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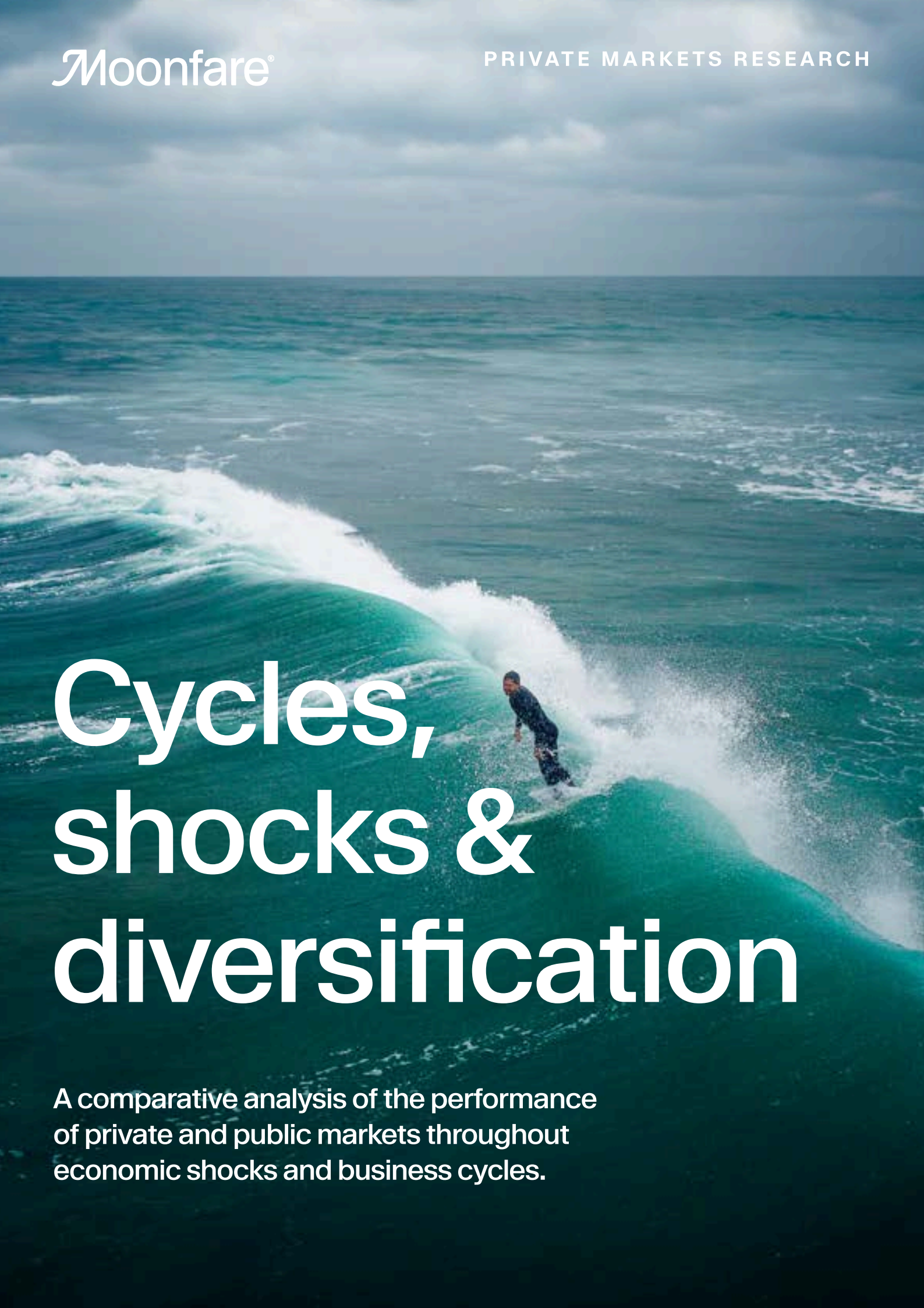
PRIVATE MARKETS RESEARCH



Cycles, shocks & diversification

A comparative analysis of the performance of private and public markets throughout economic shocks and business cycles.

Better long-term returns and lower volatility

Over the last 25 years, the majority of private assets have produced better returns than public assets. Private equity has grown by 12.7% annually, while the S&P 500 by 7.7%, our analysis showed. The private asset classes in our analysis were all less volatile than the public markets indices, with private debt and private equity exhibiting the lowest volatility.*

Asset performance amid economic crisis

Private equity outperformed the S&P 500 in every major crisis since 2000: namely the Dot.com Crisis, Global Financial Crisis, Eurozone Crisis and Covid-19. This pattern of outperformance is driven by private equity's structural flexibility, active management, and resilience during periods of market disruption.

Business cycle sensitivity across asset classes

In the past, private market assets have generally outperformed public markets in economic slowdowns and contractions, potentially protecting investors against downside risk. While public and private assets have performed similarly in expansions, public market assets have earned better returns when markets started to recover.

Portfolio enhancement through private market exposure

Introducing an allocation of private equity into a typical 60/40 stocks/bonds portfolio has the potential to drive improvements to the risk-return ratio. For example, a 50/30/20 portfolio or a stylised European family office portfolio would have outperformed a standard 60/40 portfolio over every study period for the last 25 years.**

*De-smoothed volatilities for the indices are elevated, more detail on page 8

**De-smoothed volatilities for the private equity index would increase the volatility of the 50/30/20 and EMEA family office-style portfolios, more detail on page 17

ABOUT THE DATASET

Our analysis draws on the PitchBook Private Capital Indexes, which provide quarterly data beginning in January 2000 up until and including December 2024. The indices are constructed using fund cash flow and net asset value (NAV) data, making them a useful comparison tool to public equity indices.

The indices are also net of fees and account for capital calls, meaning they can provide valuable insights in terms of cash returns.

The data covers the following private capital strategies: private equity (consisting of buyouts and growth equity), venture capital, real estate, real assets, private debt.

For this study, we focus on a subset of indices, namely:

- Private equity
- European private equity
- North American private equity
- Venture capital
- North American venture capital
- Private debt

The indices provided are meant to be estimates of asset class performance, hypothetically creating a return if one had access to all active funds on a capital-weighted basis, though the indices are not practically investable. There are certain considerations that must be made when interpreting the indices:

- Compounding quarterly index returns implies that positive performance can be fully reinvested in net asset value (NAV), when in reality much of the value created in closed-end, drawdown funds comes through distributions that cannot be immediately redeployed.
- Index-based comparisons also assume investors could gain exposure at NAV and mirror the precise cash flows of all the constituent funds, which is unrealistic in practice.
- The indices include funds from different vintages, meaning the J-curve is smoothed out: this is because capital calls for younger funds are cancelled out by distributions of more mature funds.
- Private market returns are typically smoothed due to valuation lag effects, potentially understating volatility estimates. There is more info on de-smoothed volatilities on page 8.

