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Investment Performance and Cost Insights

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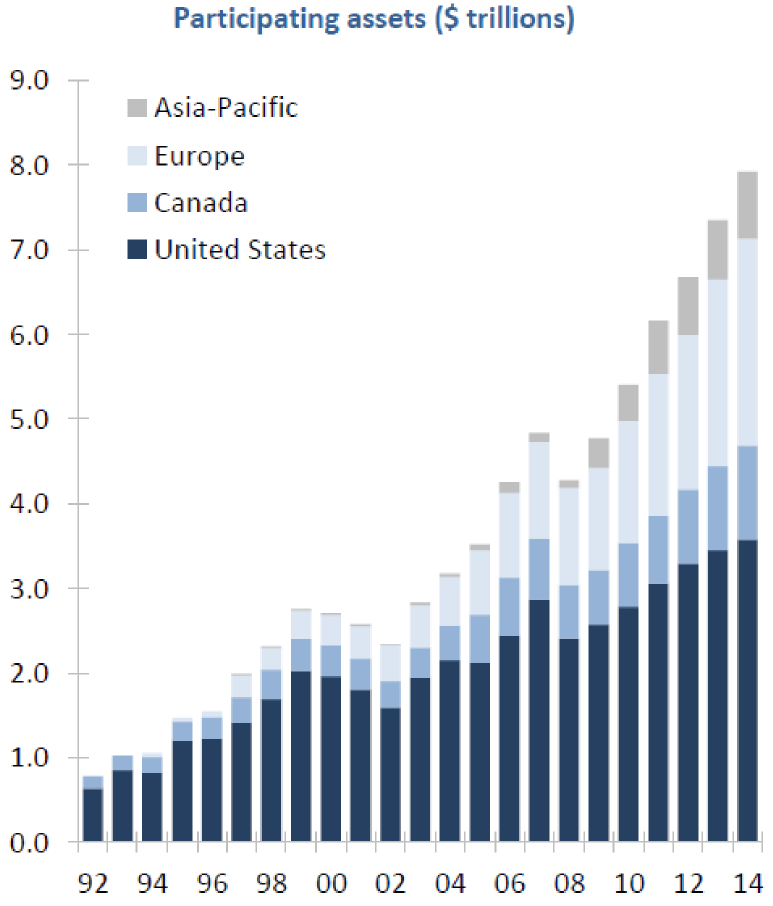
CEM Benchmarking

Data and research conclusions are drawn from the CEM global investment performance database.

- The database includes the following metrics:
  - Holdings
  - Policy portfolio weights
  - Fund and asset class returns
  - Asset class benchmarks and returns
  - Costs

- Benchmarking focus is:
  - What you paid
  - What you got
  - What you risked

- 63 U.S. public plans with aggregate assets of $2.4 trillion participate.



CEM Benchmarking

CEM cost and performance benchmarking principles:

- Costs are neither inherently good nor bad. Performance should be evaluated alongside costs to answer the fundamental question: "Are you getting reasonable value in return for what you pay?".
- Net value added relative to benchmarks should be measured to assess the effectiveness of asset class implementation decisions.
- 'Good' benchmarks should be used for every asset class.

CEM Benchmarking

Good benchmarks are essential in evaluating value for money from active management. CEM believes the following principles should be used:

- Benchmarks should be investable. An investable benchmark is "what you could have had", a real alternative that was possible, and ideally implementable at low cost.

- Benchmarks should fairly reflect available returns. Benchmarks that are too easy or too hard to beat may give undue credit for investment skill, or not give credit where it is due.

- Benchmarks should be correlated to the assets they are being used to assess. A high degree of correlation indicates that a benchmark is both fair and a useful risk proxy.

CEM Benchmarking

Full disclosure of investment costs is a challenging goal.

- Cost components are multi-layered and include: base manager fees, performance fees, fund-of-fund manager fees, transaction costs, consulting, custody, internal oversight /management, and more.

- Costs that are netted from the fund NAV need to be reported (often they are not).

- It is very difficult to obtain full private equity costs due to inconsistent and incomplete reporting by General Partners (GPs) to Limited Partners (LPs). The new Institutional Limited Partnership Association (ILPA) cost template is the solution. It needs to become the industry standard.

Costs matter – Internal management performed better on a net of cost basis. Bigger funds performed better.

