PitchBook

Allocator Solutions

EVALUATING PERSISTENCE IN FUND PERFORMANCE

PitchBook

Contents

We recently hosted a webinar to discuss the results of this report's analysis, as well as our new Manager Scoring framework. Please check out the recording on our website.
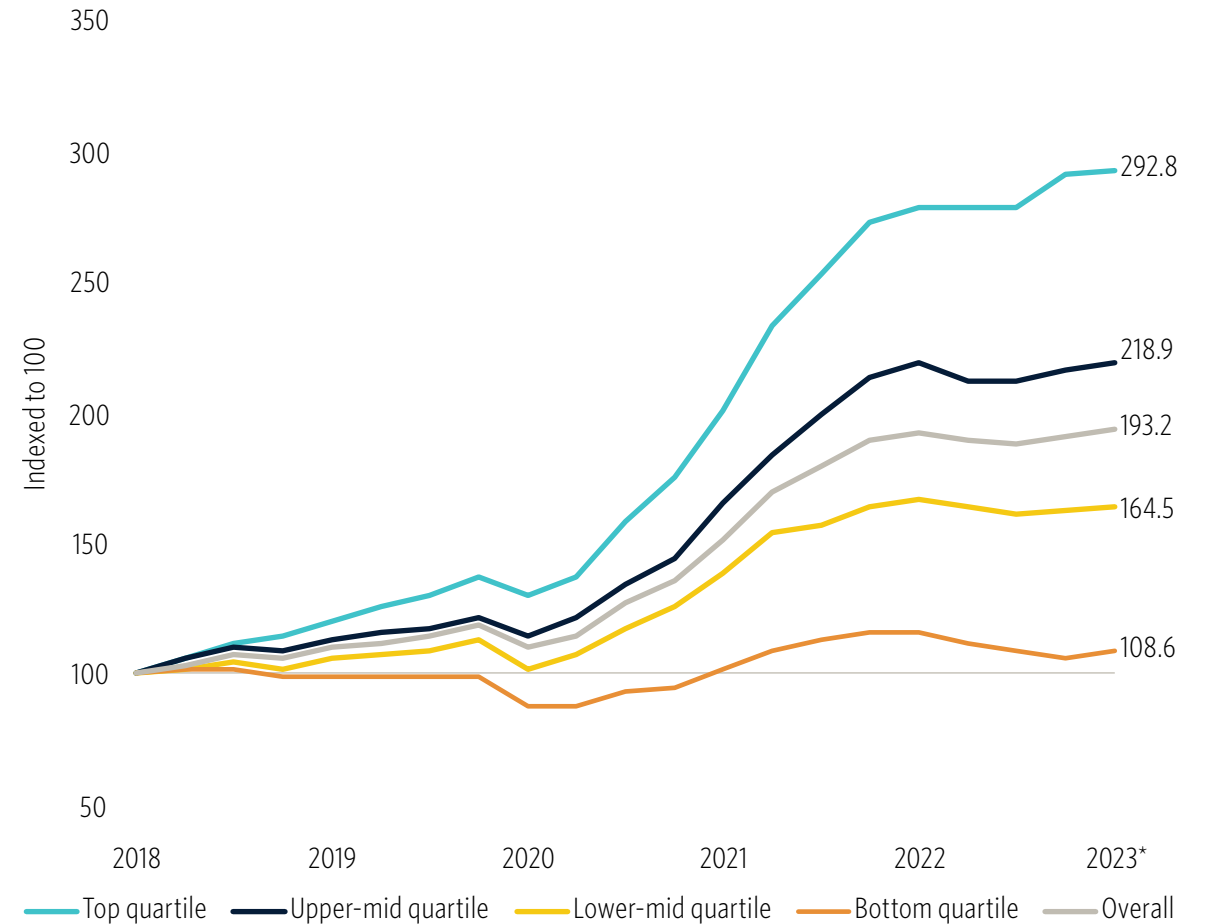
Introduction

The growth in private markets has been immense since the global financial crisis, not just in capital sloshing around, but also in the number and diversity of participants. The number of active fund managers, or GPs, has expanded from 3,700 in 2007 to 13,000 at the end of 2022,[1] and those GPs now manage more than 20,000 strategies (also known as fund families). Across PE, VC, real estate, infrastructure, and private debt, the breadth and depth of strategies available to capital allocators have never been greater. Despite the maturation of the industry, performance dispersion between managers has remained wide relative to other asset classes. Given allocators only commit to a handful of managers each year, experienced returns across private market portfolios tend to vary widely around average or benchmark returns. That makes identifying the top performers incredibly important for the economic returns an individual LP experiences—getting manager selection decisions wrong can be quite painful. The wide range of potential outcomes underpins why navigating the five (or six) "Ps" of manager due diligence is a key competency for capital allocators with exposures to private markets.

One of those "Ps," performance, has been the topic of some controversy as private markets have matured and the playing field has widened. Measuring a manager's historical return track record can ostensibly be helpful in the decision-making process of LPs. The oft-noted phrase "past performance is not a guarantee of future results" does not discourage allocators from peering into a GP's record books for clues about the likelihood of future success.[2] The existence of performance persistency has been backed both in theory and in some academic studies over the years. The theory goes that because private markets are by their nature active investments, and that access to deals and operational expertise are not uniform across GPs, some form of innate and sustainable manager "skill" exists that leads to predictable performance.