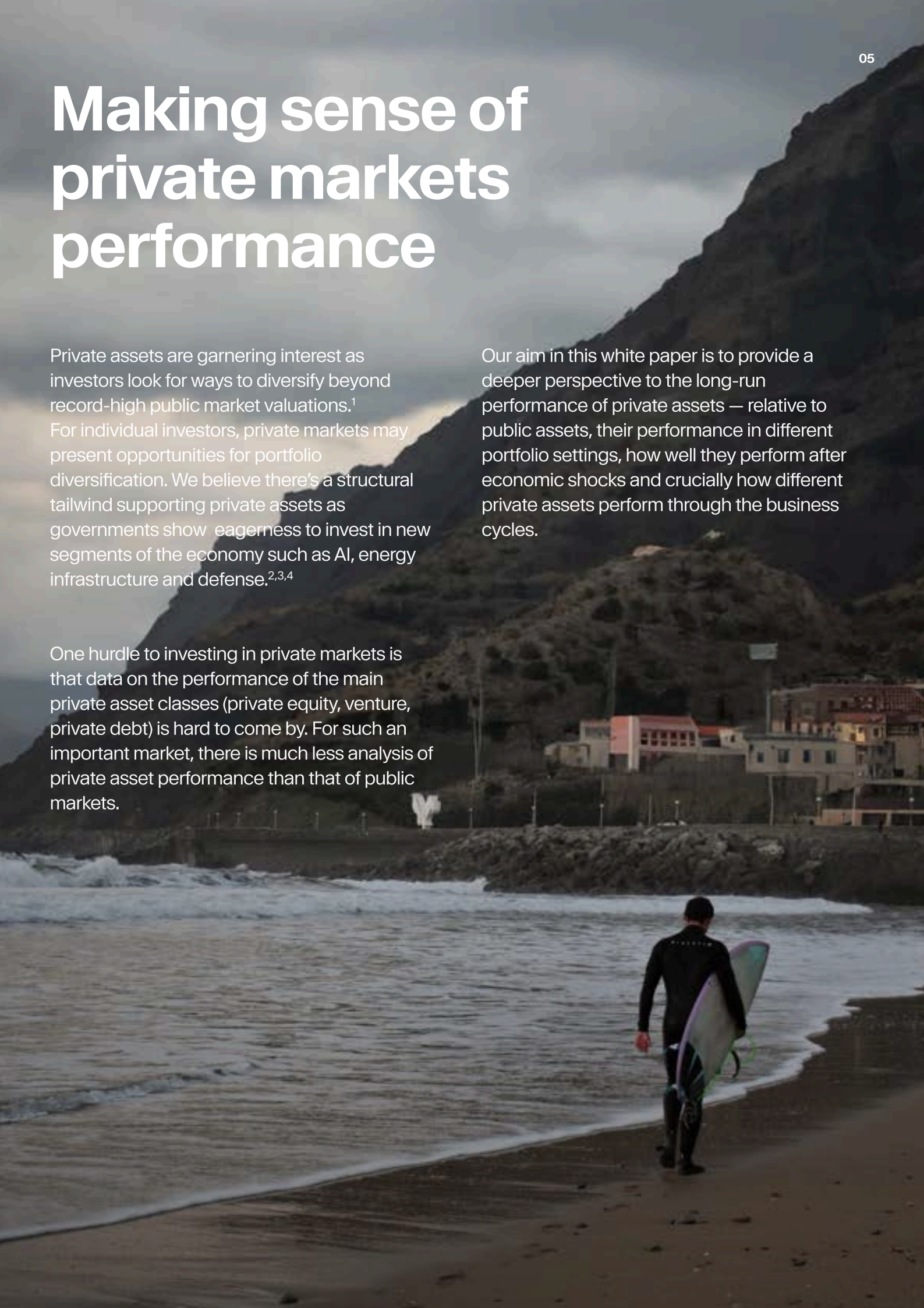
To benchmark performance against public markets, we employ the total returns indices for the S&P 500 and the Russell 2000. These benchmarks are widely recognized as representative of US equities, with the S&P 500 covering large caps and the Russell 2000 focusing on small caps.

Making sense of private markets performance

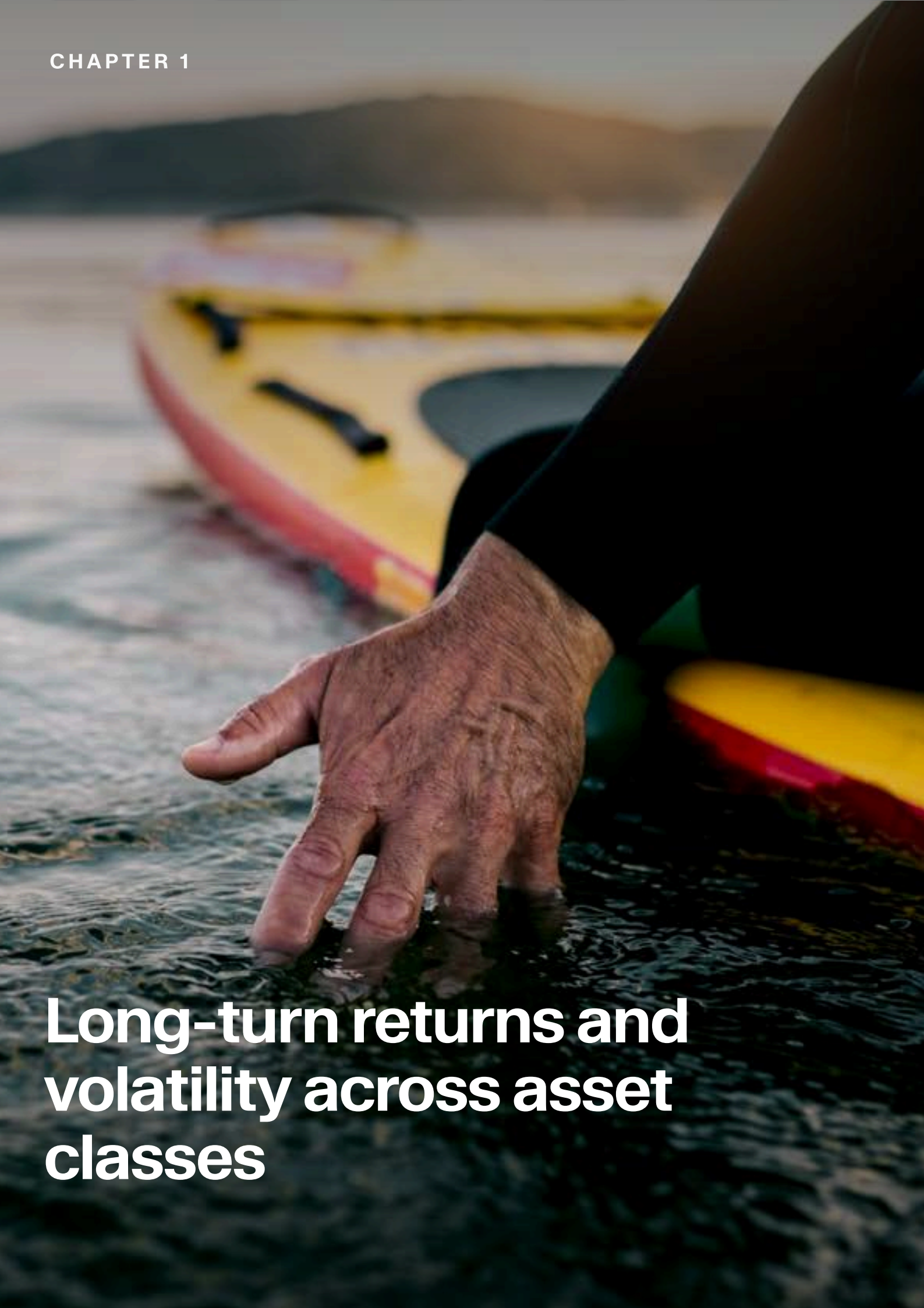
Private assets are garnering interest as investors look for ways to diversify beyond record-high public market valuations.[1] For individual investors, private markets may present opportunities for portfolio diversification. We believe there's a structural tailwind supporting private assets as governments show eagerness to invest in new segments of the economy such as AI, energy infrastructure and defense.[2,3,4]

One hurdle to investing in private markets is that data on the performance of the main private asset classes (private equity, venture, private debt) is hard to come by. For such an important market, there is much less analysis of private asset performance than that of public markets.

Our aim in this white paper is to provide a deeper perspective to the long-run performance of private assets — relative to public assets, their performance in different portfolio settings, how well they perform after economic shocks and crucially how different private assets perform through the business cycles.



CHAPTER 1



Long-turn returns and volatility across asset classes

Our data shows that private assets have historically outperformed public assets. Over the last 25 years, private equity returned an annualised growth rate of 12.7%, as compared to 7.7% for the S&P 500 index.

Amongst the private asset classes, private equity — in Europe and North America — has been the best performer, followed by private debt and then venture capital (which may suffer from the 2000 starting date, owing to overhang of VC fund valuations from the Dot.com Crisis). Venture also has the largest dispersion in returns amongst the private asset classes, highlighting the importance of manager selection.[5]

Figure 1: Private equity dominates other assets over the long run

Returns data for public and private market assets from 2000-2024

	Private equity	NA private equity	European private equity	Venture capital	NA venture capital	Private debt	S&P 500	Russell 2000
Total return	19.7x	20.3x	23.6x	4.1x	4.1x	9.7x	6.4x	6.2x
Annual return rate (CAGR)	12.7%	12.8%	13.5%	5.9%	5.8%	9.5%	7.7%	7.6%
Quarterly return rate (CQGR)	3.0%	3.1%	3.2%	1.4%	1.4%	2.3%	1.9%	1.8%

Source: Pitchbook 2025, Yahoo! Finance 2025, Moonfare 2025 **Note:** Data spans from 1 Jan 2000 to 31 Dec 2024

What about volatility? In general, reported volatility for private assets is lower than it is for public assets. However, volatility measures do not translate directly across public and private markets due to fundamental differences in how each is observed. Quarterly volatility estimates for the private capital indices start as low as 3.9% for private debt, ranging up to 6.6% for North American venture capital. On the other hand, returns to the S&P 500 and the Russell 2000 indices faced quarterly volatilities of 8.3% and 10.7% respectively.

