



Source: Cushman and Wakefield, J.P. Morgan Asset Management. "Colocation" is when organizations place their own servers and essential computing hardware for data storage in space rented in a physical data center. A Colocation facility is a data center in which a business can rent space for servers, storage and other computing or networking hardware. Data are based on availability as of November 30, 2024.

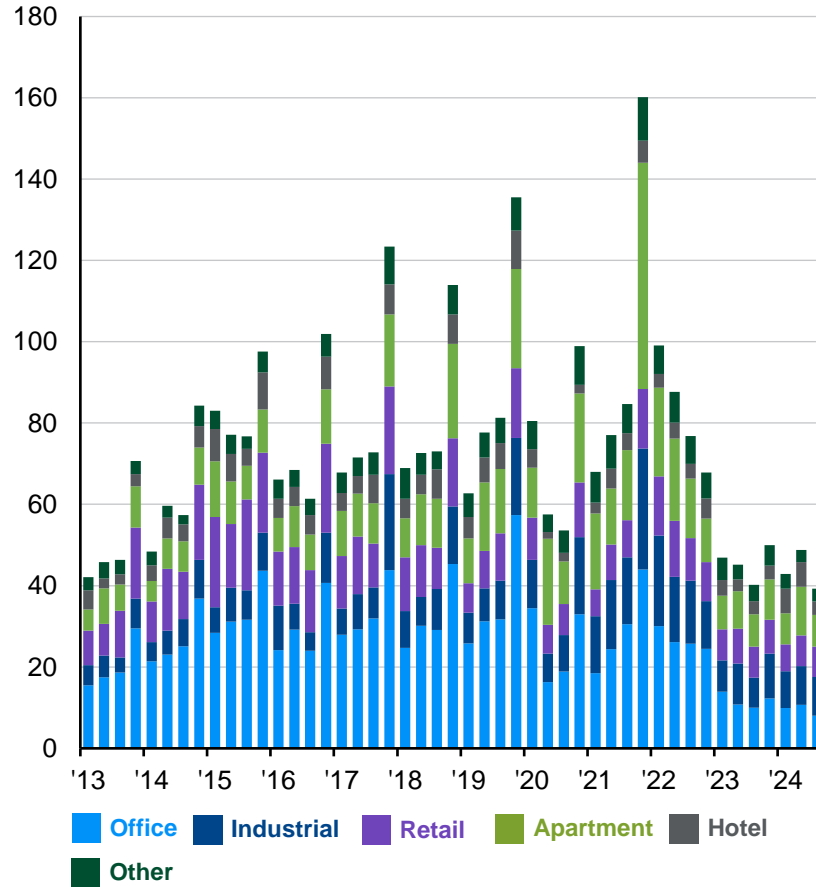


# Europe real estate: Transaction volumes

Real estate

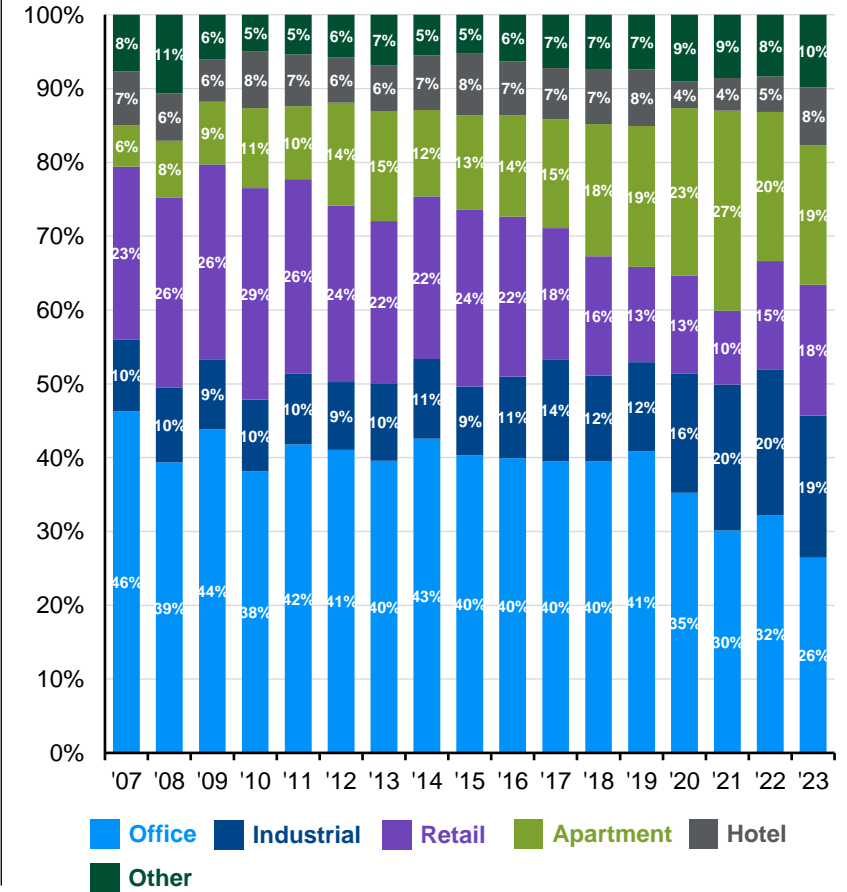
## European transaction volumes

EUR billions 1Q13 – 3Q24



## European transaction volumes by property type

Share of total, 2007 - 2023



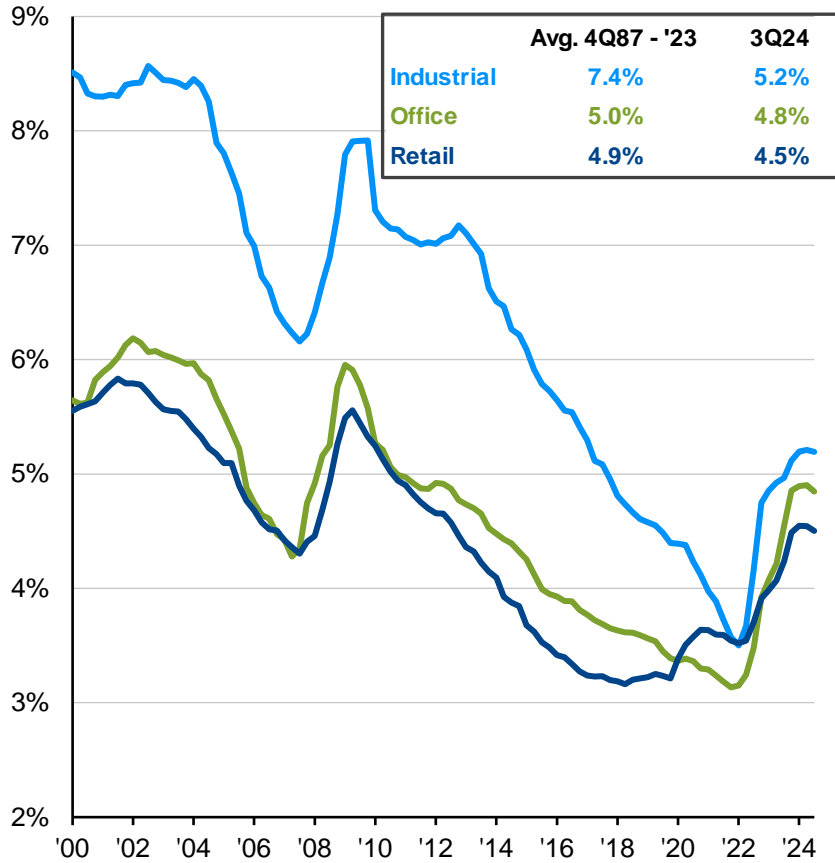
Source: RCA, J.P. Morgan Asset Management. Percentages may not sum to 100 due to rounding. Data are based on availability as of November 30, 2024.



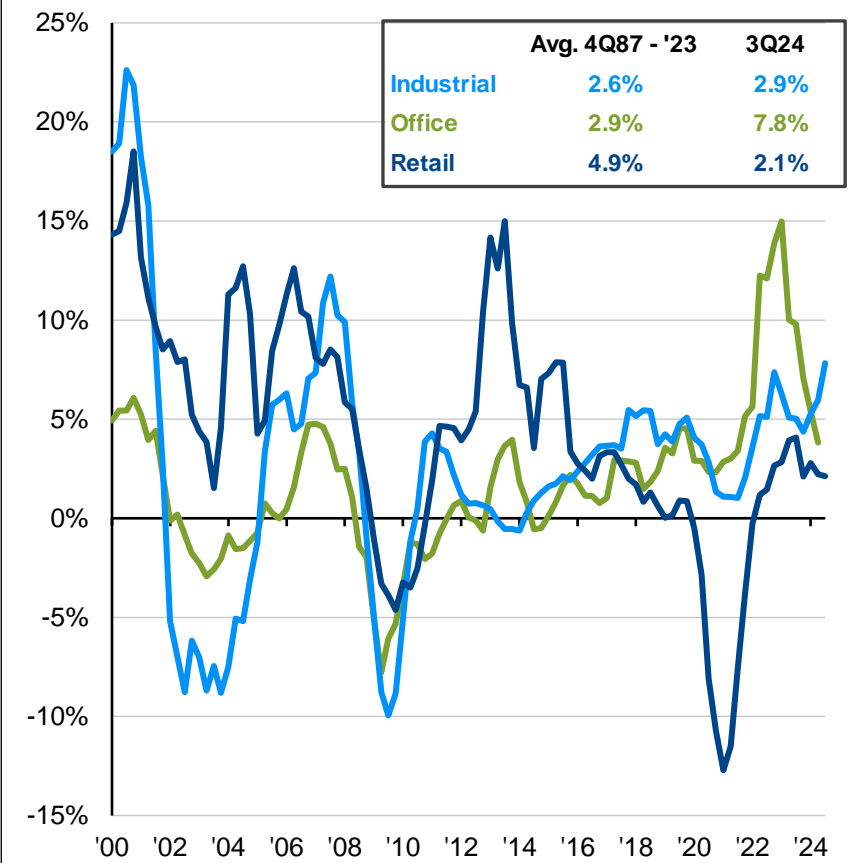
# Europe real estate: Yield and income

Real estate

### Prime yield by property type 1Q00 – 3Q24



### Prime rent growth by property type Year-over-year % change, 1Q00 – 3Q24



Source: CBRE ERIX, J.P. Morgan Asset Management. Industrial is represented by industrial logistics. Retail is represented by high street retail. Prime yields are absolute and weighted by property value. Data are based on availability as of November 30, 2024.

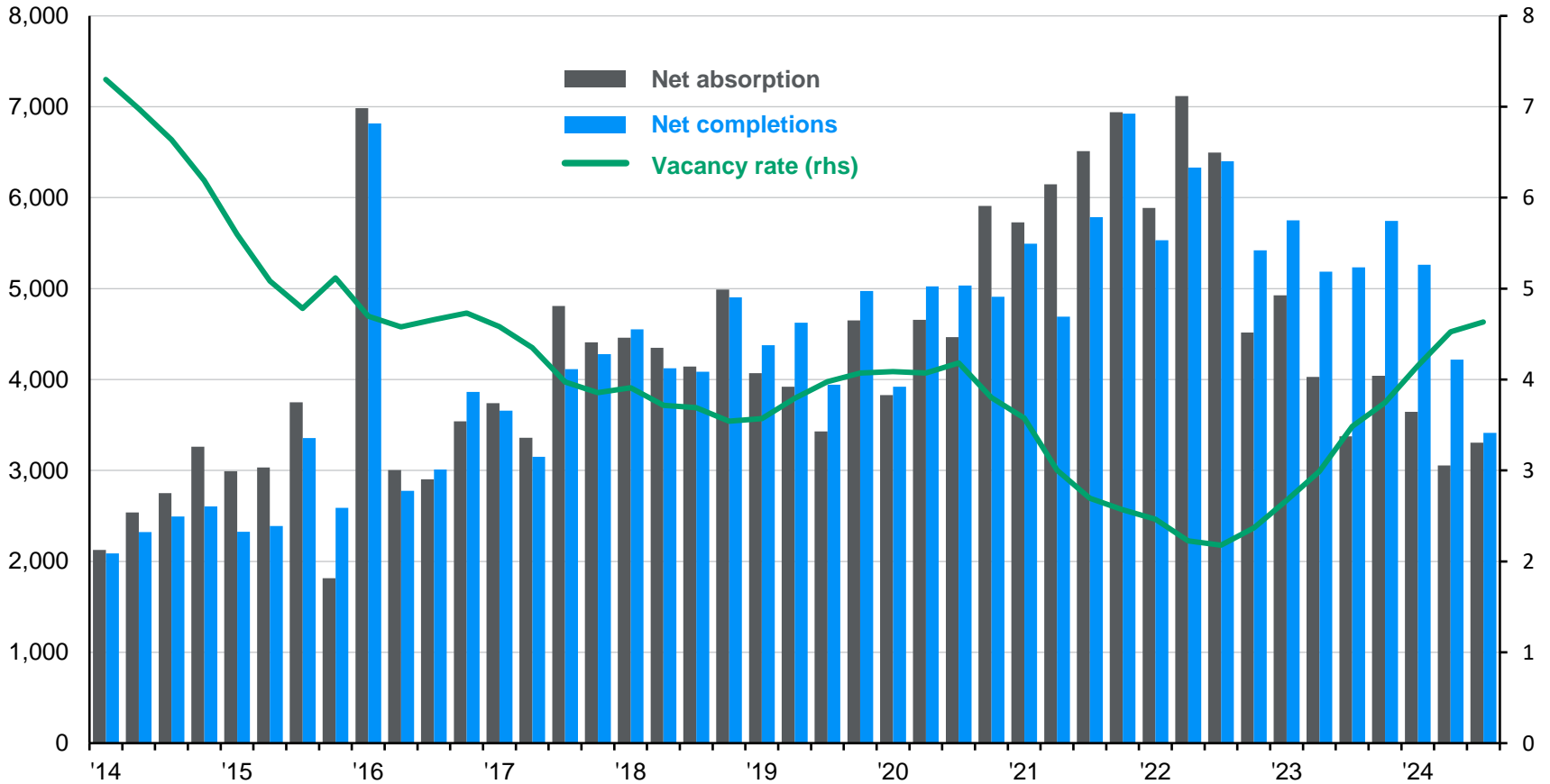


# Europe real estate: Industrial

Real estate

### European industrial logistics absorption and net completions

In thousand square meters



Source: CBRE ERIX, J.P. Morgan Asset Management. Industrial is represented by industrial logistics. Europe industrial aggregates include Belgium, Czech Republic, France, Germany, Italy, Netherlands, Poland, Spain and the United Kingdom. "Net absorption" measures the change in occupied stock. "Net Completions" measures changes in total stock. Data are based on availability as of November 30, 2024.



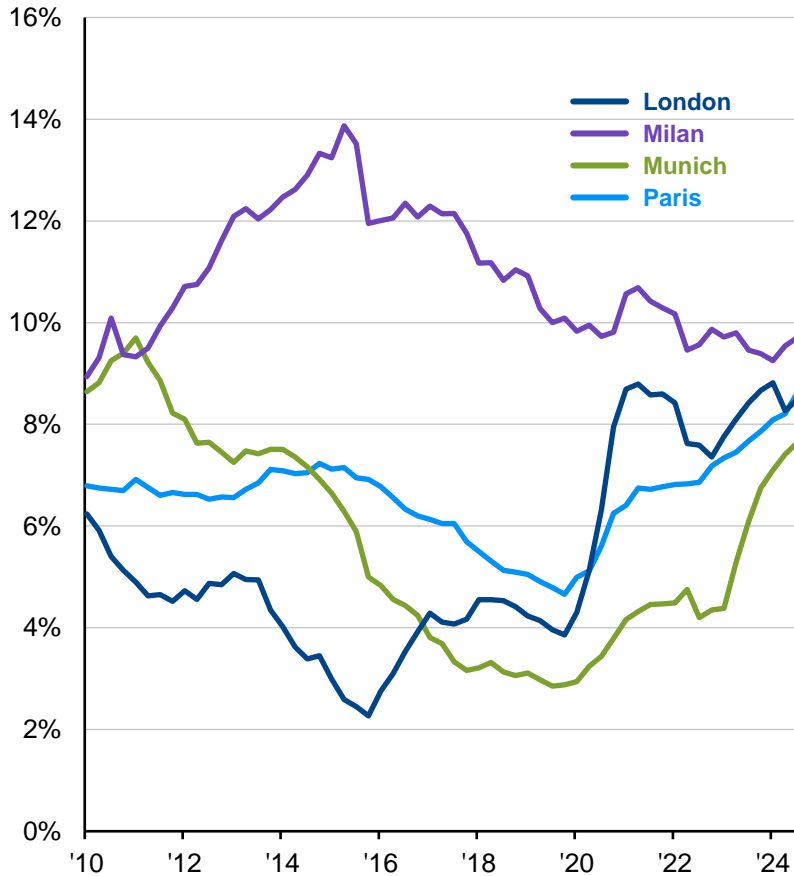


# Europe real estate: Office vacancy rates

Real estate

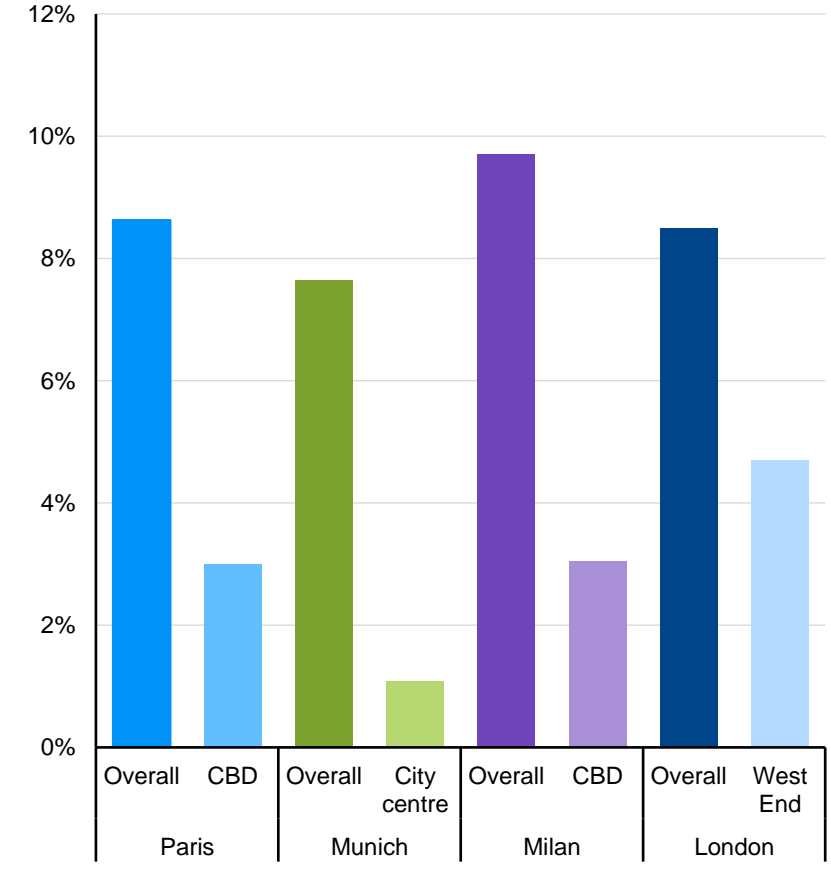
## Office vacancy rates by city

1Q10 – 3Q24



## Office vacancy rates within cities

Total city vacancy rates vs. central business districts\*, 3Q24



Source: CBRE ERIX, J.P. Morgan Asset Management. \*Includes both central business districts (CBDs) and prime areas. Data are based on availability as of November 30, 2024.

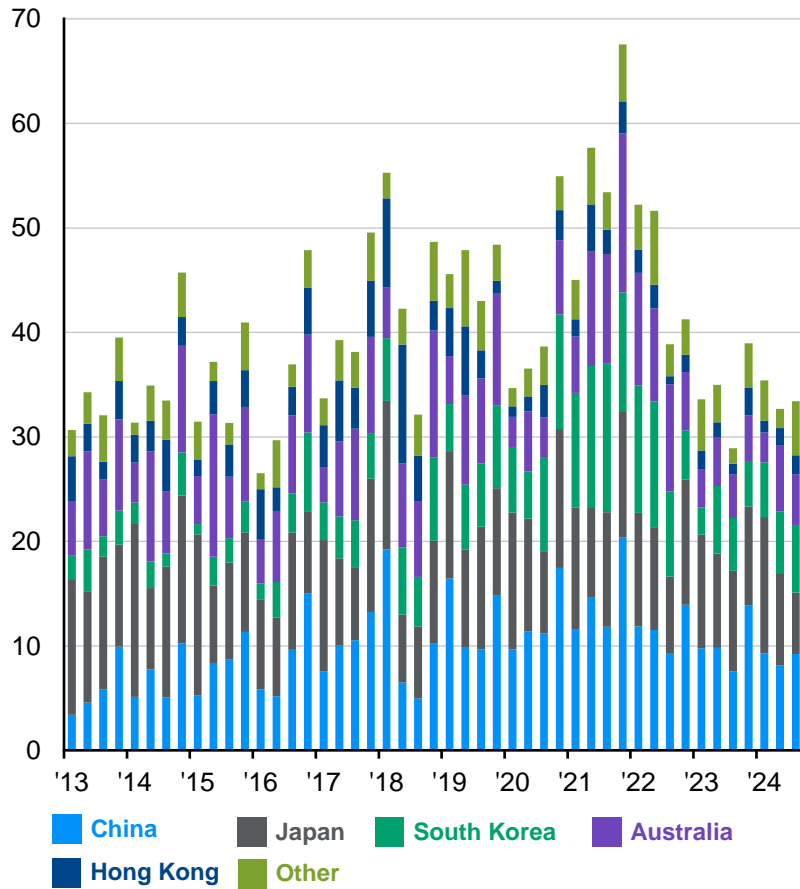


# Asia Pacific real estate: Transaction volumes

Real estate

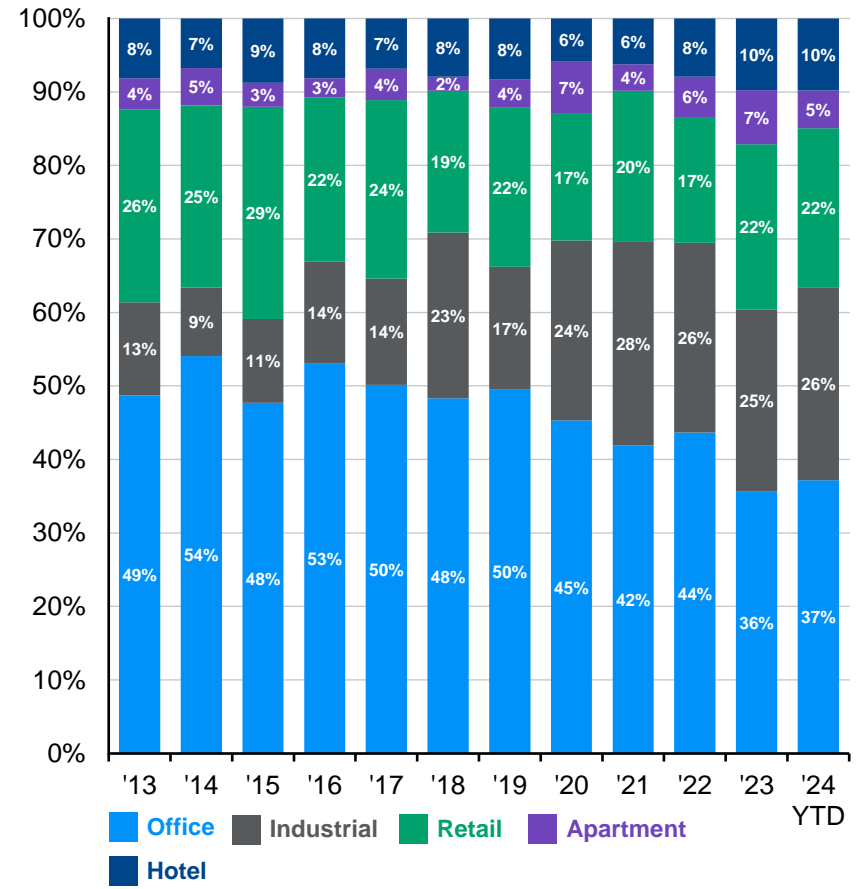
## APAC transaction volumes

USD billions, 1Q13 – 3Q24



## APAC transaction volume by property type

Share of total, 2013 – 2024 YTD



Source: MSCI Real Capital Analytics, J.P. Morgan Asset Management. Transaction volumes include office, industrial, retail, hotel, residential (professional investor) properties and portfolios >= USD 10 million and excludes development sites. Figures are not frozen and subject to updates by RCA. Year-to-date data are as of September 2024. Data are based on availability as of November 30, 2024.

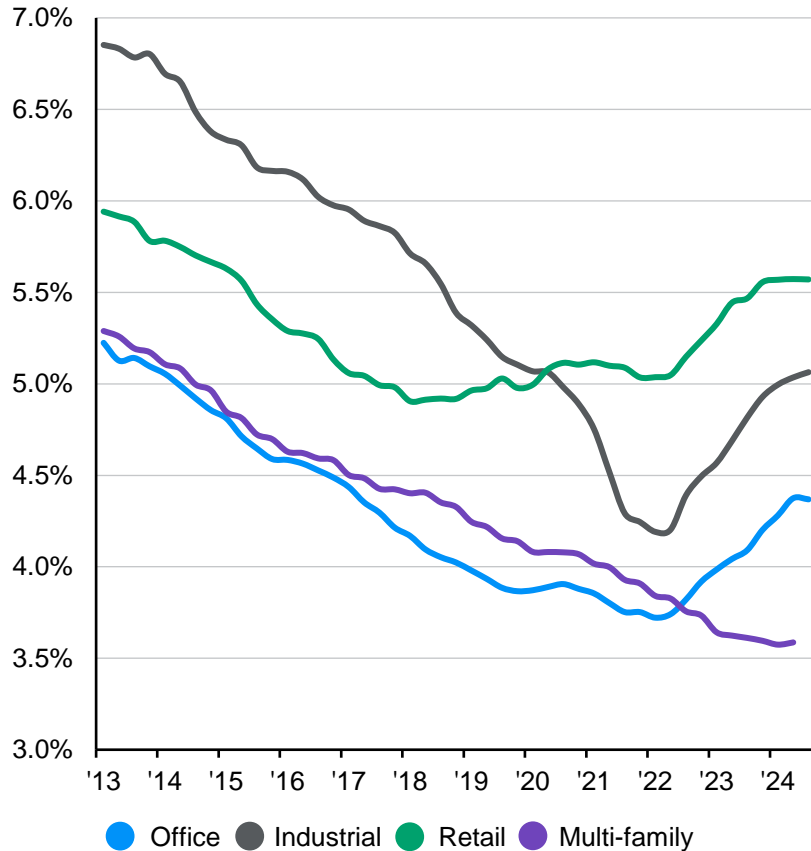


# Asia Pacific real estate: Yields and capital values

Real estate

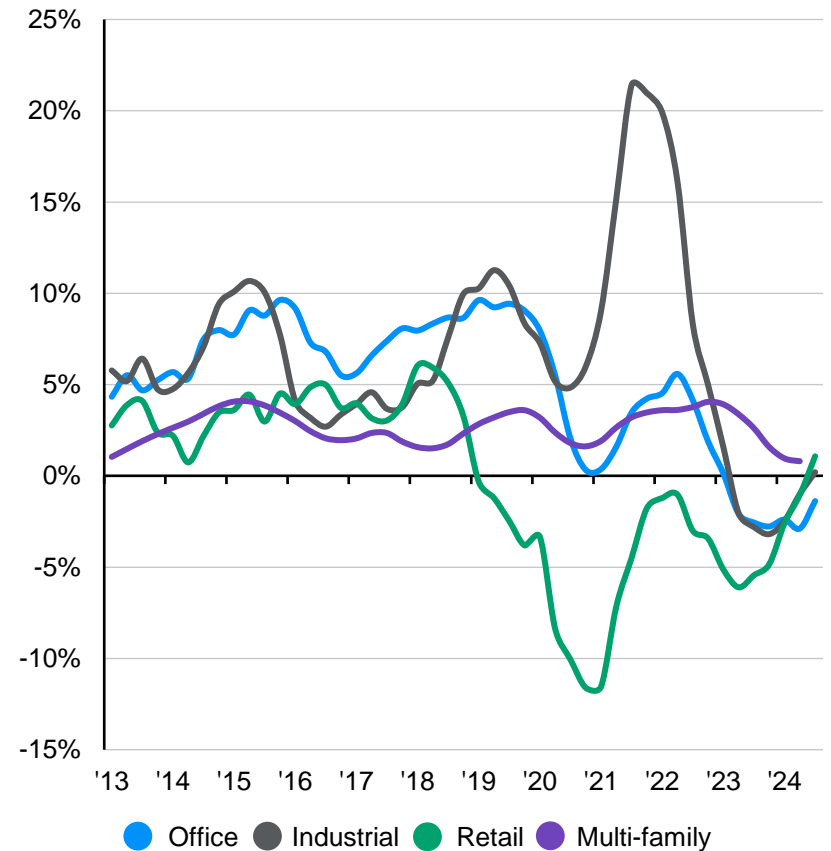
## Yields by property type

%, 1Q13 – 3Q24\*



## Capital growth by property type

Year-over-year % change, 1Q13 - 3Q24



Source: JLL REIS, J.P. Morgan Asset Management.

All yield and capital growth data from JLL REIS, except multi-family sector from MSCI-IPD. Weight of each market based on country allocation % of ANREV ODCE Fund Index. Yields for office, industrial and retail sectors refer to market yields of overall APAC, while yields for multi-family refers to the value cap rate for Japan markets only. \*Multi-family data available through 2Q 2024. Data are based on availability as of November 30, 2024.

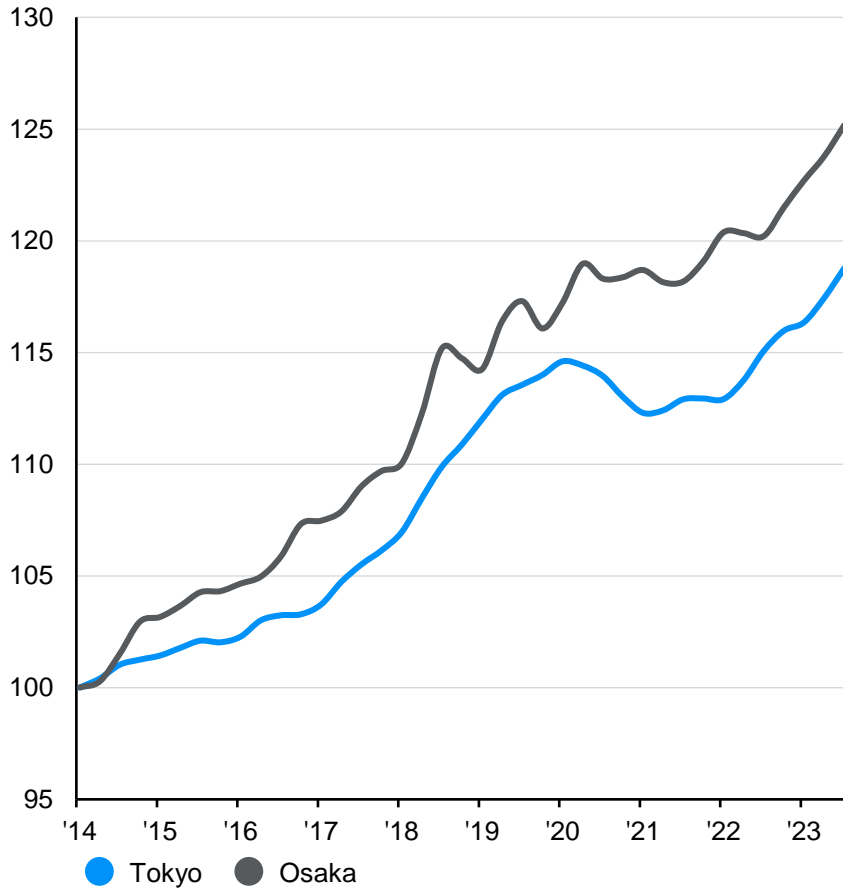


# Asia Pacific real estate: Japan multifamily

Real estate

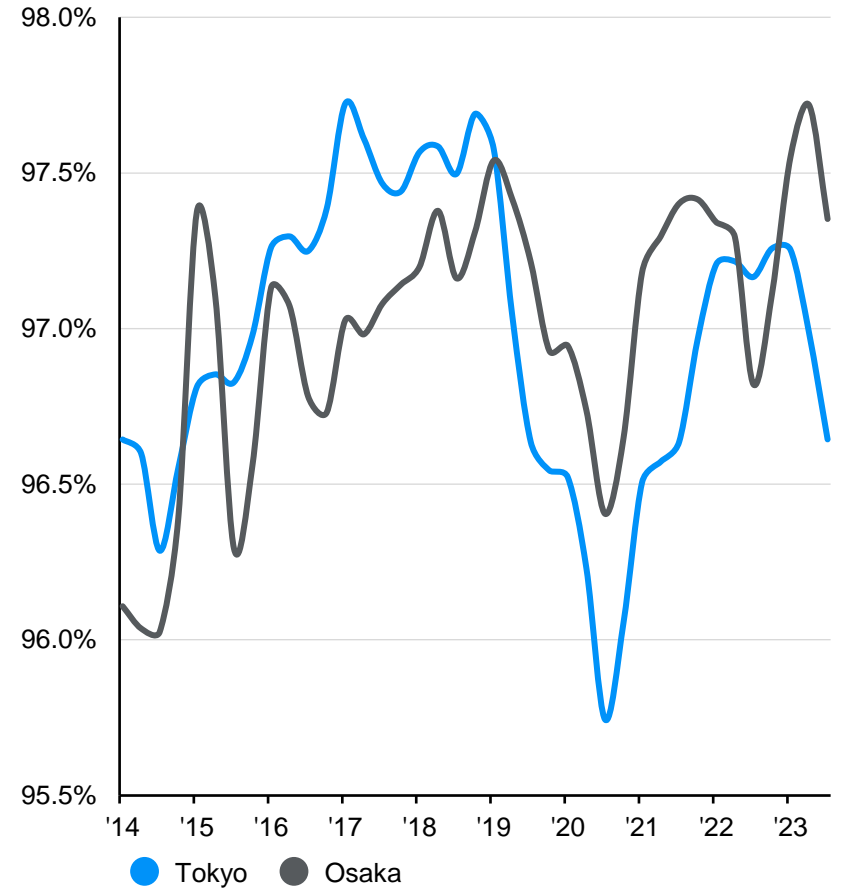
## Japan residential rents

Rent index, 4Q14 = 100



## Japan residential occupancy rates

%, 4Q14 – 2Q24



Source: MSCI-IPD, Sumitomo Mitsui Trust Research Institute, J.P. Morgan Asset Management. (Left) Data as of 2Q 2024. Rent index based on rolling 2-quarter average index returns. (Right) Data as of November 2024. Occupancy based on 3-month moving average level. Occupancy rates in recent periods are subject to regular changes when source data becomes available. Data are based on availability as of November 30, 2024.

