Private Equity Research Consortium

RESEARCH UPDATE

November 2024

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Optimal Allocation to Private Equity

By Nicola Giommetti (Copenhagen Business School) & Morton Sorensen (Dartmouth Tuck School). https://ssrn.com/abstract=3761243
Updated May 3 from original version

Theoretical model of portfolio optimization with illiquid assets

- Develop *"linear fund dynamics"* method to solve portfolio problem of investor with CRRA utility
- Each period, the LP can commit capital to new PE funds, resulting in a portfolio of staggered and partly overlapping fund commitments. PE investments are risky because the funds generate risky distributions.
- Model is calibrated using MSCI-Burgiss data

Some findings:

- More risk-averse investors are less affected by illiquidity risk
- Optimal allocation is not monotone in risk aversion
- LPs tend to prefer funds with slower distributions

Risk-Adjusted Returns of Private Equity Funds: A New Approach

By Arthur Korteweg (USC Marshall School) and Stefan Nagel (Chicago Booth School): https://ssrn.com/abstract=4157952

Latest version available from IPC

Extension of GPME that generates relative performance metrics with better statistical properties

- Provides estimates of individual fund "alphas" that are less sensitive to noise in cash flows
- Model is estimated for VC and buyout funds using MSCI-Burgiss data

Some findings:

- Beta estimates: $\beta_{VC} = 2.4$ and $\beta_{Buyout} = 0.8$
- Typical alphas (both mean and median) are negative for VC funds and positive for buyout funds.
- Alphas outperform PMEs and GPMEs when used to explain variation in fund performance related to size as well as when identifying performance persistence (especially at long horizons).

Incentives in Private Equity: The Impact of Fee Structures on Investment Behavior

By Hyeik Kim (Alberta): https://ssrn.com/abstract=4722464

Theoretical and empirical analysis of GP-LP conflict of interest on investment selection

- GPs maximize profits considering management fees, carried interest, and revenue from follow-on funds.
- Model is estimated for European buyout funds using MSCI-Burgiss holdings data

Some findings:

- GPs tend to overinvest late in investment period
- These deals exhibit lower profit margin growth and net returns, especially in funds with superior performance and experienced GPs
- Results are consistent with GPs seeking to maximize fee revenue
- The results are driven by funds with more investments coming from public pension funds, which do not appear to penalize overinvestments

Risk-Adjusting the Returns to Private Debt Funds

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By Isil Erel, Thomas Flanagan, & Michael Weisbach (all Ohio State Univ.): https://ssrn.com/abstract=4779852

Empirical analysis of private credit funds

- Use Gupta-VanNieuwerburgh model with fixed income and equity risk factors.
- Model is estimated on MSCI-Burgiss universe of private debt funds (all types) with vintages 1992-2015.

Some findings:

- Including an equity risk factor is important for assessing private credit performance
- Across all funds there is no significant excess net return (positive or negative)
  - Gross returns are about 4%.
- Rents earned by the funds from making private direct loans accrue to the general partners, not the limited partners. They appear to reflect compensation for identifying, negotiating, and monitoring private loans to firms that could not otherwise raise financing.

Do Private Equity Fund Managers Opportunistically Smooth Fund Performance?

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By Rebecca Manning (UNC): https://ssrn.com/abstract=4538593

Empirical analysis of private funds reported NAVs

- Estimate degree of smoothing as deviations from public market benchmark
- Model is estimated for North American and European equity funds using MSCI-Burgiss data for vintages 1993-2021.

