

Aren't they all a bit top quartile?

How to measure past returns in a way that points to future winners!

Prof. Oliver Gottschalg of HEC Paris
Antin IP Chair of Private Equity and
Infrastructure

June 2026

How can GPs enhance fundraising?

Let's look at How GPs Frequently Describe Themselves when speaking with LPs:



"We are a Top Quartile Performer."

"Our value creation is based on operational expertise."



"We proactively generate proprietary deal flow."

"Our unique investment strategy differentiates us from our competitors."

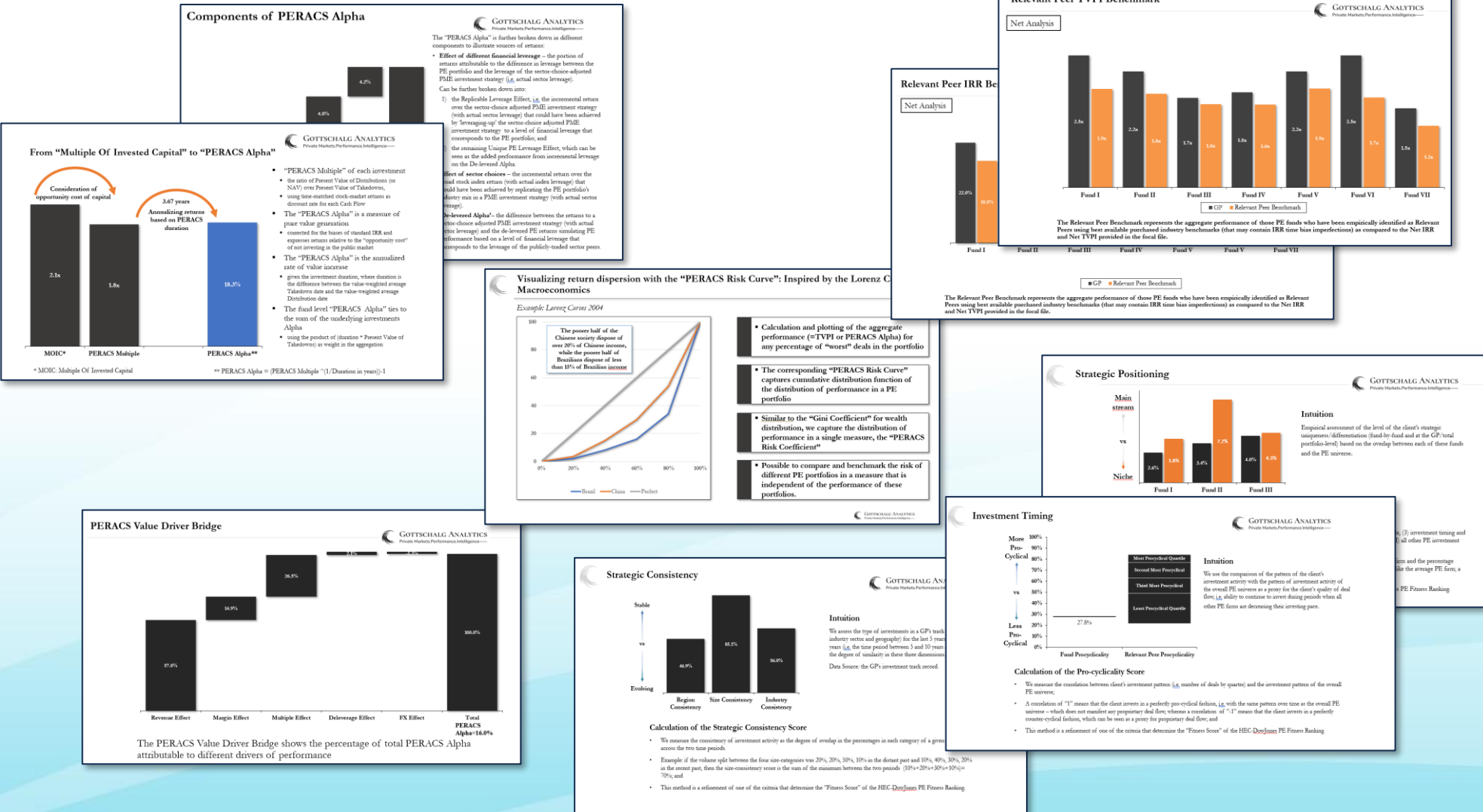


... Which Makes it Difficult for LPs to Identify True Future Outperformers

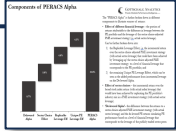


One Possible Solution: The Suite of PERACS Metrics

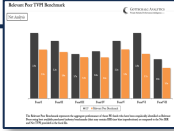
Insights into Performance, Risk and Strategy



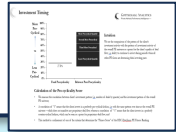
Gottschalg Analytics Numbers Speak Louder Than Words



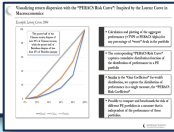
"The breakdown of our PERACS Alpha shows that our outperformance over the public markets is largely due to fundamental value creation and not to sector choice or leverage."



"PERACS identified our closest competitors based on an analysis of the similarity in the acquired entities. The strong aggregate performance of these "relevant peers" demonstrates the attractiveness of the type of deals we make – and we are proud to outperform that benchmark of the aggregate "relevant competitor" for all of our funds."



"Our unique deal making approach translates into an ability to time deals independently from deal volume for other PE investors, including our closest competitors."



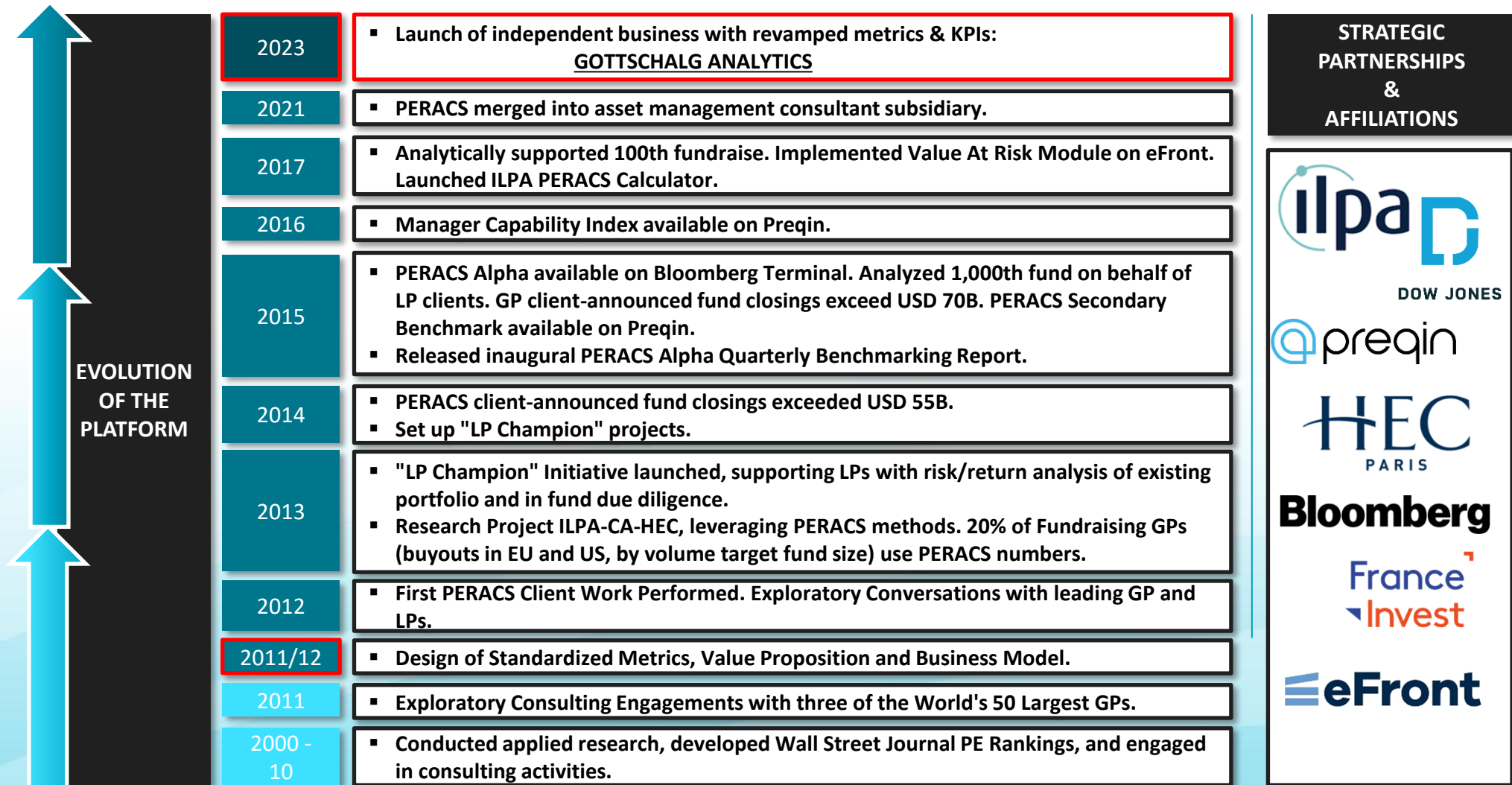
"As you can see from the PERACS Risk Curve, our returns are much more balanced than the industry benchmark."



