

A large, stylized yellow letter 'C' graphic that serves as a decorative element for the text.

QUANTITATIVE PERSPECTIVES
US Market Insights

Q1 2023



Introduction

It was a tumultuous 2022 for investors to say the least. From geopolitics, inflation, central bank hawkishness, hangovers from a growth bubble, and nearly every economist proclaiming a recession is imminent, capital allocators have had their work cut out. Slowing dealmaking and a difficult exit environment in 2022 have presented challenges likely to persist in the near term. Our own recession indicator is flashing a warning signal for the next 12 to 18 months. To help navigate these waters, we are tracking the shifting environment for private capital from VC to real assets.

In this edition of *US Market Insights*, we spotlight the growth of private markets AUM and where that growth is likely to lead in the near to long term. We offer a bird's-eye view of alternative markets through a macroeconomic lens, providing many of the key metrics our research team tracks across equity markets, real estate, real assets, and fixed income. This report includes data on the economy, public markets, private markets, and PitchBook's proprietary quantitative research.

Published on February 7, 2023

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Macro overview



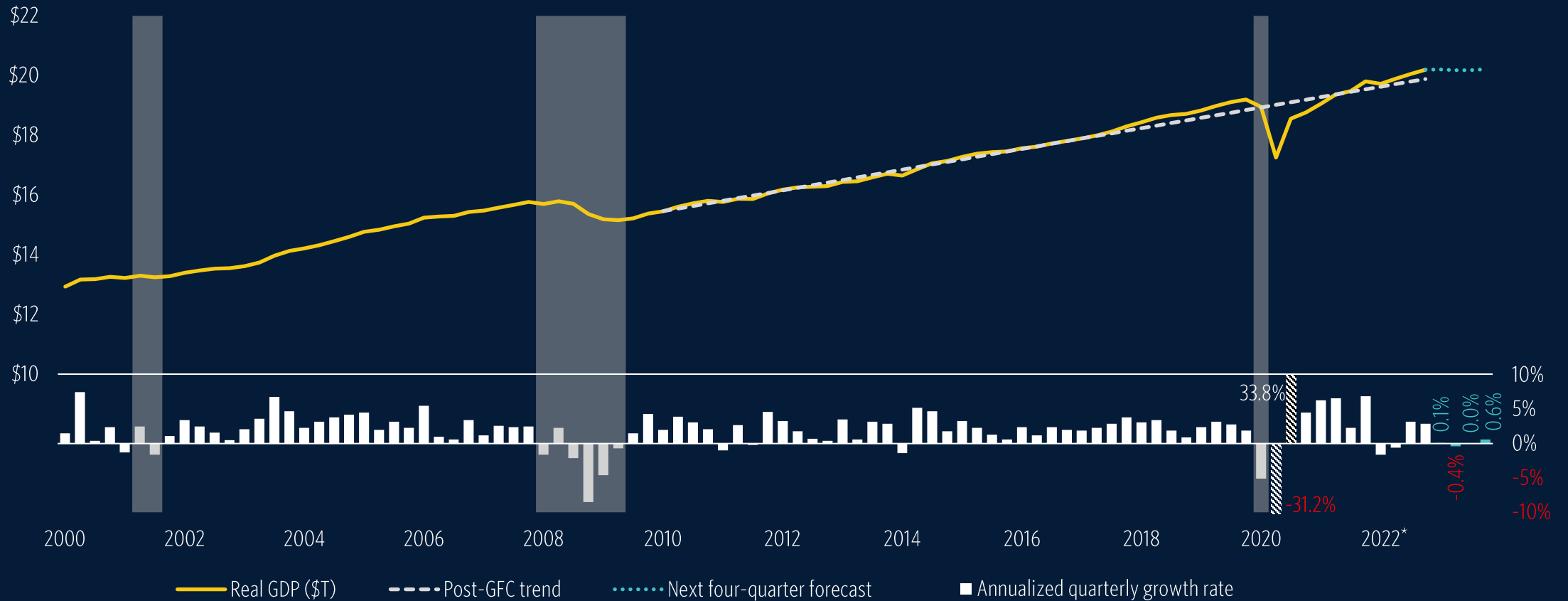
Key takeaways

- Two consecutive quarters of negative GDP growth in Q1 and Q2 of 2022 gave way to economic expansion in the back half of the year. Inflationary headwinds persist, but positive trends on that front are showing.
- Despite relatively benign economic data, our recession model predicts a downturn is more likely than not to occur in 2023 and/or into 2024. A soft landing is still possible but will be a needle-threading for the Federal Reserve (the Fed).
- The rapid rise in real rates has been notable, with the 10-year implied real yield at 1.4% in December 2022. That has led to much of the increase in cost of capital that hit financial assets in 2022.
- Allocator portfolios have been impacted by a double slap of denominator effect challenges and lower distribution rates, as evidenced by our analysis of historical trends in relation to public market performance.
- A return to normalization for PE growth and VC has begun, with our data collected through H1 2022 showing declines of -4.3% and -9.8%, respectively, for US-based funds.
- Analysis of historical returns suggests return smoothing in our quarterly return indexes—a phenomenon well-documented in private markets. We provide de-smoothed volatility estimates to give a more accurate risk measure for private fund strategies.
- VC tops out at 27.2% annualized volatility using our de-smoothed estimates, versus just 11.2% if left unadjusted.



The swift recovery in US GDP has given way to recession fears. Despite Q4 2022 real GDP growth coming in at 2.9% annualized, headwinds and fears remain for 2023's prospects...

Real GDP growth compared with post-global-financial-crisis (GFC) trend

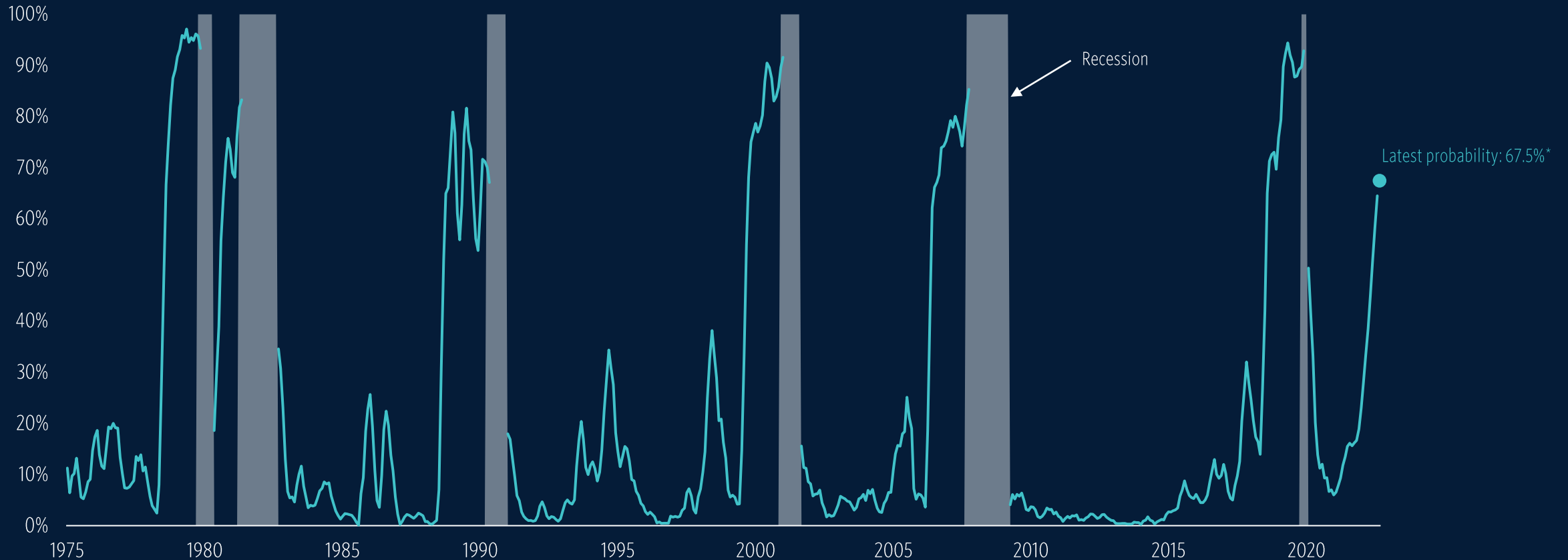


Sources: [Bureau of Economic Analysis](#), [WSJ Economic Forecasting Survey](#) | Geography: US



...which has translated into more pessimistic data coming from public markets. With that, our quantitative model predicts a recession in late 2023 or early 2024 is more likely than not.

Probability of a US recession occurring in the next 18 months



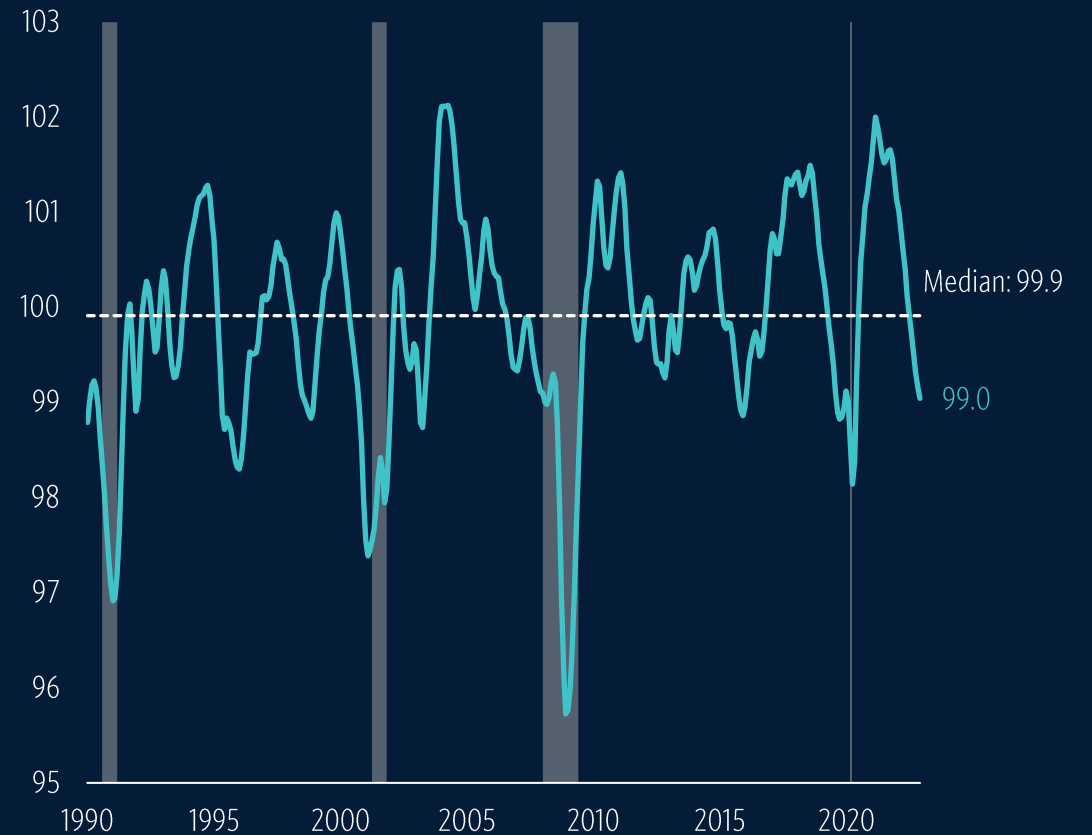
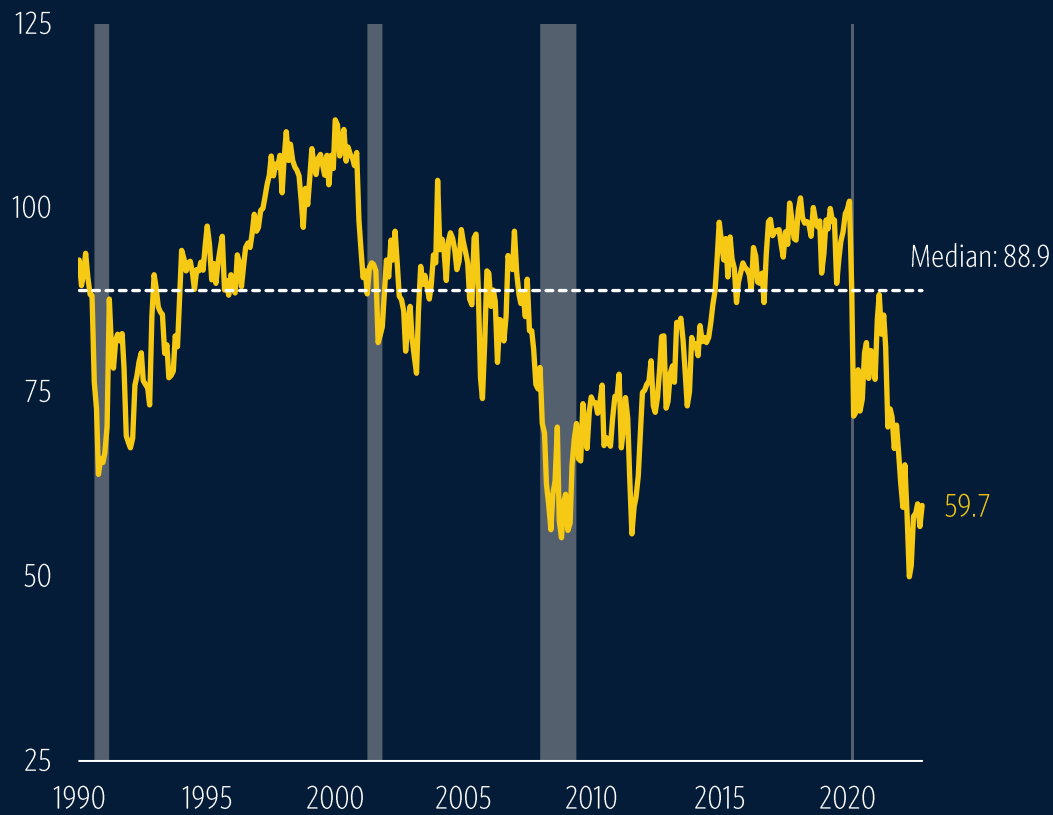
Source: PitchBook | Geography: US



Amid layoff headlines, consumer confidence has plummeted. Business confidence, likewise, has fallen from 2021 levels, but hasn't turned quite as negative.

University of Michigan Consumer Sentiment Index*

US Business Confidence Index*



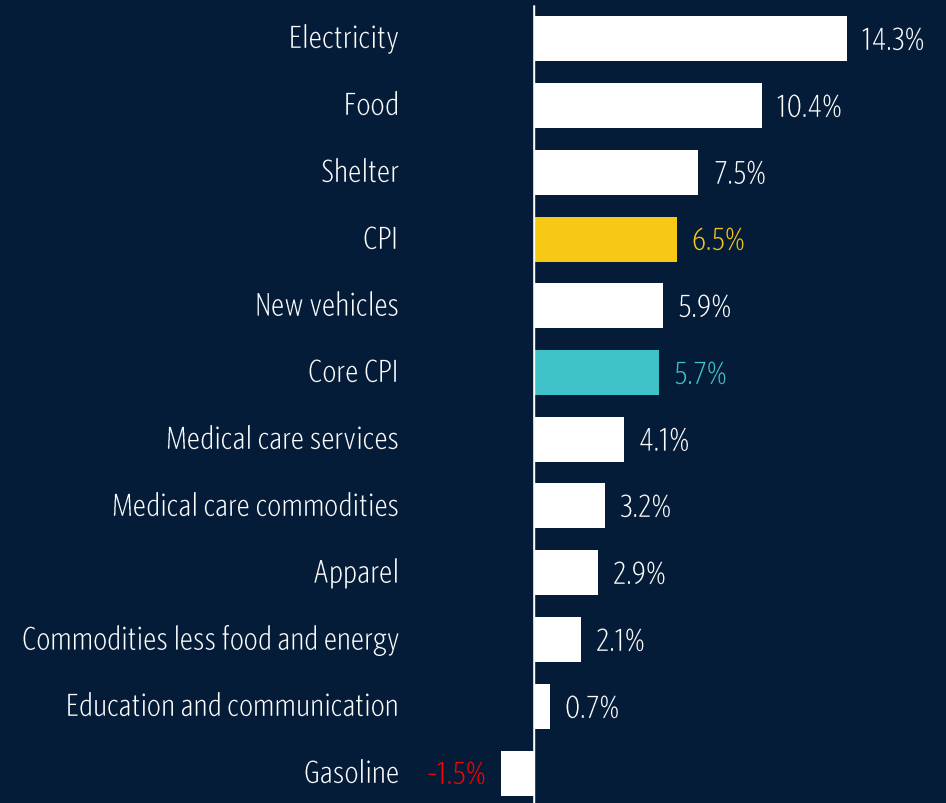
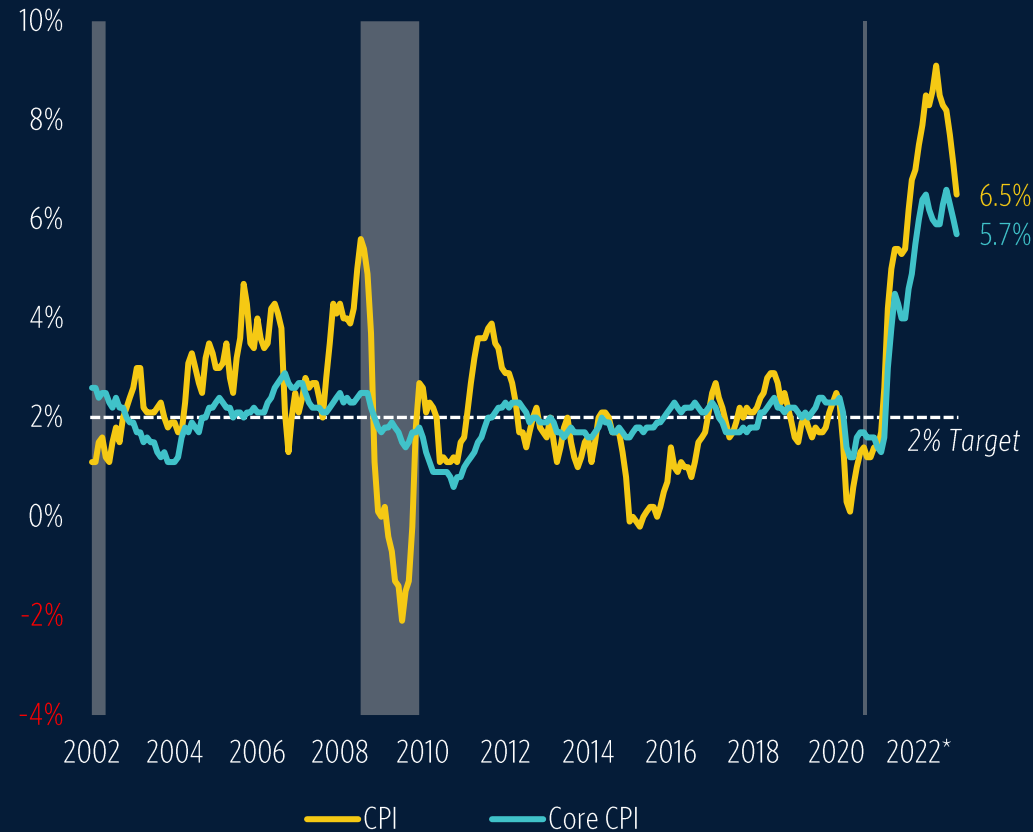
Sources: [University of Michigan](#), [OECD](#) | Geography: US



On the bright side, there appears to be a break in the clouds regarding inflation. However, there is still considerable improvement needed to get down to the Fed's 2% target.

Consumer Price Index (CPI)

CPI one-year change by select categories for December 2022*



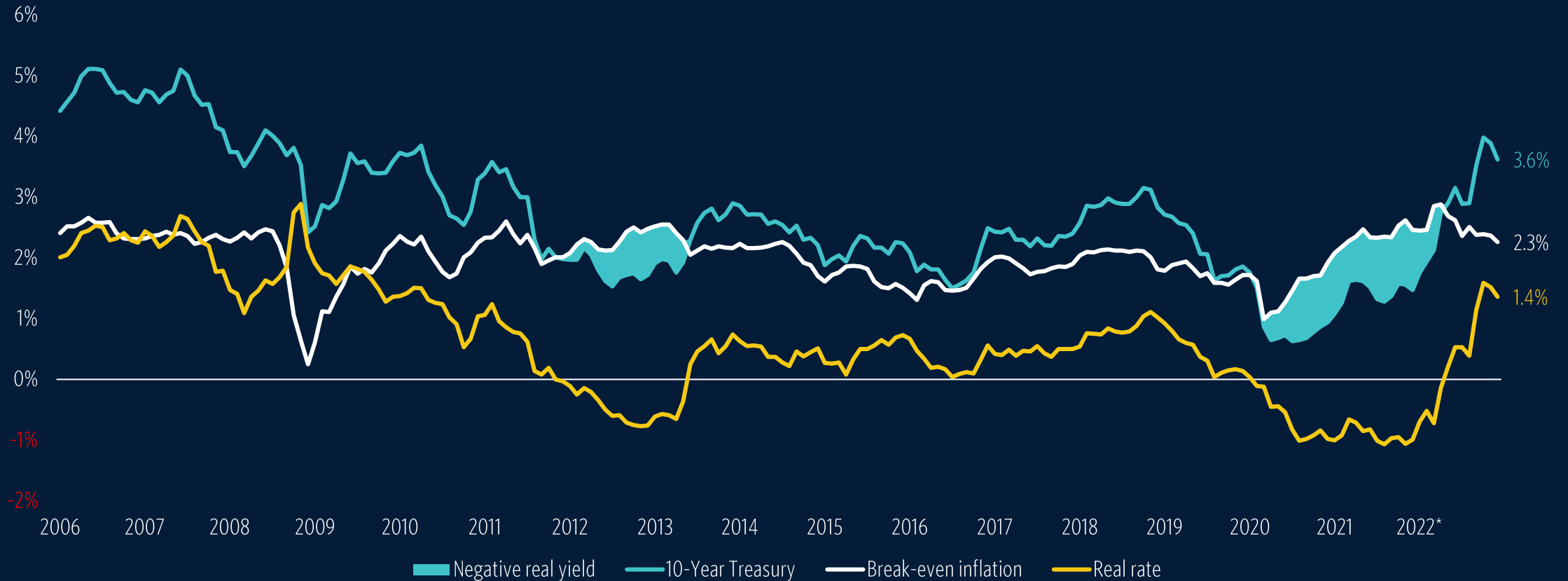
Source: [Bureau of Labor Statistics](https://www.bls.gov) | Geography: US

* As of December 31, 2022



High short-term inflation has not yet translated into spiking long-term expectations; however, a decade-plus high in real yields signals a more punitive cost-of-capital climate going forward.

10-Year Treasury real versus nominal rates (monthly series)



Source: [FRED](#) | Geography: US

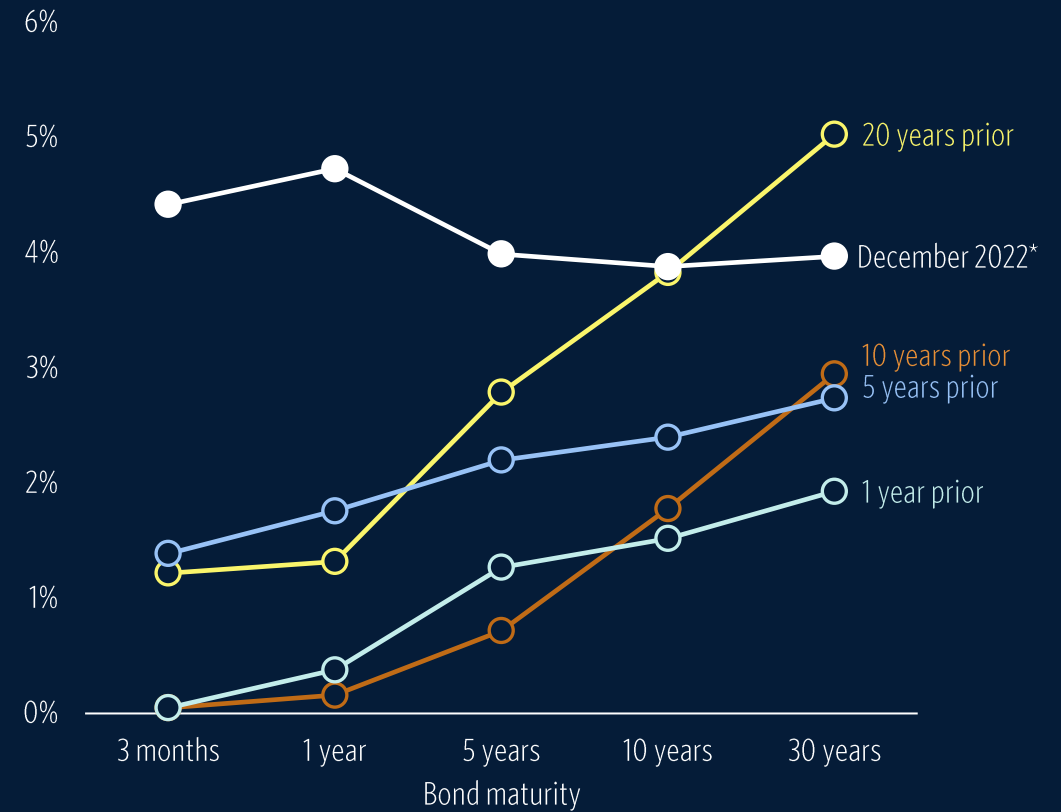
* As of December 31, 2022



Rising Treasury rates may start to adjust the calculus for allocations to risky assets by institutional investors. Meanwhile, a steep yield curve inversion has flashed warning signs in recession models.

US pension plan return assumptions versus 10-Year Treasury

Treasury market yield curve



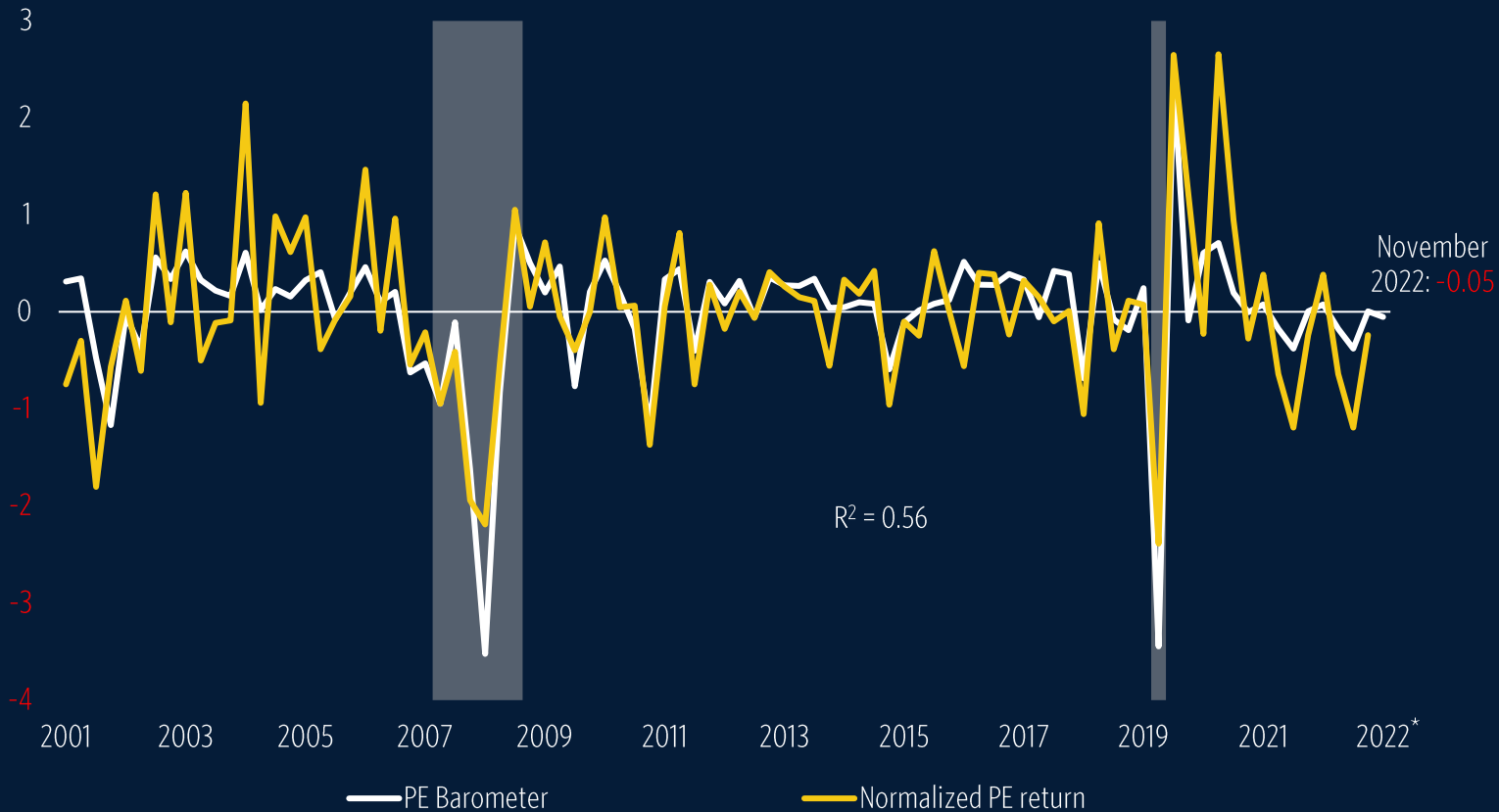
Sources: [FRED](#), [National Association of State Retirement Administrators](#) | Geography: US

*As of December 31, 2022



Despite pessimism in the macro climate, our PE Barometer signals a fairly neutral environment for fund returns.

PitchBook PE Barometer



Our PE Barometer is a factor-based framework that estimates the strength of the current return environment based on key economic and market indicators. The current score of -0.05 is relatively neutral.