This theory has been supported by academic research, most notably a 2005 paper by Kaplan and Schoar that found evidence that prior fund performance—measured by its quartile rank against its vintage and fund type benchmark—was correlated with the quartile rank of the manager's next

PitchBook Private Capital Index five-year return by fund quartile

Top quartile — Upper-mid quartile — Lower-mid quartile — Bottom quartile — Overall

1: As measured by the number of managers that have closed a fund in the preceding five years
2: It should be noted that track record analysis is not exclusively looked at as an indication for future potential returns. LPs analyze manager track records to study investment style, return attribution, sector focus, etc.

fund.[3] Our own prior analysis on performance persistence led to similar results, finding top-quartile predecessor PE and VC funds translated to top-quartile successor funds at a 10%-15% higher clip than would otherwise be the case if results were random. Other studies have shown persistence using deal-level venture data[4] and in case study analyses of qualitative characteristics of PE firms.[5] However, subsequent research by Harris et al. found that performance persistency has weakened substantially in post-2000 vintages, and controlling for information available at the time of the next fundraise when it would be useful for manager selection decisions removes the effect almost entirely for buyout funds.[6] Still, the results in that paper were supportive of the performance persistency theory for VC funds and are worth exploring further. Furthermore, an article by Böni and Manigart found evidence of persistency in private debt managers, particularly when predecessor funds are relatively mature.[7]

Regardless of whether performance persistency exists, track record analysis and accurate benchmarking are still important components of the LP due diligence process. Managers that have underperformed their peers should be scrutinized further by delving into an attribution analysis of the poor performance. Likewise for managers that have outperformed, identifying

the elements of luck and skill can help inform an LP as to the likelihood the performance will be sustained. However, the seemingly simple act of identifying top and bottom performers can be challenging due to ambiguity in peer grouping that allows more managers to claim a top-quartile ranking than theoretically possible.[8] Our newly launched Manager Scoring framework seeks to objectively measure a manager's fund family track record in a way that is easier to interpret and more comparable across vintages and strategies than traditional quartile ranking methodologies. Leveraging our new benchmarking methodologies, we have taken a deep look at our own dataset of historical private fund performance to test the performance persistency question that potentially defies the legal disclaimer found in every investment-related pitch deck: Is past performance indicative of future results?

3: "Private Equity Performance: Returns, Persistence, and Capital Flows," The Journal of Finance, Steven N. Kaplan and Antoinette Schoar, August 12, 2005.
4: "The Persistent Effect of Initial Success: Evidence From Venture Capital," Journal of Financial Economics, Ramana Nanda, et al., July 2020.
5: "The Advantage of Persistence: How the Best Private-Equity Firms 'Beat the Fade,'" The Boston Consulting Group, Heino Meerkatt, et al., February 2008.
6: "Has Persistence Persisted in Private Equity? Evidence From Buyout and Venture Capital Funds," Journal of Corporate Finance, Robert S. Harris, et al., August 2023.
7: "Private Debt Fund Returns, Persistence, and Market Conditions," Financial Analysts Journal, Pascal Böni and Sophie Manigart, August 18, 2022.
8: "Are Too Many Private Equity Funds Top Quartile?" Journal of Applied Corporate Finance, Robert S. Harris and Rüdiger Stucke, Fall 2012, accessed August 15, 2023.

Testing for persistence in fund performance

In this section, we provide details on our methodology for testing performance persistence, followed by key takeaways for allocators to keep in mind when evaluating a manager's track record. Our analysis leverages PitchBook's private market fund performance data, which is primarily sourced from public LP reports and is net of all management fees and fund expenses. We collect this data on a quarterly basis so that each fund has a historical time series of returns throughout its life.

In total, the data used in this study contains information from 1,418 fund families with at least two constituent funds and 2,854 individual funds across four asset classes: PE, VC, real estate, and funds of funds.[9] This subset of asset classes was selected because it had adequately large sample sizes compared to the other asset classes we track. We also required individual funds to be at least eight years old as of the end of 2022 to ensure their performance has been mostly finalized. Please see the Appendix for additional details on the sample of funds included in this analysis.

Individual fund performance is measured by our Manager Scoring framework, which was designed to provide LPs with a robust track record and benchmarking tool. At a high level, this framework first computes an excess IRR for each fund based on an appropriate benchmark of peers and then normalizes it at the asset-class level into a modified Z-score.[10] The score can be interpreted as a fund's excess performance relative to other strategies of the same asset class in standardized units. For example, a score of +1.0 means that a fund's excess performance equals the median absolute deviation of excess returns across all funds in its benchmark. Of particular importance to this analysis, the peer benchmarking process allows us to directly compare fund scores from different vintage years across a fund family.

Past performance at the time of next fundraise

One of the main challenges to determining whether performance persistence exists and, more importantly, is actionable arises due to the timing of data availability. Early studies on the subject have often assumed (or did not have historical data) when assessing a fund's performance expectations that the performance

9: The first fund in each family is not included in this count because there is no previous performance to analyze.
10: "How to Detect and Handle Outliers," American Society for Quality Control, Boris Iglewicz and David C. Hoaglin, 1993, accessed August 15, 2023.

Relationship between IRR at time of successor's fundraise and latest available IRR*
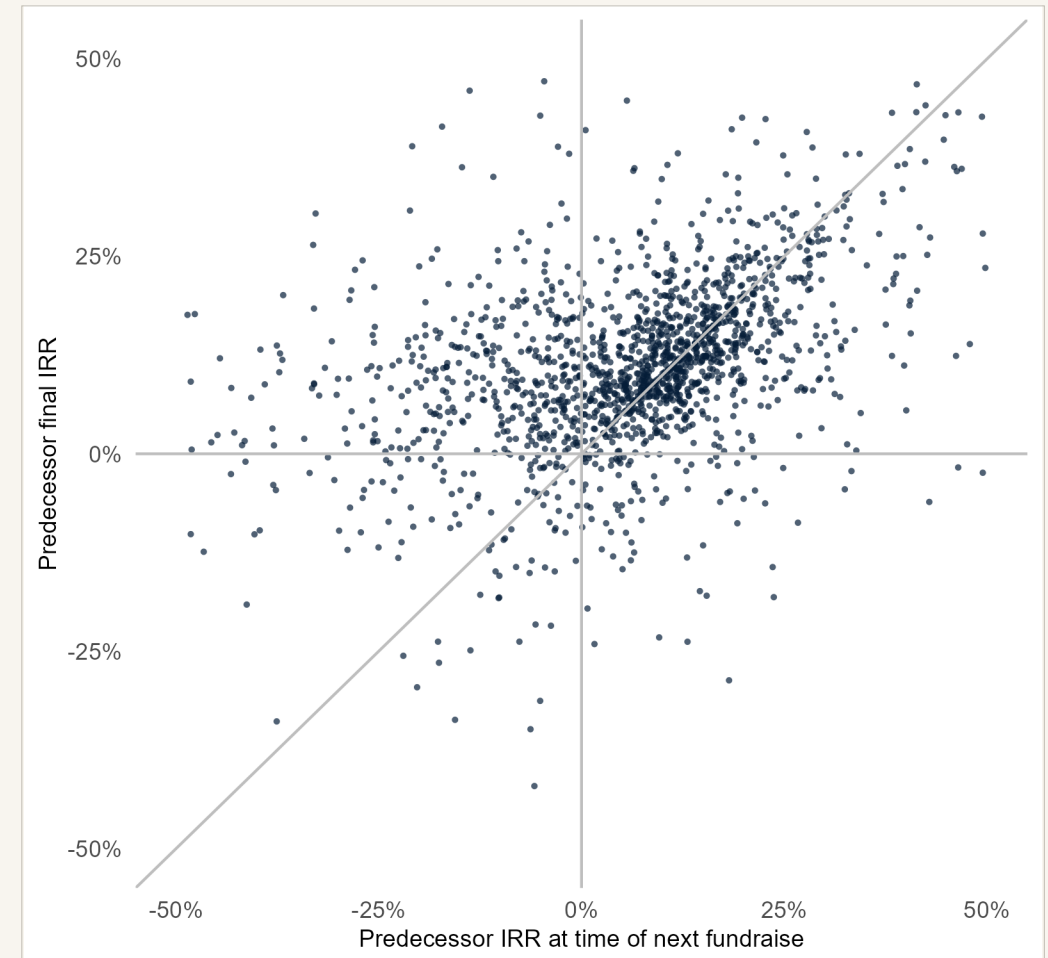
Source: PitchBook | **Geography:** Global
*As of December 31, 2022