Further examples from actual Gottschalg Analytics clients available upon request

Background & History

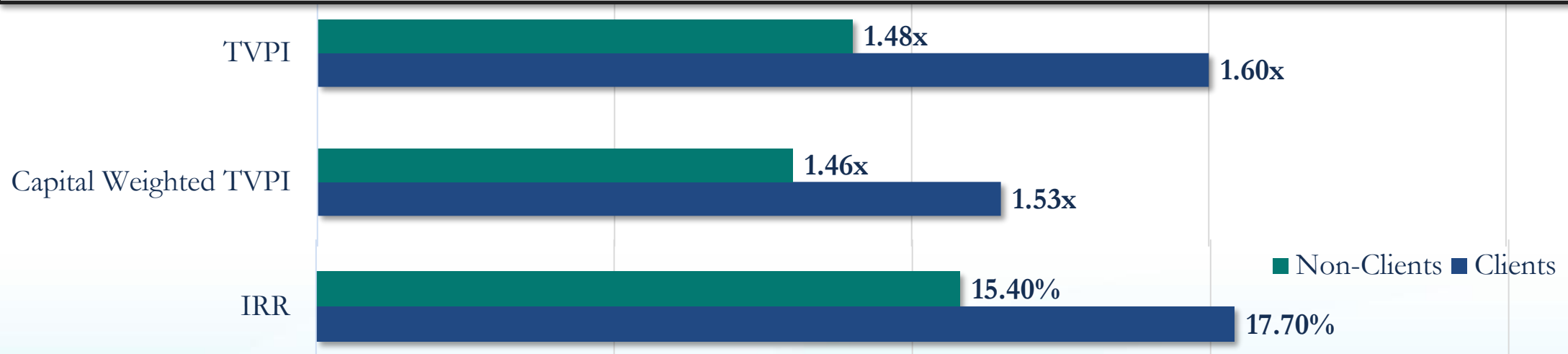
Since 2011, the Gottschalg Analytics team have specialized in providing advanced Private Equity track record analytics that help investors make better investment decisions.



Serving the best of Private Equity:

Looking back in 2021 on the first decade of our activity, we asked the question of how GPs who use Prof. Gottschalg's analytics differ from the rest of the PE universe

- We analyzed all funds classified by Preqin as “buyout”, vintages 2011-2017 as of September 2020
- We then identified the 33 largest paying GP clients (176 funds raised) and compared these across a number of metrics.



FINDING 1 INVESTMENT PERFORMANCE

- Our clients outperform.
- The returns of funds raised by the clients (1.6x average TVPI, 1.53x capital weighted TVPI, 17.7% average IRR) exceeds that on non clients (1.48x average TVPI, 1.46x capital weighted TVPI, 15.4% average IRR) -- and the difference is statistically significant.
- If we repeat the same analyses vintage by vintage, we find our clients to outperform in terms of TVPI in every single vintage

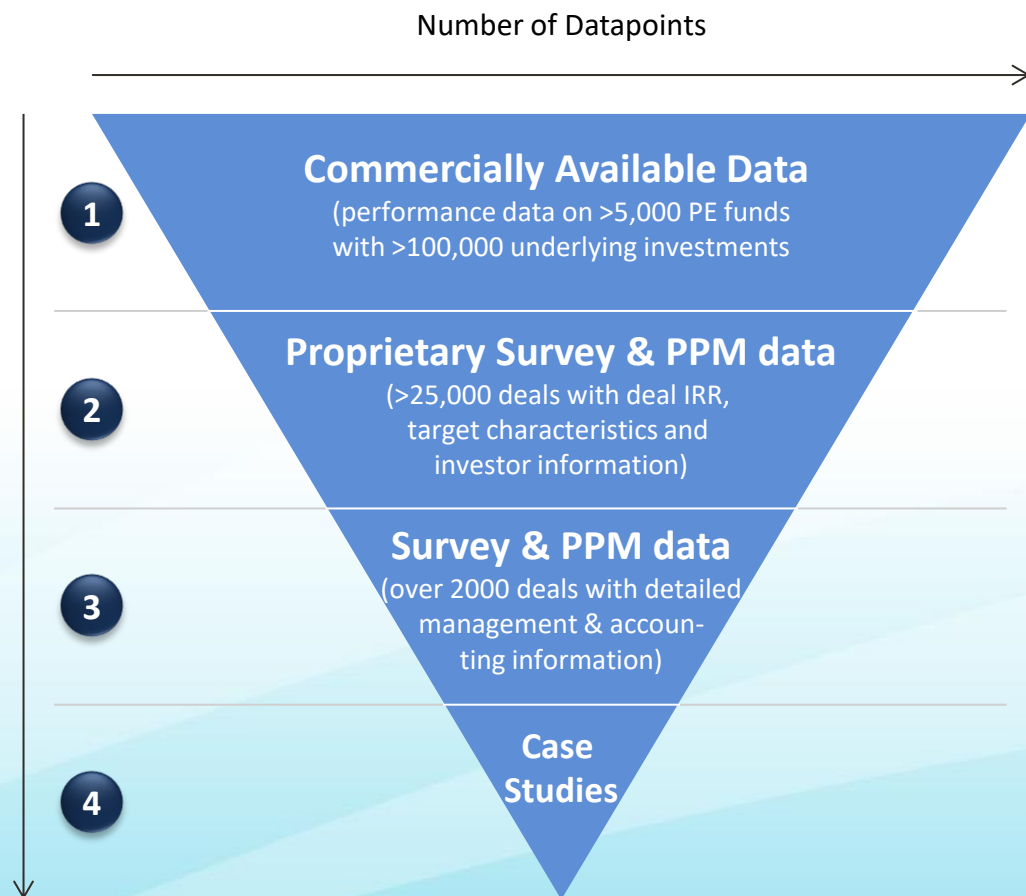
FINDING 2 FUNDRAISING ACTIVITY

- Our clients also outperform in terms of fundraising success.
- Comparing the aggregate buyout funds raised between 2010 and 2015 with those between 2015 and 2020, GPs who use Prof. Gottschalg's analytics grew their fund count by 64% (compared to 19% for non-clients), while the clients doubled fundraising volume with 99.1% growth (compared to 46% for non clients).

We do not claim any causality behind this finding, but are proud to be working with the best of the best in Private Equity.
This reinforces the sign of quality implied when a GP provides LPs with due diligence materials with “Gottschalg Analytics inside”.

Gottschalg Analytics reveals a GPs' value creation DNA through “smart” Private Equity data

This is possible thanks to a combination of thought leadership and research-based analysis on proprietary data sets with commercially, and at times limited or incomplete, available data sources.



Academic Research based on unique data made possible through partnership with buy-out firms, institutional investors, database vendors and industry associations during 20+ year research effort.