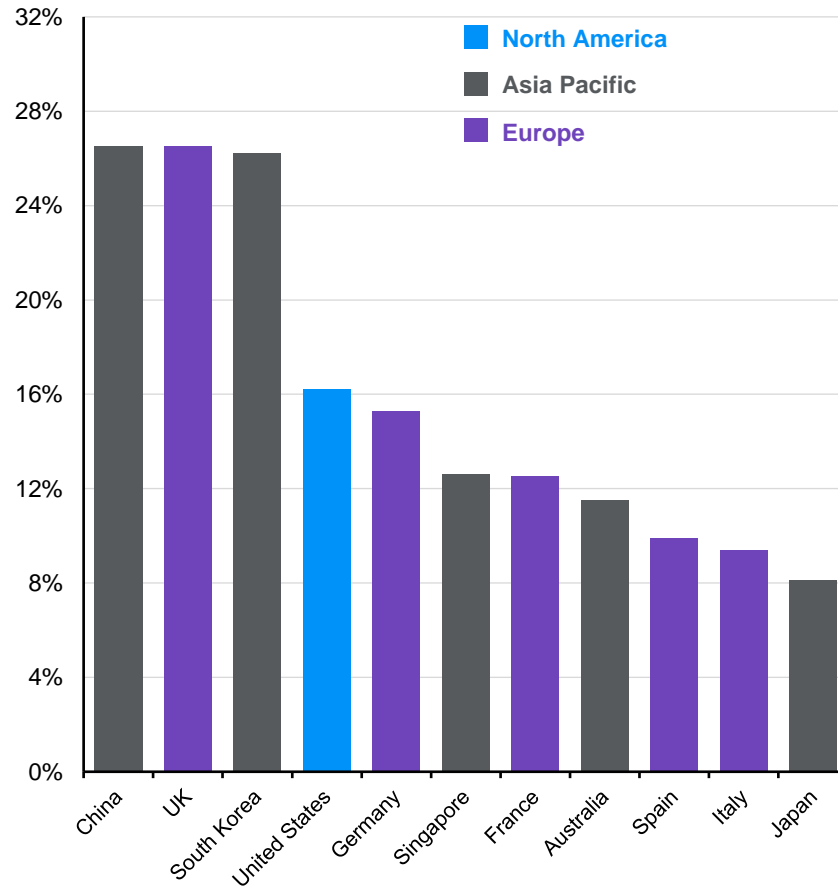


# Global real estate: Retail

Real estate

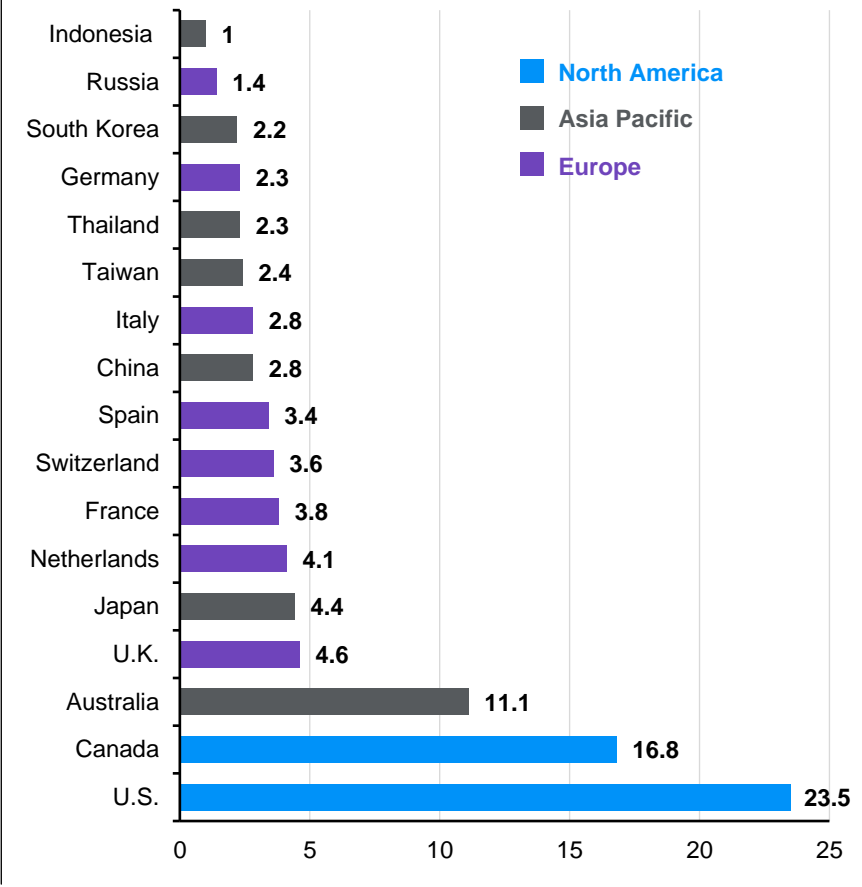
## Global online retail sales

Percent of total retail sales, 3Q24\*



## Retail real estate per capita

Square feet per person



Source: (Left) Australian Bureau of Statistics, Centre for Retail Research (Germany, France, Italy, Spain), Korean Statistical Information Service, METI (Japan), National Bureau of Statistics (China), ONS (UK), Statistics of Singapore, U.S. Census Bureau. \*All data are as of 3Q24 except for Japan which is as of 2022. (Right) Statista, J.P. Morgan Asset Management. Retail space per capita per country data was published in November 2020 and represents retail square footage per person in 2018. Data are based on availability as of November 30, 2024.

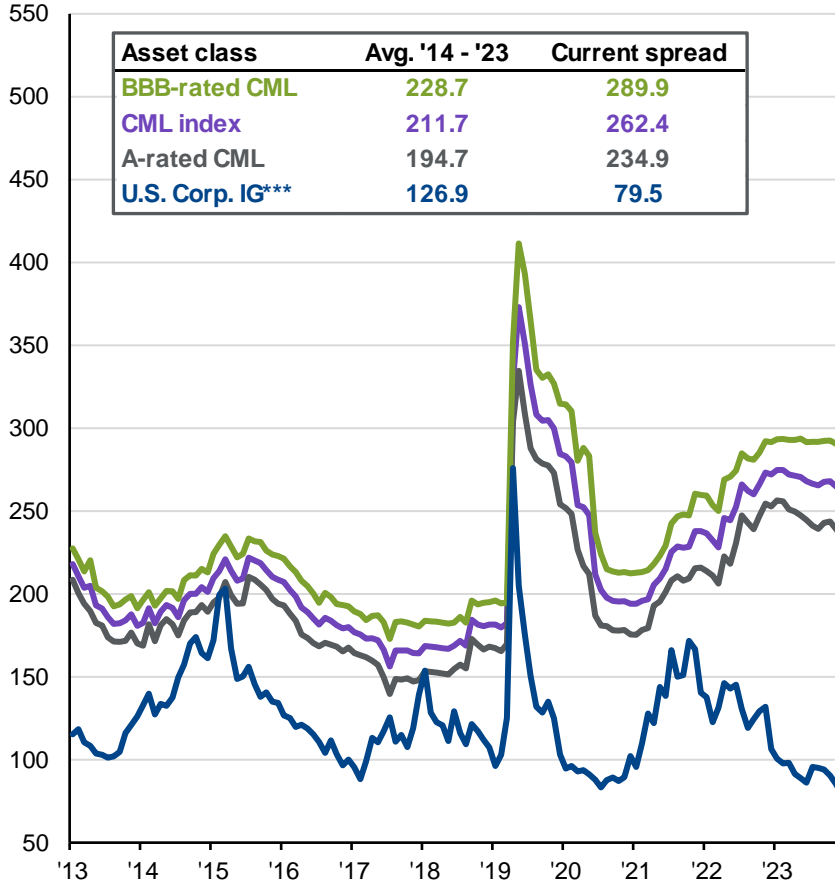


# Commercial mortgage loans

Real estate

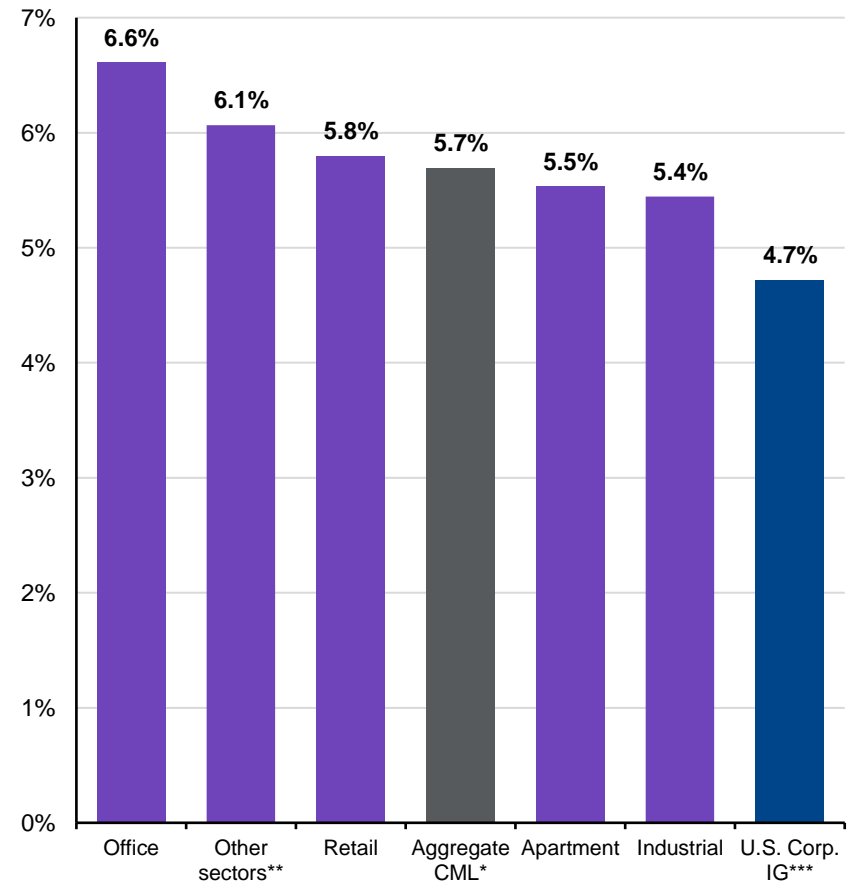
## Commercial mortgage spreads

Spreads over Treasury, basis points, senior loans



## Commercial mortgage yields

Weighted average yield, senior loans, 2Q24



Source: Bloomberg, Gilberto-Levy, FactSet, J.P. Morgan Asset Management. All spreads are as of November 2024. (Left) Commercial mortgage spreads are from a J.P. Morgan survey and are calculated as the difference between the average yield as indicated by the survey and the yield of a U.S. Treasury security with a similar duration. (Right) Commercial mortgage yields shown are market-capitalization weighted average yields for all mortgages in each sector as of quarter end. \*Aggregate CML: Gilberto-Levy Commercial Mortgage Loans Performance Index. \*\*Other sectors includes hotels, motels, mixed-use, and miscellaneous. \*\*\*U.S. Corp. IG: Bloomberg U.S. Corporate Investment Grade Index. Yield shown for U.S. Corp IG is the yield-to-worst as of quarter end. Data are based on availability as of November 30, 2024.

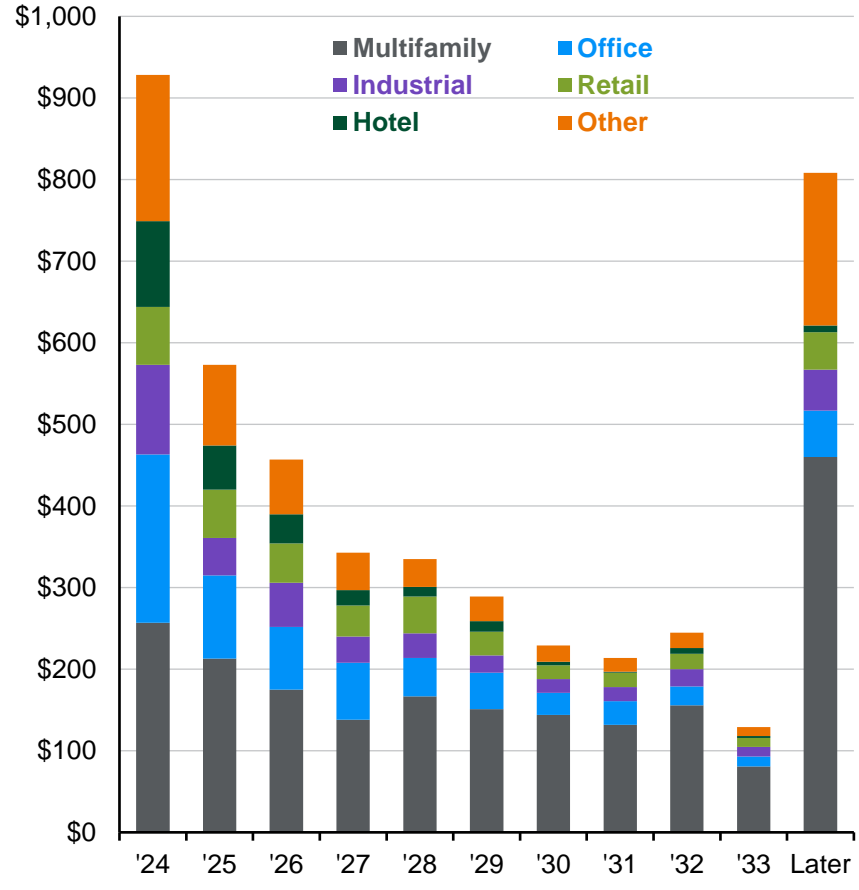


# Commercial mortgage maturities and delinquencies

Real estate

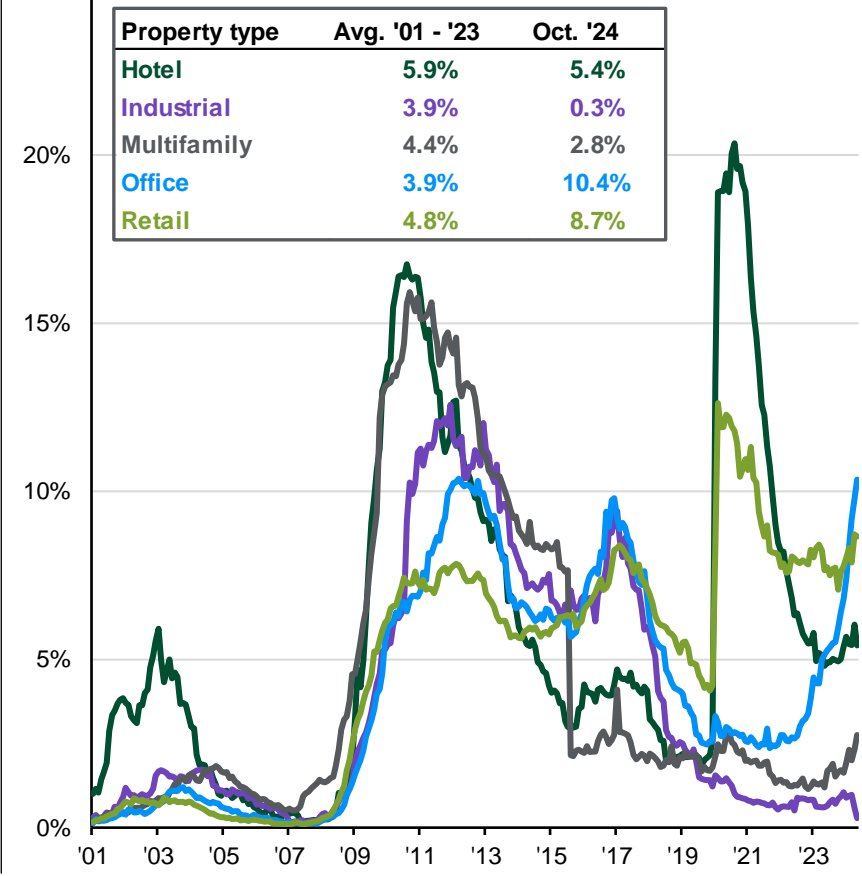
### Commercial mortgage maturity schedule

By property type, USD billions, 4Q23



### Commercial mortgage delinquencies

Delinquency rates by property type, monthly 25%



Source: J.P. Morgan Asset Management; (Left) Mortgage Bankers Association; (Right) Moody's. (Left) Data are as of December 31, 2023. Other includes hospitals. Moody's defines delinquencies as loans that are 60 or more days in payment arrears, that are matured and performing, matured and nonperforming, foreclosure in progress or REO ("real estate owned" by a bank). Data are based on availability as of November 30, 2024.



# U.S. REIT sector returns

GTA MI 40

Real estate

											2014-2023	
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	YTD '24	Ann.	Vol.*
Mfgd. Homes 46.2%	Self Storage 40.6%	Industrial 30.7%	Data Centers 28.4%	Ret. Free Standing 13.9%	Mfgd. Homes 49.1%	Data Centers 21.0%	Regional Malls 92.1%	Ret. Free Standing -6.5%	Data Centers 30.1%	Health Care 35.5%	Mfgd. Homes 16.1%	Regional Malls 35.0%
Apartments 39.6%	Mfgd. Homes 25.6%	Lodging/Resorts 24.3%	Mfgd. Homes 24.9%	Mfgd. Homes 11.4%	Industrial 48.7%	Self Storage 12.9%	Self Storage 79.4%	Shopping Centers -12.5%	Regional Malls 29.9%	Regional Malls 34.4%	Industrial 15.9%	Lodging/Resorts 29.8%
Health Care 33.3%	Apartments 16.5%	Ret. Free Standing 17.0%	Industrial 20.6%	Health Care 7.6%	Data Centers 44.2%	Industrial 12.2%	Shopping Centers 65.1%	Lodging/Resorts -15.3%	Lodging/Resorts 23.9%	Data Centers 33.1%	Self Storage 13.7%	Shopping Centers 28.9%
Regional Malls 32.6%	Ret. Free Standing 5.9%	Mfgd. Homes 14.2%	All Equity REITs 8.7%	Apartments 3.7%	Office 31.4%	Mfgd. Homes -1.7%	Apartments 63.6%	Health Care -22.2%	Industrial 19.2%	Apartments 28.8%	Apartments 8.5%	Ret. Free Standing 22.0%
Lodging/Resorts 32.5%	Shopping Centers 4.7%	Office 13.2%	Lodging/Resorts 7.2%	Self Storage 2.9%	All Equity REITs 28.7%	All Equity REITs -5.1%	Industrial 62.0%	Regional Malls -22.9%	Self Storage 18.5%	Office 28.5%	All Equity REITs 7.9%	Self Storage 21.8%
Self Storage 31.4%	Regional Malls 4.2%	All Equity REITs 8.6%	Office 5.2%	Industrial -2.5%	Apartments 26.3%	Health Care -9.9%	Mfgd. Homes 42.0%	All Equity REITs -24.9%	Health Care 13.9%	Shopping Centers 23.4%	Ret. Free Standing 7.0%	Office 21.7%
Shopping Centers 30.0%	All Equity REITs 2.8%	Health Care 6.4%	Self Storage 3.7%	All Equity REITs -4.0%	Shopping Centers 25.0%	Ret. Free Standing -10.5%	All Equity REITs 41.3%	Self Storage -26.7%	Shopping Centers 12.0%	All Equity REITs 14.0%	Health Care 4.9%	Health Care 21.3%
All Equity REITs 28.0%	Industrial 2.6%	Shopping Centers 3.7%	Apartments 3.7%	Regional Malls -7.0%	Ret. Free Standing 24.8%	Apartments -15.3%	Data Centers 25.5%	Data Centers -28.0%	All Equity REITs 11.4%	Self Storage 14.0%	Shopping Centers 4.6%	Industrial 20.6%
Office 25.9%	Office 0.3%	Apartments 2.9%	Ret. Free Standing 3.1%	Lodging/Resorts -12.8%	Health Care 21.2%	Office -18.4%	Office 22.0%	Mfgd. Homes -28.3%	Apartments 5.9%	Ret. Free Standing 10.2%	Regional Malls 2.7%	Apartments 18.9%
Industrial 21.0%	Health Care -7.2%	Regional Malls -5.2%	Health Care 0.9%	Data Centers -14.1%	Lodging/Resorts 15.6%	Lodging/Resorts -23.6%	Ret. Free Standing 19.7%	Industrial -28.6%	Mfgd. Homes 2.5%	Lodging/Resorts 1.5%	Lodging/Resorts 2.5%	Mfgd. Homes 17.3%
Ret. Free Standing 9.7%	Lodging/Resorts -24.4%	Self Storage -8.1%	Regional Malls -2.7%	Office -14.5%	Self Storage 13.7%	Shopping Centers -27.6%	Lodging/Resorts 18.2%	Apartments -32.0%	Office 2.0%	Mfgd. Homes 0.6%	Office 0.7%	All Equity REITs 17.3%
Data Centers N/A	Data Centers N/A	Data Centers N/A	Shopping Centers -11.4%	Shopping Centers -14.5%	Regional Malls -9.1%	Regional Malls -37.2%	Health Care 16.3%	Office -37.6%	Ret. Free Standing -1.5%	Industrial -10.1%	Data Centers N/A	Data Centers N/A

Source: FTSE NAREIT, FactSet, J.P. Morgan Asset Management. All indices are from FTSE NAREIT. \*Volatility calculated as the annualized standard deviation of quarterly returns. Mfgd. Homes represents manufactured homes. Data for Data Centers begins in 2017. Data are based on availability as of November 30, 2024.



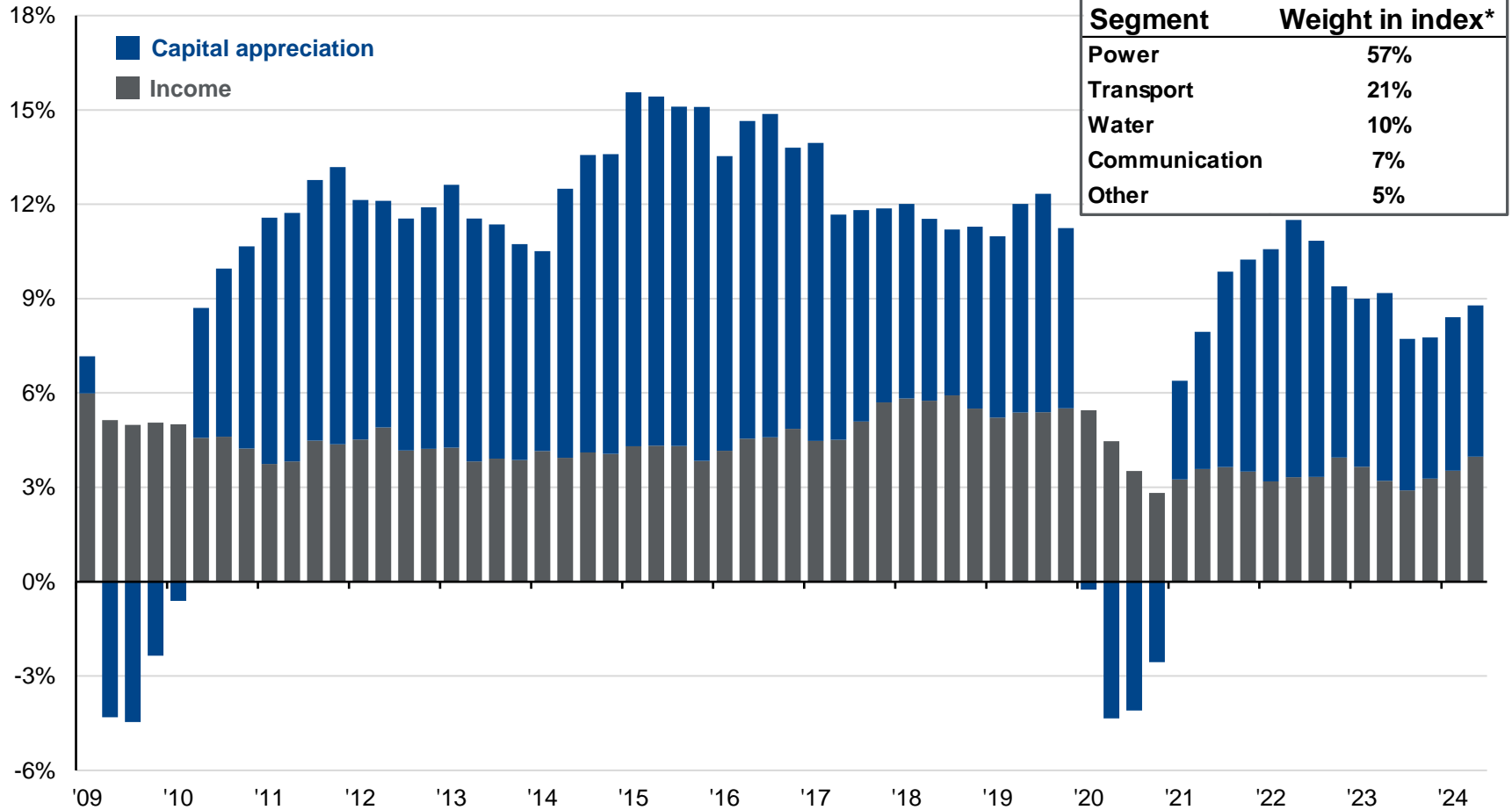


# Sources of global infrastructure returns

Other real assets

## Global core infrastructure returns

1Q09-2Q24, rolling 4-quarter returns from income and capital appreciation



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

Infrastructure returns represented by the MSCI Global Quarterly Infrastructure Asset Index. Data show rolling one-year returns from income and capital appreciation. \*Weights are based on enterprise value. 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 are based on availability as of November 30, 2024.

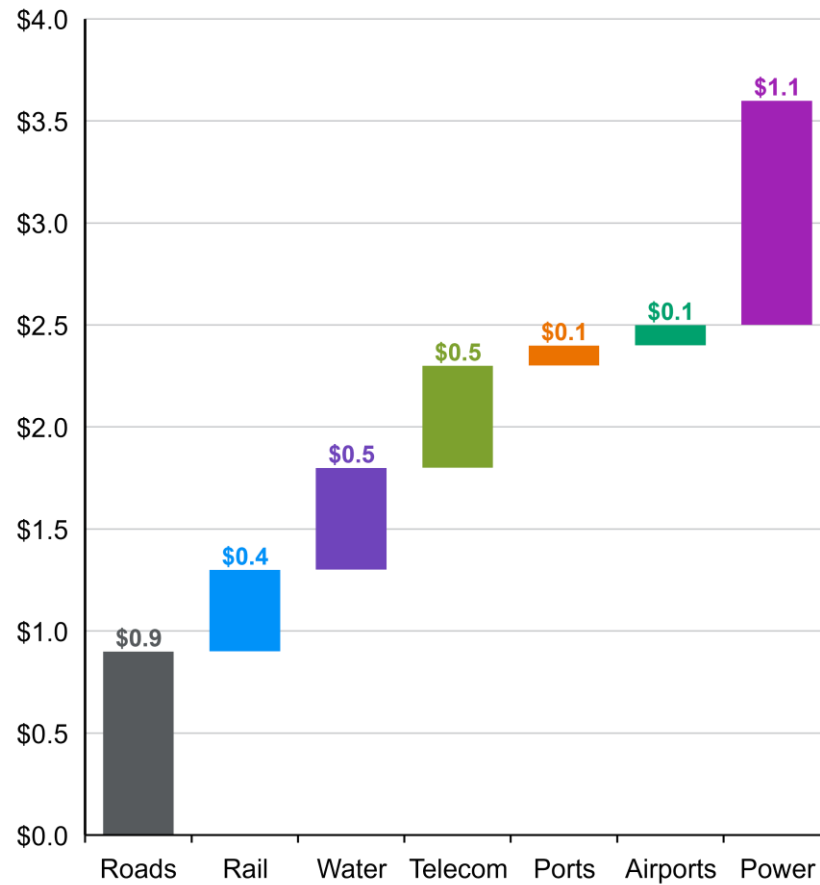


# Global infrastructure investment

Other real assets

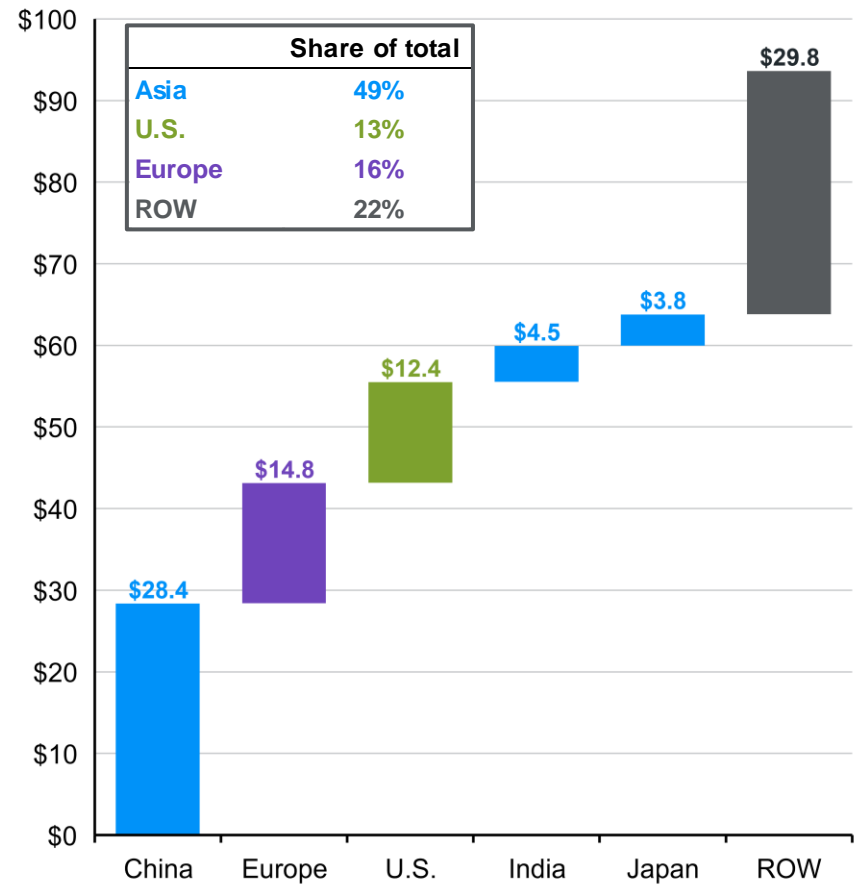
### Average annual global infrastructure need by type

USD trillions, as of 2017



### Infrastructure investment needs by region

USD trillions, 2016-2040, constant 2016 dollars



Source: J.P. Morgan Asset Management; (Left) McKinsey Global Institute; (Right) Global Infrastructure Hub by G20. ROW = Rest of World. Data are based on availability as of November 30, 2024.

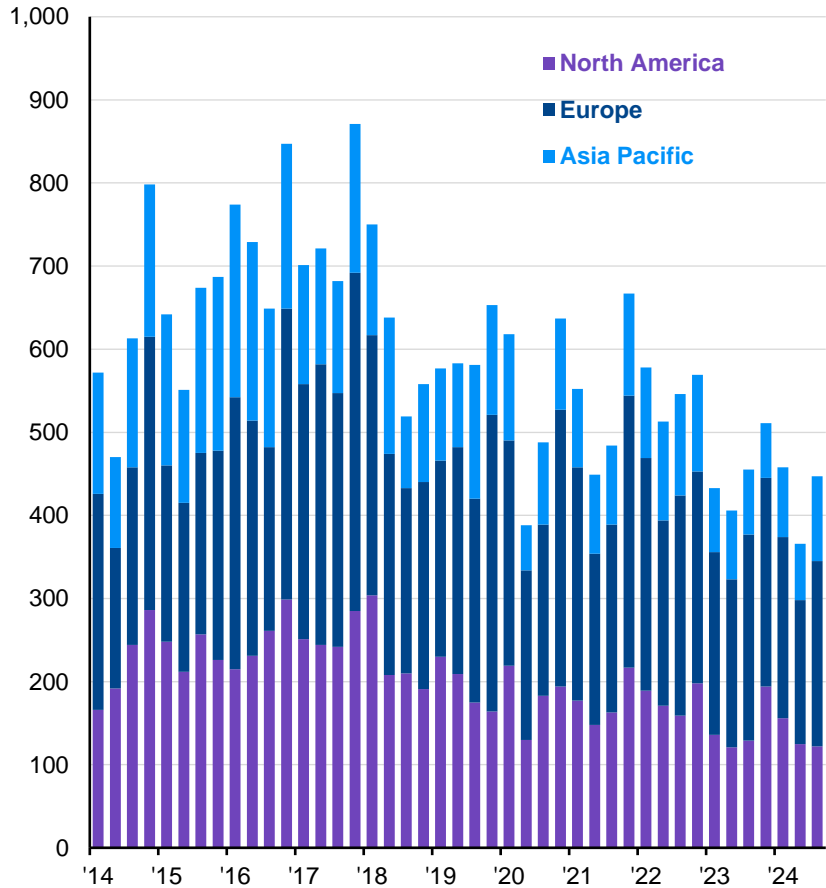


# Global infrastructure transactions

Other real assets

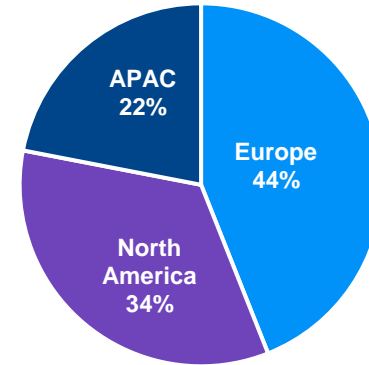
## Number of private infrastructure deals

1Q14-3Q24



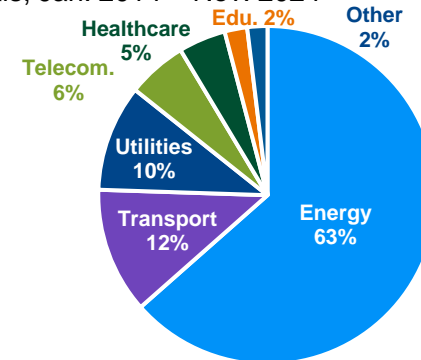
## Deals by region

Share of deals, Jan. 2014 – Nov. 2024



## Deals by type

Number of deals, Jan. 2014 – Nov. 2024



Source: Prequin, J.P. Morgan Asset Management.  
 (Bottom right): Other includes waste management, government buildings, logistics and defense.  
 Data are based on availability as of November 30, 2024.