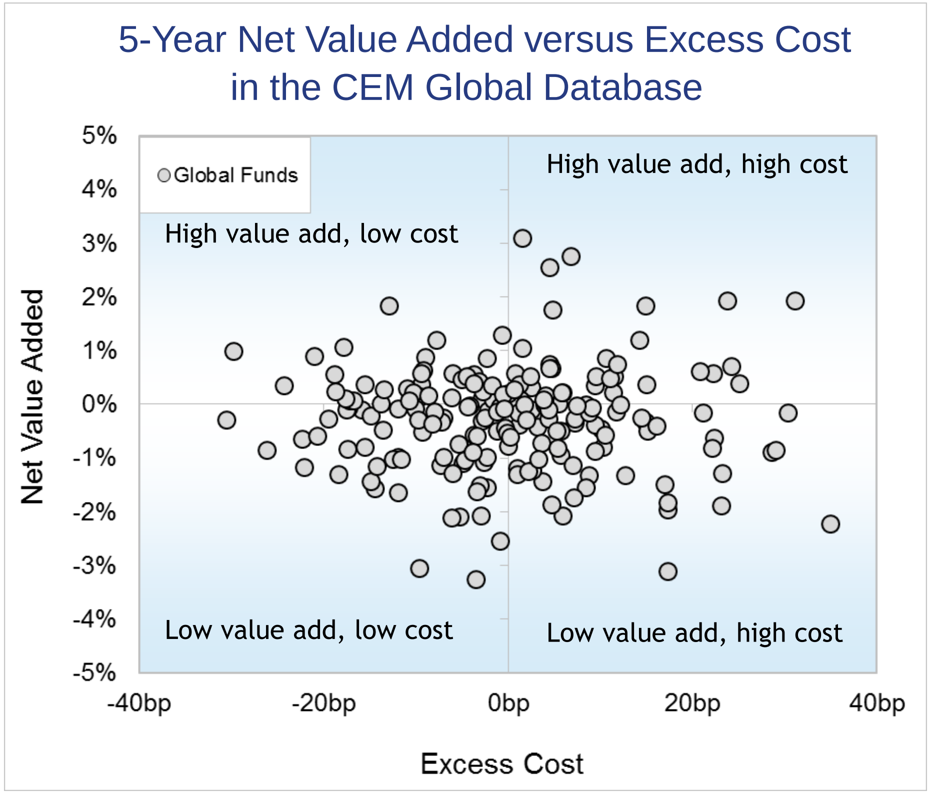
Performance advantage

Private equity	
• Internal versus fund of funds	5.52%
• Internal versus direct LPs	3.24%
Public markets	
• Internal versus external	0.22%
• Size $100 Bn vs $1 Bn	0.16%

- CEM believes that these performance differences are primarily due to related cost differences.
- For example, average total cost for private equity implemented via fund of funds is more than 5% higher than for internally implemented private equity.

CEM Benchmarking

Costs matter – Paying more does not get you more.



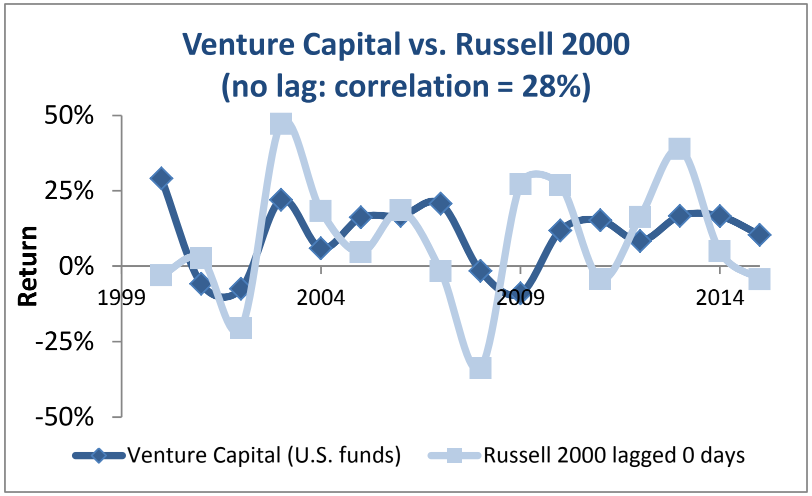
If paying more got you more, the data should cluster from the bottom left to the top right in the CEM cost effectiveness chart to the left. It does not. Paying more does not get you more.