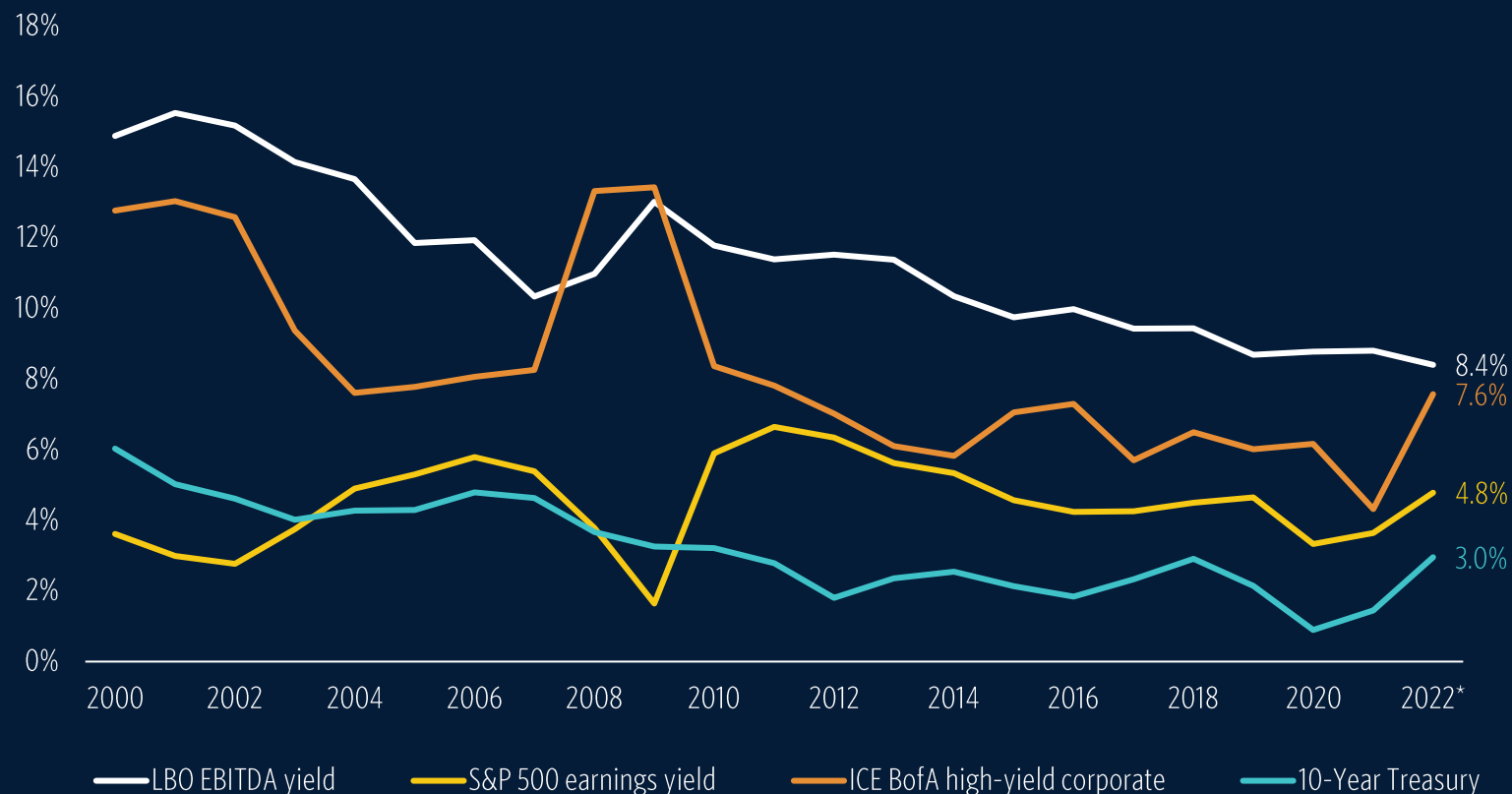
For more information, please see our full breakdown and methodology available on the [PitchBook Platform](#).

Source: PitchBook | Geography: US



Leveraged buyout (LBO) valuations keep climbing, tightening the spread between EBITDA yields and average yields in public markets.

Yearly average yields on select asset classes



For each metric, we used the average for the calendar year. Data definitions:

- S&P 500 earnings yield: the inverse of the trailing 12-month price-to-earnings multiple
- ICE BofA high-yield corporate: the yield on high-yield (below investment-grade) corporate bonds as published by ICE and Bank of America
- LBO EBITDA yield: the inverse of the average purchase-price-to-EBITDA multiple in buyout transactions

While these yields are not directly comparable, tracking valuations in terms common to the respective asset classes offers a useful exercise for relative pricing analysis.

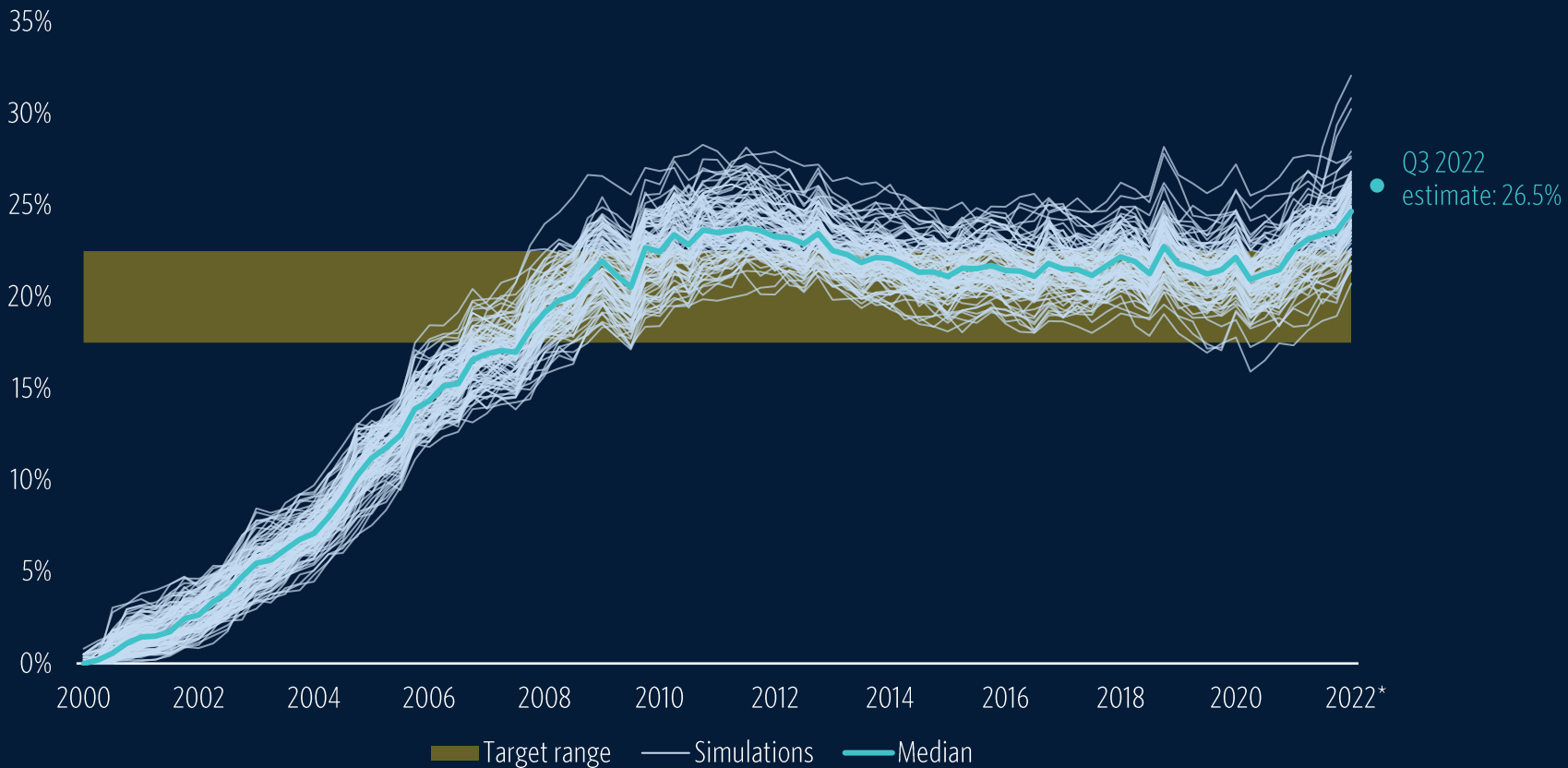
Sources: LCD, FRED, Robert Shiller | Geography: US

* As of December 31, 2022



The drawdown in public markets and lagged private fund reporting have caused relative allocations to private markets to surge...

Simulated PE allocation within a 60/40 portfolio with a 20% target (+/-2.5% range)



We simulated a simple multi-asset portfolio targeting 40% public equity (Russell 3000), 20% PE (buyout), and 40% fixed income (Bloomberg US Agg) to estimate the impact of recent market movements on LPs' relative allocation to PE. In each simulation run, four random buyout funds are added to the portfolio at the end of every year with an aggregate commitment schedule of 30% of total portfolio value during a seven-year ramp period and 18% thereafter.

The simulation results suggest that LPs are overallocated to PE at the end of Q3 2022, with the median portfolio a net 6.5% overweight. This will likely contribute to a difficult fundraising environment in the coming quarters.

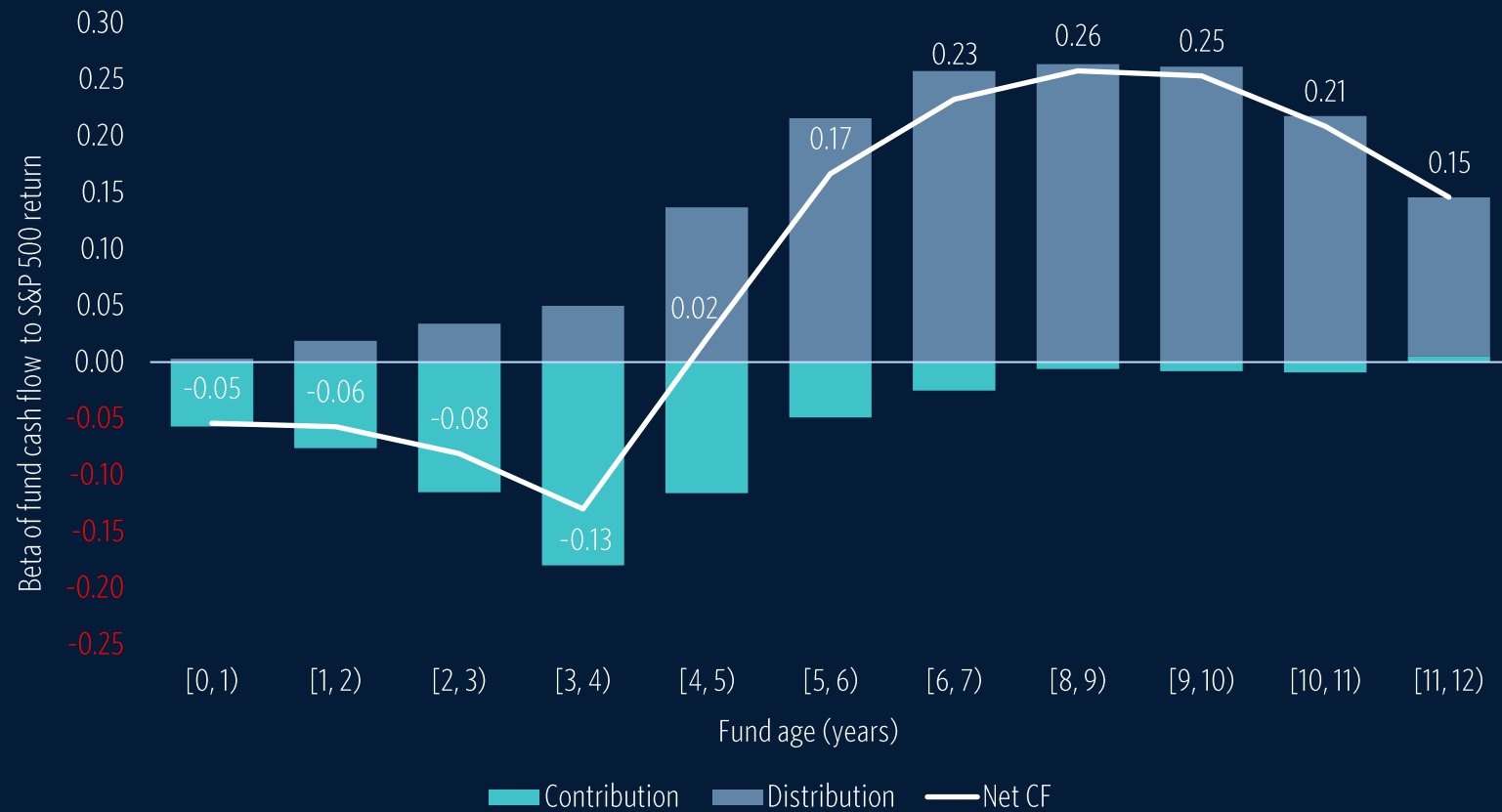
Source: PitchBook | Geography: US

*As of September 30, 2022
Note: For illustrative purposes only



...caused in part by a slow exit market. Fund cash flows are correlated with public equity returns, but distributions tend to be more sensitive.

Sensitivity of PE buyout fund cash flows to public equity performance by fund age



We used a regression model and our historical fund cash flow data to estimate the beta of annual fund cash flows to the performance of the S&P 500 Index by fund age. This can be used to estimate how net cash flows are expected to change based on what has happened in public equity markets.

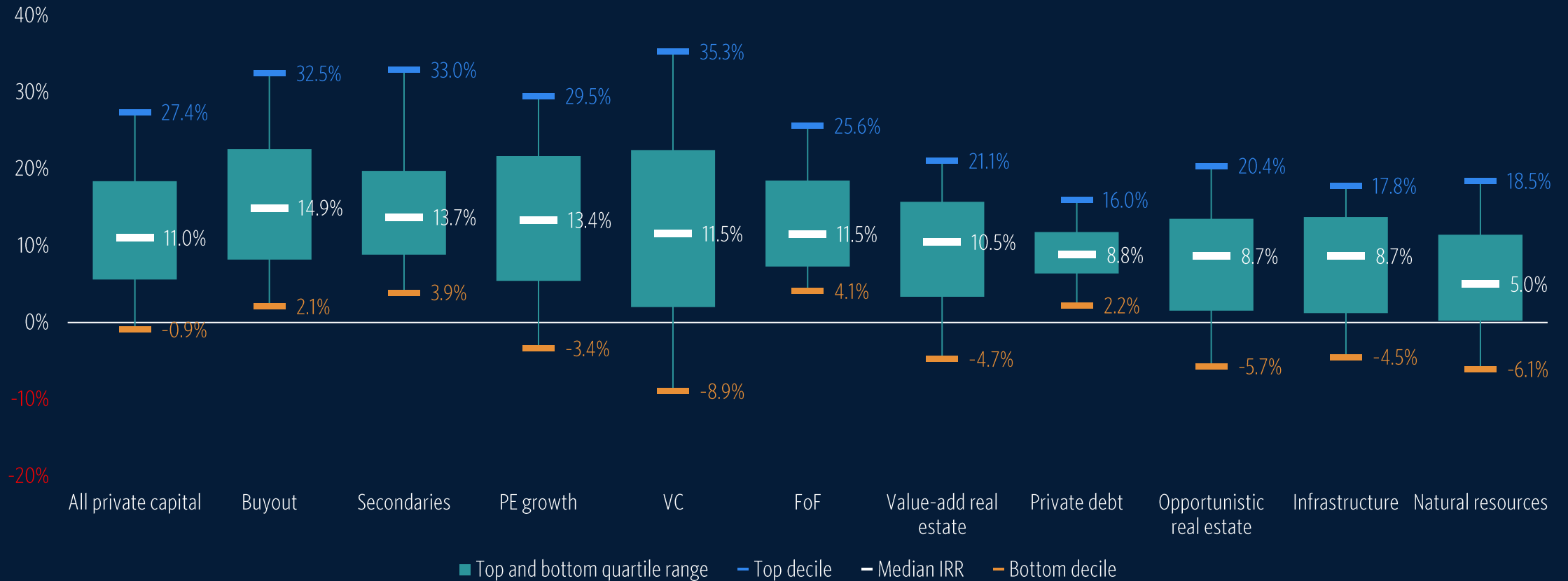
For example, consider a fund in its eighth year when the S&P 500 declined by 20%. The average annual net cash flow for this fund has been 14% of fund size. However, given an estimated beta of 0.26 and a 20% market decline, we would expect the annual net cash flow to be only 9% of fund size, a nominal decrease of nearly 40%.

Source: PitchBook | Geography: US



Allocating capital in private markets within a risk-reward framework is a challenge. Historical returns offer an important starting point when evaluating strategy and manager selection.

Range of private, closed-end fund net IRRs by strategy (vintages 2002 to 2016)*



Source: PitchBook | Geography: US

*As of June 30, 2022



Outperformance of growth prior to 2022 has given way to inflation-hedging real assets and real estate strategies. VC fund performance is lagging as of data captured through Q2 2022 at -9.8%.

One-year pooled IRRs by strategy

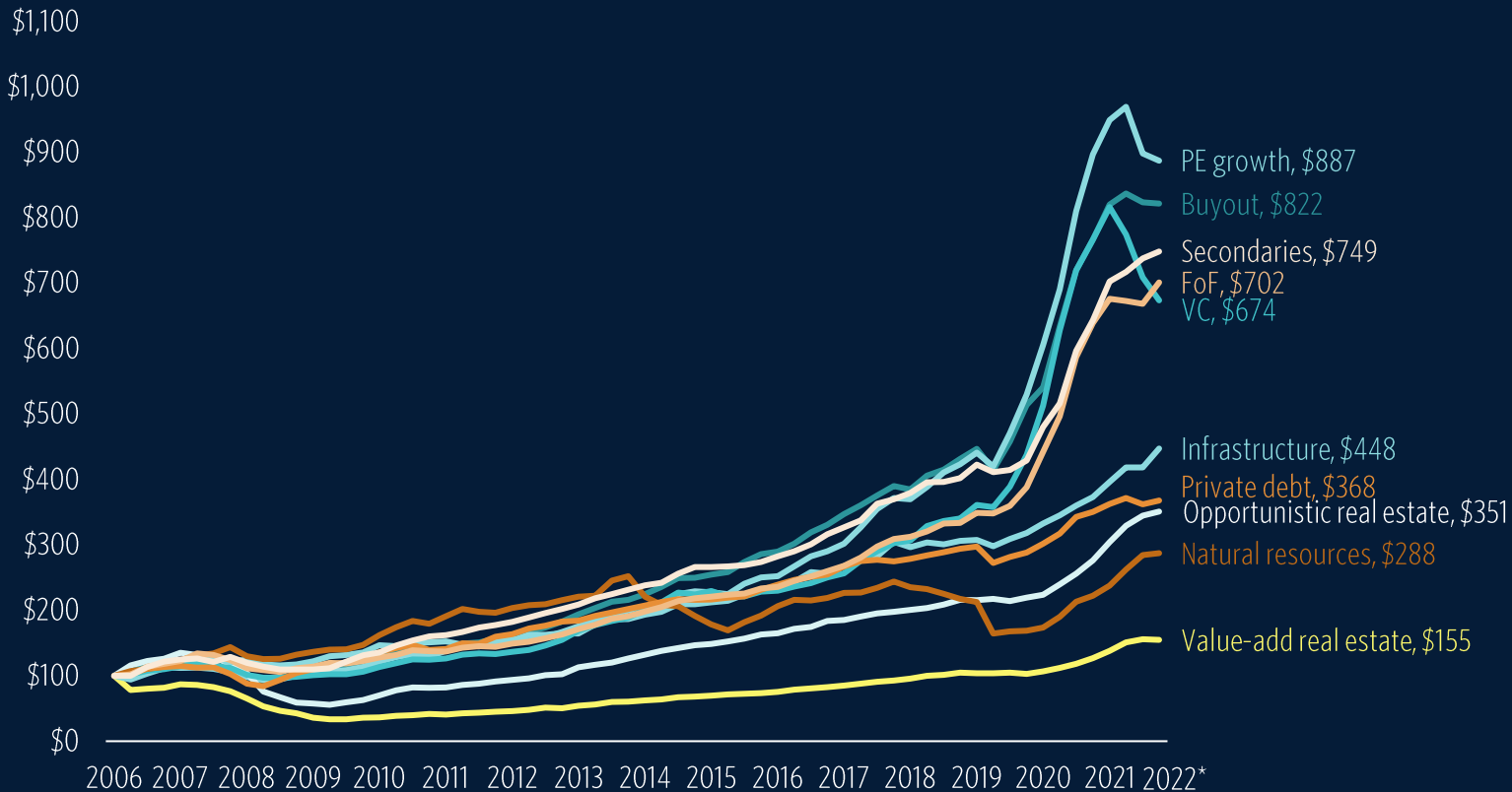
| 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022* | 15-year horizon IRR |
|---------------------------------|----------------------------------|----------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|--------------------------------|--------------------------------|--------------------------------|---------------------------------|---------------------------------|--------------------------------|
| Infrastructure 33.1% | Natural resources 2.8% | Private debt 19.6% | Secondaries 23.7% | Secondaries 19.2% | Private debt 15.6% | VC 22.1% | VC 19.3% | Value-add real estate 14.3% | Natural resources 16.3% | PE growth 21.2% | PE growth 20.3% | PE growth 20.3% | PE growth 39.3% | VC 57.5% | Natural resources 18.2% | PE growth 15.8% |
| Secondaries 24.3% | Infrastructure -8.2% | Buyout 8.6% | Private debt 19.8% | Natural resources 18.2% | Buyout 14.7% | Opportunistic real estate 21.5% | Infrastructure 16.7% | Buyout 14.3% | Buyout 14.3% | Buyout 19.3% | VC 19.8% | VC 17.2% | VC 39.3% | PE growth 56.6% | Opportunistic real estate 12.5% | Secondaries 13.1% |
| Buyout 24.2% | Secondaries -9.2% | PE growth 5.8% | Opportunistic real estate 19.7% | Opportunistic real estate 14.6% | Opportunistic real estate 13.2% | Buyout 20.3% | Buyout 15.8% | VC 12.8% | Opportunistic real estate 11.2% | Secondaries 15.6% | Secondaries 16.2% | Buyout 15.3% | FoF 25.5% | FoF 51.4% | Value-add real estate 11.0% | Buyout 12.9% |
| Opportunistic real estate 23.8% | FoF -10.9% | Natural resources 3.7% | Buyout 18.4% | PE growth 13.0% | All private capital 12.8% | Value-add real estate 18.8% | PE growth 15.7% | Secondaries 11.7% | All private capital 11.1% | All private capital 15.5% | FoF 15.8% | FoF 12.1% | Buyout 21.3% | Buyout 50.7% | Secondaries 5.2% | VC 12.3% |
| FoF 20.0% | VC -12.0% | All private capital 2.6% | Natural resources 18.0% | Value-add real estate 12.7% | Secondaries 12.8% | All private capital 17.1% | FoF 15.3% | PE growth 11.6% | PE growth 10.8% | FoF 13.3% | Value-add real estate 13.6% | All private capital 10.8% | All private capital 16.0% | Secondaries 45.5% | Infrastructure 5.2% | FoF 11.6% |
| All private capital 19.6% | PE growth -13.1% | FoF 1.3% | All private capital 17.1% | VC 11.2% | PE growth 12.7% | FoF 14.2% | Opportunistic real estate 15.0% | FoF 11.4% | Private debt 10.1% | Infrastructure 13.2% | All private capital 10.8% | Secondaries 10.7% | Secondaries 14.4% | All private capital 42.8% | All private capital 1.1% | All private capital 11.4% |
| Private debt 15.3% | All private capital -18.9% | VC -0.5% | PE growth 15.9% | Buyout 9.6% | Value-add real estate 11.2% | Private debt 13.1% | All private capital 14.5% | Opportunistic real estate 10.2% | Value-add real estate 9.0% | Opportunistic real estate 11.9% | Buyout 10.8% | Value-add real estate 8.3% | Infrastructure 9.0% | Natural resources 41.0% | Buyout 0.6% | Opportunistic real estate 9.1% |
| VC 13.4% | Buyout -20.2% | Infrastructure -6.3% | Infrastructure 13.1% | All private capital 9.5% | FoF 9.0% | PE growth 12.6% | Secondaries 14.0% | All private capital 10.1% | Infrastructure 8.9% | Value-add real estate 11.9% | Infrastructure 9.9% | Opportunistic real estate 6.9% | Opportunistic real estate 4.1% | Opportunistic real estate 31.2% | Private debt 0.1% | Infrastructure 8.6% |
| Natural resources 12.6% | Opportunistic real estate -21.1% | Secondaries -10.2% | FoF 12.0% | FoF 7.4% | VC 7.4% | Secondaries 8.6% | Value-add real estate 13.8% | Infrastructure 8.7% | FoF 6.8% | Private debt 11.3% | Opportunistic real estate 8.0% | Private debt 6.8% | Value-add real estate 3.6% | Value-add real estate 28.8% | FoF -0.9% | Private debt 8.4% |
| PE growth -0.1% | Private debt -26.2% | Opportunistic real estate -40.6% | VC 11.1% | Infrastructure 5.6% | Natural resources 7.3% | Natural resources 7.7% | Private debt 12.2% | Private debt 5.5% | Secondaries 6.5% | Natural resources 11.0% | Private debt 5.7% | Infrastructure 2.6% | Private debt 2.2% | Infrastructure 18.8% | PE growth -4.3% | Value-add real estate 6.4% |
| Value-add real estate -8.1% | Value-add real estate -26.2% | Value-add real estate -45.9% | Value-add real estate 0.3% | Private debt 4.1% | Infrastructure 6.6% | Infrastructure 2.7% | Natural resources 0.0% | Natural resources -19.4% | VC -0.3% | VC 10.5% | Natural resources 5.0% | Natural resources -9.9% | Natural resources -19.4% | Private debt 18.6% | VC -9.8% | Natural resources 6.0% |

Source: PitchBook | Geography: US



With preliminary data through September 2022, markdowns in VC and PE growth funds come through even more starkly relative to 2021.

Hypothetical growth of \$100 invested at the beginning of 2007 by closed-end fund strategy



This assumes investing in our universe of funds for which we have cash flows and net asset value (NAV) data available each quarter. It is a hypothetical result if one were able to invest in a “market” portfolio of funds. We use our quarterly returns series available in [PitchBook’s Benchmarks report](#) to calculate the growth in asset value. Actual results experienced by limited partners will vary widely.

Source: PitchBook | Geography: US

*As of September 30, 2022
Note: Data for Q3 2022 is preliminary.



A diversified portfolio should take into consideration strategy return correlations. We de-smooth quarterly returns to adjust our metrics...

Correlation matrix of de-smoothed quarterly returns over the last 10 years*

| | Buyout | PE growth | Opportunistic real estate | Value-add real estate | Infrastructure | VC | Natural resources | Private debt | FoF | Secondaries |
|---------------------------|--------|-----------|---------------------------|-----------------------|----------------|------|-------------------|--------------|------|-------------|
| Buyout | 1.00 | | | | | | | | | |
| PE growth | 0.74 | 1.00 | | | | | | | | |
| Opportunistic real estate | 0.14 | 0.00 | 1.00 | | | | | | | |
| Value-add real estate | 0.10 | 0.12 | 0.50 | 1.00 | | | | | | |
| Infrastructure | 0.39 | 0.33 | -0.22 | 0.12 | 1.00 | | | | | |
| Venture capital | 0.69 | 0.65 | 0.17 | 0.18 | 0.12 | 1.00 | | | | |
| Natural resources | 0.55 | 0.48 | 0.01 | 0.12 | 0.45 | 0.22 | 1.00 | | | |
| Private debt | 0.63 | 0.60 | -0.13 | 0.09 | 0.46 | 0.41 | 0.55 | 1.00 | | |
| FoF | 0.44 | 0.65 | 0.07 | 0.12 | 0.21 | 0.59 | 0.30 | 0.48 | 1.00 | |
| Secondaries | 0.30 | 0.45 | 0.04 | 0.19 | 0.24 | 0.36 | 0.40 | 0.48 | 0.71 | 1.00 |

The correlation matrix is calculated based on the de-smoothed quarterly returns of each asset class from Q4 2012 to Q3 2022. You can see more details in our [Analyst Note: Return Smoothing in Private Markets](#).

Source: PitchBook | Geography: US

*As of September 30, 2022
Note: Data for Q3 2022 is preliminary.



...and that provides a more realistic picture for volatility of fund performance. Venture funds become an outlier on the adjusted risk measure.

Reported and de-smoothed annualized volatility of quarterly fund returns over the last 10 years*



Source: PitchBook | Geography: US

*As of September 30, 2022



Spotlight: Private capital AUM forecasts



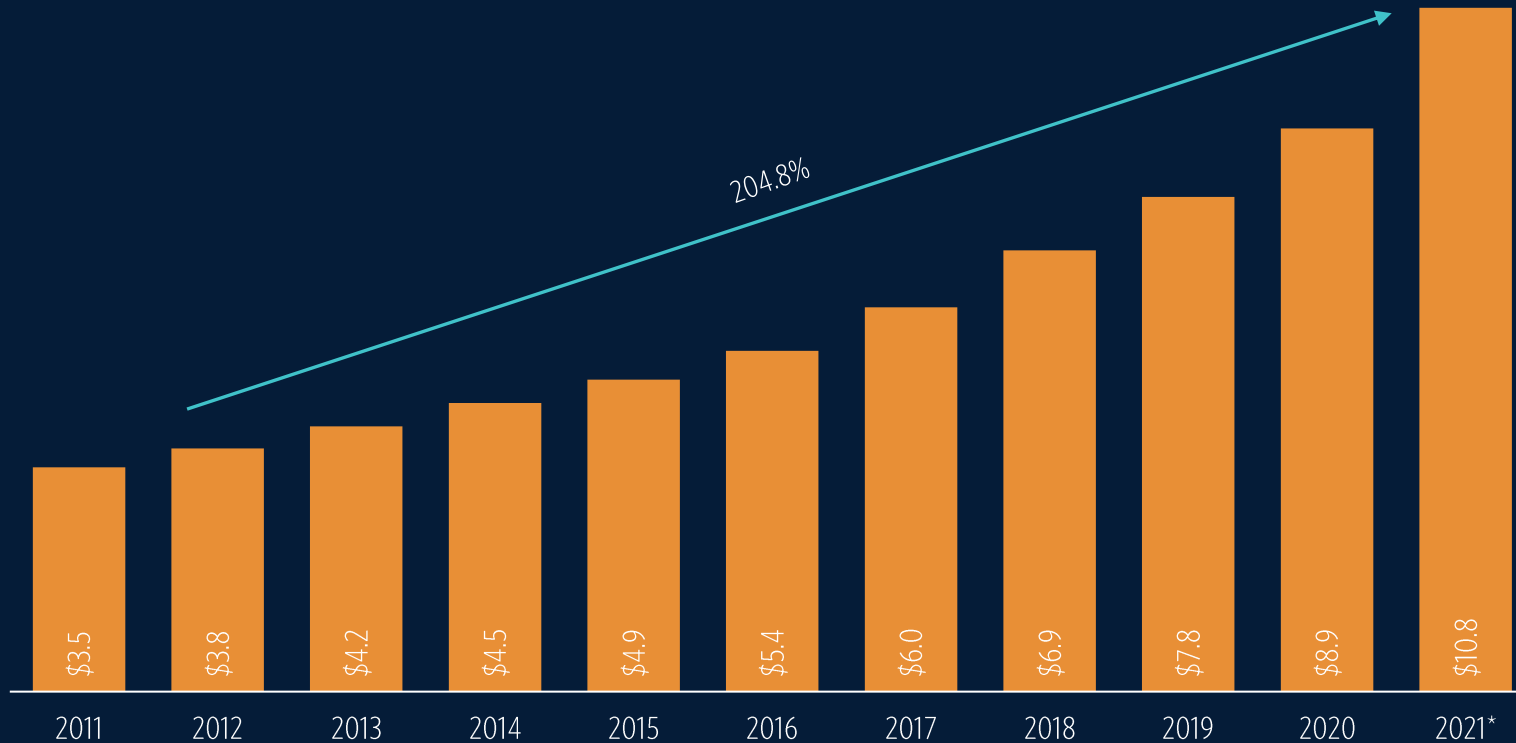
Key takeaways

- The growth of the private capital industry has been enormous over the last 10-plus years, with nearly \$11 trillion in AUM in closed-end funds globally as of 2021.
- However, with macro headwinds and the potential for portfolio markdowns, we forecast AUM to shrink through 2023 before rebounding over the subsequent four years, reaching \$13.0 trillion by 2027 across PE, VC, private debt, real estate, and real assets.
- We've created a model using a straightforward series of inputs (notably distribution yield, fundraising trend growth, and capital appreciation) in order to generate our forecasts.
- We model a "base case," "good case," and "bad case" to provide a range of outcomes based on different economic, fundraising, and return environments. Our good case estimate is for AUM to reach \$16.1 trillion, while our downside scenario yields modest growth to \$11.2 trillion.
- We break out results for each high-level asset class. You can find more details on the methodology and analysis in our recently released [Analyst Note: What the Future Holds for Private Capital](#).