of the previous fund in the strategy is known with certainty. However, the overlapping nature of finite-lived fund strategies' investment and fundraising periods makes this a grossly unrealistic assumption. To properly incorporate this reality, we only used performance data for previous funds in a strategy that would have been known at the time the next fund closes, which includes a two-quarter lag for data reporting.

In the sample used in this analysis, we found that two quarters before final close, predecessor funds were only 3.5 years old, on average. For most closed-end funds, 3.5 years is less than half of their effective duration, and performance figures at this age are likely not meaningful. The scatter plot shown on the previous page depicts the relationship between preliminary IRRs of predecessor funds at the time of the family's next fundraise against their IRRs as of the end of 2022. The vertical distance between each dot and the 45-degree line corresponds to the amount of drift each fund experienced over that time. On average, predecessor fund IRRs experienced an absolute net change of 13.9%, suggesting that these preliminary numbers are not meaningful indicators of eventual performance. Nonetheless, we test to determine whether there is predictive information using all available family performance data at the time of the next fundraise.

Traditionally, performance persistence analysis has focused on the quartile transition matrix—a four-by-four matrix in which the rows and columns represent the percentage of funds in each quartile ranking for predecessor and successor funds, respectively, within a fund family. For example, the entry in the first row and column of the matrix contains the percentage of instances where the predecessor and successor funds were both ranked in the top quartile. The diagonals of the matrix represent where both funds achieved the same quartile ranking. When incorporating the quartile ranking of the predecessor funds at the time of fundraising for the next fund, we found mixed results.

In a perfectly random setting with no persistence, we would expect to see a symmetrical 25% split between successor fund quartiles regardless of the prior funds' quartiles. At first glance, the results suggest that high-performing predecessor funds at the time of the family's next fundraise beget higher performance in the subsequent fund in VC and real estate (41.7% and 34.3% top-quartile alignment, respectively), but the opposite appears true for funds of funds and PE (15.4% and 17.2%, respectively). With these initial results, it is difficult to draw meaningful conclusions.

While transition matrices benefit from their simplicity, they also have several drawbacks. One of the biggest downsides arises from the use of quartile rankings in general, which transform a continuous variable into a discrete one with arbitrary cutoffs and can lead to loss of information when the variability within a quartile is high. Also, in the context of analyzing performance persistence, transition matrices do not establish a direct numerical relationship between past and current fund performance and cannot control for any additional factors. Regression analysis is a more direct and statistically robust way to establish a relationship between

past and current fund performance in terms of both direction and magnitude. Therefore, we fit a linear regression model for each asset class where the independent (predictor) variable is the average[11] performance score of up to the five previous funds in the family, and the dependent (response) variable is the successor fund's latest-available performance score.

Performance quartile ranking transition matrix by asset class*

		Successor fund quartile							
		Private equity (n = 488)				Venture capital (n = 190)			
		1st (top)	2nd	3rd	4th (bottom)	1st (top)	2nd	3rd	4th (bottom)
Fund family quartile	1st (top)	17.2%	25.6%	26.8%	30.3%	41.7%	21.3%	19.1%	18.8%
	2nd	27.9%	22.3%	26.8%	23.0%	20.8%	23.4%	34.0%	20.8%
	3rd	29.5%	30.6%	20.3%	19.7%	16.7%	34.0%	25.5%	22.9%
	4th (bottom)	25.4%	21.5%	26.0%	27.0%	20.8%	21.3%	21.3%	37.5%

		Real estate (n = 140)				Funds of funds (n = 155)			
Fund family quartile	1st (top)	34.3%	11.4%	37.1%	17.1%	15.4%	13.2%	30.8%	41.0%
	2nd	28.6%	25.7%	25.7%	20.0%	28.2%	23.7%	28.2%	17.9%
	3rd	20.0%	37.1%	20.0%	22.9%	30.8%	31.6%	20.5%	17.9%
	4th (bottom)	17.1%	25.7%	17.1%	40.0%	25.6%	31.6%	20.5%	23.1%

Source: PitchBook | **Geography:** Global
*As of December 31, 2022

Note: The fund family quartile is based on the average scores of up to five of the prior funds in the family. A family needs only one prior fund with a score to qualify.