Figure 2: Private assets have been considerably less volatile than public assets

Volatility data for public and private market assets from 2000-2024

	Private equity	NA private equity	European private equity	Venture capital	NA venture capital	Private debt	S&P 500	Russell 2000
Quarterly volatility	4.7%	4.7%	6.3%	6.4%	6.6%	3.9%	8.3%	10.7%
Annual volatility	9.5%	9.3%	12.5%	12.7%	13.2%	7.7%	16.5%	21.5%

Source: Pitchbook 2025, Yahoo! Finance 2025, Moonfare 2025

Note: Quarterly volatility represents the standard deviation of quarterly returns. Annual volatility is derived by multiplying the quarterly figure by √4, so for example a quarterly volatility of 8% corresponds to an annual volatility of roughly 16% ; Data spans from 1 Jan 2000 to 31 Dec 2024.

Understanding these figures is important: the volatility figures show how 'bumpy' the ride has been for each asset class over the period. Quarterly measures capture the short-term ups and downs in returns, while annual figures reflect how those fluctuations play out over longer horizons. Taken together, they provide a basis for comparing the relative stability of private and public markets. However, it must be noted that the dynamics of volatility are not directly comparable across the asset classes.*

While the summary figures provide a long-run view of variability, they can mask important shifts over time. To capture how risk evolved across different market environments, we also calculated rolling volatility measures for each asset class (see Figure 3). This approach highlights changes in stability through different market cycles and provides a more dynamic perspective than the long-term averages alone.

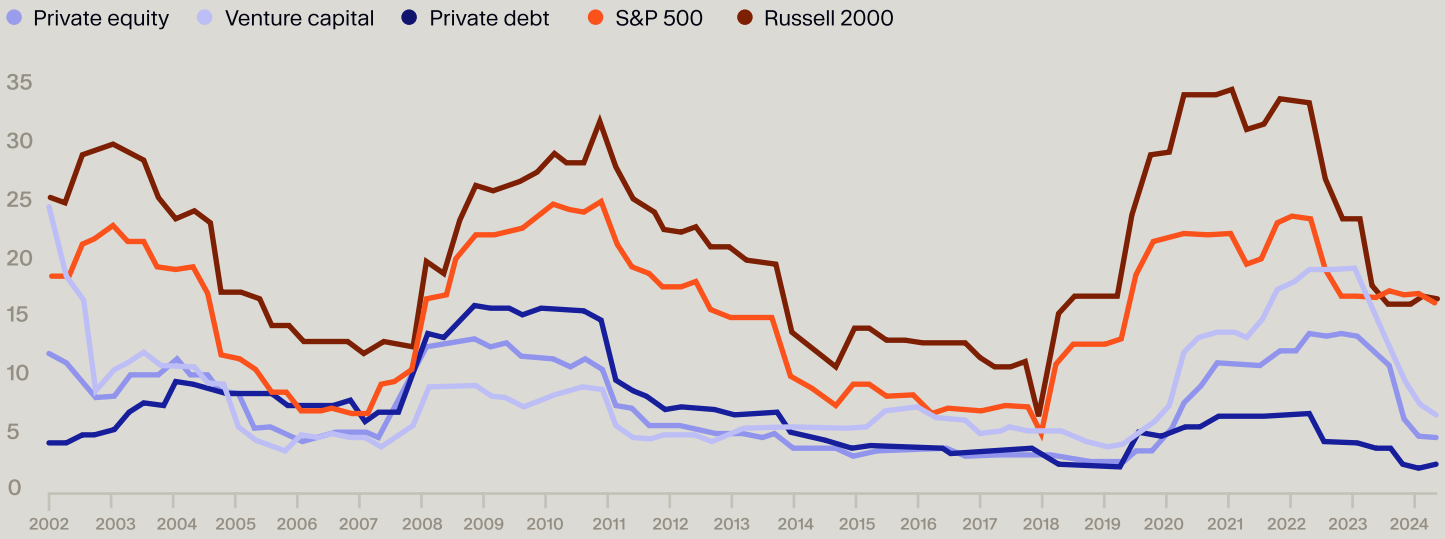
Rolling volatility estimates across the last 25 years showcase the lower volatility of private assets. The three-year rolling annual volatilities of the S&P and Russell indices remained consistently higher than those of the private assets across the dataset, with relative peaks of 25.2% and 34.8%. This compares to peaks of 16.3% for private equity, 24.6% for venture capital and 16% for private debt.

In general, the data implies volatility in private assets may be more 'fundamental', or driven more by economic shocks, rather than financial market ones. The two periods of high volatility in private asset returns occurred in the aftermath of recessions in 2009 and 2021, as seen in Figure 3. Volatility was also higher than average post the 2001 recession, but not markedly so, and far less than public markets.

*PitchBook notes that reported private market returns are typically "smoothed" due to valuation lag effects. In its Q4 2024 Private Capital Indexes report, de-smoothed volatility—calculated using a first-order autoregression adjustment—produces meaningfully higher estimates than the reported series, indicating that true underlying risk is understated by raw NAV-based returns. Private equity's adjusted annual volatility is 15.1%, venture capital's is 32.7% and private debt's is 10.8%.

Figure 3: Private markets have historically offered lower volatility than public markets

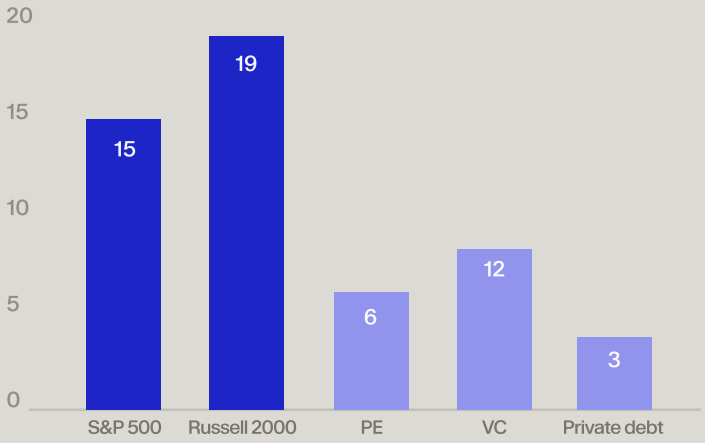
Three-year rolling average annual volatility by asset class, 2002-2024 (%)



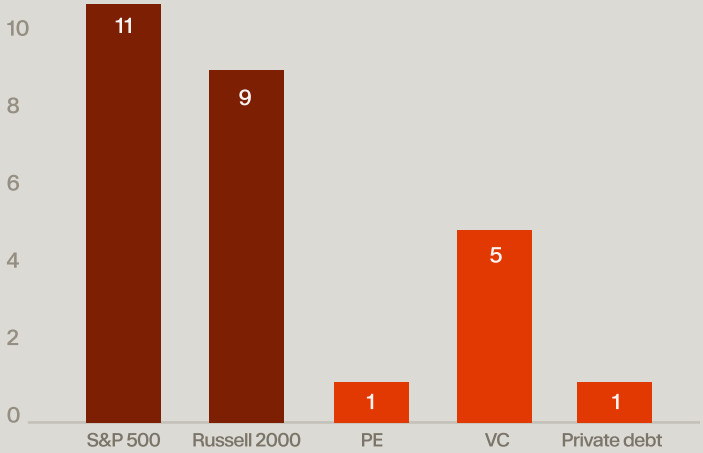
Source: PitchBook 2025, Yahoo! Finance 2025, Moonfare 2025 **Note:** Data spans from 1 Jan 2000 to 31 Dec 2024

Figures 4 & 5: Public assets have seen larger and more frequent drops

Number of times asset indices fell by at least 5% over one quarter, 2000-2024



Number of times asset indices fell by at least 10% over one quarter, 2000-2024



Source: PitchBook 2025, Yahoo! Finance 2025, Moonfare 2025 **Note:** Data spans from 1 Jan 2000 to 31 Dec 2024