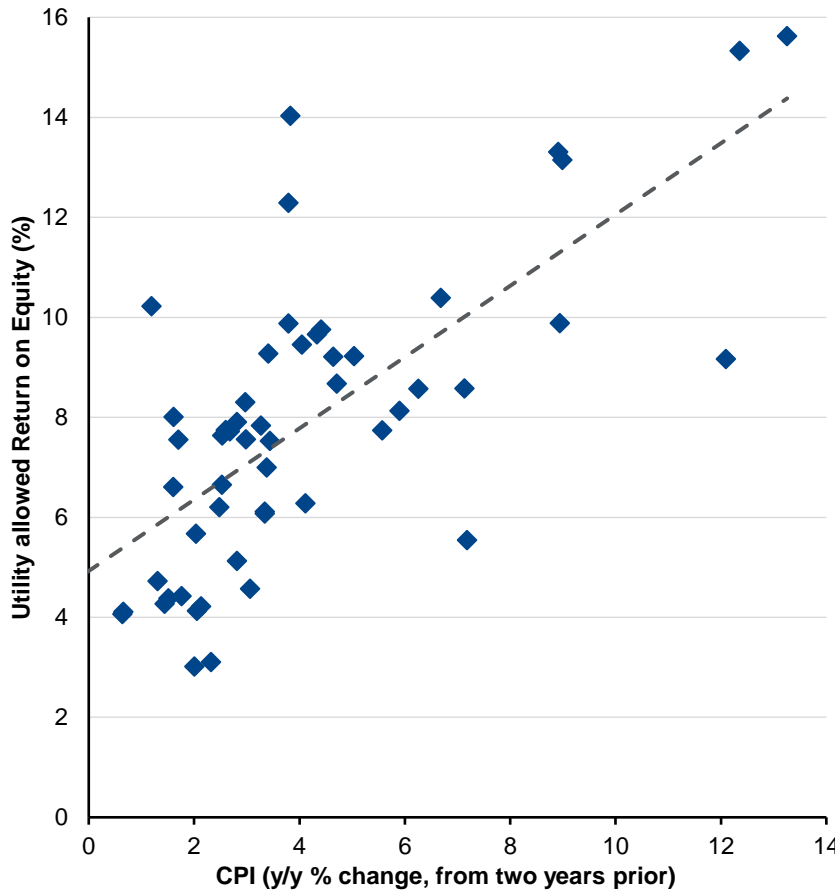


# U.S. utility profitability and consumption

Other real assets

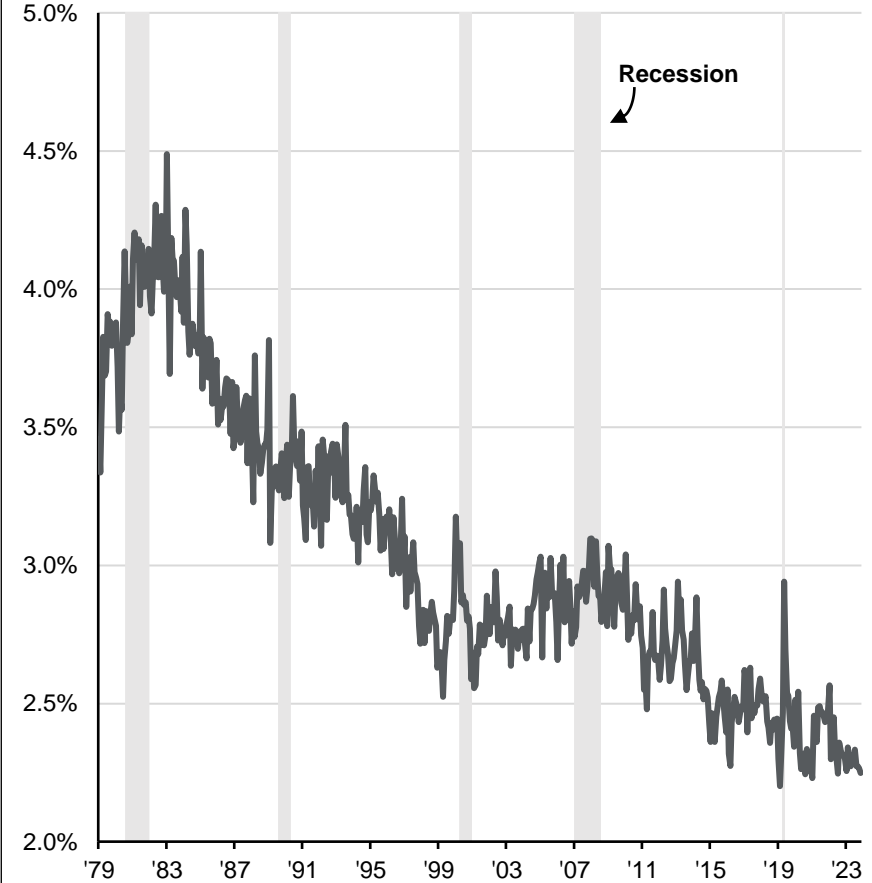
### Gas and electric utilities: Allowed returns versus inflation

Average allowed return on equity\* 1970-2023



### Household utility spending

Household utility spending % of personal consumption expenditures



Source: Bloomberg, Bureau of Economic Analysis, SNL, AEU, J.P. Morgan Asset Management. (Left) Data represent average allowed return on equities (RoEs) for Electricity and Natural Gas Utilities and annual inflation from December 1970 through December 2023. \*Return on equity is lagged by 2 years. (Right) Includes spending for all household utilities. Data are based on availability as of November 30, 2024.

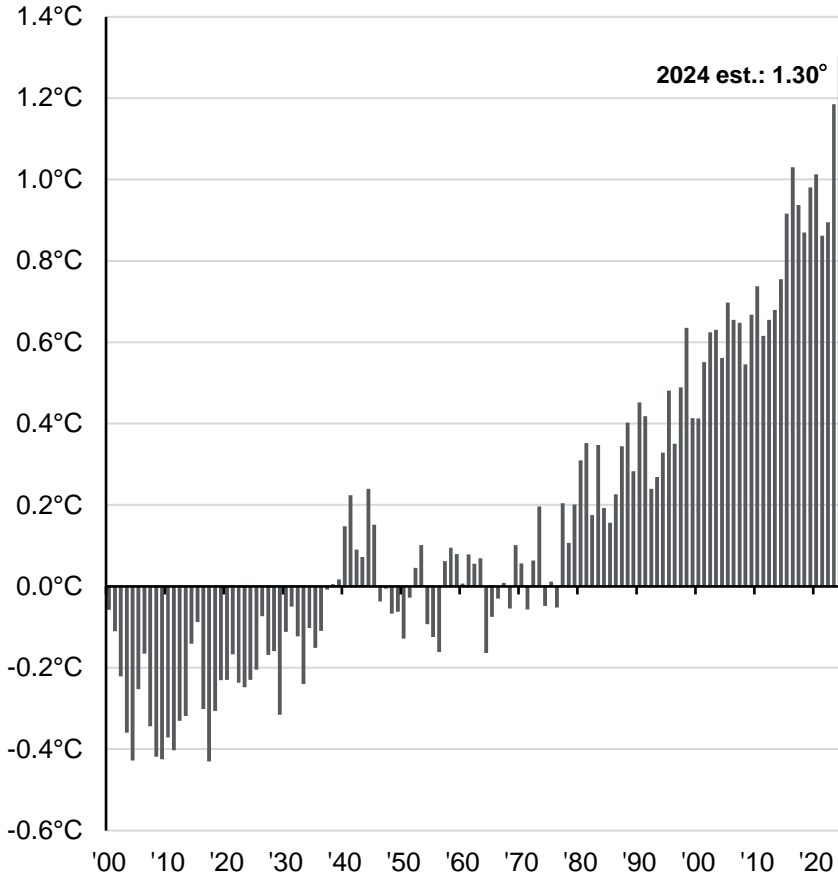


# Global warming and greenhouse gases

Other real assets

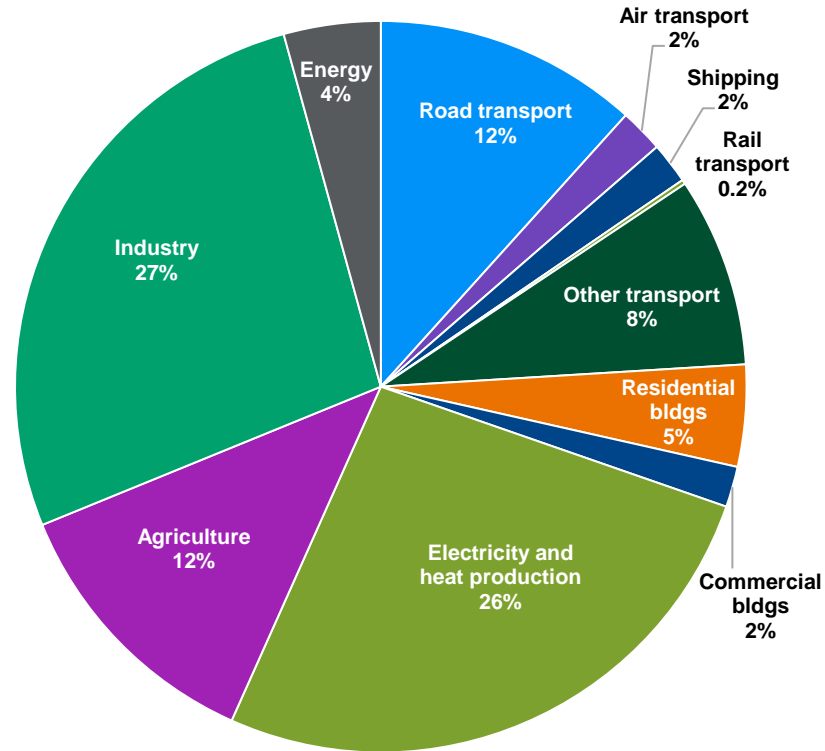
## Global temperature anomaly

1900-2024E, annual difference from 20<sup>th</sup> century average temperature



## Global greenhouse gas emissions by source

2019, measured in tons of carbon dioxide equivalents



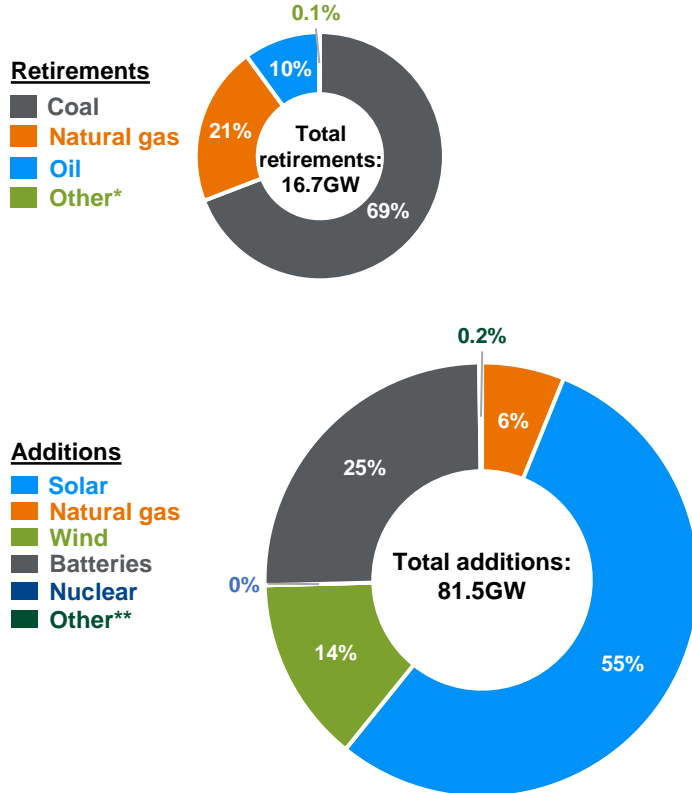
Source: J.P. Morgan Asset Management. (Left) Climate.gov, National Centers for Environmental Information. Estimate for 2024 is by J.P. Morgan Asset Management based on actual data for Jan. 2024-Oct. 2024 and last year's readings for the remaining months. (Right) Intergovernmental Panel on Climate Change (IPCC). Data are based on availability as of November 30, 2024.



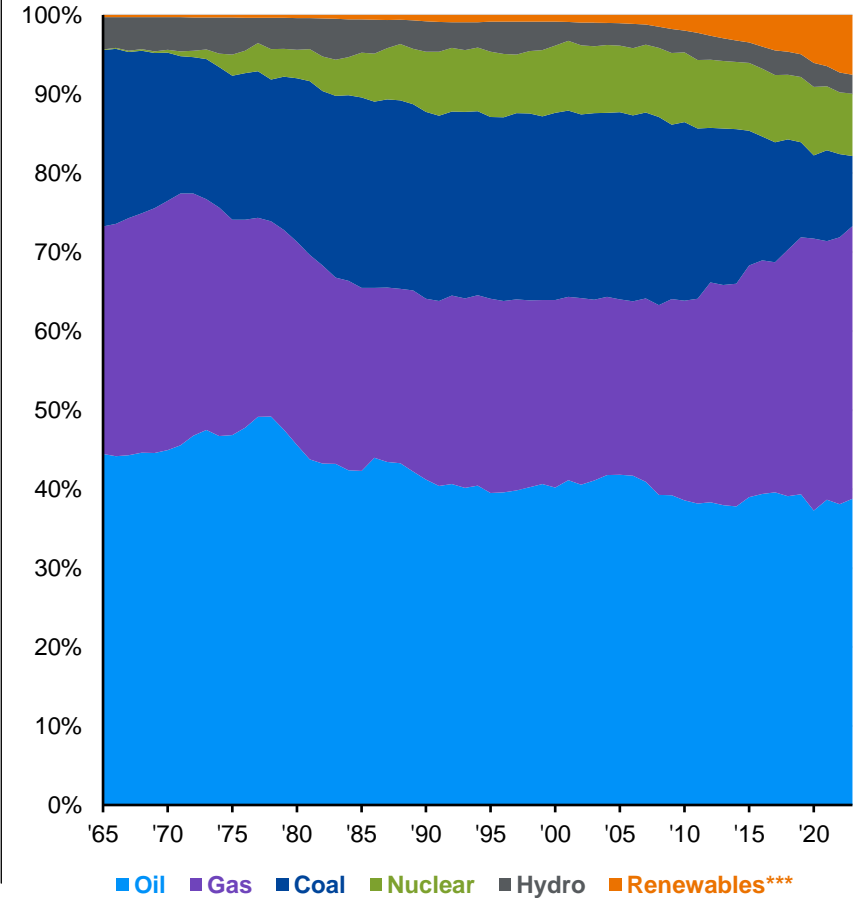
# U.S. energy production and consumption

Other real assets

## Planned U.S. electricity generating capacity Rest of 2024 and 2025



## U.S.'s energy consumption by type % of primary energy consumption



Source: EIA, U.S. Department of the Interior, J.P. Morgan Asset Management.  
 (Left) 2024 planned capacity retirements and additions are from the October 2024 Monthly Electric Generator Inventory report published by the EIA and uses net summer capacity to illustrate share of retirements and additions. \*Other retirements include conventional hydroelectric, batteries, municipal solid waste, landfill gas, solar thermal, and wind. \*\*Other additions include conventional hydroelectric, wind, petroleum liquids, wood and wood biomass, other biomass waste, and landfill gas. (Right) Statistical Review of World Energy Data. Measured in exajoules. \*\*\*Renewables include wind, solar, geothermal, biomass, biomethane and biofuels.  
 Data are based on availability as of November 30, 2024.

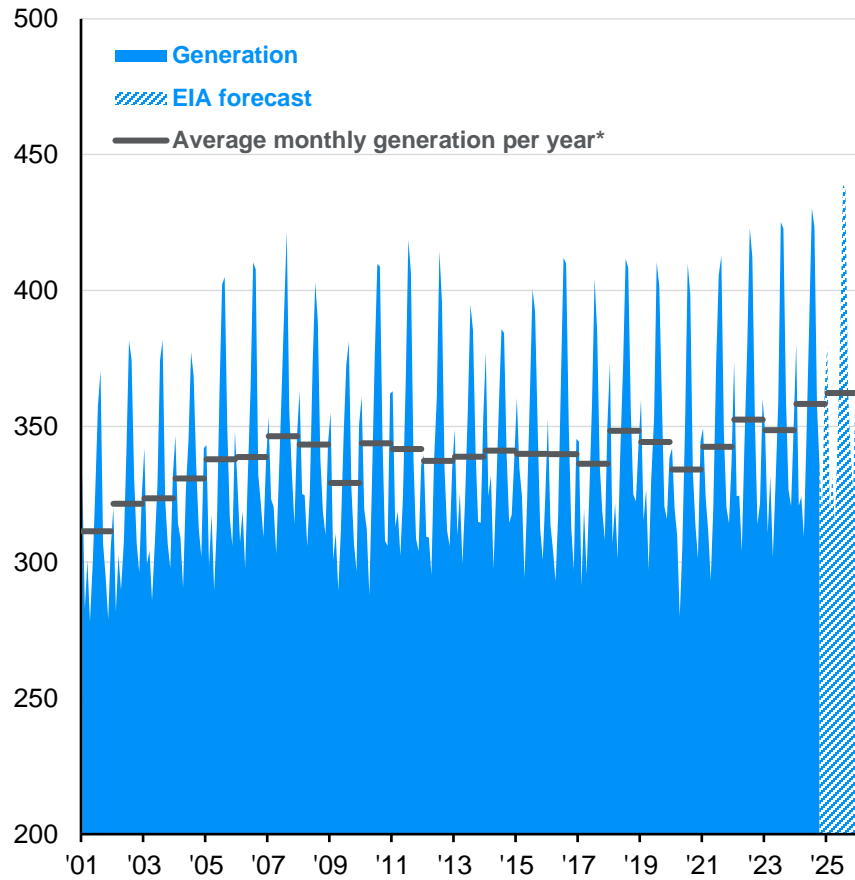


# U.S. electricity production and consumption

Other real assets

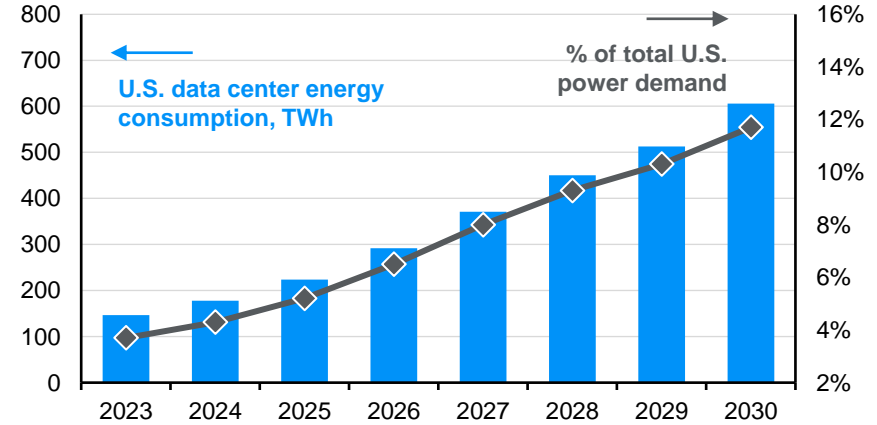
## U.S. electricity generation

Net generation, Terawatt-hour (TWh), monthly



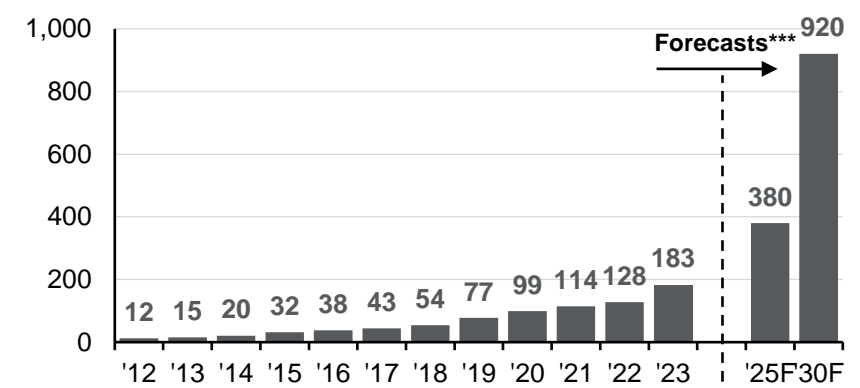
## U.S. electricity consumption from data centers

Forecasts through 2030\*\*



## Number of electric vehicle charging points in the U.S.

Thousands



Source: J.P. Morgan Asset Management; (Left) EIA; (Top right) McKinsey; (Bottom right) IEA.

\*Forecasts are from the November 2024 EIA Short-Term Energy Outlook. 2024 and 2025 averages include forecasted data. \*\*Forecasts are from the 2023 Global Energy Perspective by McKinsey. \*\*\*Forecasts are from the International Energy Agency (IEA) – Global EV Outlook 2024 and are made assuming their "STEPS" outlook. The State Policies Scenario (STEPS) outlook from the IEA does not assume governments will meet announced policy goals and instead looks at what the IEA considers feasible given current progress.

Data are based on availability as of November 30, 2024.

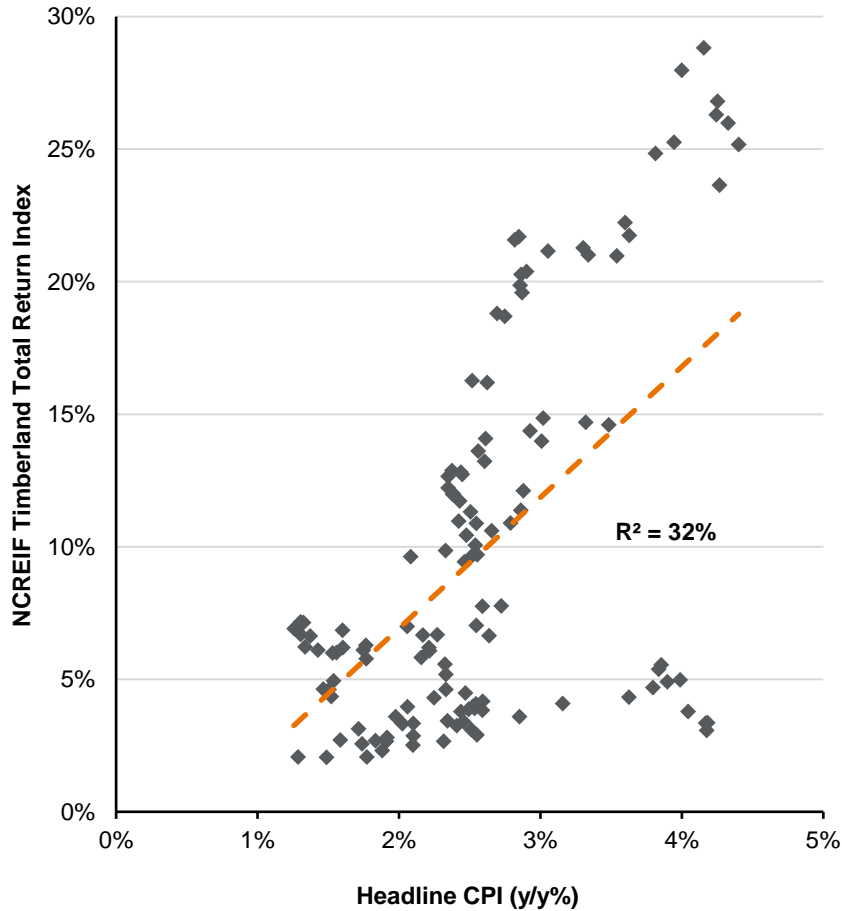


# U.S. timber investments

Other real assets

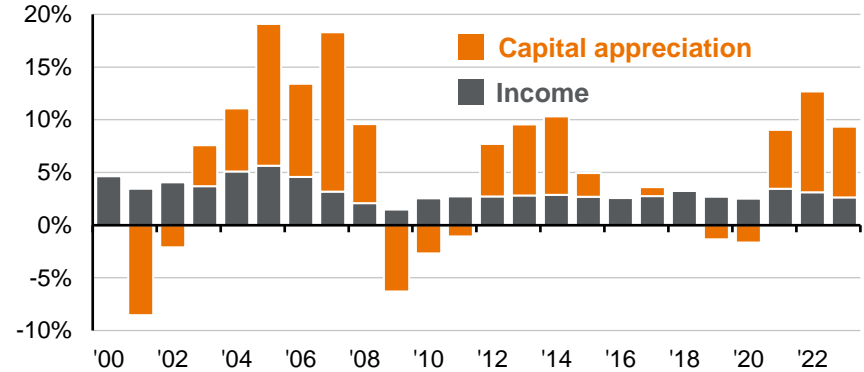
## U.S. timber returns and inflation

Headline CPI, NCREIF Timberland Index, 5-yr. ann. change, quarterly



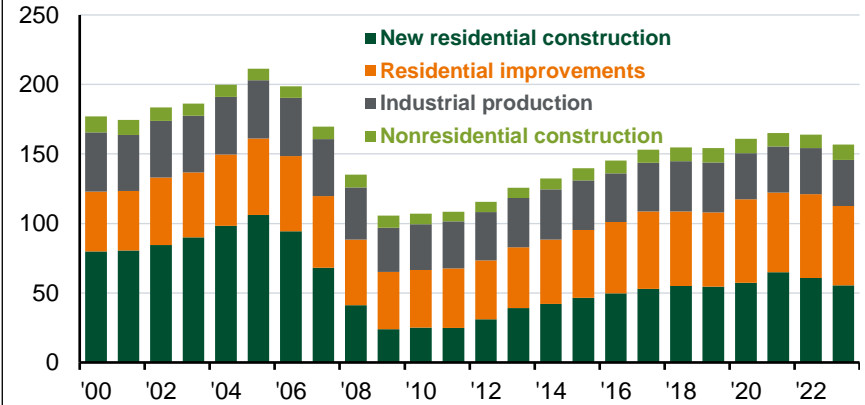
## Sources of U.S. timber returns

NCREIF Timberland Index, total return, yearly



## U.S. wood product consumption

By end-use sector, in million cubic meters



Source: BLS, FactSet, Forest Economic Advisors, National Council of Real Estate Investment Fiduciaries (NCREIF), World Bank, J.P. Morgan Asset Management. (Left) Represents the time period from 1Q87-3Q24. Data are based on availability as of November 30, 2024.

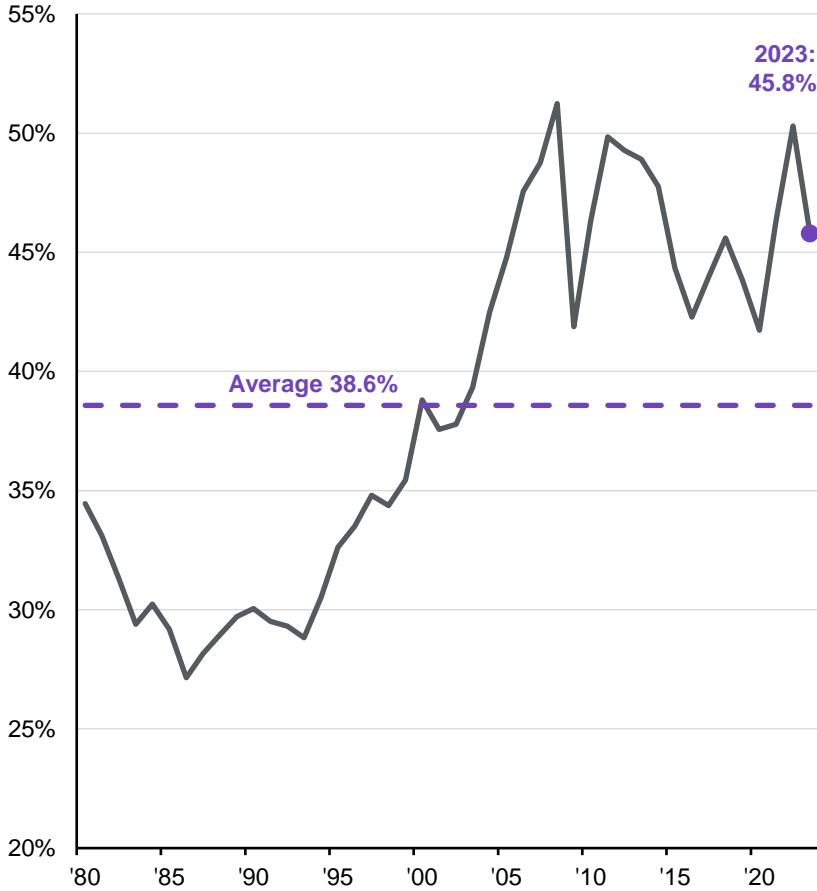




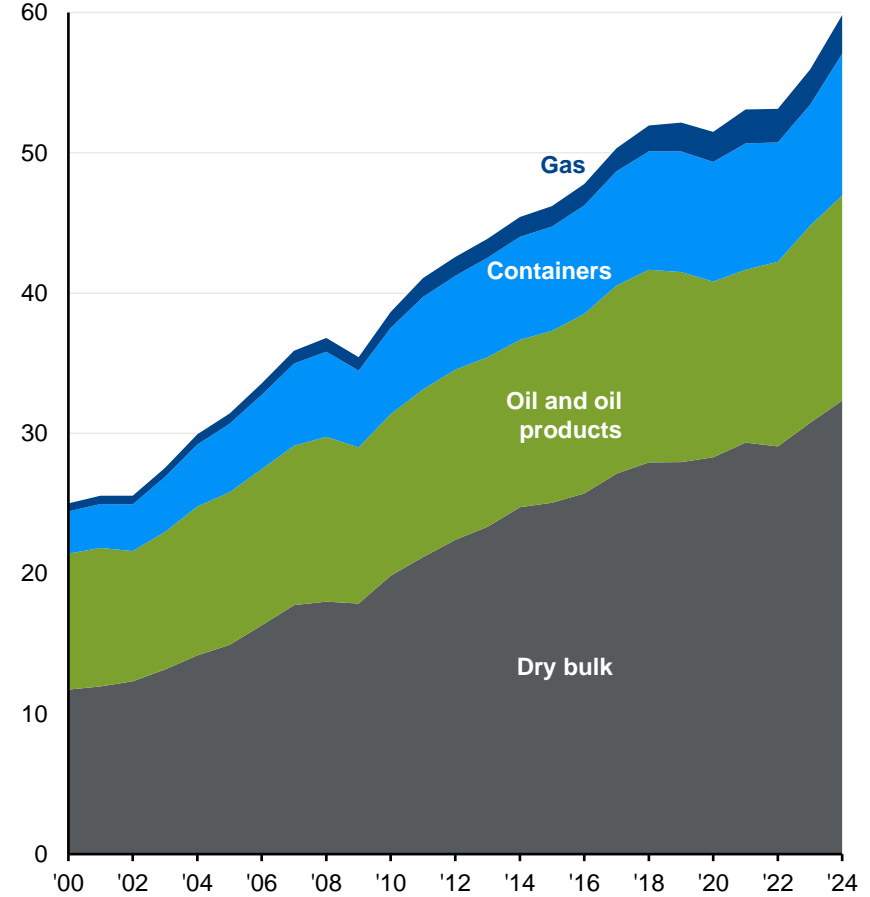
# Global trade

Other real assets

### Global merchandise trade % of global GDP



### World seaborne trade by product Estimated in trillion ton-miles



Source: World Bank – World Development Indicators, Clarksons, FactSet, J.P. Morgan Asset Management. World seaborne trade by product as of October 2024. Dry bulk is a raw material that is shipped in large unpackaged parcels. Data are based on availability as of November 30, 2024.

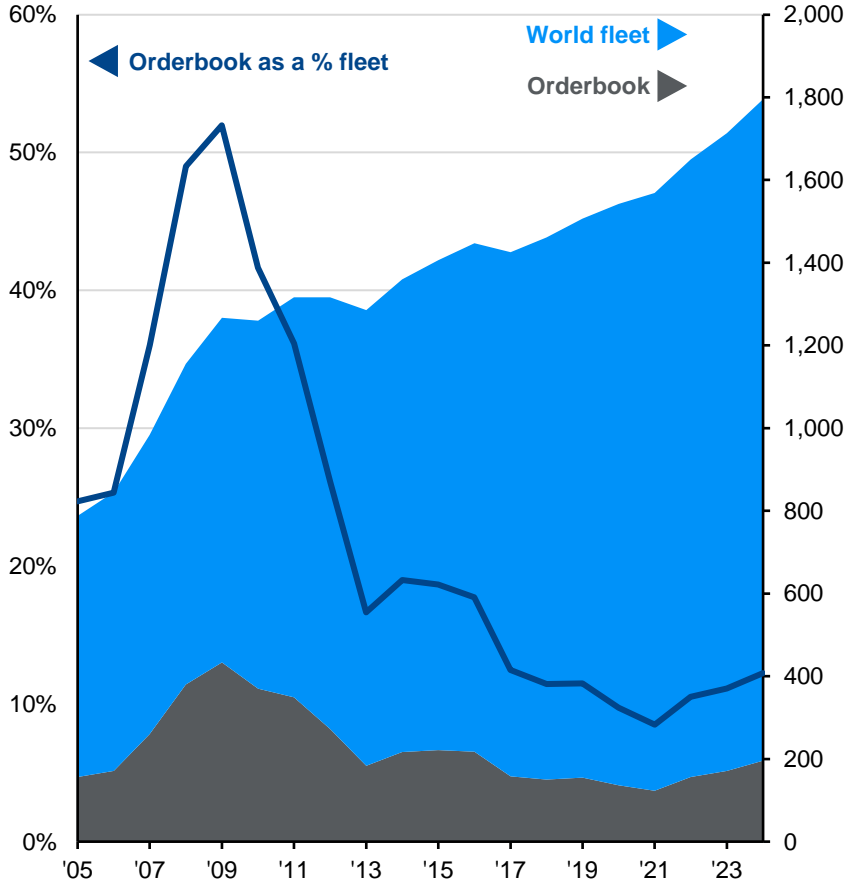


# Global shipping: Orders, capacity and age

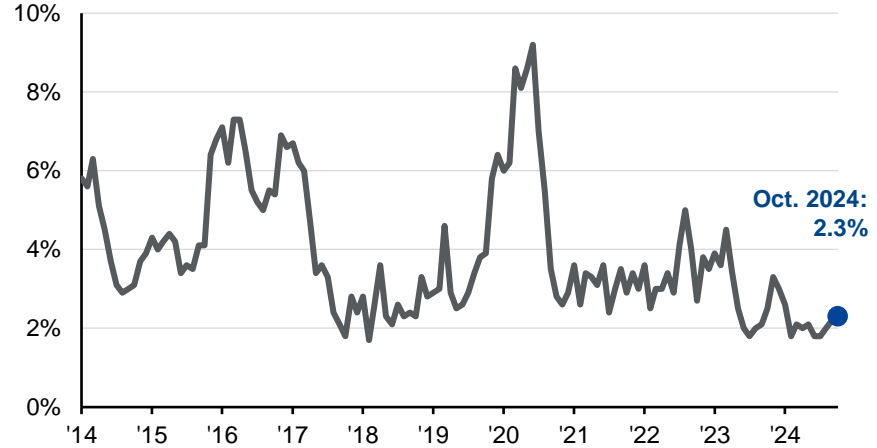
Other real assets

## Global fleet and orderbook

Gross tonnage

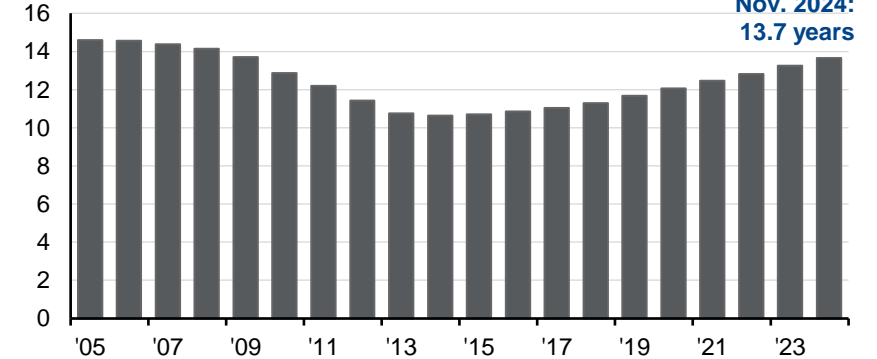


## Idle containership capacity as % of global fleet



## Global fleet age

+5,000 gross tonnage, average number of years



Source: Clarksons Research, MSI, Sea/net, J.P. Morgan Asset Management. (Left) An orderbook contains all the vessels that have been delivered as well as the current order or expected ship orders. The orderbook to fleet ratio is a useful indicator of future supply growth. (Bottom right) Gross tonnage is the volume of a ship's enclosed spaces in cubic meters. Data are based on availability as of November 30, 2024.