11: Families need only one previous fund with a performance score to qualify. The average ignores missing data and is used instead of a specific lag to increase the sample size. Results from additional regressions using only the performance of the second previous fund are included in the Appendix.
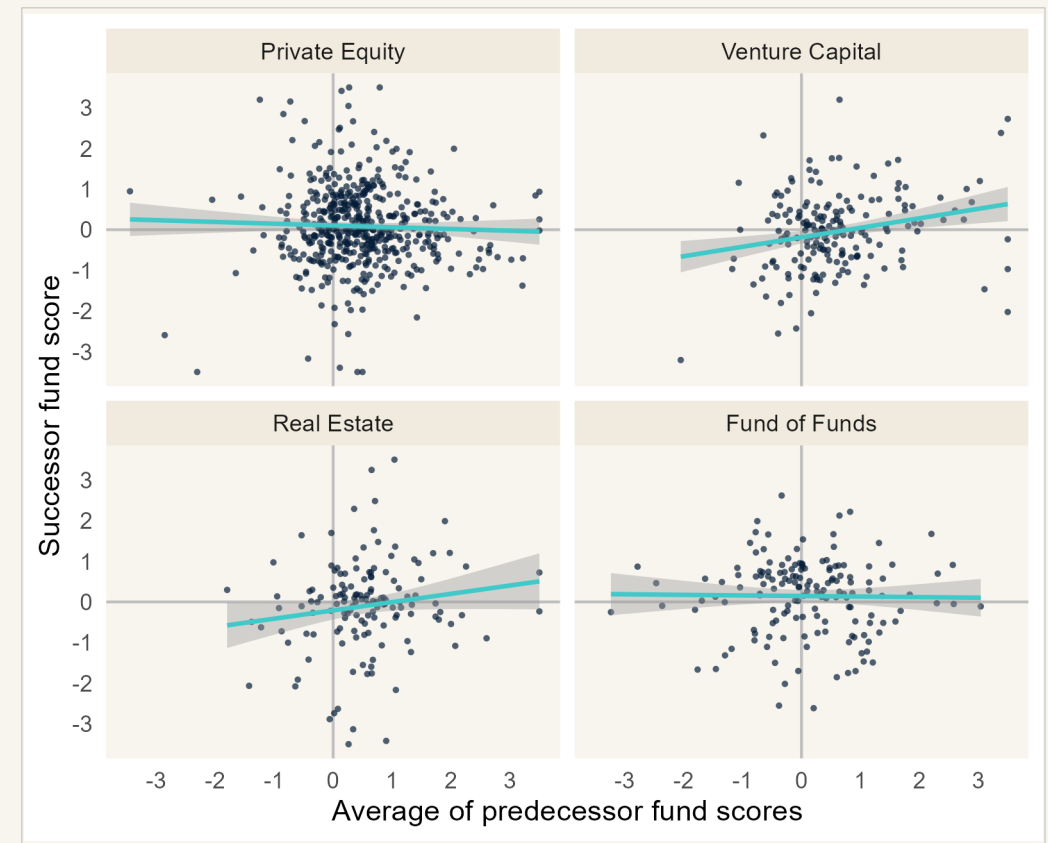
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At a high level, we found no-to-weak performance persistence across asset classes and several different statistical experiments when using data available at the time of fundraise. Persistence was nonexistent for PE and funds of funds, while persistence for VC and real estate was weak, but statistically significant.

At a high level, we found no-to-weak performance persistence across asset classes and several different statistical experiments when using data available at the time of fundraise. Persistence was nonexistent for PE and funds of funds, while persistence for VC and real estate was weak, but statistically significant. The linear regression coefficients for the average performance score of previous funds for VC and real estate were 0.20 and 0.25, respectively, after controlling for fund size and number within its family. This means that, on average, VC and real estate strategies with an average Z-score of positive (negative) 1.0 across previous funds had 0.20 and 0.25 higher (lower) Z-scores on the next fund, respectively. This approximately equates to 1.7% and 1.4% higher (lower) IRRs for VC and real estate, respectively, when reversing the Z-score transformation with average benchmark parameters. Interested readers can review the Appendix for detailed linear regression results.

Next, we looked at performance persistence in the tails of the distribution by encoding two binary predictor variables for fund families with average scores ranked in the bottom and top quartile of their respective asset class. We found evidence of persistence within top-performing VC managers. For top-quartile VC families, the next fund had a higher performance score of 0.24 (approximately 1.7% higher net IRR), on average than mid-quartile strategies and a 0.53 higher score (approximately 4.6% higher net IRR) than bottom-quartile strategies. Interestingly, top-quartile funds of funds families had statistically significant results, but with a negative coefficient.

For top-quartile VC families, the next fund had a higher performance score of 0.24 (approximately 1.7% higher net IRR) on average than mid-quartile strategies and a 0.53 higher score (approximately 4.6% higher net IRR) than bottom-quartile strategies.

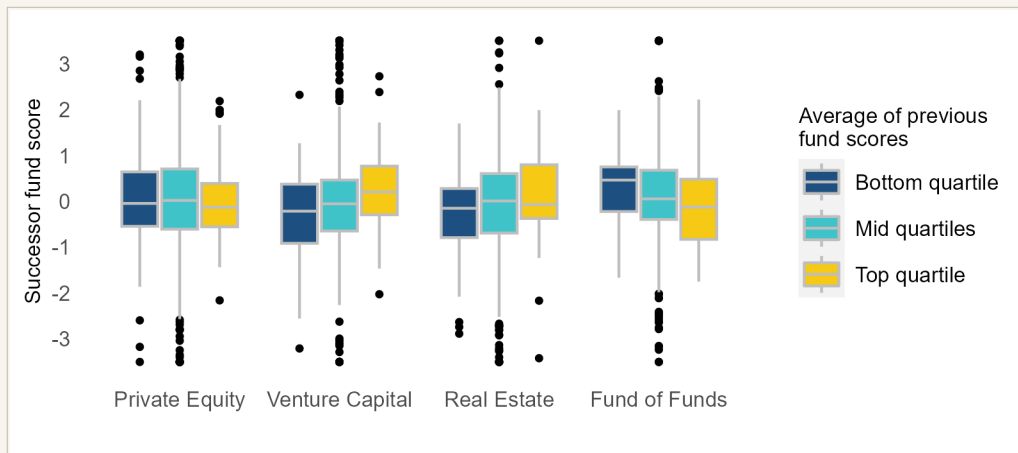## Relationship between average performance scores of predecessor funds and the successor fund*

Source: PitchBook | **Geography:** Global
*As of December 31, 2022
Note: The average of previous fund scores is based on up to five funds.