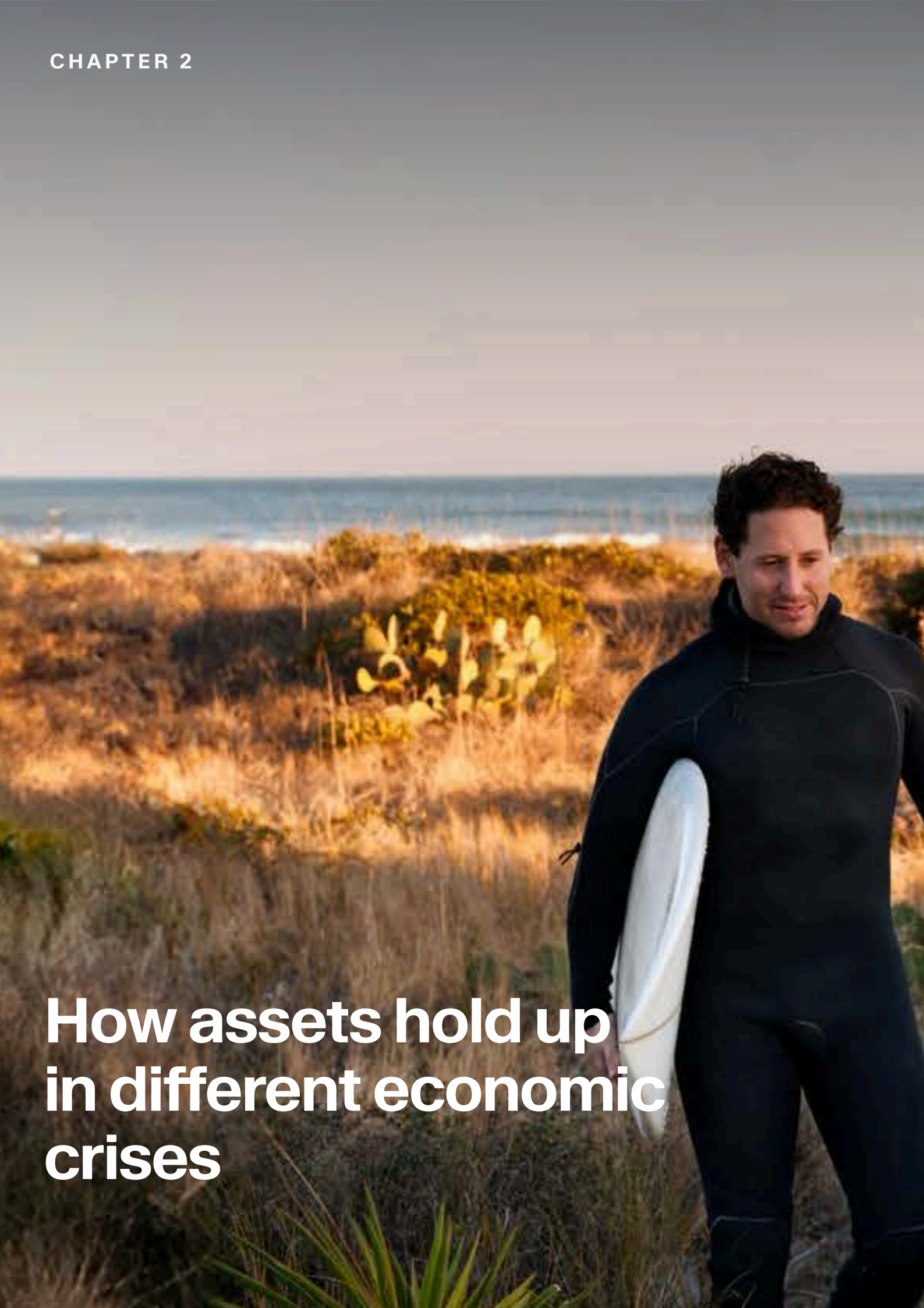
While the reporting of private asset returns in indices may not always reflect the short-term behaviour of underlying businesses, the frequency of drawdowns in periods of volatility can be particularly insightful from the viewpoint of portfolios and capital allocation.

Our analysis (Figures 4 and 5) shows regular drawdowns of 5% and 10% for public markets. On a quarterly basis, the S&P 500 fell by at least 5% 15 times through the period 2000 to 2024, and by at least 10% 11 times. On a longer basis (two quarters or six months), the index fell at least 5% 20 times and by at least 10% 13 times.

In comparison, drawdowns in private equity are much rarer — on a two quarter basis the Pitchbook PE index fell 10% only four times, and private debt fell by that amount twice. Similarly, on a one quarter basis, the private equity and private debt indices both fell by at least 10% on only one occasion.

The main takeaway is that the financialisation of public markets has typically imparted a volatility that is not seen in private assets. Arguably as public markets become more financialised (for example more driven by option markets), the risks of volatility spikes may increase.

CHAPTER 2



How assets hold up in different economic crises

Over the last 25 years, we have seen four major economic crises: the Dot.com Crisis, the Global Financial Crisis (GFC), the Eurozone Crisis and COVID-19.

When examining these specific shocks, we see continued evidence of heightened public market volatility in comparison to private markets.

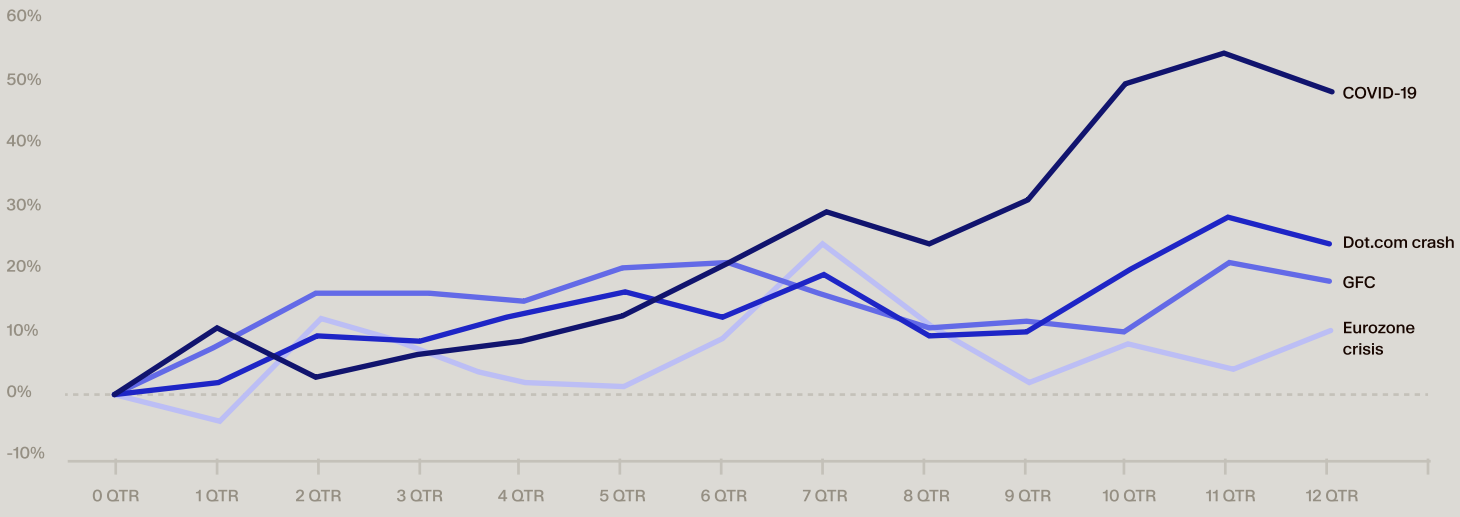
In general, private assets, and particularly private equity, have historically outperformed public assets coming out of all these crises, as seen from Figure 6.

For example, honing in on the GFC, the S&P 500 index declined in value as much as 45.8%, whereas the private equity index only declined by 24.8%. The more-pronounced reaction to shocks exhibited by the S&P 500 show how strongly the market, and the wider economy, were disrupted at the time.

The most pronounced outperformance occurred following Covid-19. Over the 12 quarters after the pandemic, the private equity index rose by 73.3%, compared with 24.7% for the S&P 500, resulting in outperformance of 48.6 percentage points. While both markets benefited from unprecedented policy support, private equity was better positioned to capitalise on the recovery due to its ability to invest through the downturn, actively support portfolio companies and concentrate exposure in faster-recovering sectors.