**“In the land of the blind,
the one-eyed man is king”**

- Desiderius Erasmus (1466-1536), Adagia (1500)

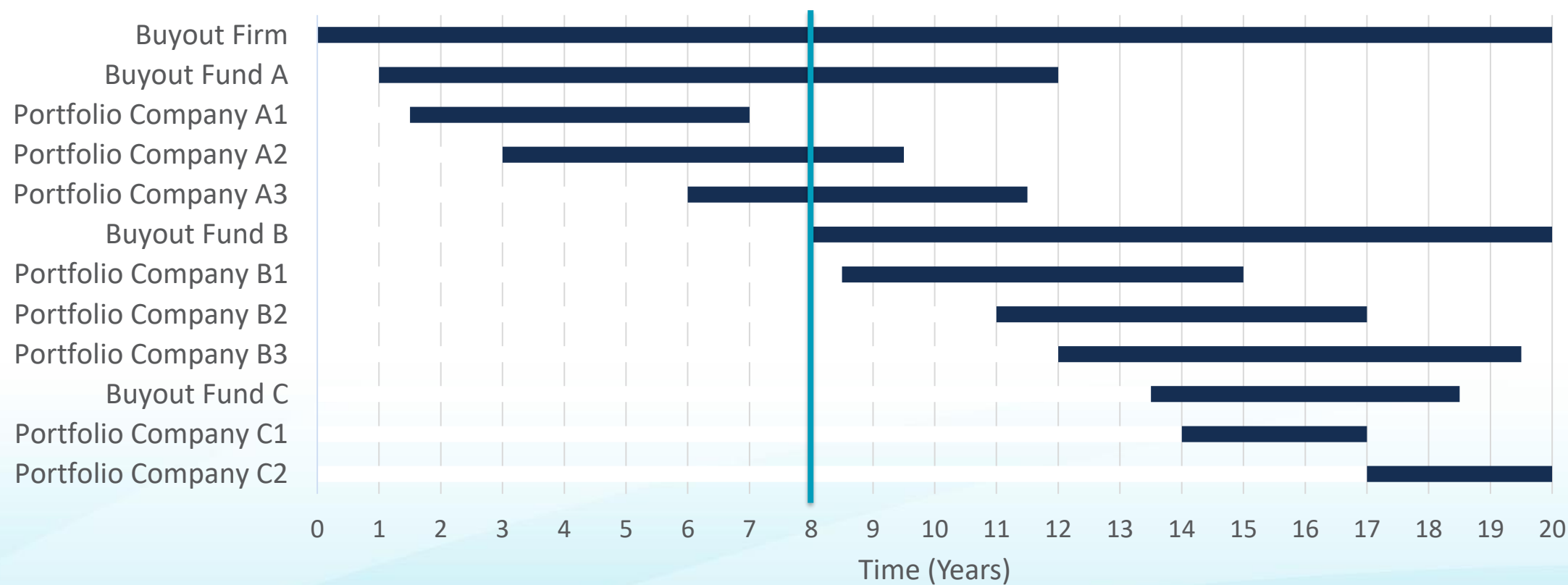
Aren't they all a bit top quartile?

- **The problem for LPs to act on insights from traditional persistence studies**
- HEC Dow Jones PE Ranking: Inspiration to look at longer return cycles
- Aggregate returns over a longer cycle better predict subsequent fund performance
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The standard way to assess return persistence

- Identification of (mature or liquidated) pairs of funds raised by the same GP and with the same strategy and regional focus, immediately following each other in the sequence of fundraises
- Assessment of correlation of returns across pairs, of correlation of performance quartiles between fund pairs etc.
- Widely used in academic literature (e.g. Kaplan and Schoar 2005, Phalippou and Gottschalg 2009, Harris et al, 2020) and practitioners (McKinsey etc)
- ... **but there is a problem!**

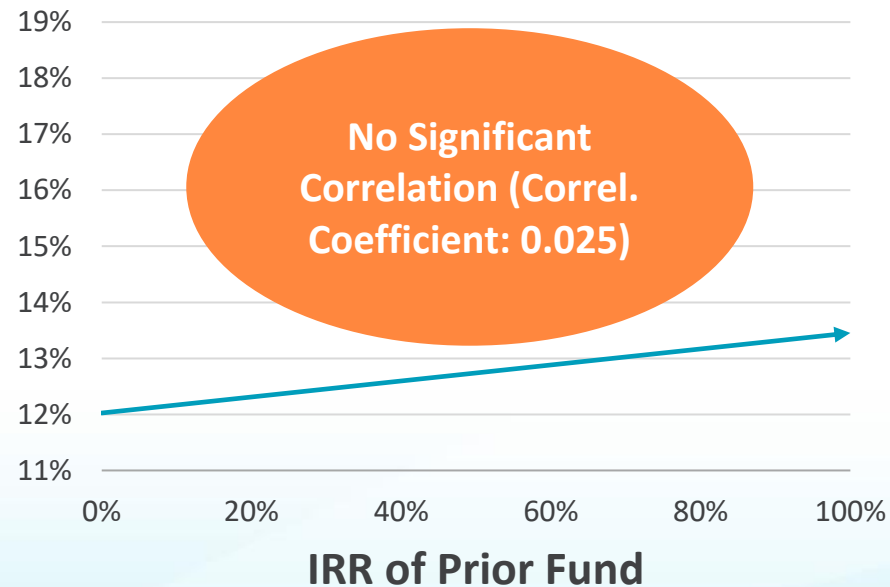
The problem for LPs to act on insights from traditional persistence studies



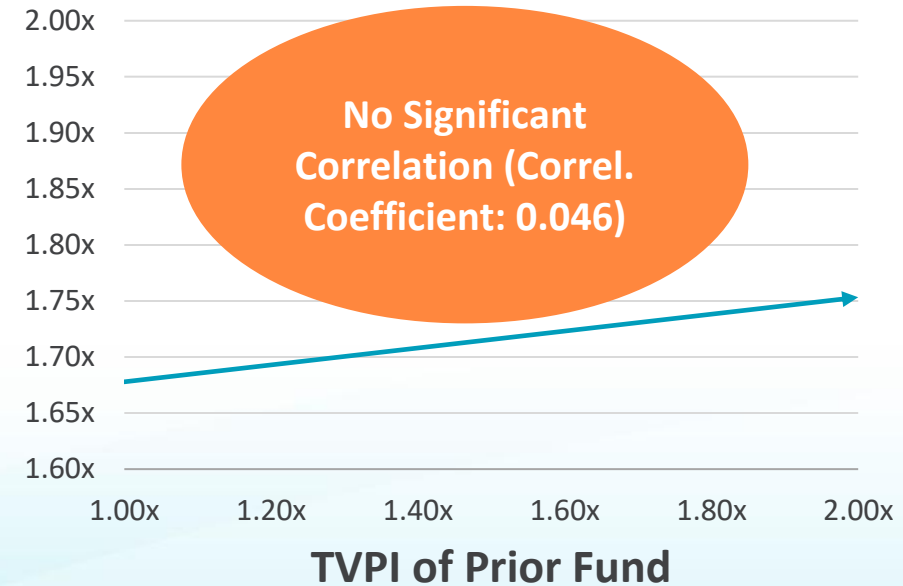
Even if the ultimate performance of Fund B is related to the ultimate performance of Fund A, LPs do not have this information on Fund A when Fund B is being raised ... (see Has Persistence Persisted in Private Equity? Evidence from Buyout and Venture Capital Funds , Robert S. Harris, Tim Jenkinson, Steven N. Kaplan, and Ruediger Stucke, November 2020, JEL No. G11,G24.)

