ADDEPAR

2022 Annual Report

How portfolios navigated inflation into the cross-currents of decelerating growth

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Introduction

After 12 years of clear skies for global financial markets, 2022 was downright stormy. In the last year, we have witnessed unprecedented turbulence and uncertainty in markets we thought were well-understood and predictable. Even the cash market — the bastion of boring — was turned upside down as interest rates shot up in response to rampant inflation. The consequences of this single change have been profound, driving borrowing costs for companies higher, threatening investment strategies reliant on leverage and putting significant pressure on investors to optimize cash positions and reduce drag. Indeed, the drawdown in equity markets seemed to reinforce market uncertainty, as reliable diversifiers such as hedge funds, private equity and even bonds were actually drawn down with equities.

All of this turbulence left investors with the sense of navigating uncharted waters. From our perch at Addepar, we watched as global investors internalized these changes and collectively tapped their instruments, so to speak, to make sure that what they were seeing in front of them was in fact real. It was real. And it was uncharted, as stormy financial markets often do not function as our conventional theories and models predict. Just as you can't navigate by the stars in a storm, investors can no longer trust their 50-year-old models (CAPM, MPT, etc.) and heuristics. Investors today have likely never lived through a market like this one, which means track records and experience are also unreliable for managing risk.

And we, on the research team at Addepar, watched all of this play out from our unique vantage point. We saw these movements in real time, and we began to understand the value of collective intelligence; the ability to share navigational data with investors in real time. We helped investors navigate this uncertainty through novel analytics and insights.

By way of background, Addepar was actually founded on the heels of another major financial crisis. In 2009, the lack of transparency for investors on portfolio positions, exposures and risks spurred our founders to begin building a tech and data platform that could answer three key questions: where are my assets, what's been impacted and what should I do? Addepar's research team was built to answer the questions that would follow. Where should I go next? Can I optimize my portfolios given what we're seeing?

The research platform natively supports all ownable asset categories, with a particular focus on alternative asset classes such as hedge funds and private equity. Our analysis is based on the

assets of independent registered investment advisors (RIAs) and single family offices (SFOs), a subset that represents more than 275,000 portfolios with almost $4 trillion in assets[1]. The true power of our platform is its ability to fundamentally change how investors make decisions. The research team helps investors leverage the power of Addepar to improve portfolio performance.

For more information or to connect with the team, email Research@Addepar.com.

[1] The aggregated and anonymized data set that forms the basis of this paper is, as far as we know, one of a kind in its ability to aggregate across accounts to the full household level inclusive of public and private assets for private wealth investors. Although quite mechanical, full portfolio data aggregation on a timely basis is the most fundamental best practice (and quite hard to achieve) because it is the critical foundation required for all portfolio analytics. Our data are also sought out by top thinkers in economics from institutions like Chicago Booth, Stanford and Harvard who partner with us to deliver deep insights that can help you achieve better portfolio outcomes.

Asset allocation and performance update

You may have noticed that equity and bond markets dramatically sold off in 2022, as the Fed and other central banks responded to inflation with record tightening. Looking forward into 2023, the risk of recession and persistent inflation may create additional headwinds for investors. Many are looking to diversify their portfolios with illiquid and alternative assets, such as private equity. Sophisticated investors, or "smart money," who have honed their skill in selecting and managing alternative assets over the last few decades, are better positioned for these risks through diversification via uncorrelated alpha return streams.

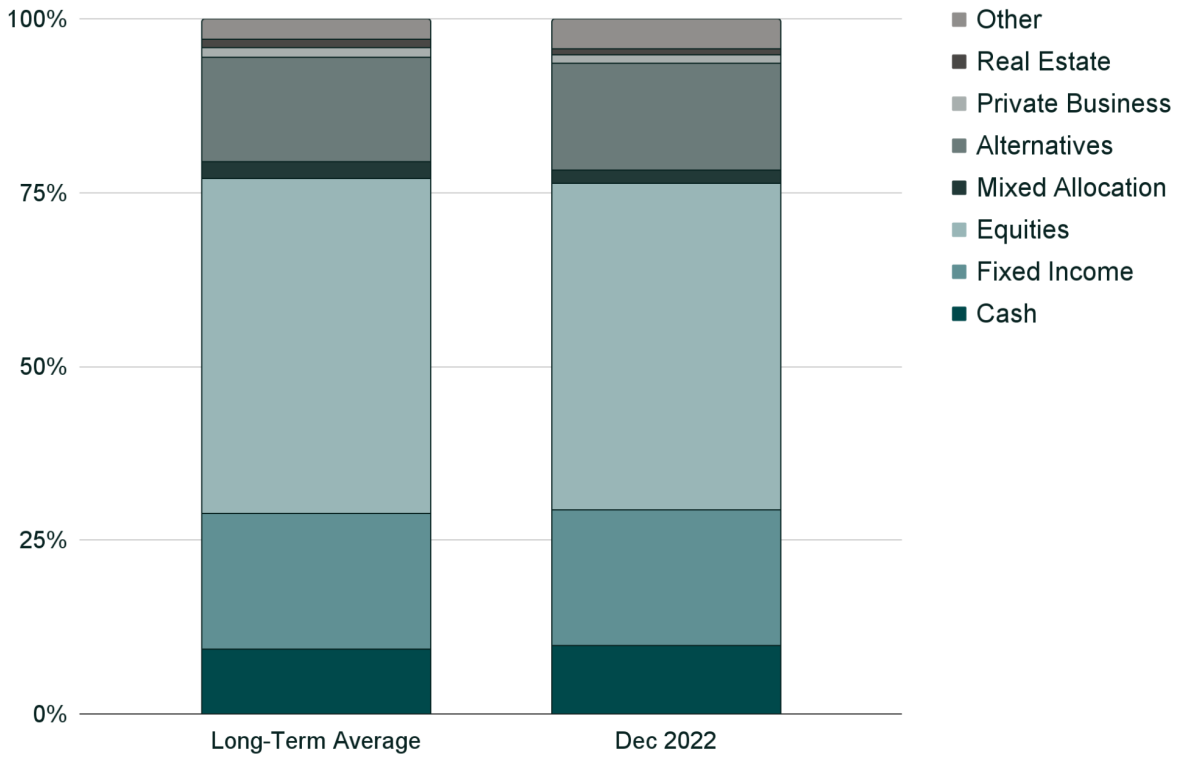
The "smart money," however, may not be as "smart" (or in this case, diversified) as many assume. As we shall show, a significant component of alternatives exposure is just equity beta, which means a lot of work is being done — and fees are being paid — to simply add to an already large public equity exposure. On average, we can see that portfolios are not well-diversified and remain susceptible to those economic forces that are harder to diversify but happen to be major drivers of equity performance, such as inflation and slowing growth. Additionally, higher interest rates shine a light on cash management, such as the drag that tends to come with increasing allocations to private equity. Higher private equity commitments means higher cash reserves to fund those commitments, which means investors with strong cash management skills stand to really benefit. But reducing cash drag is hard, and few investors have built sophisticated cash strategies in the way that corporate treasuries have, meaning they may miss a chance to outperform in an environment where other assets prices may continue to fall.

But perhaps we are putting the cart ahead of the horse; let's get back to sharing some collective intelligence. We start with the examination of the average asset allocation across the Addepar platform (see Exhibit 1). The percentages shown are dollar-weighted across 275,000 portfolios. Equities (47%), fixed income (20%) and alternatives (15%) together make up the vast majority of capital allocations. **Despite extreme market turbulence, and increasing sample size of portfolios over time, the allocation averages remain remarkably stable over the long term.** On average, capital allocations do not shift by more than 1-2% above or below the long-term averages. While the averages remain stable, comparisons of individual allocations against the average can be a useful data point in a broader benchmarking analysis.

Exhibit 1

Allocations remain relatively stable despite excess market volatility and economic uncertainty.

Aggregate asset allocation, long-term average 2016 - 2022 and as of Dec 2022, percent



Source: Addepar

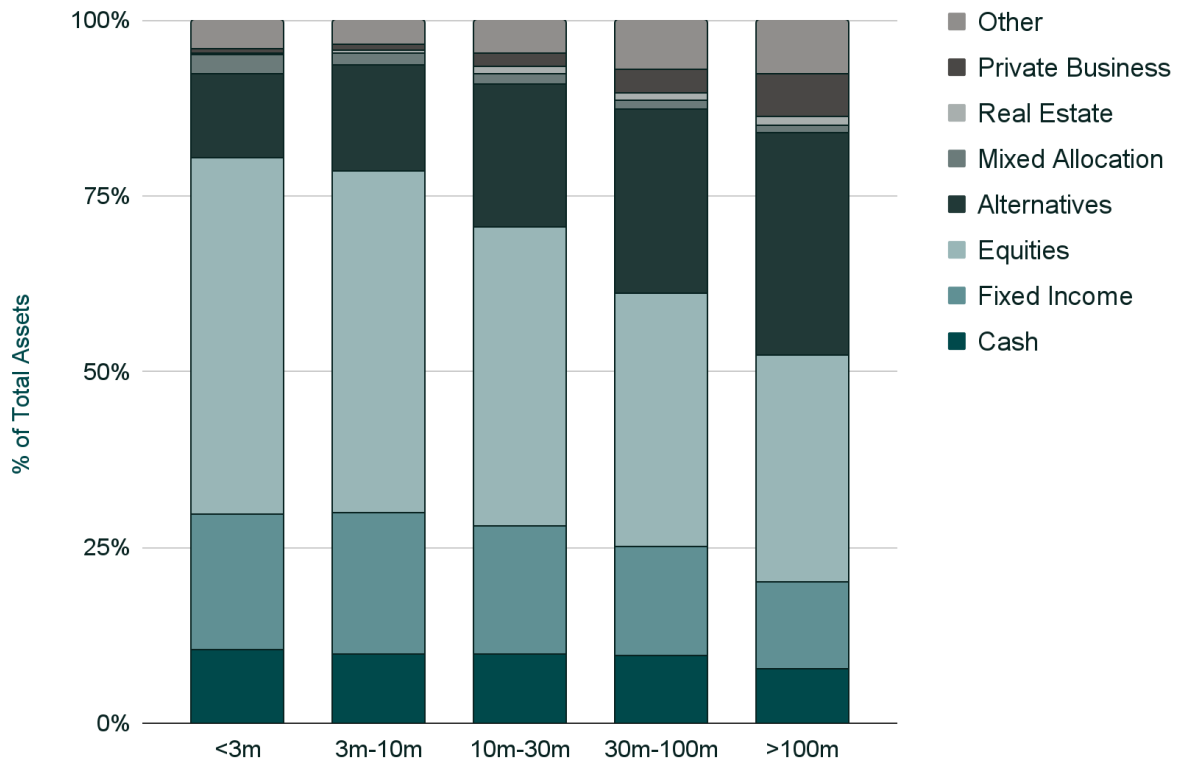
Addepar is used by a highly diverse group of investors. One dimension we examine is how asset allocations differ by the size of their portfolio (see Exhibit 2). Leveraging their competitive advantage of scale and access, we see that larger investors make proportionally smaller allocations to public equities and larger allocations to alternatives.

A best practice employed by many RIA clients is to use benchmarks on the basis of portfolio size to assess the portfolios of new clients and use the benchmarks to educate investors on appropriate asset allocation. In a number of cases, clients have used portfolio benchmark data (such as that in Exhibit 2) to facilitate a fact-based discussion on how to rightsize allocations to alternatives to achieve maximal diversification. As noted, the wealthier the client, the bigger the exposure to illiquid and alternative assets. And yet, as we will show later, this may not deliver factor-based diversification as expected.

Exhibit 2

Allocations toward alternatives increase while equity holdings decline with investor wealth.