Figure 6: Private equity outperformed the S&P 500 in every major crisis of the last 25 years

Change in Private Equity Index value compared to S&P 500 index



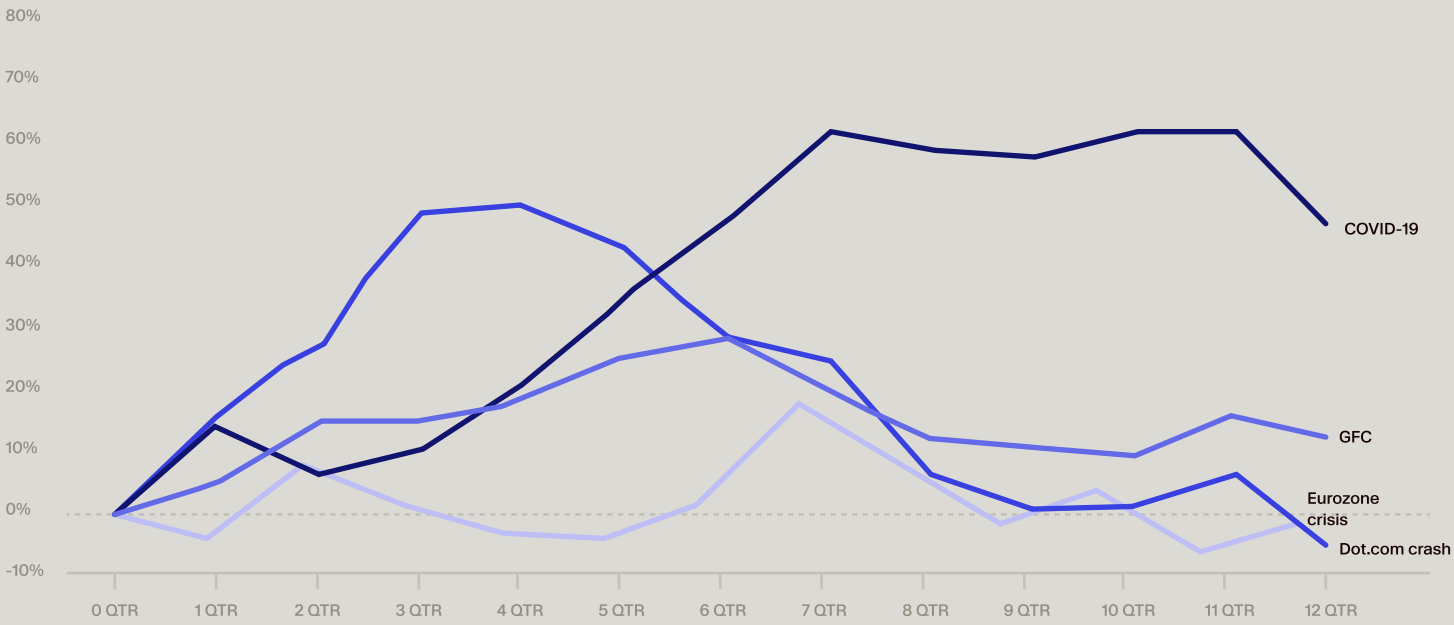
Source: PitchBook 2025, Yahoo! Finance 2025, Moonfare 2025

There are several likely reasons for this past outperformance following economic crises. Firstly, the structure of private equity funds, whereby capital is locked away for longer periods of time, means that GPs have a steady stream of funds. Private market funds also tend to have lower exposure to cyclical industries, instead opting for recurring revenue business models with lower volatility — such as technology, healthcare and communication services.

We have run the same analysis for venture capital (Figure 7) and a similar pattern emerges — private assets have beaten public assets coming out of crises. However, in the longer term, venture capital was outperformed by the S&P following the Eurozone Crisis and the Dot.com Crisis. During COVID, cheap funding and frenetic deal making drove venture capital but, in contrast, high valuations in the aftermath of the Dot.com Crisis proved a drag on returns.

Figure 7: Venture capital delivered stronger returns than the S&P 500 amid Covid and the GFC

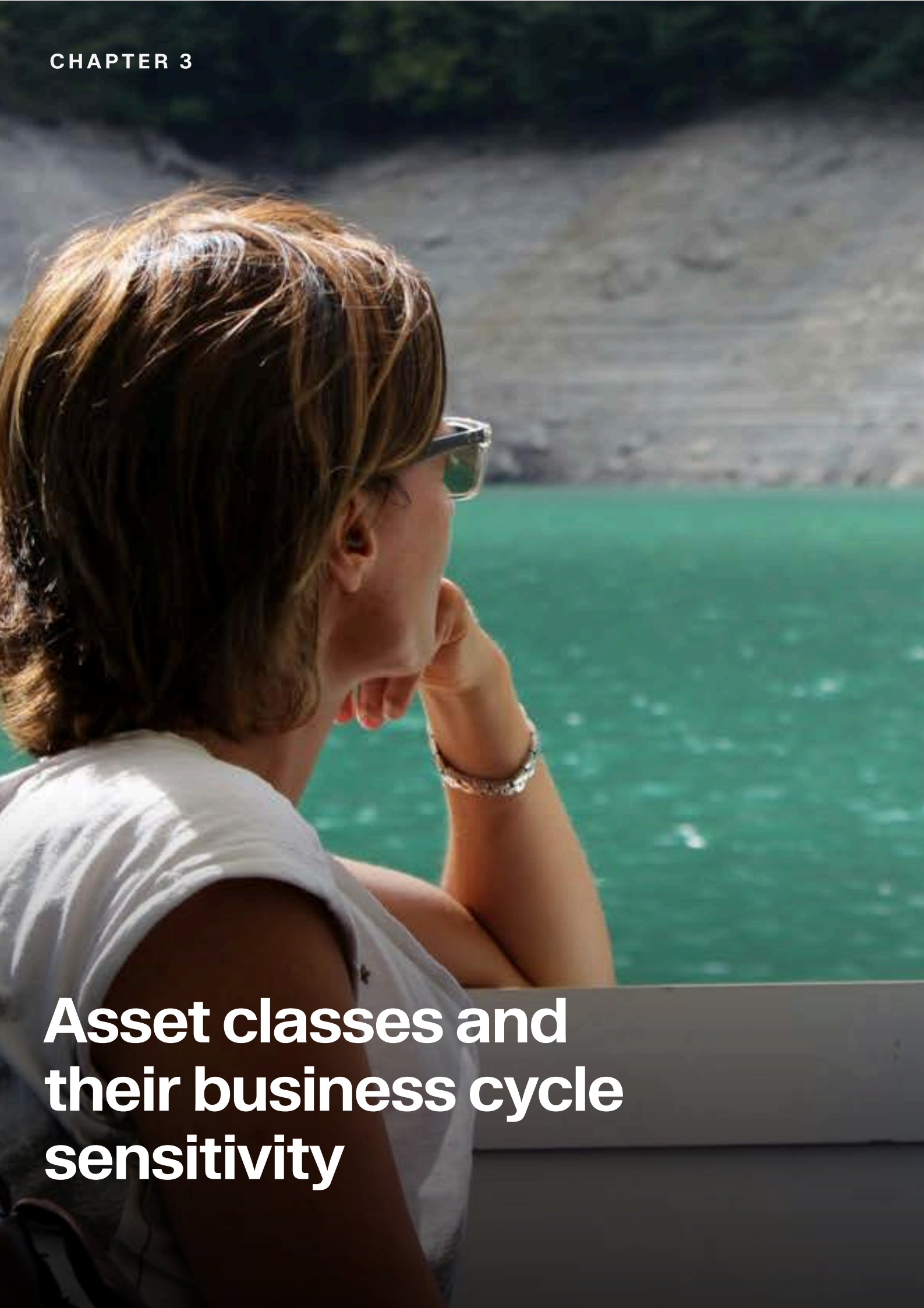
Change in Venture Capital Index value compared to S&P 500 index



Source: PitchBook 2025, Yahoo! Finance 2025, Moonfare 2025

Private equity significantly outperformed the S&P in every major economic crisis since 2000.

CHAPTER 3



Asset classes and their business cycle sensitivity

Another important aspect of private asset performance is how well different types of assets perform in different phases of the business cycle.

In public markets, researchers have already established some sectors are more 'pro-cyclical' in nature than others. For example industrials, information technology and consumer discretionary sectors see a greater variance than other sectors in their performance over the business cycle stages.[6]

Our aim is to see if there is a 'seasons' effect in private assets, namely do different types of private assets perform differently during distinct phases of the business cycle. We've broken the business cycle into four phases (recovery, expansion, contraction, slowdown), according to the level and momentum of the OECD lead economic indicator.* We've then tabulated the performance of the private assets during the phases of the business cycle.