With real-world set-up: We link returns of prior fund *measured when next fund is raised to next fund returns*

IRR of Following Fund



TVPI of Following Fund

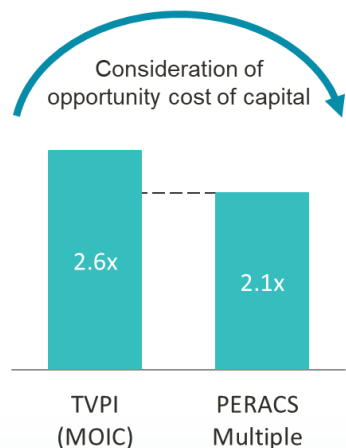


- No Statistically Significant Persistence in Performance for traditional performance measures
- Confirming results based on earlier research with final fund performance comparison (Phalippou and Gottschalg, 2005)
- Analysis of 806 sufficiently mature buyout funds (vintages 2020 or before)

Source: Blackrock/preqin data, Gottschalg Analytics analysis, buyout funds only

Measuring Absolute and Relative Aggregate Returns

From TVPI to “PERACS Multiple”



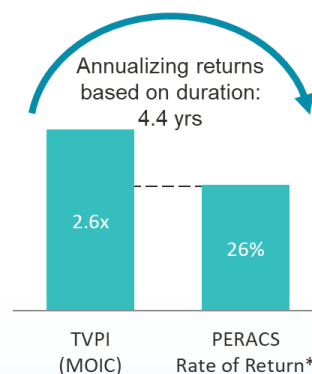
PERACS Multiple of each investment is calculated as a variable-rate Profitability Index, i.e. the ratio of Present Value of Distributions (or NAVs) over Present Value of Takedowns, using the MSCI Global Index as discount rate.



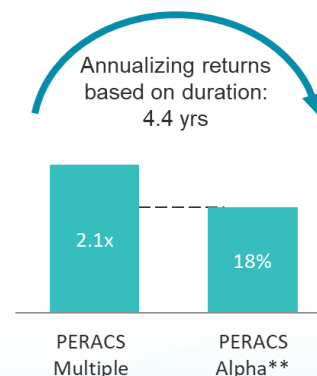
Seen from the LP-Perspective, each Capital Call has an “*opportunity cost*” as the money is not available to be invested elsewhere until the corresponding distribution. The PERACS Multiple explicitly considers this opportunity cost, which is approximated as the MSCI Global Index.

Measuring Absolute and Relative Annual Returns

From Total Return Multiple to PERACS Rate of Return



From Total Return Multiple to PERACS Alpha



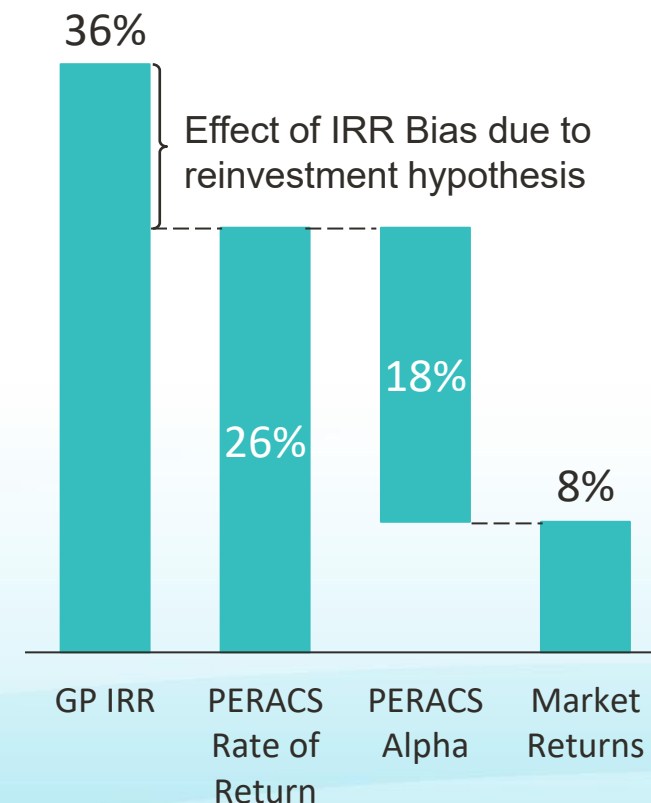
The “PERACS Rate of Return” is an annualized measure of investment returns that avoids the biases of IRR (and related measures) based on the explicit consideration of the investment duration, i.e. the time between the (capital weighted) average cash outflow and the (capital weighted) average inflow.

- PERACS Rate of Return = $(TVPI^{1/Duration \text{ in years}}) - 1$

The “PERACS Alpha” is the corresponding measure of annual value creation Relative to the ‘opportunity cost’ of not investing in the public market.

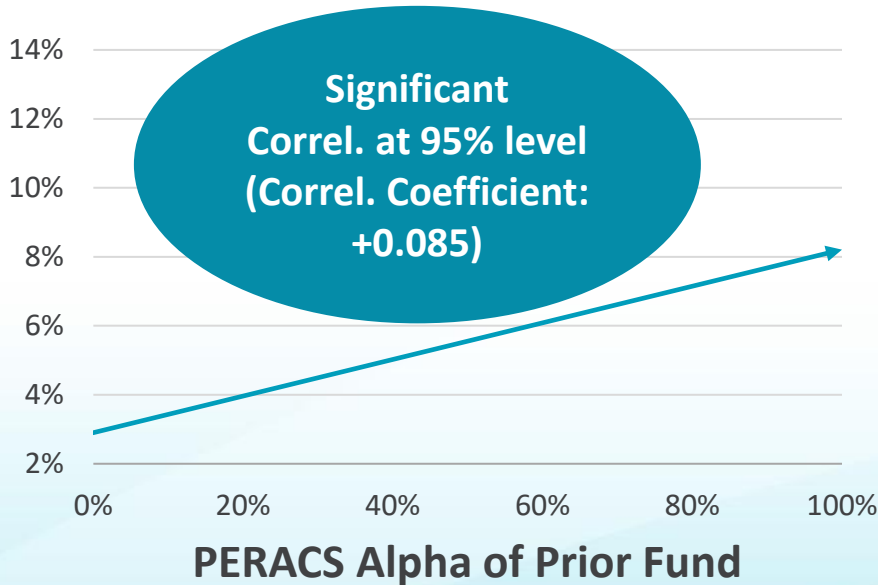
** PERACS Alpha = $(PERACS \text{ Multiple}^{1/Duration \text{ in years}}) - 1$

Measuring Returns: From IRR to PERACS Alpha

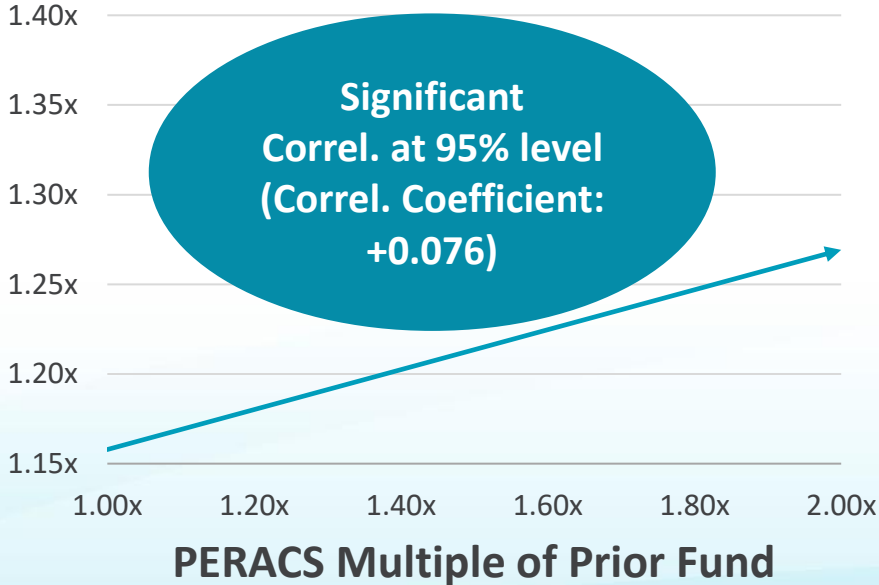


With real-world set-up: We link returns of prior fund *measured when next fund is raised to next fund returns*.