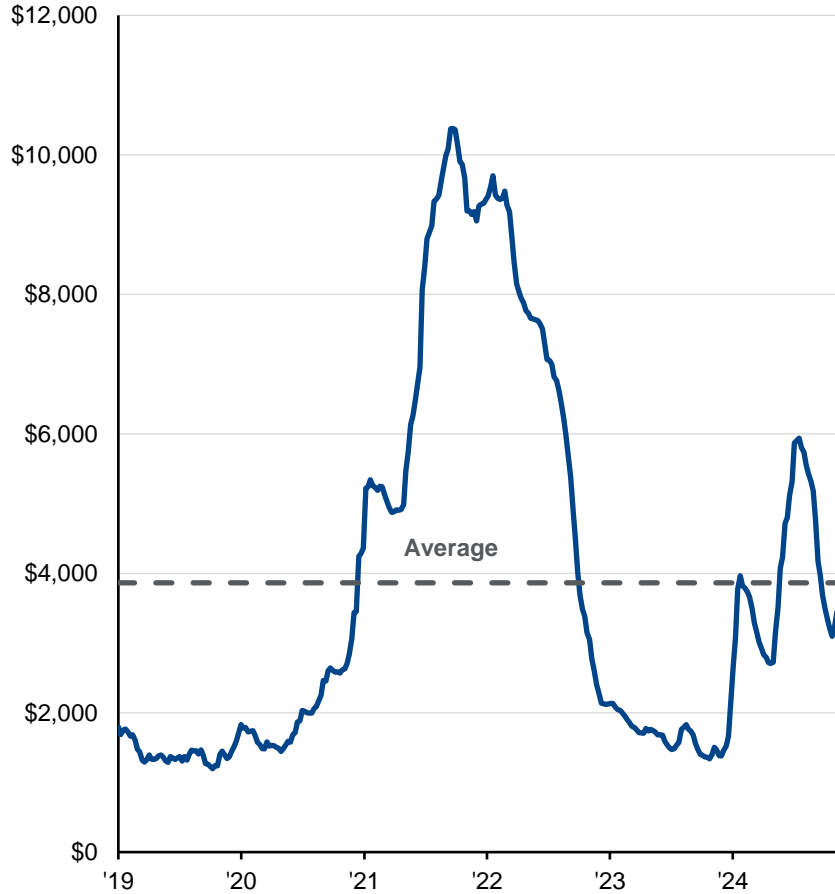


# Global shipping: Pricing and port calls

Other real assets

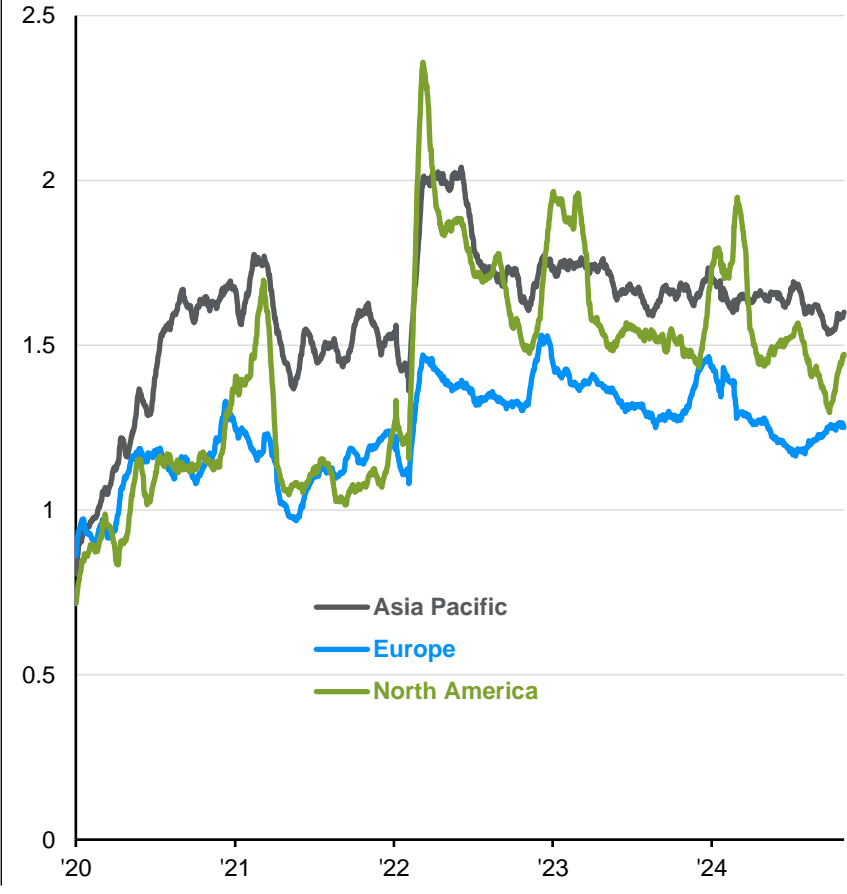
### Global shipping costs

USD per 40-foot container, weekly



### Global port call duration\*

Number of days, 30-day moving average



Source: Bloomberg, Clarksons Research, MSI, Sea/net, J.P. Morgan Asset Management. Port calls defined as all instances of a vessel entering and leaving a defined port location, excluding instances where vessel not recorded as travelling at less than 1 knot, and combining multiple consecutive instances at the same port where the vessel has not left a buffered shape around the port. Data basis date vessel last recorded in port location. \*Global port calls excludes calls at ports by tugs. U.S. and Europe port calls are of deep-sea cargo vessels, which only includes larger bulkers. Port call duration is defined as the average number of days spent by the vessels seen at a location. The duration is calculated using the total number of hours a vessel spent at location to complete the visit based on the time arrival and time of departure. Data are based on availability as of November 30, 2024.

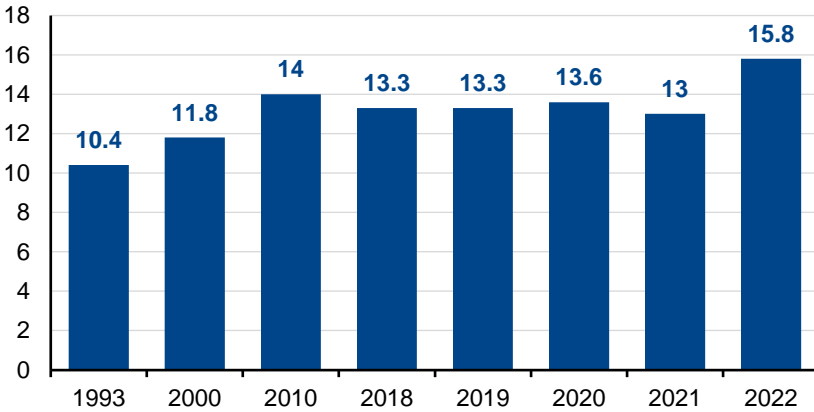


# Global airline industry trends

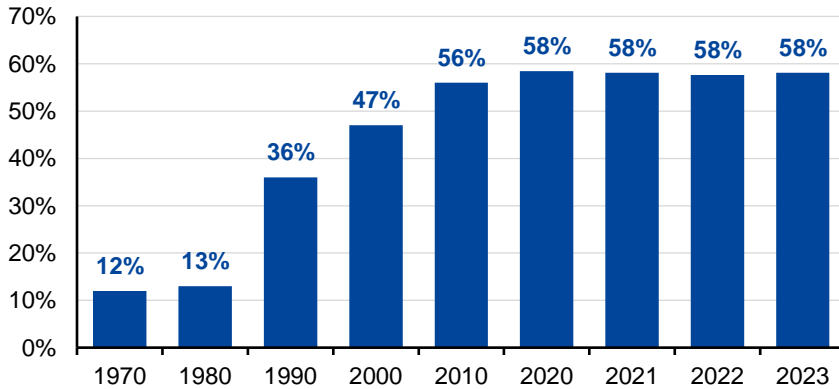
Other real assets

## Average age of commercial aircraft in the U.S.

Major airlines\*, number of years

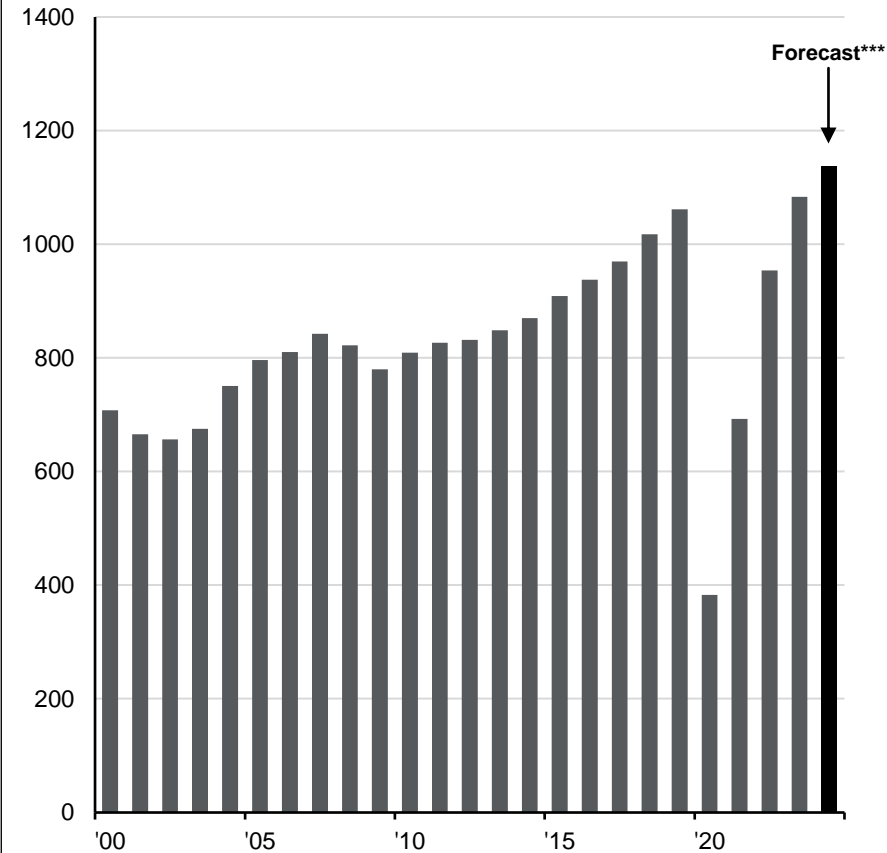


## Percent of industry-wide aviation fleet leased globally\*\*



## U.S. airline passenger miles flown

Billions of miles, yearly



Source: Cirium, Defense & Security Monitor, IATA Sustainability and Economics, U.S. Bureau of Transportation Statistics, J.P. Morgan Asset Management. (Right) Shows revenue passenger miles. \*Major airlines are those that generate more than \$1bn in operating revenues annually. Data based on aircrafts that are available for service. \*\*Includes parked and in-service regional, single-aisle and widebody aircraft. \*\*\*2024 data reflects J.P. Morgan Asset Management forecast based on TSA checkpoint volume data. Data are based on availability as of November 30, 2024.

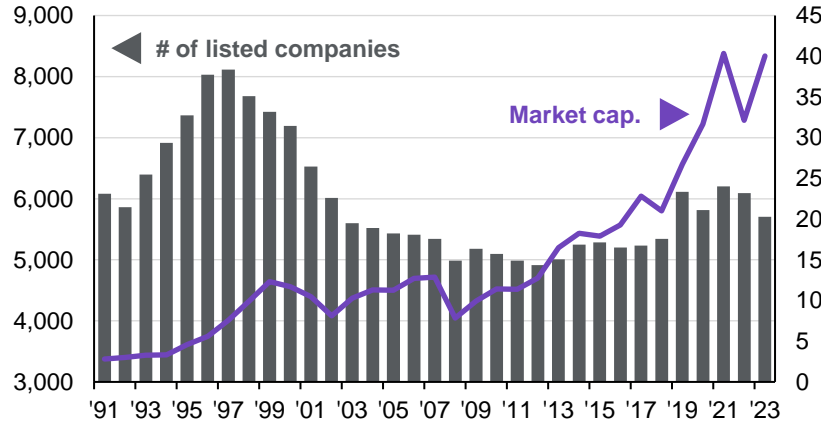


# U.S. public vs. private equity

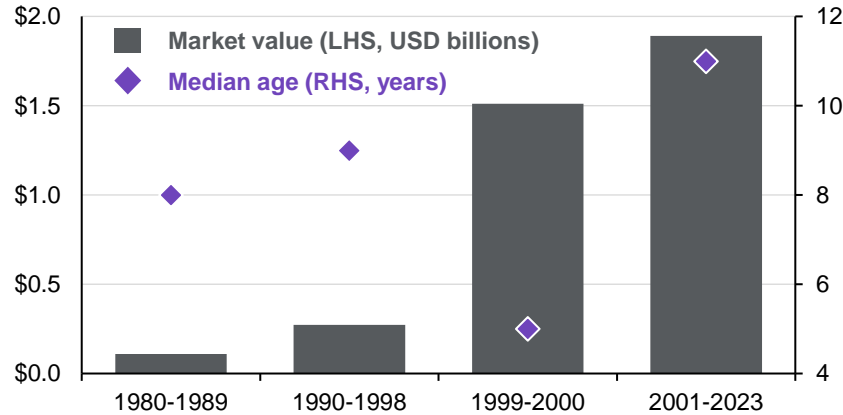
Private equity

## Number of listed U.S. companies\* and market cap.

Number, S&P 500 market capitalization in USD trillions

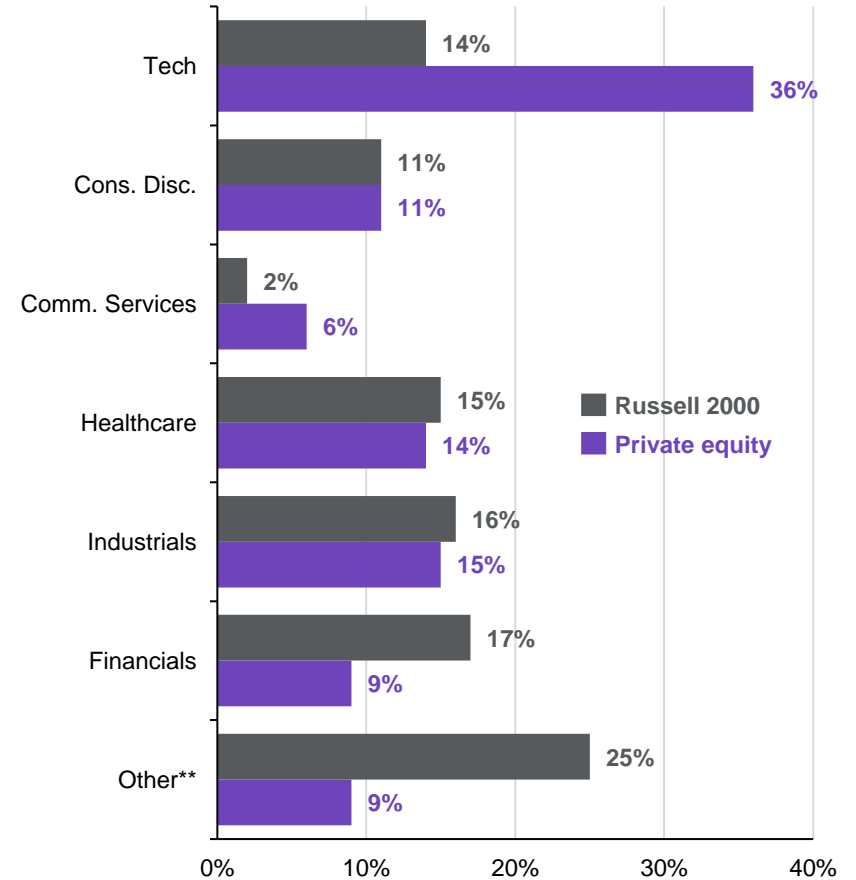


## Average market value and median age at IPO



## Private equity vs. small cap sector weights

2023



Sources: Cambridge Associates, Jay Ritter, University of Florida, Russell, World Federation of Exchanges, J.P. Morgan Asset Management.  
 (Top left) \*Number of listed U.S. companies is represented by the sum of number of companies listed on the NYSE and the NASDAQ. (Bottom left) Average market value is calculated by dividing the total market value at first closing price by the total number of IPOs for each period. The sample is IPOs with an offer price of at least \$5, excluding ADRs, unit offers, closed-end funds, REITs, natural resource limited partnerships, small best efforts offers, banks and S&Ls and stocks not listed on CRSP (CRSP includes Amex, NYSE and NASDAQ stocks). (Right) \*\*Other includes real estate, utilities and energy. Percentages may not sum due to rounding. Sector weights are as of December 31, 2023.  
 Data are based on availability as of November 30, 2024.

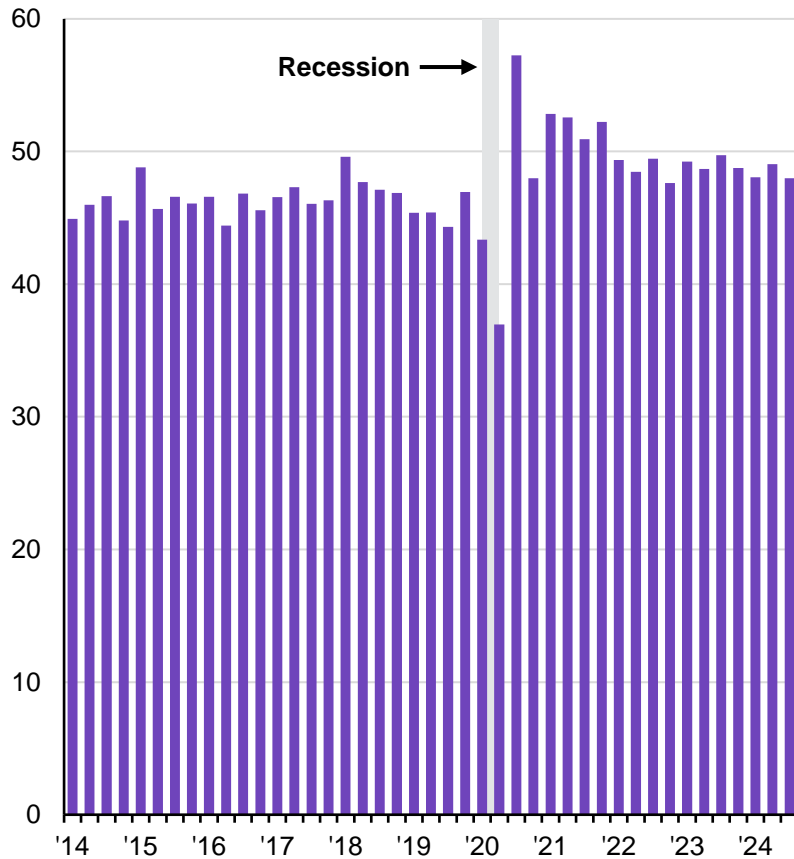


# U.S. business formation

Private equity

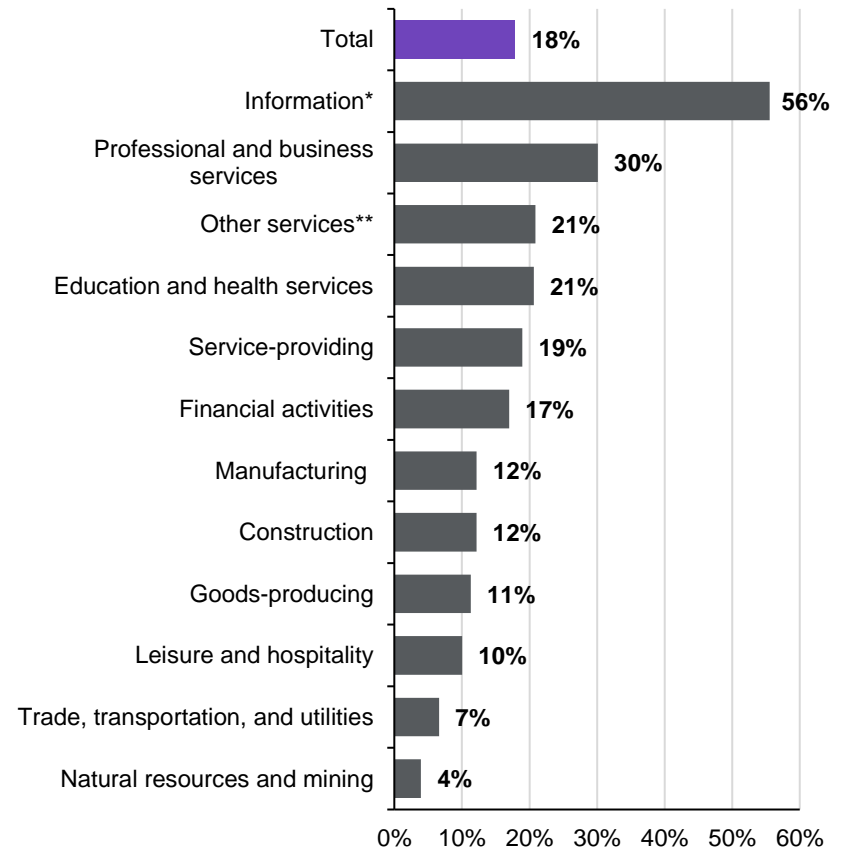
### U.S. applications for business formation by corporations

Seasonally adjusted, thousands, 1Q14 – 3Q24



### Growth in business establishments by private industry

December 2019 – March 2024



Source: Bureau of Labor Statistics, U.S. Census Bureau, J.P. Morgan Asset Management. Business formation data as of 3Q24 represent the average monthly business applications from corporations.\*Information includes broadcasting (excluding internet), data processing, hosting and related services, motion picture and sound recording industries, publishing industries (excluding internet) and telecommunications.\*\*Other services includes unclassified businesses. Data are based on availability as of November 30, 2024.

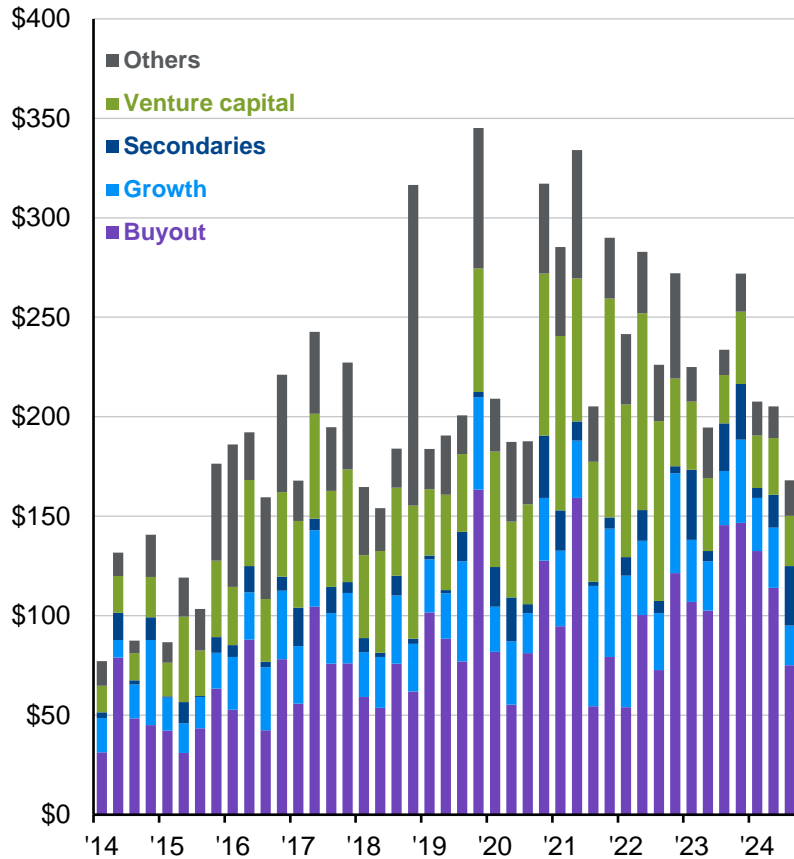


# Global private equity fundraising

Private equity

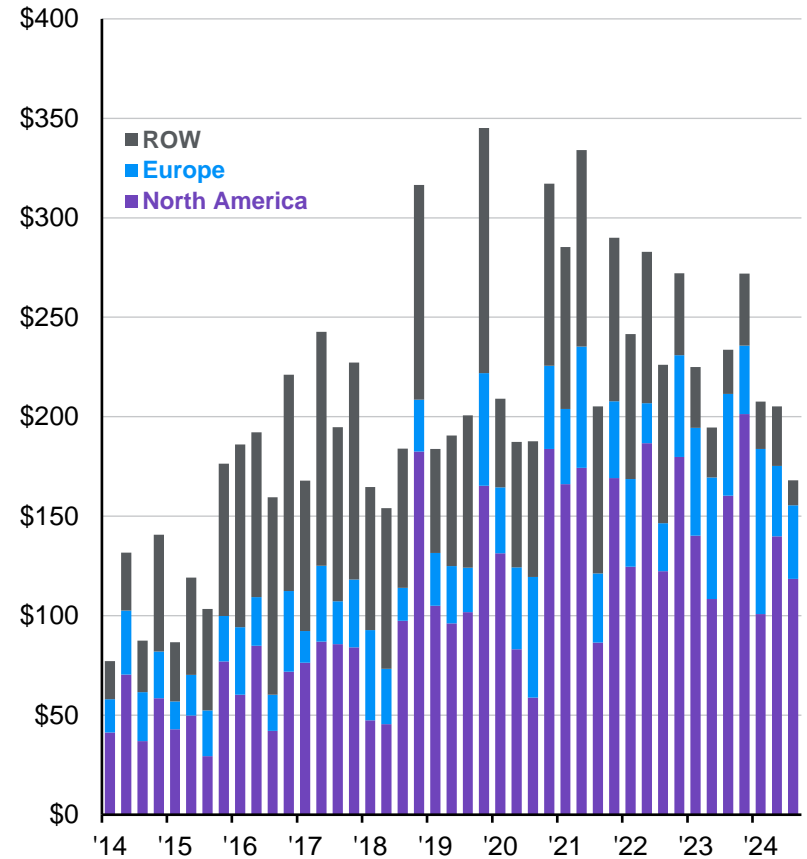
### Global private equity fundraising by type

USD billions, 1Q14 – 3Q24



### Global private equity fundraising by region

USD billions, 1Q14 – 3Q24



Source: Preqin, J.P. Morgan Asset Management. (Left) Buyout funds: Acquire all or a significant amount of equity in their target company, often financed by a high proportion of debt; Growth equity funds: Take minority stakes in companies, financed by all-equity deal structures; Secondary funds: Purchase existing stakes in private equity funds from other limited partners (LPs); Venture capital funds: Invest in early-stage companies with high growth potential; Others: Includes funds raised for restructuring or turnaround deals which use a combination of debt and equity financing. (Right) Fundraising by region is defined as the location of the manager raising the funds. Data are based on availability as of November 30, 2024.

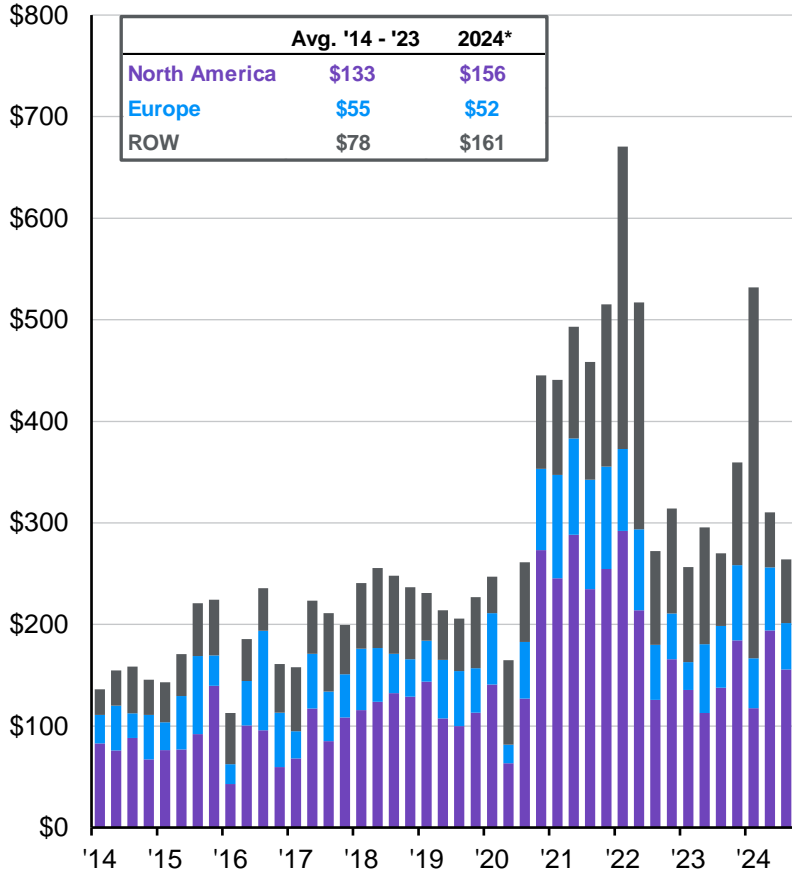


# Global private equity investments and exits

Private equity

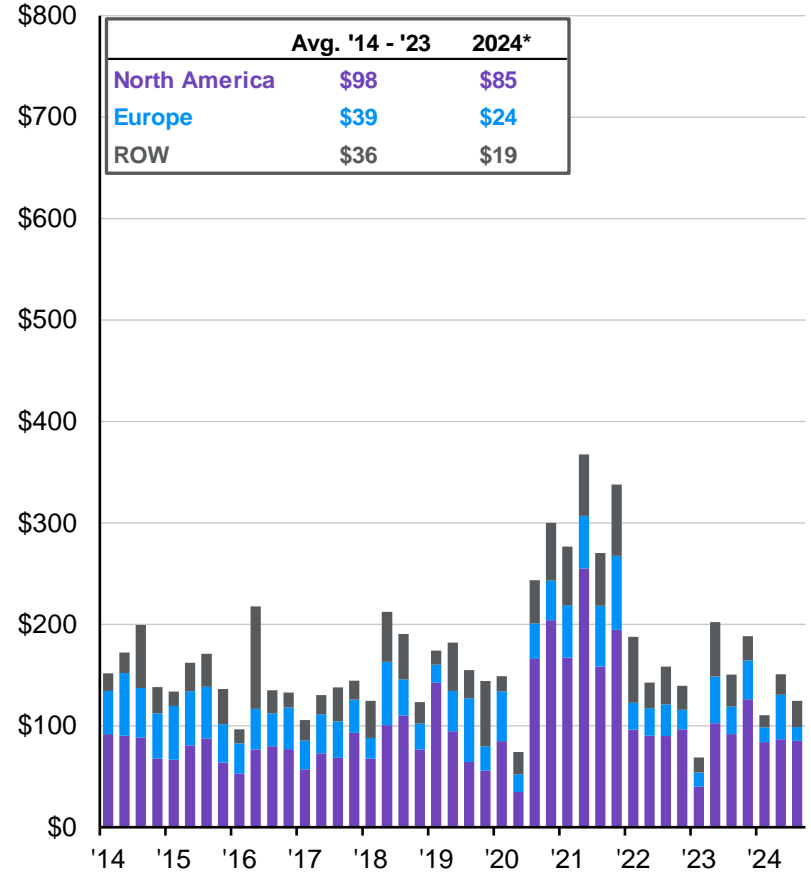
## Private equity investments by value

USD billions, 1Q14 – 3Q24



## Private equity exits by value

USD billions, 1Q14 – 3Q24



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

Investments include Add-ons, Angel investments, Buyouts, Company formations, Corporate carve out, GP Stakes, Grant, Growth, Joint Venture, LP Direct, Merger, PIPE, Pre-IPO, Private Debt, Public to Private, Recapitalization, Restructuring, Secondary Buyout, Seed, Series A-L, Spin-off and venture debt. Exits include Bankruptcy/Write-off, IPO, Private placement/follow on, sale to management, secondary buyout, secondary stock purchase, trade sale, unspecified exit. \*Data for the year 2024 is through 3Q24.

Data are based on availability as of November 30, 2024.