Some findings:

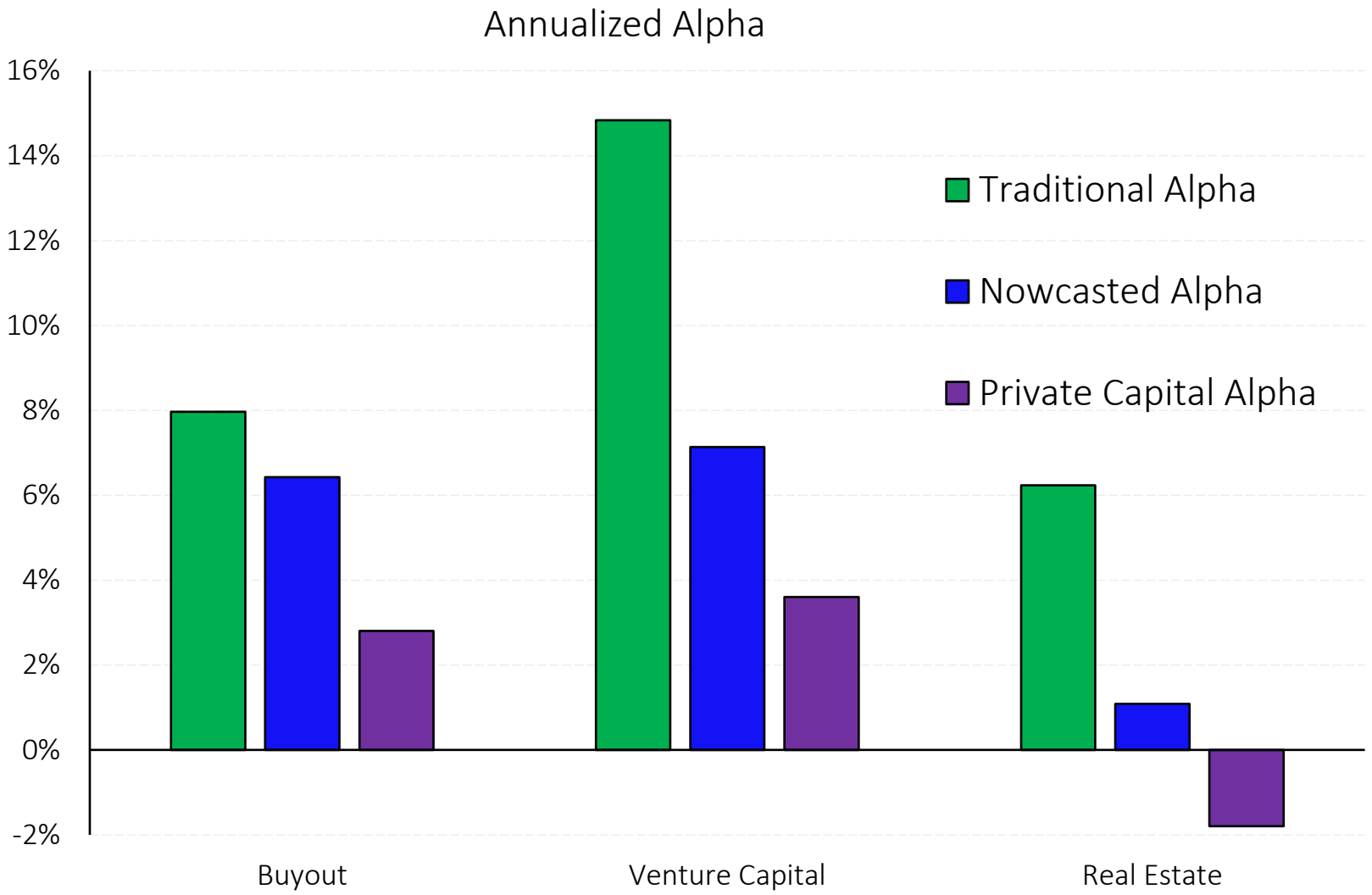
- Managers report smoother fund performance before raising capital for new funds and when fund managers are publicly traded firms.
- Results are consistent with work on loss ratios

Private Capital Alpha

- By Greg Brown (UNC), Andrei Goncalves (OSU) and Wendy Hu (MSCI)
- Literature focuses on fund-level "Net Present Value" measures like PME of Kaplan, Schoar (2005), GPME of Korteweg, Nagel (2016)
- However, NPV measures have important drawbacks:
  - They reflect fund-level, not overall performance in a portfolio context
  - They are not comparable to alphas used for other asset classes
- **This paper: Develops a measure of alpha that accounts for the illiquidity of private capital in several ways:**
  - Smoothed returns
  - Unavoidable deviations from target weights
  - Idiosyncratic return component from being allocated to only a subset of funds