PERACS Alpha of Following Fund



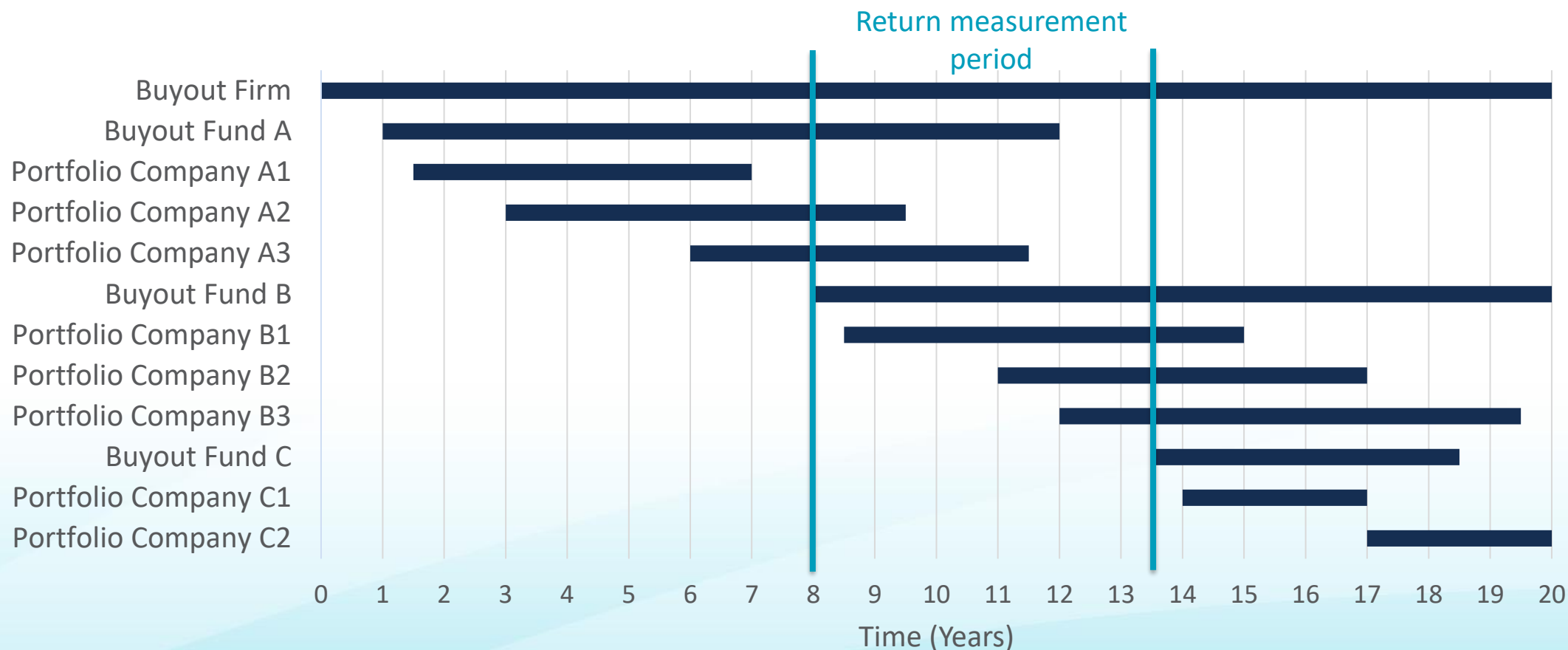
PERACS Multiple of Following Fund



Advanced performance Indicators show significant persistence

...but the r^2 (0.7%) remains disappointing and the economic relevance (0.9% PERACS Alpha gain for successors of Top Quartile PERACS Alpha Funds) leaves room for improvement

Intuition for a better way to assess return persistence:



We aggregate net CFs across all active funds (of the same strategy) by a GP; we calculate the rolling (!) returns over a certain time period, always assuming entry and exit at NAV to calculate the overall value add of the GP across all funds combining funds at different stages of their life

Aren't they all a bit top quartile?

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Background. HEC-Dow Jones Partnership for Private Equity GP Rankings from 2009

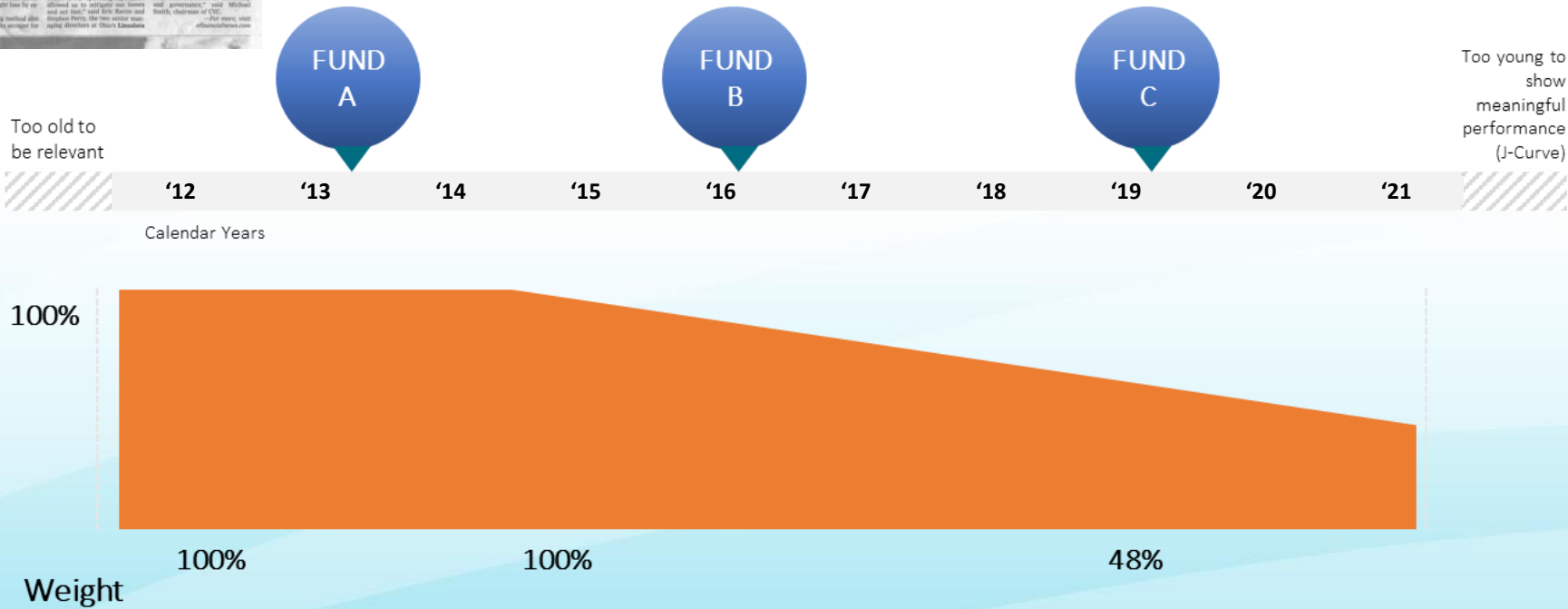


Rankings Method addressed three challenges:

- Performance is published at the fund-level, not the firm level
- GPs sequentially invest through funds from various vintage years
- Performance measurement across vintage year is complicated by the “J-Curve effect”



Link to More
Background
on Rankings



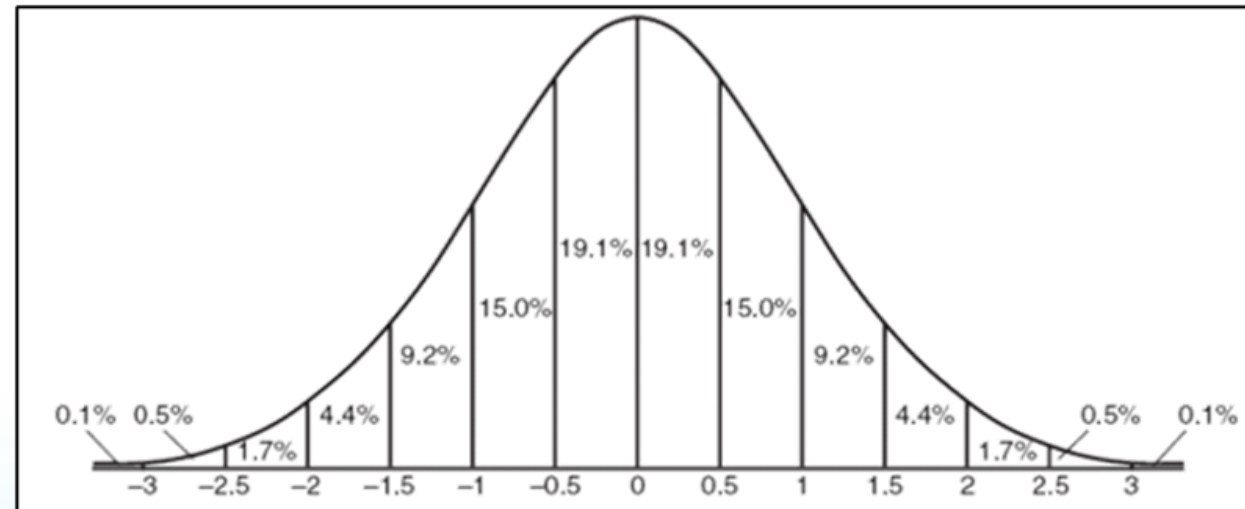
Funds between 4 years and 13 years of age are considered and enter the calculations, weighted with the empirically derives reliability of return data at a given fund age.