The rise of private capital has been remarkable, with global AUM reaching \$10.8 trillion in 2021. Sustaining that growth will be a challenge.

Global AUM (\$T) in closed-end, private capital funds



Source: PitchBook | Geography: Global

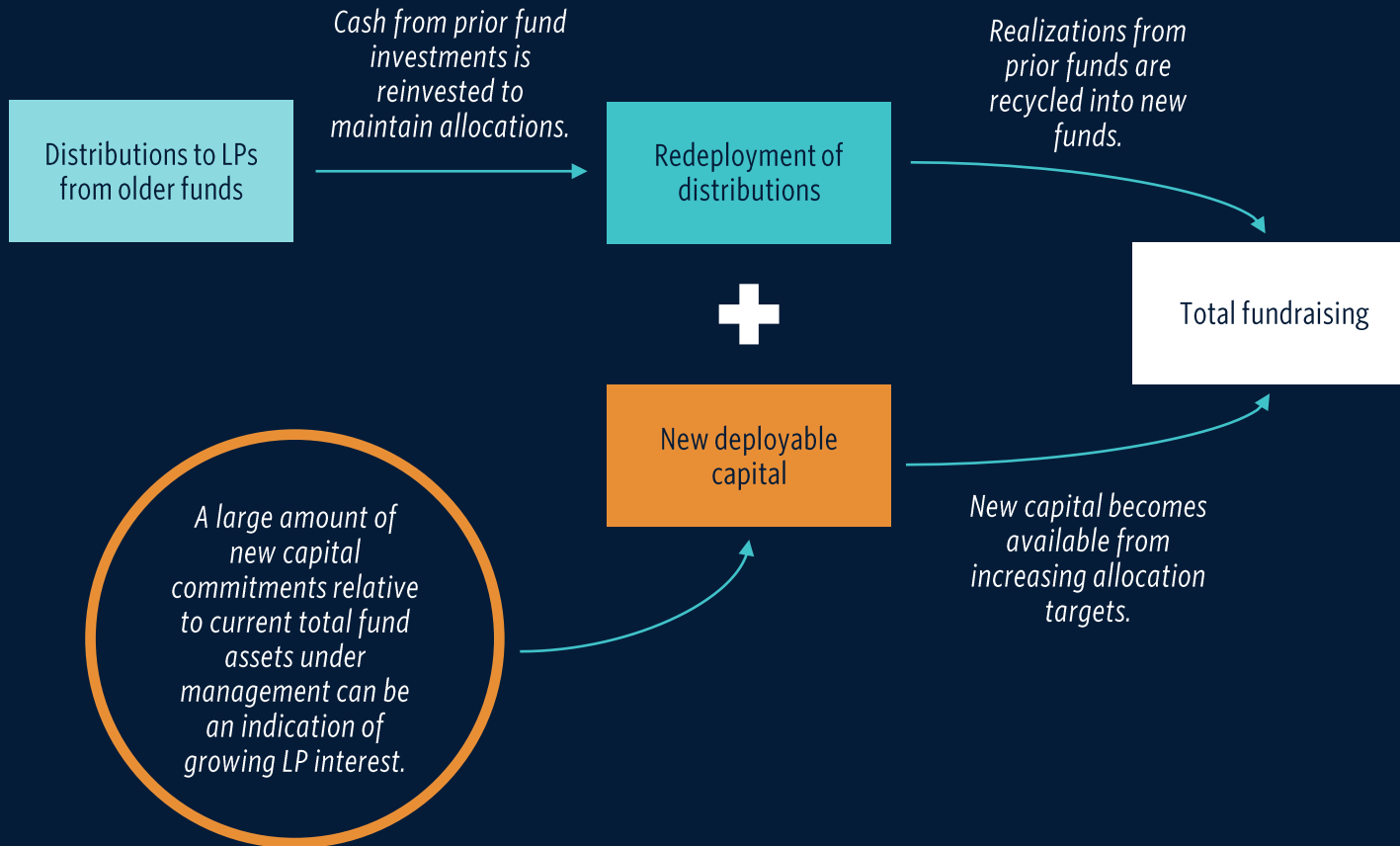
*As of December 31, 2021

For our analysis, we consider a global view, focusing in on five main strategies: private equity, venture capital, private debt, real estate, and real assets. Our dataset and forecasts will include only closed-end, primary-access private capital vehicles. We show historical data through 2021, when the last full-year estimate was available.



Our previous **US Market Insights** introduced this framework for capital recycling. We take this further to forecast future AUM growth.

Simplified fundraising sources for LP fund commitments



This basic framework is useful for conceptualizing the proportion of total fundraising by GPs that is sourced from new deployable capital allocated to a strategy, versus recycling of prior distributions. New sources of capital can be existing LPs growing allocations and brand-new LPs launching a private markets program.

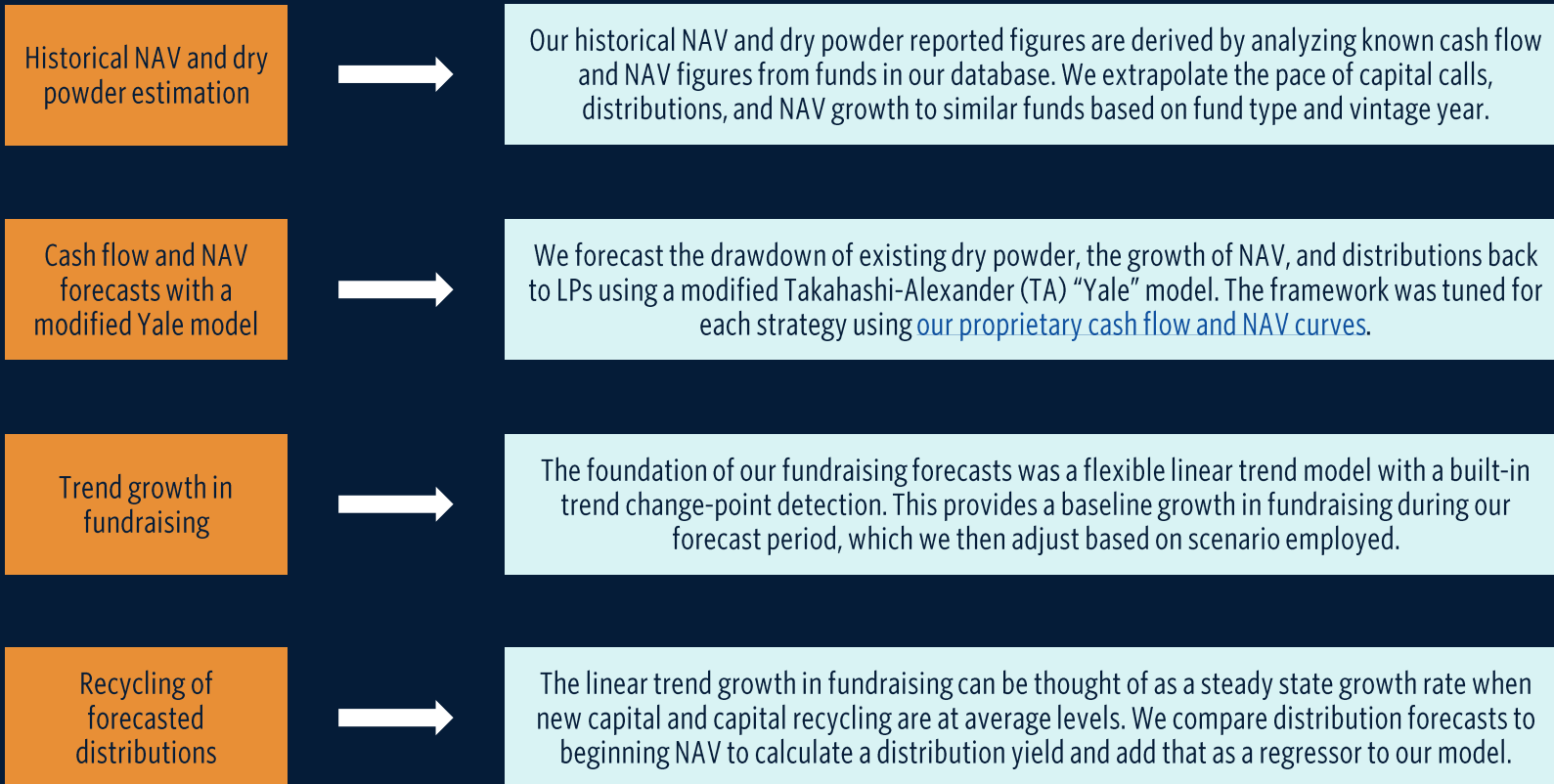
Source: PitchBook

Note: For illustrative purposes only



Recycling of distributions becomes a component of our simple yet intuitive model developed to forecast growth in private capital AUM.

High-level components to AUM forecasting model



For more details on the methodology used to generate our AUM forecasts, we encourage you to check out our [Analyst Note: What the Future Holds for Private Capital](#).

Source: PitchBook



Given the uncertainty in forecasting, we provide three scenarios for our forecasts with varying NAV growth forecasts...

NAV growth and TA model inputs*

| | | NAV growth forecasts | | | | | | Bow factor | Fund term (years) |
|-----------|-----------------|----------------------|--------|-------|-------|-------|-------|------------|-------------------|
| | | 2022E | 2023E | 2024E | 2025E | 2026E | 2027E | | |
| Base case | Private equity | -5.0% | -10.0% | 15.0% | 15.0% | 15.0% | 15.0% | 2.0 | 18 |
| | Private debt | 5.0% | -5.0% | 10.0% | 10.0% | 10.0% | 10.0% | 1.4 | 18 |
| | Venture capital | -10.0% | -15.0% | 14.0% | 14.0% | 14.0% | 14.0% | 2.5 | 18 |
| | Real estate | 5.0% | -10.0% | 12.0% | 12.0% | 12.0% | 12.0% | 1.5 | 18 |
| | Real assets | 10.0% | -5.0% | 9.0% | 9.0% | 9.0% | 9.0% | 1.8 | 18 |
| Good case | Private equity | -5.0% | 19.0% | 19.0% | 19.0% | 19.0% | 19.0% | 2.0 | 18 |
| | Private debt | 5.0% | 14.0% | 14.0% | 14.0% | 14.0% | 14.0% | 1.4 | 18 |
| | Venture capital | -10.0% | 20.0% | 20.0% | 20.0% | 20.0% | 20.0% | 2.5 | 18 |
| | Real estate | 5.0% | 16.0% | 16.0% | 16.0% | 16.0% | 16.0% | 1.5 | 18 |
| | Real assets | 10.0% | 14.0% | 14.0% | 14.0% | 14.0% | 14.0% | 1.8 | 18 |
| Bad case | Private equity | -5.0% | -15.0% | 6.0% | 12.0% | 12.0% | 12.0% | 2.0 | 18 |
| | Private debt | 5.0% | -10.0% | 2.5% | 5.0% | 5.0% | 5.0% | 1.4 | 18 |
| | Venture capital | -10.0% | -20.0% | 3.5% | 7.0% | 7.0% | 7.0% | 2.5 | 18 |
| | Real estate | 5.0% | -15.0% | 4.5% | 9.0% | 9.0% | 9.0% | 1.5 | 18 |
| | Real assets | 10.0% | -10.0% | 3.0% | 6.0% | 6.0% | 6.0% | 1.8 | 18 |

Base case: This scenario assumes markdowns continue to occur to reflect the sell-off seen in public markets with a lagged effect. Outer-year NAV performance is based on median one-year IRRs since the GFC.

Good case: The rosy scenario assumes markdowns reverse course in 2023, reflecting a soft landing. Forecasted NAV performance is based on top-quartile one-year IRRs since the GFC.

Bad case: The downside scenario assumes markdowns accelerate in 2023 and take a slower recovery in 2024. Forecasted NAV performance is based on bottom-quartile one-year IRRs since the GFC.

Source: PitchBook | Geography: Global

*Forecasts generated on January 5, 2023



...and combine the distribution estimates, along with adjustments to trend fundraising growth, to generate fundraising forecasts.

Forecasted fundraising*

| | | Forecasted fundraising (\$B) | | | | | | |
|-----------|-----------------|------------------------------|---------|---------|---------|---------|---------|---------|
| | | Trend growth | 2022E | 2023E | 2024E | 2025E | 2026E | 2027E |
| Base case | Private equity | 6.6% | \$471.6 | \$451.5 | \$452.8 | \$545.1 | \$593.7 | \$656.3 |
| | Private debt | 6.5% | \$180.0 | \$237.7 | \$233.1 | \$271.3 | \$295.0 | \$327.6 |
| | Venture capital | 7.0% | \$292.7 | \$212.5 | \$217.2 | \$281.5 | \$313.7 | \$353.4 |
| | Real estate | 3.1% | \$138.3 | \$192.8 | \$172.4 | \$194.2 | \$201.2 | \$213.1 |
| | Real assets | 5.3% | \$128.9 | \$209.3 | \$201.7 | \$218.6 | \$227.4 | \$239.9 |
| Good case | Private equity | 9.6% | \$471.6 | \$451.5 | \$537.7 | \$595.7 | \$672.8 | \$768.3 |
| | Private debt | 9.5% | \$180.0 | \$237.7 | \$268.3 | \$296.6 | \$332.9 | \$380.1 |
| | Venture capital | 10.0% | \$292.7 | \$212.5 | \$275.2 | \$314.1 | \$365.6 | \$428.8 |
| | Real estate | 6.1% | \$138.3 | \$192.8 | \$202.4 | \$212.5 | \$227.8 | \$248.2 |
| | Real assets | 8.3% | \$128.9 | \$209.3 | \$223.2 | \$237.5 | \$255.3 | \$277.5 |
| Bad case | Private equity | 3.6% | \$471.6 | \$451.5 | \$428.3 | \$491.5 | \$532.7 | \$570.6 |
| | Private debt | 3.5% | \$180.0 | \$237.7 | \$219.4 | \$244.4 | \$261.1 | \$281.3 |
| | Venture capital | 4.0% | \$292.7 | \$212.5 | \$204.1 | \$249.3 | \$273.2 | \$296.7 |
| | Real estate | 0.1% | \$138.3 | \$192.8 | \$162.9 | \$176.0 | \$180.3 | \$185.2 |
| | Real assets | 2.3% | \$128.9 | \$209.3 | \$192.1 | \$201.3 | \$205.1 | \$210.1 |

Trend growth in fundraising is estimated using data from 2004 to 2022. We adjust the base case trend growth by +/-3% in our upside and downside scenarios, respectively. The forecasted fundraising figures will also reflect varying forecasts of fund distributions. Lower distributions will result in lower capital recycling and therefore lower fundraising in future vintage years, and vice versa.

Source: PitchBook | Geography: Global

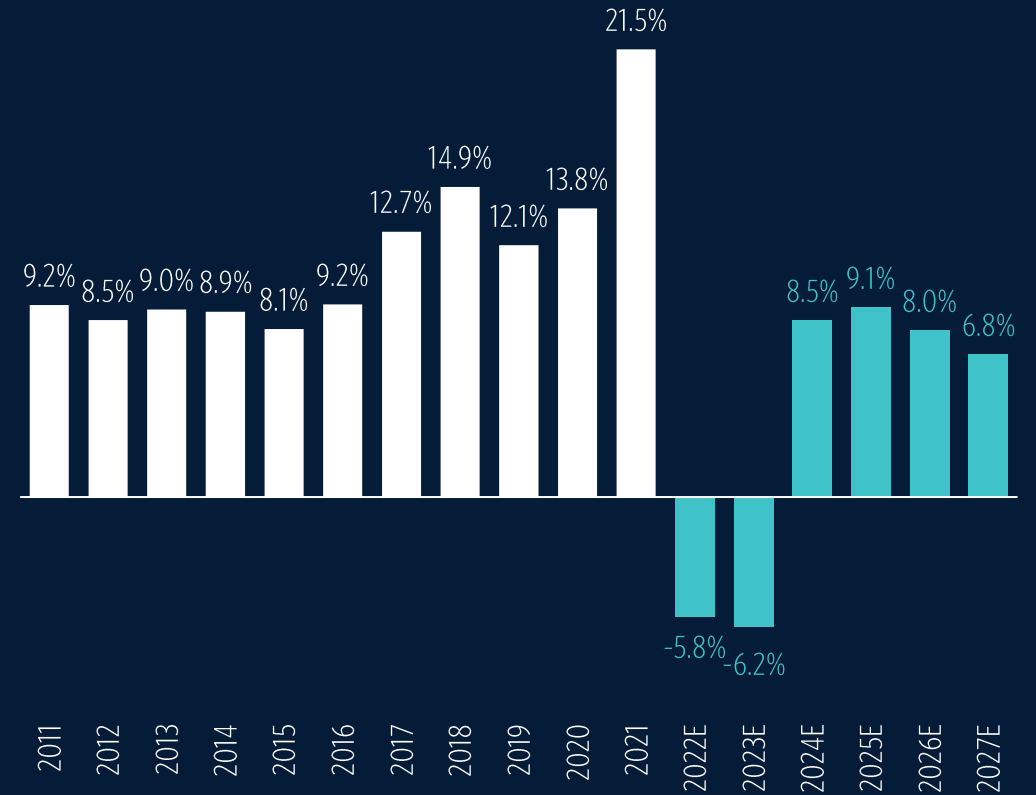
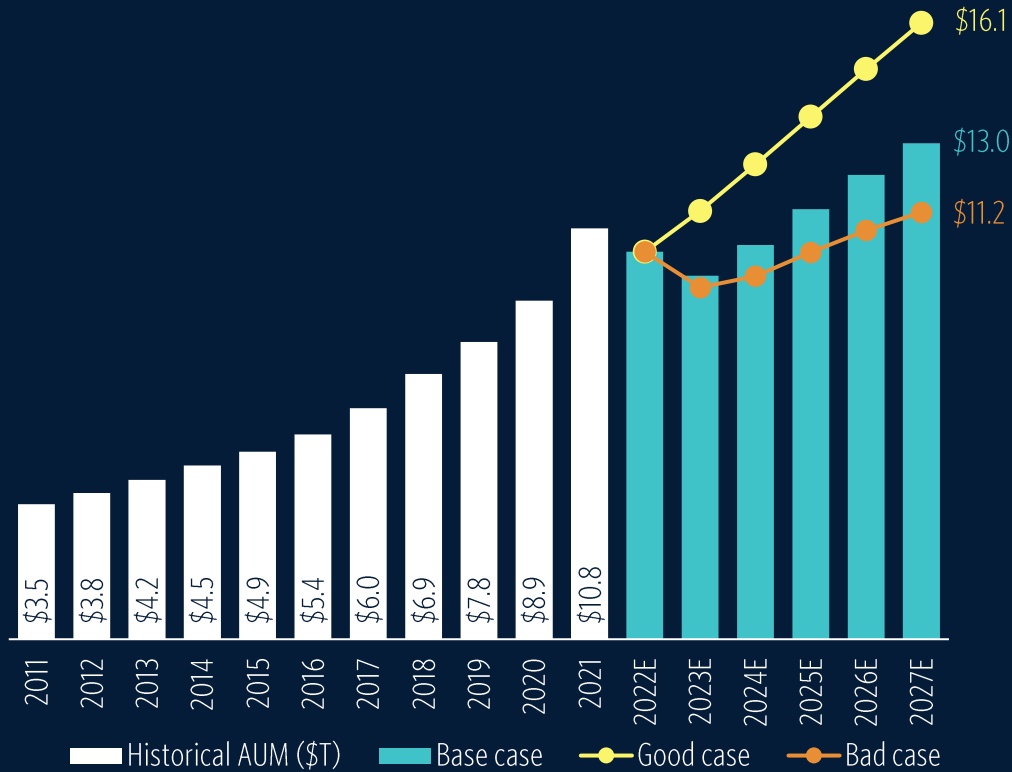
*Forecasts generated on January 5, 2023



In aggregate, our models suggest a cumulative growth of 20.7% to \$13.0 trillion in total AUM by 2027 for all private capital. Overall, we expect tame YoY change in assets in 2024 and beyond.

Private capital AUM forecast*

Year-over-year change in private capital AUM with base-case forecast*



Source: PitchBook | Geography: Global

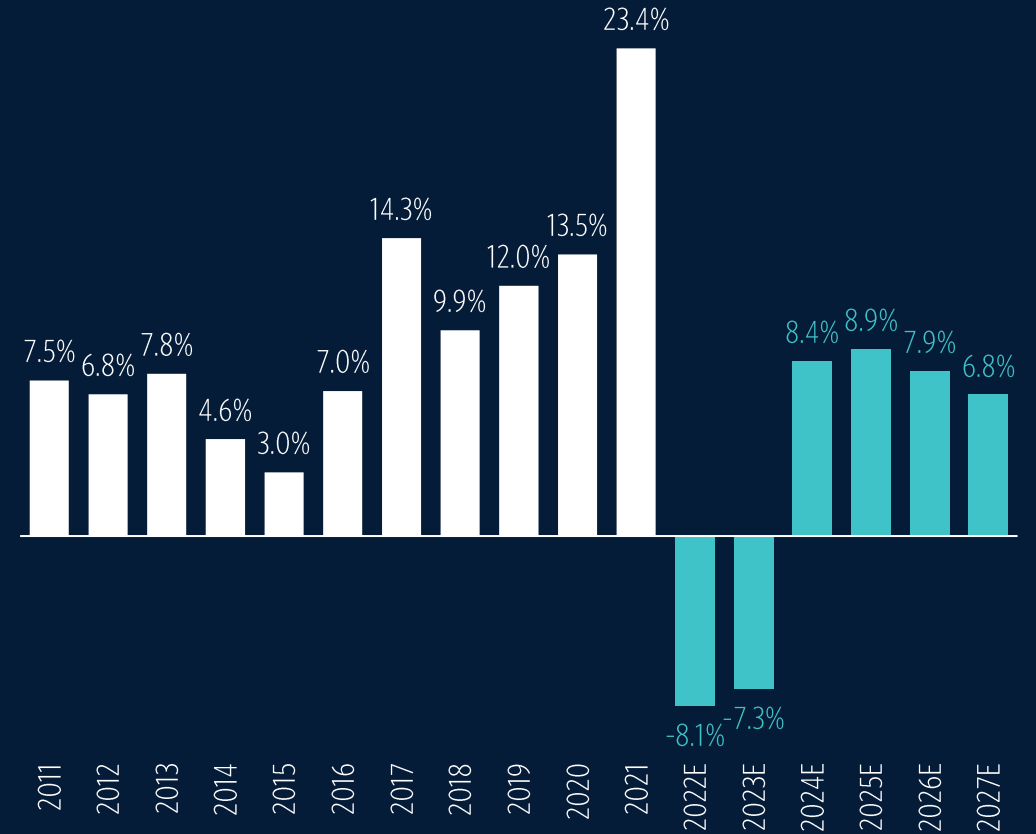
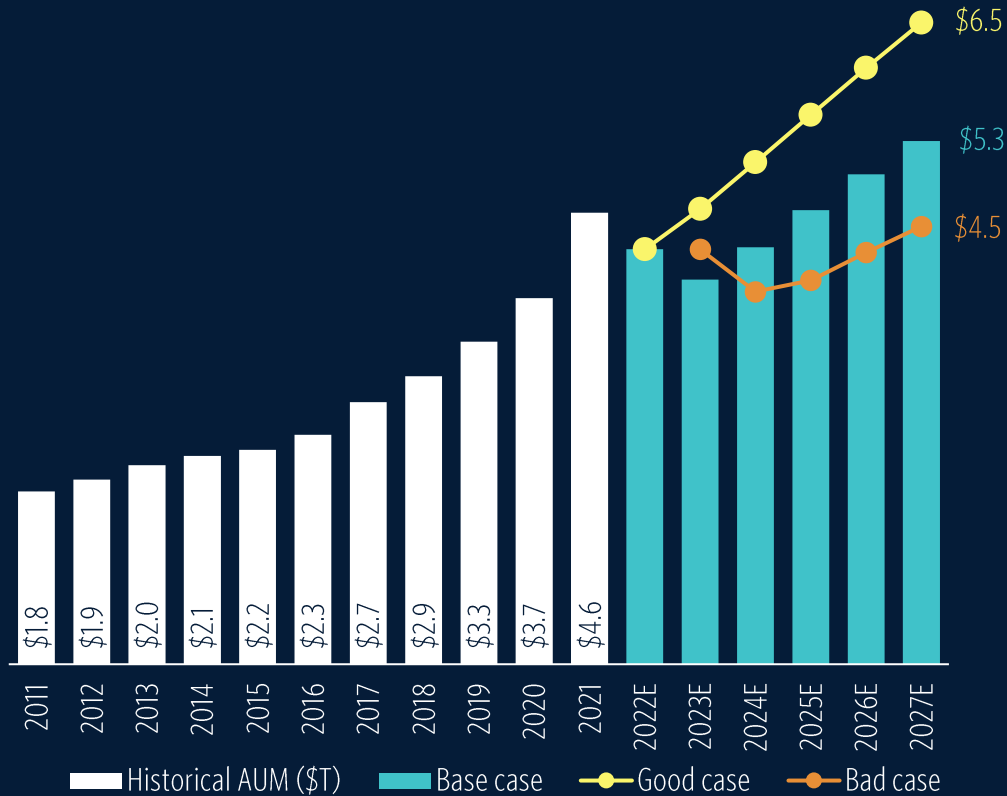
*Forecasts generated on January 5, 2023



Variation in our scenarios is wide. For example, our PE AUM estimates range from \$4.7 trillion to \$6.5 trillion, while our base case forecast reflects growth rates seen earlier last decade.

PE AUM forecast*

Year-over-year change in PE AUM with base-case forecast*



Source: PitchBook | Geography: Global

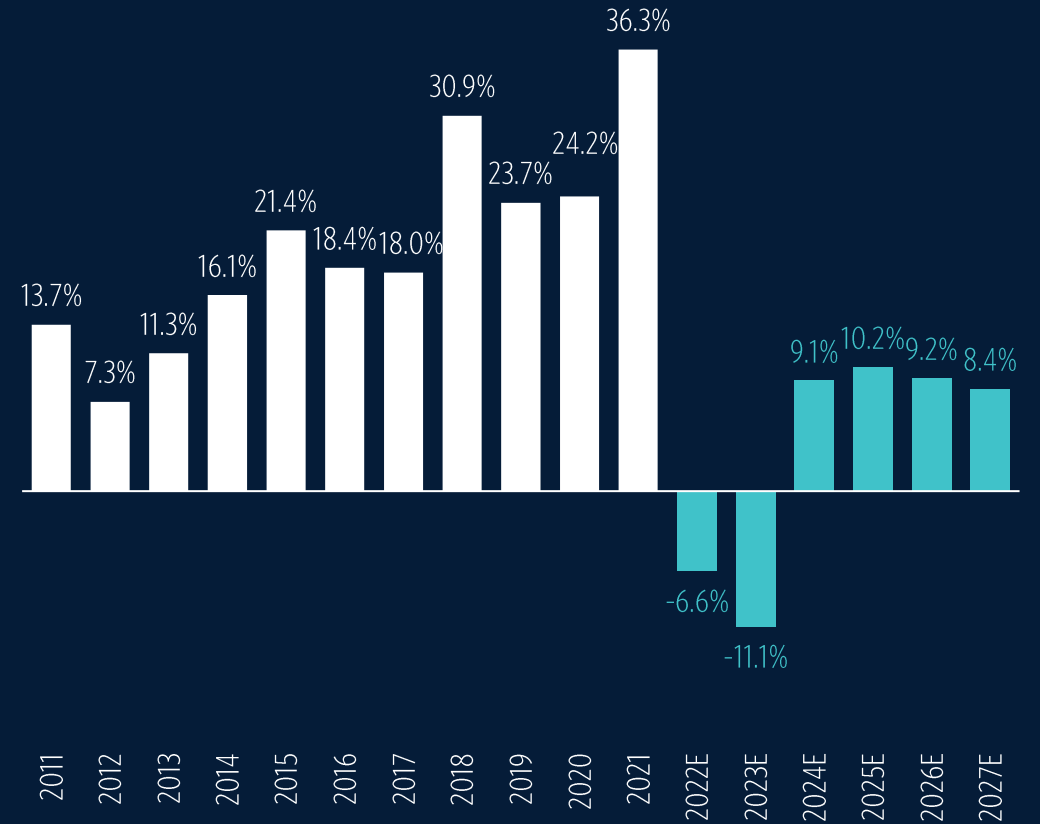
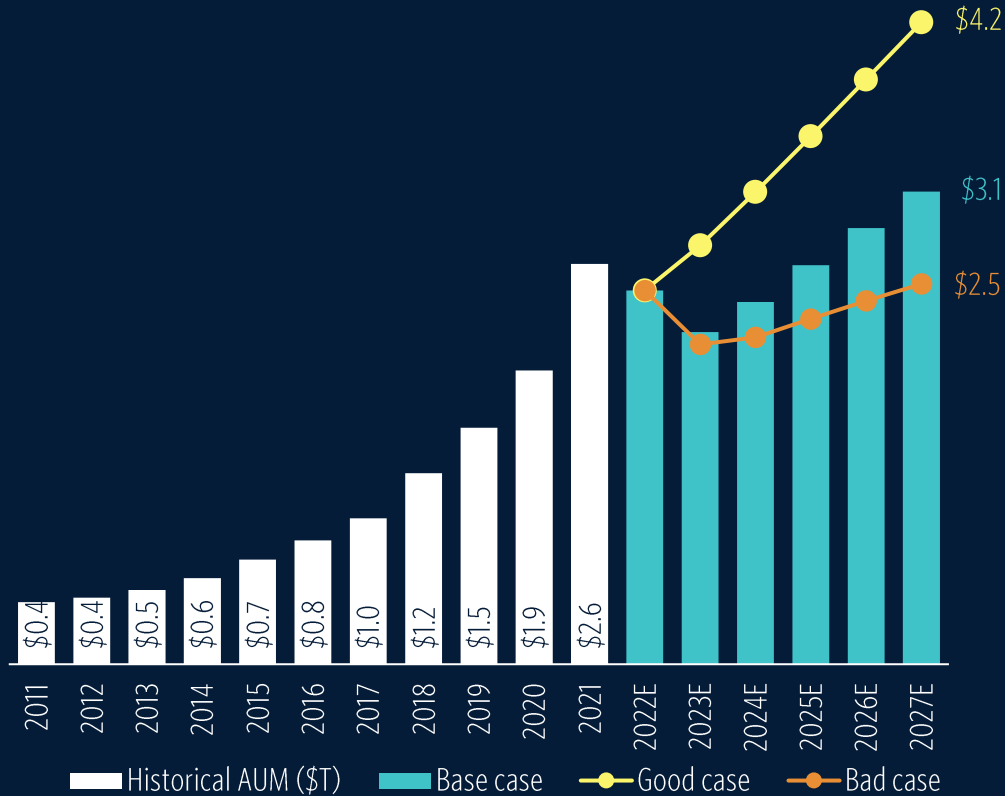
*Forecasts generated on January 5, 2023



For VC, markdowns are likely to continue into 2023, though depending on a potential rebound in public markets, our good case scenario sees the VC machine cranking up again soon.