… and estimate on sample of MSCI-Burgiss US VC, buyout, and real estate funds

Private Capital Alpha – Main Result



Scale, Scope & Speed in Private Markets

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- Very little research comprehensively examines the relationship between investment size and performance in alternative assets.
- Our two big research questions:

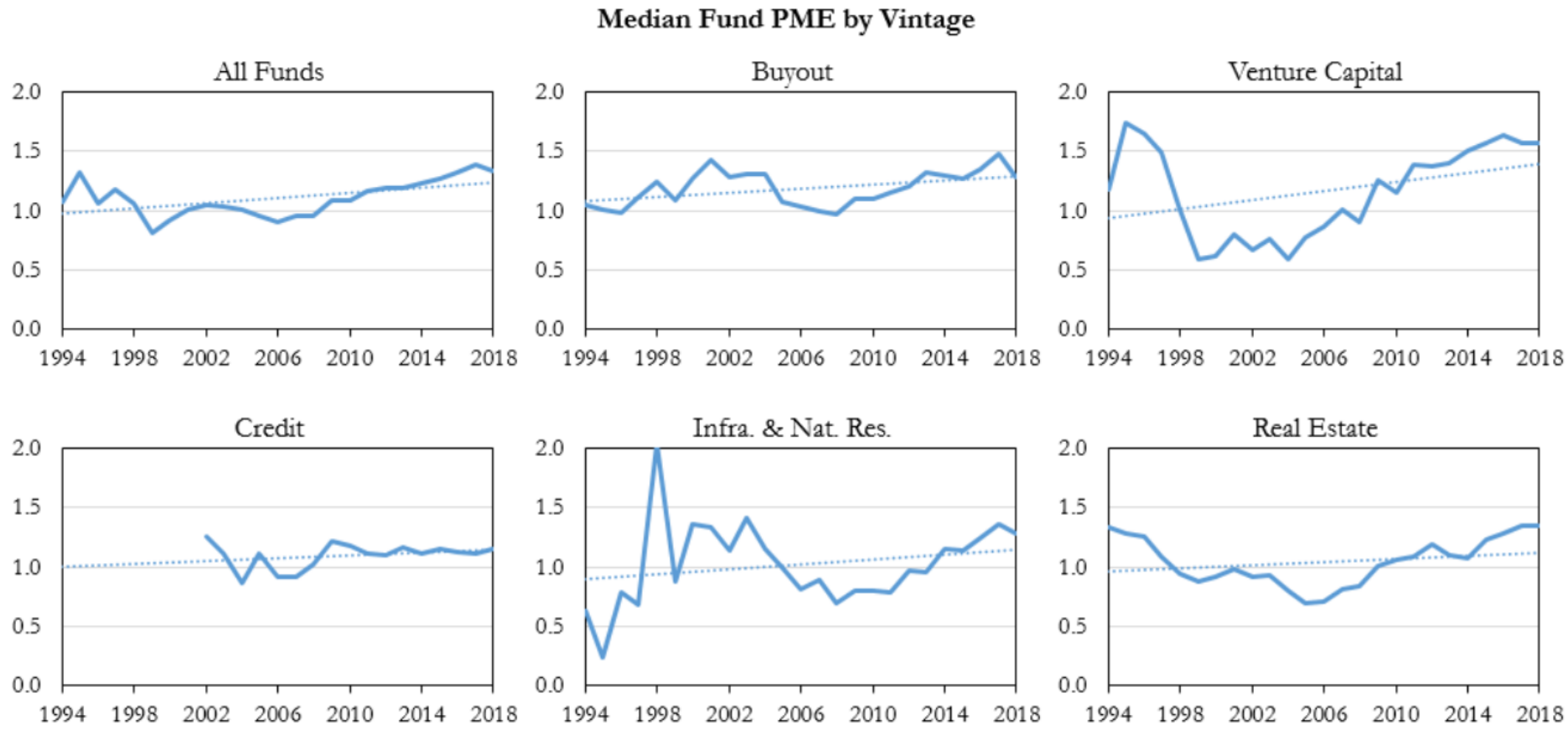
1. Does **strategy performance** decline as combined AUM grows? (strategy capacity)
2. Does **fund/manager performance** decline as AUM grows? (manager capacity)

But also.. How do results vary across strategies and why?