Average investor holdings by wealth, percent, Q4 2022



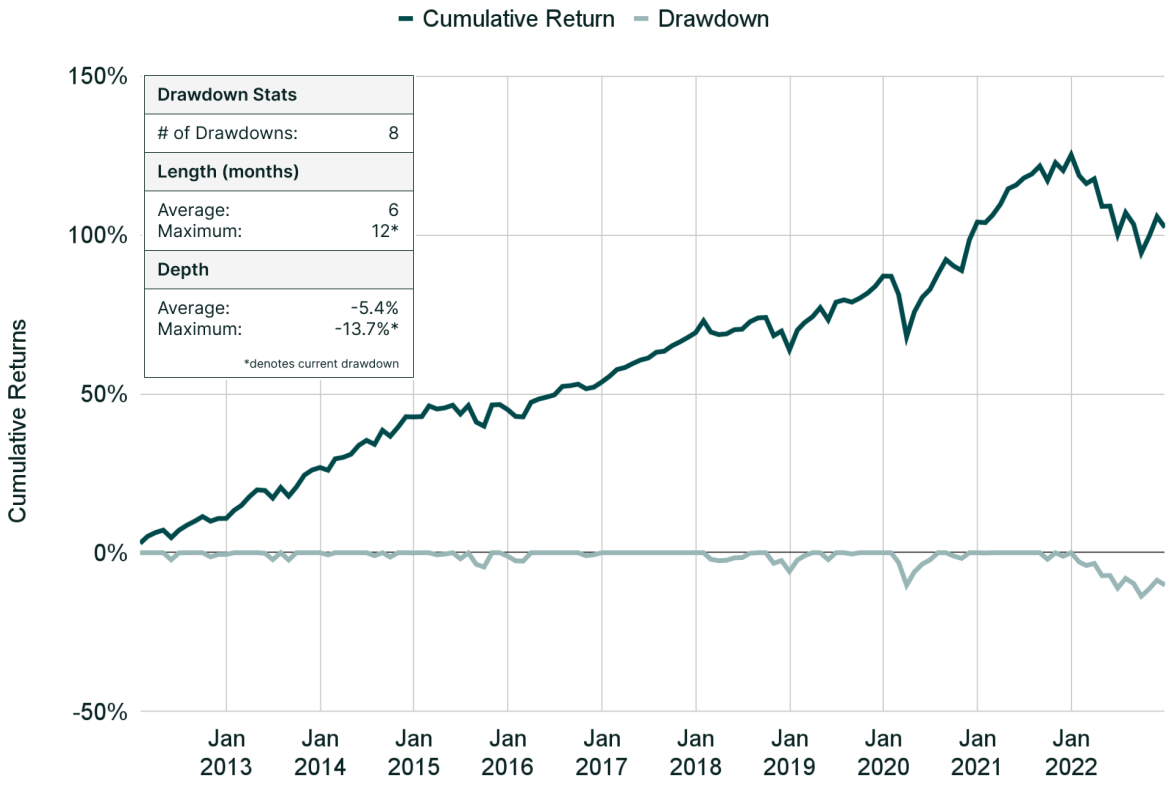
Source: Addepar

In 2022, the median portfolios on our platform returned -10% compared to the -19.4% return of the S&P 500. The following chart shows median portfolio cumulative performance and drawdowns since 2012. The 2022 drawdown was concentrated around the first three quarters of the year, while markets were mostly flat in the fourth quarter. Fed tightening has been unprecedented in recent history in terms of speed and size, leading to the historically deep drawdown. By comparison, a modest bout of quantitative tightening in 2018 led to the more moderate trough seen in Exhibit 3. Our *Submergence Primer* digs deeper into portfolio strategies for immunization against drawdown risk (see Additional Resources for more detail).

Exhibit 3

Strong 2021 investor performance was reversed by the drawdown in 2022.

Cumulative performance and drawdowns of the median investor, percent, 2012-2022



Source: Thomson Reuters for returns Jan 2012 through Dec 2015, Addepar thereafter.

Cumulative returns from Jan 2012 through Dec 2015 are calculated using a portfolio 60% invested in the S&P 500 and 40% invested in 10-Year U.S. Treasuries rebalancing on a monthly basis. Returns Jan 2016 through December 2022 come from the median performing portfolio of all portfolios with data on the Addepar platform across that time period.

Some of our clients also benefit from our historical stress testing and scenario modeling[2] that simulates their portfolio allocations against historical drawdowns and other economic scenarios to better assess risk and the chances of meeting their financial goals. While many visualizations and perspectives exist, let's take a look at one of our favorites: the probability cone.

[2] Learn more about historical stress testing and scenario modeling (see Additional Resources).

Over the last 50 years, economic environments have varied quite dramatically. Returns have also varied significantly, though long-term performance remains high. The average portfolio has produced an approximately 0.5 Sharpe ratio[3] or 5.3% excess return above cash (risk-free rate) with approximately 10.4% annualized volatility. Examining shorter time frames, particularly since the bottom of the Great Recession, investors have done really well, with portfolios on average delivering a 1.1 Sharpe ratio or a 8.3% excess return and relatively low annualized volatility of 7.9%.

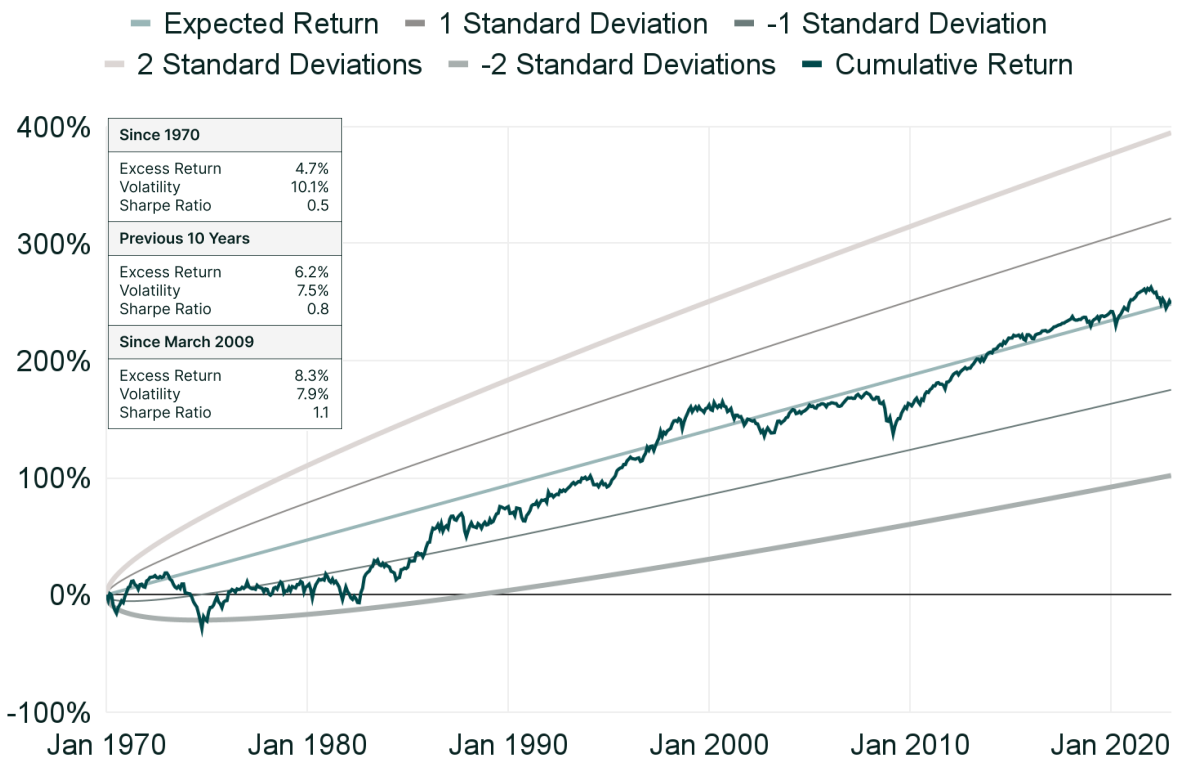
Although performance was quite poor in 2022, it is important to review recent performance in context of the longer-term investment perspective. One can use the following chart as a tool in this endeavor because it's designed to illustrate long-term performance and risk within one visualization. In this case, it shows cumulative performance from 1970 to the end of 2022. The light green line shows the portfolio's excess return[4] goal (which we set to actual return for this analysis), while actual cumulative returns in dark green oscillate around the average. In gray, we have the expected range of returns based on long-term volatility estimates.

[3] Sharpe ratios were calculated by annualizing the average monthly excess return and standard deviation during the given time period.
[4] Return above cash

Exhibit 4

Long-term performance on average remains high, even after the 2022 drawdown.

Sharpe ratio, 2008 to today and 1970 to today



Source: FRED for returns 1970 through 2015, Addepar thereafter.

Investor returns from 1970 to 2015 use historical excess returns of a 60/40 equity and bond portfolio, and returns 2016 through 2022 use the median excess return of investors on Addepar, rebalanced monthly. Expected returns and volatility are based on excess returns in a 60/40 portfolio dating back to 1970 and investor data from Addepar.

While there are many ways to benchmark performance, we believe that the best way is to compare against portfolio benchmarks of similar portfolios. Indices are unfortunately theoretical and quite hard to achieve, as our studies show that investors, on average, systematically underperform equity benchmarks and private capital benchmarks[5]. Unlike other data sources, Addepar isolates the true net of fees performance of private wealth investors. Investment managers who serve this segment have an edge with this data set in relation to the competition as these benchmarks are more attainable and realistic.

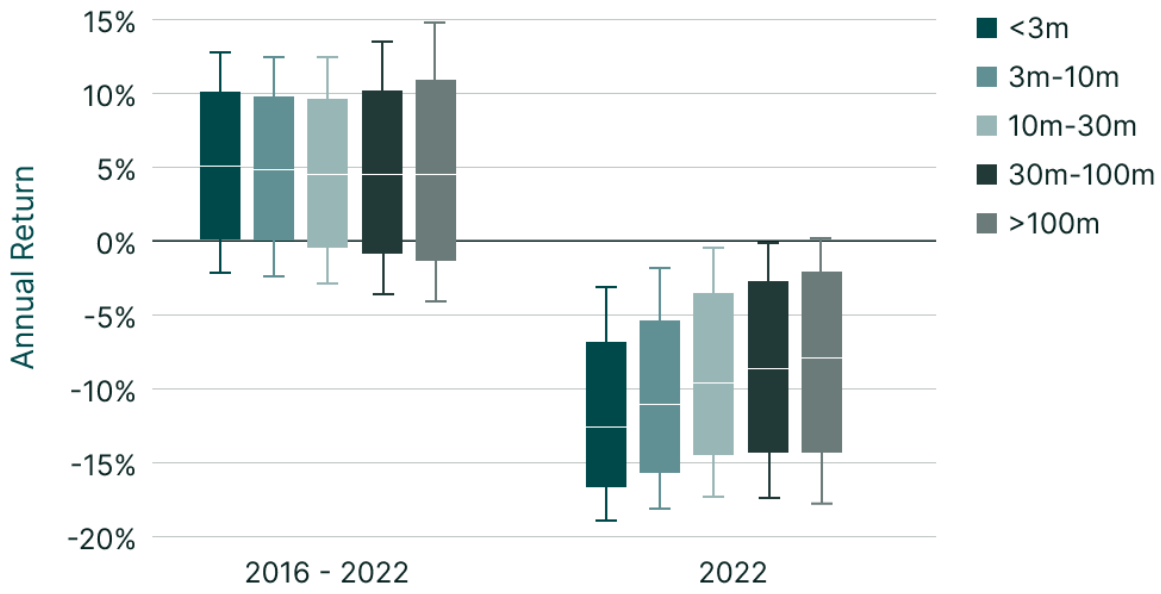
[5] Our *Private Equity Benchmarks* research dives deeper into this topic (see Additional Resources).

The following chart shows performance quartiles by portfolio size for 2022 and since 2016. As you can see, performance increases with portfolio size for 2022, with the smallest portfolios returning -13.6% at the median and the largest portfolios returning -8.0%. **These differences however broadly washed out over the longer term,** with portfolios, regardless of size, averaging annual returns of approximately 4.8% since 2016. Below we will dig further into the mechanics behind the differences in returns of different levels of wealth.

Exhibit 5

Larger portfolios outperformed smaller portfolios in 2022, albeit with greater dispersion.