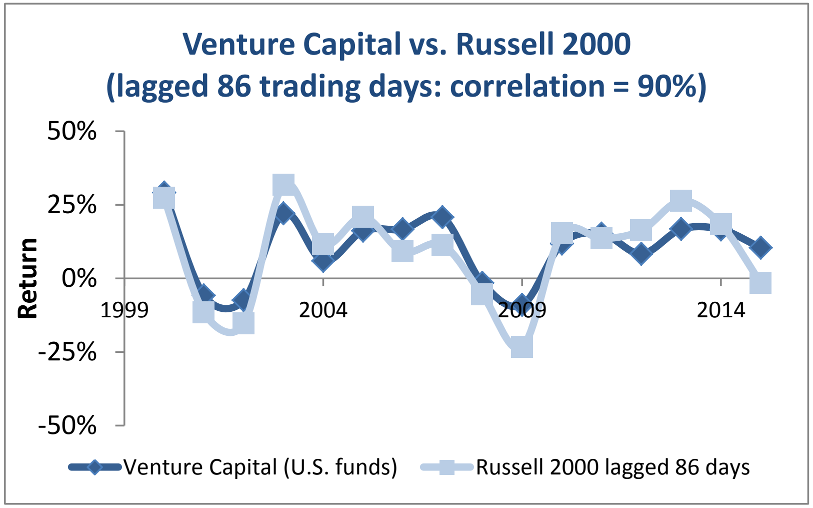
CEM Benchmarking

Better benchmarks are available for illiquid asset classes.

- Most existing benchmarks used by funds are flawed. They generate noise rather than signal:
  - Timing mismatches due to lagged reporting. The charts on the right illustrate the lag effect vividly.
  - Un-investable peer-based benchmarks
  - Aspirational premiums (e.g. S&P 500 + 3%)

- Investable benchmarks exist with high correlations to performance:
  - Private Equity returns in the CEM database: 84% correlation with lagged small cap stock

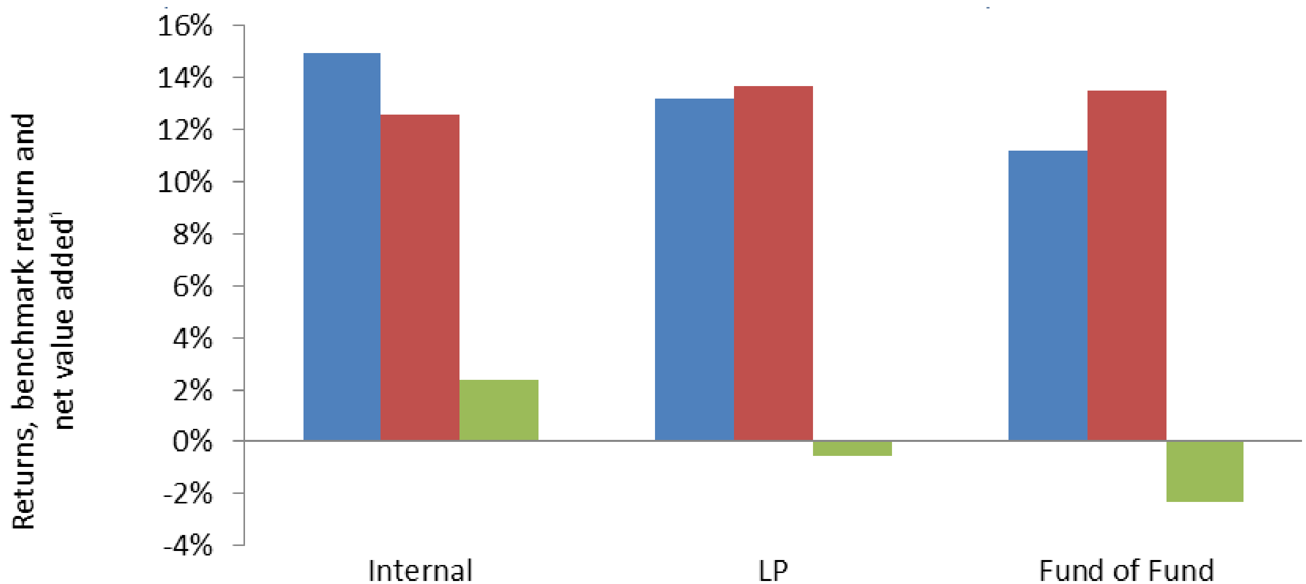




CEM Benchmarking

Internal management outperformed Direct LPs. Direct LPs outperformed fund of funds.