- *Most comprehensive analysis to date and utilizes a global sample*
- *10,276* ***buyout, venture capital, credit, infrastructure & natural resource, and real estate funds*** *representing 8.7 trillion USD in committed capital using MSCI-Burgiss data.*

Strategy Scale

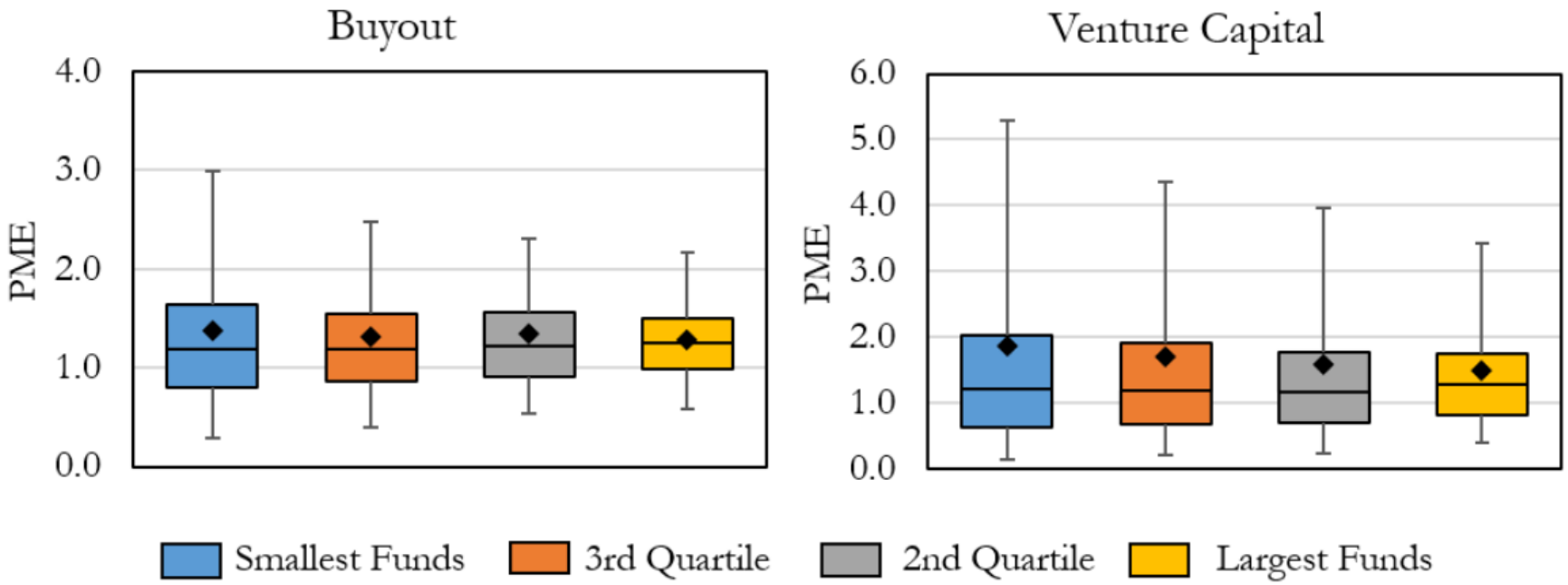
Little evidence of time trend in strategy performance over time despite substantial growth in AUM for all strategies



Source: MSCI-Burgiss

Manager Scale

Differences in mean returns by fund size are driven by dispersion (positive skewness). There are no trends in median performance



Source: MSCI-Burgiss

Conclusions on Scale, Scope & Speed

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- **We find no evidence of negative trends in performance for any investment strategy**. However, there is a notable dip in performance for most strategies in vintages leading up to the GFC.