Lastly, we analyzed the relationship between past performance and the probability that the successor fund ended up in the bottom or top quartiles using a logistic regression. While there was also some evidence that past poor performance was associated with a higher likelihood that the successor fund finished in the bottom quartile in both VC and real estate, a statistical confidence interval showed these results are inconclusive, influenced by low sample sizes.

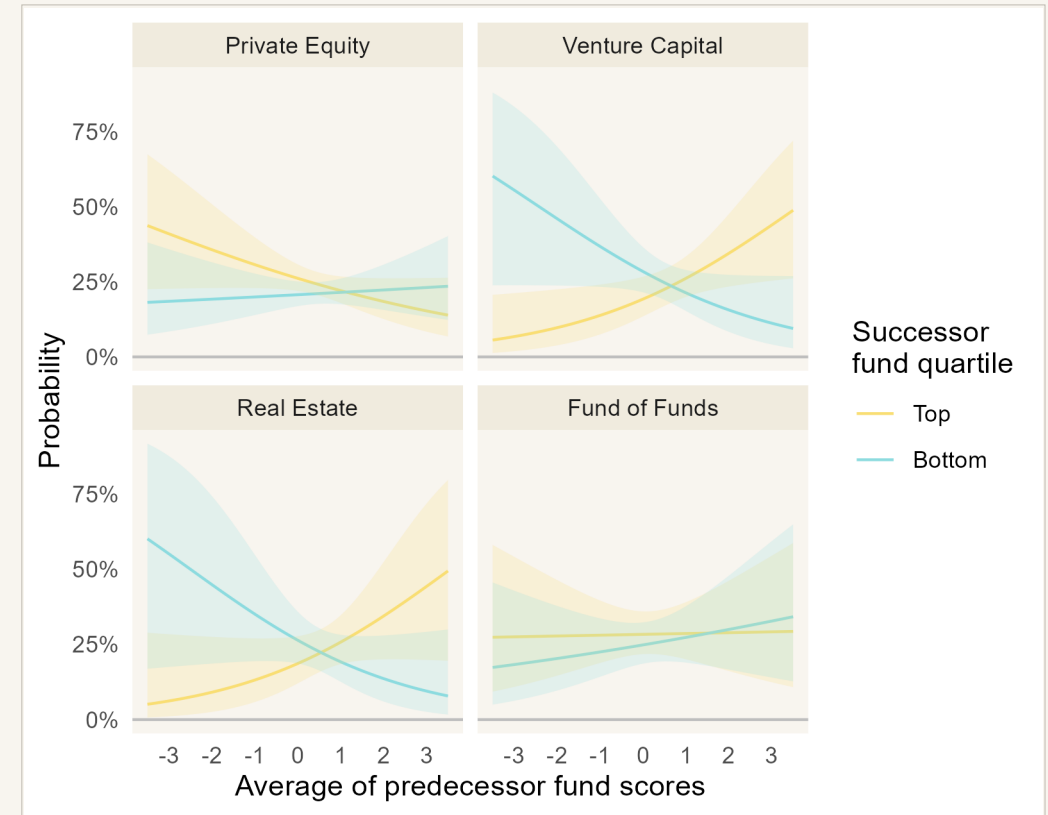**Distribution of fund performance scores by ranking of average scores of previous funds***

Using the latest available performance data

With mixed results using past performance to predict future returns contemporaneously, the next obvious question is whether performance persistence exists at all when using the most recent available performance figures. While this may not be practical information for allocators in most cases, it could be useful in certain situations. Depending on the age of the prior fund at the time of fundraise, capital already distributed, and an assessment of portfolio holding companies, it could be possible to make a reasonable evaluation of a

Probability successor fund ranked in the bottom and top quartile*

fund's final performance. Additionally, an answer to this question can help inform investors' decision-making around secondary transactions. If performance persistence does exist, a secondary investor could look at past performance along with preliminary performance to get an objective estimate of the expected return.

Beginning with the transition matrix, once again, we find stronger results in favor of persistence using the ex-post information. Top-quartile fund families tend to produce top-quartile successors, and bottom-quartile families continue in the bottom quartile at a rate higher than the baseline. This held for each of the four strategies and appears strongest in the case of funds of funds, where 52.1% of bottom-quartile predecessor funds translated to bottom-quartile successor funds, more than doubling the baseline rate of 25%.
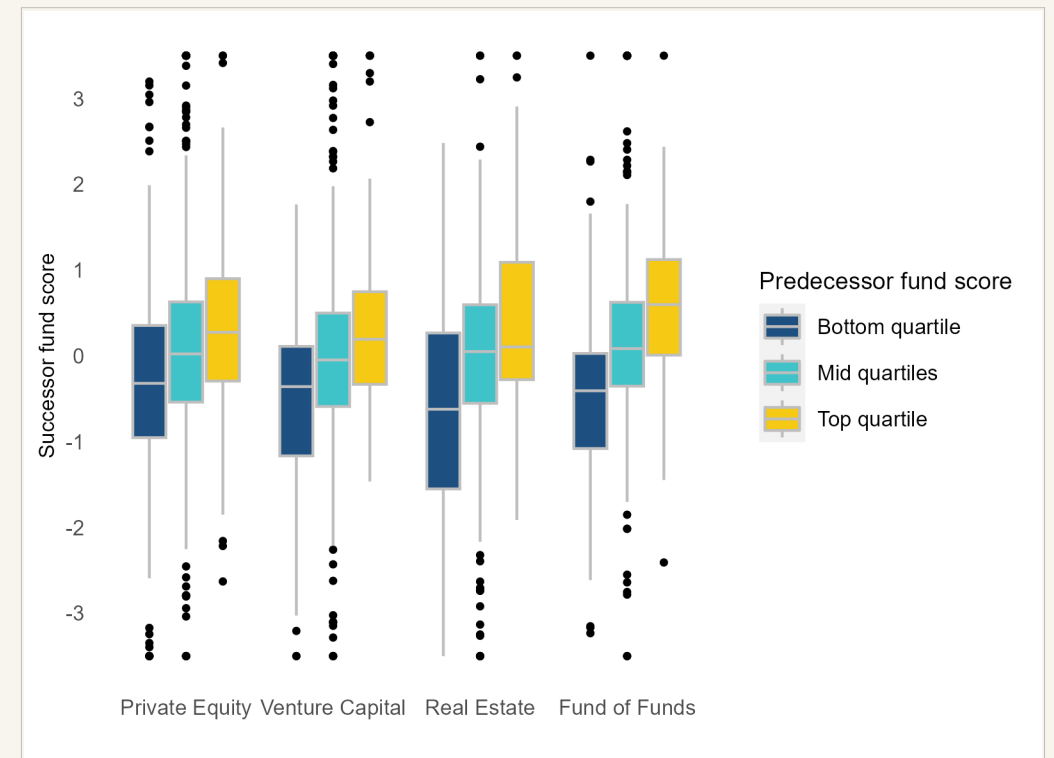
To test the significance of this persistence, we then repeated the regression analysis performed in the previous section using the most recent performance data available as of the end of 2022. Consistent with anecdotes and prior academic research, we found evidence of moderate performance persistence across all asset classes. Overall, persistence was strongest within funds of funds, and across all strategies it was most significant when the prior fund underperformed. However, with low-double-digit R^2 values throughout the regression results, the relationship lacks significant explanatory power.