Compound private equity performance by implementation style
(CEM Universe, 1996 – 2014)

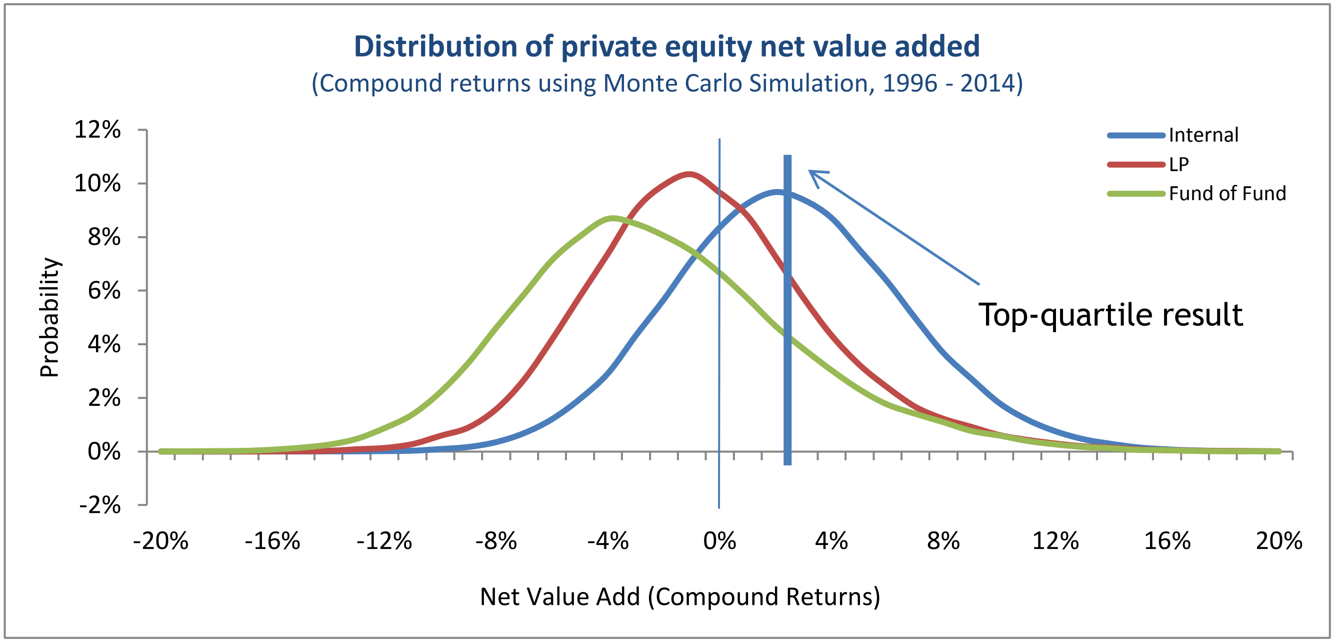


	Internal	LP	Fund of Fund
Annualized return	14.98%	13.20%	11.22%
Annualized benchmark	12.58%	13.71%	13.52%
Net value added	2.40%	-0.52%	-2.30%

* Benchmarks consist of regionally-blended small cap equity indices with a lag as constructed by CEM. These annual benchmarks are then selected, compounded and annualized alongside actual returns.

CEM Benchmarking

Top quartile results in private equity have been good.



Fund characteristics associated with top-quartile PE results:

- Large funds, long history with and serious commitment to PE
- More low cost internal implementation
- Less high cost fund of fund implementation

CEM Benchmarking

Most benchmarks used for hedge funds are seriously flawed.

Cash-based benchmarks, used by 38% of funds (e.g., LIBOR + 4%)

- ☒ No correlation to hedge fund returns
- ☒ No information about performance – generates noise not signal
- ☒ Un-investable

In order to standardize hedge fund performance comparisons, CEM constructed investable benchmarks consisting of customized blends of debt and equity for all database participants. The average equity/debt split was 44%/56% and the average duration of the debt component was 5.6 years.