- **Average returns for large funds are lower than average returns for small funds across all strategies and geographies** that we examine. However, these results are driven primarily by greater dispersion (positive skewness) in the performance of small funds. **Specifically, we find no reliable difference in median performance of large funds versus small funds**.

- **Growth in fund size from one fund to the next is not related to market adjusted performance** for any strategy or geography.

- We find **no reliable evidence that overall growth of GP AUM is related to lower performance** of private funds. In contrast, the total number of funds previously managed by a GP is positively related to performance for funds in general, as well as for buyout and venture funds in particular.

- The **relation between performance and a GP's time-to-market for its next fund is nonlinear and follows an inverted U-shape** (as would be expected, GPs with poor relative performance in the current fund are slow to raise a next fund). However, GP's that raise a next fund very quickly also have below-average performance in their most recent fund.

Private Fund Performance

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"What do we know about private fund risk-adjusted returns?"

Current research project with Greg Brown & Christian Lundblad funded by UCSD Kroner Center

Private fund performance analysis and attribution is difficult for all the reasons we know:

- Lack of market return time series
- Uncertainty about benchmarks and risk loadings
- Lack of long/accurate data series for some assets

What we're doing: Provide historical context for risk-adjusted performance using high-quality comprehensive data & methods

- Goal 1: Catalog methods and generate common/comprehensive dataset
  Large sample analysis of most popular risk-adjusted performance models
- Goal 2: Help move toward a common agreement of how to evaluate funds and portfolios of illiquid assets

Private Fund Performance

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	Pros	Cons
MOIC	• Easy to calculate & intuitive	• Doesn't consider investment horizon or risk
IRR	• Easy to calculate & intuitive	• Doesn't consider risk • Unpalatable reinvestment assumption • Easy to manipulate
MIRR	• Easy to calculate & intuitive • Fixes IRR reinvestment issue	• Doesn't consider risk • Need to make reinvestment rate assumption • Easy to manipulate
KS-PME	• Allows for explicit comparison to a public market benchmark • Provides a precise estimate of the total outperformance	• Need to pick an appropriate public market benchmark (and β) • Does not adjust for investment time horizon
Direct Alpha	• Allows for explicit comparison to a public market benchmark • Provides a precise estimate of the total outperformance on an annualized basis	• Need to pick an appropriate public market benchmark (and β) • Reinvestment rate assumption (but less severe than for IRR)
KN-Alpha	• Allows for explicit comparison to a public market benchmark(s) • Provides a precise estimate of the total outperformance	• Hard to estimate and requires a large sample of similar funds with (assumed) similar βs • Does not adjust for investment time horizon

Private Fund Performance

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Vintages	1987-2019			
	North America			
Metric	**All**	**Buyout**	**Venture Capital**	**Generalist**
MOIC	1.89	1.79	2.21	1.93
IRR	14.83%	13.31%	21.12%	16.61%
MIRR (12%)	12.28%	12.15%	12.61%	12.42%
KS-PME (Beta=1)	1.17	1.15	1.23	1.24
Direct Alpha (Beta=1)	3.97%	3.36%	5.37%	6.25%
KN-Alpha	-0.02	0.19	-0.17	0.19
Beta	1.71	0.96	2.34	0.96
Number of Funds	3,818	1,372	1,925	444

MSCI fund performance data for vintages up to 2019, but performance data are through 2023Q4.