Annual investor performance by portfolio size with percentiles (10th, 25th, 50th, 75th, 90th)



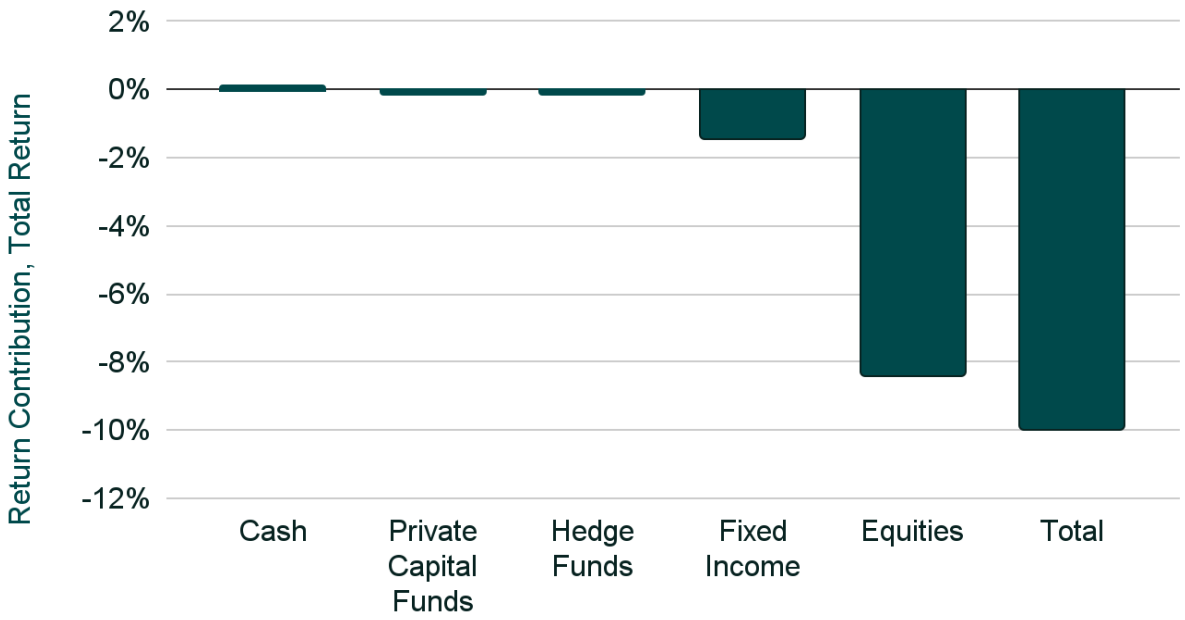
Source: Addepar

As shown below for 2022, the median return was -10.0%. Cash delivered a positive return contribution that partially offset large negative return contributions from fixed income and equities. In absolute terms, equities delivered 84% of return contribution for the year. Our long-term research suggests that much of private capital provides lagged and smoothed equity returns, which, in the moment, may appear to be diversifying portfolios.

Exhibit 6

Equities and fixed income losses led to -10% median portfolio returns.

Quartiled returns by asset class of the median portfolio in 2022



Source: Addepar

Asset class returns are calculated for investors who owned the asset class across all months of 2022 and represent the median portfolio performance in that asset class. Cash returns are calculated using a 50% of 2.1%, which was the average annualized 3-month Treasury bill rate during 2022.

The following sections will provide in-depth coverage for each asset class and reveal key trends in positioning and attribution of the range of portfolio performance. Because we have designed the sections to stand alone, at times we repeat some text with definitions or core analytical concepts. Additionally, we have highlighted to you where we have in-depth research that is available (see Additional Resources).

Cash

Key Takeaways:

- Clients hold 9% of their portfolio in cash in a variety of cash instruments, with significant dispersion in cash returns
- Even as the year-long sell-off steadied in Q4, clients derisked their portfolios, moving capital into cash and particularly short-duration Treasuries[6]

Cash management is a topic of increasing importance to investment managers. **Across the Addepar client base, approximately 9% of holdings are in cash instruments, and — as interest rates are now substantially above zero — having a suitable cash management strategy can have a substantial impact on performance.** Typical clients that use the Addepar platform hold a significant portion of their portfolios in private capital, which strengthens the importance of liquidity management where "cash drag" is becoming an increasingly visible component of private equity performance. Finally, in a high-inflation economy, there is the additional hurdle of high opportunity costs from holding any cash at all. Addepar's *Cash Landscape* research primer[7] has an up-to-date picture of the current cash environment.

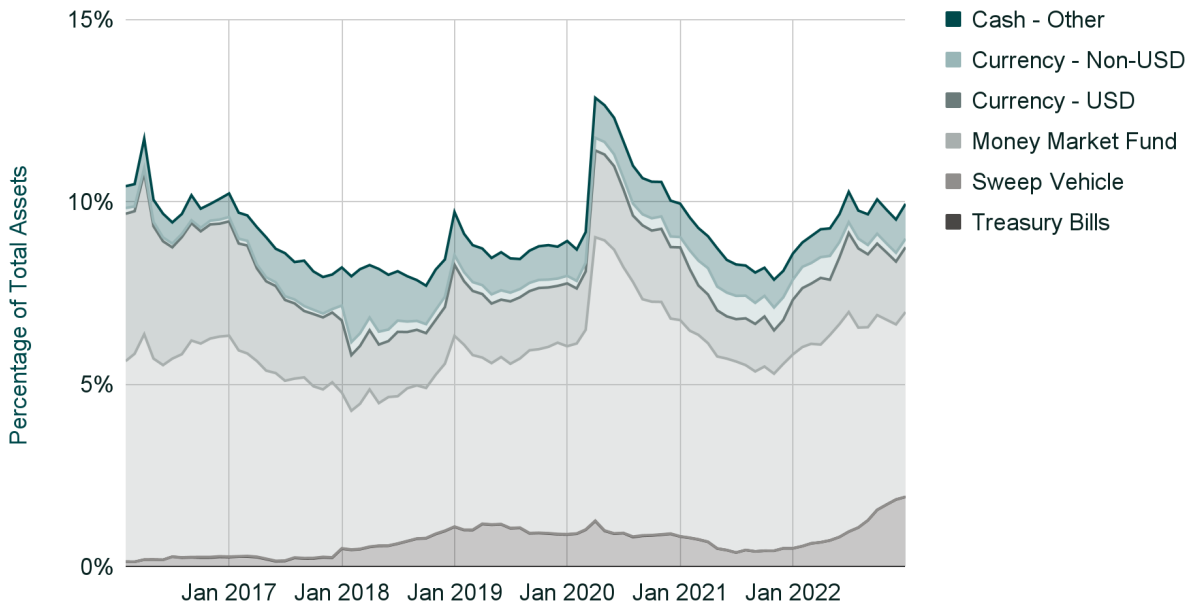
While the range of possible cash investments is vast, the most common of these opportunities are outlined below. As Exhibit 7 shows, aggregate cash holdings peaked during the start of the pandemic (in part due to a sharp fall in asset prices) and declined to more historic levels in 2021, as asset prices bounced back and subsequently increased in 2022. **Of particular note, we've seen a significant uptick in relative holdings of short-term Treasuries (particularly bills and off-the-run[8] Treasuries with less than one year to maturity)** over money market funds, presumably due to increasingly competitive yield.

[6] Short-term Treasuries consist of Treasury bills and off-the-run Treasury securities which are set to mature within one year.
[7] Our *Cash Landscape* study provides more insight into today's cash environment (see Additional Resources).
[8] Not of the latest issuance, trading in secondary markets.

Exhibit 7

Short-duration Treasury holdings increased nearly 4x in 2022.

Cash holdings by investment type, % of total assets, Jan 2016 to Dec 2022



Source: Addepar

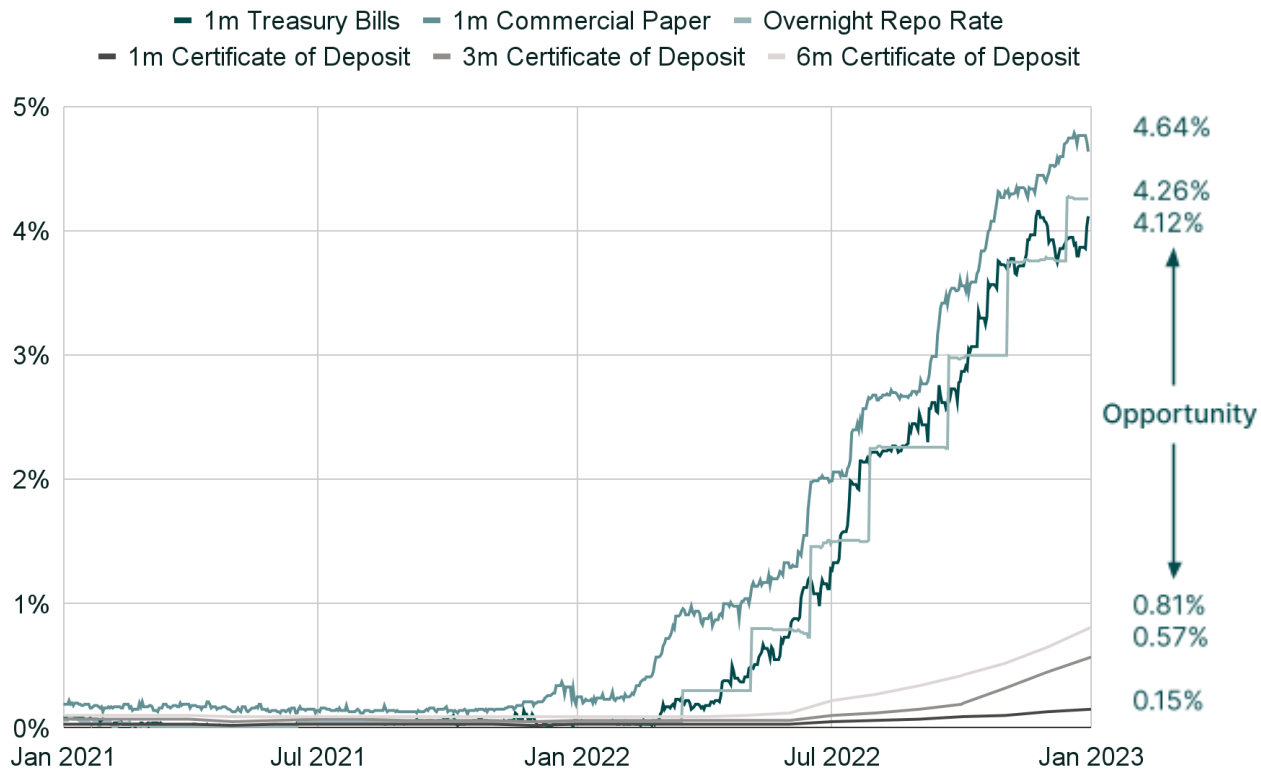
Currency is defined as paper money and cash held at banks. Sweep vehicles are programs that automatically invest end-of-day capital held at custodians into higher earning instruments. Money market funds are ETFs and mutual funds that invest in safe fixed income instruments with maturities of one year or less. Treasuries are Treasury bills and off-the-run Treasury securities set to mature in one year or less.

As Exhibit 8 shows, **over the last year, yield differentials between cash instruments have skyrocketed as the Fed increased interest rates.** In earlier years, many investors prioritized operational ease by holding cash in depository products — ignoring cash as an asset class that can move the needle for investors — when yields were broadly low and therefore held significant allocations to bank deposits. Today, that trade-off looks increasingly less appropriate, with spreads between Treasury bills and deposit rates in the hundreds of basis points in some cases. Yet, **for some investors, allocations to bank deposits remain stubbornly high.**

Exhibit 8

Yields on depository instruments have barely moved despite the Fed raising interest rates in 2022.

Daily yields of cash instruments during 2022



Source: Thomson Reuters, Federal Reserve Bank of New York

Once a sleepy corner of the investment industry, cash is quickly becoming a strategic portfolio management tool, particularly as inflation is now high and investors have materially increased their allocations to private equity over the last decade. It is a best practice to both monitor returns across the zoo of cash instruments and perform portfolio optimizations that take into account hard-to-predict future cash flow needs due to private capital. A number of clients are benefiting from Addepar's cash market monitoring and optimization tool[9]. We may even see investors (re)building capabilities around Treasuries, agency debt and other traditionally "boring" assets. Because alternative investments draw commitments over time — sometimes over as long as five

[9] Learn more about cash market monitoring and optimization (see Additional Resources).

years — the importance of sound cash management will increase along with the size of allocations to alternatives.

Asset allocations change over time based on a combination of (1) investment flows into and out of individual assets (e.g., buying, selling) and (2) the investment performance of individual assets. Here, we examine investment flows to cash in isolation. Investment flows are highly informative due to the fact that they are an outcome of the investor decision-making process. Flows are an "over-time" concept; we explore them at a quarterly resolution because this is the smallest scale at which (statistically) meaningful inferences can be drawn. Unlike other data sources, Addepar isolates the behavior of private wealth investors.

For context on recent trends, you should be made aware of several broad conclusions that have been drawn from long-term analysis of flows. First, the flows to cash and liquid risky assets are strongly negatively correlated (p = -0.63 since 2016). This implies that cash is an important substitute for liquid risky assets. Second, the flow to liquid risky assets falls during times of financial market turmoil, such as the first quarter of 2020, while the flow to cash picks up during those same periods. This highlights the role that cash plays as a safe asset in investors' portfolios[10].