Performance quartile ranking transition matrix by asset class*

		Successor fund quartile							
		Private equity (n = 849)				Venture capital (n = 462)			
		1st (top)	2nd	3rd	4th (bottom)	1st (top)	2nd	3rd	4th (bottom)
Predecessor fund quartile	1st (top)	34.4%	25.0%	23.1%	17.4%	34.8%	29.3%	19.1%	17.2%
	2nd	26.9%	30.7%	24.5%	17.8%	25.2%	25.9%	25.2%	23.3%
	3rd	22.6%	27.8%	25.5%	23.5%	28.7%	25.9%	27.8%	17.2%
	4th (bottom)	16.0%	16.5%	26.9%	41.3%	11.3%	19.0%	27.8%	42.2%

		Real estate (n = 340)				Funds of funds (n = 474)			
Predecessor fund quartile	1st (top)	35.3%	17.6%	32.9%	14.1%	45.4%	27.1%	16.9%	10.9%
	2nd	37.6%	32.9%	18.8%	10.6%	27.7%	33.9%	26.3%	11.8%
	3rd	12.9%	29.4%	31.8%	25.9%	13.4%	28.0%	32.2%	25.2%
	4th (bottom)	14.1%	20.0%	16.5%	49.4%	13.4%	11.0%	24.6%	52.1%

Source: PitchBook | Geography: Global
*As of December 31, 2022

Distribution of successor fund performance by ranking of predecessor fund score*
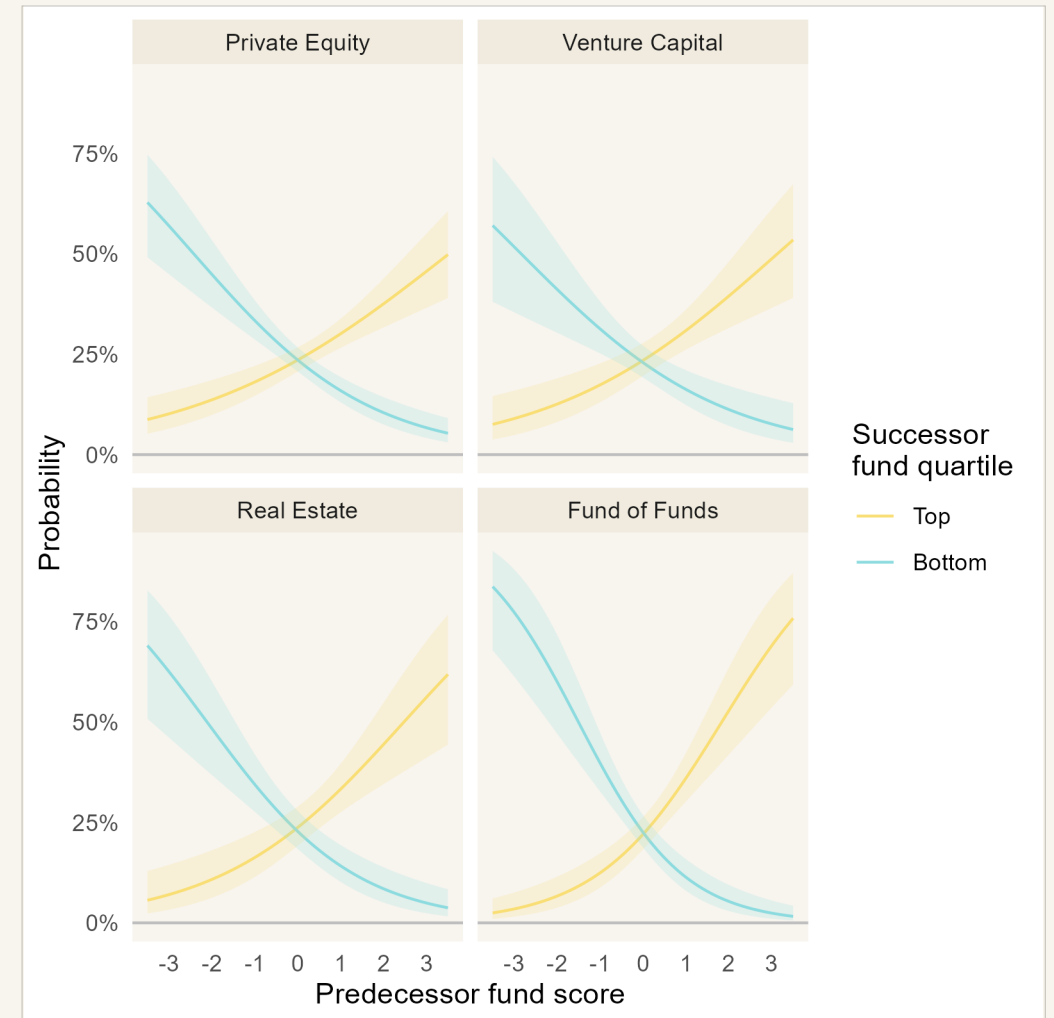