Key Take-aways:

- Venture drives differences in IRR and MIRR (buyout difference is small)
- All KS-PMEs > 1.0 and likewise, all Direct Alphas > 0.0%, indicating outperformance relative to benchmark (with Beta=1)
- KN-Alphas are mixed: >0 for buyout and generalist, but <0 for VC and All
  - Driven by estimates of β which are large for VC and All
  - Probably bad to assume β=1 across the board, but also bad to estimate KN-model on All funds

Unpacking PE Performance

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- The increasingly common practices of using subscription lines of credit and recycling of capital make performance analysis a challenge.
- We analyze performance in a stylized model to better understand how fund performance is affected by capital deployment pacing, subscription lines of credit and recycling of capital.
- Key findings:
  - Intermediate IRRs are **strongly affected** by sub lines and deployment pacing.
  - Intermediate MOICs are only **weakly affected** by sub lines, but **strongly affected** by capital deployment pacing.
  - IRRs and MOICs are **strongly affected** by recycle deal accounting methodology.

Performance “Rules of Thumb”

Key takeaway: since neither IRR nor MOIC are consistently the preferred metric for understanding true economic outcomes, limited partners (LPs) must be very deliberate in unpacking performance metrics. We find some general, rule-of-thumb conclusions about the sensitivity of performance metrics that are shown in the table below.

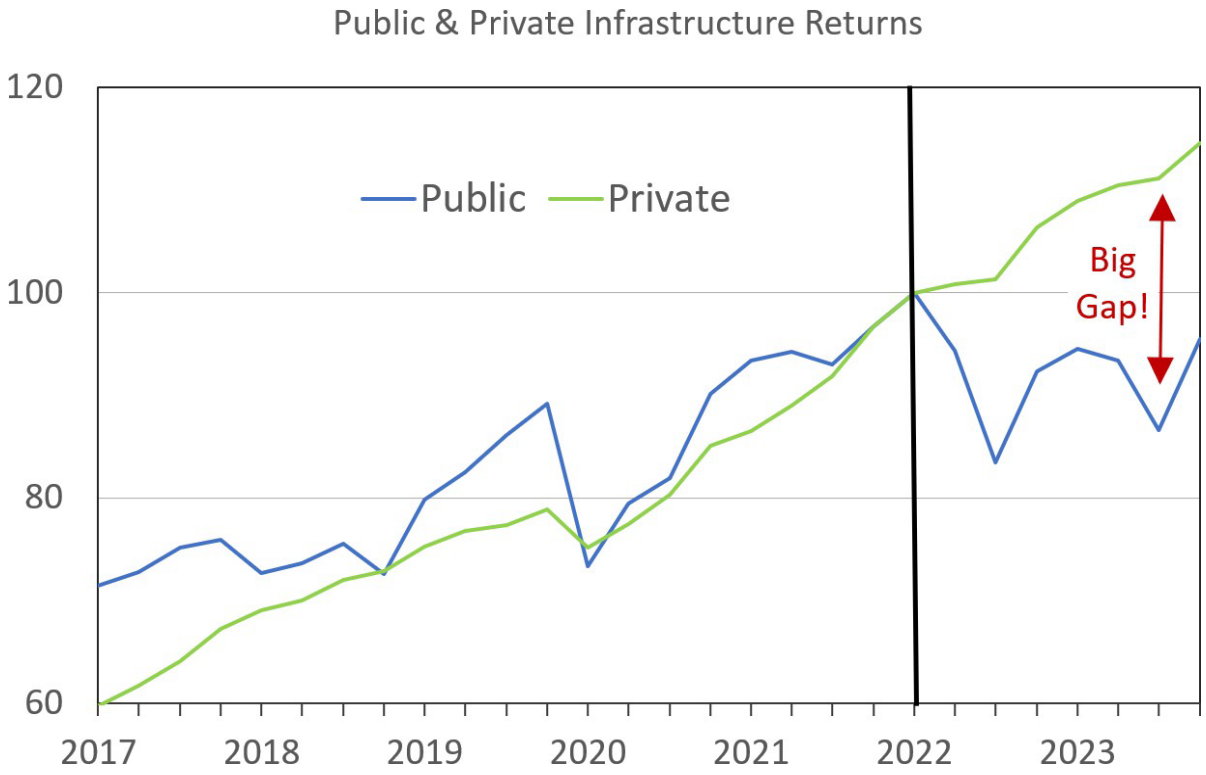
Table 1: “Rule-of-Thumb” Stability Chart