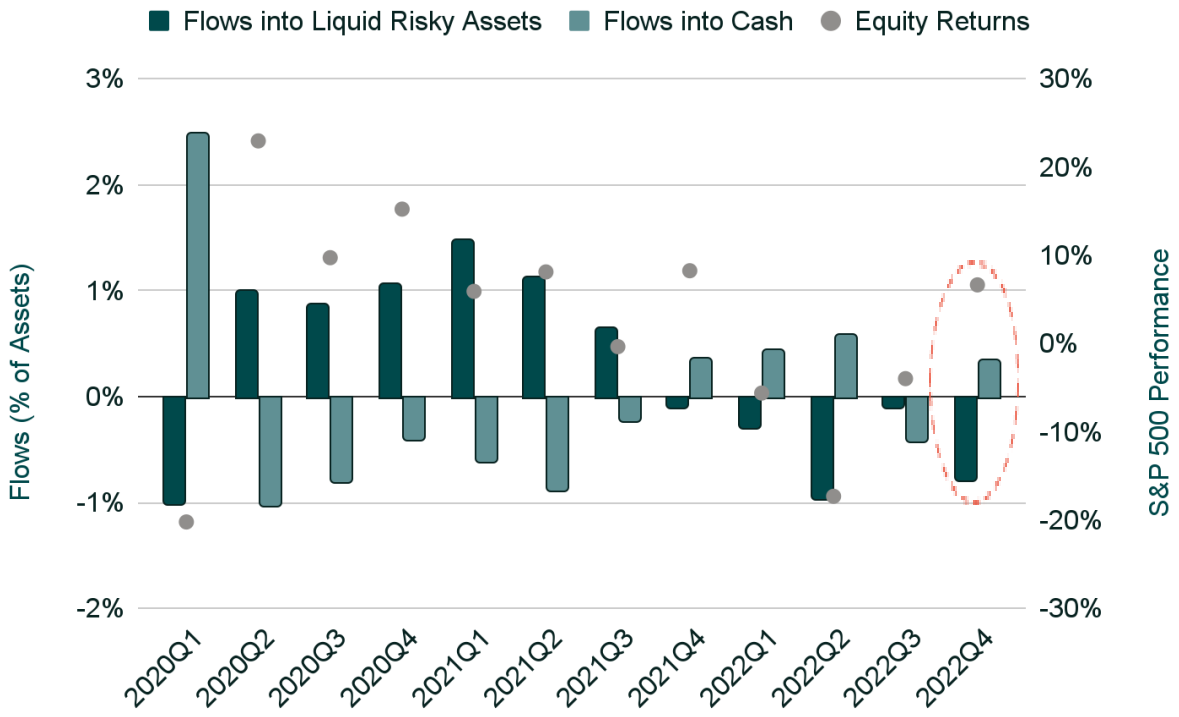
Flows into cash (see Exhibit 9) corroborate the cash allocation picture in Exhibit 7. We saw significant flows out of liquid risky assets[11] and into cash in Q4 of 2022, despite an upturn in equity market performance. Flows into liquid risky assets tend to track equity market performance[12] closely, which makes Q4 2022 a surprising outcome. **Despite the Q4 rally in the markets, this derisking may indicate a pessimistic forward view on equity and fixed income markets in 2023.** We will continue to monitor this signal very closely.

[10] This is discussed further in Ralph Koijen and Xavier Gabaix's paper *Asset Demand of U.S. Households*.
[11] Risky assets include equities and fixed income
[12] The correlation between equity market returns and risky asset flows is +0.6 since 2016.

Exhibit 9

Investors derisked in Q42022, despite a rally in equities.

Flows as a percentage of overall assets, quarterly, 2020 - 2022



Source: S&P 500 returns from FRED, flows from Addepar

Note that to rule out seasonality, an F-test was completed on quarterly dummy variables that did not return statistically significant results (e.g., there was not statistically significant seasonality in our sample).

While no one really knows what will happen in 2023, the easy part is to comment on what is priced into assets or future expectations and describe the implications if things were to play out that way. As of the writing of this piece, markets are pricing in that short rates will rise to 5.0% in June 2023, followed by a rapid easing to 4.5% in August 2023. **The implication for cash is that rates should continue to rise for some time, and dynamics that arose in 2022, such as rate dispersion, cash drag and inflation hurdles, will persist and may get further magnified. Investment managers who focus on cash management have the potential to demonstrate value to clients and outperform their peers.**

Fixed Income

Key Takeaways:

- Fixed income experienced a historically large drawdown in 2022
- Fixed income was a poor diversifier to equities, primarily due to the predominance of inflation factor risk
- Investors reduced their credit risk and duration by decreasing holdings of opportunistic and international developed bonds while increasing holdings of medium-term Treasuries.

Fixed income, historically used as a diversifier of assets, experienced one of its biggest drawdowns in 2022. This came at the same time as equities sold off, which further reduced the traditional diversification benefits of the asset class. Yet looking into 2023, investors have been adding to their fixed income exposure, particularly in short-term Treasuries, which offer richer yields in a backdrop of a secularly increasing interest rate environment.

Exhibit 10 outlines median investor previous year TWR[13] and change in positioning in 2022 by fixed income security type. We also share performance *Z-scores*, which are measures of how unusual a value is relative to its history (in this case, 2016–2022)[14]. Returns were historically low across most fixed income sub-asset classes across most geographies (the U.S., international developed and emerging markets) and credit risk taken (Treasuries, U.S. corporates and opportunistic). **Over the past year, investors reduced their credit risk and duration by decreasing holdings of opportunistic and international developed bonds while increasing holdings of medium-term Treasuries.**

[13] Time-weighted return

[14] Z-scores (or "standard scores") are defined as $z = (x - \mu) / \sigma$, where μ is the mean of the sample and σ is the standard deviation of the sample. In this case, we calculate the mean of quarterly flows (i.e., Buys–Sells) from Q1 2016 to Q1 2022. Similarly, the standard deviation is calculated based on quarterly flows over the same timeframe. For reference, a Z-score with a magnitude larger than -1 or 1 has a probability of ~16%. A Z-score with a magnitude larger than -2 or 2 has a probability of approximately 4%.

Exhibit 10

Fixed Income performance was historically low across sub-asset classes in 2022.

2022 cumulative performance, 12-month return Z-score, Dec 2021 vs. 2022 average ownership

	2022 Returns	Z-Score of 1-Year Returns	Dec 2022 % of Assets	Dec 2021 % of Assets	Difference
US Treasuries	-7.9%	-2.4	2.5%	2.0%	0.5%
US Municipals	-5.8%	-2.0	6.0%	6.0%	0.0%
US Corporate	-7.9%	-2.2	4.3%	4.0%	0.3%
International Developed	-7.8%	-2.2	2.0%	2.4%	-0.4%
Emerging Markets	-14.3%	-1.7	1.0%	1.0%	0.1%
Opportunistic	-13.1%	-2.6	1.6%	2.1%	-0.5%
Other Fixed Income	-5.8%	-2.1	2.2%	2.1%	0.1%

Source: Addepar

Holdings are in terms of total assets held as of December 2022. Performance is the median 2022 cumulative return across portfolios that held a position in that sub-asset class in all 12 months of the year. Similarly, Z-score is calculated for the same sample using the median portfolio's rolling 12-month returns from January 2016 to December 2022.

We have developed a number of risk lenses to assess your portfolios and the assets held within them. These risk lenses recognize that every security or asset class is essentially a packaging of underlying exposures. The macro risk lens can be helpful in understanding the range of possible outcomes under different economic scenarios. As a first step, we select a set of risk factors for our analysis. In this case, we select factors that represent broad drivers of asset class performance. In this context, considerations like economic growth, inflation and overall risk premiums are front and center.

Macro Factors	Description	Intent
Growth	Most recent real growth print relative to average of previous year	Captures sensitivity to economic growth and profitability of companies
Inflation	Most recent inflation print relative to average of previous year	Captures sensitivity to changes in inflation rates
Volatility	Previous month of equity volatility relative to previous year of equity volatility	Captures sensitivity to the changes in equity market volatility
Real Interest Rates	Previous month's average real interest rates relative to previous year real interest rates	Captures sensitivity to the real future interest rate risk

Exhibit 11 shows average returns of 10-year Treasuries in all historical scenarios since 1972 based on our macro lens factors. How actual conditions evolve relative to what is priced in drives performance. **From the analysis, one can see that fixed income, on average, performs better in declining growth, declining inflation, increasing volatility and declining real rates environments.**

As we will show in a later section, equities share environmental factor sensitivity with fixed income to inflation and real rates but have opposite sensitivities to growth and volatility. As a result, the dominating factors will drive the degree to which performance in equities and fixed income is correlated. **Because inflation has been the dominant factor in 2022 and has, by and large, been higher than expectations, treasury bonds have been correlated to equities, and both asset classes have sold off simultaneously.** Should the balance shift to other economic factors, we may see bonds regain their traditional role as a diversifier to equities.

It is important to note that averages hide a wide dispersion in potential outcomes in each of these macro environments based on the particular assets held in a portfolio and the ways that these four macro variables interact with one another. Scenario analysis, which can model the way an investor's current portfolio would have behaved in specific, historical economic environments, gives a much better idea of the potential range of future returns.

Exhibit 11

10-year Treasuries perform best as volatility rises and growth, inflation and real rates fall.

Annualized average 10-year Treasury performance across changing macroeconomic environments

	Increasing	Declining	Difference
Growth	3.7%	9.9%	-6.2%
Inflation	5.2%	8.6%	-3.4%
Volatility	8.7%	5.0%	3.7%
Real Rates	5.9%	7.8%	-1.9%

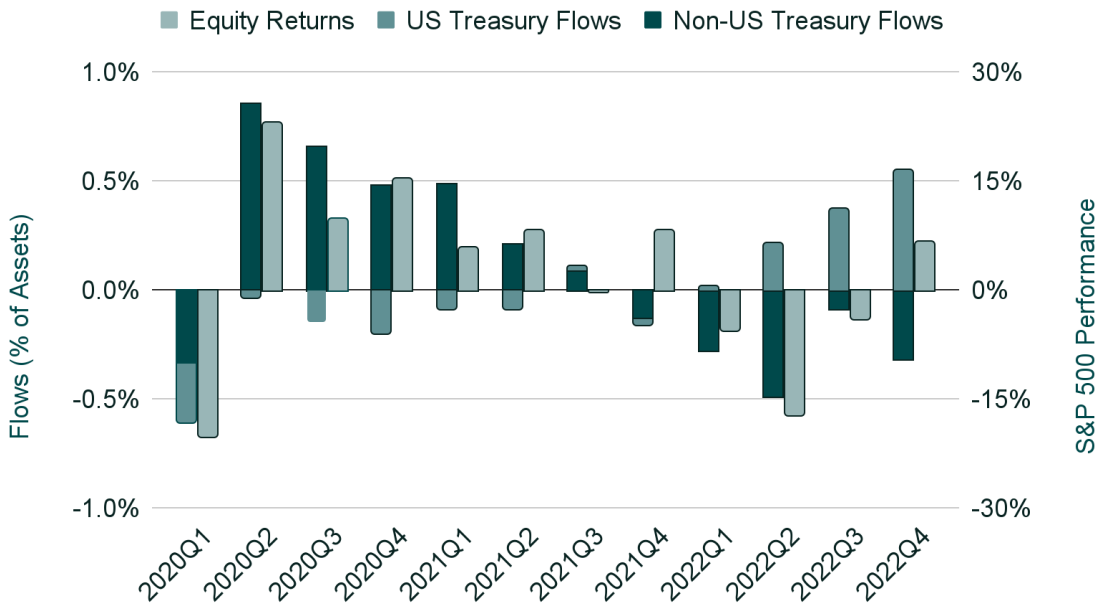
Source: FRED for growth, inflation and real rate data. Volatility is calculated. Increasing and declining scenarios are based on recent month relative to previous year's average.

We now turn to a review of bond flows to gain insight into investor positioning. In Exhibit 12, we demonstrate that bond flows tend to move with equity returns (correlation p = 0.6 since 2016). This occurs because investors are, on average, increasing portfolio risk (both equities and fixed income) when equity markets rally and reducing portfolio risk when equity markets are selling off. When this pattern breaks, this sends a strong signal about what investors are thinking. **Despite a large sell-off in equity markets in 2022, fixed income flows were net positive due to investors purchasing large amounts of short-duration Treasuries.** Exhibit 12 presents average fixed income flows compared to equity returns. As shown, Treasuries have typically been a small proportion of fixed income flows. The proportion rose rapidly after Q1 2022 over municipal bonds, corporates and mutual funds.

Exhibit 12

Non-Treasury flows tended to move alongside equity returns until Q4 2021.