Source: PitchBook | Geography: Global
*As of December 31, 2022

Relationship between predecessor and successor fund performance scores*
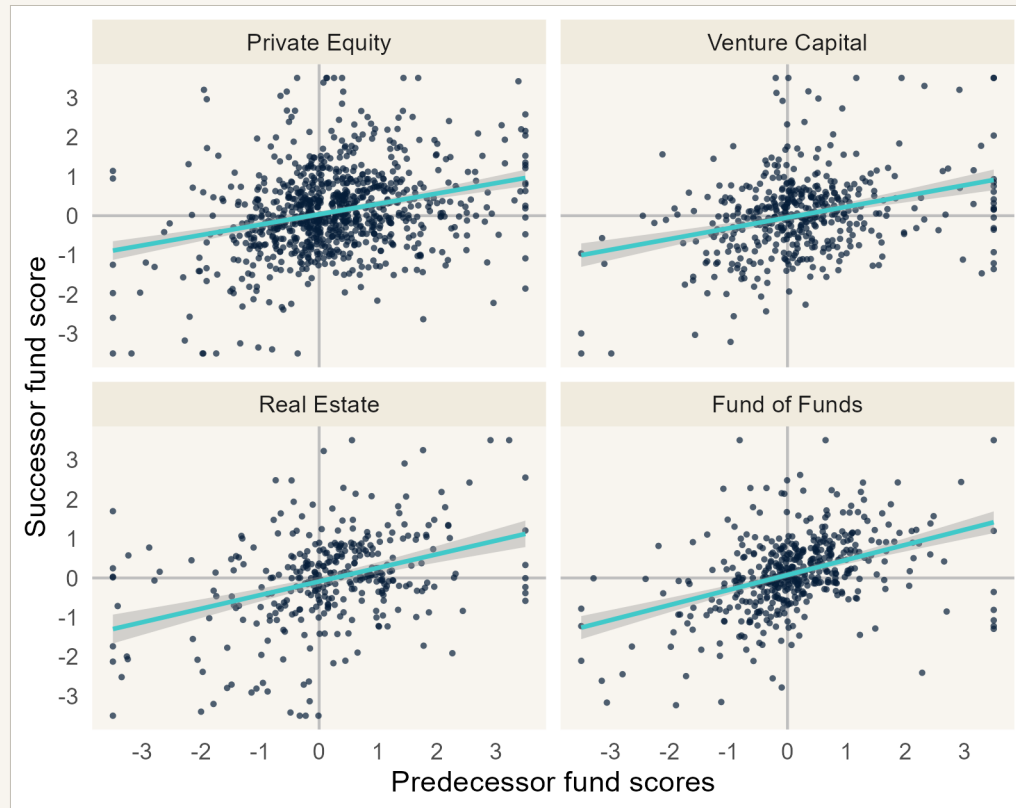
Source: PitchBook | Geography: Global
*As of December 31, 2022

Probability successor fund ranked in the bottom and top quartile*

Source: PitchBook | Geography: Global
*As of December 31, 2022
Note: Shaded area represents a 95% confidence interval.

Takeaways for LPs

Our findings show that performance persistence does exist in private markets; unfortunately, at the time a fund is raising, the interim performance of the young predecessor fund is not particularly useful for most strategies. In VC and real estate, the average performance of predecessor funds appears to have some informational value, but not enough for LPs to gain a material advantage when using it to make manager selection decisions. Due to data gaps for some of the top name-brand VC firms, we may be understating persistency for the asset class, but the drift in interim fund performance from the fundraising period to final realized returns creates debilitating noise regardless. The large error rates found in our regression analyses suggest that the practical use cases are severely limited. The bottom line is that much like in public markets, LPs should avoid being overly reliant on past performance when selecting managers and instead focus on their assessment of the broader investment thesis and whether the manager has the right processes and personnel to execute that thesis.

Even if an allocator had a crystal ball to see the most recent available fund performance, our results show that although persistency exists, it still has relatively low explanatory power from a statistical standpoint. Revisiting the transition matrix with final available data, an allocator picking from the group of top-quartile families would only have a 35% to 45% chance of selecting a family whose next fund is also top-quartile—meaning that even with future information at your disposal, more than half the time you would still miss out on the best cohort of successor funds. It is also important to note that the effects estimated from the regression analyses relate to average values from a distribution of funds, not individual funds. Given the high degree of manager concentration in most LP private market portfolios, the significant variability around those average effects is an important consideration.

Perhaps more helpfully, our analysis indicates that poor performers tend to have greater persistency, signaling that yellow flags raised in the track record diligence process may in fact be red. Managers with poor track records should have good explanations and a clear roadmap for delivering better future results. Whether that takes the form of a strategy pivot or new personnel, there can be good reasons to not rely too much on prior performance. However, poor performers tend to have difficulty raising subsequent funds, which means LPs are faced with the cost of diligencing and establishing a long-term relationship with a manager who will be closing up shop after a bad vintage or two. Investors must then restart the process to find a replacement for the allocation, taking time and resources. For GPs, the poor performing dropouts also mean that the competitive landscape is constantly shifting, making it progressively more difficult for the exceptional performers to stay exceptional.

> **The bottom line is that much like in public markets, LPs should avoid being overly reliant on past performance when selecting managers and instead focus on their assessment of the broader investment thesis and whether the manager has the right processes and personnel to execute that thesis.**

Appendix

Fund counts by vintage year and strategy*

	Private equity		Venture capital		Real estate		Funds of funds	
	Count at fundraise	Current count	Count at fundraise	Current count	Count at fundraise	Current count	Count at fundraise	Current count
2003	10	26	2	10	2	10	2	17
2004	11	34	7	18	2	10	3	22
2005	42	72	15	28	8	31	5	34
2006	45	81	18	37	10	26	10	42
2007	58	96	27	50	13	42	12	50
2008	45	75	18	39	5	24	19	53
2009	21	33	10	21	10	20	11	29
2010	26	40	14	22	6	14	13	34
2011	44	58	18	28	13	21	20	31
2012	52	69	19	22	20	32	18	34
2013	56	67	13	25	21	30	15	33
2014	48	60	22	31	17	23	21	27
2015	26	30	4	3	13	14	5	7
2016	2	3	2	2	1	1	1	1
2017	2	3	1	1	1	1	1	1