	Pacing	**Subscription Lines**	**Recycling**
Intermediate IRR	Unstable	Unstable	Stable
Final Net IRR	Stable	Unstable	Stable
Intermediate Net MOIC	Unstable	Stable after investment period	Unstable
Final Net MOIC	Stable	Stable	Accounting methodology matters
Net Profit	Small differences	Small differences	Large differences
Fees and Interest	Small differences	Small differences	Small differences

Real Assets & Inflation: Public vs. Private

- IPC is expanding our research into real assets through our **Real Assets Research Initiative**

- Public vs. private infrastructure returns (annualized) – Why so different?



2023:Q4 difference between public and private infrastructure is almost 20%!

Real Assets & Inflation: Public vs. Private

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- Public vs. private infrastructure returns (annualized) – Why so different?

Region	Public Weight	Private Weight
North America	**63.2%**	**49.4%**
Europe	**24.2%**	**34.9%**
Asia Australia	12.7%	8.7%
Africa	0.0%	0.2%
Latin America	0.0%	5.3%
Middle East	0.0%	1.0%

GICS Sector	Public Weight	Private Weight
Utilities	52.2%	**31.0%**
Comms Services	31.1%	**11.6%**
Energy	11.3%	**19.0%**
Health Care	2.9%	2.3%
Industrials	2.1%	**24.2%**
Consumer .	0.4%	2.8%
Consumer Staples	0.0%	0.3%
Financials	0.0%	1.7%
IT	0.0%	5.0%
Materials	0.0%	1.0%
Real Estate	0.0%	1.0%

Real Assets & Inflation: Public vs. Private

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- It's challenging to understand how inflation relates to public and private real asset performance because there are many moving pieces:
  - Differences in industries and geographies: Privates are more diversified and perhaps in industries with more pricing power
  - Real interest rates vs. inflation expectations: private infrastructure has positive inflation exposure
  - Differences in cash flow durations & sensitivities: private fund strategies may have lower cash flow duration (development vs. mature assets)
- Doing a detailed Campbell-Shiller-style return decomposition **we find evidence that private real assets – and especially, value-add infrastructure – have provided a better inflation hedge than public real assets**.
  - More sensitivity to TIPS breakeven inflation changes
  - Less sensitivity to changes in real rates

GP Commitments and Performance

New project to examine if GP skin-in-the-game is related to fund performance

- GP commitment provide incentive alignment with LPs…
- … up to a point where GP risk-aversion may lead to sub-optimal decision-making by GPs
- Recent stories about some younger GPs having to get second mortgages to meet GP commitment obligations

4/18/24, 7:58 AM Private Equity Investors Driving Tougher Deals as Power Balance Shifts - Bloomberg

Markets | The Big Take

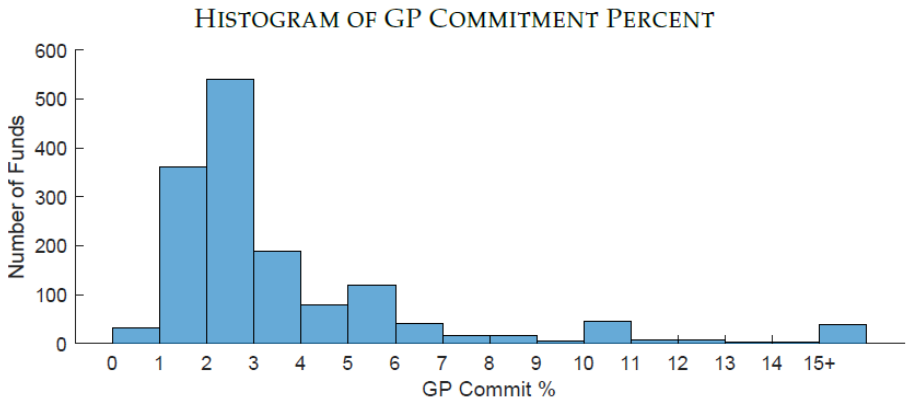
Private Equity's Titans Are Told to Cough Up Their Own Cash

Dealmakers are being told to put more of their own assets on the line as they struggle to wring cash from their increasingly wary backers.