Quarterly average portfolio fixed income and U.S. Treasury flows, S&P 500 returns, Q1 2020 - Q4 2022



Source: S&P 500 returns from FRED, flows from Addepar
Non-U.S. Treasuries are primarily comprised of U.S. Corporates, U.S. Municipals, International Developed, Emerging Market and Opportunistic bonds.

In summary, 2022 performance for fixed income was historically poor, which added insult to injury given poor equity market performance. Looking into 2023, the way in which underlying macroeconomic conditions play out will drive performance and asset class diversification. Given the broad range of possible outcomes, investors are choosing to lock in higher government yields by purchasing short-duration Treasuries. Meanwhile, outflows from municipal bonds and funds persisted for the fifth quarter in a row.

Equities

Key Takeaways:

- On average, investor portfolios are not well diversified due to concentration in equities and correlated alternative instruments that together contributed over 80% of the risk
- Analysis of factor risk and trading intensity suggests that very few investors are systematically generating equity alpha
- Investors rotated out of growth and into defensive sectors
- Energy sector flows were muted given the strong outperformance of the sector relative to the aggregate equity market. Energy sector flows generally track to the energy market.

The equity asset class is the biggest — and by far the most important one — for investors. Equity performance dominates the portfolio because of the size of the allocations and relative volatility of the asset class. As we will describe in other sections, other asset classes, like hedge funds, private equity and in the current environment, even fixed income, also display equity-like characteristics, which accentuates the import of the asset class. As a result, understanding the drivers of asset class performance is paramount and the starting point to structuring a diversified portfolio.

To illustrate, we show from our stress testing and scenario modeling tool[15] the average performance outcomes that equities exhibit in different macroeconomic conditions. Additionally, many investors actively manage their equity portfolios. In this section, we will also review how well active equity investors are doing while giving you insight into how they are repositioning portfolios for 2023.

Asset allocations are typically considered on the basis of how much capital is allocated to different investments. While this illustrates how the money is allocated, it doesn't provide a good view of which assets actually drive performance. For example, in a classic portfolio with a 60/40 allocation to equities and bonds, equities will drive the performance of the portfolio because they represent the bulk of the risk in the portfolio (i.e., equities will be roughly 80% of the risk, and bonds will be roughly 20%). So, a risk-weighted view of asset allocations can provide further insight into what drives the performance of portfolios.

[15] Learn more about our stress testing and scenario modeling tool (see Additional Resources).

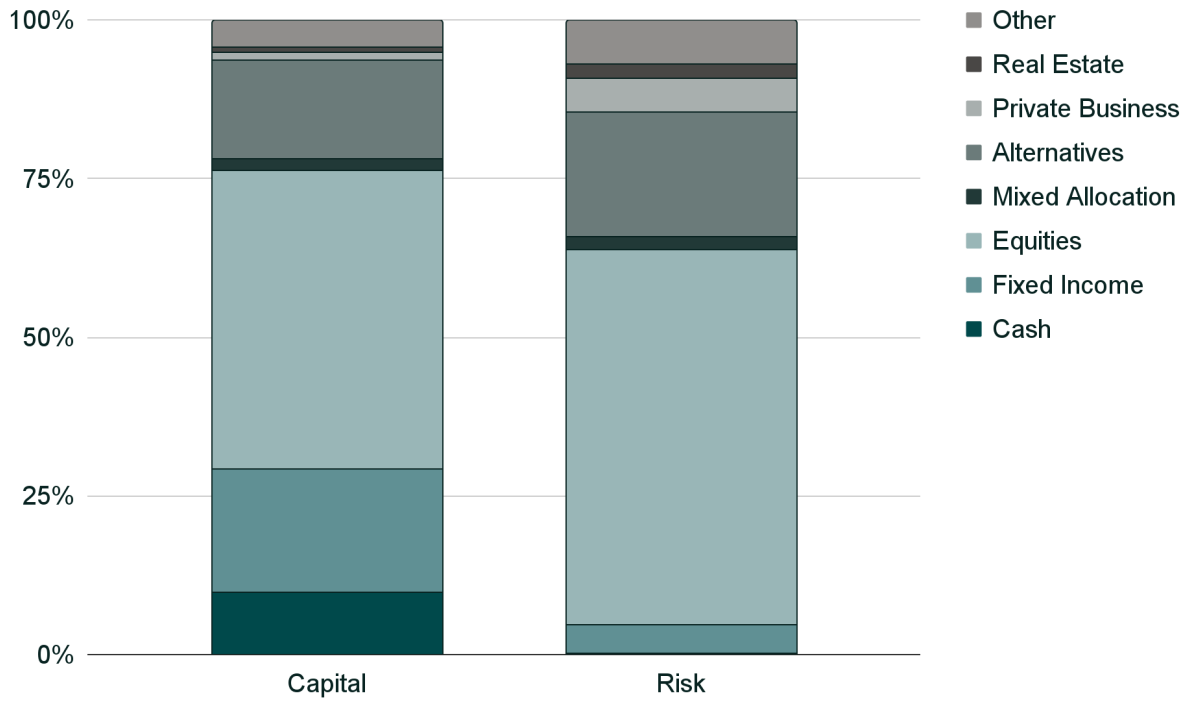
We calculate risk-weighted asset allocations by multiplying the dollar allocations by the realized annual volatility of the asset. While past volatility is certainly not an indication of future volatility, it can help provide a better sense of the risk profile of investments and what allocations broadly drive the performance of the portfolio. Risk views that combine all exposures, including publics and privates, are critical to understanding the portfolio's exposures.

In Exhibit 13, we see a comparison of capital allocations versus risk-weighted allocations. While the capital-weighted portfolio appears to be roughly diversified, we see far less diversification in the risk-weighted view. In particular, **equities and alternatives dominate the portfolio (79% of risk combined), with very little allocated to fixed income (4%).** As we will show later, private equity, venture and hedge funds track public equity markets, which suggests they are not as differentiated from mainstream equities to the extent that is popularly presumed.

Exhibit 13

Lack of portfolio diversification: Equities and Alternatives make up ~80% of investors' overall risk.

Allocation of capital vs. risk, percent, Q4 2022



Source: Addepar

To understand the exposures in equities, we apply our macro lens that we developed for factor and scenario modeling. This macro risk lens can be helpful in understanding the range of possible outcomes under different economic conditions. As a first step, we select a set of risk factors for our analysis. In this case, we select factors that represent broad drivers of asset class performance. In this context, considerations like economic growth, inflation and overall risk premiums are front and center.

Macro Factors	Description	Intent
Growth	Most recent real growth print relative to average of previous year	Captures sensitivity to economic growth and profitability of companies
Inflation	Most recent inflation print relative to average of previous year	Captures sensitivity to changes in inflation rates
Volatility	Previous month of equity volatility relative to previous year of equity volatility	Captures sensitivity to the changes in equity market volatility
Real Interest Rates	Previous month's average real interest rates relative to previous year's real interest rates	Captures sensitivity to the real future interest rate risk

Exhibit 14 shows average returns of U.S. equities in historical scenarios since 1972 based on our macro lens factors. How actual conditions evolve relative to what is priced in will drive performance. **From the analysis, one can see that equities, on average, perform better when growth increases and inflation, volatility and real rates decline.** Growth and inflation are the more dominant factors relative to volatility and real rates. As we look forward to how economic conditions may play out relative to what is discounted, one should consider the potential outcome that growth may be weaker than expected and inflation more persistently high than markets are pricing — scenarios that would negatively impact equity pricing.

Averages hide a wide dispersion in potential outcomes in each of these macro environments based on the particular assets held in a portfolio and the ways that these four macro variables interact with one another. Scenario analysis, which can model the way an investor's current portfolio would have behaved in specific, historical economic environments, offers a much better idea of the potential range of future returns.

Exhibit 14

Equities tend to perform best when growth increases and inflation, volatility and real rates decline.

Annualized average equity performance across changing macroeconomic environments

	Increasing	Declining	Difference
Growth	11.5%	2.9%	8.6%
Inflation	1.4%	12.9%	-11.5%
Volatility	3.8%	10.2%	-6.4%
Real Rates	5.1%	8.9%	-3.7%

Source: FRED for growth, inflation, S&P 500 and real rate data. Volatility is calculated. Increasing and declining scenarios are based on recent month relative to previous year's average.

One avenue investors seek to diversify their systematic beta is through active portfolio management, or "alpha." As we will show, however, alpha remains elusive and is awarded to a very small portion of investors.

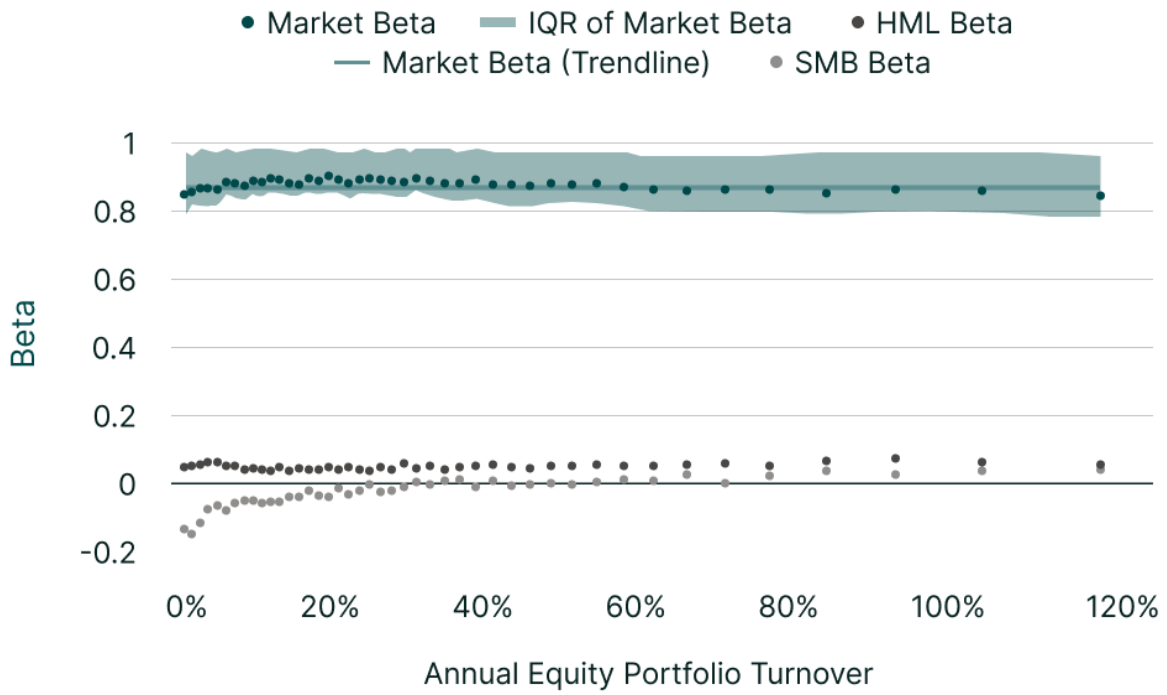
We analyze active management of equities by looking at whether investors who trade a lot outperform or underperform the market. Below we divide our universe of investors into 50 equally sized groups bucketed by the magnitude of their trading activity (as a percentage of portfolio value) and evaluate their portfolio performance with the classic Fama-French 3-factor framework from our factor modeling tool[16]. For each bucket, we average the factors as well as show their interquartile range. Whatever is not explained by the framework is considered "alpha." Exhibit 15 below shows that, by and large, factors are incredibly consistent across the trading buckets with quite narrow deviation. In particular, **exposure to the market remains consistently high regardless of the amount of total trading in an equity portfolio.** Betas appear to be independent of turnover.

[16] Learn more about our factor modeling tool (see Additional Resources).

Exhibit 15

Exposure to the market remains consistently high regardless of total trading in an equity portfolio.