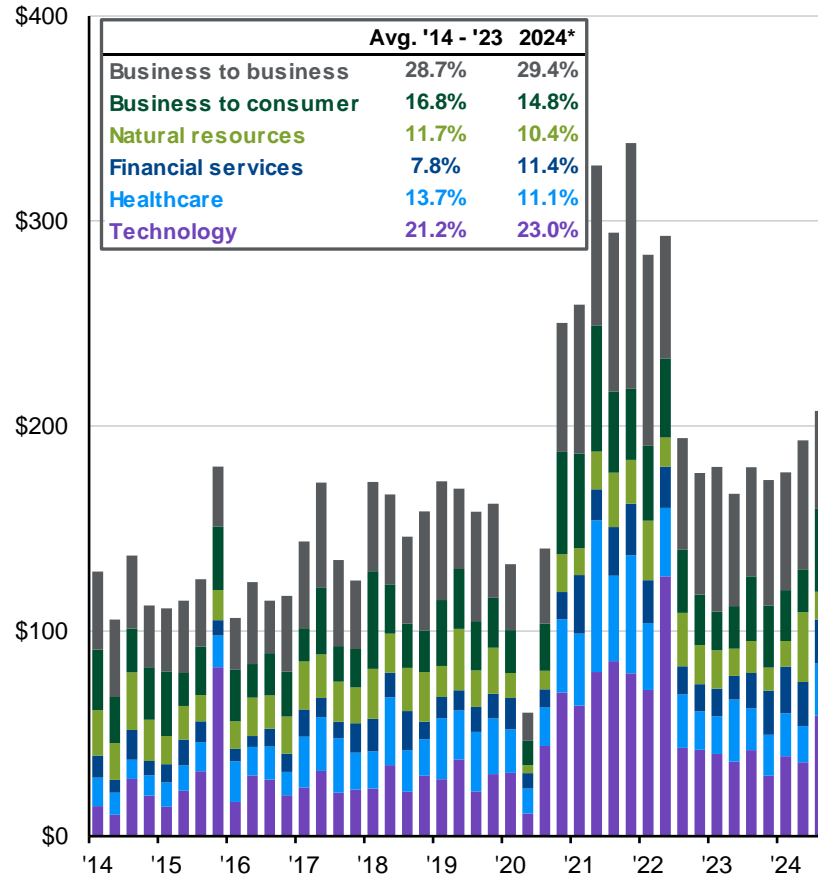


# U.S. private equity investments and exits

Private equity

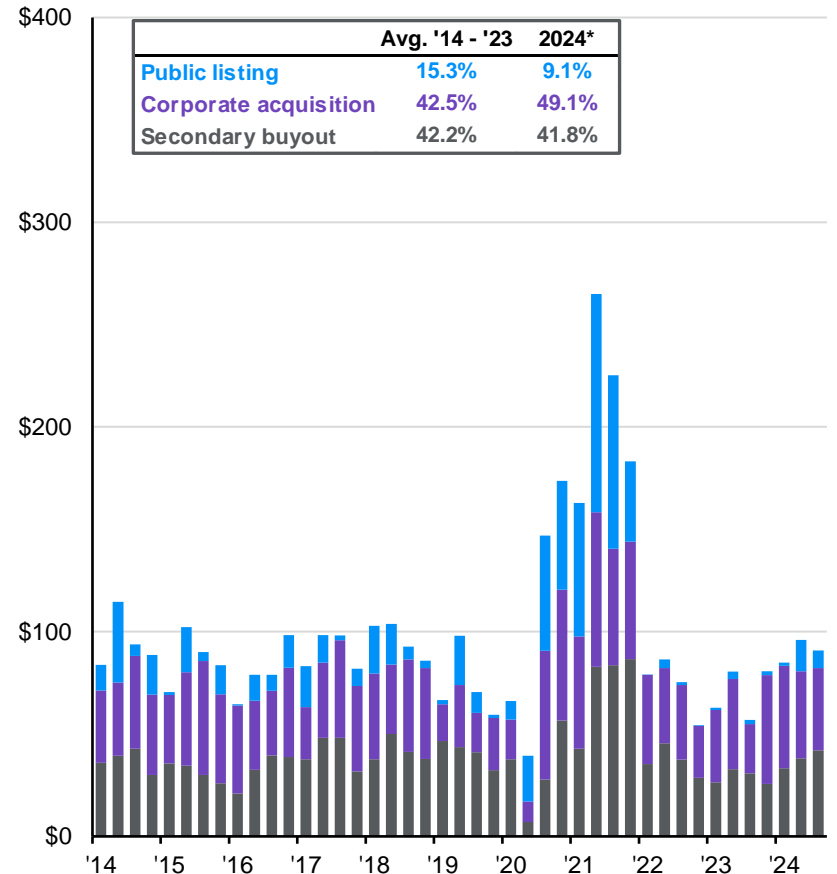
### U.S. private equity investments by sector

USD billions, 1Q14 – 3Q24



### U.S. private equity exits by type

USD billions, 1Q14 – 3Q24



Source: PitchBook, J.P. Morgan Asset Management.  
(LHS) Natural resources = Materials & resources and energy. \*Data for the year 2024 is through 3Q24.  
Data are based on availability as of November 30, 2024.

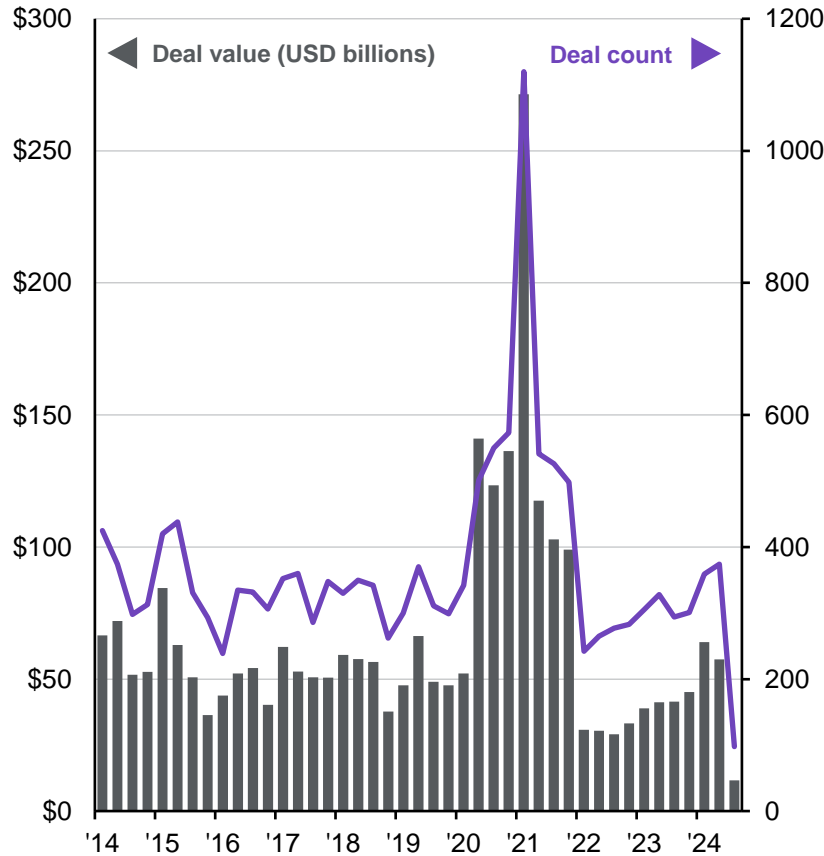


# IPOs by deal value and count

Private equity

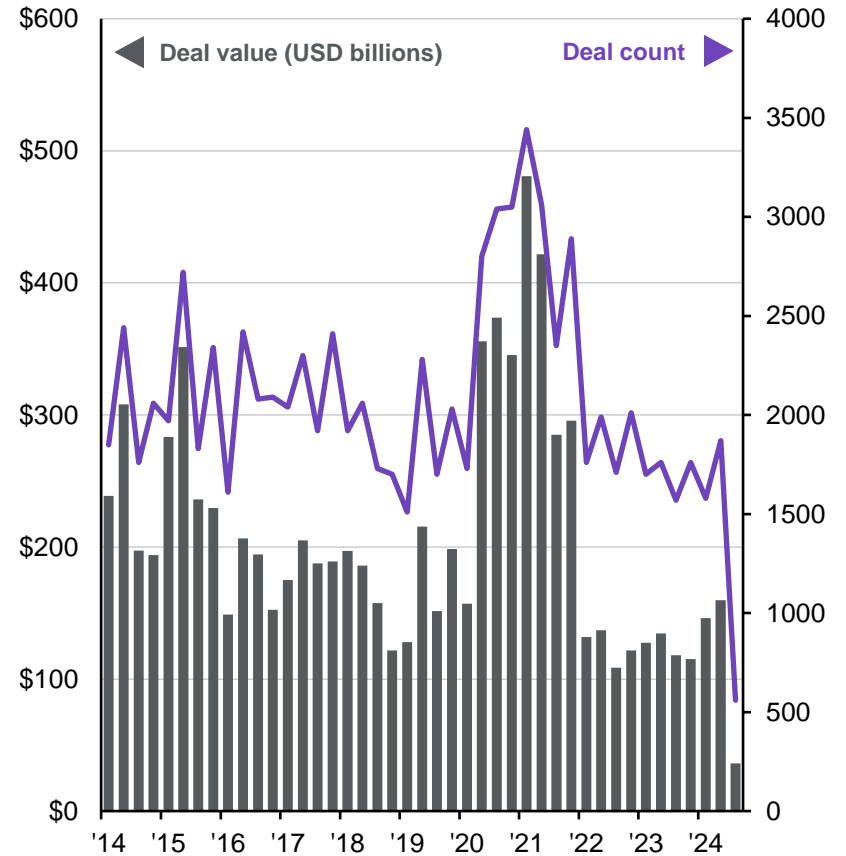
## US IPOs

Deal value and deal count by announcement, 1Q14 – 3Q24



## Global IPOs

Deal value and deal count by announcement, 1Q14 – 3Q24



Source: Bloomberg, J.P. Morgan Asset Management. Data are based on availability as of November 30, 2024.

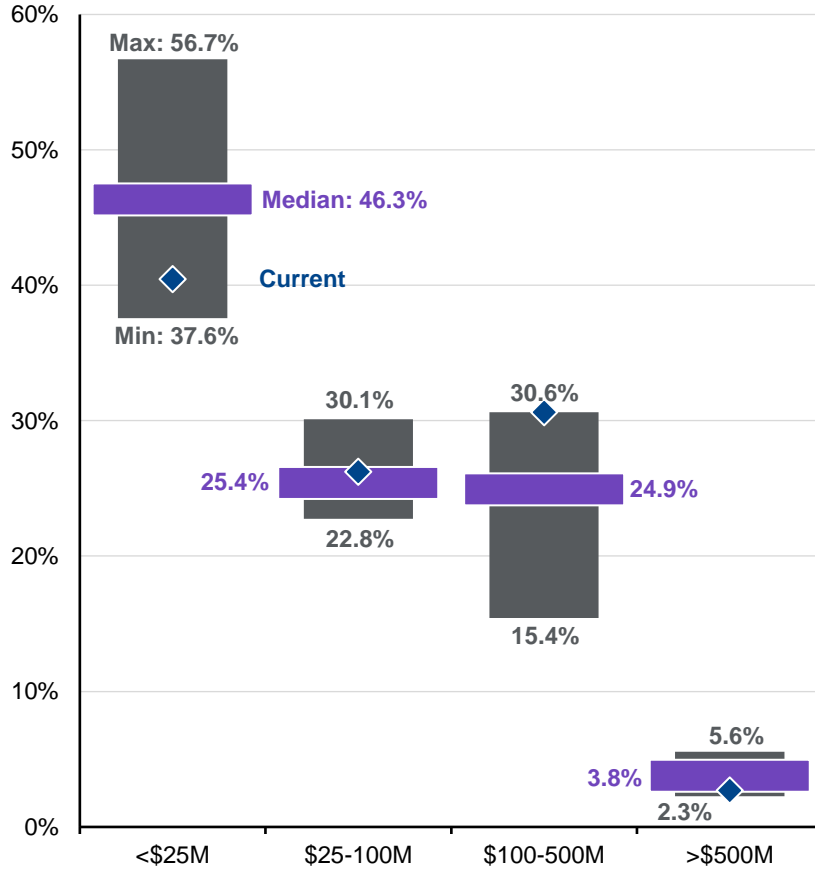


# U.S. private equity investments by size and type

Private equity

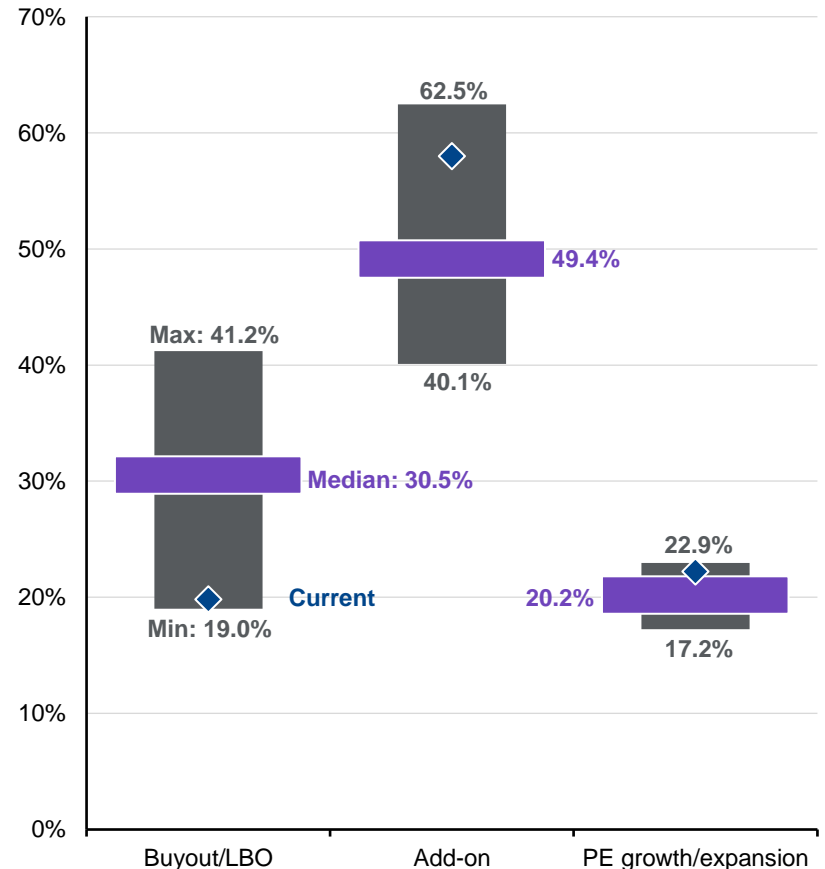
### U.S. private equity investments by size

% of total number of investments, 2008 – 3Q24



### U.S. private equity investments by type

% of total number of investments, 2008 – 3Q24



Source: PitchBook, J.P. Morgan Asset Management. Private equity investment size and type activity are as of September 30, 2024. Data are based on availability as of November 30, 2024.

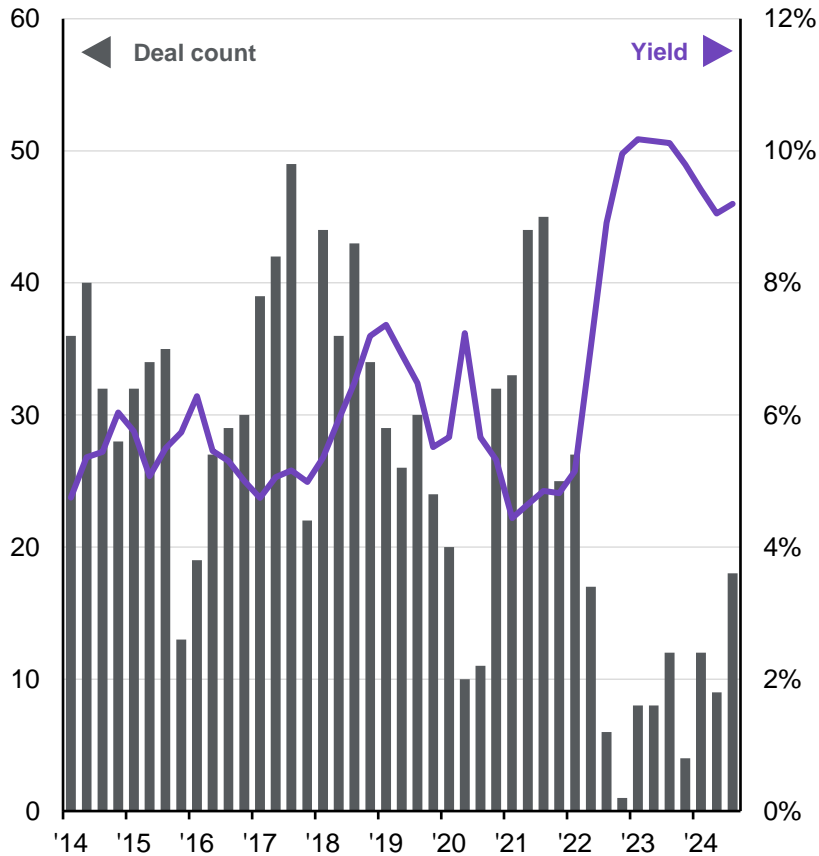


# U.S. leveraged buyouts

Private equity

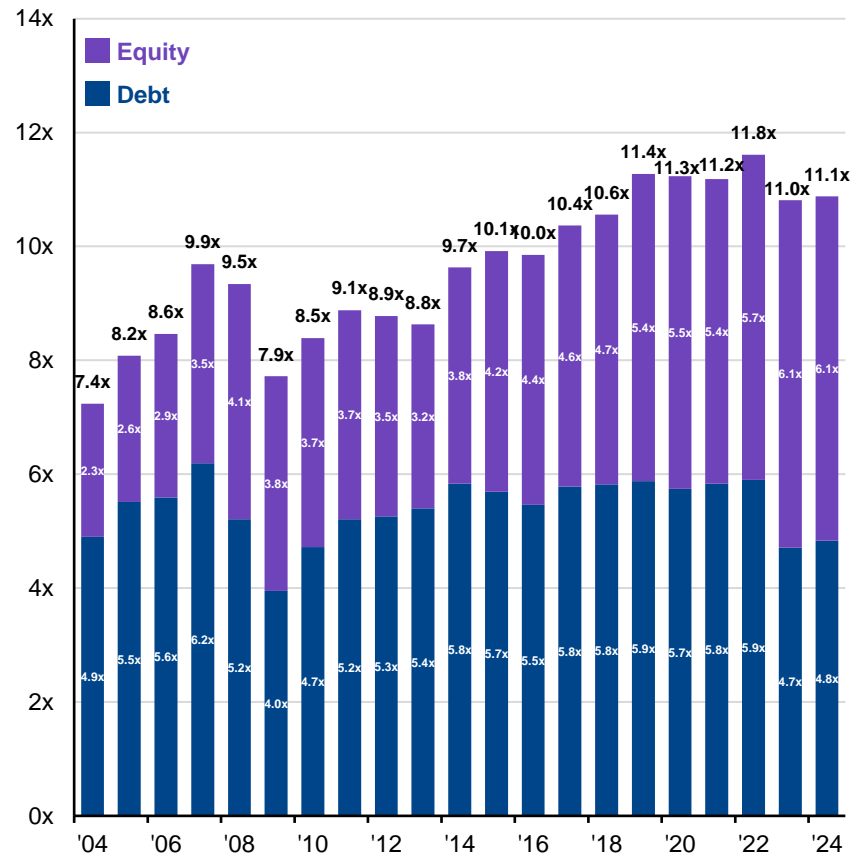
### U.S. LBOs: deal activity and yield

1Q14 – 3Q24



### U.S. LBOs: purchase price multiples

Equity and debt over trailing EBITDA



Source: LCD, PitchBook, J.P. Morgan Asset Management. (Left) Yield represents the average new-issue yield on LBOs. (Right) Purchase price multiples are as of September 30, 2024. Data are based on availability as of November 30, 2024.

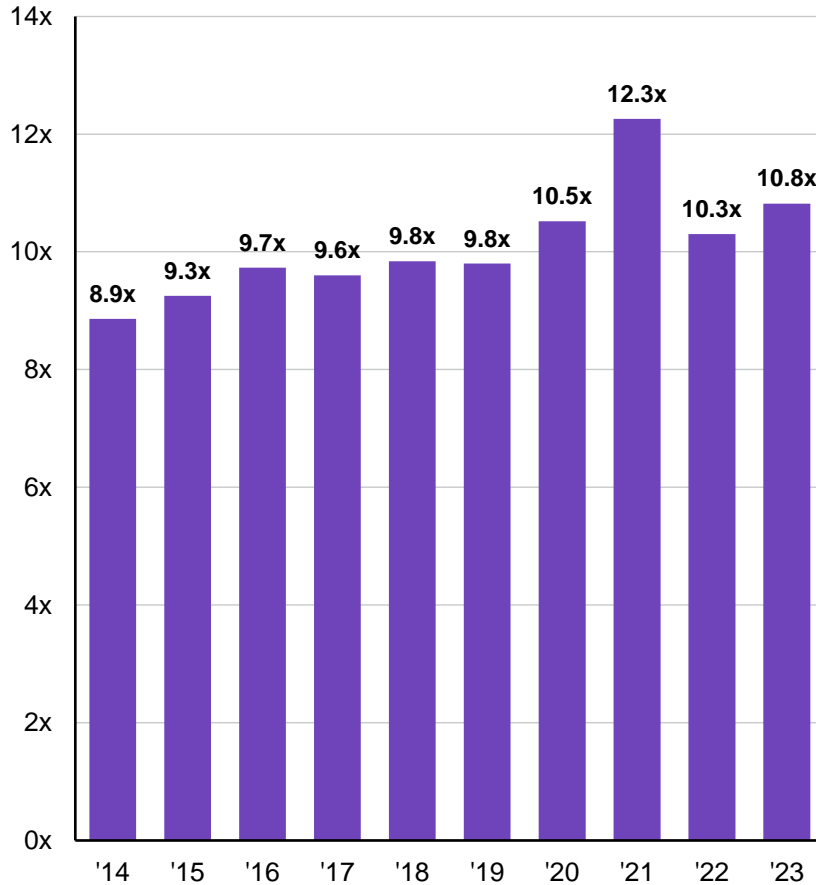


# U.S. middle market

Private equity

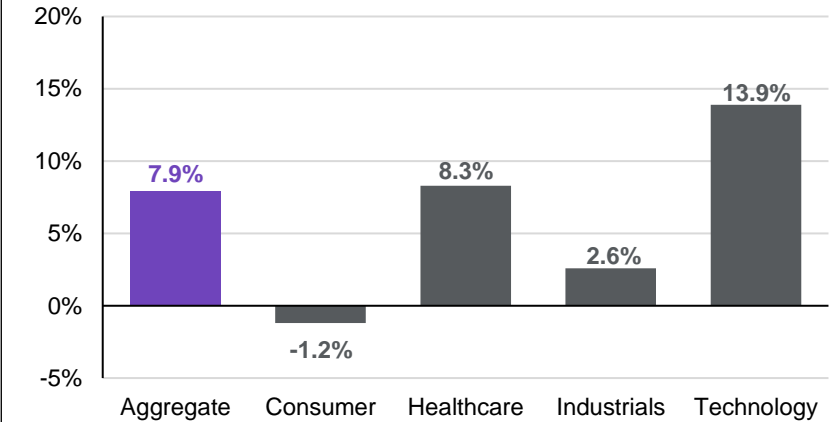
### U.S. middle market: purchase price multiples

Enterprise value over EBITDA



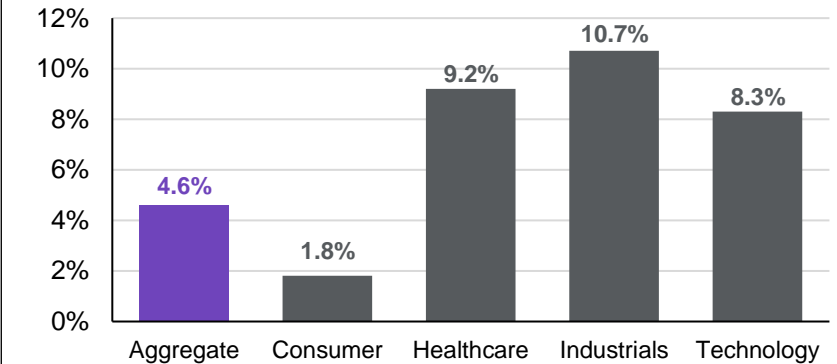
### U.S. middle market private company revenues by sector

3Q24, year-over-year growth



### U.S. middle market private company earnings by sector

3Q24, year-over-year growth



Source: Golub Capital, PitchBook, LCD, J.P. Morgan Asset Management. Middle market revenue and earnings data are from the Golub Capital Altman Index. "The Golub Capital Altman Index measures the actual revenue and EBITDA (earnings before interest, taxes, depreciation and amortization) growth of US middle market private companies for the first two months of each calendar quarter and provides insight into anticipated quarterly performance of US public companies. The index is based on aggregated data from approximately 150 companies in the loan portfolio of Golub Capital, a leading middle market lender." Data are based on availability as of November 30, 2024.

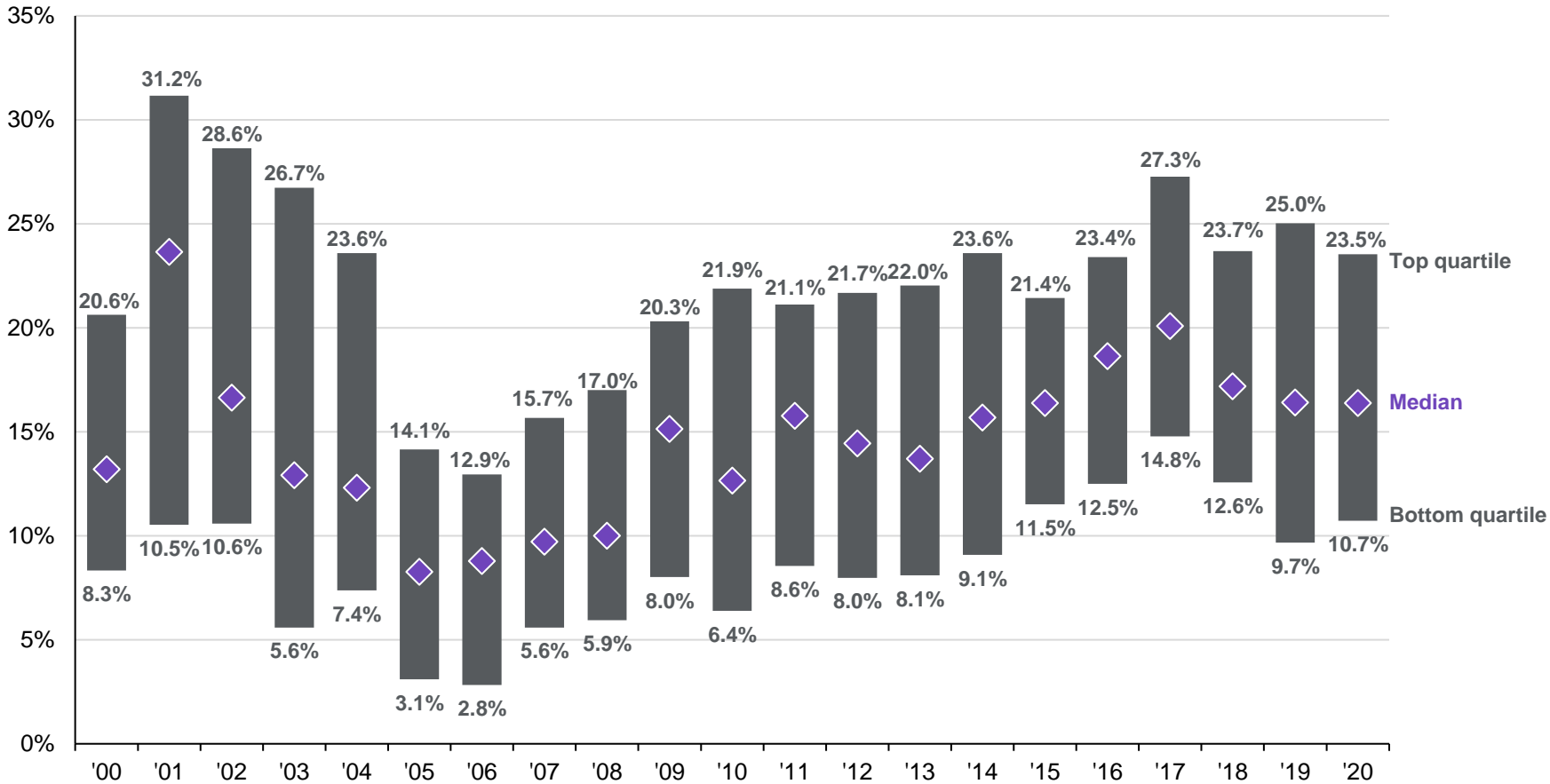


# Global private equity returns

## Global private equity return dispersion by vintage year

2000 - 2020, Internal rate of return (IRR)

Private equity



Source: Burgiss, J.P. Morgan Asset Management. Global private equity is represented by global buyout funds. IRR performance data is as of June 30, 2024. Data is based on availability As of November 30, 2024.

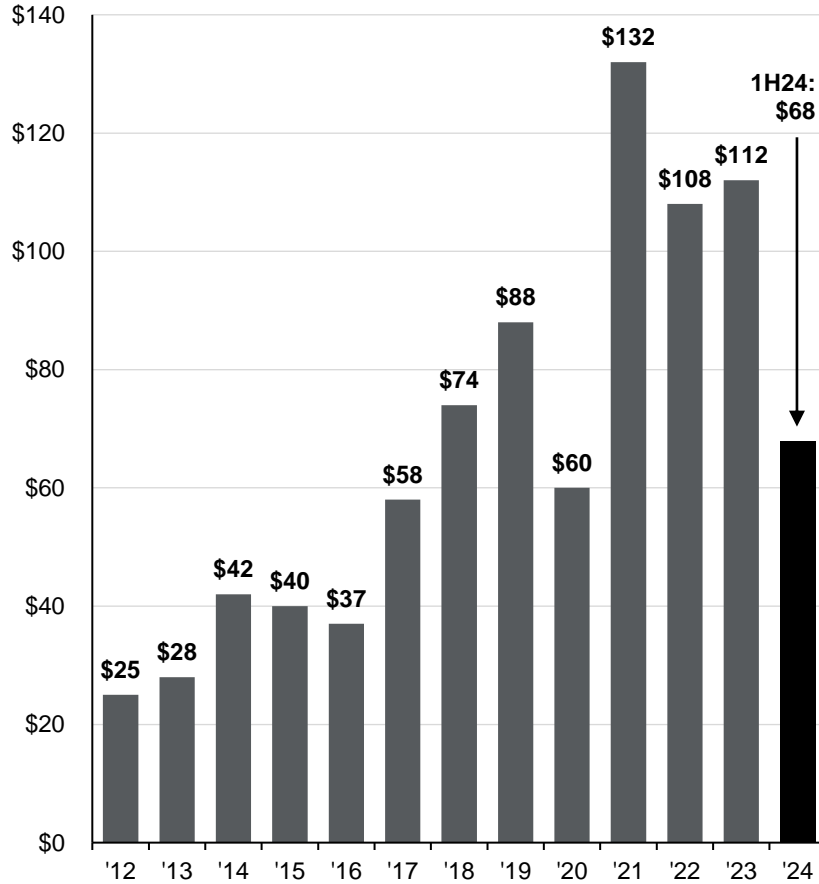


# Global private secondary market

Private equity

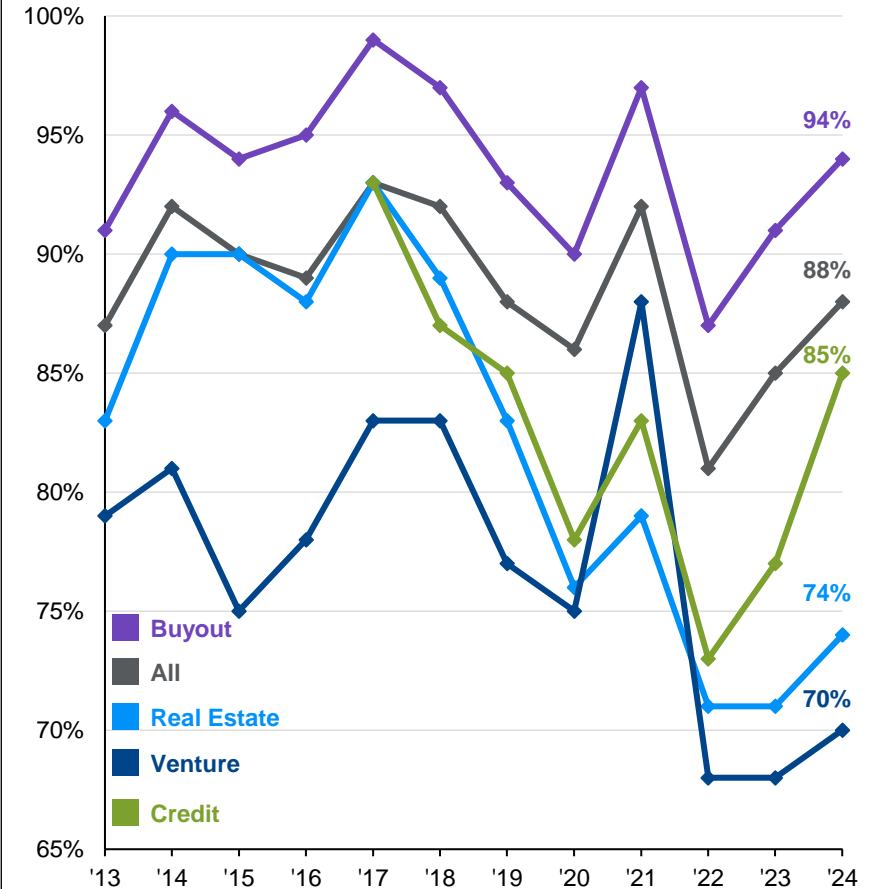
### Secondary market volume

USD billions



### Secondary pricing\*

Percent of net asset value (NAV)



Source: Greenhill, Jefferies, J.P. Morgan Asset Management. "Global Secondary Market Review," Jefferies, July 2024. Secondary market volume represents total value of general partner and limited partners-led secondary transactions. Secondary transactions involve selling existing stake of a target company to raise liquidity, exit a position, modify exposures, or lock in gains. \*Secondary pricing of LP portfolios. Data for 2024 is for 1H24. Data are based on availability as of November 30, 2024.