Interpretation of the “Performance Score” in the PE Rankings



Link to More
Background on
Rankings

NORMAL CURVE, STANDARD DEVIATION



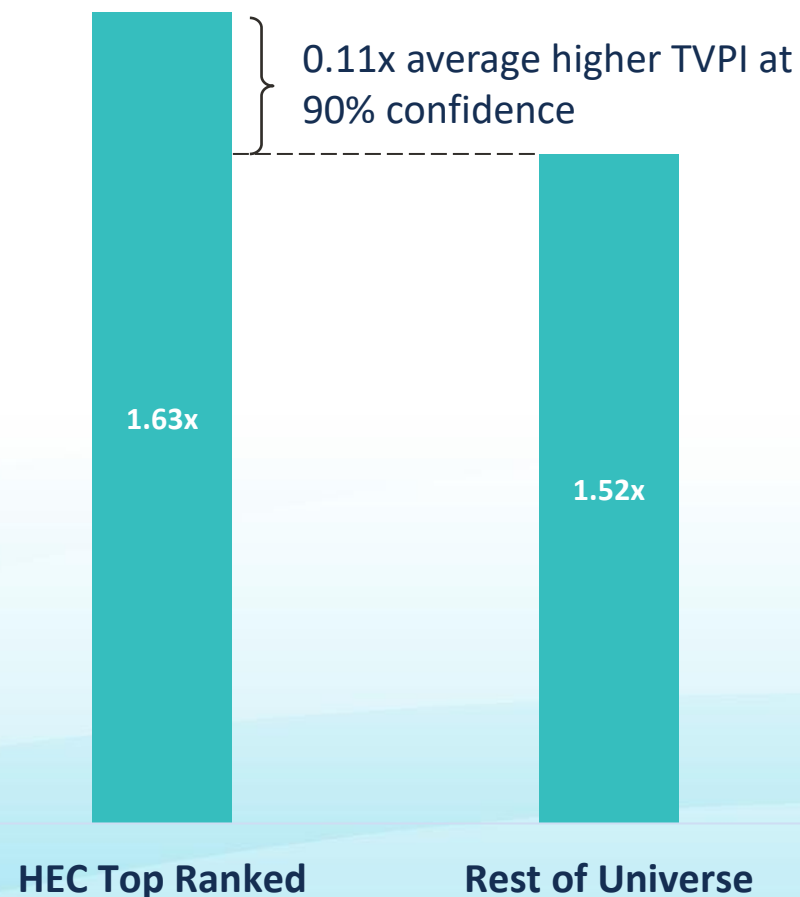
- The Aggregate Return Score is no Multiple- and no IRR-type measure
- It has an average of Zero and a Standard Deviation of 1 and makes it possible to compare a LP's performance to the distribution of returns of all LPs in the sample

A GP with a Rankings Score of “2” it does NOT have twice the IRR and twice the TVPI of a GP with a Score of “1”

Ranking Score points to Future Outperformers (even if it was not designed to do so)

Methodology

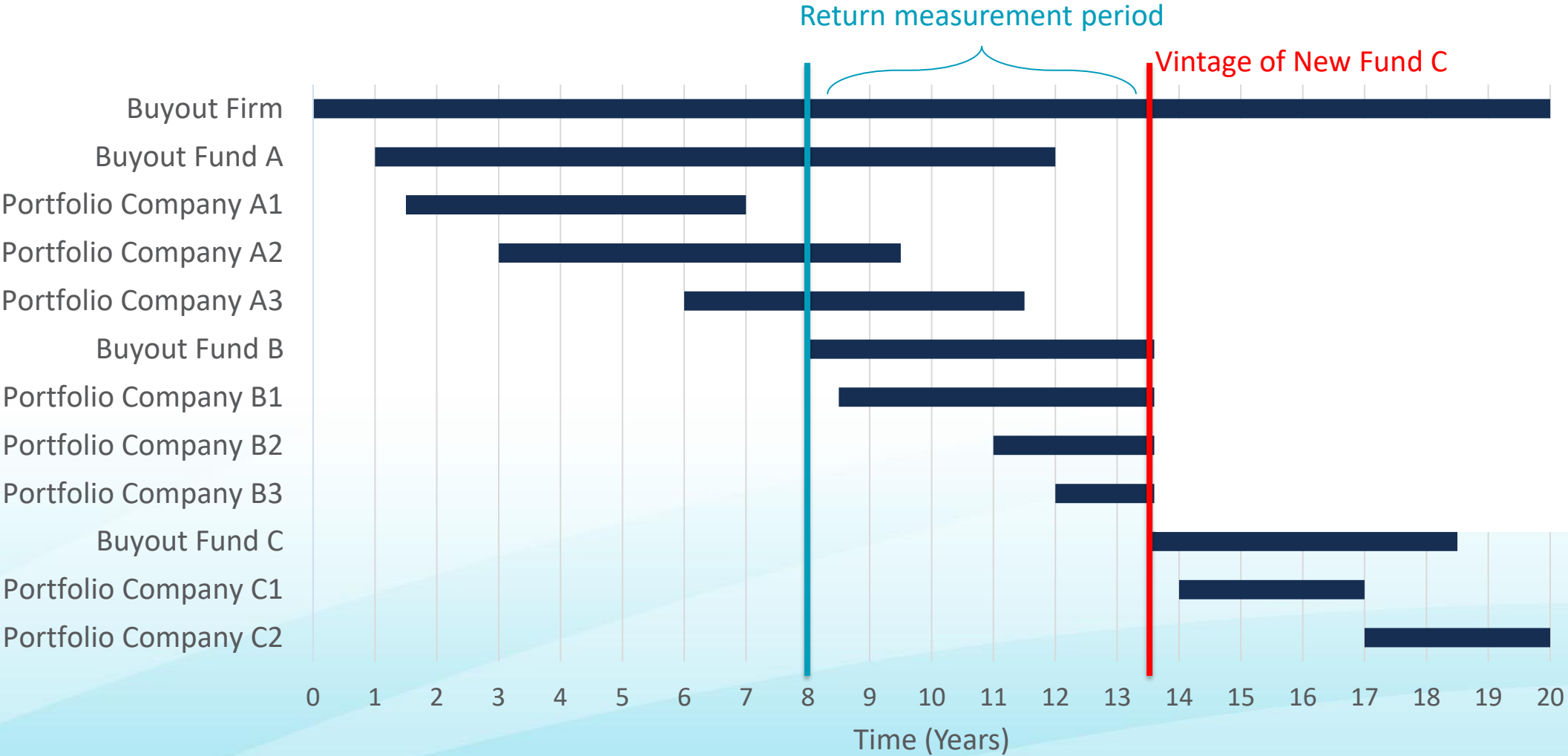
- Compiled the HEC–Dow Jones PE Rankings (2009–2020) and matched ranked GPs to the Preqin buyout fund universe.
- Identified new funds raise by top ranked GPs in two years following ranking.
- Constructed a comparable control group of non-ranked managers and matched observations by vintage year and fund size.
- Focused on large buyout funds (>\$2bn) and compared subsequent fund performance using TVPI.
- Tested the robustness of the findings through t-tests and regression analyses controlling for fund size, region and alternative ranking specifications.