Fama-French factor loadings for investor equity portfolios based on amount of portfolio trading



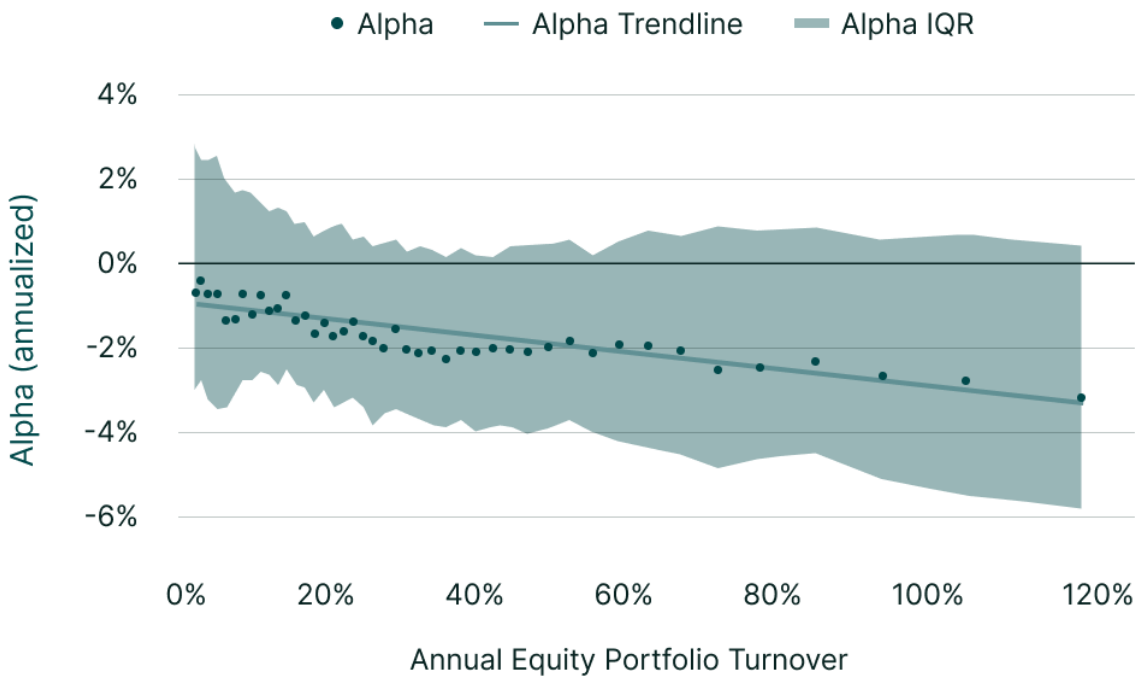
Source: Addepar

Exhibit 16 shows average investor alpha across equity turnover bins, with the best fit trendline across equity turnover bins, as well as the interquartile range of alpha returns. As can be seen below, alpha has been quite negative for the median investor and consistently declines with trading volume. **The deviation of alpha is broad but mostly negative, suggesting very few investors are benefiting from an active equity strategy.** A number of our clients have used this factor/turnover framework to assess their external managers.

Exhibit 16

Investors' equity portfolio alpha decreases as the amount of trading in a portfolio increases.

Average annual alpha for investors' equity portfolios based on total portfolio turnover, 2016 - 2022



Source: Addepar

Annual equity portfolio turnover is calculated as the absolute value of buys plus the absolute value of sells in a period divided by two, and that whole amount divided by the average portfolio value during the period. The interquartile range is defined as the 25th to 75th percentile alphas in equity portfolios for a given level of equity portfolio turnover.

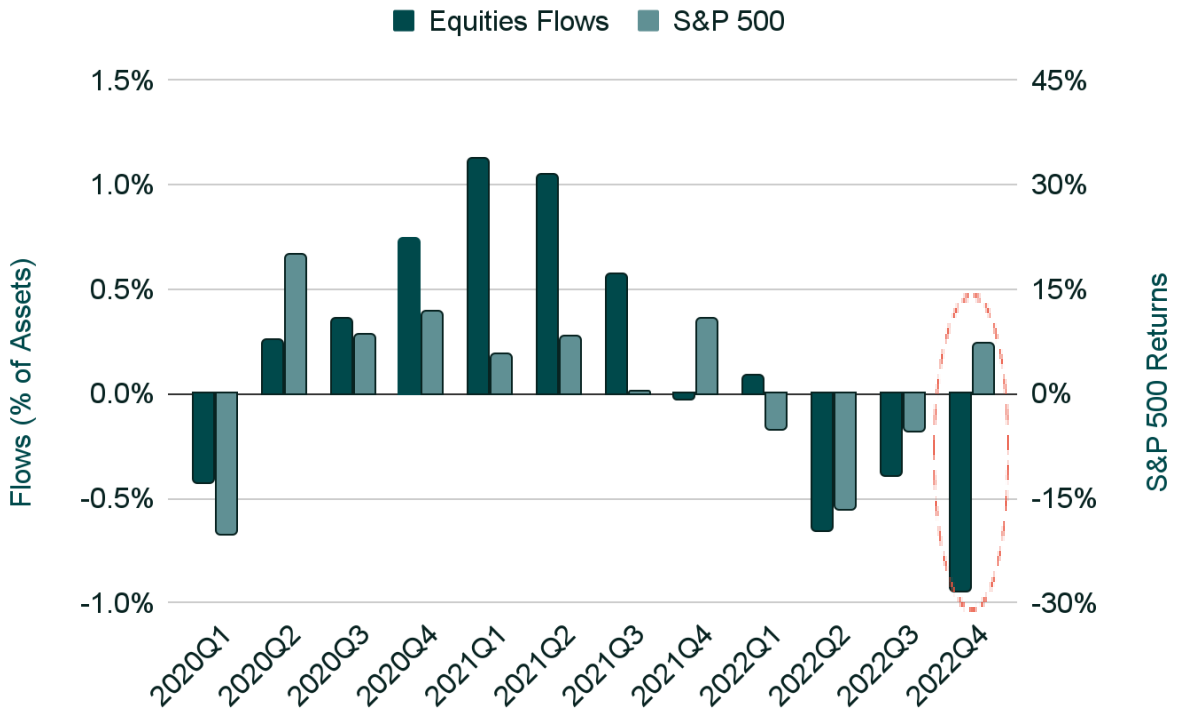
The long-term value of active investing is clearly much debated. Here, we provide a view into active decision-making through the analysis of flows.

We first demonstrate the link between equity flows and aggregate stock market returns in Exhibit 17**.** The two series are meaningfully correlated (p = 0.44 since 2016), which shows that on average, investors are somewhat trend-following, (i.e., buying when markets are rising and selling when markets are decreasing). Notably, we see very significant flows out of equities in Q4 of 2022 despite an upturn in equity market performance. This derisking may be indicative of a forward view on risk markets in 2023. We will continue to monitor this signal very closely.

Exhibit 17

Equity flows tend to move alongside S&P 500 returns. Investors sold equities, however, in the last quarter of 2022.

Quarterly investor equity flows compared to S&P 500 returns, Q1 2020 - Q4 2022



Source: flows from Addepar, S&P returns from FRED

The table below further outlines net investor flows into and out of equities by Morningstar sector definitions. These flows represent individual equity positions without "looking through" into fund instruments, which may also hold equities. The values are *Z-scores*, which are measures of how unusual a value is relative to its history (in this case, 2016–2022)[17]. Note that we have filtered out unusually large positions and portfolios to avoid skewing results.

As you can see, over the course of 2022, there were notable positive flows into utilities and consumer defensive, both considered defensive sectors. Flows into healthcare were quite

[17] Z-scores (or "standard scores") are defined as $z = (x - \mu) / \sigma$, where μ is the mean of the sample and σ is the standard deviation of the sample. In this case, we calculate the mean of quarterly flows (i.e., Buys–Sells) from Q1 2016 to Q1 2022. Similarly, the standard deviation is calculated based on quarterly flows over the same timeframe. For reference, a Z-score with a magnitude larger than -1 or 1 has a probability of ~16%. A Z-score with a magnitude larger than -2 or 2 has a probability of less than 4%.

average, even though this sector is also considered defensive. **Flows into growth sectors, including communications, consumer cyclical and technology, were quite negative.** Interestingly, the best-performing sector relative to the market was energy, which showed moderately positive inflows, the bulk of which occurred between January and May 2022.

Exhibit 18

Traditionally defensive sectors saw large inflows, while growth sectors saw outflows in 2022.

2022 excess return of sector over S&P 500, 2022 cumulative flows

Sector	Excess Return over S&P 500	Z-score of 1-Year Flows
Utilities	21.0%	2.3
Consumer Defensive	18.8%	1.5
Energy	85.2%	0.5
Financial Services	8.9%	0.0
Healthcare	17.5%	0.0
Real Estate	-6.7%	-0.2
Industrials	14.0%	-0.2
Basic Materials	7.2%	-0.2
Consumer Cyclical	-17.6%	-1.4
Technology	-8.8%	-1.7
Communication Services	-20.4%	-1.8

Source: Addepar for sector returns and flows, FRED for risk-free returns

Excess returns are calculated as 2022 sector returns minus 2022 S&P 500 returns. Flows Z-scores are calculated using median portfolio annual flows in comparison to rolling annual flows dating back to 2016. Percentiles are calculated assuming that flows follow a normal distribution.

In summary, equities account for the majority of portfolio risk exposure that in turn drove performance in 2022. Performance in the asset class is historically weaker in recessionary and inflationary environments, both scenarios are in the range of possible outcomes for 2023 based on economic forecasts. While it's difficult to generate alpha through active management, active portfolios rotated into defensive sectors and out of growth sectors.

Hedge Funds

Key Takeaways:

- Many hedge funds have been delivering equity-like returns, which means they are not delivering their promised hedge
- Hedge funds have, on average, seen outflows since 2016, which reversed in 2021 but re-accelerated to historically large outflows in 2022

Hedge funds are a key alpha-generating tool for investors. As we will show, finding alpha managers is quite challenging, as the "pack" looks a lot like equities, and very few funds are really outside the pack. The long-term allocations to hedge funds have also declined.

Addepar is looking into constructing a hedge fund performance index for our clients. We believe this could be superior to other sources for two main reasons. First, this index would be based on the portfolio returns for private wealth investors, who have different access to funds than institutional investors. Second, these are net numbers reported by investors, not hedge fund managers. We now share some of our initial findings. Please let us know if we can assist you in benchmarking your own hedge fund managers.

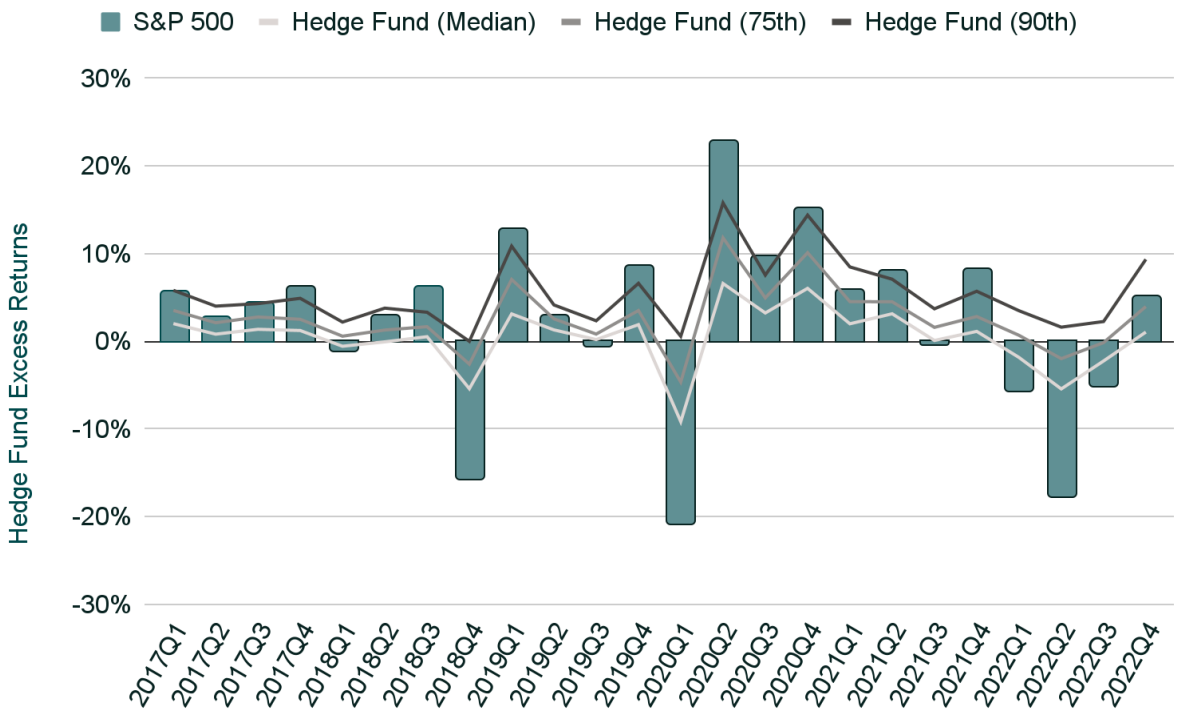
For Addepar's clients, the median hedge fund investment returned -6.1% for 2022. The negative hedge fund returns are unsurprising because hedge fund indices generally track equity markets (correlations are 0.95). Exhibit 19 presents the quarterly excess returns of the median, 75th and 90th percentiles[18] of hedge fund portfolios compared to the excess return of the S&P 500 from Q1 2017 through Q4 2022. To achieve high alpha returns, an investor must really excel at manager selection. While the S&P 500 returned 2.8% per quarter on average during this period, the median hedge fund only returned 0.8%, and the 75th percentile fund returned 3.0%. Material deviation from the S&P 500 only began to emerge in the 90th percentile, which returned 5.5% on average. In other words, only the top 10% of hedge fund portfolios had returns significantly in excess of the market[19].