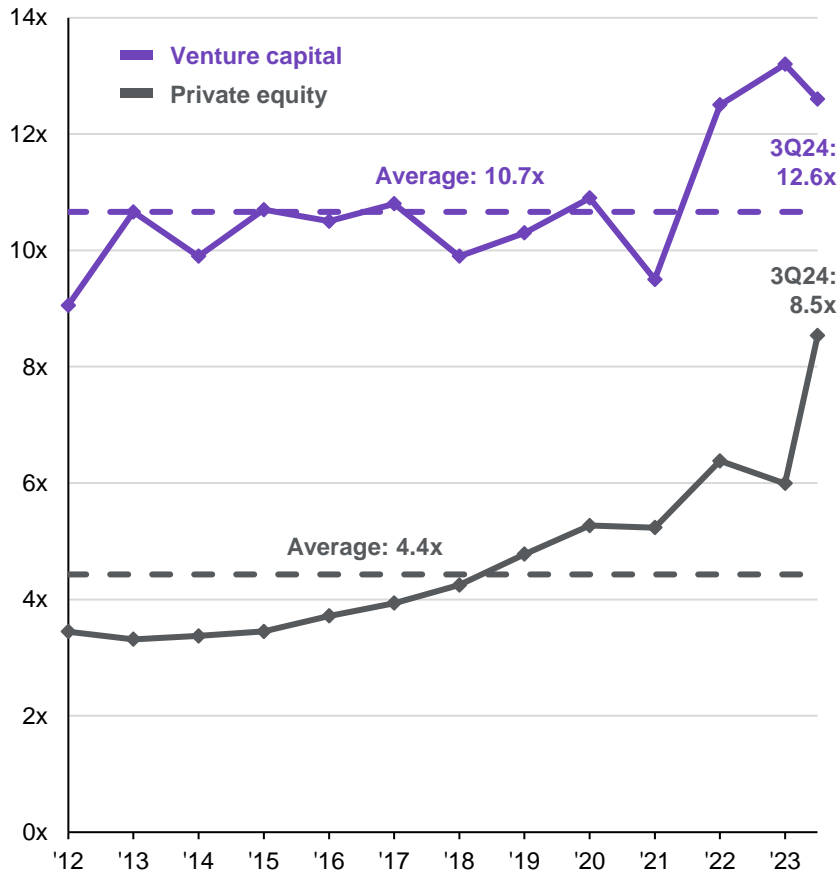


# U.S. venture capital

Private equity

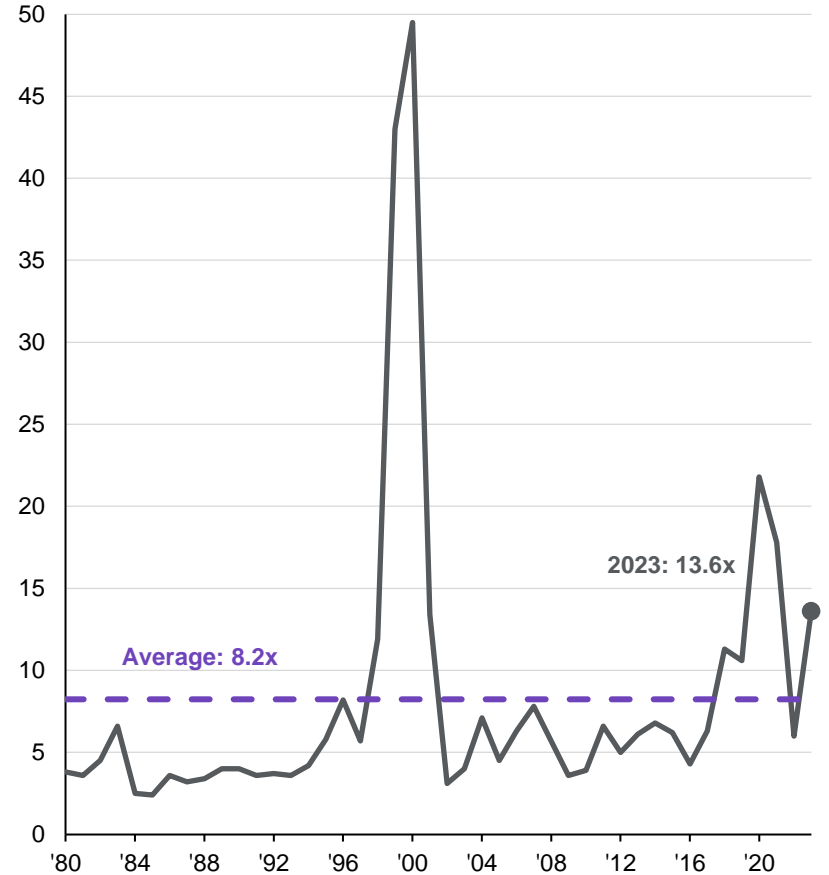
## Investment and exit activity

Number of investments/number of exits\*, 2012 - present



## Venture capital IPO price-to-sales

1980 – 2023, market price



Source: PitchBook, Cordell Eminent Scholar, Eugene F. Brigham Department of Finance, Insurance, and Real Estate Warrington College of Business, University of Florida, J.P. Morgan Asset Management. \*Number of investments is defined as deal count. Data are based on availability as of November 30, 2024.



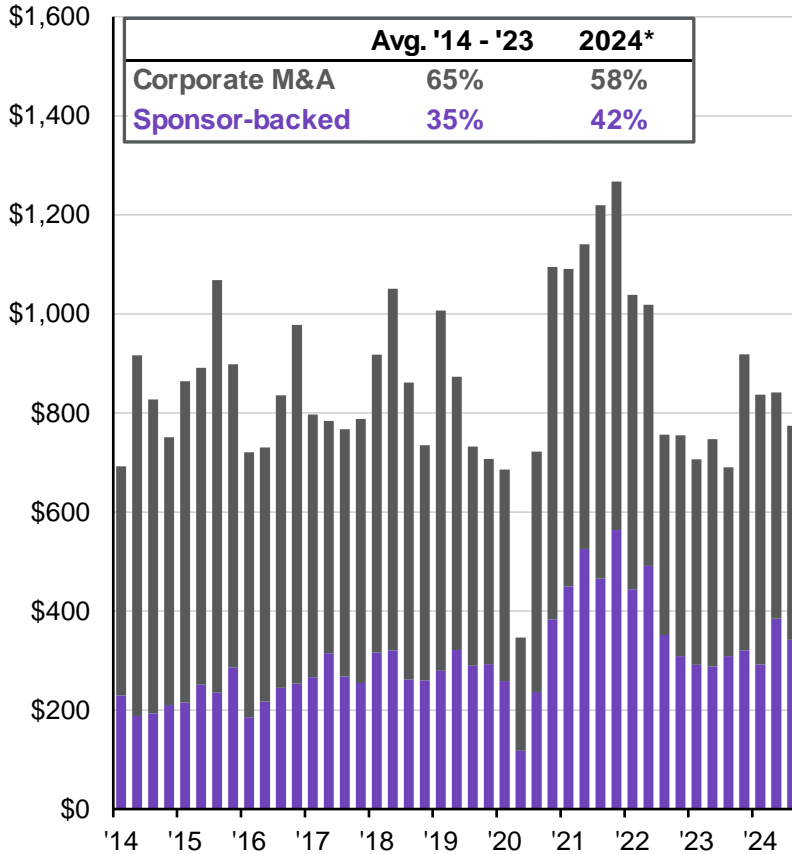


# Global mergers and acquisitions

Private equity

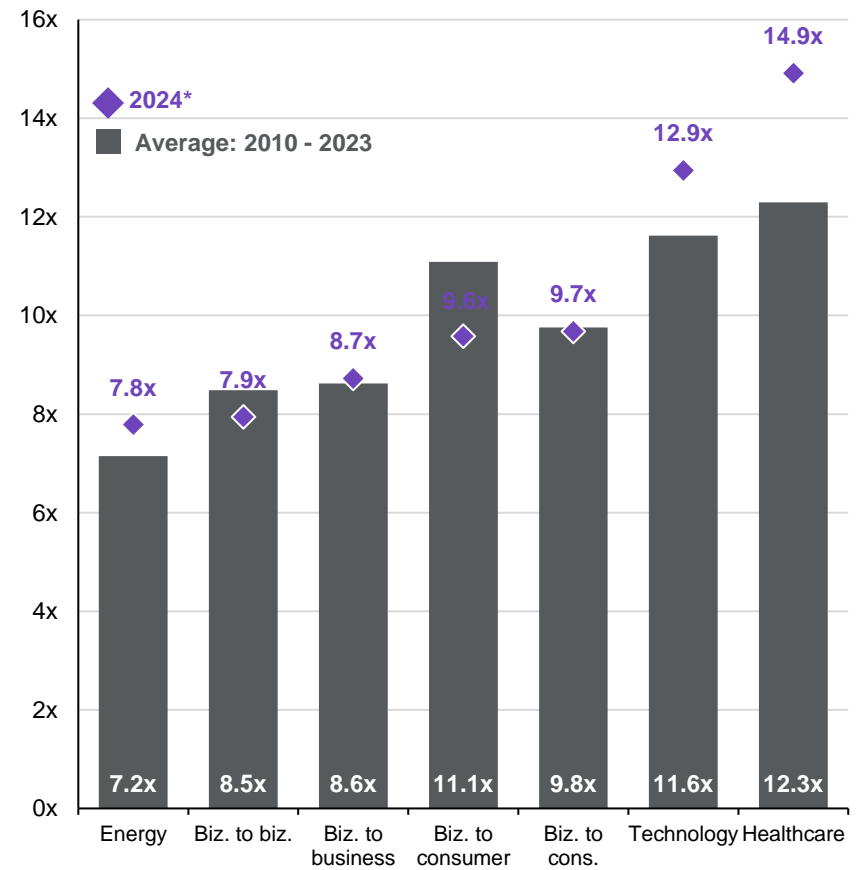
## Global M&A by acquirer type

USD billions, 1Q14 – 3Q24



## Global M&A multiples by sector

Enterprise value/EBITDA, trailing 12-month multiples



Source: PitchBook, J.P. Morgan Asset Management. \*Data for the year 2024 is through 3Q24. M&A deal data are as of September 30, 2024. Percentages may not sum to 100 due to rounding. Data are based on availability as of November 30, 2024.

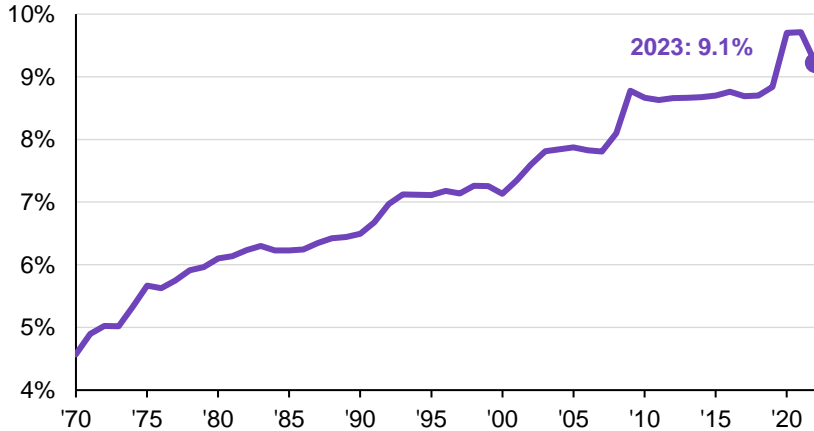


# Healthcare dynamics

Private equity

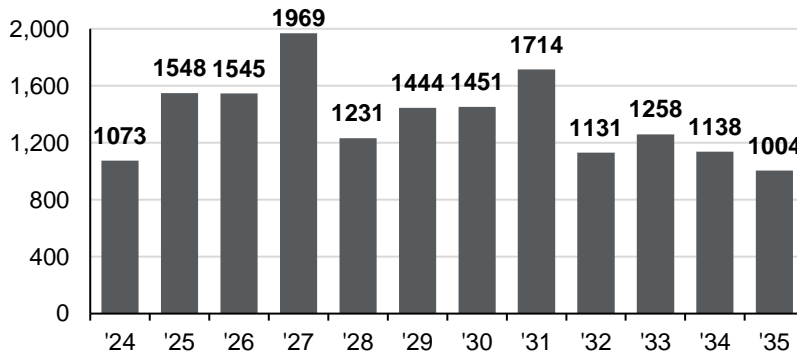
### OECD average current expenditure on health

Percent of GDP



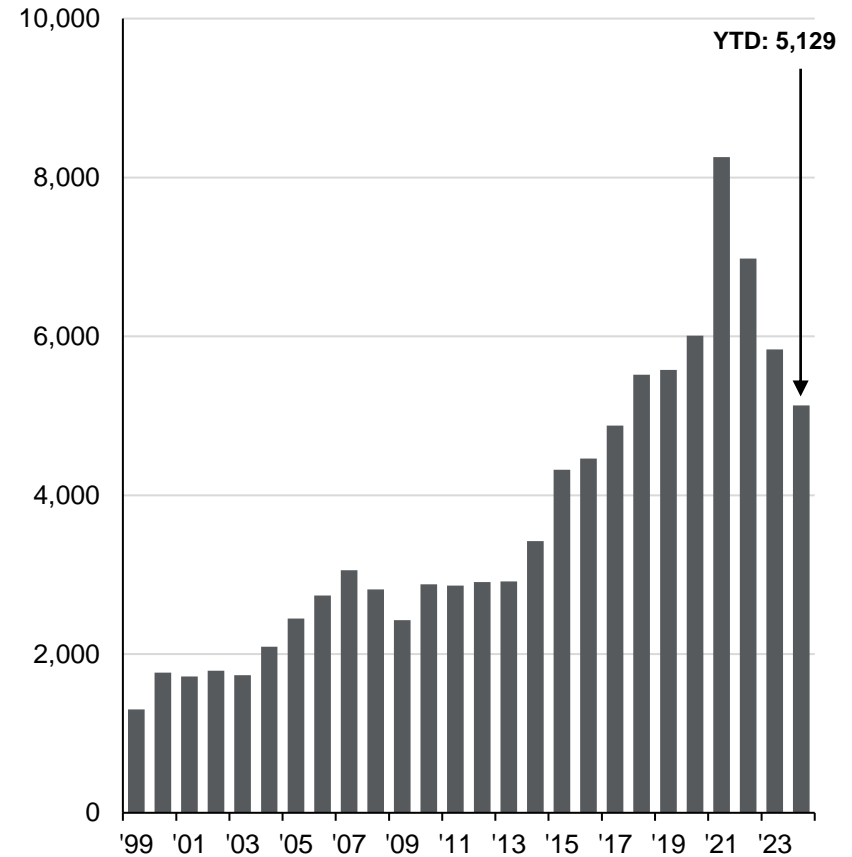
### U.S. drug patent expiration

Number of patents expiring each calendar year



### Global Healthcare M&A activity

Deal count, 25 years



Source: Bloomberg, FDA, OECD, J.P Morgan Asset Management.  
 (Top left) OECD Health Statistics. (Bottom left) Total patents expiring are from the FDA's Orange Book and Purple Book. (Right) Data for 2024 is year-to-date through 9/30/2024.  
 Data are based on availability as of November 30, 2024.

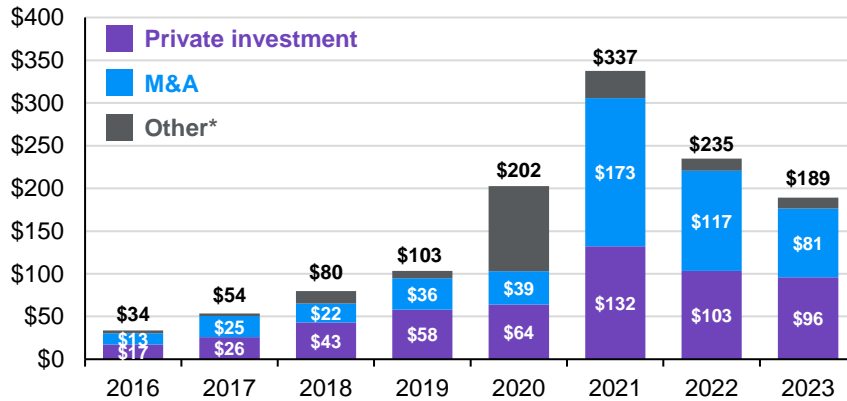


# Global investment in artificial intelligence

Private equity

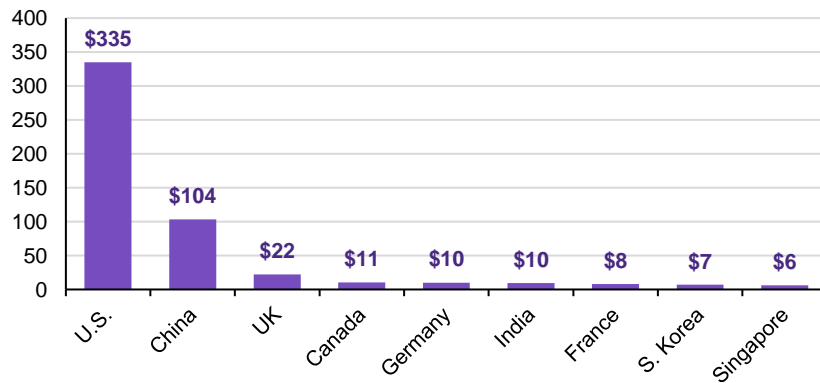
## Global corporate investment in AI by type

USD billions



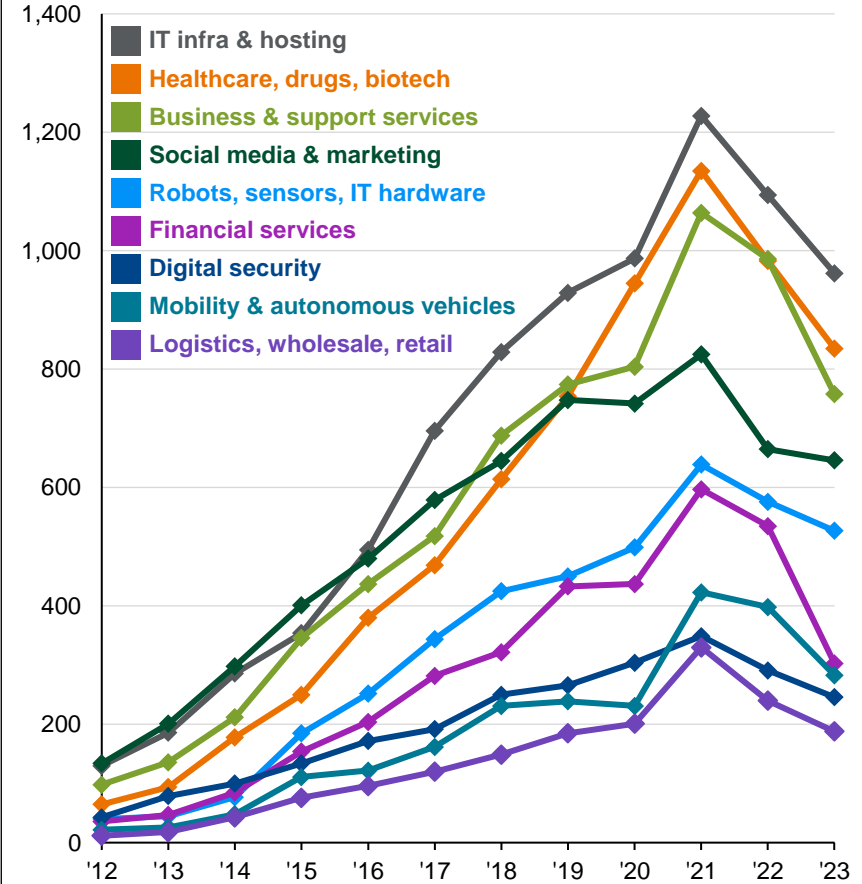
## Global private investment in AI by region

USD billion, sum over last 10 years (2013-2023)



## Global venture capital investments in AI by industry

Number of investments



Source: Stanford University, OECD, Preqin, J.P Morgan Asset Management.

(Left) Stanford Artificial Intelligence Index Report 2024. \*Other includes minority stake and public offering. (Right) Data from OECD.AI. 2023 data is an estimate.

Data are based on availability as of November 30, 2024.

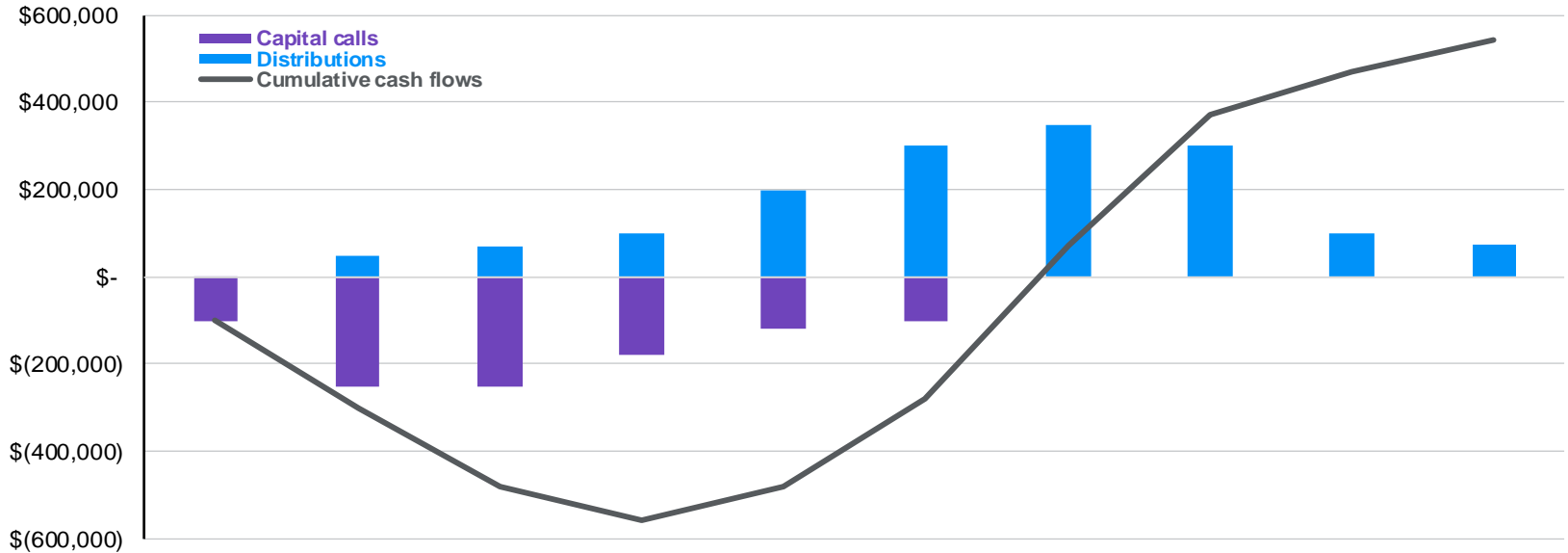


# Cash flows, the J-curve and returns in private equity

Private equity

## Illustrative Annual Cash Flows from a Private Equity Investment

Assuming a \$1M investment



End of Year	1	2	3	4	5	6	7	8	9	10
Net Cash Flow	-\$100,000	-\$200,000	-\$180,000	-\$80,000	\$80,000	\$200,000	\$350,000	\$300,000	\$100,000	\$75,000
Balance	\$900,000	\$700,000	\$520,000	\$440,000	\$520,000	\$720,000	\$1,070,000	\$1,370,000	\$1,470,000	\$1,545,000
Annual Return	-10%	-22%	-26%	-15%	18%	38%	49%	28%	7%	5%

**Internal Rate of Return: 15%**

Discount rate that equates the sum of positive and negative discounted cash flows

**Multiple on Invested Capital: 1.54x**

Ending Balance/Starting Balance  
= 1,545,000/1,000,000 = 1.545

**Time-Weighted Return: 4.4%**

$(Ending\ Balance/Starting\ Balance)^{(1/Number\ of\ Years)} - 1$   
=  $(1.545^{1/10}) - 1 = 4.4\%$

Source: J.P. Morgan Asset Management.

Assumes a 10-year investment cycle with a five-year investment period (common direct investment private equity fund terms). In calculating both the multiple on invested capital and time-weighted return, the above example implicitly assumes that capital earns a zero return before it is called and after it is distributed. If we instead assume that this capital is invested in a USD cash account paying 2.9%\*, the MOIC and TWR are 1.59 times and 4.74% respectively. If we assume that it is invested in U.S. equities, returning 7.0%\*, the MOIC and TWR are 1.65 times and 5.17% respectively. (\*from JPMAM's 2024 Long-term Market Assumptions). There is no assurance that a private equity fund will make any distributions or perform in a similar fashion. The above cash flows are illustrative of those that may be experienced by an investor in a direct investment private equity fund and are not intended to be illustrative of the cash flows experienced by an investor.

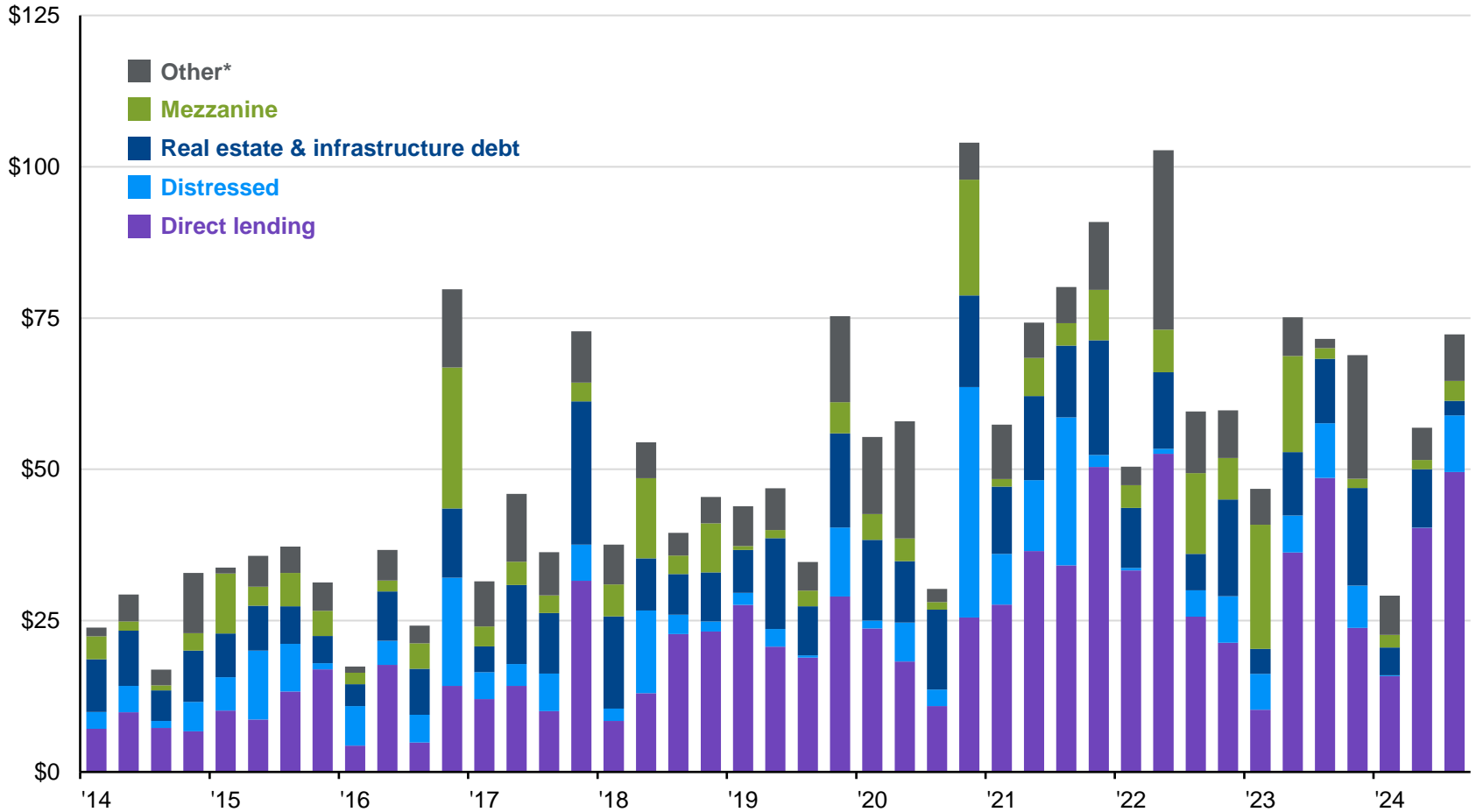
Data are based on availability as of November 30, 2024.



# Private credit fundraising

## Global private credit fundraising by type

USD billions, 1Q14 – 3Q24



Private credit

Source: Preqin, J.P. Morgan Asset Management. \*Other includes venture debt, fund of funds and special situations. Data are based on availability as of November 30, 2024.

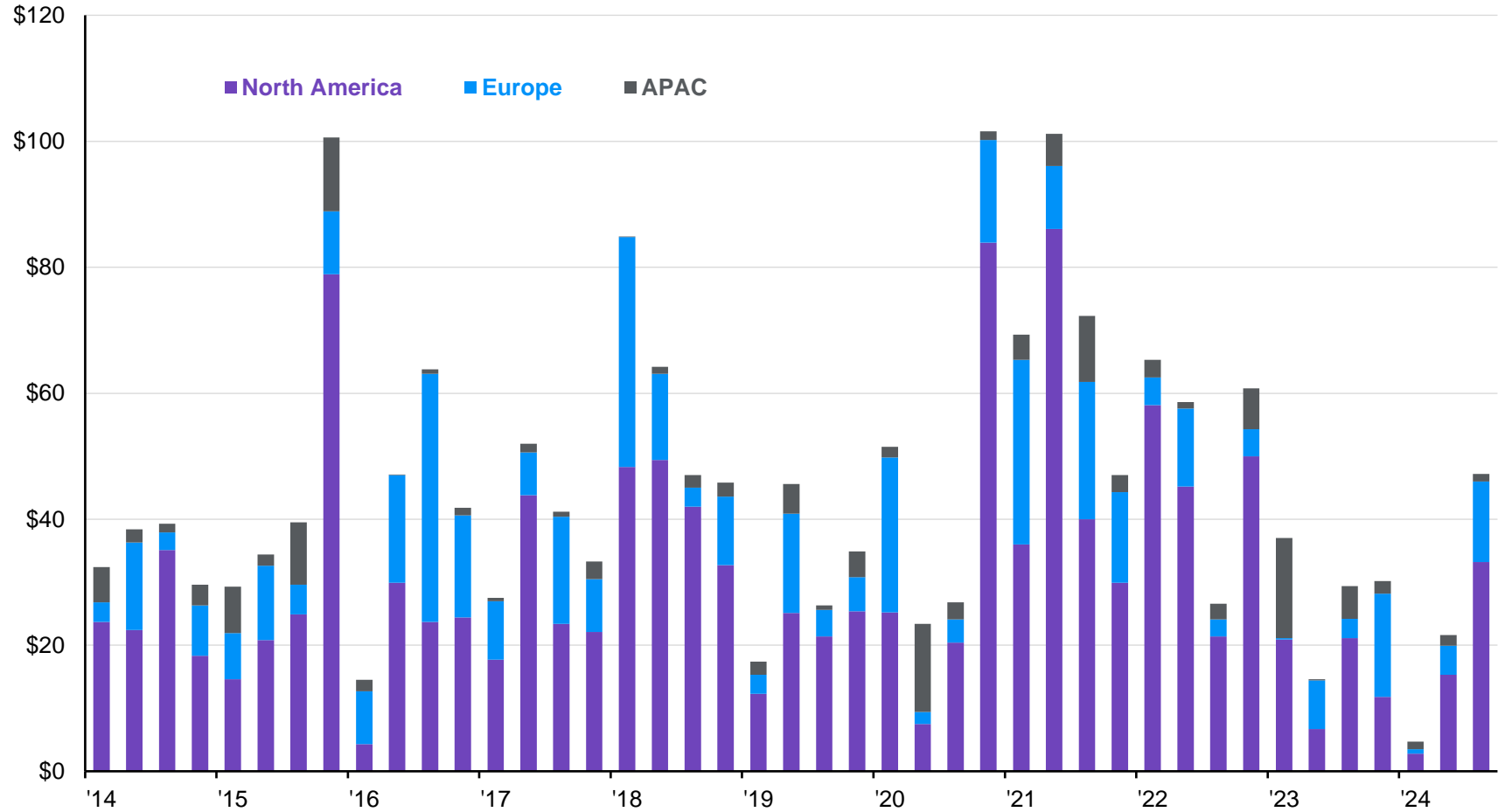


# Private credit deal activity

## Global private credit deal activity

Aggregate deal value by region, USD billions, 1Q14 – 3Q24

Private credit



Source: Preqin, J.P. Morgan Asset Management. APAC includes data from Asia, Australia and New Zealand. Data are based on availability as of November 30, 2024.

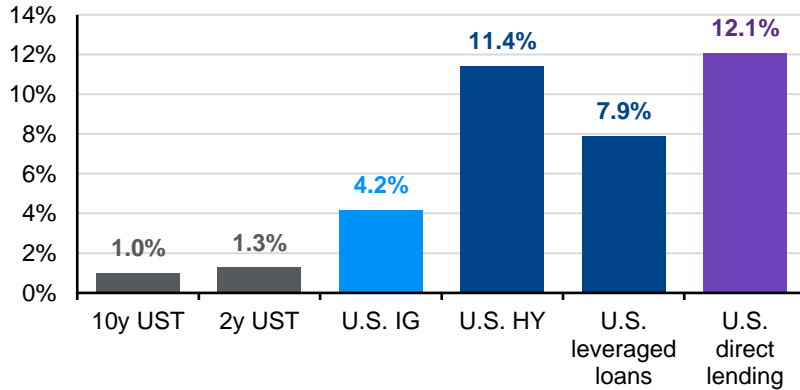


# Credit returns across recent economic cycles

Private credit

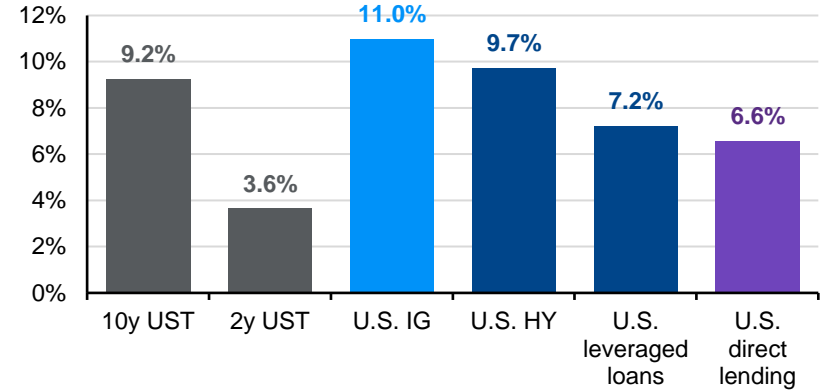
### Expansion: Manufacturing PMI >50 and rising

Average annualized total return, 1Q05 – 3Q24\*



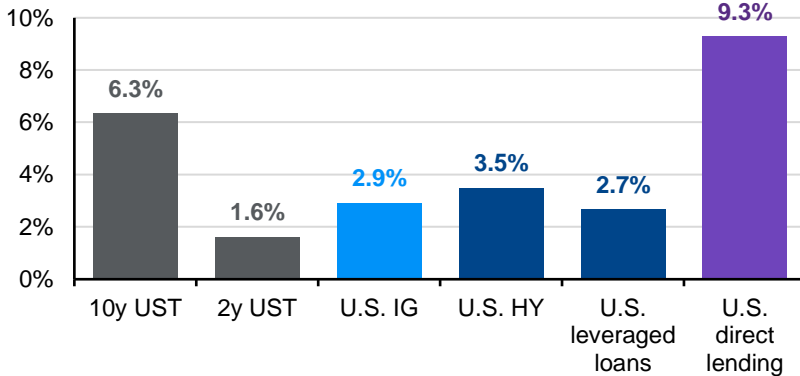
### Recession: Manufacturing PMI <50 and falling

Average annualized total return, 1Q05 – 3Q24\*



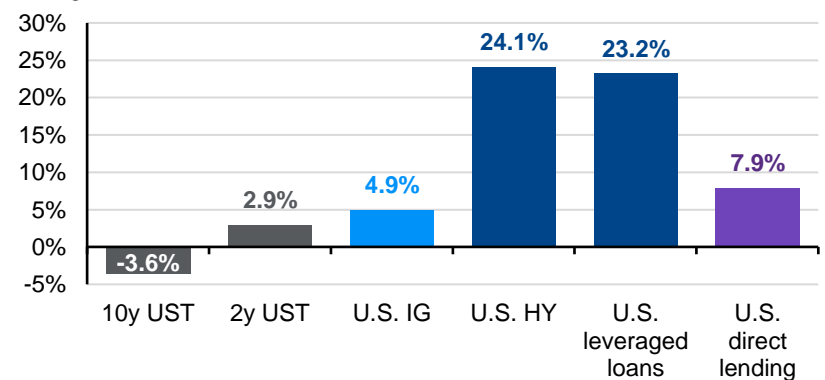
### Late cycle cooling: Manufacturing PMI >50 and falling

Average annualized total return, 1Q05 – 3Q24\*



### Turnaround: Manufacturing PMI <50 and rising

Average annualized total return, 1Q05 – 3Q24\*



Source: Institute for Supply Management, Bloomberg, 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. Analysis based on quarterly returns. 10y UST: Bloomberg U.S. Treasury Bellwethers (10y), 2y UST: Bloomberg U.S. Treasury Bellwethers (2y), U.S. IG: Bloomberg U.S. Aggregate Corporate Investment Grade, U.S. HY: Bloomberg U.S. Aggregate Corporate High Yield, U.S. leveraged loans: Leveraged loans: Morningstar LSTA US Leveraged Loan Total Return Index, U.S. direct lending: Cliffwater Direct Lending Index \*Direct lending returns are through 2Q24.  
 Data are based on availability as of November 30, 2024.