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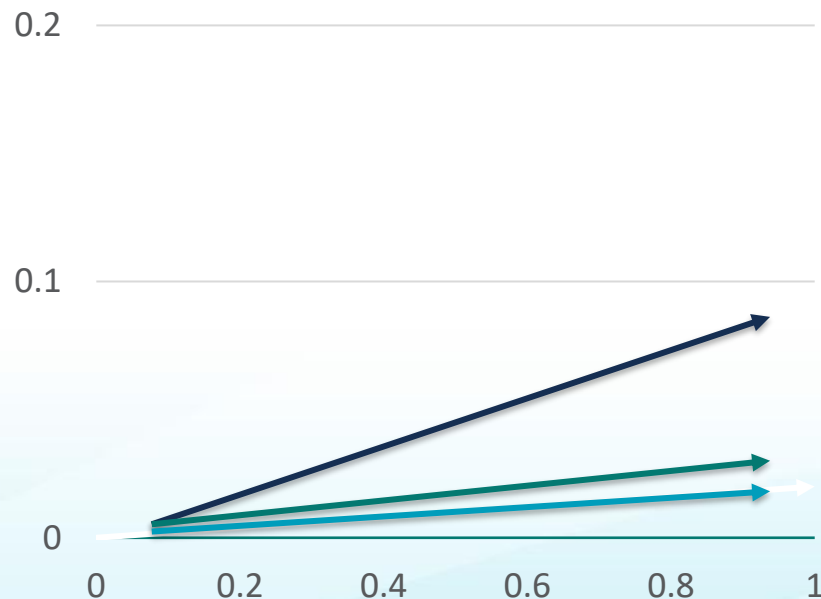
Aggregate returns over a longer cycle better predict subsequent fund performance



We aggregate net CFs across all active funds (of the same strategy) by a GP; we calculate the rolling (!) returns over a certain time period, always assuming entry and exit at NAV to calculate the overall value add of the GP across all funds combining funds at different stages of their life

Aggregate returns over a longer cycle better predict subsequent fund performance

Subsequent Fund
Performance



Aggregate returns over period

PERACS Alpha:

Significant
Correl. at 90% level
(Correl. Coefficient: +0.089)

TVPI:

No significant correlation
(Correl. Coefficient: +0.017)

IRR:

No significant correlation
(Correl. Coefficient: +0.023)

Illustrative Example:

382 observations of 5-year early period, 0 year
lag time and 5 year subsequent period

Only slightly improved r^2 (0.8%) but now of meaningful economic relevance: 3% PERACS Alpha gain ($p < 0.99$) and 0.2x TVPI ($p < 0.95$) gain of Funds preceded by Top Quartile “5-year Alpha GPs”

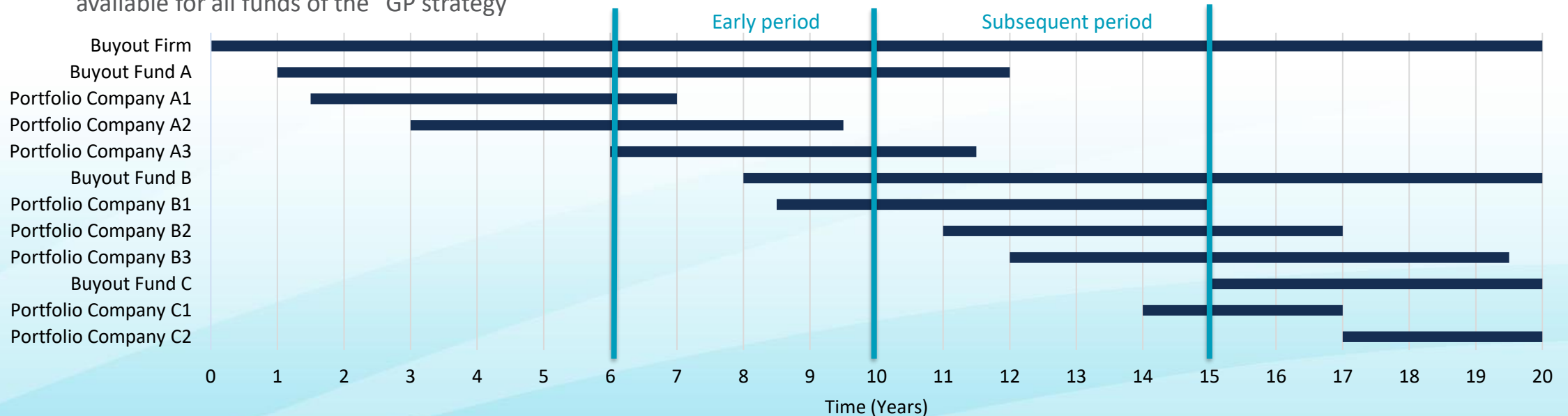
Source: Blackrock/preqin data, PERACS analysis, buyout funds only

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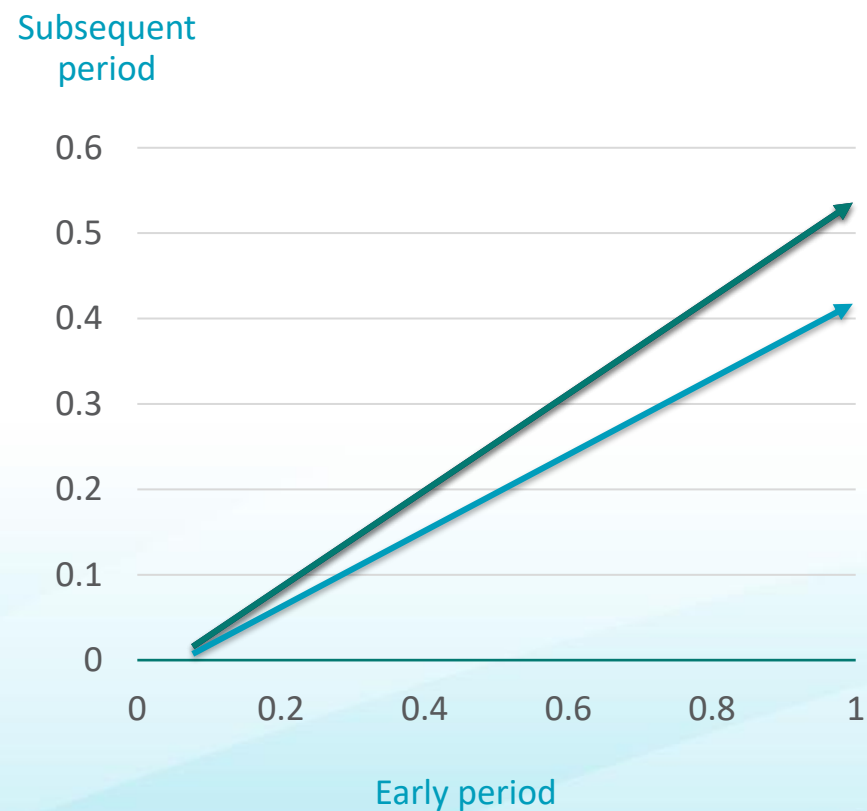
A superior way to assess return persistence: Comparing longer return periods

- Group GPs funds according to products or “GP strategies”: Bain Asia, KKR Europe, Carlyle Financial Services, Ardian Expansion etc
- Calculate rolling returns (TVPI, IRR, PERACS Alpha – all winzorized at 99% level to reduce distortion through outliers) across various “early periods” and “subsequent periods” for each “GP Strategy”, compare persistence between early and subsequent period, possibly after some lag time
- Data from Preqin on different fund types
- Filter on data from 1990 to 2021 for “GP strategies” for which at least one fund was raised post 2015 and with data on CF and NAV over time available for all funds of the “GP strategy”



We aggregate net CFs across all active funds (of the same strategy) by a GP; we compare the rolling returns over an “early period”, possibly after some lag time with the rolling returns over a “subsequent period”, always assuming entry and exit at NAV.