VC AUM forecast*

Year-over-year change in VC AUM with base-case forecast*



Source: PitchBook | Geography: Global

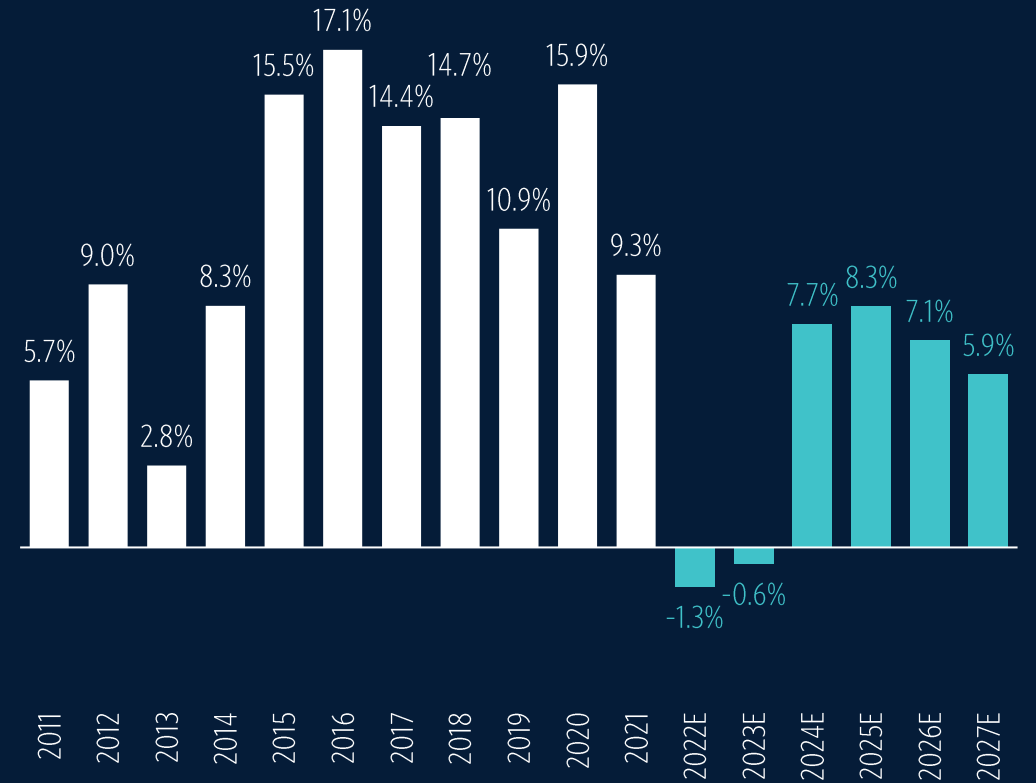
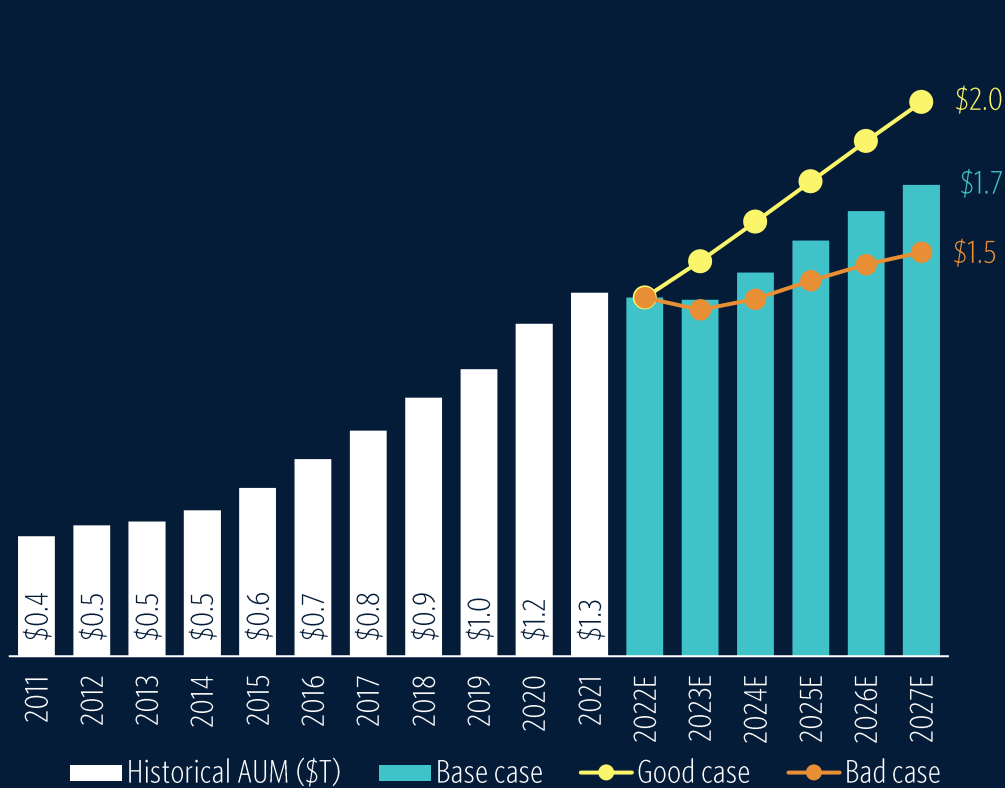
*Forecasts generated on January 5, 2023



Private debt funds will likely hold up well in a mild downturn, with attractive yields and the overall maturity of debt managers insulating against portfolio losses.

Private debt AUM forecast*

Year-over-year change in private debt AUM with base-case forecast*



Source: PitchBook | Geography: Global

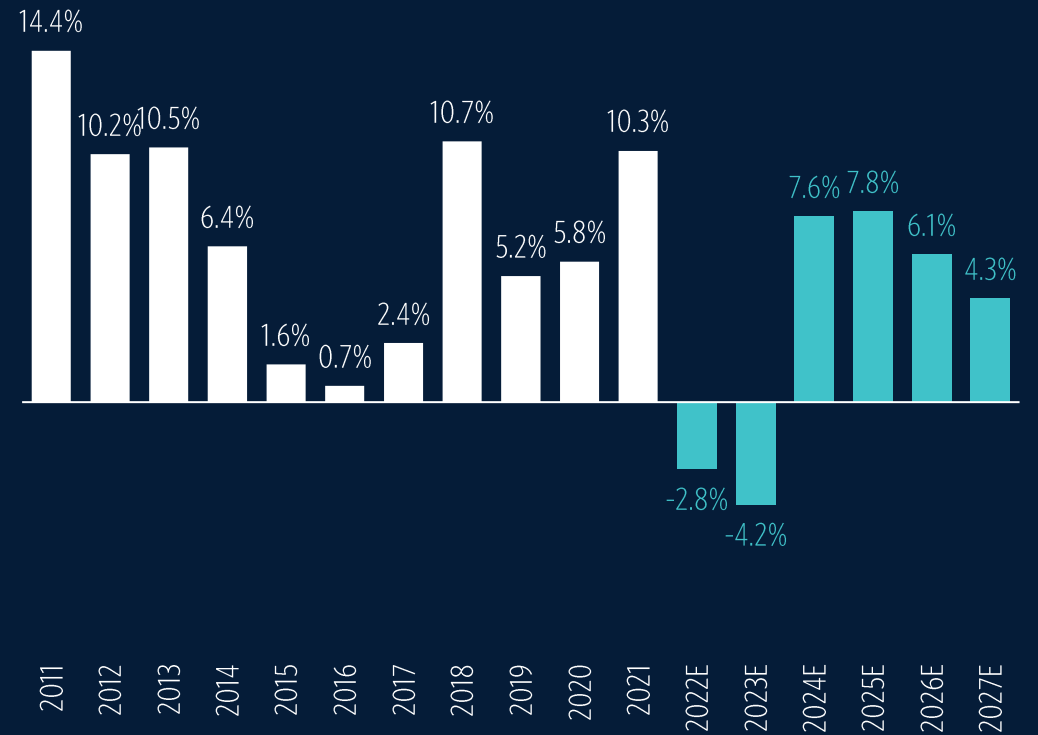
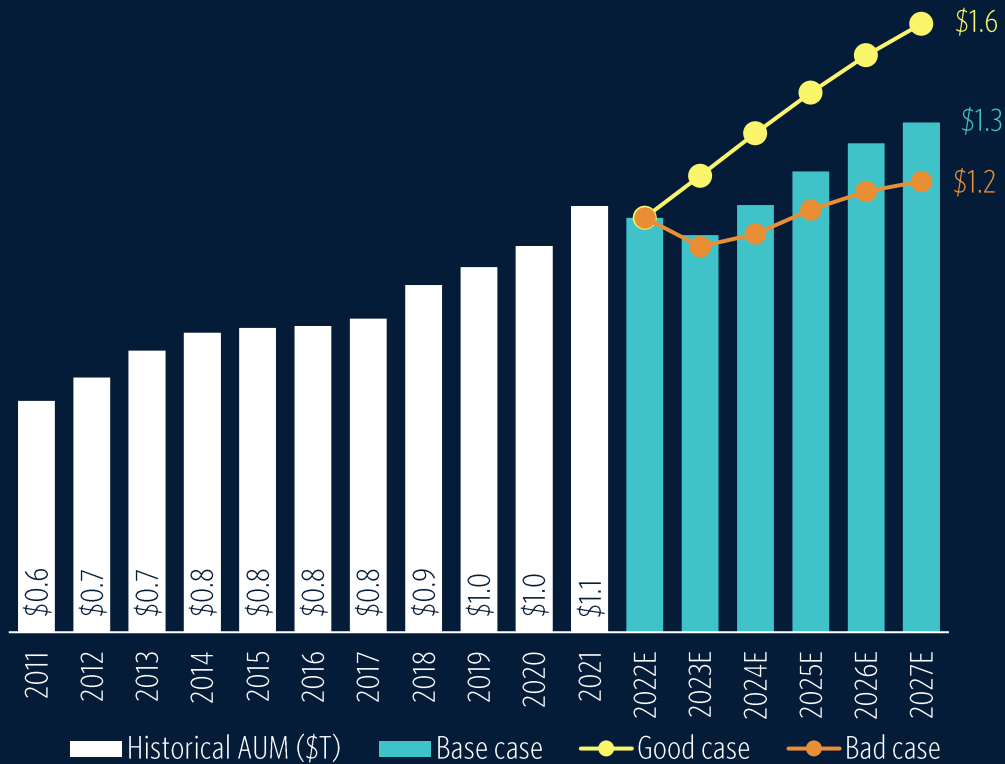
*Forecasts generated on January 5, 2023



Overvaluation of private property compared to public REITs complicates the picture for real estate. For now, our scenarios expect relatively muted decline in AUM in 2023 before a rebound.

Real estate AUM forecast*

Year-over-year change in real estate AUM with base-case forecast*



Source: PitchBook | Geography: Global

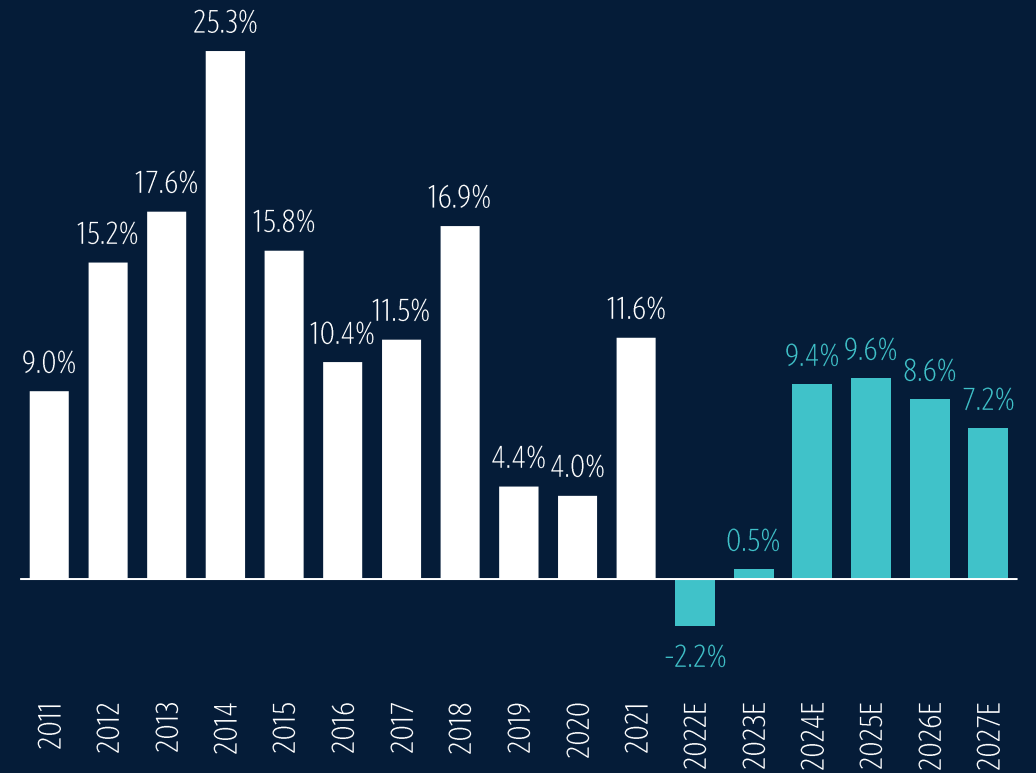
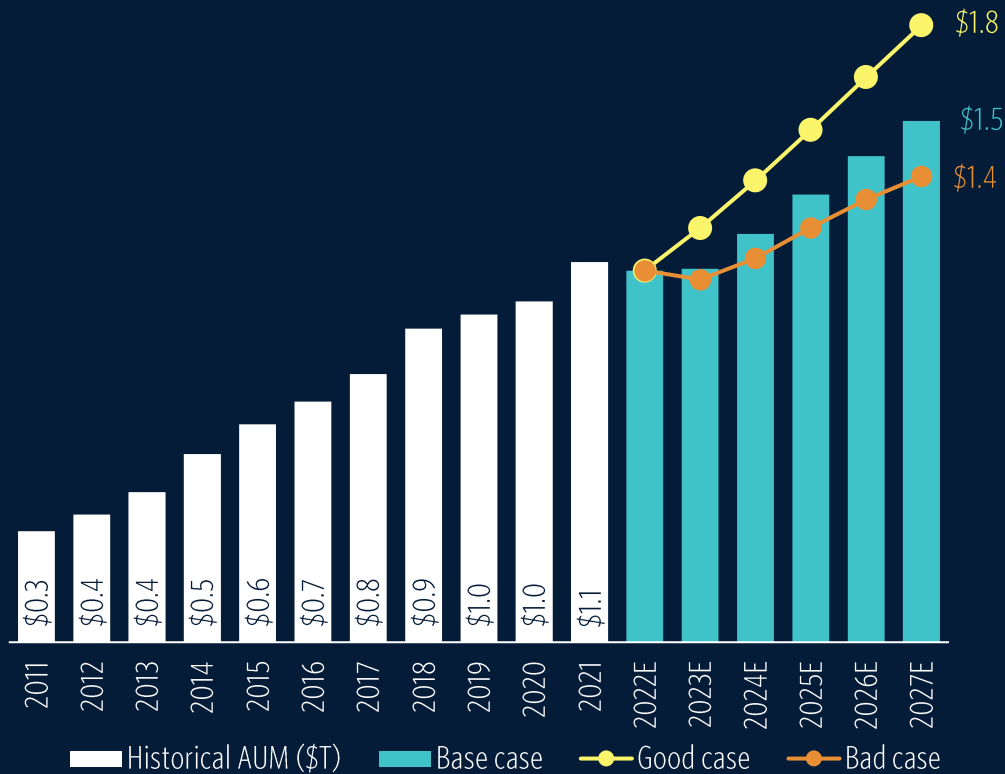
*Forecasts generated on January 5, 2023



Finally, real assets have been a focal point for investors. With recent performance in natural resources and infrastructure holding up with inflation, the asset class has renewed interest.

Real assets AUM forecast*

Year-over-year change in real assets AUM with base-case forecast*



Source: PitchBook | Geography: Global

*Forecasts generated on January 5, 2023



Equity markets



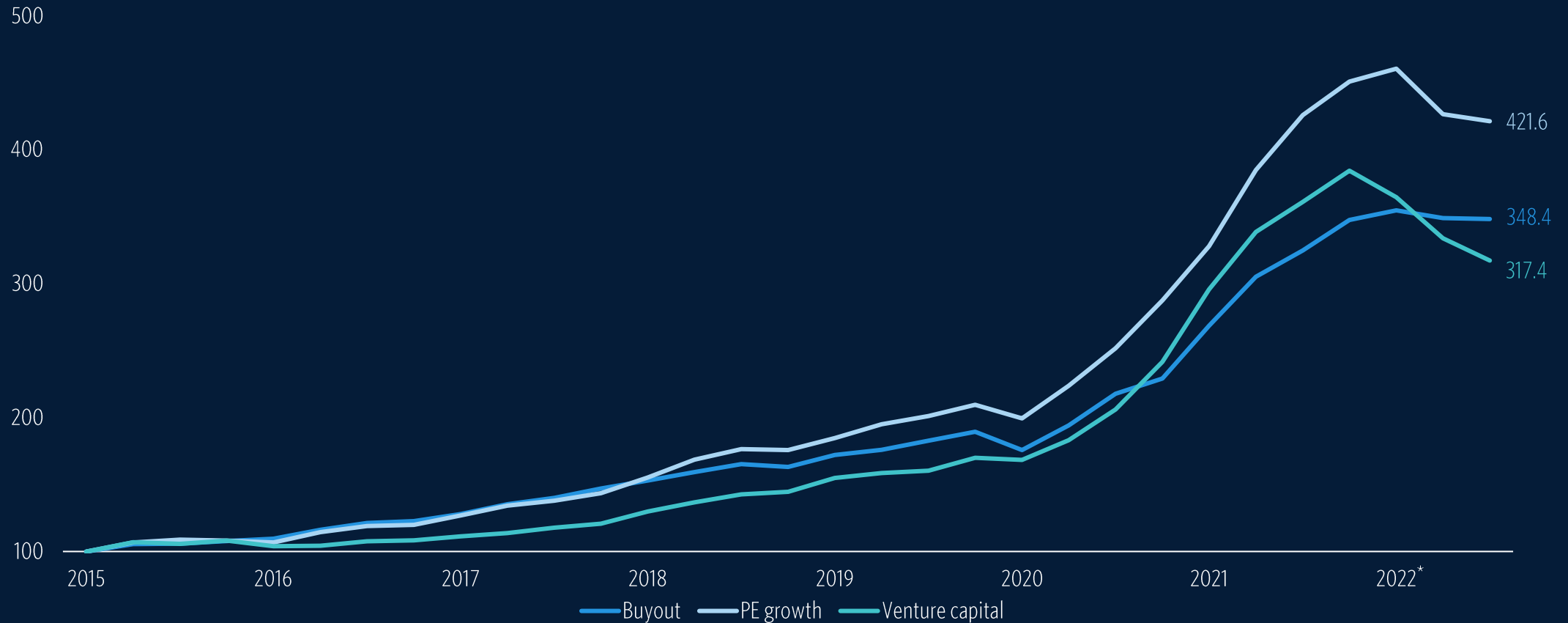
Key takeaways

- 2022 ended with a dramatic falloff in both PE and VC deals as fund managers paused to assess the best use of remaining dry powder in the face of depressed equity markets, rapidly rising interest rates, and an extension in hold periods.
- The unicorn population is adding fewer names to the herd, though it is also losing fewer to exits, and markdowns have so far been rare.
- Energy and healthcare are the only areas with some shorter-term VC dealmaking resilience, but overall, most market segments paused in sync with one another.
- Maintaining their commitment schedules despite growing denominator effect concerns, LPs continued to support US PE and VC, as a slight uptick in commitments was recorded in 2022 over 2021.
- IPOs have dropped off a cliff in the back half of 2022. While they do not represent all possible exits, they signal that hold times may be extending for late-stage VC, forming a headwind for IRRs.
- With money flowing less freely, those with capital to invest in VC are in a better position to command better terms as founders see an end to the frothy times of 2021 and the beginning of 2022.



Following a 2021 boom year, performance of PE and VC funds suffered through the third quarter of 2022. For now, buyout funds remain a bright spot compared with falling VC and PE growth funds.

Select PitchBook US Private Market Indexes performance (indexed to 100 in 2015)



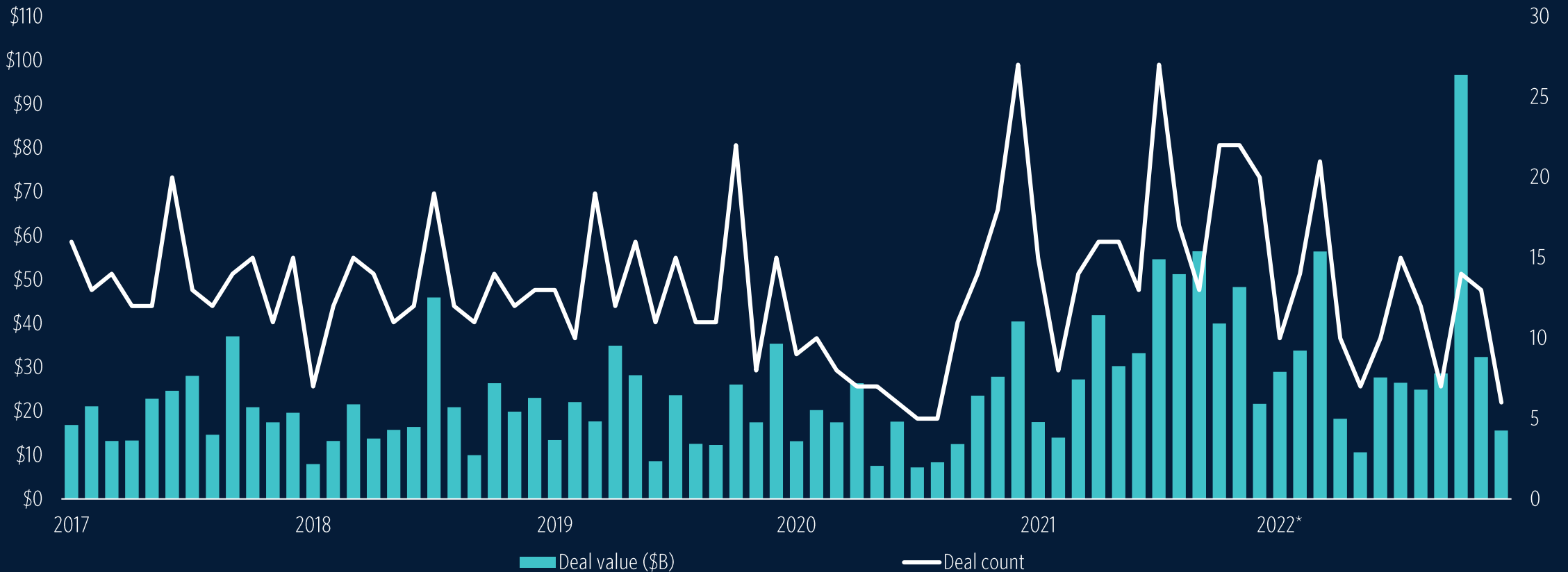
Source: PitchBook | Geography: US

*As of September 30, 2022
Note: Data for Q3 2022 is preliminary.



October carried Q4 of 2022 in terms of mega buyout deals, but generally large buyouts in H2 2022 were less popular in the face of the highest interest rates in a generation of PE investors.

Monthly buyout mega-deal activity (\$500 million+ deal value)



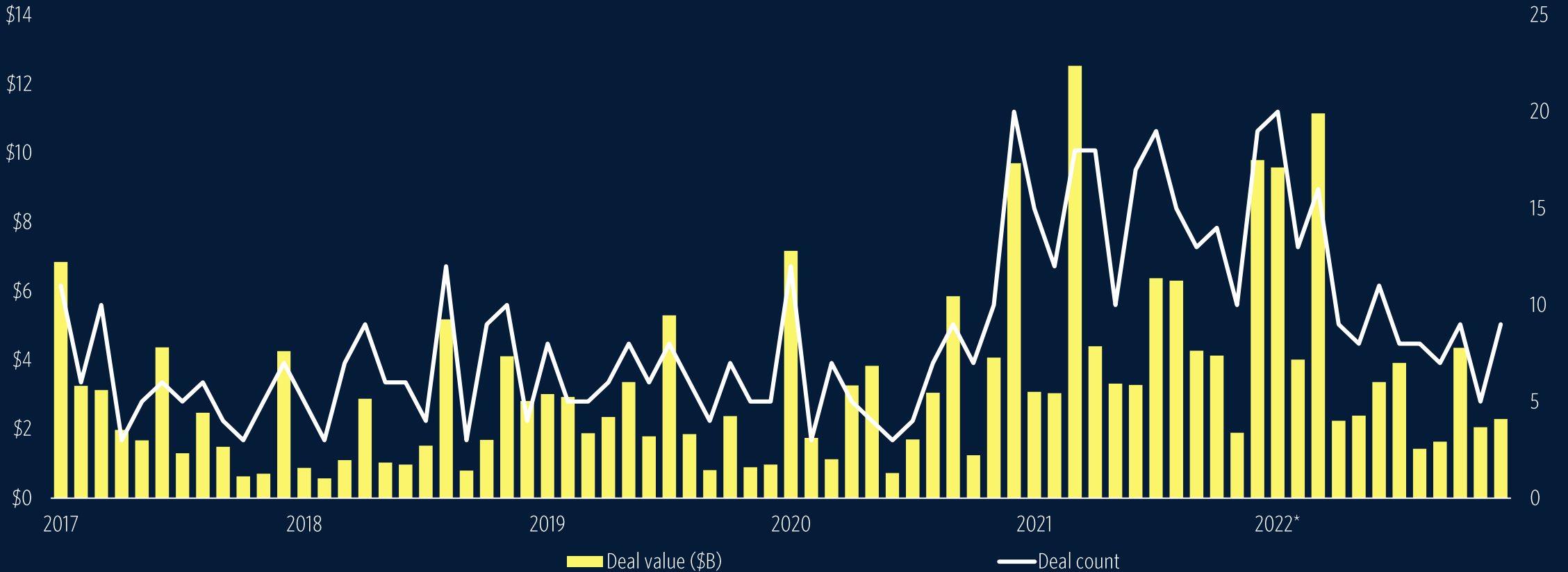
Source: PitchBook | Geography: US

* As of December 31, 2022



The closing of the IPO market may necessitate more growth equity support from PE, but in the back half of the year, this potential trend was not evident. Investor purse strings have tightened.

Monthly PE growth mega-deal activity (\$100 million+ deal value)



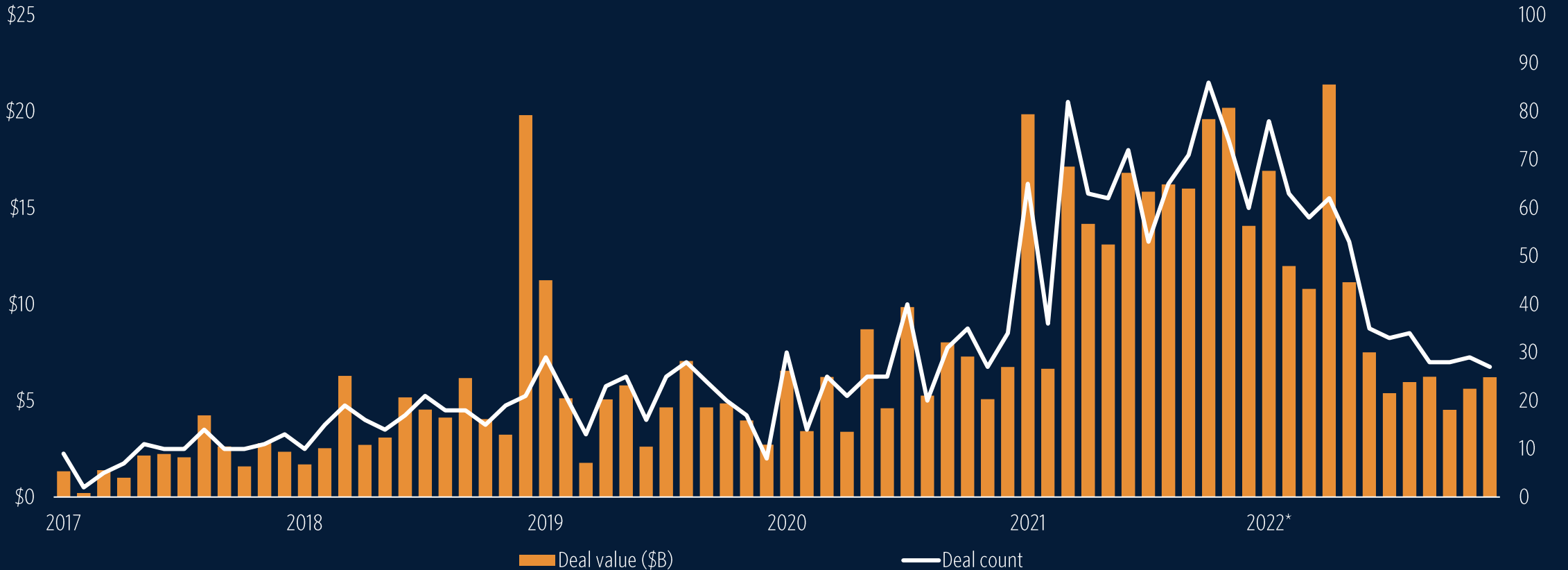
Source: PitchBook | Geography: US

* As of December 31, 2022



Exuberance that reigned in VC through Q1 2022 tempered dramatically with public market declines and a normalization in mega-deals as a new valuation regime ripples through the late stage.