Figure 8 summarises our results. Intuitively, private equity — as the lead private asset — has historically seen dips in performance in business cycle contractions, and has shown strong returns in economic expansions.

In more detail (Figures 9 and 10): in the lower segments of the business cycle (contractions and recoveries) private assets have moved in a less extreme way to public assets. That is, they have held up better in contractions but recovered less dramatically in recoveries. For reference, the average returns to the S&P 500 in contraction and recovery periods were -3.9% and +7.3% respectively, compared to -0.8% and +3.9% for private equity funds, and -3.2% and +0.8% for venture funds.

Similarly, in the higher segments of the business cycle, private assets have performed well. In expansion periods, both public and private markets showed strong returns. The top performers were private equity funds and small cap equities, averaging returns of +6.3% and +6.7%. In slowdown phases, private equity and venture capital funds were the top performers, averaging +3.9% and +4.2% in quarterly returns respectively. This compares to returns of +0.8% and +0.4% for the S&P 500 and the Russell 2000.

Figure 8: Public and private markets perform differently across business cycle stages

Average returns of asset classes across contractions, recoveries, slowdowns and expansions

	Private equity index quarterly returns	S&P index quarterly reports returns	Russell index quarterly returns
Contractions	-0.8%	-3.9%	-5.3%
Recoveries	3.9%	7.3%	8.7%
Slowdowns	3.9%	0.8%	0.4%
Expansions	6.3%	5.5%	6.7%

Source: PitchBook 2025, Yahoo! Finance 2025, Moonfare 2025

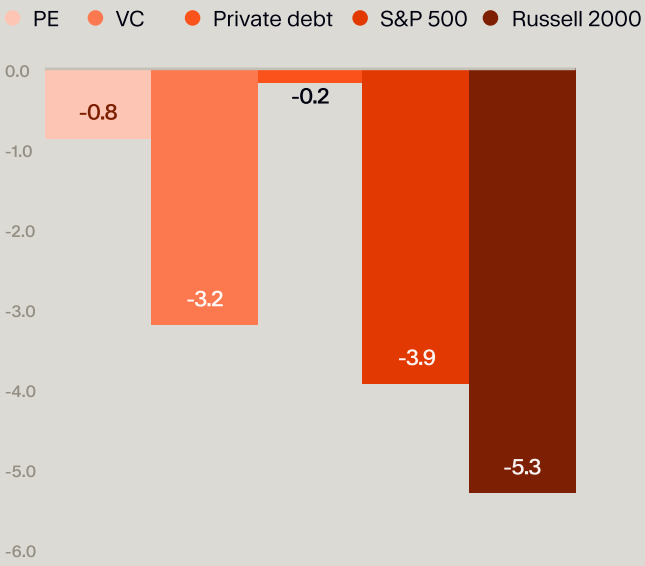
Note: Data spans from 1 Jan 2000 to 31 Dec 2024

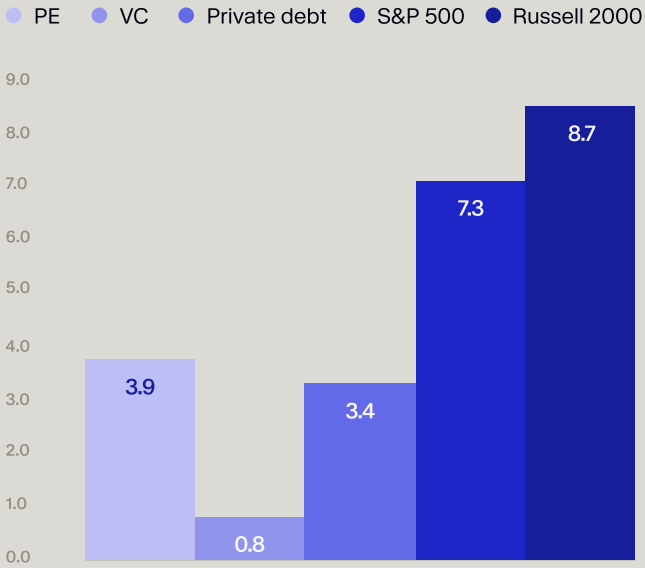
*The OECD composite leading indicator (CLI) is designed to provide early signals of turning points in business cycles, showing fluctuation of economic activity around its long-term potential level.

In expansion periods, both public and private markets showed strong returns. The top performers were private equity funds and small cap equities, averaging returns of +6.3% and +6.7%

Figure 9: Public markets have typically been more reactive in the lower segments of the business cycle

Average returns, by asset class (%)

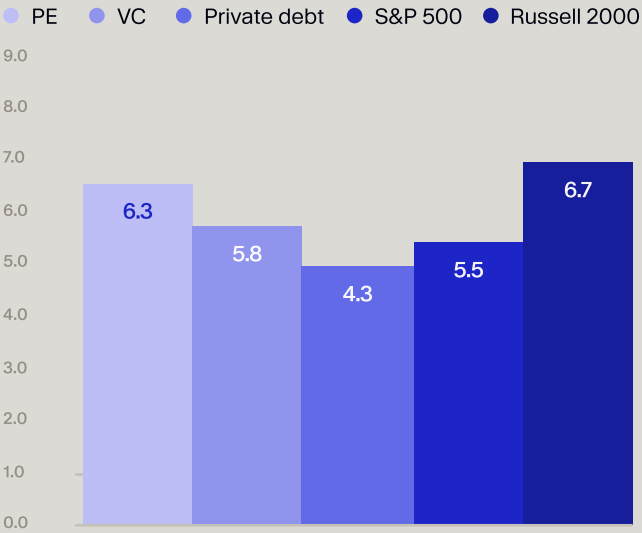


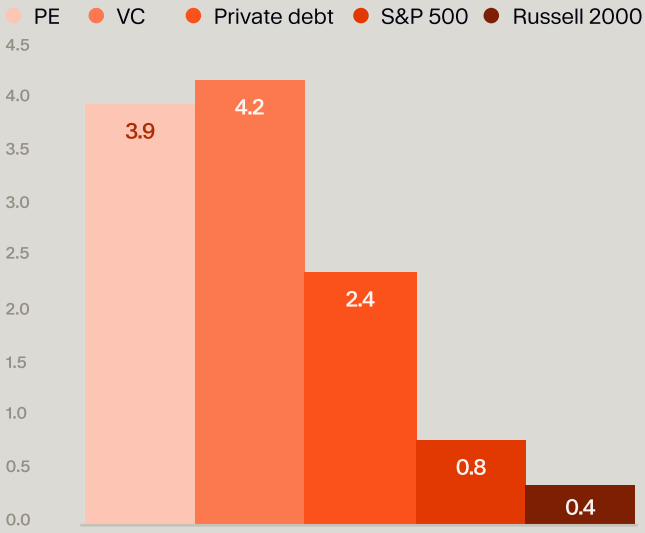


Source: Source: PitchBook 2025, Yahoo! Finance 2025, Moonfare 2025 **Note:** Data spans from 1 Jan 2000 to 31 Dec 2024

Figure 10: Private markets have generally outperformed public markets across the higher segments of the business cycle

Average returns, by asset class (%)





Source: PitchBook 2025, Yahoo! Finance 2025, Moonfare 2025 **Note:** Data spans from 1 Jan 2000 to 31 Dec 2024

CHAPTER 4

Improving portfolios with private market assets

In our analysis, there is plenty of evidence to suggest a significantly different profile in the performance of private assets compared to equities. This quality can make them valuable in the context of portfolios.

We have analysed how the inclusion of private assets in portfolios can improve risk-return trade-offs. Taking private equity as an example, we have built a portfolio around the notional asset allocation of a European family office,[7] as well as a more simple (50/30/20) portfolio.

Our stylised European family office portfolio consists of 20.88% US treasuries, 31.86% S&P 500, 36.26% private equity and 11% cash; the 50/30/20 portfolio consists of an allocation of 50% to the S&P 500, 30% to US treasuries and 20% to private equity.

In both cases the return-risk trade-off (simplified Sharpe ratio) improves compared to that of a 60/40 portfolio (60% stocks, 40% bonds).* Figure 11 shows that the model portfolios including private equity would have outperformed a typical 60/40 portfolio over every time frame in our analysis over the last 25 years.