[18] Note that the median and 90th percentile hedge fund is not the same each period. It's sampled independently from the set of hedge fund returns for each quarterly time period.
[19] Hedge fund portfolio returns are net of fees

Exhibit 19

Hedge fund returns are highly correlated to the S&P 500.

Median investors' hedge fund excess returns vs. S&P 500 excess returns, quarterly 2017 - 2022



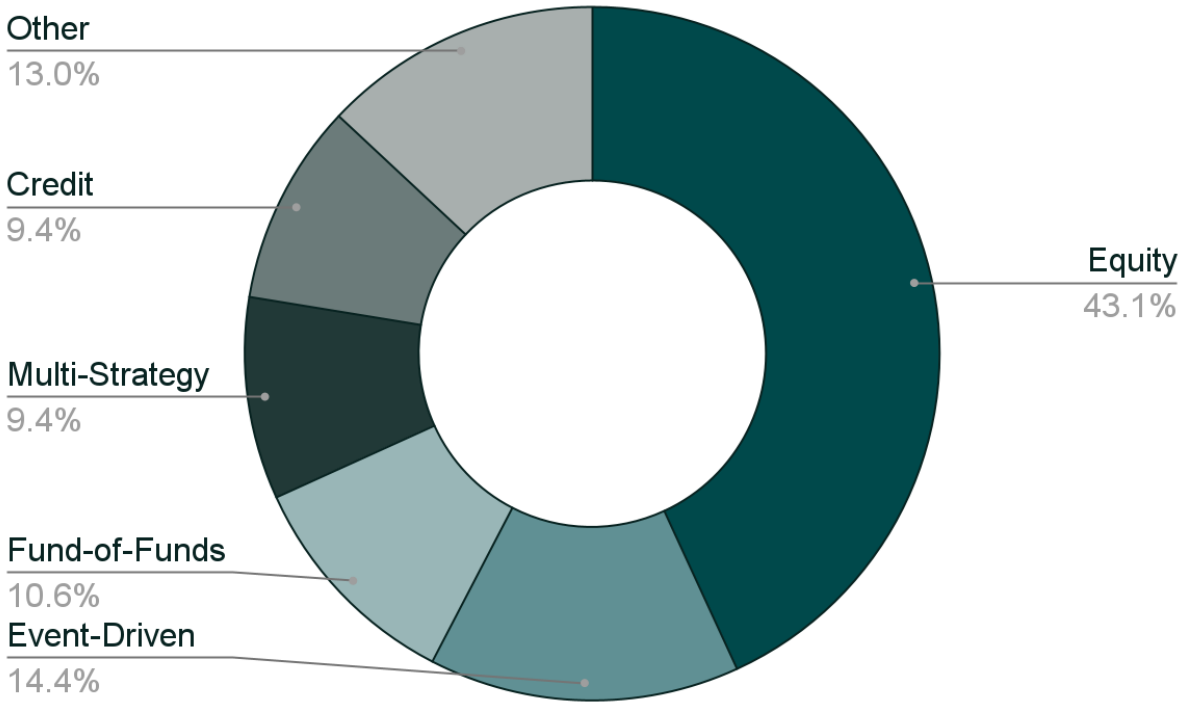
Source: Fama-French for S&P 500 excess returns, Addepar for hedge fund returns

Exhibit 20 below shows aggregate hedge fund sub-strategy ownership at the end of December 2022. Equity strategies are the largest segment. In a follow-up piece, we will write about systematic risks in these strategies.

Exhibit 20

Hedge fund investors allocated their capital most heavily to equity-focused funds.

Aggregate hedge fund sub-strategy ownership, December 2022



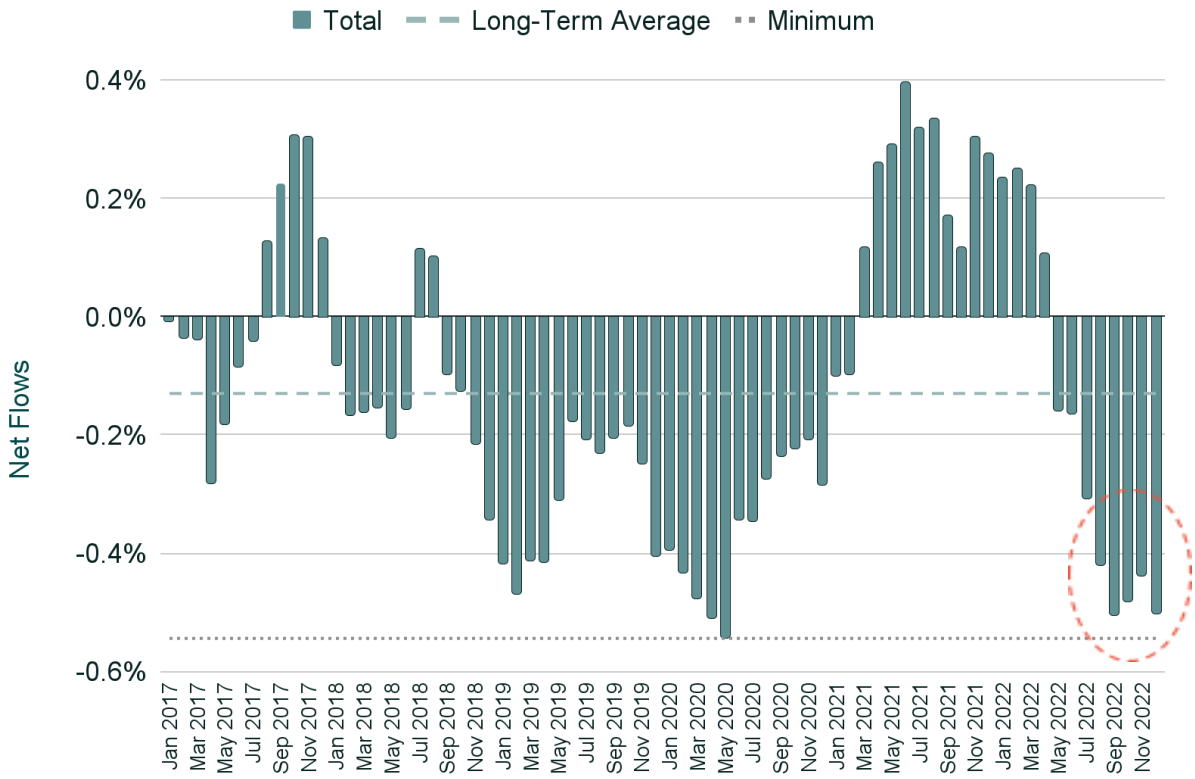
Source: Addepar

Exhibit 21 shows that **long-term average monthly flows into hedge funds have been negative.** While 2021 was somewhat of an exception, we see the reversion back to the trend thereafter: By the end of 2022, **flows fell to approximately their lowest historical level.**

Exhibit 21

The secular downtrend of flows out of hedge funds accelerated during 2022.

Aggregate flows to hedge funds, six-month rolling average, Jan 2017 to Dec 2022



Source: Addepar
*Long-term average calculated as 2016 to present

The median investment in hedge funds tends to underperform equity returns net of fees while closely tracking overall equity market returns. However, top investors who are able to select the best managers have been able to earn meaningful alpha over time. Through performance benchmarking, investors will better be able to orient themselves to know how they are doing compared to others, and can use our factor modeling to understand whether their portfolio is actually achieving the alpha that they are paying for.

Private Capital

Key Takeaways:

- Larger portfolios tend to hold more private capital, as well as higher allocations to venture capital over private debt
- Unlike hedge funds, high dispersion among private capital investor returns provides the opportunity for skilled investors to earn alpha through quality manager selection and appropriate fund diversification
- Net new commitments dropped off to a negligible rate at the end of 2022

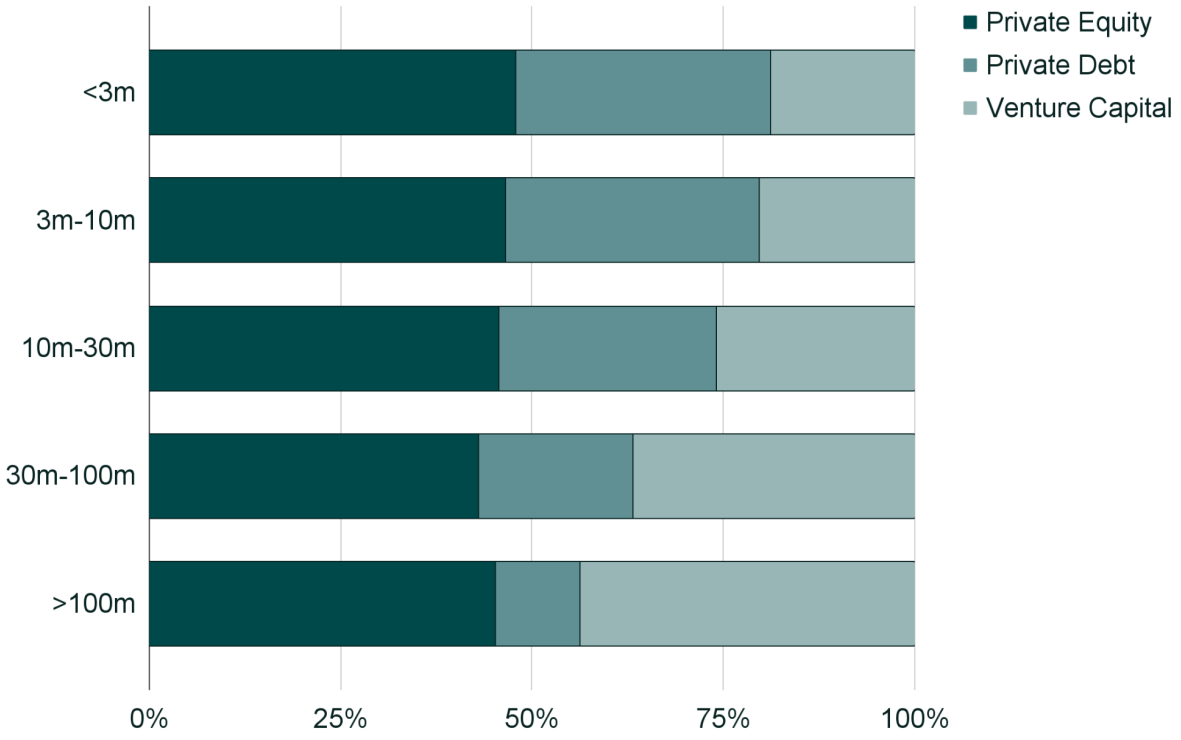
Private capital investments have long been used by investors to generate high returns in excess of markets. Yet, these structures are a complex packaging of equity beta, manager skill (alpha), “cash drag” and fees/operational costs. We believe it is a best practice to disassemble exposures into these components to achieve effective allocation decisions. As we have shown, on average, portfolios are extremely exposed to equities both directly and indirectly (i.e., via hedge funds and private capital). Here we put a spotlight on aggregate exposure trends.

Addepar is used by a diverse set of investors. We showed previously that larger investors make proportionally smaller allocations to public equities and larger allocations to alternatives. With longer time horizons and a larger appetite for risk, we see that larger investors tend to make more substantial allocations to venture capital than smaller investors do.

Exhibit 22

Larger portfolios tend to hold more venture capital and less private debt than smaller portfolios.

Percent, Q4 2022



Source: Addepar

Addepar is looking into constructing a private capital fund performance index for our clients, as discussed in our *Private Equity Benchmarks* piece. Similar to what we mentioned in the hedge fund section, we believe this will be superior to other sources for two main reasons. First, this index would be based on portfolio returns of private wealth investors, who have different access than institutional investors. Second, these are net numbers reported by investors, not managers.