Illustration: Christian Blaza

Analysis with new dataset: *2,000 buyout and VC funds with data on GP commitment levels from StepStone.*

GP Commitments and Performance



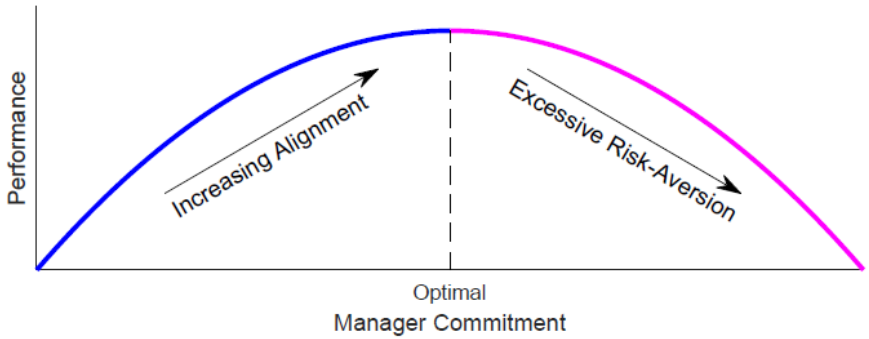


TABLE 4: OPTIMAL GP COMMIT ESTIMATES

	All Equity		Buyout		Venture + Growth	
	IRR	MOIC	IRR	MOIC	IRR	MOIC
Optimal GP Commit	11.5%	13.0%	12.3%	13.0%	10.5%	12.6%

Research Paper Links

- **Optimal Allocation to Private Equity**, by Giommetti (Copenhagen Business School) & Sorensen (Dartmouth Tuck). https://ssrn.com/abstract=3761243
- **Risk-Adjusted Returns of Private Equity Funds: A New Approach**, by Korteweg (USC Marshall) & Nagel (Chicago Booth) https://ssrn.com/abstract=4157952
- **Incentives in Private Equity: The Impact of Fee Structures on Investment Behavior**, by Kim (Alberta) https://ssrn.com/abstract=4722464
- **Risk-Adjusting the Returns to Private Debt Funds**, by Flanagan, Erel, & Weisbach (all Ohio State University) https://ssrn.com/abstract=4779852
- **Do Private Equity Fund Managers Opportunistically Smooth Fund Performance?**, by Manning (UNC Kenan-Flagler) https://ssrn.com/abstract=4538593
- **Do Investors Overvalue Startups? Evidence from the Junior Stakes of Mutual Funds**, (Presented by Ayako Yasuda; Best IPC/PERC Conference Paper, 2023): https://ssrn.com/abstract=4425744

Research Paper Links

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- **The Private Capital Alpha**
  https://uncipc.org/index.php/publication/the-private-capital-alpha/
- **Scale, Scope, and Speed in Private Capital Funds**
  https://uncipc.org/index.php/publication/scale-scope-white-paper/
- **What Do We Know About Institutional-Quality Hedge Funds?**
  https://uncipc.org/index.php/publication/institutional-quality-hedge-funds/
- **Loss Avoidance in Private Equity** https://ssrn.com/abstract=4707873
- **Is the U.S. IPO Market About to Thaw?** https://uncipc.org/index.php/publication/is-the-u-s-ipo-market-about-to-thaw-ipc-research-notes/
- **Unpacking Private Equity Performance**
  https://uncipc.org/index.php/publication/unpacking-private-equity-performance/
- **ESG for Institutional Portfolios**
  https://uncipc.org/index.php/publication/esg-for-institutional-portfolios/
- **Portfolio Management in Private Equity** https://ssrn.com/abstract=4557858

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