Monthly VC mega-deal activity (\$100 million+ deal value)



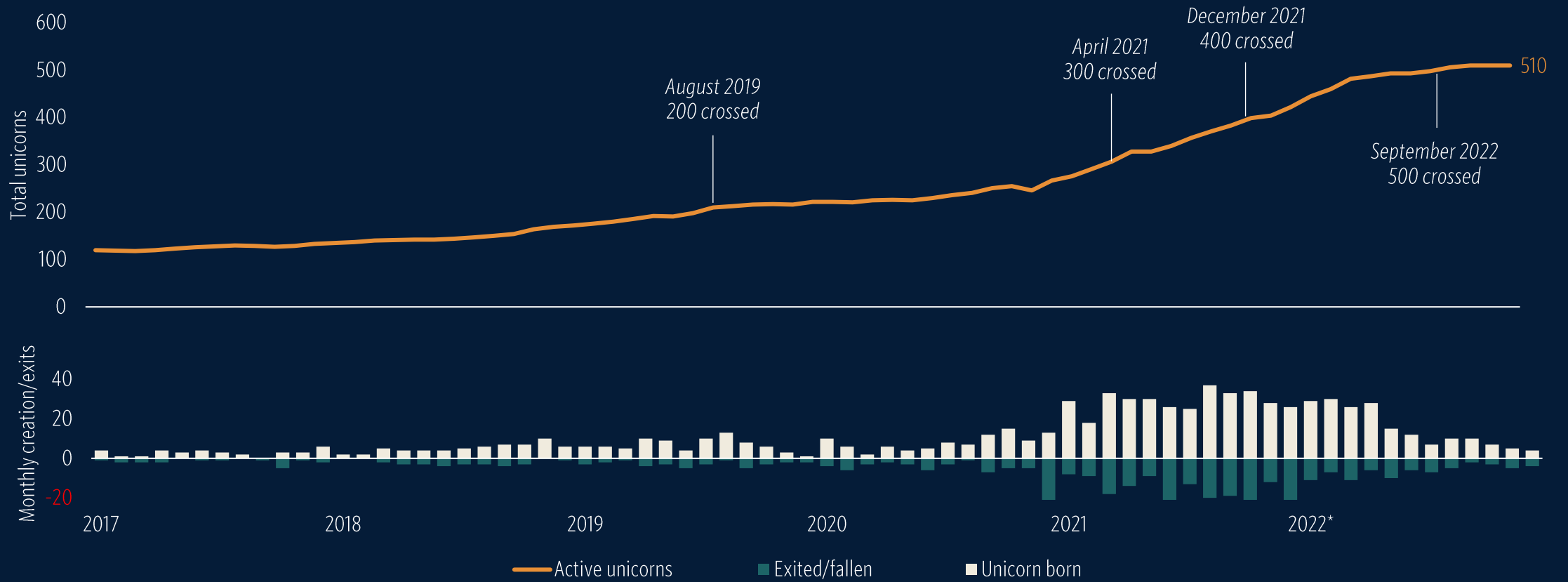
Source: PitchBook | Geography: US

* As of December 31, 2022



If unicorns were truly an endangered species five years ago, the population now has healthy numbers, though birth rates have dropped off dramatically and population growth has slowed.

Unicorn counts and monthly change



Source: PitchBook | Geography: US

*As of December 31, 2022
Note: "Fallen" unicorns are those that suffered a down round to less than a \$1B valuation.



VC deal values trended lower nearly across the board in the past year, excluding energy, though healthcare-related segments continued to close deals.

VC deal activity scorecard*

| | Segment | Deal count | | | | Deal value (\$B) | | | |
|----------------|---------------------------------|----------------|------------|-----------------|------------------|------------------|------------|-----------------|------------------|
| | | Current | % of total | Long-term score | Short-term score | Current | % of total | Long-term score | Short-term score |
| Sector | Total | 9,009 | 100.0% | 1.15 | -1.19 | \$53.85 | 100.0% | -0.01 | -2.88 |
| | B2B | 1,410 | 31.8% | 1.78 | -0.25 | \$7.30 | 31.8% | 0.51 | -1.67 |
| | B2C | 1,210 | 27.3% | -0.33 | -1.00 | \$4.56 | 19.9% | -1.28 | -2.15 |
| | Energy | 114 | 2.6% | 0.55 | 0.29 | \$1.24 | 5.4% | 1.64 | 0.29 |
| | Healthcare devices & supplies | 441 | 10.0% | 0.11 | 0.20 | \$2.64 | 11.5% | -0.76 | -1.17 |
| | Healthcare services & systems | 740 | 16.7% | 1.14 | -1.10 | \$4.49 | 19.6% | -0.01 | -2.45 |
| | Information technology hardware | 296 | 6.7% | 1.58 | 0.62 | \$2.13 | 9.3% | 0.94 | -1.30 |
| | Media | 220 | 5.0% | -0.54 | -0.68 | \$0.60 | 2.6% | -2.14 | -1.85 |
| | Pharma & biotech | 663 | 15.0% | 1.54 | 0.12 | \$6.94 | 30.2% | -0.11 | -1.74 |
| | Software | 3,397 | 76.7% | 0.99 | -1.60 | \$20.38 | 88.8% | 0.03 | -2.75 |
| | Transportation | 100 | 2.3% | -0.62 | -0.68 | \$0.95 | 4.1% | -0.29 | -0.35 |
| | Type | Angel and seed | 3,507 | 38.9% | -0.70 | -0.99 | \$8.74 | 16.2% | 1.43 |
| Early-stage VC | | 2,710 | 30.1% | 1.82 | -0.41 | \$18.13 | 33.7% | -0.11 | -2.40 |
| Late-stage VC | | 2,767 | 30.7% | 2.24 | -0.89 | \$26.96 | 50.1% | -0.33 | -3.22 |

Source: PitchBook | Geography: US



There really were no bright spots over the past four quarters for PE when it comes to near-term trends in deal counts or deal values; energy had the least poor showing.

PE deal activity scorecard*

| | Segment | Deal count | | | | Deal value (\$B) | | | |
|--------|------------------------|------------|------------|-----------------|------------------|------------------|------------|-----------------|------------------|
| | | Current | % of total | Long-term score | Short-term score | Current | % of total | Long-term score | Short-term score |
| Sector | Total | 3,712 | 100.0% | -0.13 | | \$285.05 | 100.0% | -0.51 | |
| | B2B | 1,485 | 40.0% | 0.35 | | \$109.44 | 38.4% | 0.11 | |
| | B2C | 602 | 16.2% | 0.05 | | \$37.64 | 13.2% | -0.94 | |
| | Energy | 108 | 2.9% | -1.78 | | \$16.51 | 5.8% | -1.17 | |
| | Financial services | 310 | 8.4% | 0.11 | | \$23.81 | 8.4% | -0.98 | |
| | Healthcare | 532 | 14.3% | -0.70 | | \$39.14 | 13.7% | -0.91 | |
| | Information technology | 592 | 15.9% | -0.41 | | \$52.09 | 18.3% | -0.14 | |
| | Materials & resources | 71 | 1.9% | -1.41 | | \$5.40 | 1.9% | -1.50 | |
| Type | Buyout (all) | 3,031 | 81.7% | -0.11 | | \$250.66 | 87.9% | -0.60 | |
| | Buyout (add-on) | 2,319 | 62.5% | 0.38 | | \$160.35 | 56.3% | -0.12 | |
| | PE growth | 669 | 18.0% | -0.44 | | \$33.37 | 11.7% | -0.03 | |

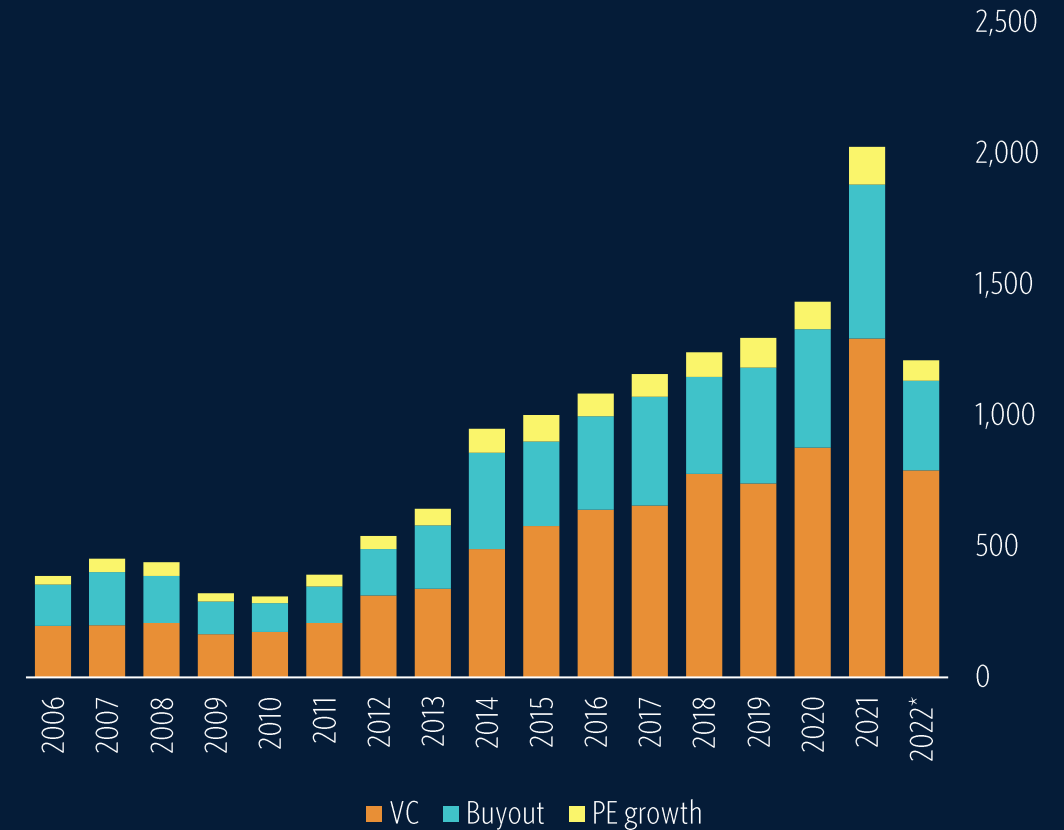
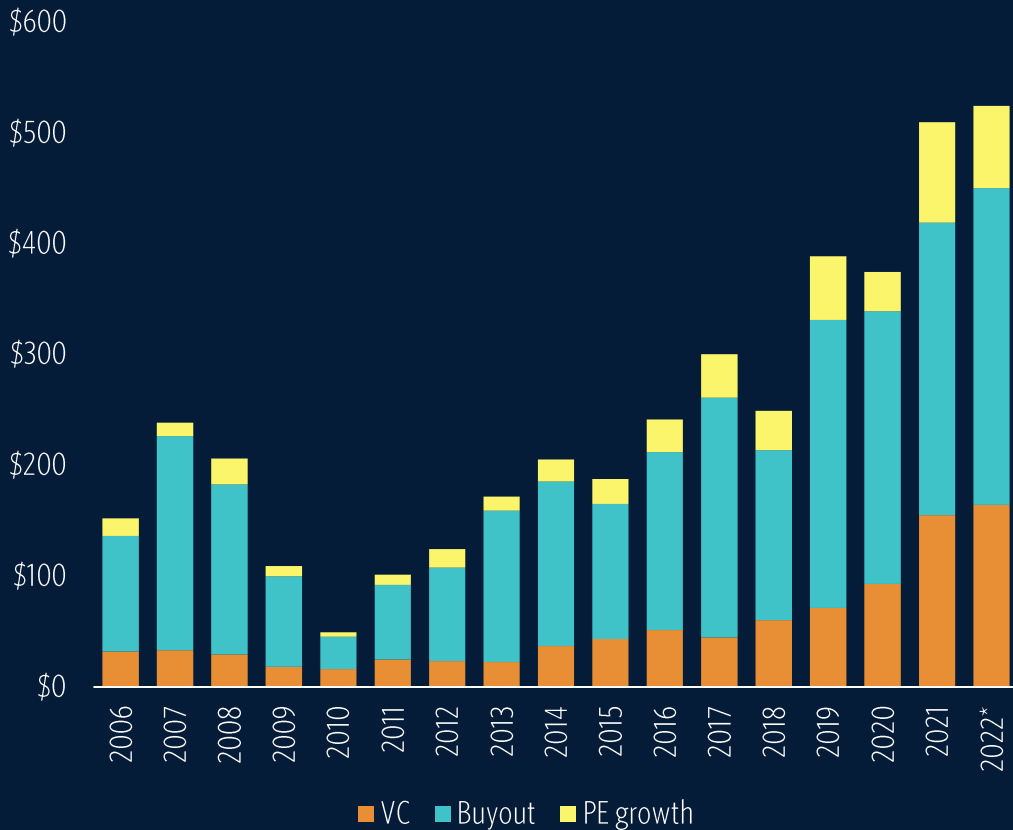
Source: PitchBook | Geography: US



Fundraising was surprisingly strong in 2022 as both buyout and VC collected more commitments than in 2021. This picture masks that mega-funds dominated among managers seeking to raise.

Capital raised (\$B) for select strategies

Funds closed by select strategies



Source: PitchBook | Geography: US

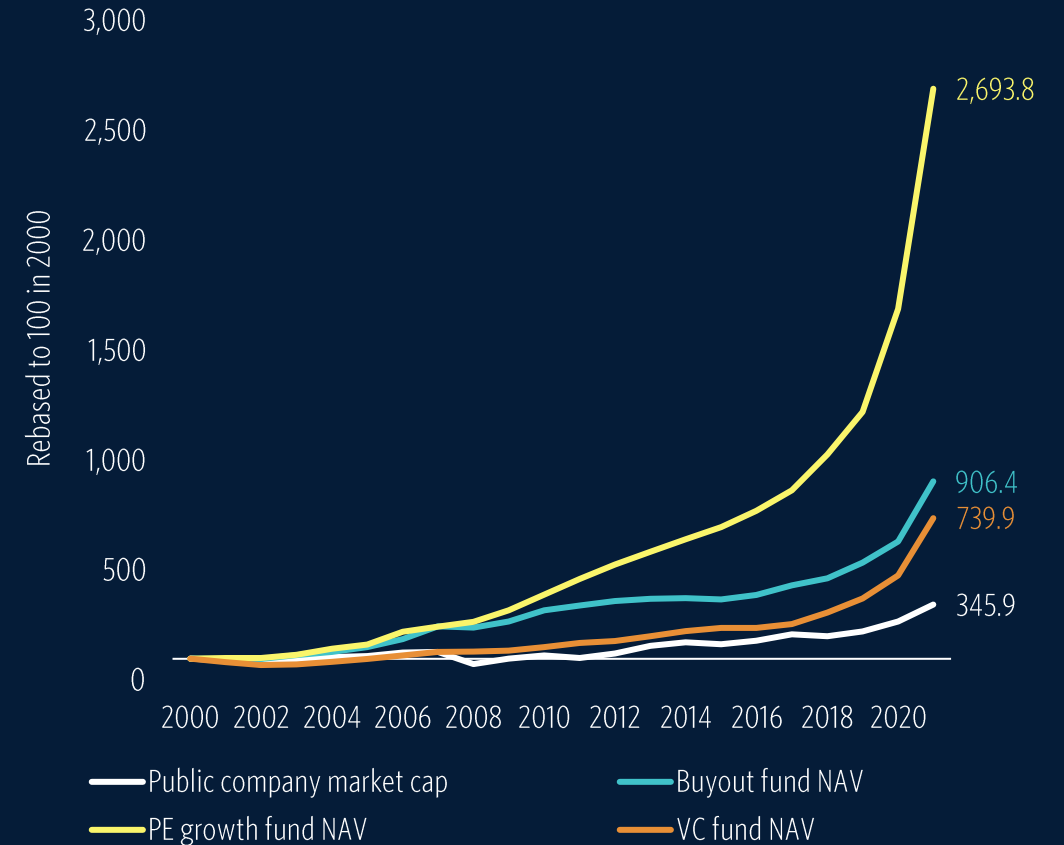
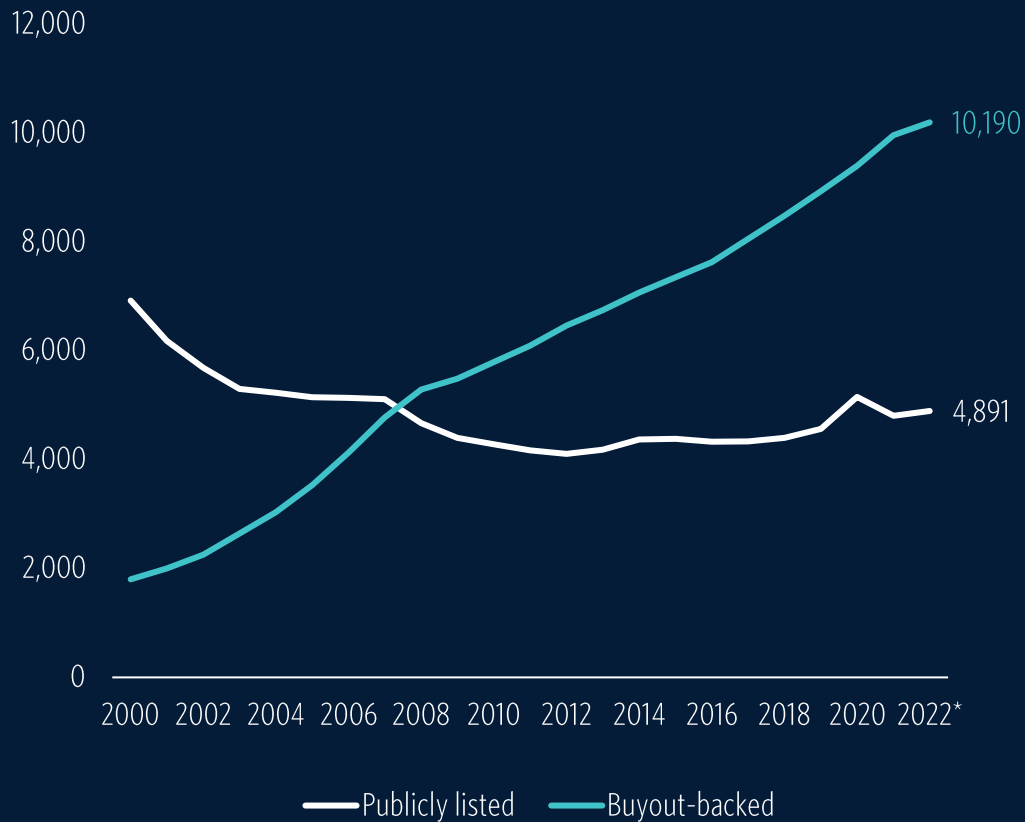
*As of December 31, 2022



Major arguments for the democratization of PE are that there are far fewer public companies to choose from and the highest return opportunities are hidden away in PE vehicles.

Number of PE-backed companies versus domestic firms publicly listed on NYSE and Nasdaq exchanges

Growth of fund NAV versus US public equity market cap (rebased to 100 in 2000)**



Sources: [World Bank](#), [Statista](#), [Siblis Research](#), PitchBook | Geography: US

*As of September 30, 2022 | **As of December 31, 2021



The lack of IPO activity has been well-documented, but strategic acquirers appear to have also vanished from the picture, making it difficult for VCs to crystalize unrealized fund NAVs...

VC exit activity scorecard*

| | Segment | Exit count | | | | Exit value (\$B) | | | |
|----------------|---------------------------------|-------------|------------|-----------------|------------------|------------------|------------|-----------------|------------------|
| | | Current | % of total | Long-term score | Short-term score | Current | % of total | Long-term score | Short-term score |
| Sector | Total | 634 | 100.0% | -1.87 | -2.49 | \$11.94 | 100.0% | -2.65 | -2.87 |
| | B2B | 87 | 32.2% | -2.42 | -2.11 | \$2.30 | 35.5% | -1.47 | -1.35 |
| | B2C | 64 | 23.7% | -1.09 | -0.97 | \$0.21 | 3.2% | -2.84 | -2.12 |
| | Energy | 12 | 4.4% | 1.34 | 0.39 | \$0.68 | 10.6% | 0.97 | 0.28 |
| | Healthcare devices & supplies | 22 | 8.1% | -2.12 | -1.47 | \$1.26 | 19.5% | -1.69 | -1.15 |
| | Healthcare services & systems | 45 | 16.7% | -1.33 | -1.37 | \$0.37 | 5.7% | -1.65 | -1.56 |
| | Information technology hardware | 21 | 7.8% | 0.02 | -1.53 | \$0.77 | 12.0% | -0.66 | -1.49 |
| | Media | 19 | 7.0% | -0.85 | -0.34 | \$0.88 | 13.6% | -0.01 | -0.35 |
| | Pharma & biotech | 45 | 16.7% | -1.77 | -1.27 | \$3.08 | 47.7% | -2.51 | -1.94 |
| | Software | 288 | 106.7% | -1.27 | -2.07 | \$1.67 | 25.9% | -3.48 | -3.69 |
| | Transportation | 10 | 3.7% | 0.46 | 0.00 | \$0.49 | 7.6% | -0.79 | -0.22 |
| | Type | Acquisition | 434 | 68.1% | -2.57 | -2.88 | \$6.20 | 51.9% | -3.57 |
| Buyout | | 165 | 25.9% | 0.80 | -0.62 | \$2.06 | 17.3% | -1.32 | -0.29 |
| Public listing | | 38 | 6.0% | -1.42 | -1.41 | \$3.67 | 30.8% | -1.93 | -2.03 |

Source: PitchBook | Geography: US



...and PE is seeing similar challenges. With the dramatic drop in exits, extended hold periods for investors will drag on IRRs in PE funds.

PE exit activity scorecard*

| | Segment | Exit count | | | | Exit value (\$B) | | | |
|--------|------------------------|------------|------------|-----------------|------------------|------------------|------------|-----------------|------------------|
| | | Current | % of total | Long-term score | Short-term score | Current | % of total | Long-term score | Short-term score |
| Sector | Total | 517 | 100.0% | -2.79 | -2.65 | \$104.71 | 100.0% | -2.57 | -2.28 |
| | B2B | 207 | 40.0% | -2.06 | -2.17 | \$35.41 | 33.8% | -2.02 | -1.92 |
| | B2C | 80 | 15.5% | -3.03 | -2.69 | \$12.72 | 12.2% | -2.65 | -2.24 |
| | Energy | 38 | 7.4% | -1.71 | -0.71 | \$16.51 | 15.8% | 0.03 | 0.12 |
| | Financial services | 19 | 3.7% | -3.86 | -2.51 | \$3.44 | 3.3% | -3.85 | -2.35 |
| | Healthcare | 62 | 12.0% | -2.39 | -2.48 | \$14.91 | 14.2% | -2.25 | -2.20 |
| | Information technology | 81 | 15.7% | -2.48 | -2.32 | \$17.17 | 16.4% | -2.06 | -1.52 |
| | Materials & resources | 29 | 5.6% | -0.55 | -0.37 | \$4.33 | 4.1% | -1.45 | -1.00 |
| Type | Acquisition | 238 | 46.0% | -3.30 | -2.86 | \$52.64 | 50.3% | -2.53 | -2.22 |
| | Buyout | 274 | 53.0% | -1.87 | -1.92 | \$51.35 | 49.0% | -2.04 | -1.60 |
| | Public listing | 4 | 0.8% | -1.89 | -2.79 | \$0.50 | 0.5% | -1.98 | -2.53 |

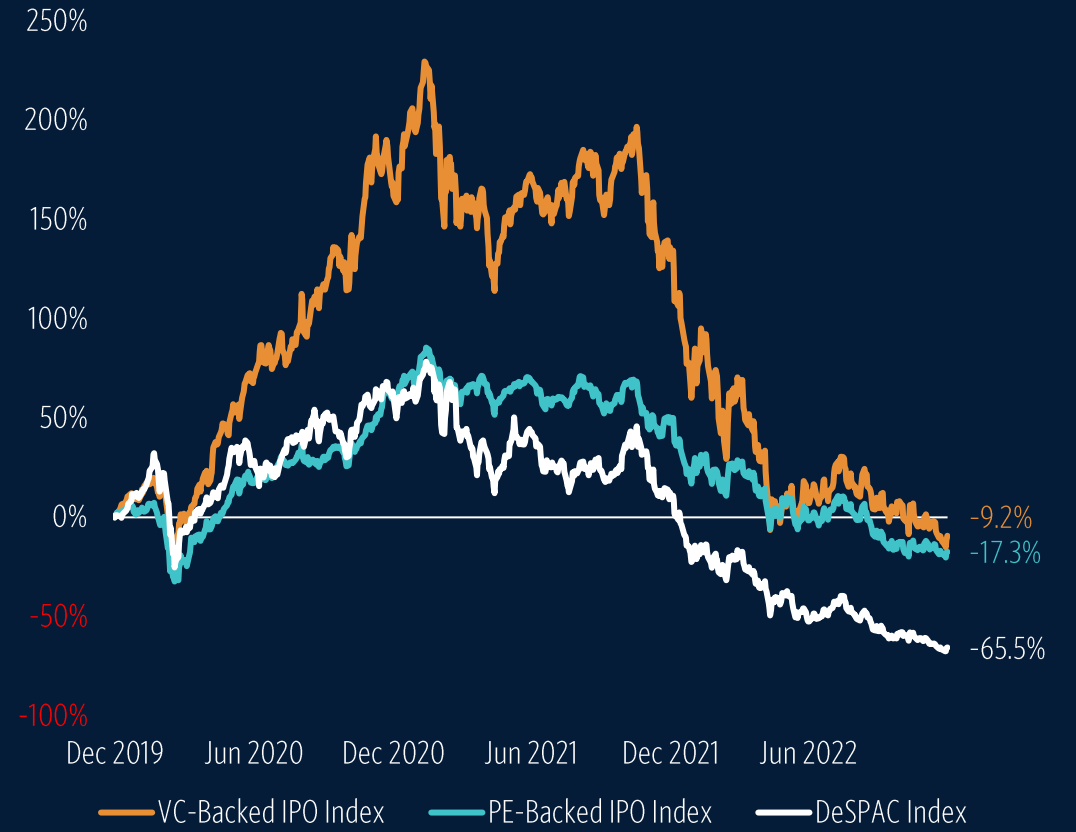
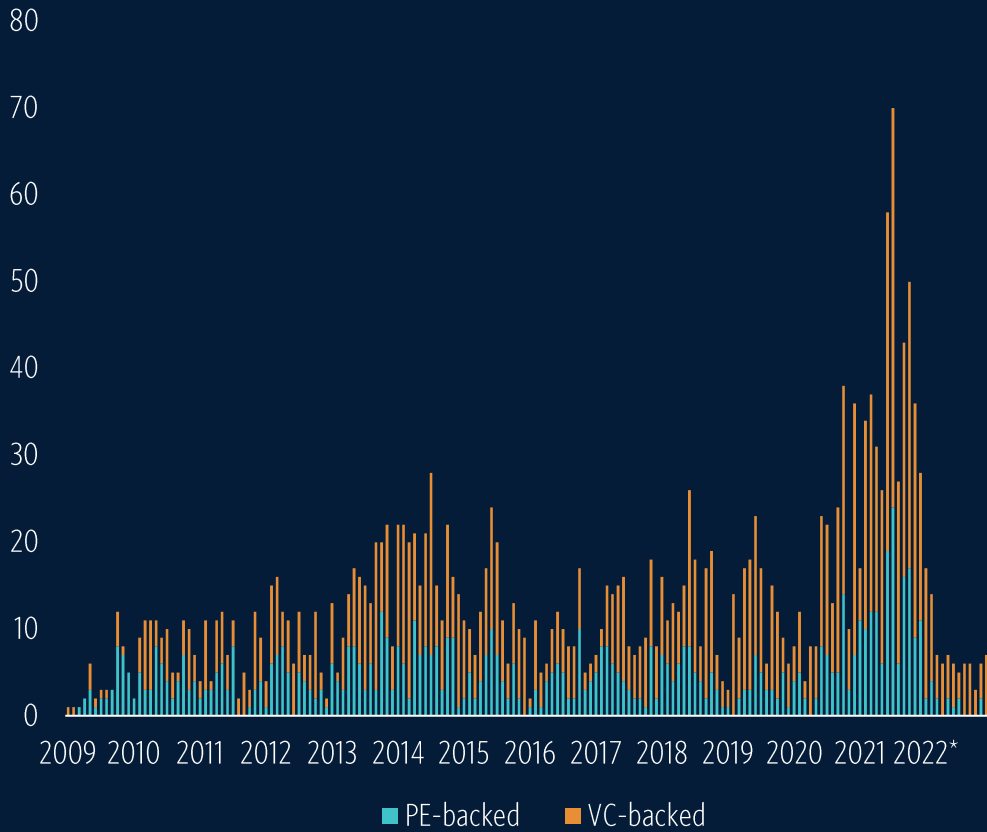
Source: PitchBook | Geography: US



While IPOs are always a minority of exits, they reflect the tone of the exit environment, and that tone has fallen to pianissimo. Public listings have been some of the worst performers in markets.

PE- and VC-backed public listing count

PitchBook IPO and DeSPAC Indexes total return since start of 2020*



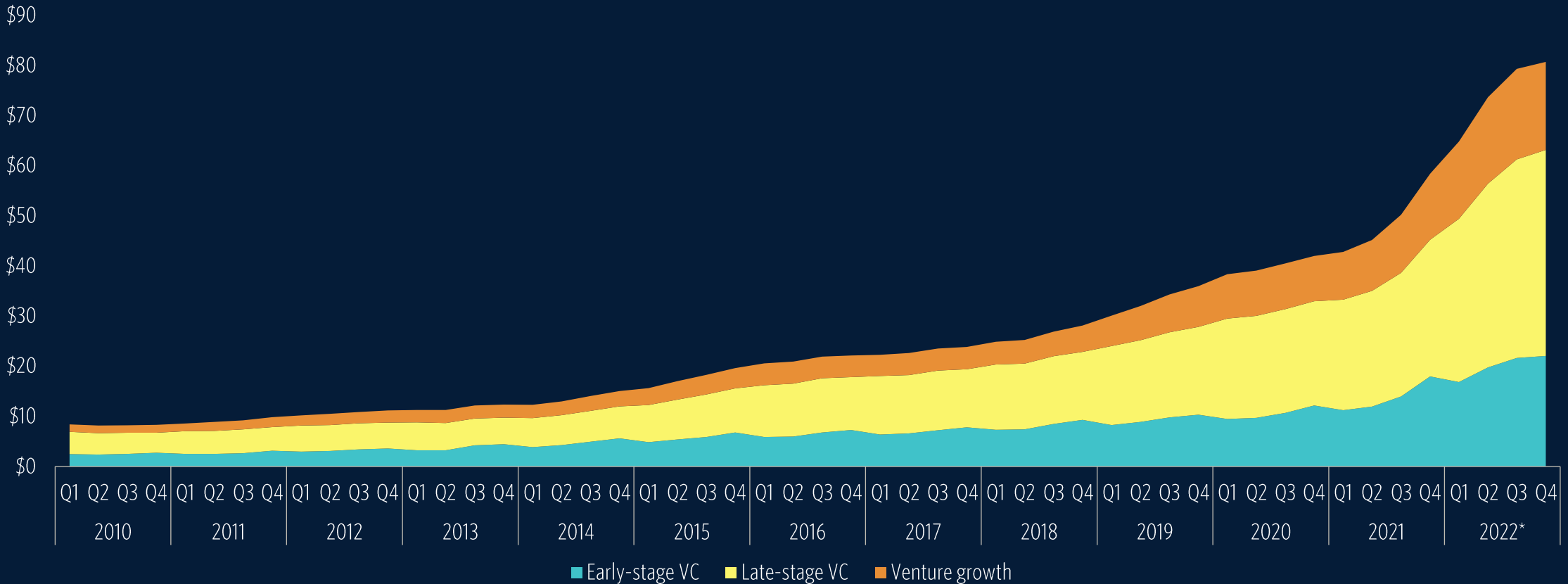
Sources: Morningstar, PitchBook | Geography: US

*As of December 31, 2022



In order to avoid down rounds, many tech firms are delaying capital raising and stretching their runways. However, our estimated new capital needed by startups is starting to grow quickly...