Figure 11: Private assets have improved traditional portfolios over the past 25 years

Portfolio with 60% allocation to the S&P 500 and 40% to treasury bonds

	Last 5 years	Last 10 years	Last 25 years	2000-2009	2010-2019
Average annual return	8.9%	8.7%	7.2%	3.3%	10.3%
Volatility	12.1%	9.7%	9.2%	9.4%	7.0%
Simplified Sharpe ratio	0.74	0.90	0.78	0.35	1.48

Portfolio with 50% allocation to the S&P 500, 30% to treasury bonds and 20% to private equity

	Last 5 years	Last 10 years	Last 25 years	2000-2009	2010-2019
Average annual return	10.8%	10.4%	8.6%	4.7%	11.3%
Volatility	11.6%	9.1%	9.1%	9.8%	6.4%
Simplified Sharpe ratio	0.93	1.13	0.94	0.48	1.77

EMEA Family Office-style portfolio with 20.88% allocation to treasury bonds, 31.86% to the S&P 500, 36.26% to private equity and 11% to cash

	Last 5 years	Last 10 years	Last 25 years	2000-2009	2010-2019
Average annual return	11.1%	10.6%	9.0%	6.2%	10.8%
Volatility	9.5%	7.4%	7.6%	8.7%	4.8%
Simplified Sharpe ratio	1.16	1.44	1.18	0.71	2.27

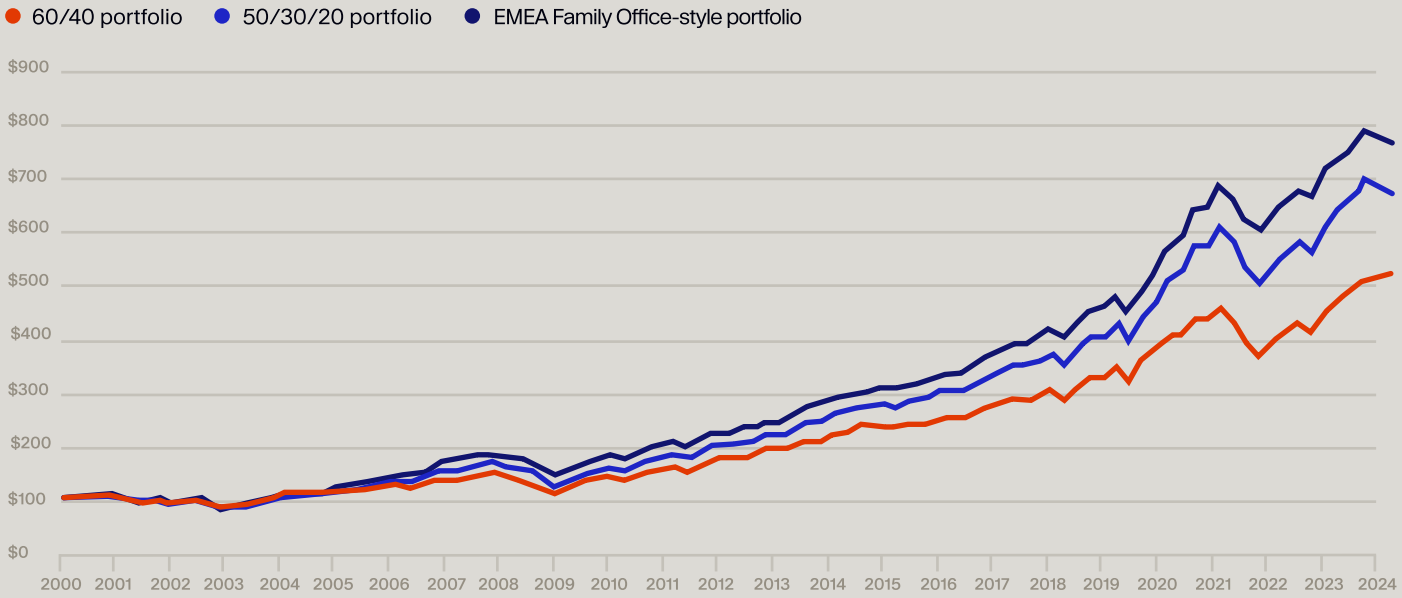
Source: PitchBook 2025, Yahoo! Finance 2025, Moonfare 2025
Note: Data spans from 1 Jan 2000 to 31 Dec 2024

*Portfolios including the private equity index may have smoothed returns, owing to valuation lag effects.

Figure 12: Typical 60/40 portfolios have seen increased cash flows with the addition of private assets

Cash return from a $100,000 investment over time, by portfolio type (in $)

	Last 5 years	Last 10 years	Last 25 years	2000-2009	2010-2019
60/40 portfolio	148,137	219,425	507,539	131,050	261,438
50/30/20 portfolio	161,618	256,008	684,902	147,354	287,591
EMEA Family Office-Style Portfolio	165,033	265,247	782,071	170,782	277,480



Source: PitchBook 2025, Yahoo! Finance 2025, Moonfare 2025

Note: Data spans from 1 Jan 2000 to 31 Dec 2024

In cash terms, from a $100,000 investment, a 60/40 portfolio would have yielded just over $500,000 over a 25-year horizon ending in December 2024. If this money were invested instead into a 50/30/20 portfolio, it would have grown to roughly $685,000. Similarly, the shift in allocation to a European family office portfolio, would have yielded just over $780,000 (Figure 12).*

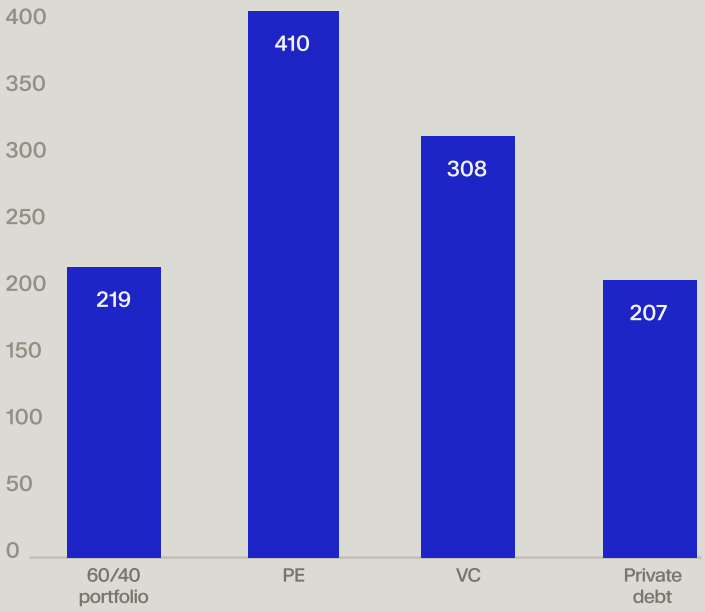
We have also analysed the performance of theoretical sole private asset investments compared to a simple 60/40 portfolio. A $100,000 invested in a global 60/40 portfolio twenty five years ago would be worth close to $500,000 today, but the same amount invested in private equity would be worth close to $2 million. We observed similar outperformance over a 10-year horizon (Figure 13).

*These portfolio values are illustrative and assume investment in the Pitchbook Private Capital Indices. The indices represent the performance of a continuously refreshed, multi-vintage portfolio rather than a single fund or commitment.

Past performance is not an indicator of future results.