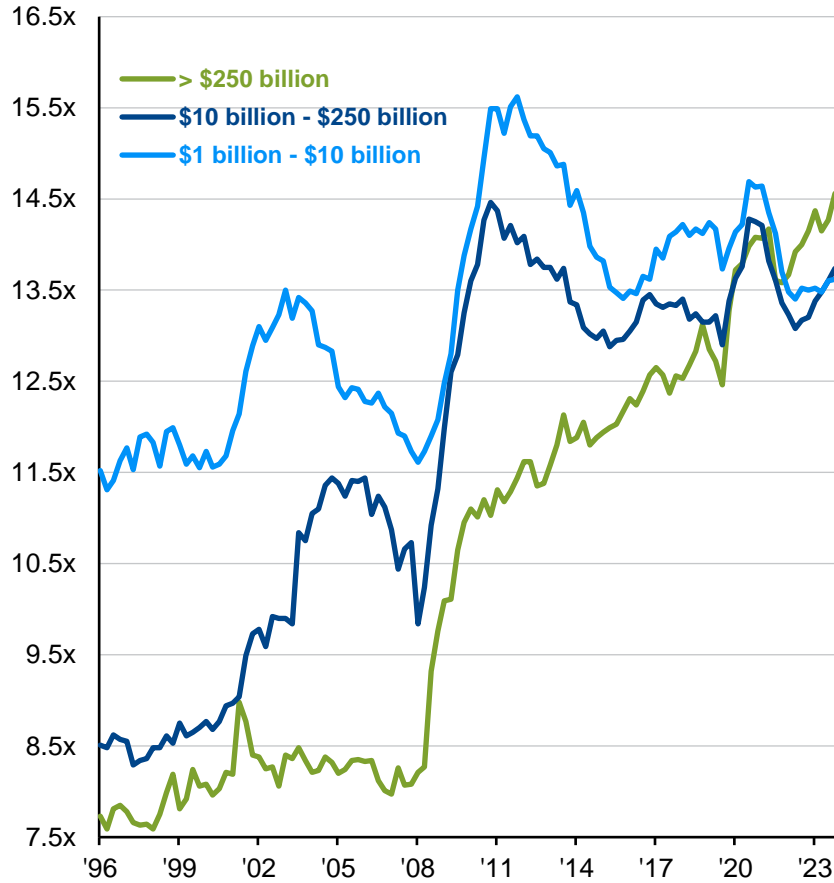


# U.S. banks and credit market participants

Private credit

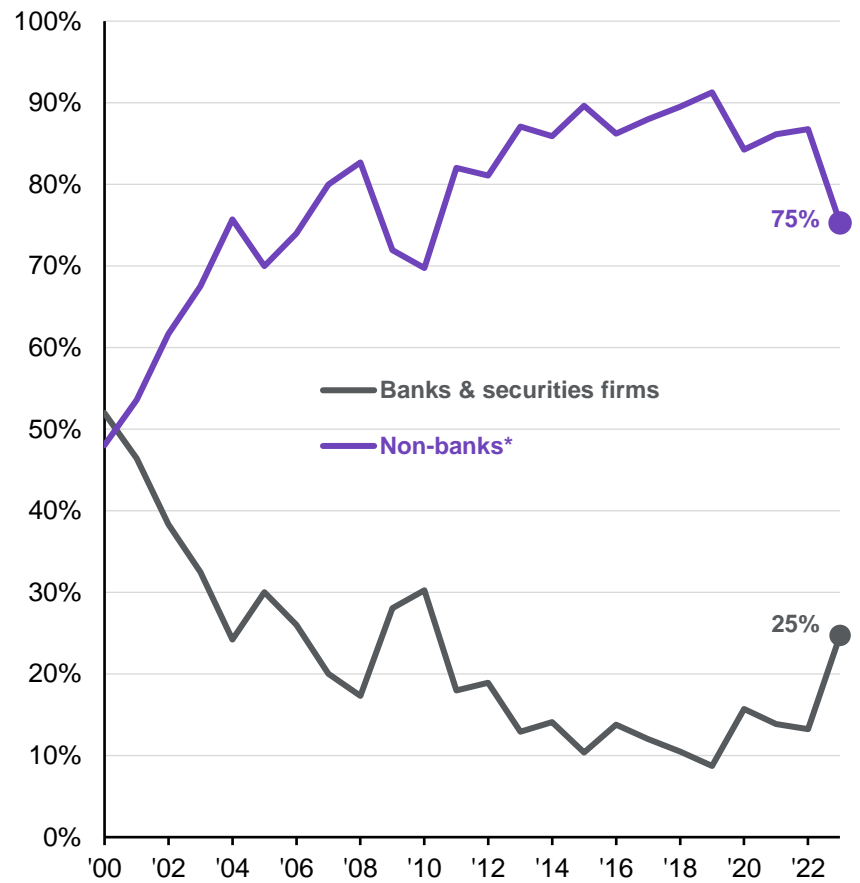
## Tier 1 risk-based capital ratios by bank asset size

Percentage, quarterly, 4Q96 – 2Q24



## Primary market sources of financing

New-issue market for broadly syndicated loans, 1999 – 2022



Source: FDIC, LCD, PitchBook, J.P. Morgan Asset Management. Broadly syndicated loans are the most common type of leveraged loans and represent lending to below investment grade companies by institutional investors (banks and non-banks). Broadly syndicated loans are senior secured. \*Non-bank includes institutional investors and finance companies. Data are based on availability as of November 30, 2024.

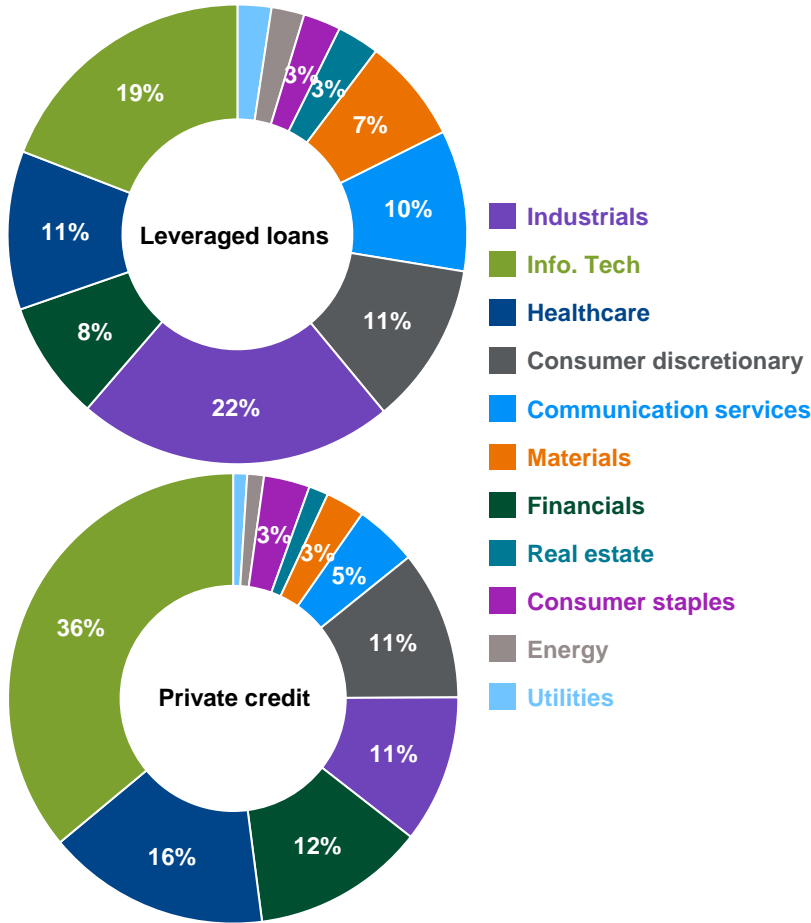




# U.S. private credit vs. leveraged loans

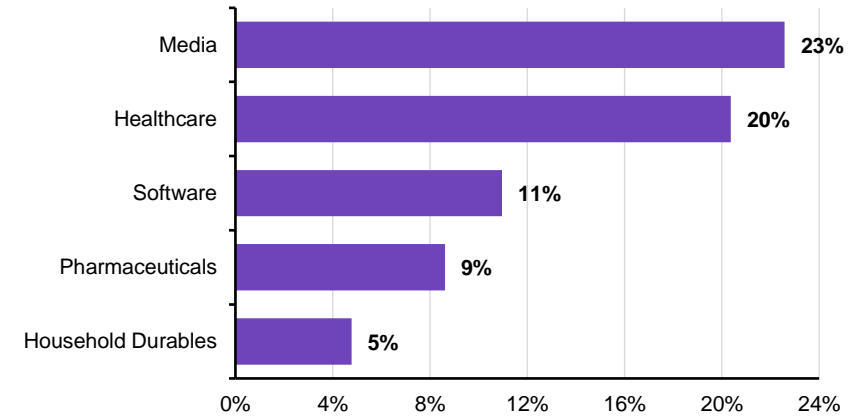
Private credit

## Leveraged loans vs. private credit sector exposure



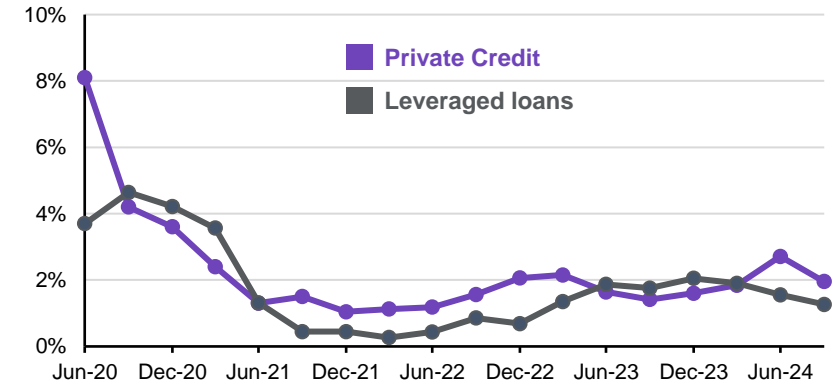
## Share of leveraged loan defaults by industry

U.S., December 2023, last 12 months, % of total default volume



## Private credit and leveraged loans default rate

Quarterly, 2Q20 – 3Q24



Source: Cliffwater, LCD, Standard & Poor's, Pitchbook, Proskauer, J.P. Morgan Markets Research, J.P. Morgan Asset Management. Pitchbook defines leveraged loans as a commercial loan provided by a group of lenders that is either: 1) rated BB+ or lower, 2) not rated or rated BBB- or higher and has a base rate spread of 125 bps or higher and is secured by a first or second lien. Private credit (direct lending) is defined as when a non-bank lender directly lends to a company. All leveraged loans data are from the Morningstar LSTA U.S. Leveraged Loan Index. (Left) For private credit, information technology includes business services. Private credit sector exposure is as of March 31, 2024. Leveraged loans sector exposure is as of October 31, 2024. (Top right) Healthcare includes providers and services. (Bottom right) The leveraged loans default rate is calculated using the LTM number of defaults as a % of total issuers. The private credit default rate is calculated by dividing the number of defaulted loans by the aggregate number of loans in the Index. Data are based on availability as of November 30, 2024.

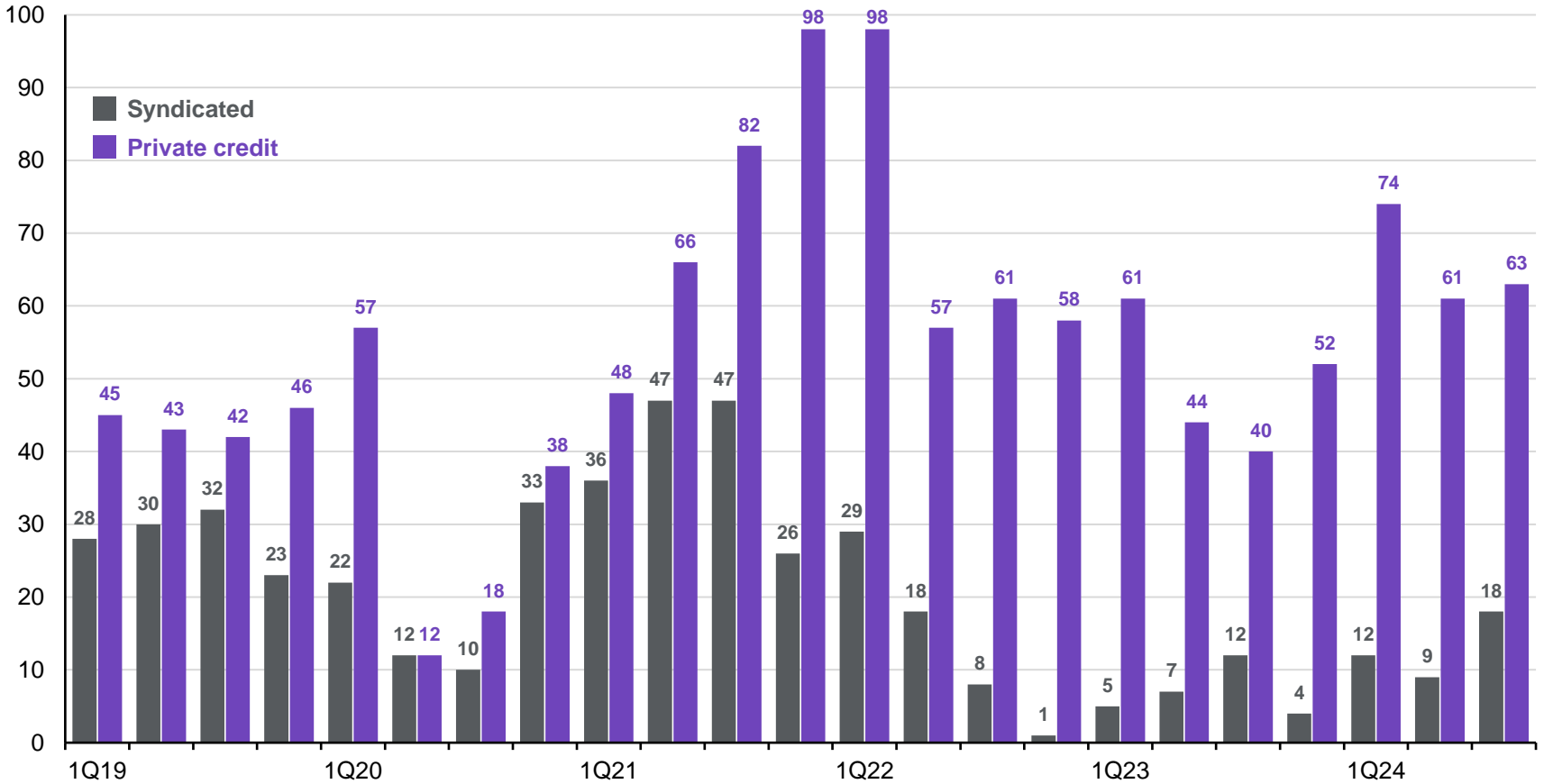


# Leveraged buyout financing

## Sources of LBO financing

Number of deals of broadly syndicated or private credit loans, quarterly, 1Q19–3Q24

Private credit



Source: Pitchbook, LCD, Morningstar LSTA U.S. Leveraged Loan Index, J.P. Morgan Asset Management. Data are as of September 30, 2024. Data are based on availability as of November 30, 2024.

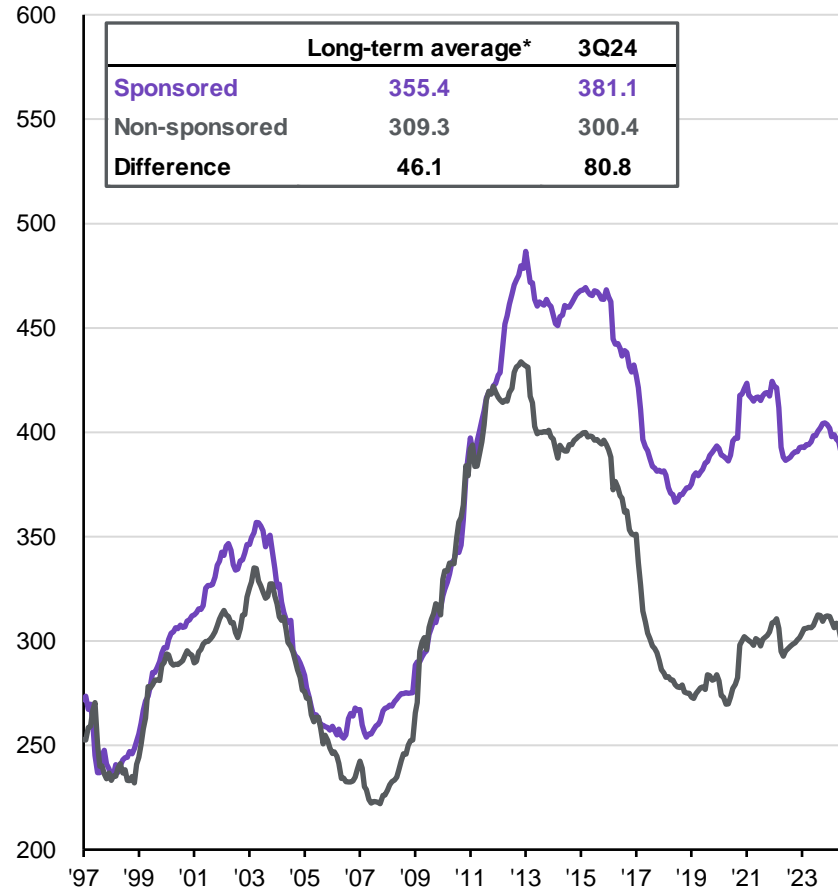


# Sponsored vs. non-sponsored leveraged loans

Private credit

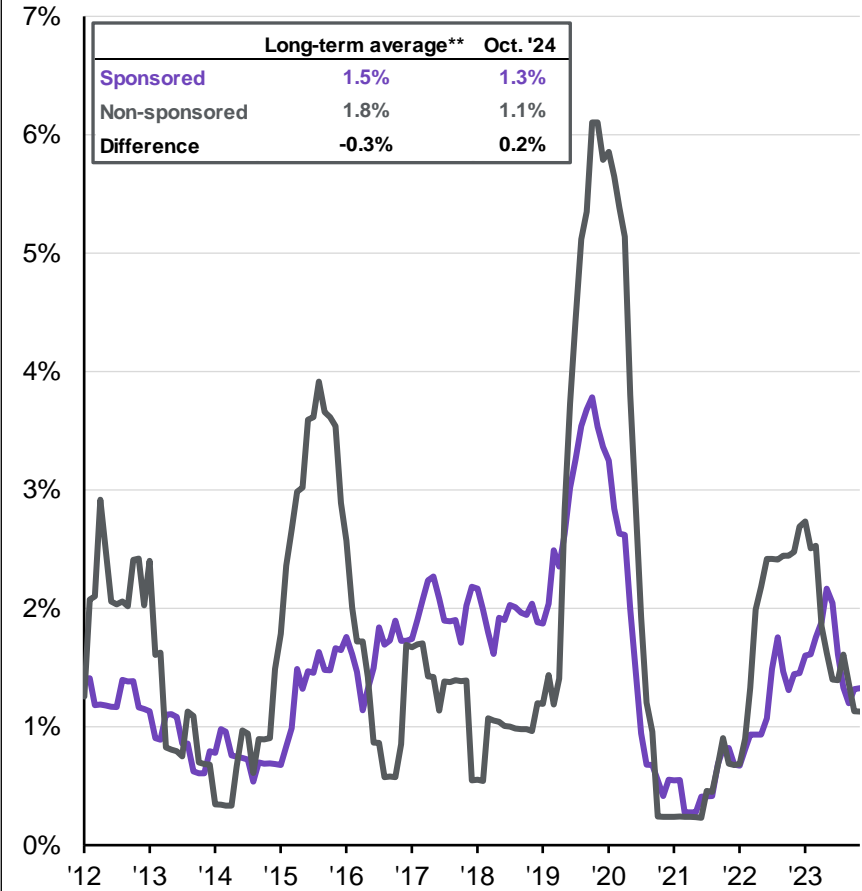
## Sponsored and non-sponsored leveraged loan spreads

Weighted average nominal spreads, monthly, 1Q97 – 3Q24



## Sponsored and non-sponsored leveraged loan default rates

By issuer count, monthly, December 2012 – October 2024



Source: Pitchbook, LCD, Morningstar LSTA U.S. Leveraged Loan Index, J.P. Morgan Asset Management. Sponsored financing is when a non-bank lender provides credit to a business that is either wholly-owned or majority-owned by a private equity firm. Non-sponsored financing is when a lender provides credit to a company not backed by a financial institution. \*Averages are since 1997. \*\*Average default rates are since December 2012.

Data are based on availability as of November 30, 2024.

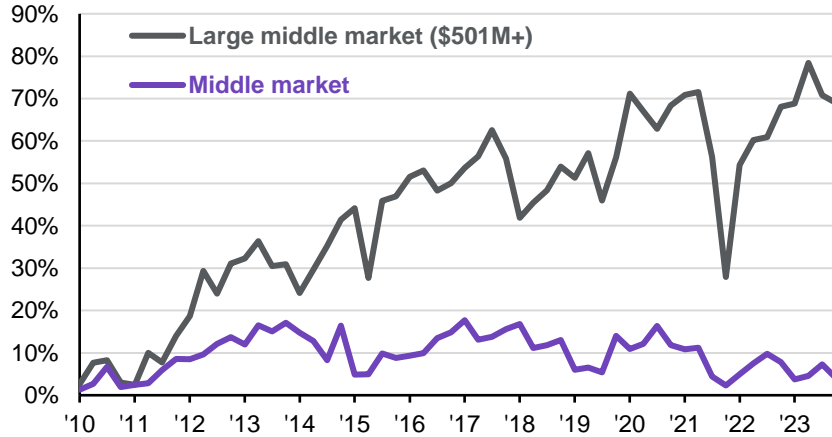


# Middle market lending dynamics

Private credit

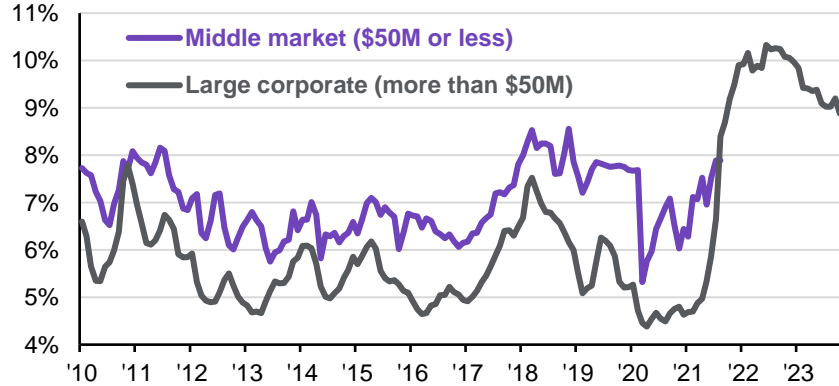
## Covenant-lite loans\*

% of total loans, 4Q10 – 3Q24, quarterly, by deal size



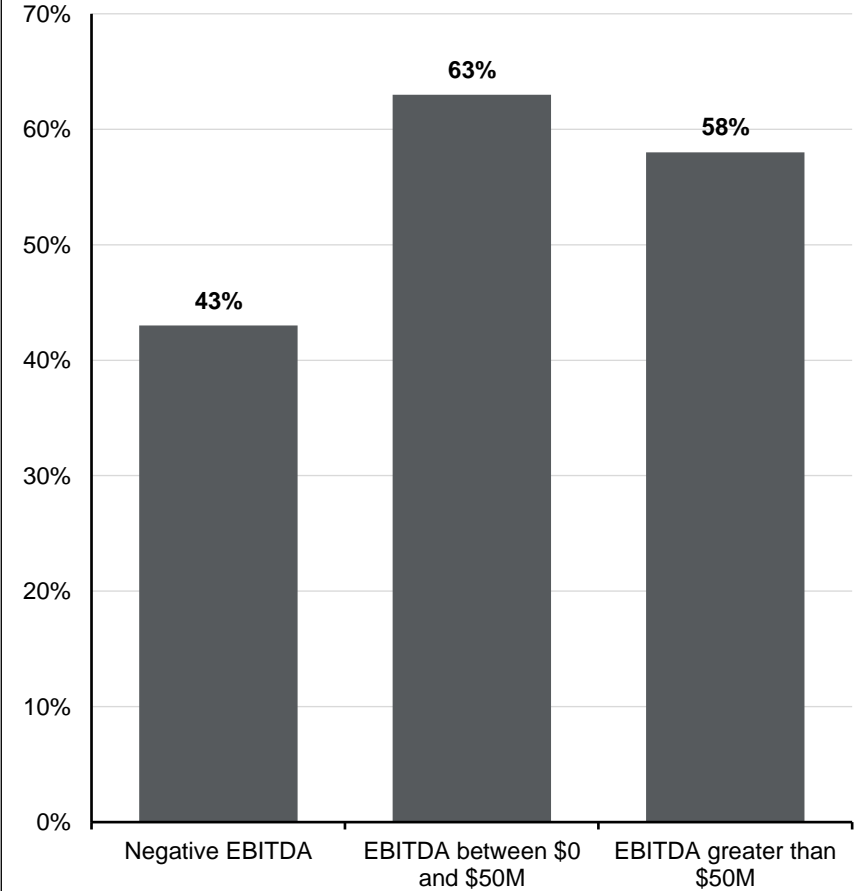
## New issue yields

December 2010 – October 2024\*\*, monthly, by EBITDA



## Average discounted recovery rates by EBITDA

1987 – 2023



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

(Top left) \*Covenant-lite loans are a type of financing that is issued with fewer restrictions on the borrower regarding 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. Deal size refers to the total size of the debt facility. (Bottom left) \*\*Due to a decline in loan issuance, middle market data is only available through July 2022. Middle market yields from April 2020 to January 2021 are estimated using a 12-month trailing average due to lack of data availability over that period. (Right) Middle market corporate are companies with EBITDA of \$50 million or less. Large corporate are companies with EBITDA greater than \$50 million. Data are based on availability as of November 30, 2024.

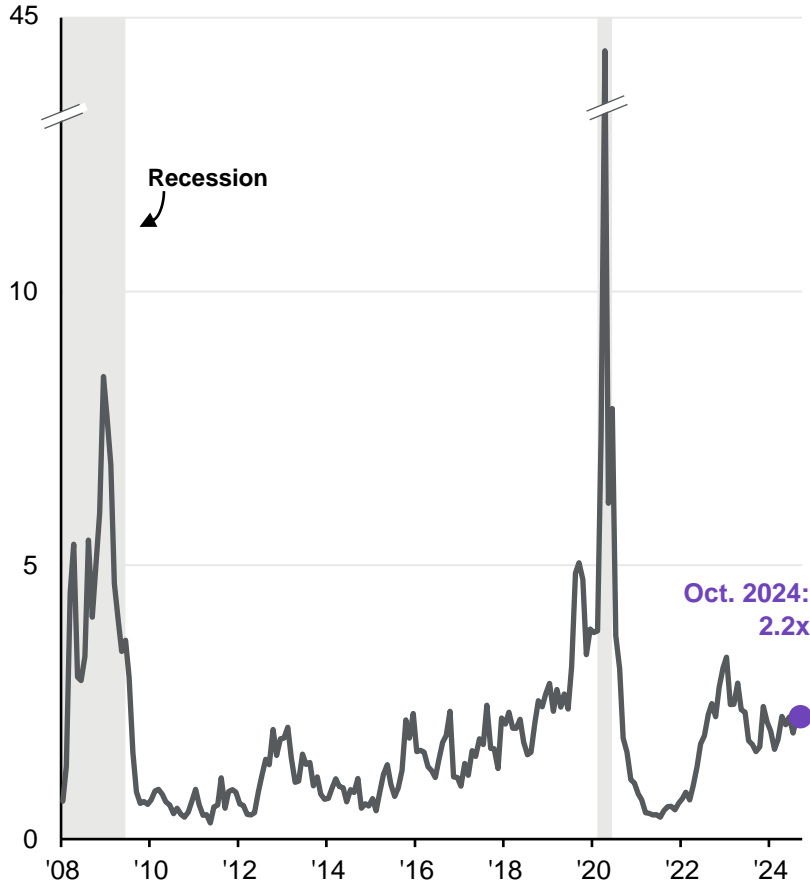


# Credit market stress

Private credit

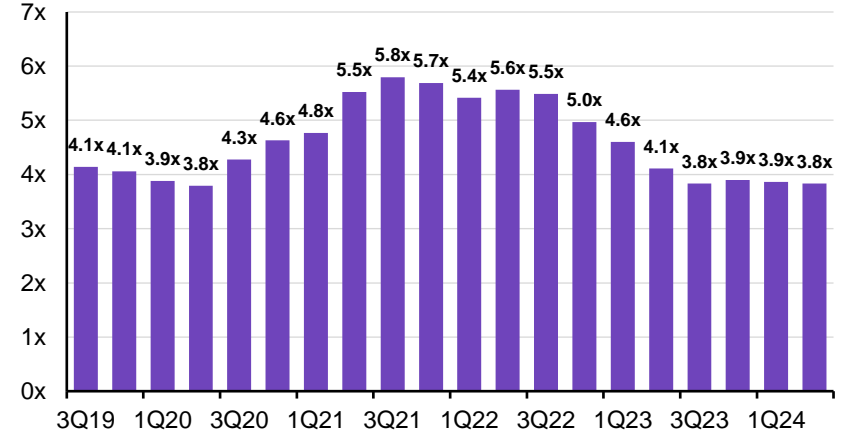
### U.S. leveraged loans downgrade/upgrade ratio

Rolling 3-month period



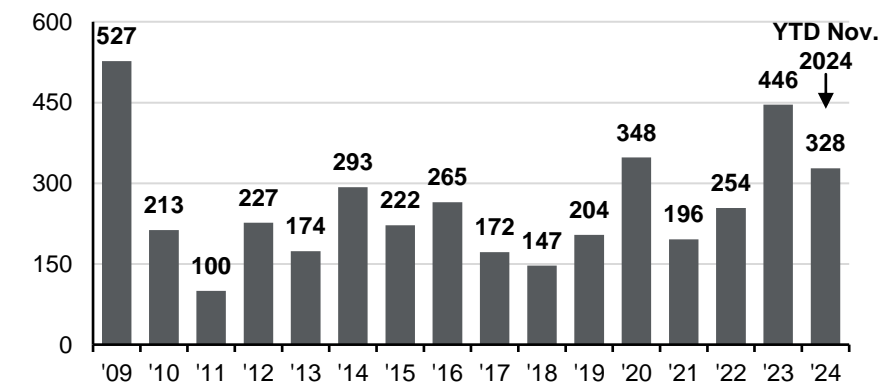
### U.S. leveraged loans interest rate coverage

Weighted average\*, EBITDA/Interest expense, 3Q19 – 2Q24



### U.S. leveraged loans amendments and extensions by year

Count



Source: LCD, PitchBook, J.P. Morgan Asset Management. \*Averages are weighted by outstanding loan amount. Data are based on availability as of November 30, 2024.

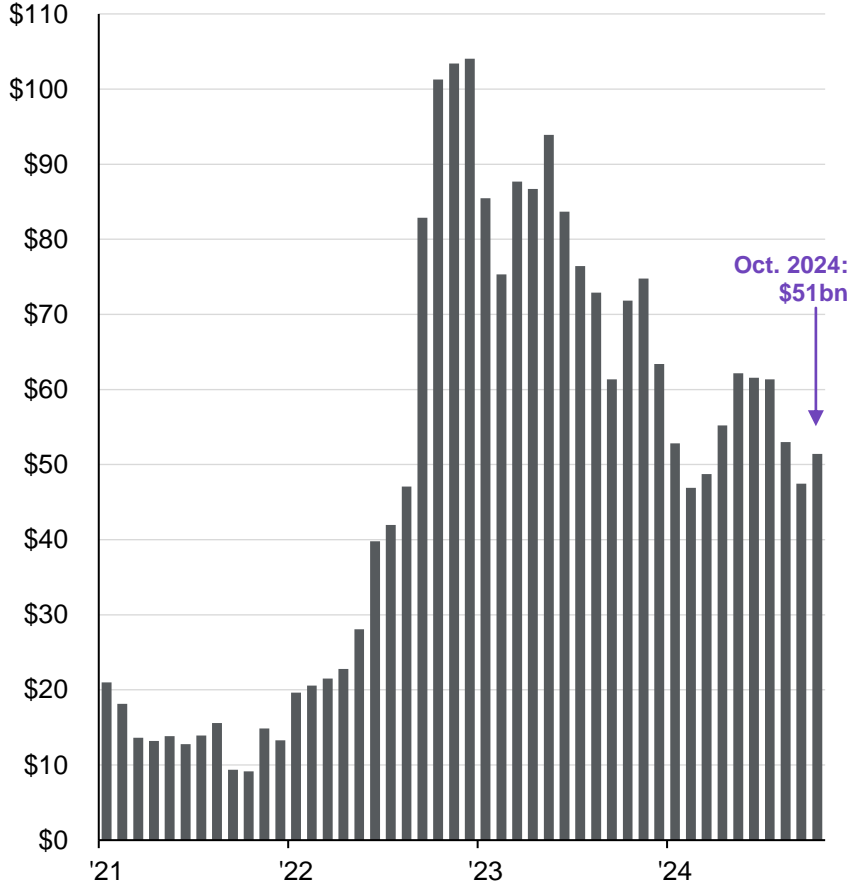


# U.S. distressed loans

Private credit

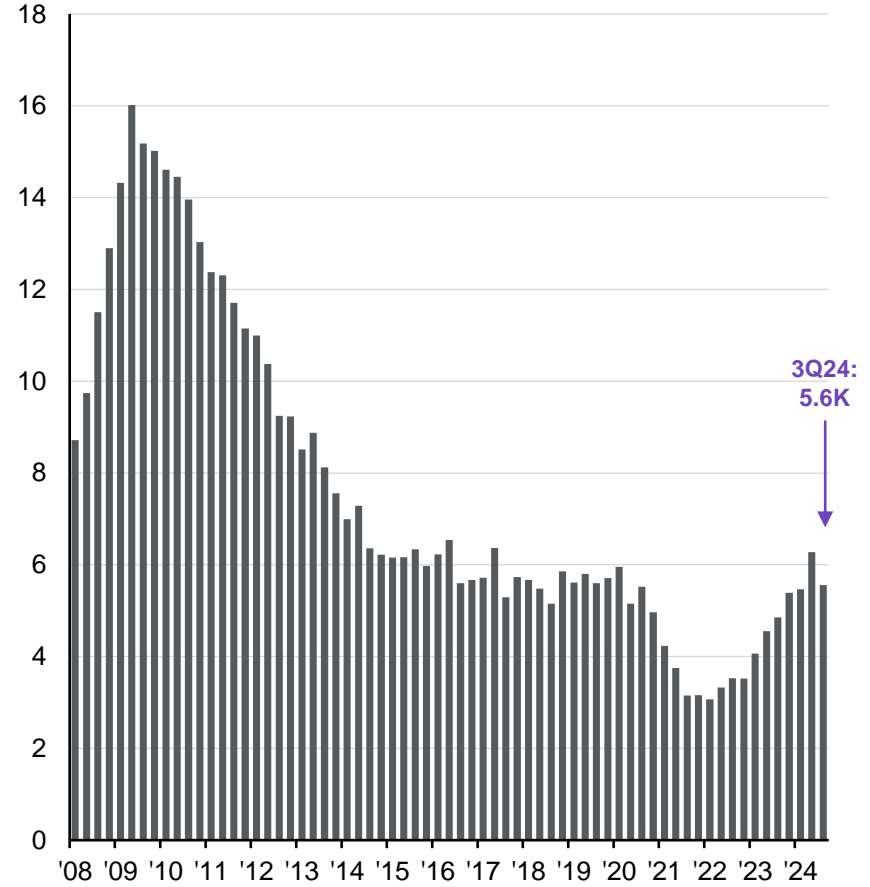
### U.S. distressed loan volume outstanding

USD billions



### Business bankruptcy filings by year

U.S., 1Q08 – 3Q24, in thousands



Source: Pitchbook, LCD, Morningstar, United States Courts, J.P. Morgan Asset Management. Distressed loan data are from the Morningstar LSTA U.S. Leveraged Loan Index, which defines distressed loans as performing leveraged loans priced below 80 cents on the dollar. Data are based on availability as of November 30, 2024.