- ☑ Good correlation and similar risk (84% average correlation, 90% median)
- ☑ Reasonable performance signal
- ☑ Investable

CEM Benchmarking

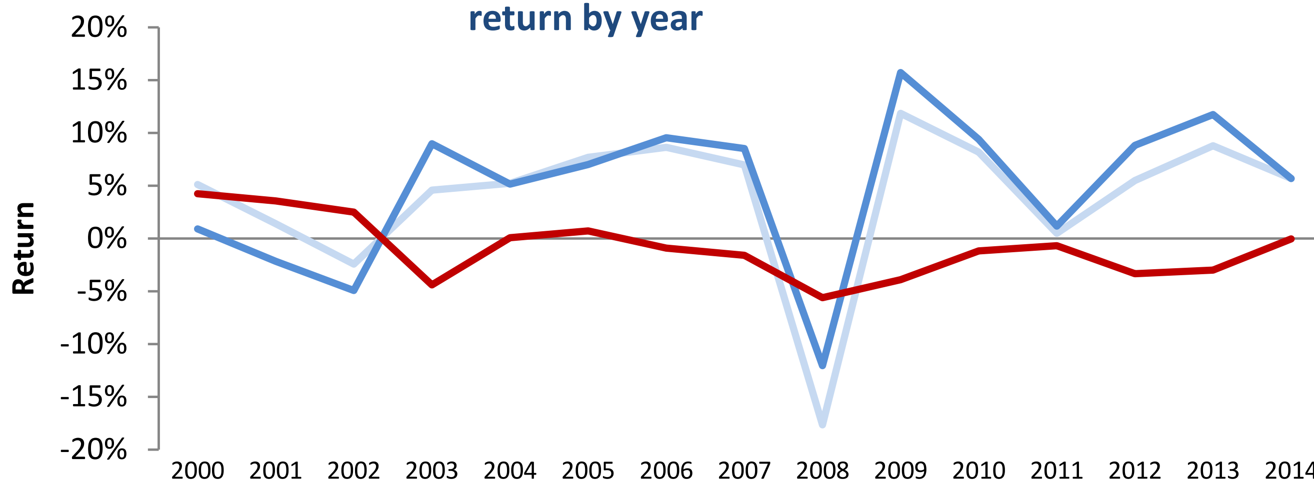
Net of costs, hedge funds spanning 2000-2014 in the CEM database have significantly underperformed simple equity/debt benchmarks.

	All	Direct Hedge Funds	Fund-of-Fund Hedge Funds
Gross Value Added (A)	0.97%	0.65%	1.39%
Cost (B)	2.85%	2.31%	3.56%
Net Value Added (A-B)	-1.88%	-1.66%	-2.17%

CEM Benchmarking

Hedge funds did not provide protection during the global financial crisis when 'hedging' was most needed.

Average† hedge fund return and average CEM hedge fund benchmark return by year



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Hedge funds	5.1%	1.4%	-2.4%	4.6%	5.2%	7.7%	8.6%	7.0%	-17.6%	11.9%	8.2%	0.5%	5.5%	8.8%	5.7%
CEM Benchmark	0.9%	-2.2%	-4.9%	9.0%	5.1%	7.0%	9.5%	8.5%	-12.1%	15.7%	9.4%	1.2%	8.8%	11.8%	5.7%
Net Value Added	4.2%	3.6%	2.5%	-4.4%	0.1%	0.7%	-0.9%	-1.6%	-5.6%	-3.9%	-1.2%	-0.7%	-3.3%	-3.0%	0.0%

CEM Benchmarking

Key takeaways:

- Most private market and hedge fund portfolio-level benchmarks used are flawed. They generate noise rather than signal. The flaws can be fixed. Investible public market proxies can be constructed that are much better.

- Cost transparency has been a problem, especially in PE and all limited partnership investment structures. Fortunately a solution is in hand: the new ILPA disclosure template.

- Costs matter. Internal management outperforms External. Big funds outperform small funds. Paying more does not get you more. Fund of funds underperform other styles. CEM believes these performance differences are mostly due to cost differences.

- Top-quartile results in private equity have been good. Funds that achieve top-quartile results tend to be large, have a long history with, and serious commitment to, the asset class. They also tend to use lower cost implementation styles.

CEM Benchmarking