Figure 13: Private asset investments have been more fruitful over the last ten years

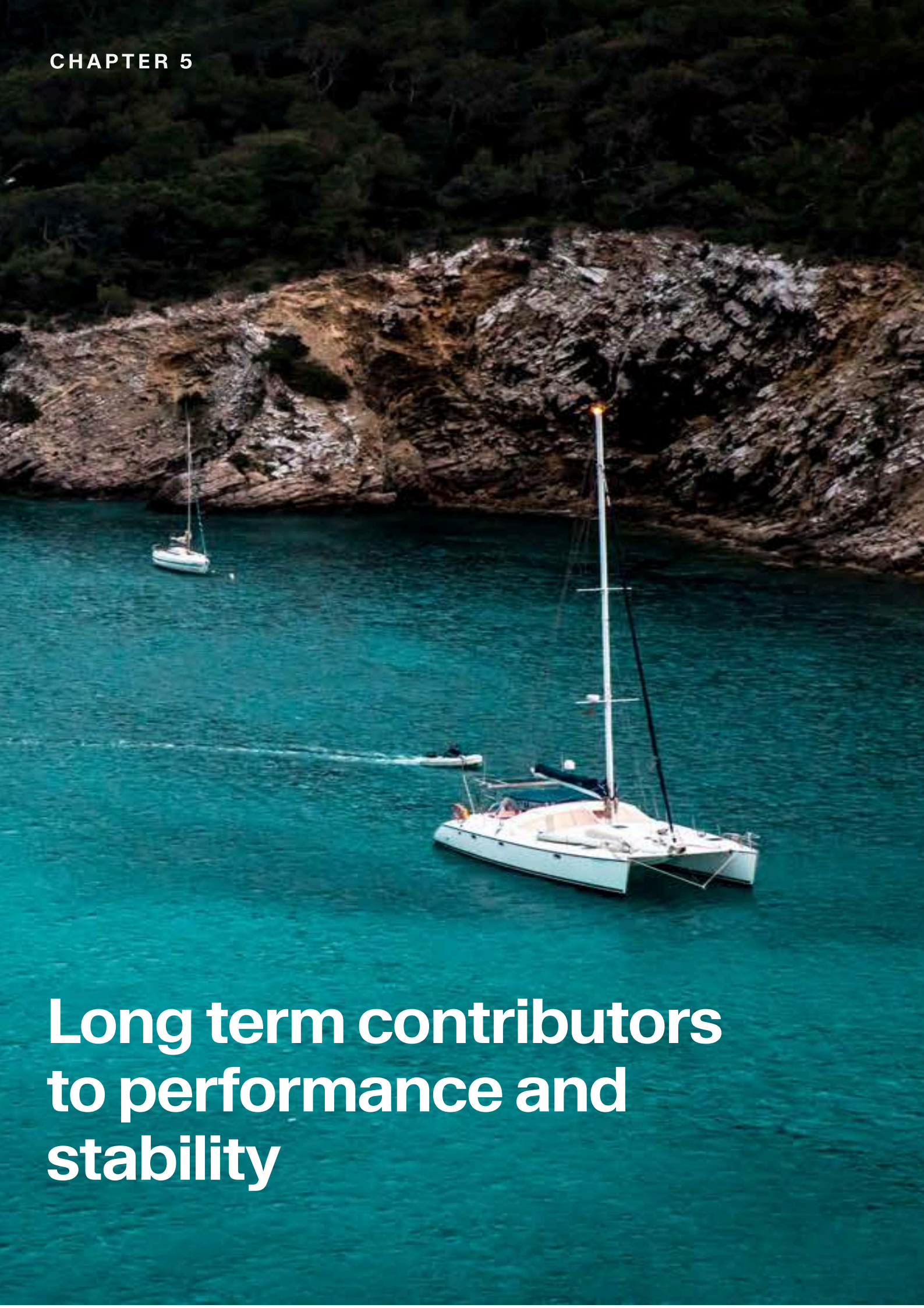
Cash return from a $100,000 investment over the last ten years, by asset class (in $K)



Source: PitchBook 2025, Yahoo! Finance 2025, Moonfare 2025

Note: Data spans from 1 Jan 2000 to 31 Dec 2024

CHAPTER 5



Long term contributors to performance and stability

The purpose of this research was to shed more light on the cyclical behavior, crisis resilience, long-term performance and potential contribution to portfolio performance of private market assets.

We have been able to analyse private capital performance across various strategies and directly compare them with public equity benchmarks by using the PitchBook Private Capital Indexes, which provide a remarkably comprehensive and reliable dataset dating back to 2000.

Our study reveals a number of important facets. First, private assets have proven to be able to provide long-term returns that are competitive, and, over the last 25 years, frequently better than public markets, while also having less risk.*

Second, their crisis-related behavior highlights significant distinctions from public markets, with private equity and private debt in particular showing comparatively high resistance to market shocks and to macro shocks too.

Third, there are differences across strategies in how sensitive private assets are to the business cycle, with private assets having exhibited preferential returns in slowdowns and contractions, strong returns in expansions, yet lagging behind in recovery phases.

Last but not least, the inclusion of private market assets in portfolio creation highlights their potential to present opportunities for diversification and improved risk-return trade-offs.

Careful selection has the potential to unlock resilience and outperformance, although investors must acknowledge the dispersion of returns across funds and strategies.

*PitchBook notes that reported private-market returns are typically “smoothed” due to valuation lag effects.

ENDNOTES

1. https://www.apollo.com/content/dam/apolloaem/documents/insights/apollo-beyond-60-40-private-assets.pdf
2. https://www.iiss.org/online-analysis/military-balance/2025/02/global-defence-spending-soars-to-new-high/
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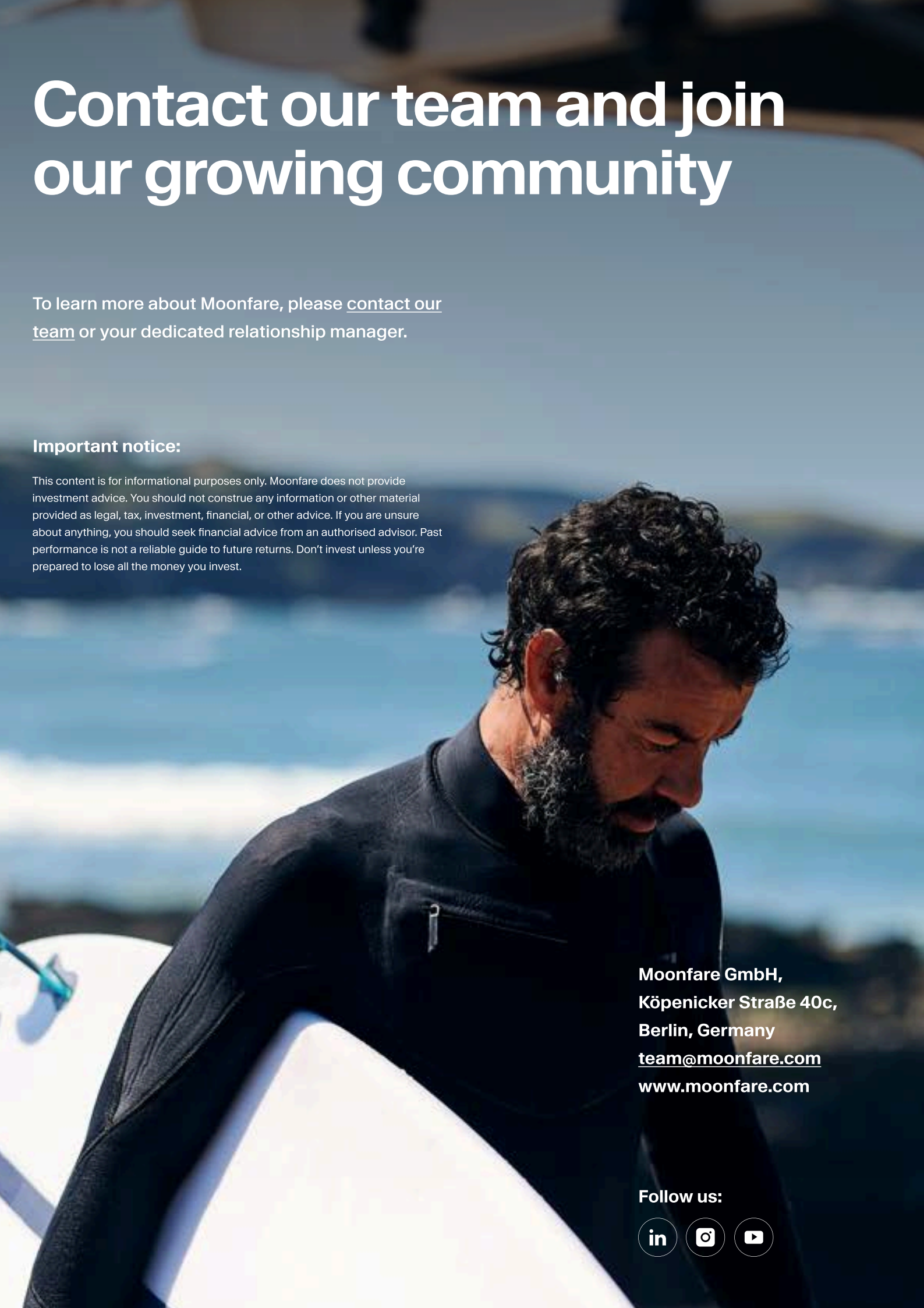

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