# Public and private credit returns

Private credit

											2014-2023	
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	YTD '24	Ann.	Vol.**
Mezzanine Debt 14.7%	Mezzanine Debt 10.8%	High Yield 17.1%	Mezzanine Debt 18.9%	Direct Lending 8.1%	Mezzanine Debt 16.0%	Investment Grade 9.9%	Distressed Debt 22.6%	Mezzanine Debt 6.9%	Mezzanine Debt 13.8%	Direct Lending 5.7%	Mezzanine Debt 11.4%	High Yield 8.6%
CML - Apartment 9.6%	Direct Lending 5.5%	Direct Lending 11.2%	Distressed Debt 9.2%	Mezzanine Debt 3.8%	Investment Grade 14.5%	High Yield 7.1%	Mezzanine Debt 16.5%	Direct Lending 6.3%	High Yield 13.4%	Mezzanine Debt 5.0%	Direct Lending 8.8%	Investment Grade 7.2%
Direct Lending 9.6%	CML - Office 3.2%	Mezzanine Debt 10.9%	Direct Lending 8.6%	CML - Industrial 3.7%	High Yield 14.3%	CML - Industrial 6.6%	Direct Lending 12.8%	Distressed Debt 5.5%	Leveraged Loans 13.2%	Leveraged Loans 4.6%	Distressed Debt 6.8%	Distressed Debt 6.6%
Distressed Debt 9.2%	Distressed Debt 3.0%	Leveraged Loans 9.8%	High Yield 7.5%	CML - Senior* 2.6%	Direct Lending 9.0%	CML - Apartment 6.5%	Leveraged Loans 5.5%	Leveraged Loans 0.1%	Direct Lending 12.1%	Distressed Debt 4.6%	Leveraged Loans 4.7%	Leveraged Loans 6.3%
Investment Grade 7.5%	CML - Retail 3.0%	Investment Grade 6.1%	Investment Grade 6.4%	CML - Apartment 2.6%	Leveraged Loans 8.6%	CML - Senior* 6.3%	High Yield 5.3%	CML - Retail -7.6%	Investment Grade 8.5%	High Yield 2.6%	High Yield 4.6%	Mezzanine Debt 4.7%
CML - Senior* 7.4%	CML - Industrial 2.9%	Distressed Debt 4.4%	CML - Apartment 6.3%	CML - Retail 2.4%	CML - Apartment 8.3%	CML - Office 6.3%	CML - Apartment 2.0%	CML - Office -7.6%	Distressed Debt 8.3%	CML - Retail 1.8%	CML - Retail 3.5%	CML - Apartment 4.4%
CML - Retail 7.0%	CML - Senior* 2.7%	CML - Retail 3.4%	CML - Senior* 5.7%	CML - Office 2.4%	CML - Senior* 8.1%	CML - Retail 6.1%	CML - Senior* 1.9%	CML - Senior* -9.0%	CML - Retail 6.2%	CML - Industrial 1.5%	CML - Apartment 3.4%	CML - Senior* 4.0%
CML - Office 6.7%	CML - Apartment 1.6%	CML - Senior* 2.9%	CML - Office 5.5%	Distressed Debt 1.4%	CML - Retail 8.0%	Direct Lending 5.5%	CML - Retail 1.9%	CML - Industrial -9.5%	CML - Industrial 5.8%	CML - Apartment 1.5%	CML - Senior* 3.3%	CML - Industrial 3.9%
CML - Industrial 6.2%	Leveraged Loans 0.5%	CML - Industrial 2.8%	CML - Industrial 5.2%	Leveraged Loans 1.1%	CML - Office 7.9%	Distressed Debt 3.2%	CML - Industrial 1.8%	CML - Apartment -9.8%	CML - Apartment 5.6%	CML - Senior* 1.4%	CML - Office 3.2%	CML - Retail 3.6%
High Yield 2.5%	Investment Grade -0.7%	CML - Apartment 2.7%	CML - Retail 5.1%	High Yield -2.1%	CML - Industrial 7.5%	Leveraged Loans 3.2%	CML - Office 1.6%	High Yield -11.2%	CML - Senior* 5.6%	CML - Office 0.4%	CML - Industrial 3.2%	CML - Office 3.6%
Leveraged Loans 2.0%	High Yield -4.5%	CML - Office 2.6%	Leveraged Loans 4.2%	Investment Grade -2.5%	Distressed Debt 2.6%	Mezzanine Debt 3.1%	Investment Grade -1.0%	Investment Grade -15.8%	CML - Office 4.5%	Investment Grade -0.5%	Investment Grade 3.0%	Direct Lending 2.9%

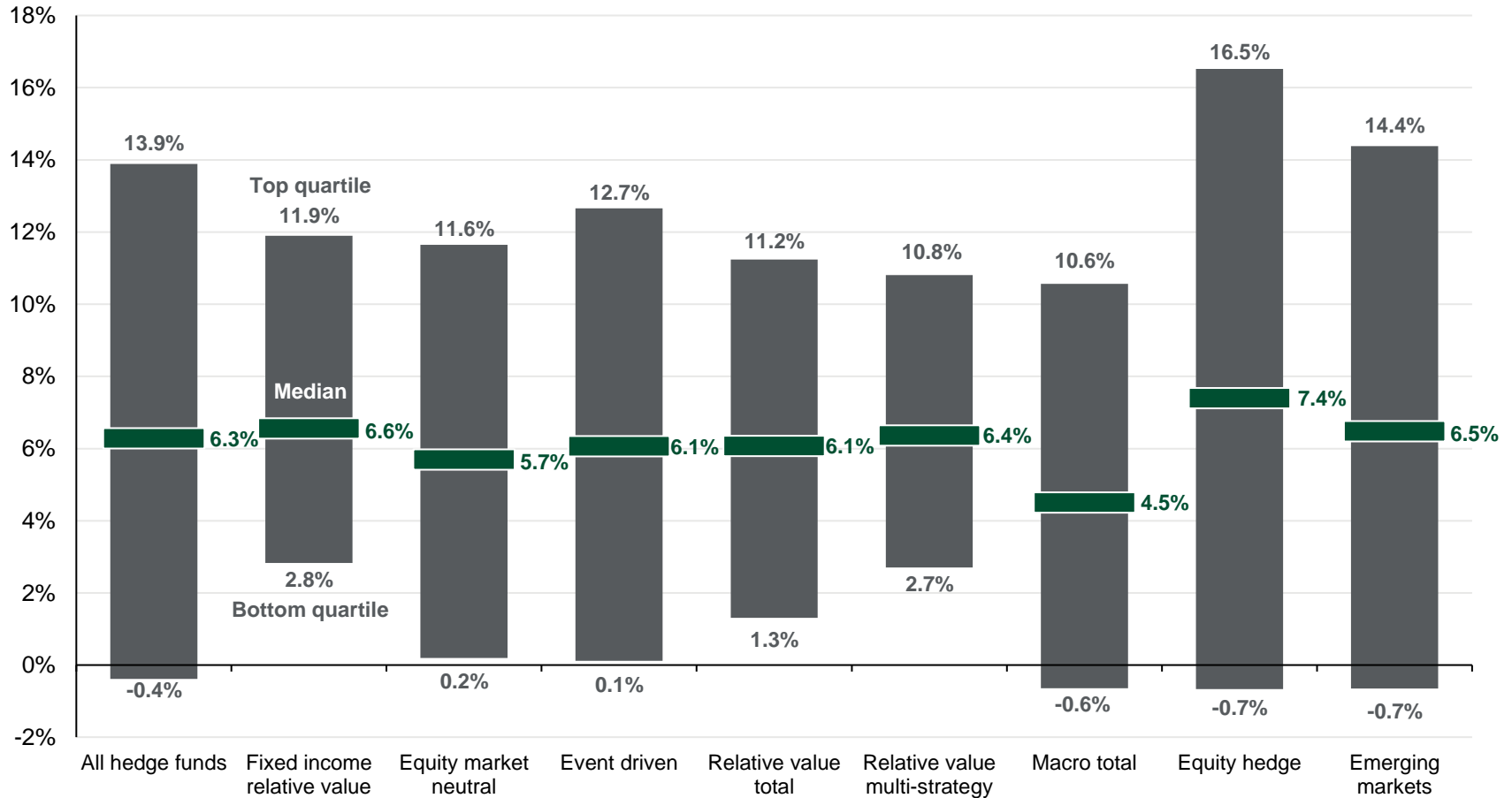
Source: Bloomberg, Cliffwater, Gilberto-Levy, J.P. Morgan, Preqin, J.P. Morgan Asset Management.  
 CML is commercial mortgage loans. CML: Gilberto-Levy Commercial Mortgage Performance Index; Direct Lending: Cliffwater Direct Lending Index; Distressed Debt: Preqin Quarterly Distressed Debt Index; Investment Grade: Bloomberg U.S. Aggregate Credit - Corporates - Investment Grade Index; High Yield: Bloomberg U.S. Aggregate Credit - Corporate - High Yield Index; Leveraged Loans: J.P. Morgan Leveraged Loan Index; Mezzanine Debt: Preqin Quarterly Mezzanine Debt Index. Annualized return (Ann.) and volatility (Vol.) represents the period from 12/31/2013 to 12/31/2023. \*Year-to-date 2024 data updated through 6/30/2024. \*\*Volatility calculated as the annualized standard deviation of quarterly returns. Data are based on availability as of November 30, 2024.



# Hedge funds and manager selection

## Hedge fund manager dispersion Based on returns from 2014-2024\* in USD

Hedge funds



Source: PivotalPath, J.P. Morgan Asset Management. Manager dispersion is based on monthly returns for hedge funds. Green 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. \*2024 data are through September 30, 2024. Data are based on availability as of November 30, 2024.





# Hedge fund strategy returns

Hedge funds

2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	YTD '24*	2014-2023	
											Ann.	Vol.
Global Macro 5.8%	Eq. Market Neutral 4.5%	Distressed 9.8%	Global Equities 24.6%	Merger Arbitrage 4.3%	Global Equities 27.3%	Global Equities 16.8%	Distressed 20.0%	Global Macro 9.7%	Global Equities 22.8%	Global Equities 19.1%	Global Equities 8.5%	Global Equities 15.7%
Relative Value 5.3%	Merger Arbitrage 2.6%	Global Equities 8.5%	Equity Long/Short 12.8%	Relative Value 2.1%	Global Bonds 6.8%	Equity Long/Short 14.2%	Global Equities 19.0%	Merger Arbitrage 2.7%	Equity Long/Short 5.9%	Equity Long/Short 13.7%	Equity Long/Short 5.0%	Distressed 7.6%
Global Equities 4.7%	Global Macro 0.4%	Relative Value 5.4%	HFRI Composite 8.5%	Distressed 2.1%	Equity Long/Short 6.7%	Global Bonds 9.2%	Equity Long/Short 16.3%	Eq. Market Neutral 1.8%	Relative Value 5.8%	Distressed 10.5%	Merger Arbitrage 4.4%	Equity Long/Short 7.5%
HFRI Composite 4.3%	Relative Value 0.2%	Merger Arbitrage 3.5%	Distressed 7.7%	Eq. Market Neutral -0.8%	Global Macro 6.0%	HFRI Composite 8.9%	HFRI Composite 13.9%	Relative Value -0.6%	Global Bonds 5.7%	HFRI Composite 10.1%	HFRI Composite 4.4%	Global Bonds 7.0%
Equity Long/Short 3.6%	Equity Long/Short -0.2%	Equity Long/Short 3.4%	Global Bonds 7.4%	Global Bonds -1.2%	HFRI Composite 5.6%	Distressed 8.4%	Merger Arbitrage 13.4%	HFRI Composite -2.8%	Eq. Market Neutral 5.2%	Eq. Market Neutral 8.5%	Relative Value 4.0%	HFRI Composite 5.4%
Eq. Market Neutral 3.2%	HFRI Composite -0.2%	HFRI Composite 3.2%	Relative Value 5.5%	HFRI Composite -1.2%	Merger Arbitrage 5.3%	Merger Arbitrage 2.9%	Global Macro 11.1%	Distressed -3.1%	HFRI Composite 4.5%	Relative Value 7.0%	Distressed 3.9%	Global Macro 5.0%
Merger Arbitrage 1.9%	Global Equities -1.8%	Global Bonds 2.1%	Merger Arbitrage 5.0%	Equity Long/Short -2.2%	Relative Value 4.1%	Relative Value 2.7%	Relative Value 9.5%	Equity Long/Short -8.1%	Distressed 3.4%	Merger Arbitrage 6.0%	Global Macro 3.0%	Merger Arbitrage 4.7%
Distressed 1.2%	Global Bonds -3.2%	Eq. Market Neutral 1.6%	Eq. Market Neutral 4.9%	Global Macro -3.6%	Eq. Market Neutral 2.3%	Global Macro 2.0%	Eq. Market Neutral 7.4%	Global Bonds -16.2%	Merger Arbitrage 3.2%	Global Macro 4.1%	Eq. Market Neutral 2.9%	Relative Value 4.0%
Global Bonds 0.6%	Distressed -7.4%	Global Macro -1.3%	Global Macro 2.5%	Global Equities -8.9%	Distressed -0.7%	Eq. Market Neutral -1.2%	Global Bonds -4.7%	Global Equities -18.0%	Global Macro -1.0%	Global Bonds 3.6%	Global Bonds 0.4%	Eq. Market Neutral 2.2%

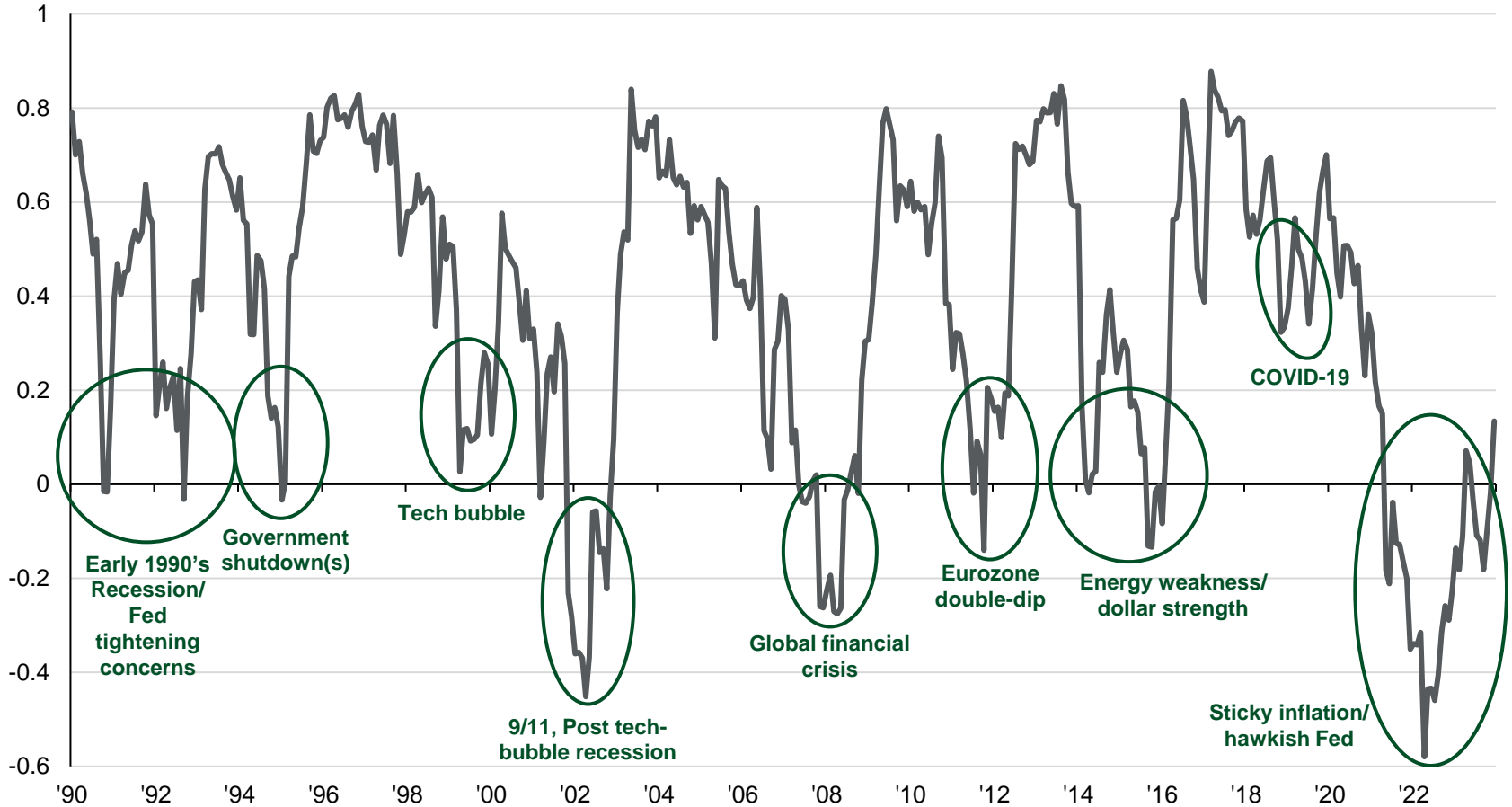
Source: MSCI, Bloomberg, Hedge Fund Research Institute (HFRI), FactSet, J.P. Morgan Asset Management. All returns are in USD. Global equities reflect the MSCI AC World Index and global bonds reflect the Bloomberg Global Aggregate Index. All hedge fund returns are from HFRI. HFRI Composite: HFRI FW Composite Index. The HFRI Fund Weighted Composite Index strategy weights as of March 2024 are as follows: Equity Hedge: 48.4%, Event-Driven: 12.2%, Macro: 18.4% and Relative Value: 21.0%. Returns may fluctuate as hedge fund reporting occurs on a lag, and HFRI data is reported on a one-month lag. Please see disclosure pages for index definitions. \*2024 data are as of September 30, 2024. Data are based on availability as of November 30, 2024.



# Hedge funds and traditional portfolios

**Hedge fund correlation with a 60/40 stock-bond portfolio\***  
Monthly, rolling 12 months

Hedge funds



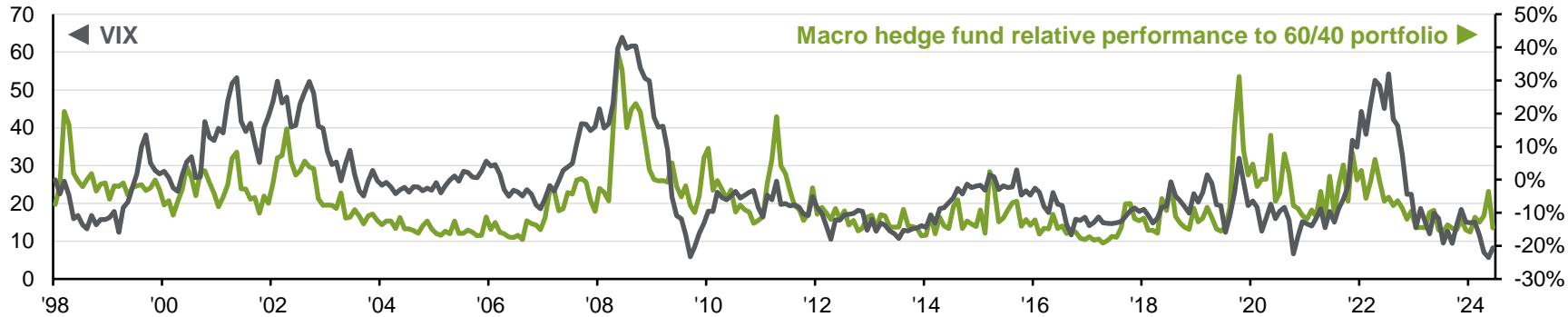
Source: HFRI, Standard & Poor's, Bloomberg, FactSet, J.P. Morgan Asset Management.  
\*60/40 portfolio is 60% S&P500 and 40% Bloomberg U.S. Aggregate. Hedge funds are represented by HFRI Macro.  
Data are based on availability as of November 30, 2024.



# Hedge fund performance and volatility

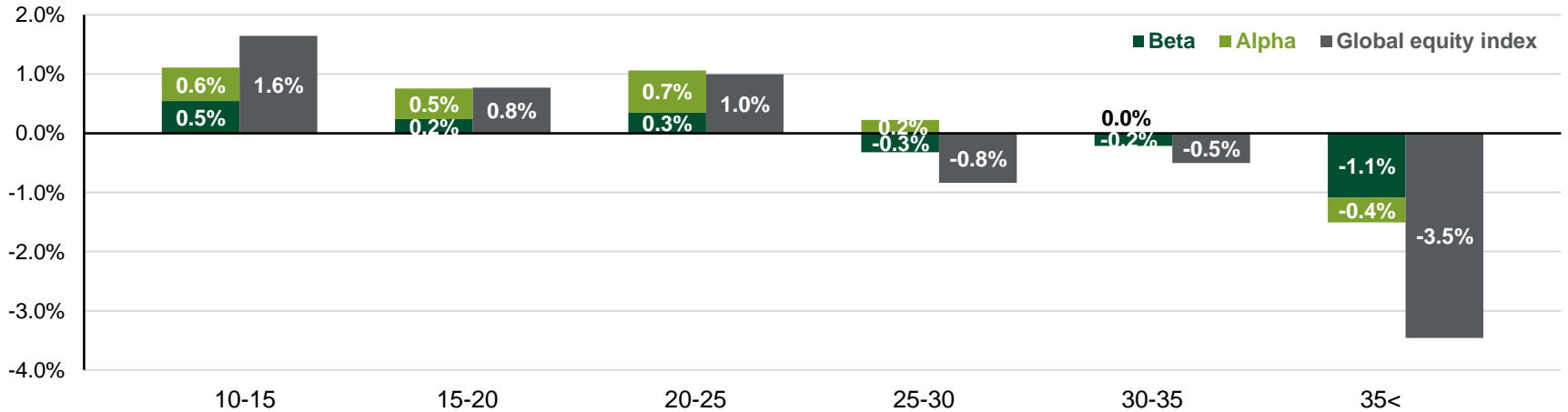
## Macro hedge fund relative performance & volatility

VIX index level, y/y change in relative performance of Hedge Fund Research Institute Macro Index



## Hedge funds vs. global equity performance and volatility

Average monthly returns by VIX level, Nov. 1990 – Nov. 2024, total return



Hedge funds

Source: Bloomberg, CBOE, HFRI, FactSet, MSCI, Standard & Poor's, 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. Macro hedge fund relative performance volatility is since June 30, 1998. Numbers may not sum to aggregate total return due to rounding. Global equity index = MSCI All Country World Index. 60/40 portfolio = 60% S&P 500 Total Return Index and 40% Bloomberg U.S. Aggregate Total Return Index. Data are based on availability as of November 30, 2024.

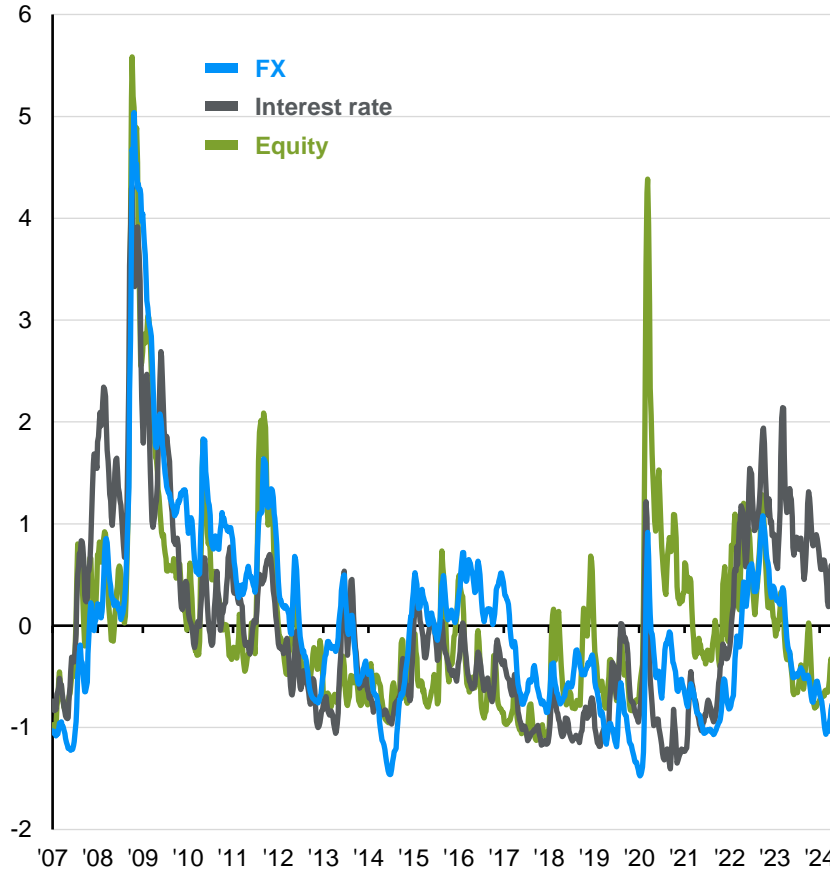


# Volatility, rates and hedge fund returns

Hedge funds

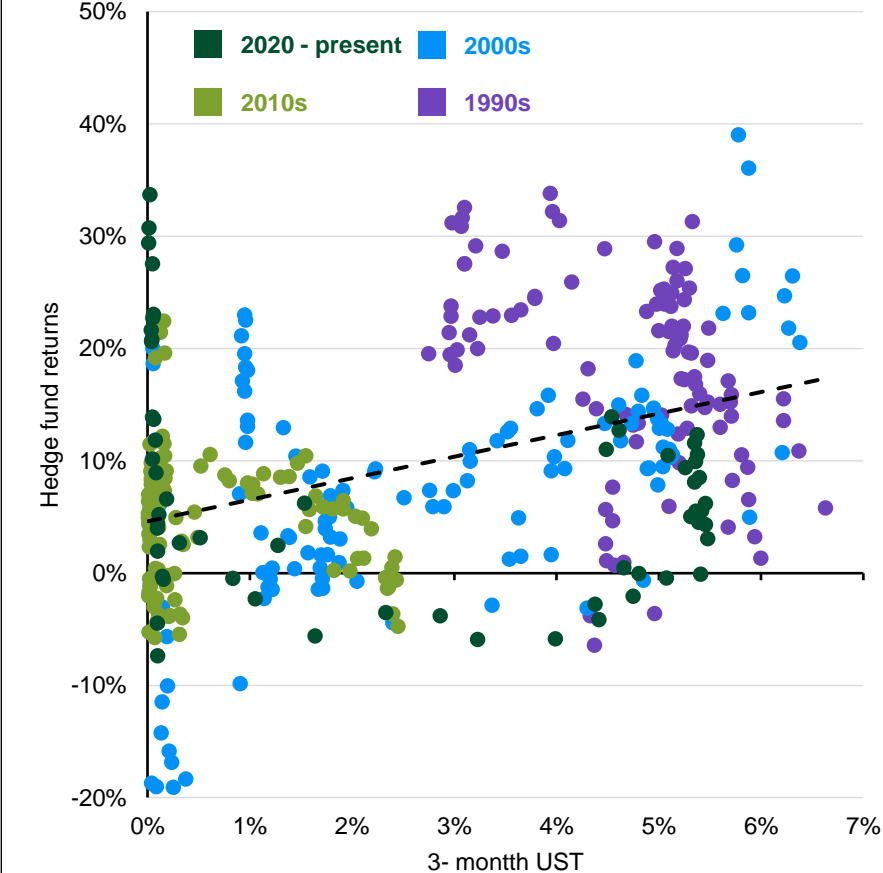
### Equity, interest rate and foreign exchange volatility

Z-score, 4-week moving average



### Hedge fund returns and short rates

Dec. 1990 – Nov. 2024, year-over-year, total return



Source: CBOE, ICE BofA, HFRI, FactSet, J.P. Morgan Index Research, J.P. Morgan Asset Management. (Left) Equity volatility is represented by the VIX Index, interest rate volatility is represented by the MOVE Index and foreign exchange volatility is represented by the J.P. Morgan Global FX Volatility Index. (Right) 3-month U.S. T-bill yield: Bloomberg U.S. Short Treasury (1-3 months) Index, Hedge fund returns: HFRI Fund Weighted Composite (USD) Index. Data are based on availability as of November 30, 2024.



## Real estate

**Base rent** – The gross revenue from rental payments.

**Capitalization rate (Cap rate)** – The rate of return on a real estate investment property defined as the net operating income from the property divided by the current market price of the property.

**Cap rate spread** – The difference between the cap rate and a Treasury security with the same maturity.

**Core real estate** – High quality properties in primary markets with high occupancy rates, credit-worthy tenants and long leases.

**Effective rent** – Base rent less rental concessions and tenant improvements.

**Gross absorption** – Space that became physically occupied in a specific period.

**Mezzanine debt** – Financing that is half-way between equity and debt by which the lender can convert to equity if the loan is not paid on time or in full.

**Net absorption** – Space that became physically occupied minus space that was physically vacated in a specific period.

**Net absorption rate** – Net absorption during a specific period divided by space available to lease at the start of that period.

**Occupancy rate** – The percentage of available space that is occupied.

**Real estate prime yield** – The real estate yield on a property at a prime location.

**Real estate net operating income** – Income after operating expenses but before interest, taxes, capital spending, depreciation and amortization.

**Real estate yields** – Annual income divided by total investment. Note that annual income, unlike NOI, does deduct interest costs so that real estate yields should be lower than cap rates.

**Real estate yield spread** – The difference between the yields and a Treasury security with the same maturity.

**Vacancy rate** – The percentage of available space that is unoccupied.

## Private equity

**Buyout fund** – Private equity fund that focuses on taking a majority stake or full control of mature, undervalued.

**Called capital** – The amount of capital wired to a fund that is “drawn down” over time as the general partner selects investments.

**Committed capital** – The specific amount of capital that a limited partner is obliged to provide to a closed-end fund 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.

**Corporate mergers and acquisition (M&A)** – The consolidation of companies through financial transactions.

**Dry powder** – The amount of capital that has been committed to a private capital fund minus the amount that has been called by the general partner for investment.

**Earnings before interest, taxes, depreciation and amortization (EBITDA)** – A broad measure of the cash profit generated by a company’s operations.

**Enterprise value (EV)** – The total value of a company including equity and debt.

**General partner (GP)** – 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).

**Growth fund** – Private equity fund that targets firms with the potential for scalable and renewed growth.

**Initial public offering (IPO)** – When shares of a private company are made available to the public for the first time.

**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.

**Leveraged buyout (LBO)** – The acquisition of another company using a significant amount of debt to finance the acquisition.

**Limited partner (LP)** – 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.

**Middle market** – Companies having revenues between \$10 million and \$1 billion.

**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.

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

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

**Sponsor-backed acquisition** – Acquisition of a company by a private equity firm.

**Secondary fund** – Private equity funds that purchase existing assets from a primary private equity fund.

**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.



## Private credit

**Amend and extend** – A technique that allows an issuer to delay part of its loan maturity or amend existing terms through an amendment rather than a refinancing.

**Covenant-lite loans** – A type of financing that is issued with fewer restrictions on the borrower regarding 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.

**Direct lending** – A loan made by an investor or non-bank lender to a company.

**Distressed debt** – The securities of a company that has either defaulted, is under bankruptcy protection or is in financial distress and is moving towards default or bankruptcy in the near future.

**Hedge-adjusted yield** – The yield on a foreign currency denominated asset minus the cost of hedging the asset back into U.S. dollars. For assets countries with short-term rates that are lower than U.S. rates, the hedge-adjusted yield will be lower than the yield denominated in foreign currency.

**Leveraged loan** – A commercial loan provided by a group of lenders that is either: 1) rated BB+ or lower, 2) not rated or rated BBB- or higher and has a base rate spread of 125 bps or higher and is secured by a first or second lien. This loan is structured, arranged and administered by one or several banks, and is then syndicated to other institutional investors. As such, this market is often referred to as the broadly syndicated loan market.

**Mezzanine commercial real estate debt** – 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.

**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.

**Non-sponsored loan** – Credit provided to a business that is *not* wholly-owned or majority-owned by a private equity firm or another financial sponsor.

**Payment-in-kind (PIK)** – An interest payment in which the borrower makes an interest payment in forms other than cash. This includes, but is not limited to, a type of debt whose interest payments come in the form of additional debt accrued onto existing debt.

**Performing loans** – Loans that are not in default.

**Private credit** – Nonbank corporate credit provided through bilateral agreements or small “club deals” outside the realm of public securities or commercial banks. This definition excludes bank loans, broadly syndicated loans, and funding provided through publicly traded assets such as corporate bonds.

**Sponsored loan** – Credit provided by a non-bank lender to a business that is either wholly-owned or majority-owned by a private equity firm or another financial sponsor.

**Syndicated loan** – A loan extended by a group of financial institutions, often referred to as a loan syndicate, to a single borrower.

## Hedge funds

**Distressed securities** – Funds that invest in debt and equity securities of firms in reorganization or bankruptcy.

**Long/short (L/S) equity** – Funds that involve 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** – Funds that invest in opportunities created by significant corporate transactions and events which tend to alter a company’s financial structure or operating strategy.

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

**Relative value/Arbitrage** – Funds that involve 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.



# J.P. Morgan Asset Management – Risks & disclosures

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**Guide to Alternatives**

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