Estimated demand from startups for VC investment (\$B) by stage



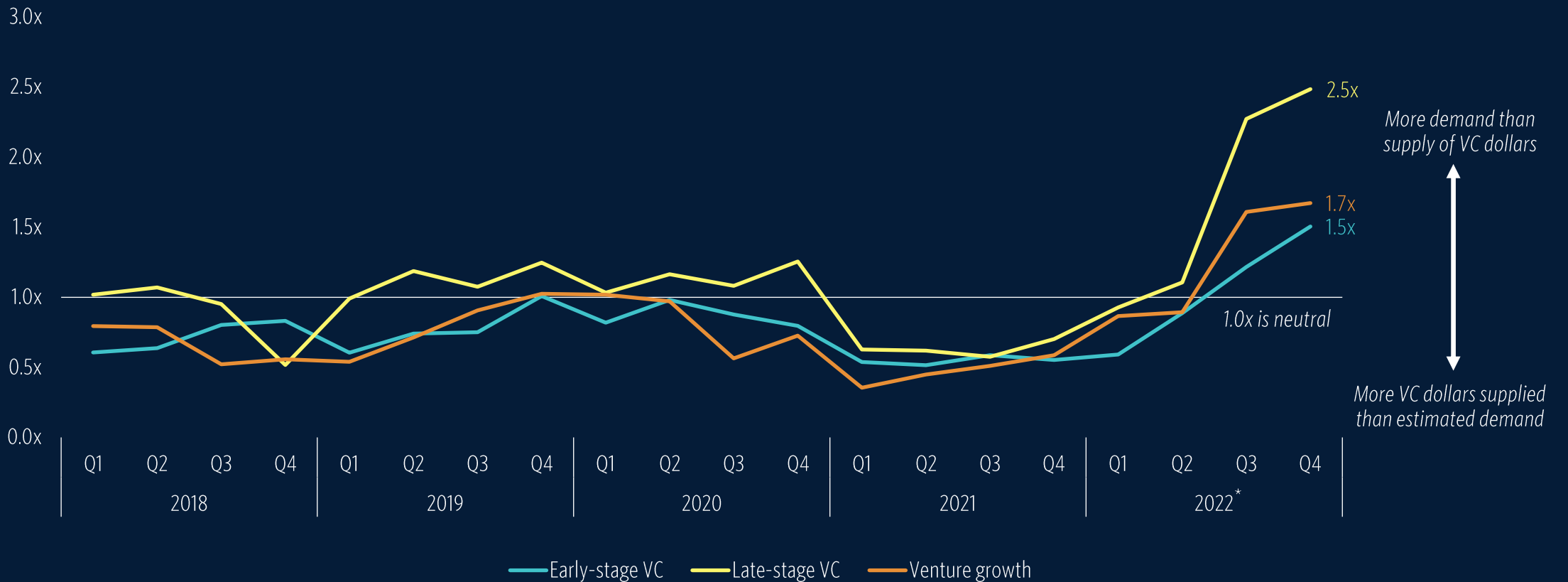
Source: PitchBook | Geography: US

*As of December 31, 2022



...and as the business cycle slows and startups begin to starve for capital, the bargaining power of VC funds with capital to spend will grow in step with the ratio of capital demanded to supplied.

Estimated startup demand for VC investment relative to supplied by quarter



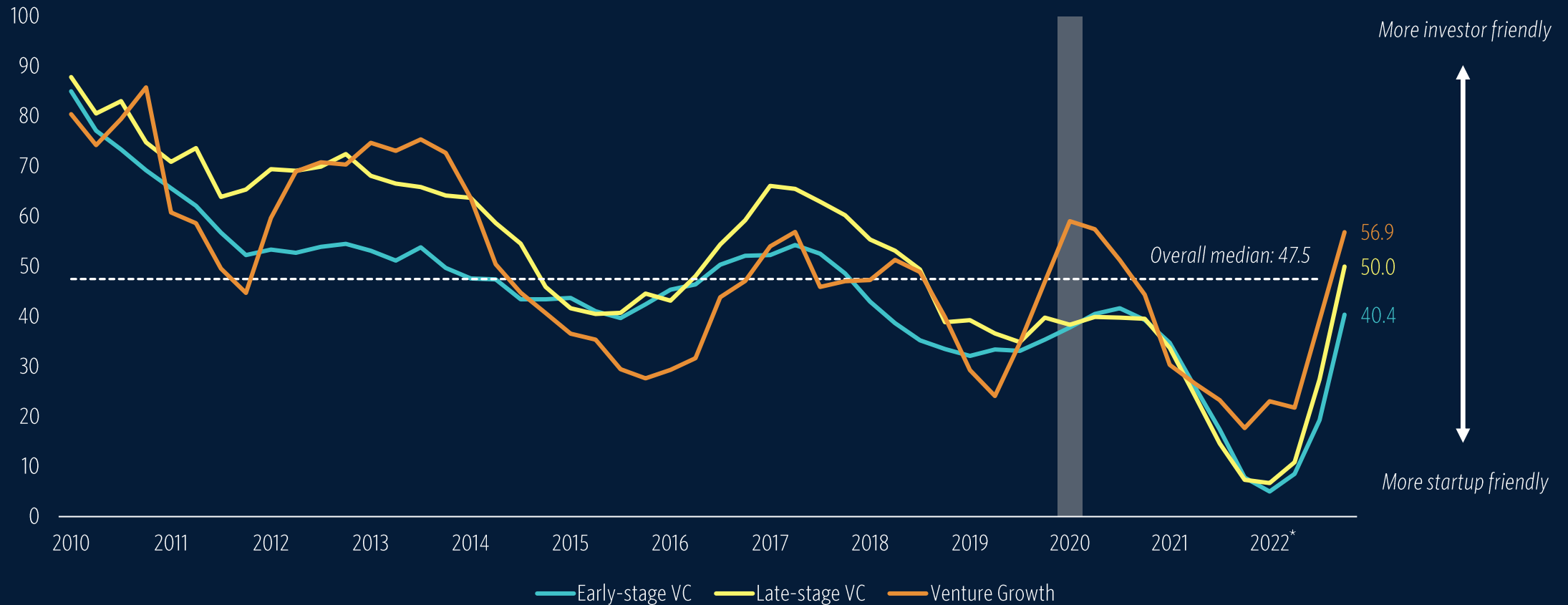
Source: PitchBook | Geography: US

* As of December 31, 2022



With fewer deals getting done, those seeking funding will have to work harder to attract capital, and those with capital will be able to exert more influence over terms.

[PitchBook VC Dealmaking Indicator](#)



Source: PitchBook | Geography: US

*As of December 31, 2022



Real estate



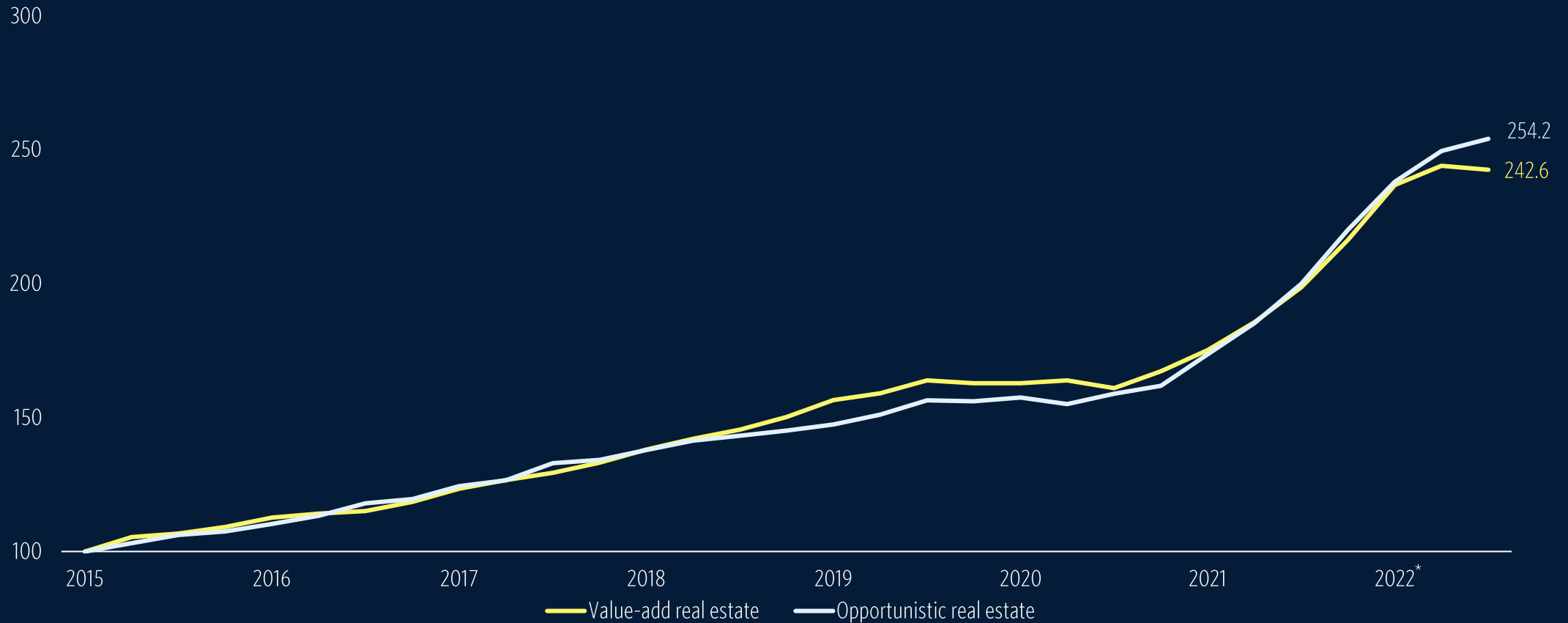
Key takeaways

- Fundraising for real estate strategies struggled to reach 2021 levels, with \$83.8 billion in fund commitments raised.
- Venture financing of real estate technology startups has fallen significantly in 2022. Construction technology startups have seen deal counts come down, with overall dollars raised supported by fewer bigger deals.
- Credit conditions are continuing to tighten, reflected by the Fed's [Senior Loan Officer Survey](#) results. Despite this, CMBS delinquency rates have remained nearly unchanged at 3.0% since May 2022.
- The public market selloff, climbing financing rates, elevated vacancy rates, and property value depreciation have continued to hammer the REIT market, with pandemic-favorite industrial REITs falling -28.6% in 2022.
- US commercial property values have fallen across the board, dipping -13% in 2022 and nearly -8% in only the last three months.



Private real estate fund performance has remained somewhat stable compared with other private assets through Q3 2022, owing in part to lagging revaluations of portfolio holdings.

Select PitchBook US Private Market Indexes performance (indexed to 100 in 2015)



Source: PitchBook | Geography: US

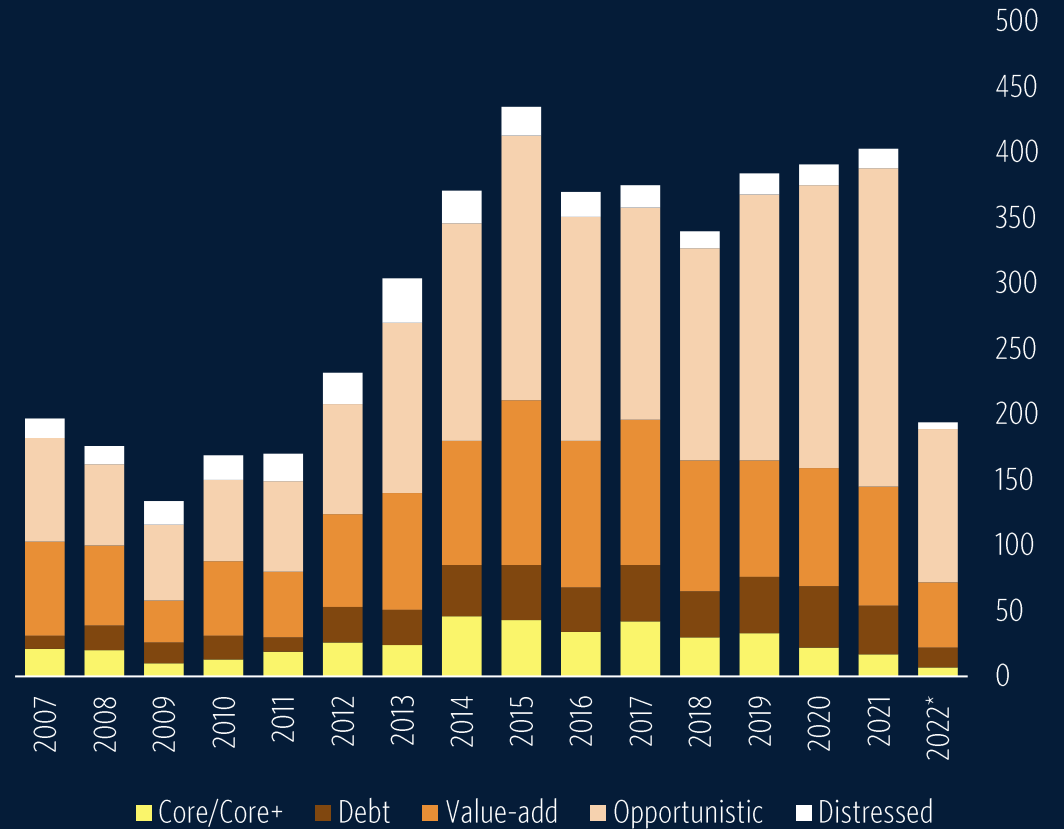
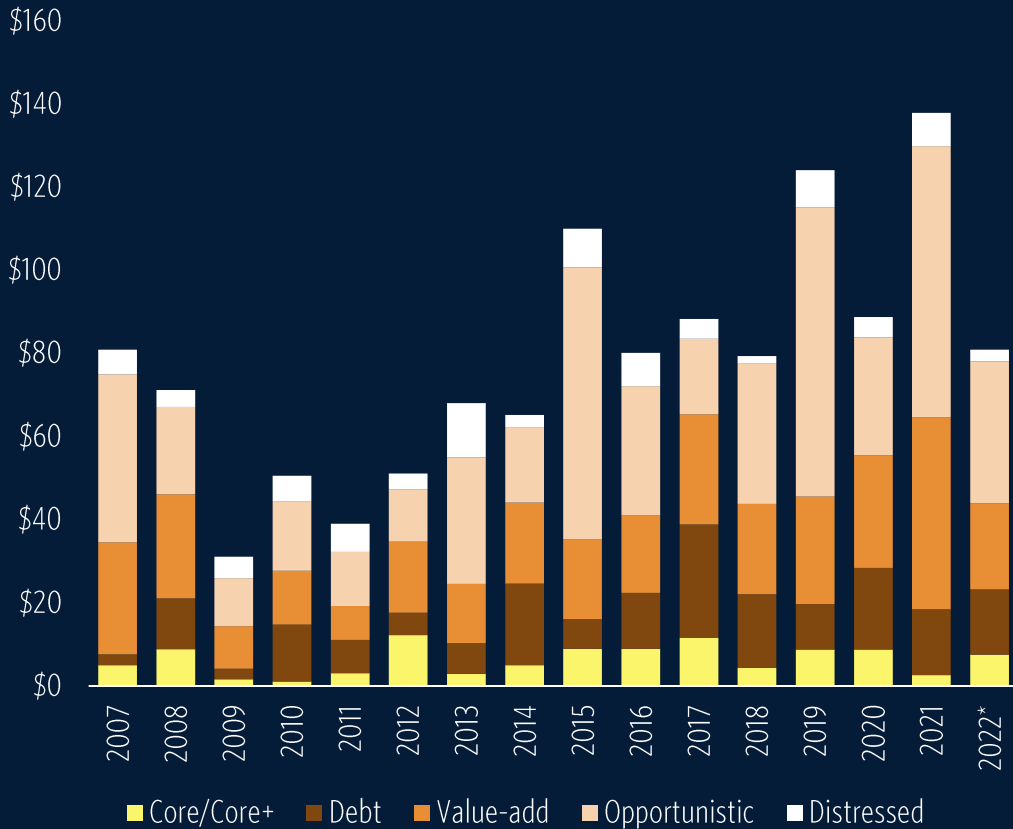
*As of September 30, 2022
Note: Data for Q3 2022 is preliminary.



Real estate fundraising activity in 2022 moderated toward its historic median, but the number of funds closed was only half that of prior years' counts, due in part, however, to data collection lag.

Capital raised (\$B) for select strategies

Funds closed by select strategies



Source: PitchBook | Geography: US

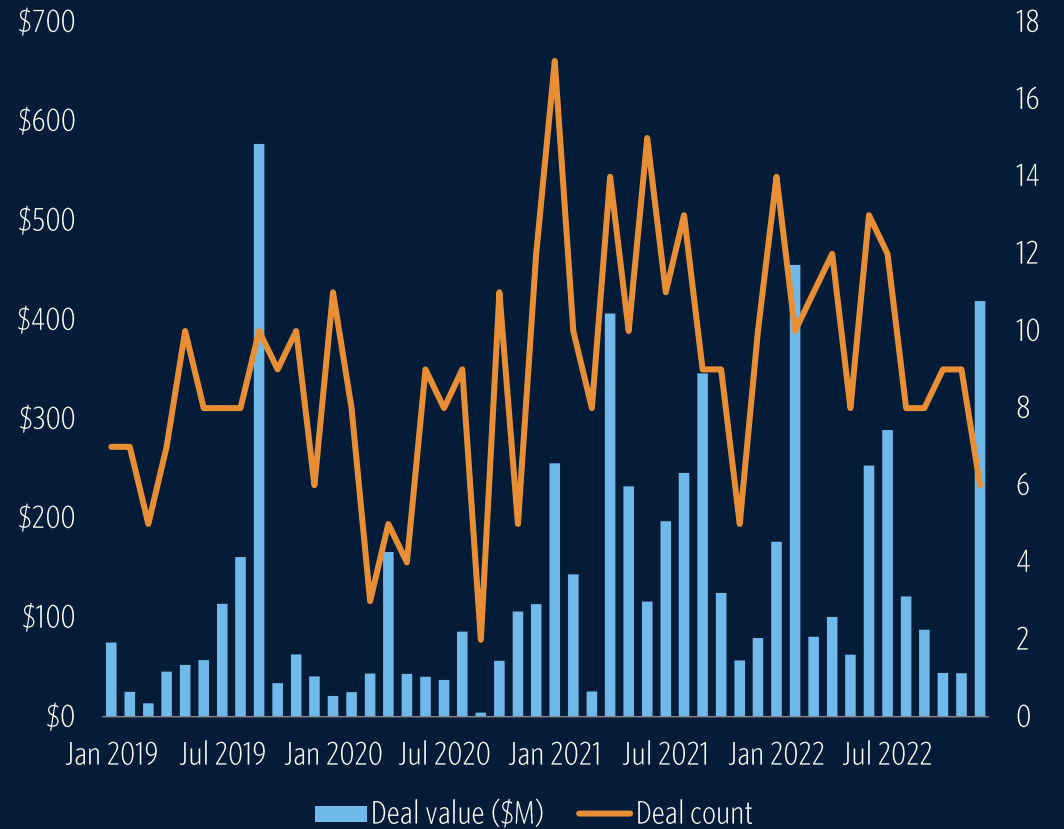
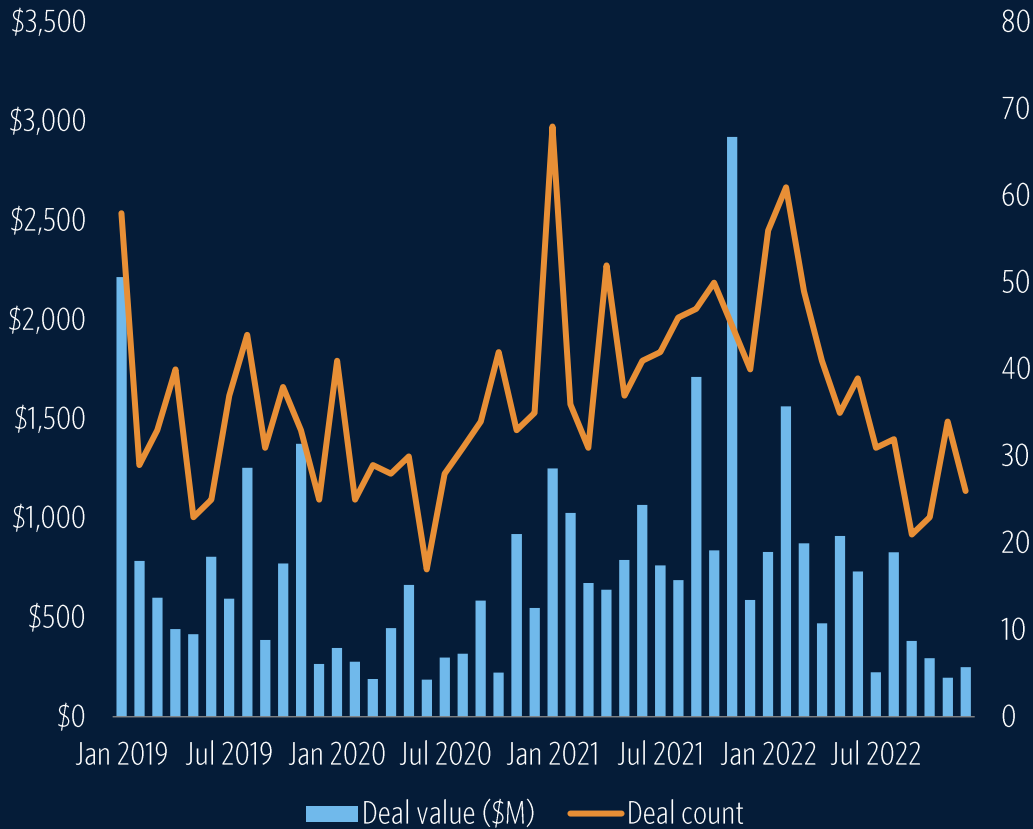
*As of December 31, 2022



Venture activity in real estate tech startups has fallen like most of VC. Construction tech held up better in 2022, with capital raising buoyed by a small number of deals.

Monthly real estate tech VC deal activity*

Monthly construction tech VC deal activity*



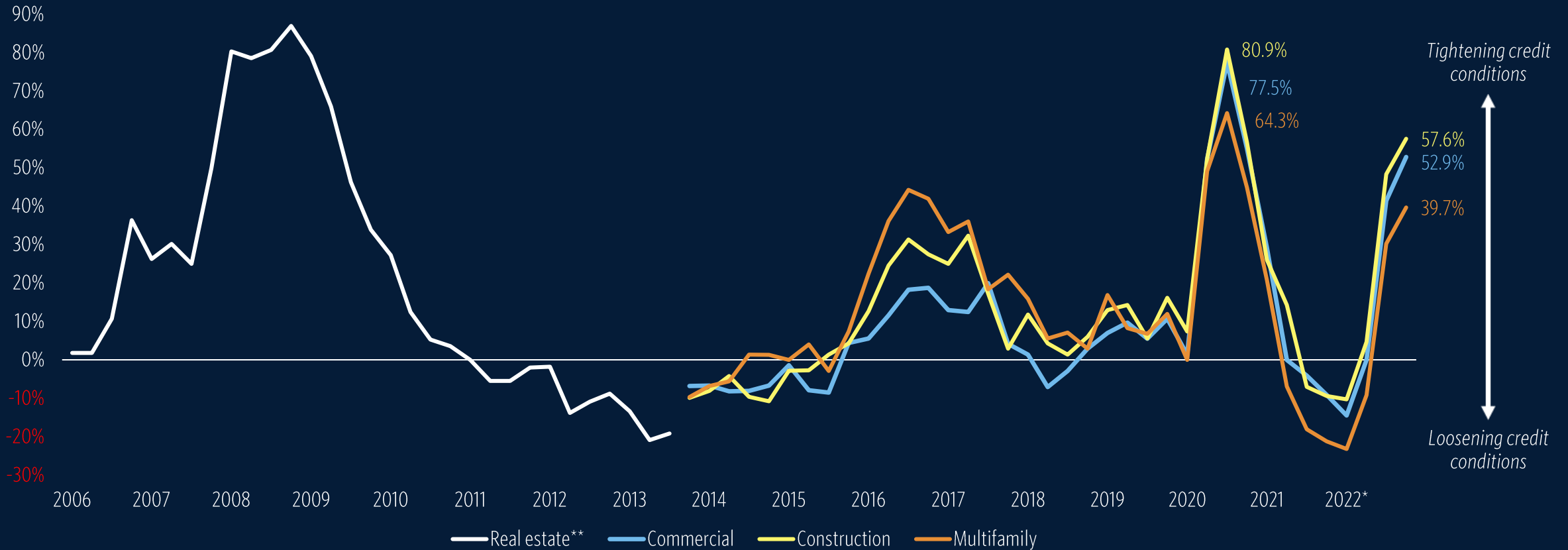
Source: PitchBook | Geography: US

*As of December 31, 2022



The shifting macro climate has led to a swift tightening of credit standards on real estate lending. The most cyclical category, construction, has seen the biggest pullback by loan officers.

Net percentage of banks tightening standards on real estate loans



Source: [Senior Loan Officer Survey](#) | Geography: US

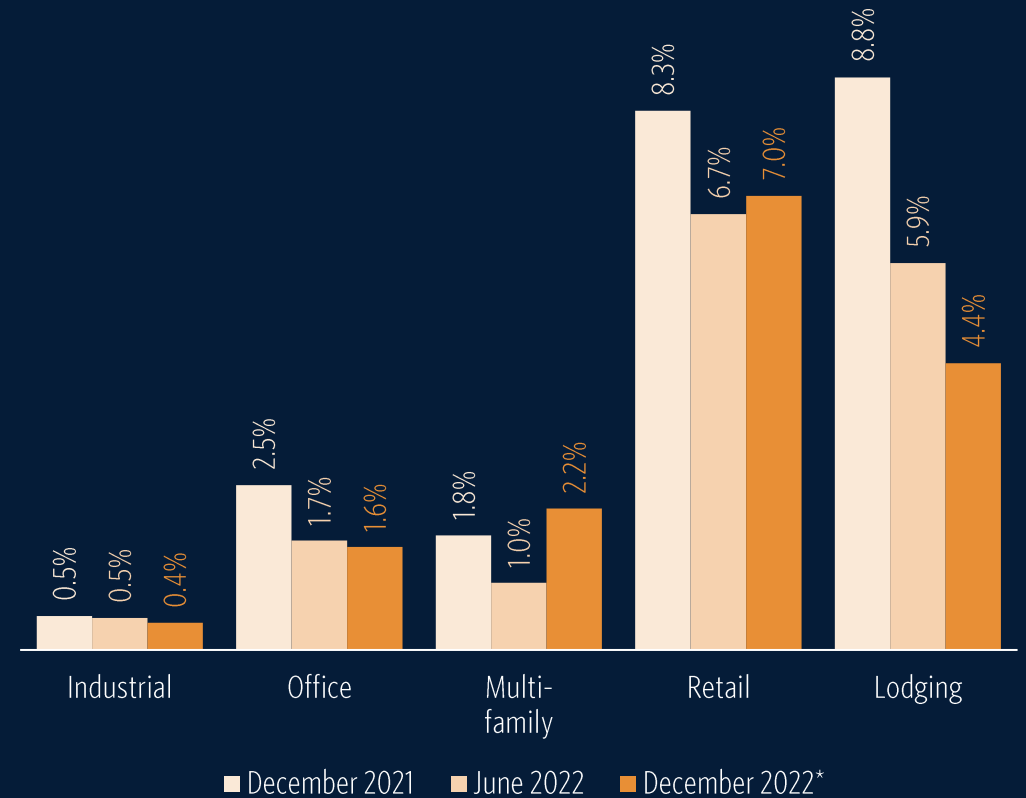
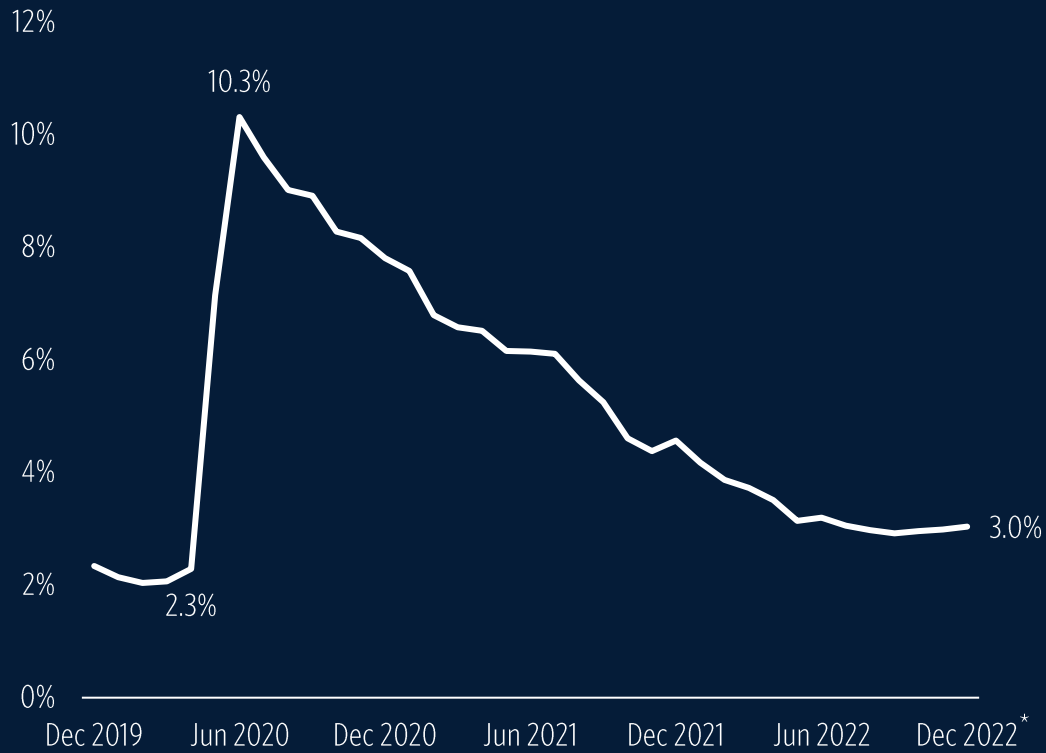
*As of December 31, 2022 | **Series was split up starting in 2014



Delinquency rates for commercial mortgage back securities (CMBS) have stabilized at around 3.0%, returning to healthy levels seen before the COVID-19 pandemic...