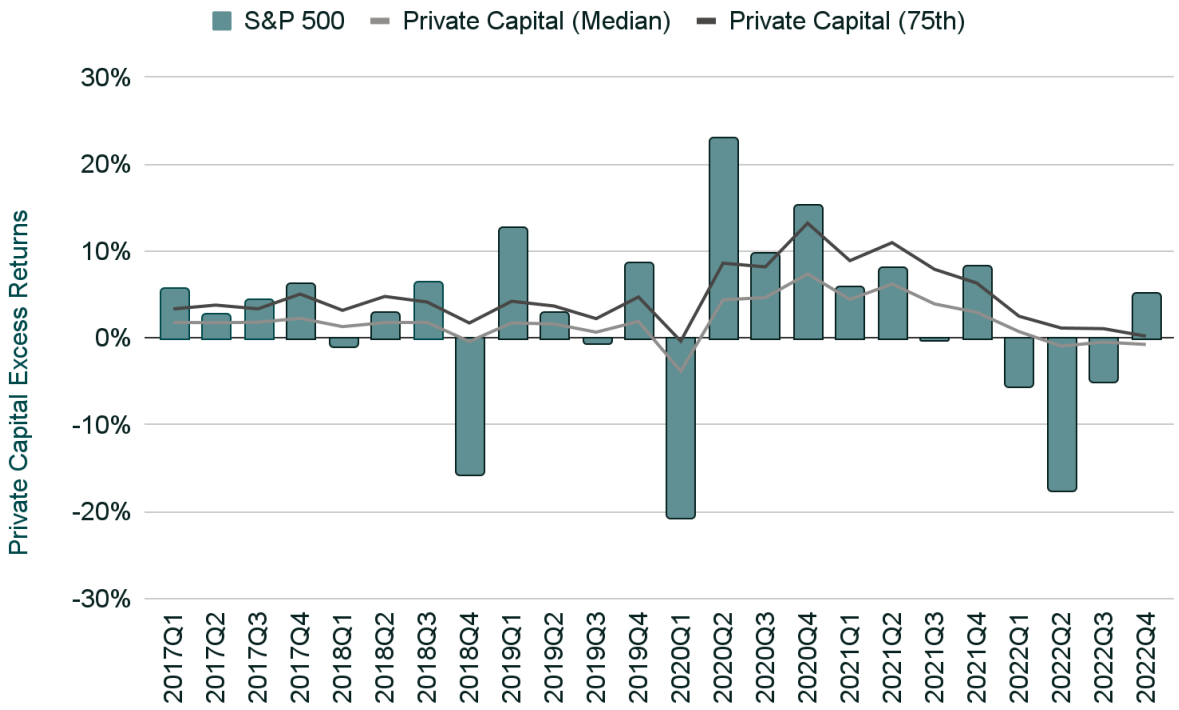
Performance in private capital for the median investor was -0.8% for 2022. To illustrate the equity beta, we compare the excess returns (returns above cash) of private equity against the excess returns of the S&P 500. Returns have been extremely correlated (p = +0.8) since 2017, indicating that public and private equities (in aggregate) are quite similar on a quarterly basis. Choosing the correct manager makes a tremendous difference in returns. Since 2017, the S&P 500 had a quarterly average return of 2.8%, while the median private capital fund only returned 2.25%.

But those upper-quartile investors who chose their managers wisely achieved an average return of 5.0%. Unlike hedge funds, there is much more dispersion in private capital portfolios.

Exhibit 23

Only upper-quartile private capital investors have achieved returns in excess of the S&P 500.

Quarterly median and 75th percentile private capital fund excess returns, 2017 - 2022



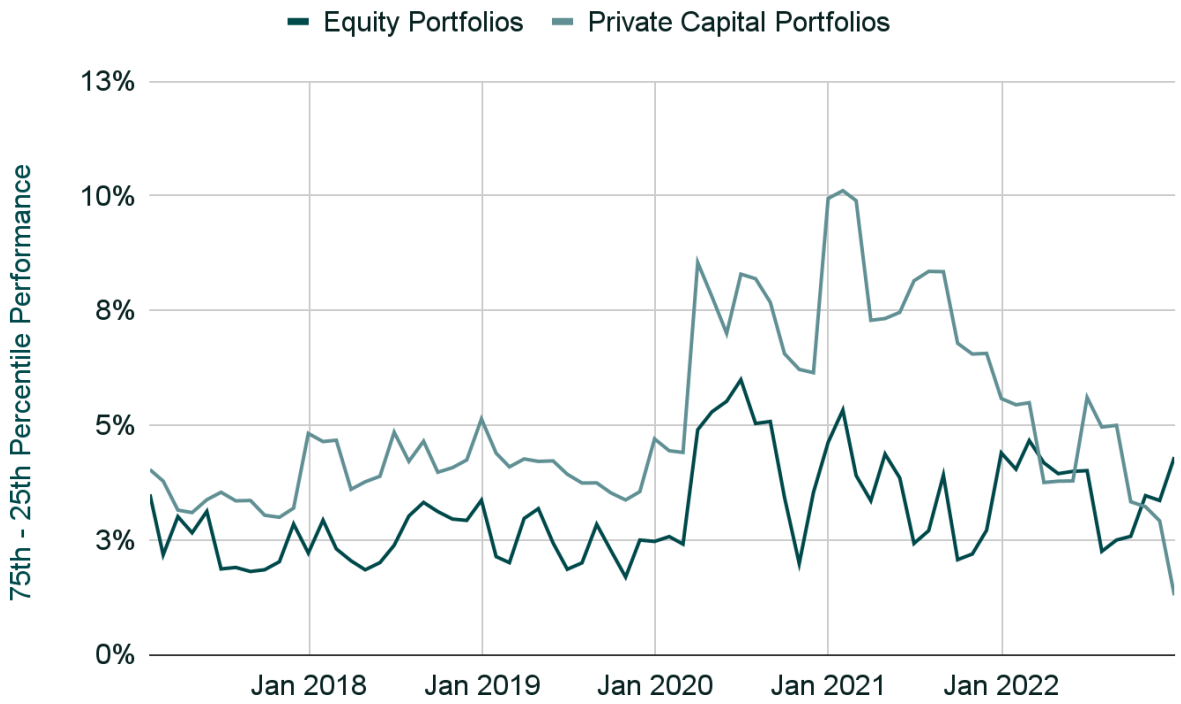
Source: Addepar

Although aggregate returns in alternatives have historically tracked public market equivalents, they remain a popular asset class due to the alpha potential in manager selection. As shown below, **skilled investors who are able to identify and select high-quality managers may be able to generate ample alpha returns.** In Exhibit 24, we highlight the amount of dispersion in 1-year cumulative returns in public equity and private equity from January 2017 through December 2022. We measure dispersion by subtracting the 25th percentile cumulative return for each asset class from the 75th percentile cumulative return for that asset class. We see that over time, HNW investors have experienced higher dispersion in their private equity investments.

Exhibit 24

Investor returns on their private capital portfolios are 70% more varied than they are for equities.

Rolling asset class specific 3m interquartile range of returns



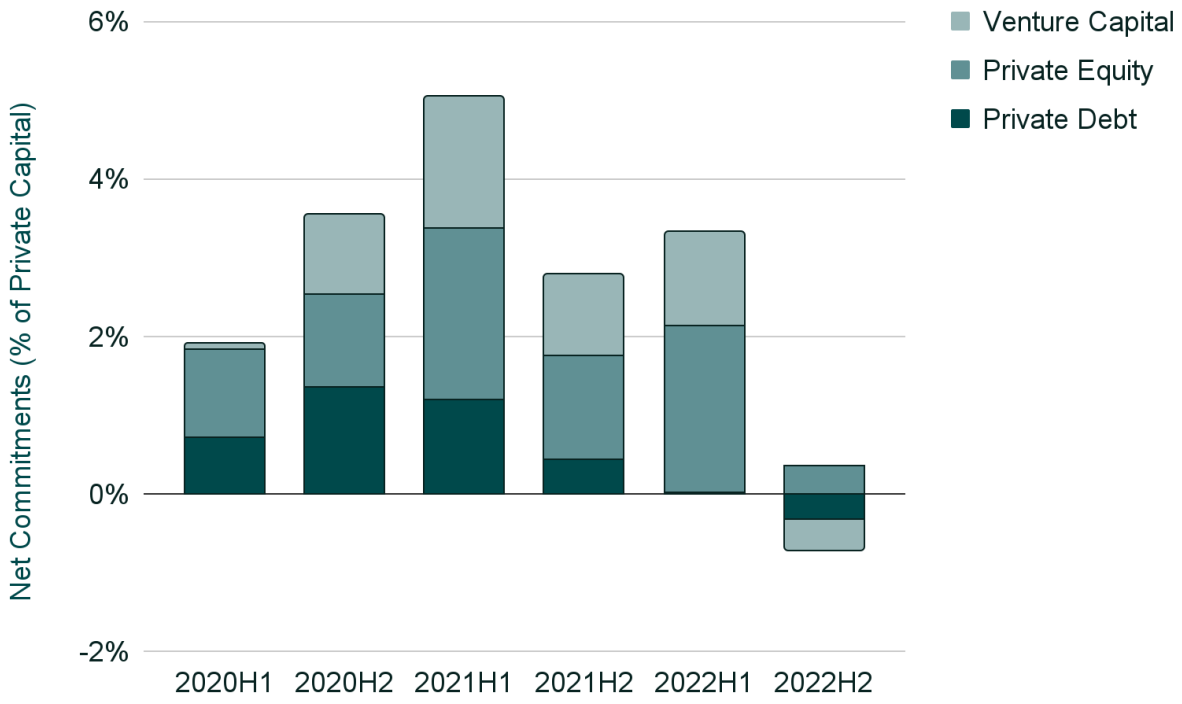
Source: Addepar

Net commitments are a cousin of flows for public assets. They measure the total dollars entering minus the total dollars leaving a private capital fund over time. A positive net commitment signifies that portfolios are adding to their allocations toward a fund. Exhibit 25 shows the net commitments into private equity, private debt and venture capital from 2020 through 2022. As you can see, net new commitments trickled down to a negligible rate by the second half of 2022.

Exhibit 25

Private capital net commitments turned negative in the second half of 2022.

Average monthly net commitments, semi-annually, 2020 - 2022



Source: Addepar
We define net commitments as an investor's total commitments net of cash flows in terms of overall portfolio equity.

When an investor makes a commitment to a private capital manager, they promise to provide a set amount of cash to that manager at an unknown future time. This can lead to liquidity risk for investors that they won't be able to fulfill their promises. The typical way that investors mitigate this risk is by holding large cash buffers; however, that generally causes a drag on portfolio returns. Another popular way — particularly amongst larger portfolios — is to hold a large number of private capital positions, which effectively diversifies away some of that liquidity risk. As discussed in *Mechanics of Fund Diversification*[20] however, that reduction in risk comes at the price of also diversifying away manager alpha. Our research finds that keeping it simple by holding 3-6 funds balances these concerns. As Exhibit 26 shows, many investors are positioned outside of this range.

[20] *Mechanics of Fund Diversification* discusses balancing contribution diversification against alpha potential (see Additional Resources).

Exhibit 26

Larger investors tend to overly diversify their portfolios, which reduces alpha potential.

Average number of private capital positions and the size of those positions by wealth size

Wealth Group	Average Positions	Size (m)
<3m	1.8	0.3
3m-10m	4.3	0.6
10m-30m	8.7	1.5
30m-100m	17.4	3.3
>100m	35.2	17.7

Source: Addepar

We have shown that as a whole, private capital was the second-best-performing asset class in 2022, with the median investor nearly breaking even with a return of -0.8% net of fees. There is evidence, however, that private equity returns tend to track the public equity markets on a lagged basis. Perhaps investors pulled back on their net commitments in the second half of the year for this reason.

Additional Resources

This report is meant to pique your interest in what we, as a research team, are planning for 2023. You've seen references throughout this report to other research studies and tools, such as cash optimizations and manager alpha assessments. These are real-world projects that we are working on — all with the goal of helping investors make smarter decisions. If you'd like to learn more about the specific topics referenced below, please email us for more information at Research@Addepar.com.

Topic	Description
Cash	In these papers and tools, we discuss the varying rates of return currently earned on cash, as well as a novel solution for improving yield while planning for upcoming liabilities.
Factor Modeling	In this paper, we describe both how factor models work and how they can be applied to assess portfolio and individual assets from risk and exposure perspectives.
Stress Testing and Scenario Modeling	This piece introduces a framework and research product for how advisors and investors can help clients stay abreast of ever-changing markets by putting current conditions into the context of economic and market history.
Mechanics of Fund Diversification	We examine the optimal number of funds to hold in a private capital portfolio in managing the tradeoff between holding more funds to reduce cash flow uncertainty while not diversifying away alpha.
Private Equity Benchmarks	This paper examines the applicability, accuracy and timeliness of private equity benchmarks for the typical investment advisor and single-family office.
Submergence	This primer introduces a new framework for considering drawdowns in the context of overall portfolio risk to improve risk management practices.

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