Detailed regression results with data available at the time of fundraise*

Private equity						
Average of previous fund scores	-0.046 (-0.89)	-0.043 (-0.79)				
2nd previous fund score					-0.062 (-1.25)	-0.037 (-0.71)
Average of previous fund scores (bottom quartile)			-0.082 (-0.74)	-0.078 (-0.69)		
Average of previous fund scores (top quartile)			-0.157 (-1.43)	-0.145 (-1.30)		
Fund size (log)		-0.012 (-0.31)		-0.018 (-0.47)		-0.052 (-1.14)
Fund family number		0.028 (1.19)		0.027 (1.13)		0.053** (1.86)
Number of observations	488	488	488	488	309	309
R^2	0.00	0.00	0.00	0.00	0.00	0.02

Venture capital						
Average of previous fund scores	0.233*** (3.35)	0.200*** (2.89)				
2nd previous fund score					0.160 (1.88)	0.128 (1.53)
Average of previous fund scores (bottom quartile)			-0.235 (-1.43)	-0.171 (-1.07)		
Average of previous fund scores (top quartile)			0.294** (1.78)	0.243 (1.50)		
Fund size (log)		0.273*** (3.20)		0.277 (3.18)		0.327*** (2.94)
Fund family number		-0.017 (-0.61)		-0.019 (-0.67)		-0.056 (-1.59)
Number of observations	190	190	190	190	120	120
R^2	0.06	0.12	0.04	0.10	0.03	0.10

Detailed regression results with data available at the time of fundraise*

Real estate					
Average of previous fund scores	0.204** (1.80)	0.251*** (2.08)				
2nd previous fund score					0.092 (0.87)	0.062 (0.53)
Average of previous fund scores (bottom quartile)			-0.367 (-1.58)	-0.415 (-1.75)		
Average of previous fund scores (top quartile)			0.098 (0.42)	0.174 (0.72)		
Fund size (log)		-0.081 (-0.78)		-0.080 (-0.76)		0.054 (0.45)
Fund family number		0.048 (1.10)		0.049 (1.11)		-0.062 (-1.07)
Number of observations	140	140	140	140	72	72
R^2	0.02	0.03	0.02	0.03	0.01	0.03

Funds of funds					
Average of previous fund scores	-0.014 (-0.19)	-0.071 (-0.89)				
2nd previous fund score					0.192 (1.66)	0.167 (1.40)
Average of previous fund scores (bottom quartile)			0.006 (0.03)	0.164 (0.86)		
Average of previous fund scores (top quartile)			-0.373*** (-2.04)	-0.400*** (-2.22)		
Fund size (log)		0.040 (0.64)		0.060 (0.97)		0.027 (0.25)
Fund family number		0.063*** (2.15)		0.069*** (2.39)		0.052 (0.85)
Number of observations	155	155	155	155	68	68
R^2	0.00	0.04	0.03	0.08	0.04	0.05

Detailed regression results with latest available data*

Private equity

Previous fund score	0.264*** (8.63)	0.269 (8.76)			0.175*** (3.92)	0.178*** (3.98)
2nd previous fund score					0.036 (0.93)	0.047 (1.18)
Previous fund score (bottom quartile)			-0.553*** (-6.22)	-0.562*** (-6.30)		
Previous fund scores (top quartile)			0.159** (1.79)	0.161** (1.81)		
Fund size (log)	5**	-0.038 (-1.35)		-0.042 (-1.46)		-0.044 (-1.18)
Fund family number		0.035** (1.72)		0.029 (1.38)		0.029 (1.12)
Number of observations	849	849	849	849	383	383
R^2	0.08	0.08	0.06	0.06	0.05	0.05

Venture capital

Previous fund score	0.273*** (7.09)	0.272*** (7.05)			0.193*** (3.04)	0.180** (2.84)
2nd previous fund score					0.123** (2.41)	0.109** (2.13)
Previous fund score (bottom quartile)			-0.646*** (-5.78)	-0.648*** (-5.78)		
Previous fund scores (top quartile)			0.213** (1.91)	0.208** (1.85)		
Fund size (log)		0.006 (0.16)		0.008 (0.21)		0.115** (2.22)
Fund family number		-0.008 (-0.38)		-0.010 (-0.50)		-0.021 (-0.82)
Number of observations	462	462	462	462	205	205
R^2	0.10	0.10	0.10	0.10	0.08	0.10

Detailed regression results with latest available data*

Real estate

	Real estate					
Previous fund score	0.345*** (7.23)	0.345*** (7.18)			0.255*** (3.74)	0.255*** (3.78)
2nd previous fund score					"0.014 (0.19)"	-0.014 (-0.19)
Previous fund score (bottom quartile)			-0.682*** (-4.44)	-0.683*** (-4.43)		
Previous fund scores (top quartile)			0.333** (2.17)	0.330** (2.12)		
Fund size (log)		-0.040 (-0.76)		-0.047 (-0.86)		0.048 (0.68)
Fund family number		0.010 (0.35)		-0.002 (-0.07)		-0.077* (-1.96)
Number of observations	340	340	340	340	162	162
R^2	0.13	0.14	0.09	0.10	0.09	0.12

Funds of funds

|	Funds of funds					
Previous fund score	0.382*** (9.65)	0.372*** (9.25)			0.483*** (9.03)	0.475*** (8.78)
2nd previous fund score					0.198*** (3.98)	0.192*** (3.82)
Previous fund score (bottom quartile)			-0.601*** (-5.95)	-0.593*** (-4.43)		
Previous fund scores (top quartile)			0.412*** (4.06)	0.391*** (3.83)		
Fund size (log)		-0.020 (-0.66)		-0.035 (-1.12)		-0.030 (-0.87)
Fund family number		0.027 (1.48)		0.026 (1.39)		0.018 (0.81)
Number of observations	474	474	474	474	281	281
R^2	0.16	0.17	0.14	0.15	0.32	0.32

Source: PitchBook | **Geography:** Global
*As of December 31, 2022
Note: The t-statistics of the coefficients are shown in parentheses. A *, **, and *** indicate the coefficient is statistically significant at the 90%, 95%, and 99% confidence levels, respectively.

Additional research

Private market allocations
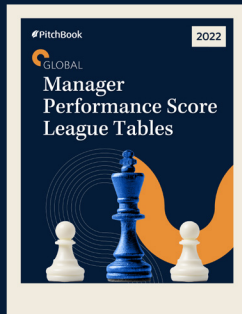
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