CMBS delinquency rates

CMBS delinquency rates by property type



Source: [Trepp](#) | Geography: US

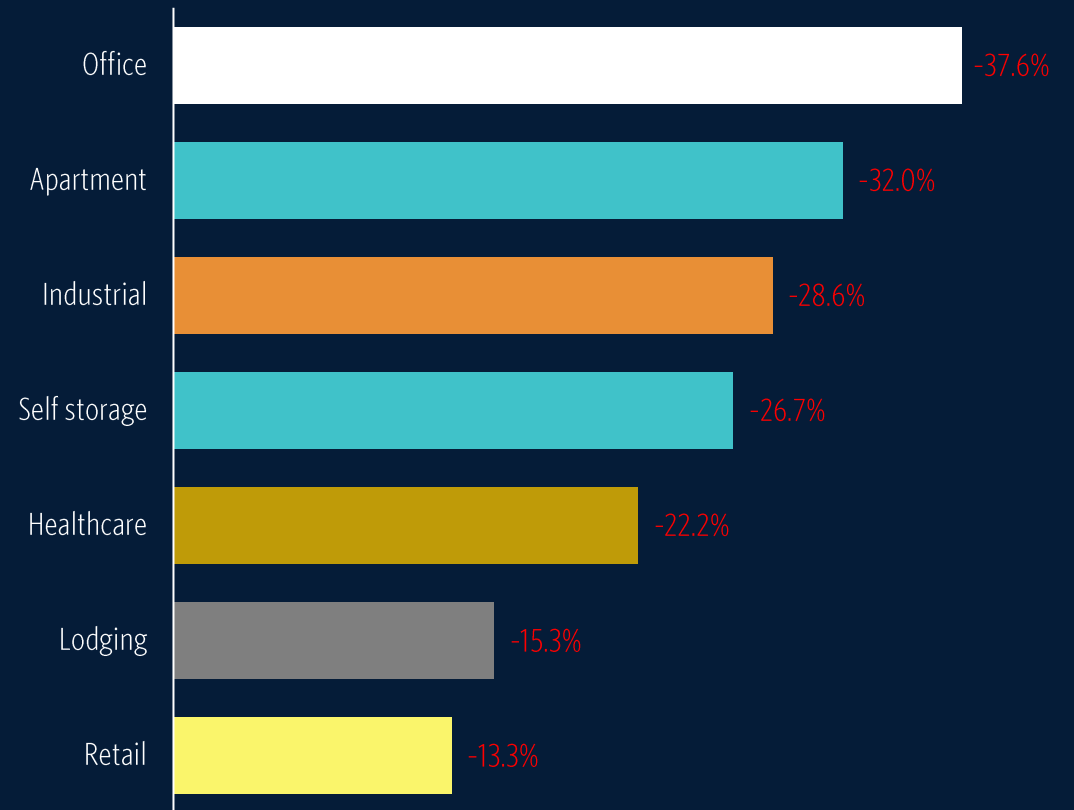
* As of December 31, 2022



...but lack of stress in debt markets hasn't stopped the punishment of public REITs. Higher interest rates are the main headwind, but office owners face a unique challenge in work-from-home shifts.

Sector-specific REIT index total returns (rebased to 100 at end of 2015)

Sector-specific REIT index total return YTD*



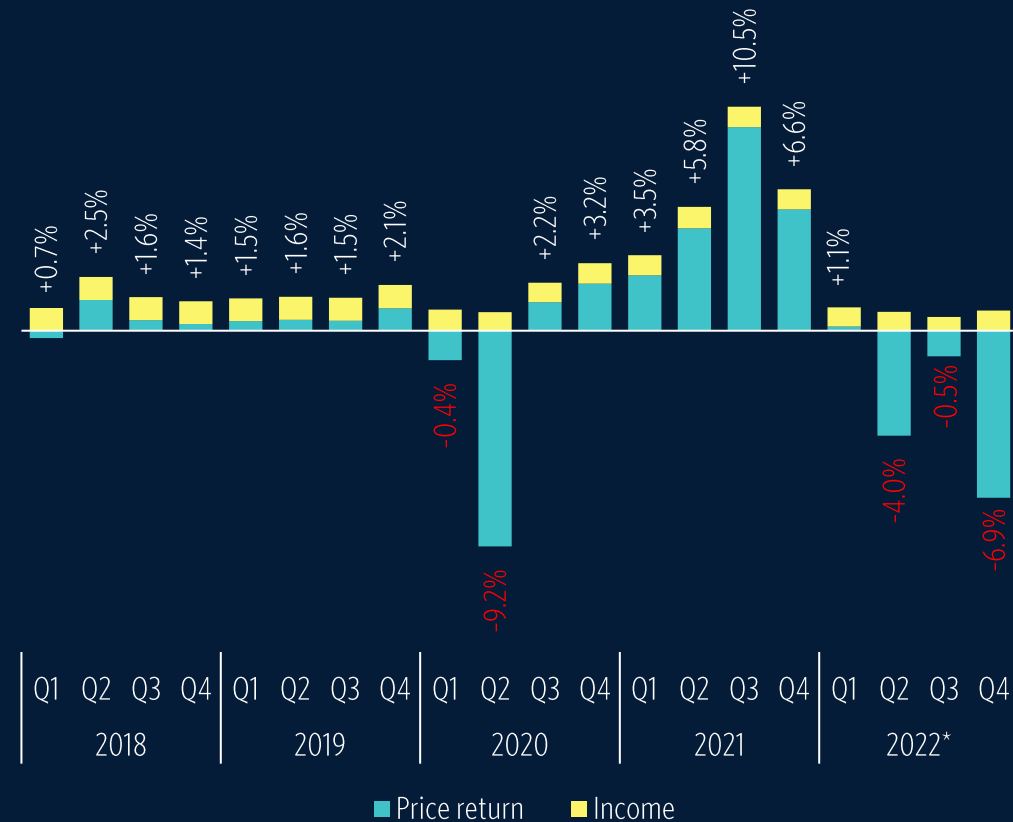
Source: [Nareit](#) | Geography: US

*As of December 31, 2022

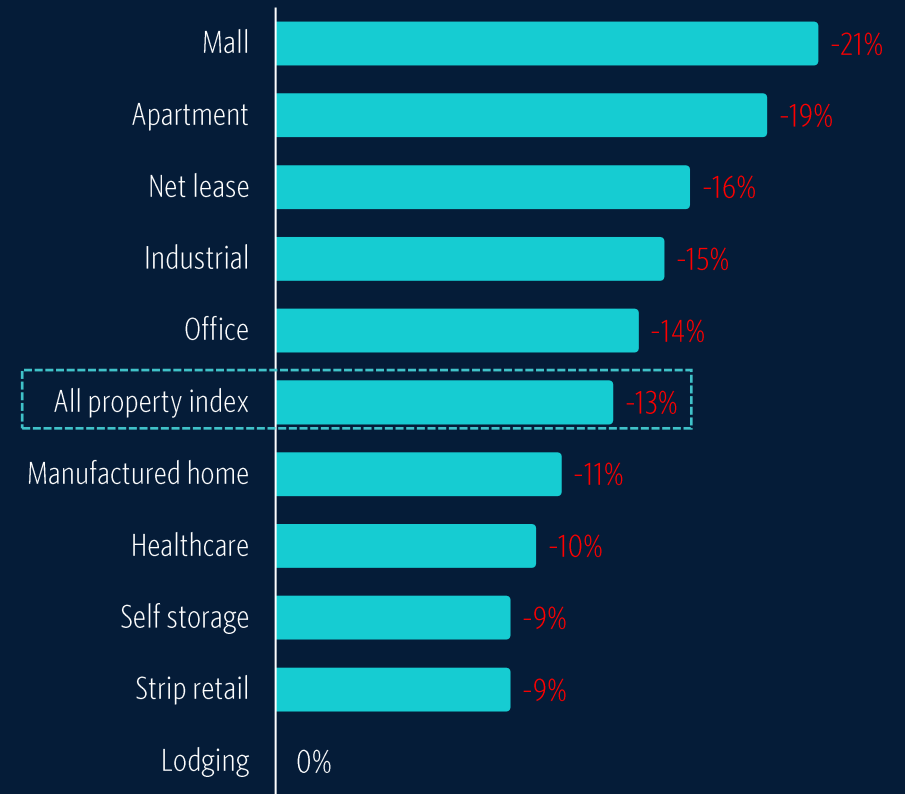


Private markets are no longer insulated from this pain as property revaluations start to take place and rents across the US start to shrink in some sectors.

Green Street All Property Return Index



Green Street Price Index one-year change by property type*



Source: [Green Street](#) | Geography: US

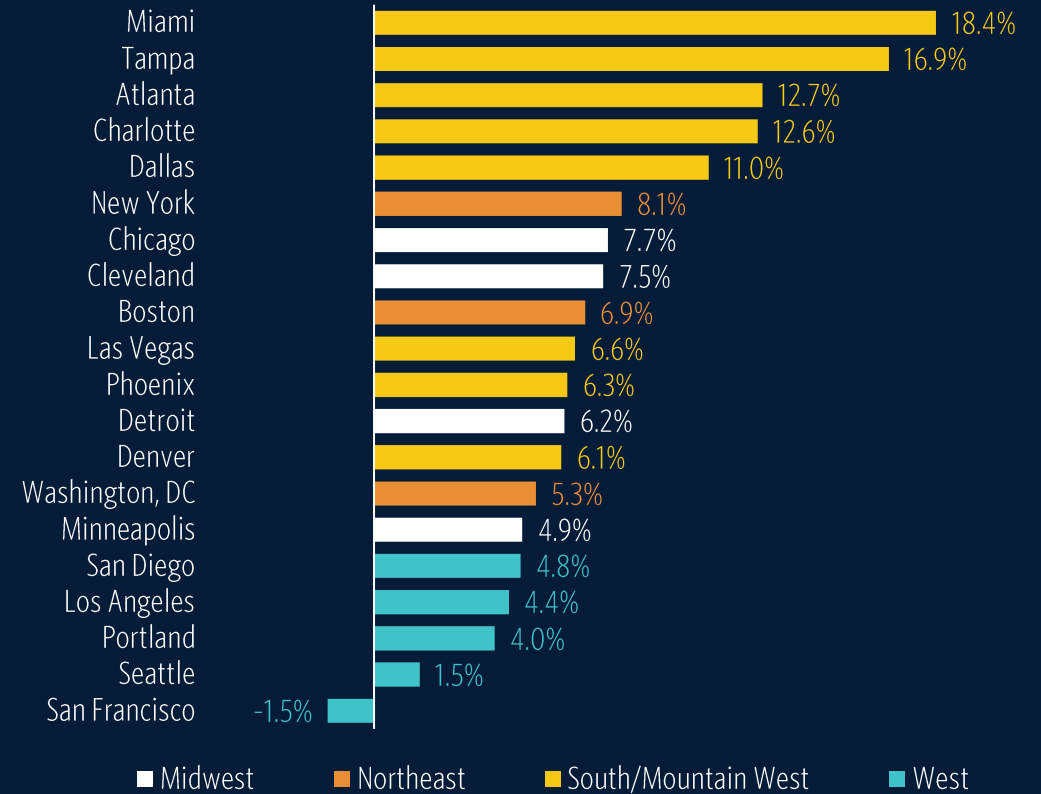
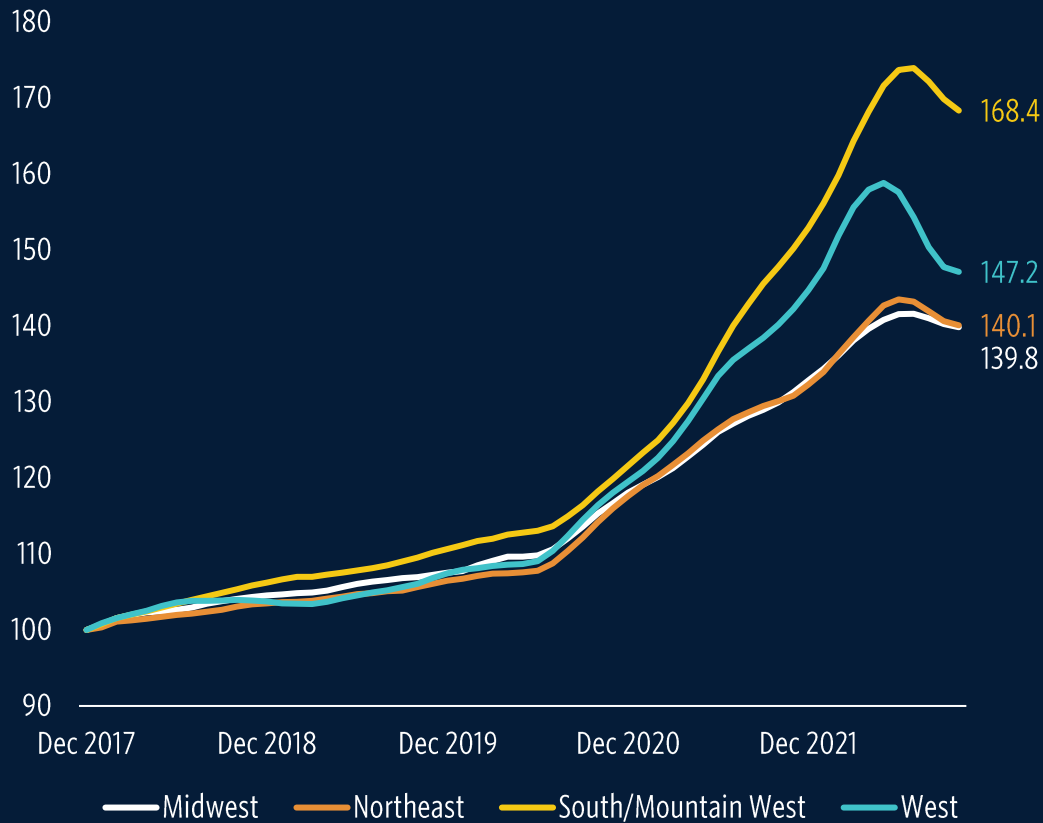
* As of December 31, 2022



In residential real estate, the Sun Belt saw rapid home price appreciation since the start of the COVID-19 pandemic. Now, prices are starting to return to historic levels...

Average home price appreciation across select cities in US regions (rebased to 100 at end of 2017)*

One-year change in home prices*



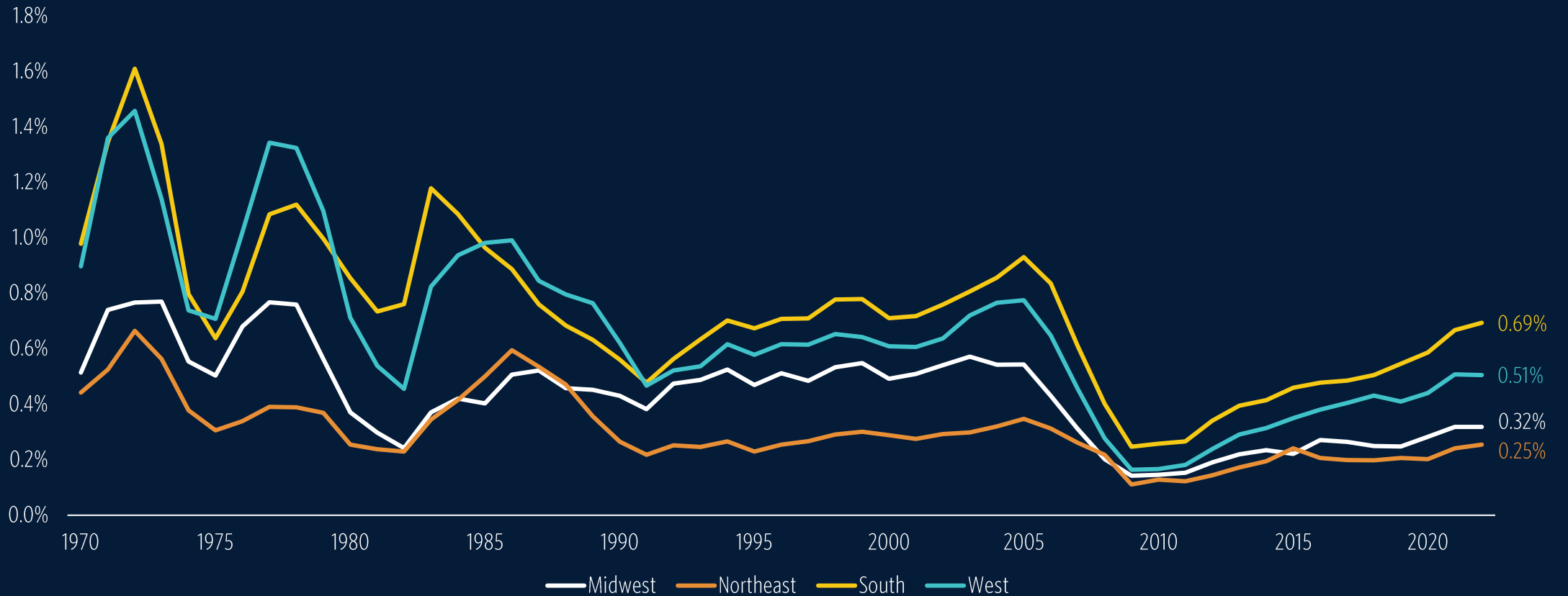
Source: FRED | Geography: US

*As of November 30, 2022



...and despite a drastic climb in financing rates, new home construction continues to grow. A potential headwind to home price appreciation in the South is the prospect for more supply.

Housing starts as a share of population by region*



Source: [US Census](#) | Geography: US

* As of December 31, 2022



Real assets



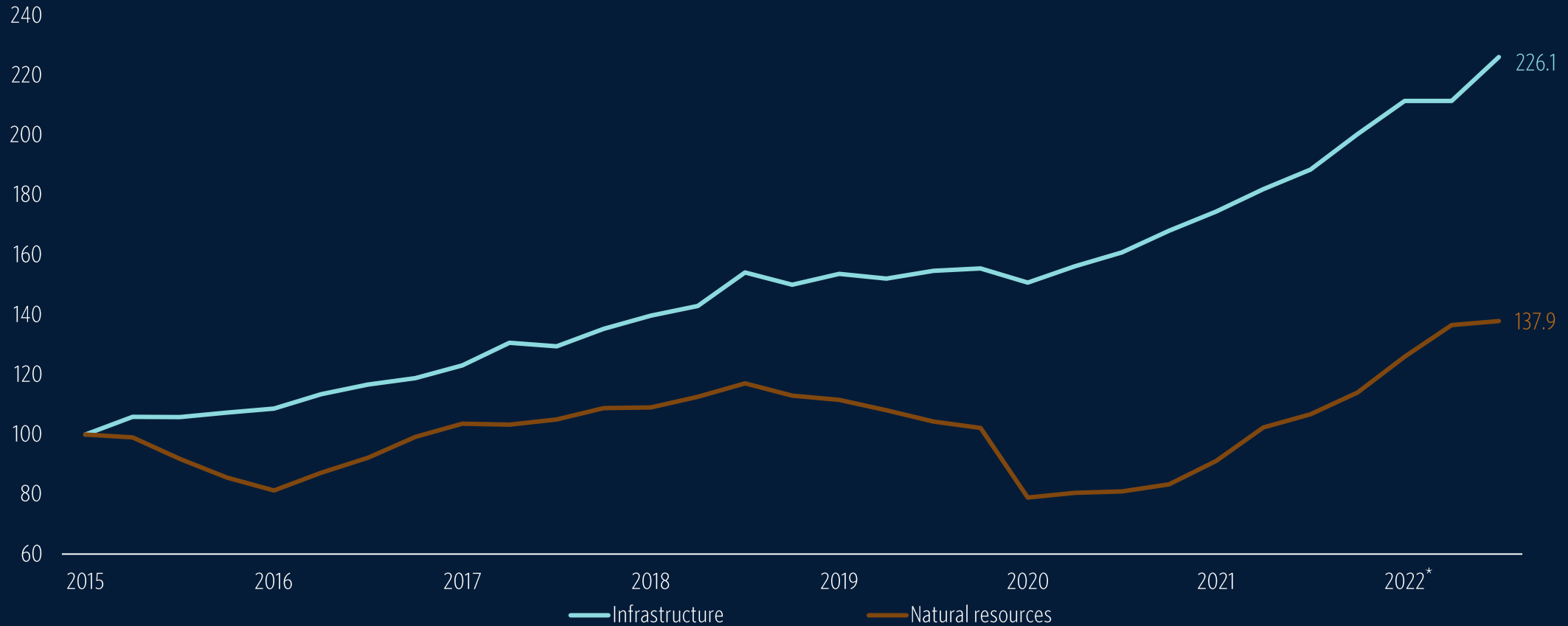
Key takeaways

- Infrastructure funds succeeded in fundraising where many of its private markets asset class peers largely did not, raising north of \$60 billion in the largest fundraising year for the asset class on record.
- While the first half of 2022 saw a run up in the prices of many raw materials, the back half of the year saw a retreat in spots for Brent, copper, and agricultural commodities.
- Despite some commodity prices backtracking, public market equities in both traditional and transitional energy managed to hold on to gains made in early 2022.
- Venture activity for climate tech and cleantech startups has remained quite strong in the face of a broad venture activity slowdown late in 2022.



Infrastructure funds maintained strong performance through Q3 2022, extending a string of steady returns in this inflationary environment. Natural resources has rebounded from 2020 doldrums.

Select PitchBook US Private Market Indexes performance (indexed to 100 in 2015)



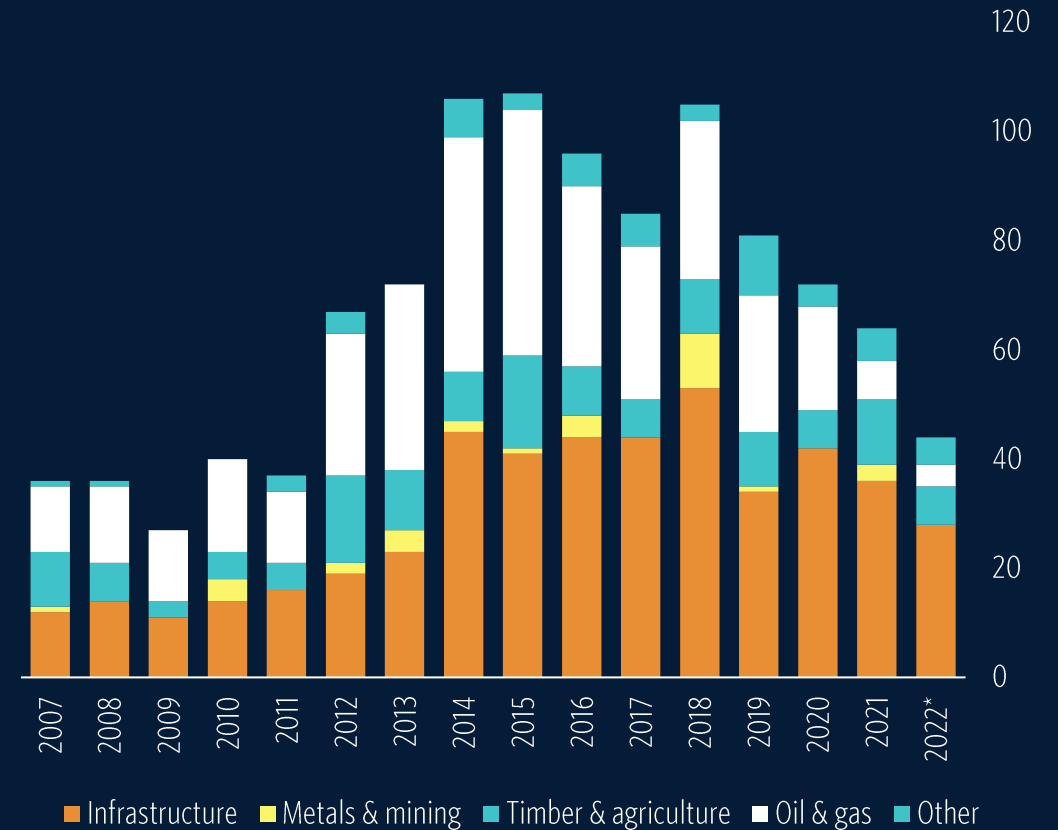
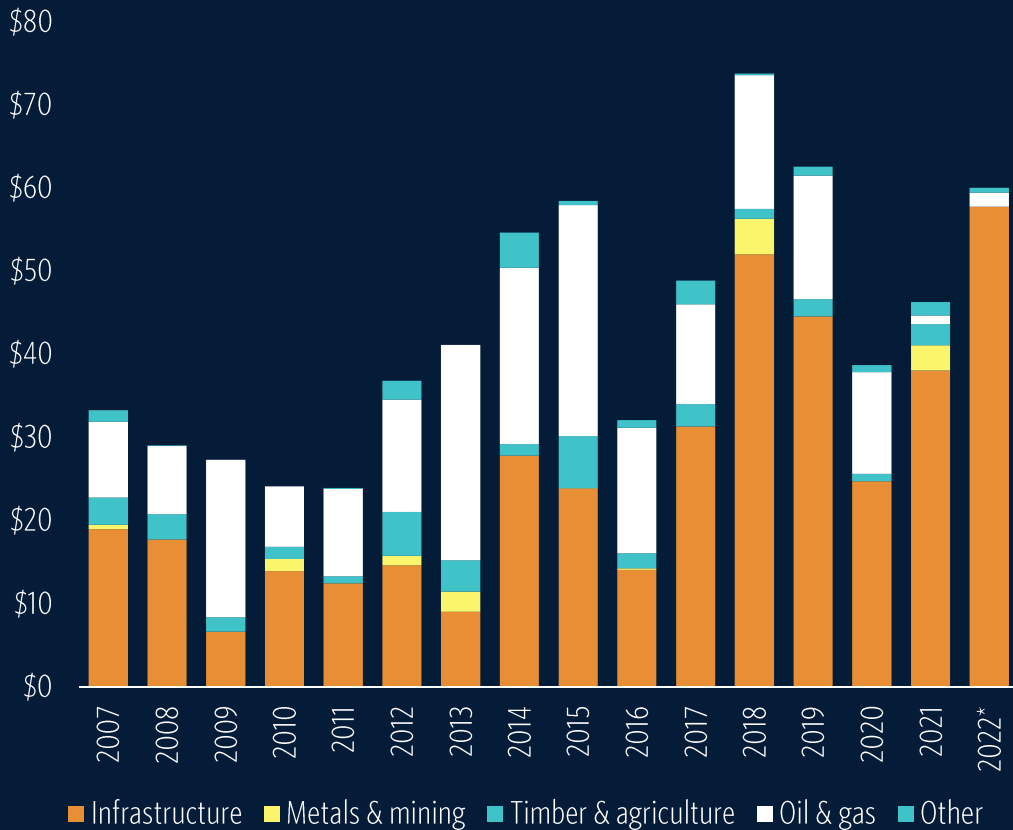
Source: PitchBook | Geography: US



Real assets fundraising neared its all-time annual high in 2022, dominated by infrastructure. The passage of infrastructure legislation may help bolster fundraising in 2023 as well.

Capital raised (\$B) for select strategies

Funds closed by select strategies



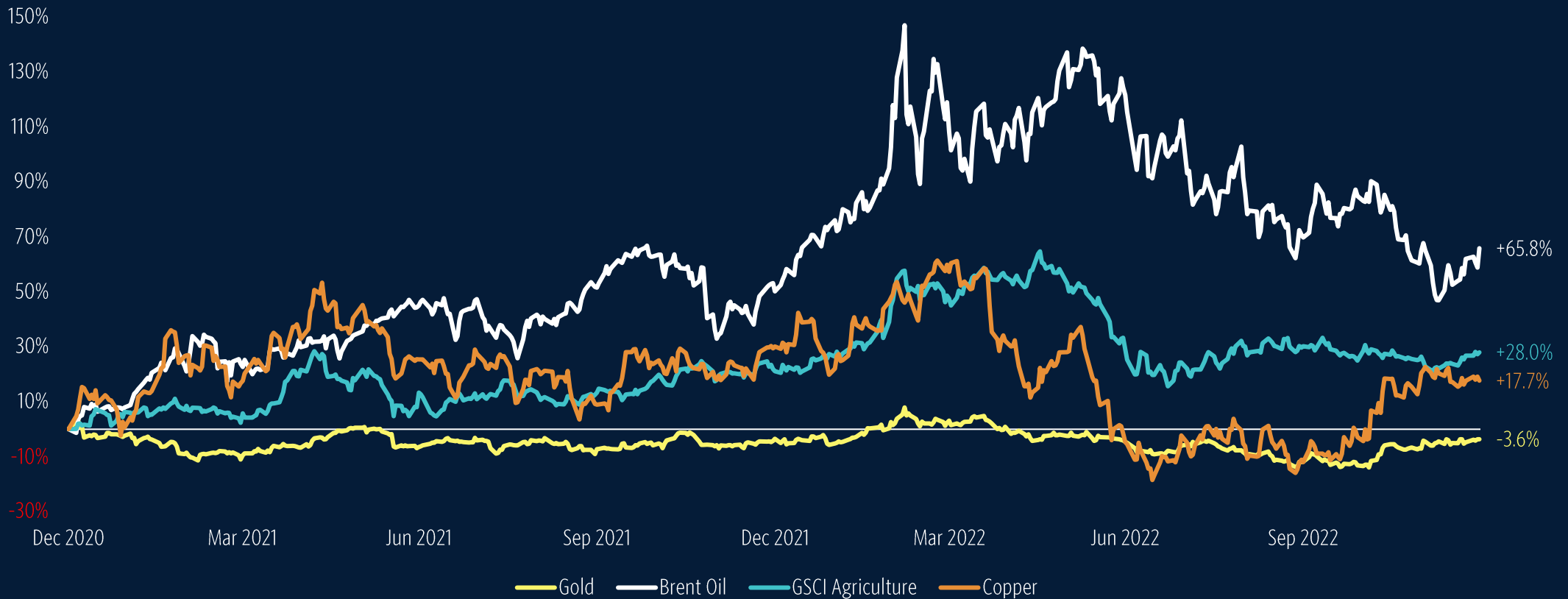
Source: PitchBook | Geography: US

* As of December 31, 2022



Commodities were strong performers in the face of rising global macroeconomic headwinds. As the Chinese economy reopens, it will support commodities prices such as crude and copper.

Select commodities price performance over the last two years*



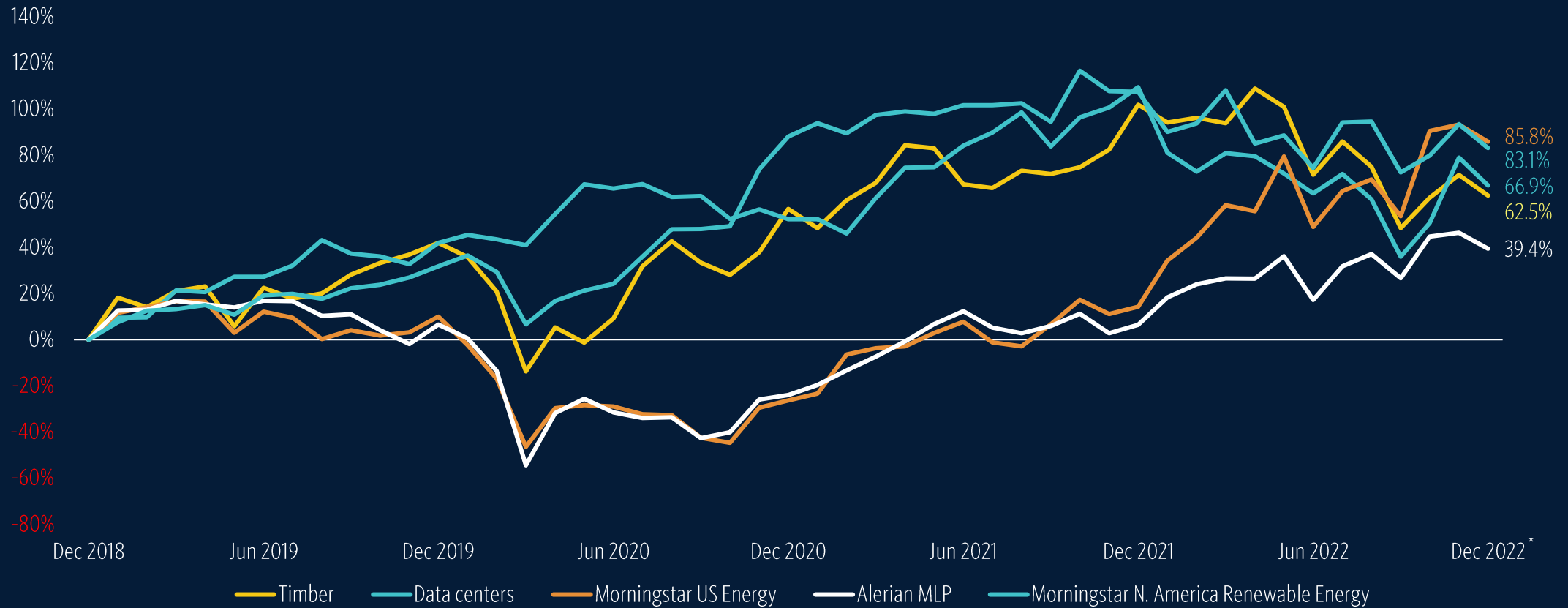
Source: Morningstar | Geography: Global

*As of December 31, 2022



While commodity price appreciation has lost some steam, a basket of public equities composed of traditional real assets and renewables continues to cling onto gains made in 2021...

Select real assets public equity total returns



Sources: [Nareit](#), Morningstar | Geography: US

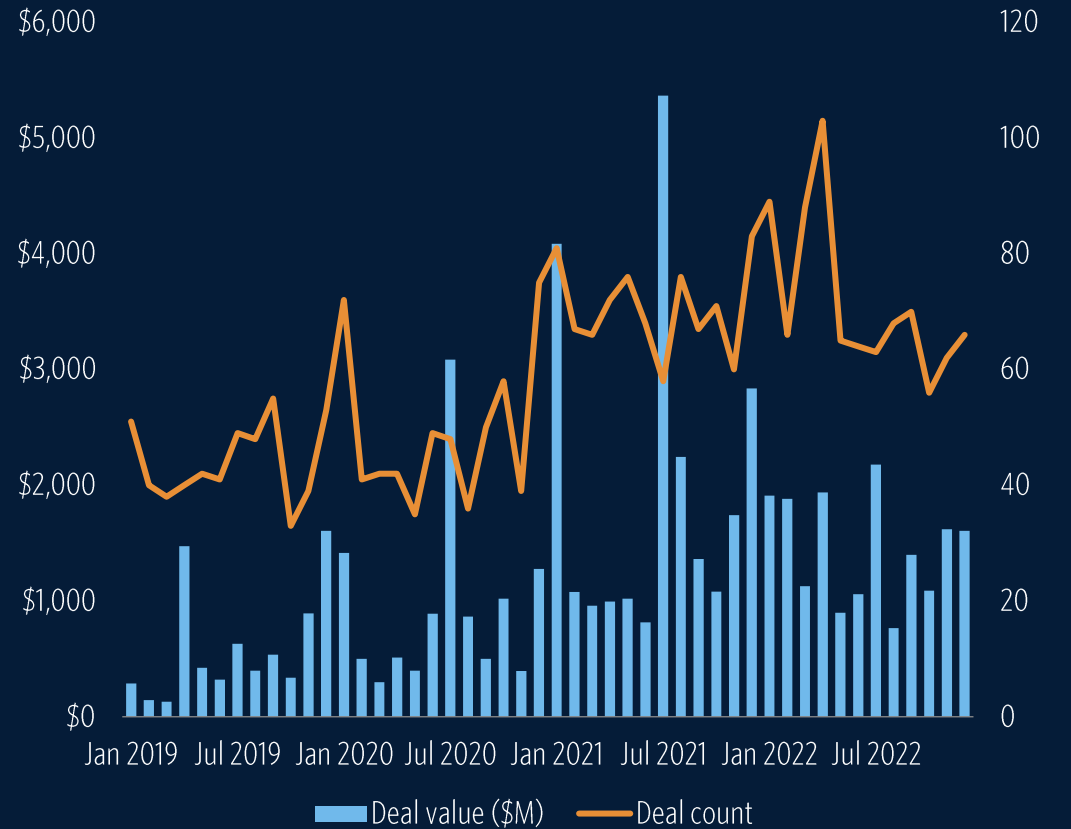
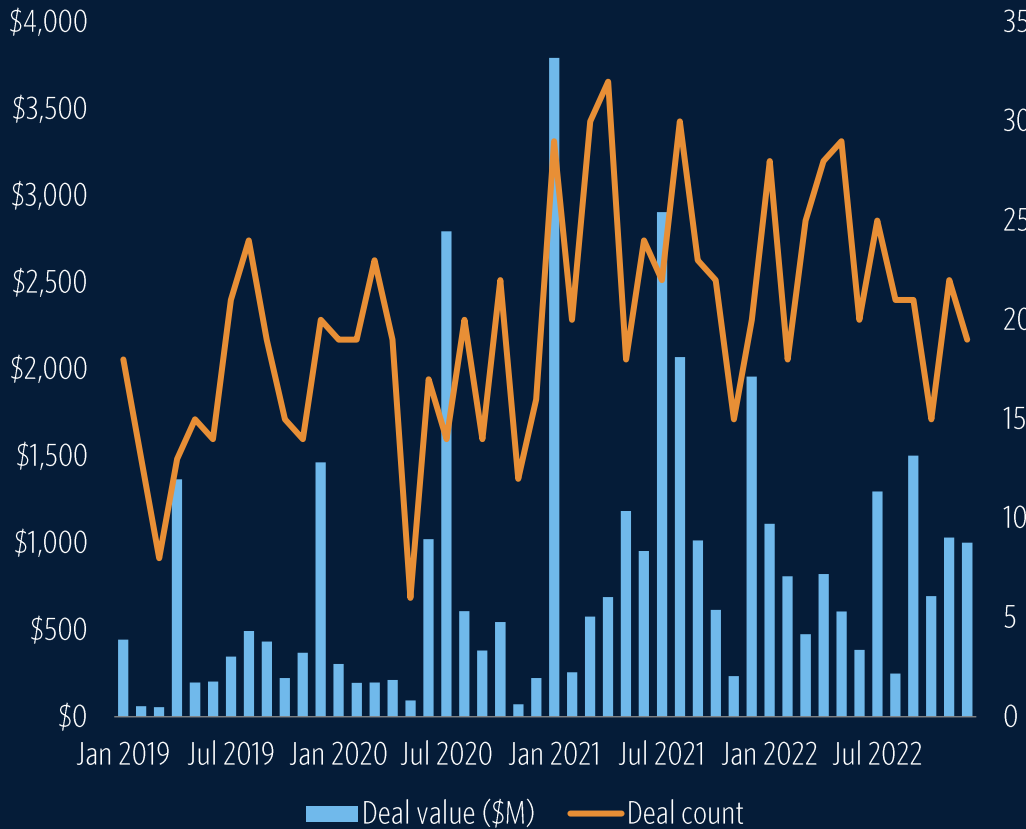
* As of December 31, 2022



...and VC deal activity in energy transition-related startups remains robust in count and dollar value terms, despite the pullback in the broader venture ecosystem.

Climate tech VC deal activity by month*

Cleantech VC deal activity by month*



Source: PitchBook | Geography: US

* As of December 31, 2022



Debt markets



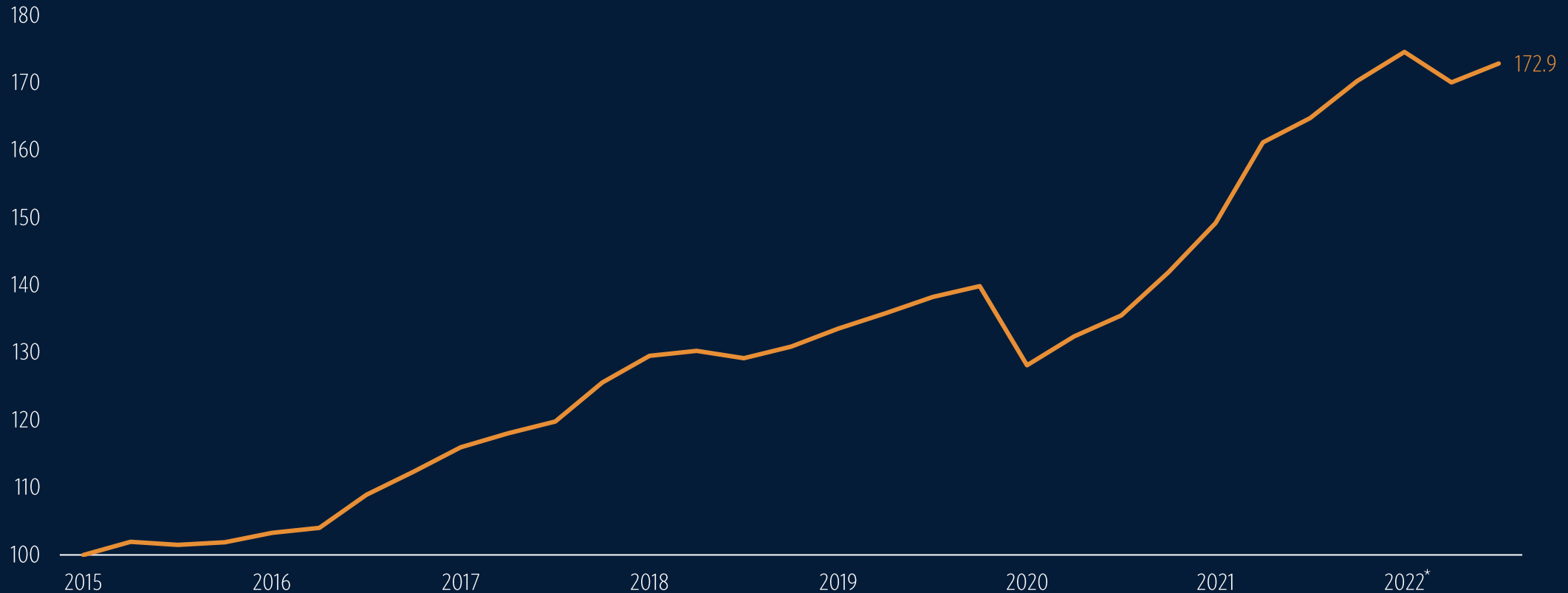
Key takeaways

- Banks are continuing to tighten lending standards for small- and medium-sized businesses, according to the Fed's [Senior Loan Officer Survey](#).
- New issuance of leveraged loans and high-yield bonds all but stopped in the back half of 2022 due to skyrocketing new-issue yields demanded by buyers and several high-profile leveraged loan sales that went awry during the year.
- The pullback in bank lending has presented an opportunity for private debt lenders. Asset managers are taking advantage, with 2022 private debt fundraising coming in at \$107.5 billion in new capital, close to the all-time high reached in 2021.
- Notably, new-issue yields on private debt instruments broadly remain elevated, despite a narrowing in investment-grade bond spreads over Treasury bonds in the last two quarters of 2022.



While the second quarter of 2022 saw the first negative quarterly return for debt funds since the beginning of 2022, the third quarter saw a rebound motivated in part by higher benchmark rates.

PitchBook US Private Debt Index performance (indexed to 100 in 2015)

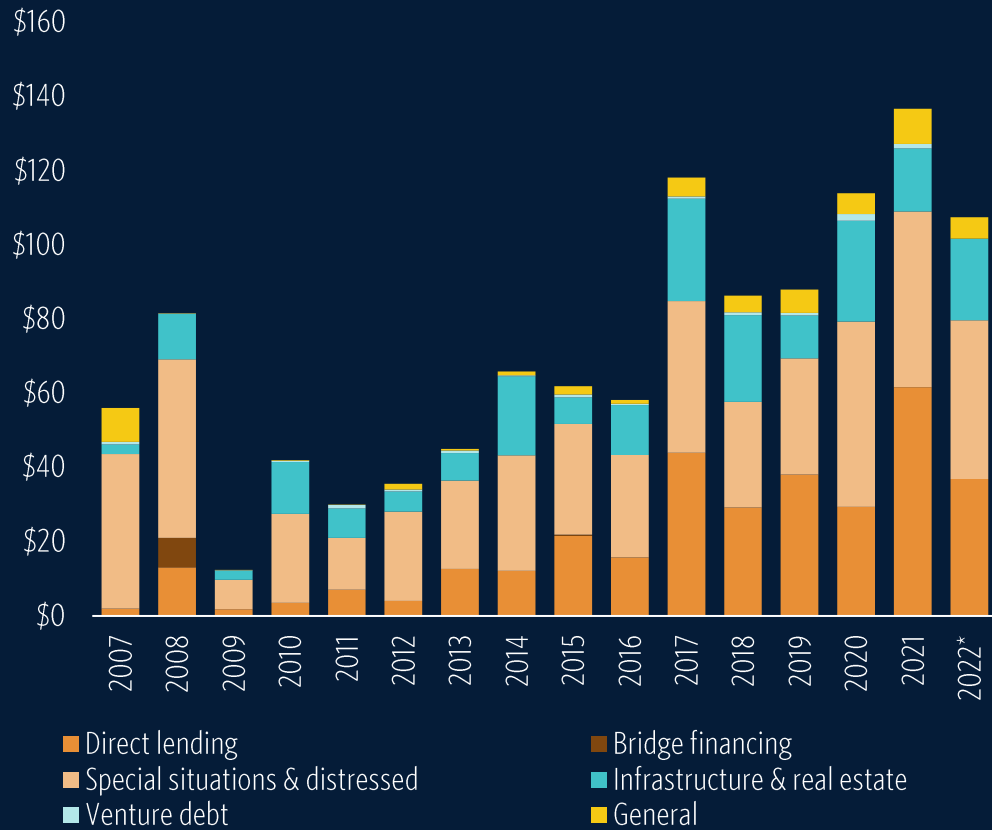


Source: PitchBook | Geography: US

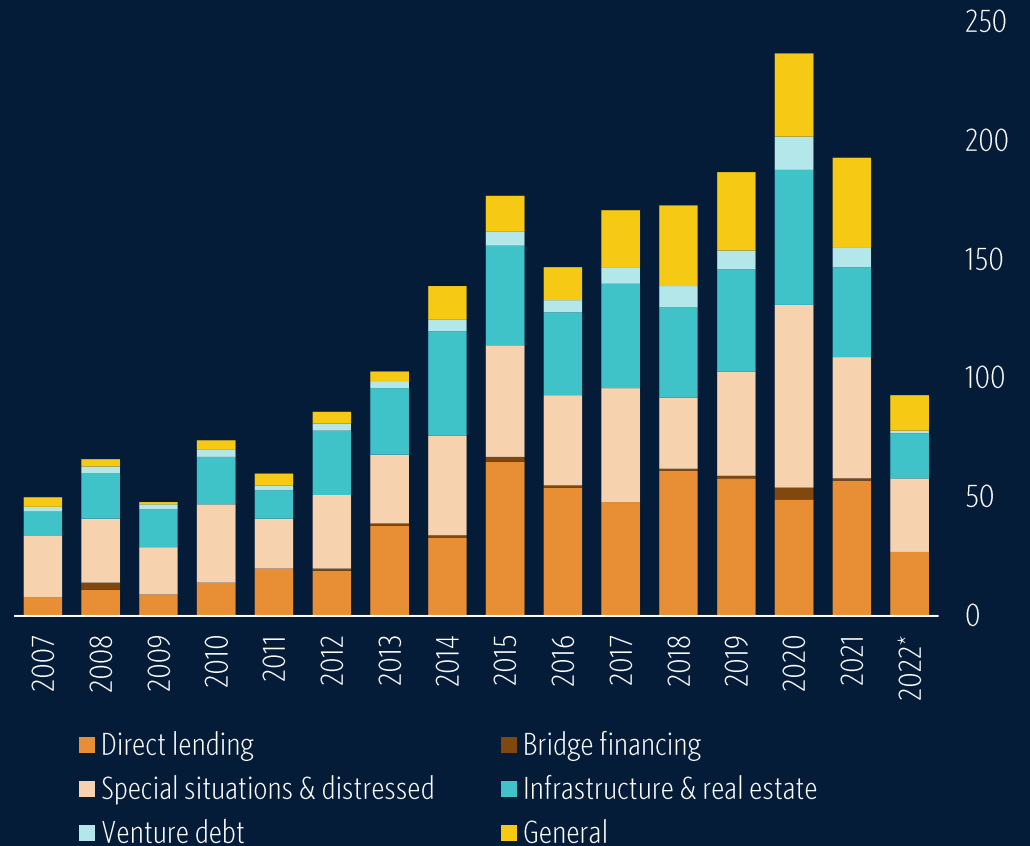


Closed-end private debt saw record fundraising in 2021, and 2022 has tracked well above median annual fundraising...

Capital raised (\$B) for select strategies



Funds closed by select strategies



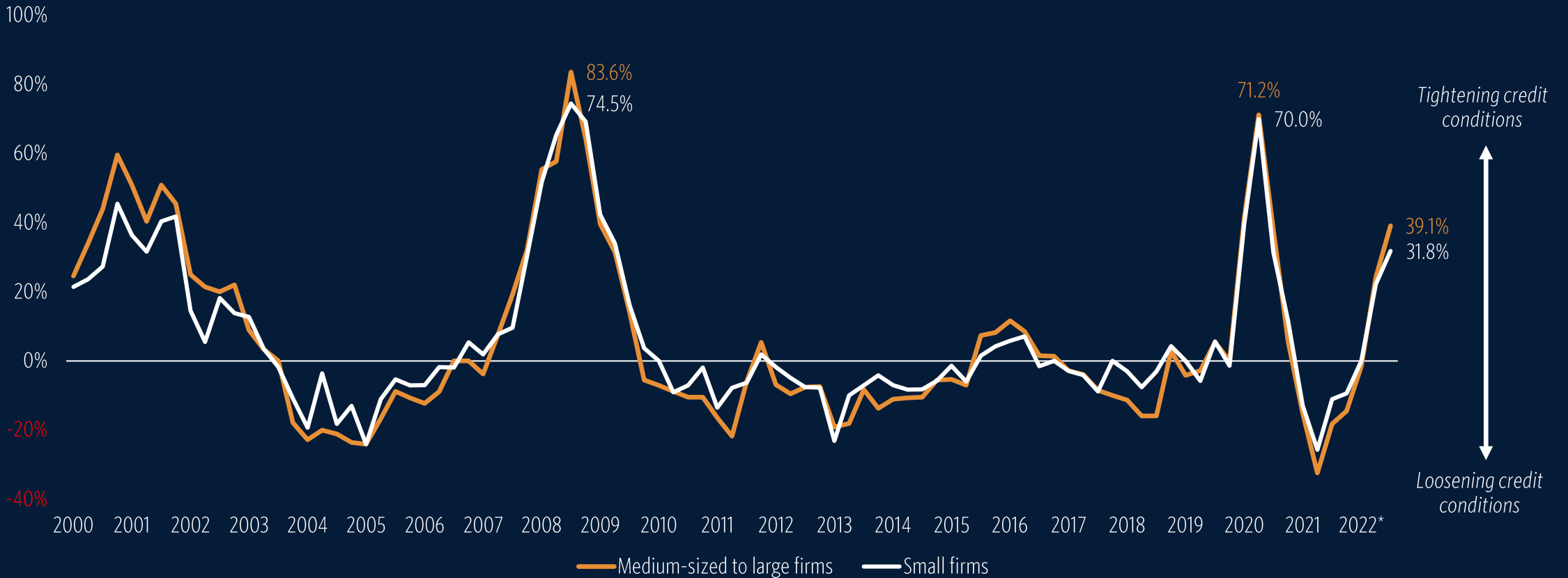
Source: PitchBook | Geography: US

* As of December 31, 2022



...and while defaults remain low, variable rate debt is still attractive to many LPs. Tightening credit conditions aren't ideal, but there is opportunity for market share gains given the bank pullback.

Net percentage of banks tightening standards on loans to small and medium-sized to large firms



Source: [Senior Loan Officer Survey](#) | Geography: US

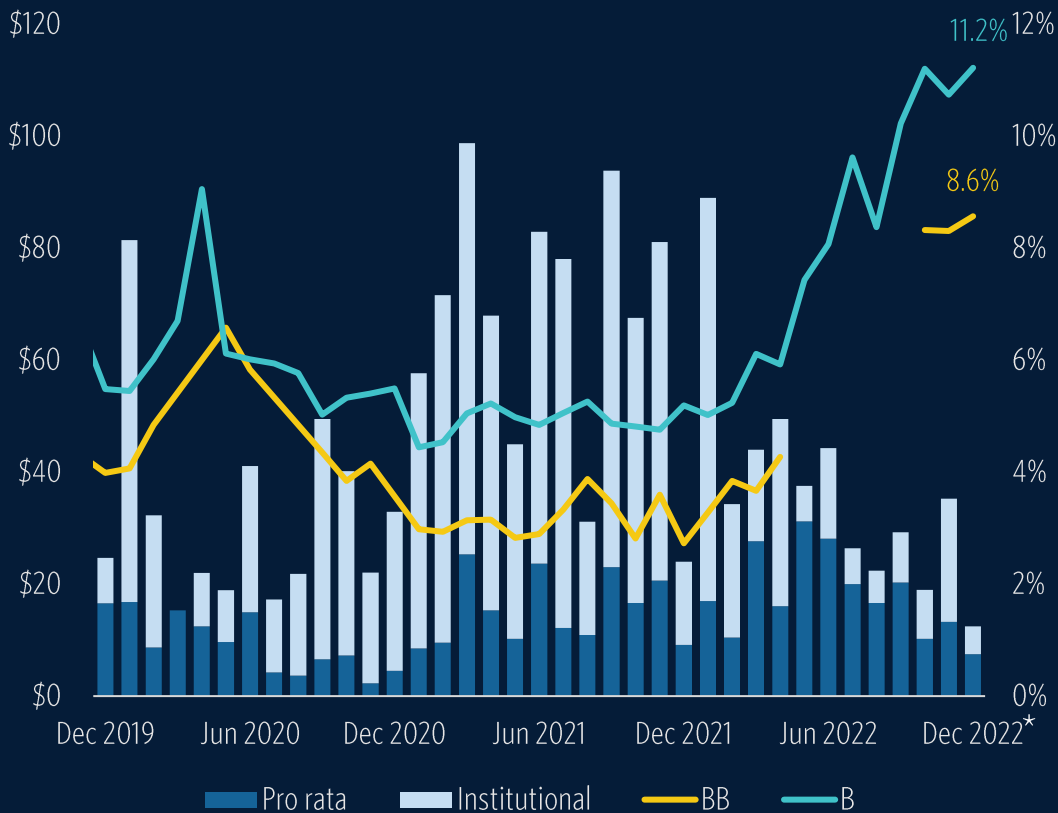
*As of November 7, 2022



Leveraged loan markets are feeling pain, with new-issue yields on single and double B leveraged loans doubling and tripling, respectively. Secondary bids for loans have drifted down relative to par.

Leveraged loan volume (\$B) and yields

Weighted average bid of leveraged loans



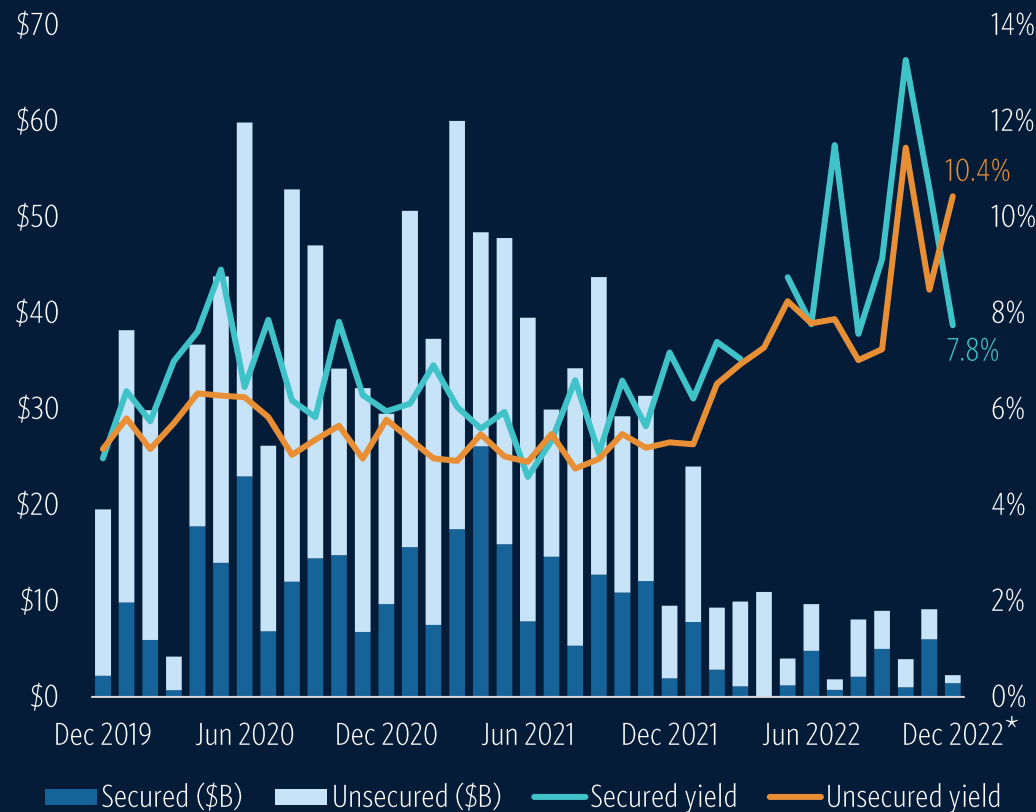
Source: LCD | Geography: US

*As of December 31, 2022
Note: BB has some periods where data counts are too low for inclusion.

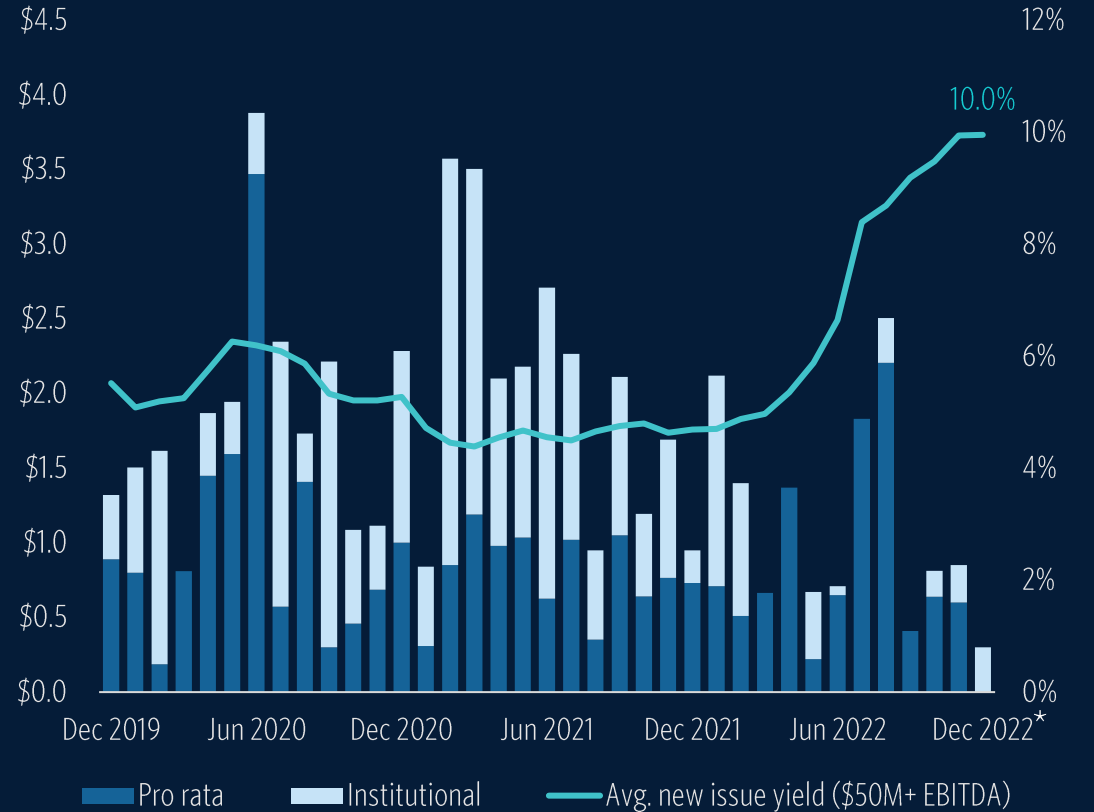


Meanwhile, the high-yield bond issuance and middle-market lending window has all but closed as a result of tightening credit conditions. A door is open in 2023 for private credit to step into the gap.

High-yield bond volumes and yields



Middle-market loan volume and yields



Source: LCD | Geography: US

*As of December 31, 2022

Additional research

Market updates



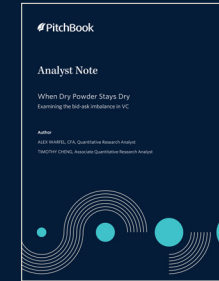
January 2023 Global Markets Snapshot

Download the report [here](#)



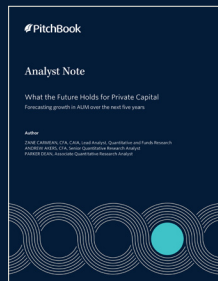
2022 Global Fund Performance Report (As of Q2 2022 with preliminary Q3 2022 data)

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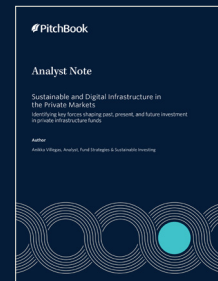
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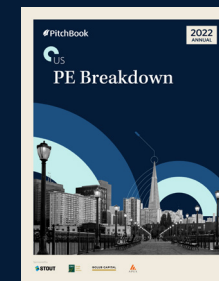
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