Comparing longer return periods identifies strong and statistically significant of Persistence in Buyout Performance: not only for Advanced Indicators



Source: Blackrock/preqin data, PERACS analysis, buyout funds only

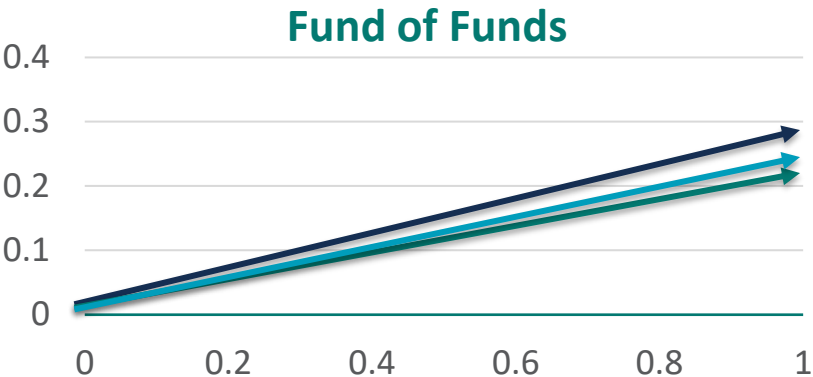
PERACS Alpha:
Significant
Correl. at 99.9% level
(Correl. Coefficient: +0.52)

IRR:
Significant
Correl. at 99.9% level
(Correl. Coefficient: +0.52)

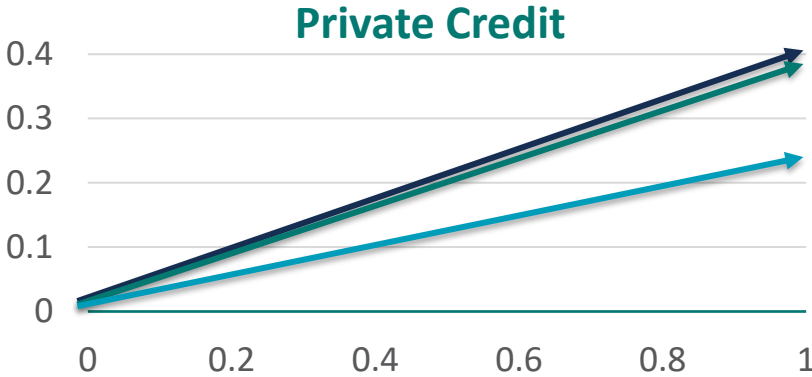
TVPI:
Significant
Correl. at 99.9% level
(Correl. Coefficient: +0.41)

Illustrative Example:
1332 observations of 5-year early period, 0 year lag time and 5 year subsequent period

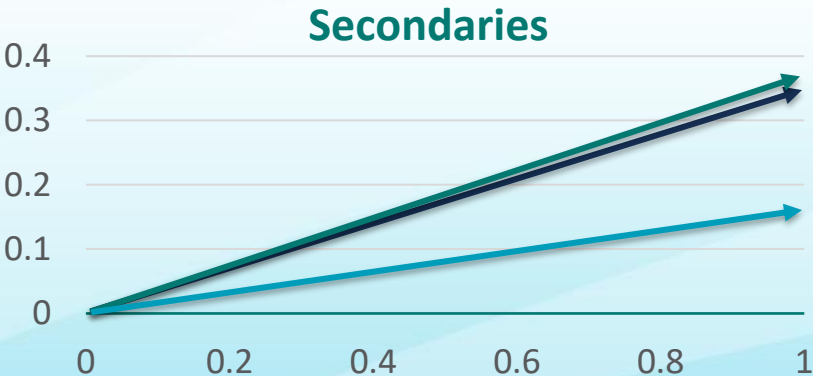
Statistical Significance of Persistence in Performance Across Private Capital Strategies: Advanced Indicator Show Persistence



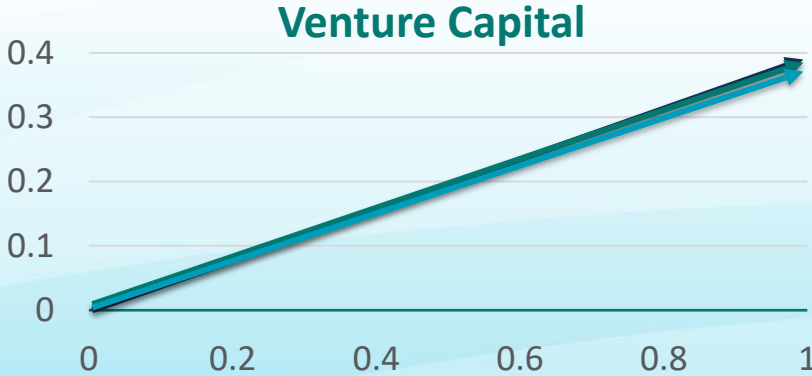
PERACS Alpha: +0.29 correlation at 99.9% level
TVPI: +0.26 correlation at 99.9% level
IRR: +0.23 correlation at 99.9% level
1195 observations, 5 year early period



PERACS Alpha: +0.41 correlation at 99.9% level
TVPI: +0.25 correlation at 99.9% level
IRR: +0.38 correlation at 99.9% level
349 observations, 5 year early period

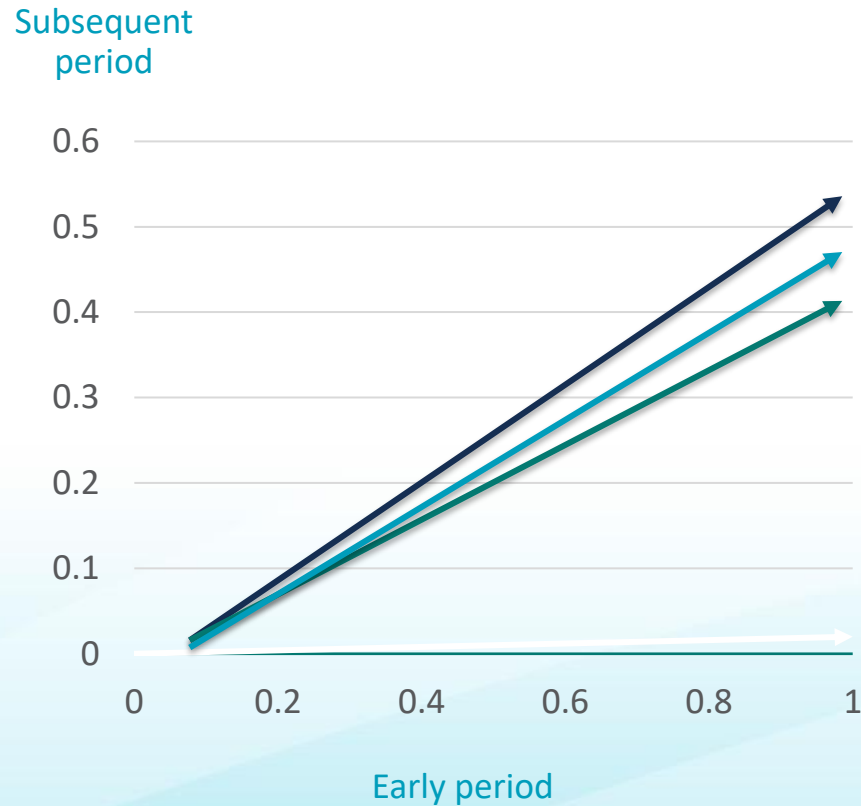


PERACS Alpha: +0.34 correlation at 99.9% level
TVPI: +0.17 correlation at 99% level
IRR: +0.37 correlation at 99.9% level
277 observations, 5 year early period



PERACS Alpha: +0.39 correlation at 99.9% level
TVPI: +0.38 correlation at 99.9% level
IRR: +0.39 correlation at 99.9% level
603 observations, 5 year early period

What is the best time period to observe returns:



Source: Blackrock/preqin data, PERACS analysis, buyout funds only

3 year PERACS Alpha:

Significant
Correl. at 99.9% level
(Correl. Coefficient: +0.52)

1134 observations of 3-year early period, 0 year lag time and 7 year subsequent period

5 year PERACS Alpha:

Significant
Correl. at 99.9% level
(Correl. Coefficient: +0.47)

1042 observations of 5-year early period, 0 year lag time and 7 year subsequent period

7 year PERACS Alpha:

Significant
Correl. at 99.9% level
(Correl. Coefficient: +0.42)

903 observations of 7-year early period, 0 year lag time and 7 year subsequent period

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• **The Economic Relevance of Persistence**

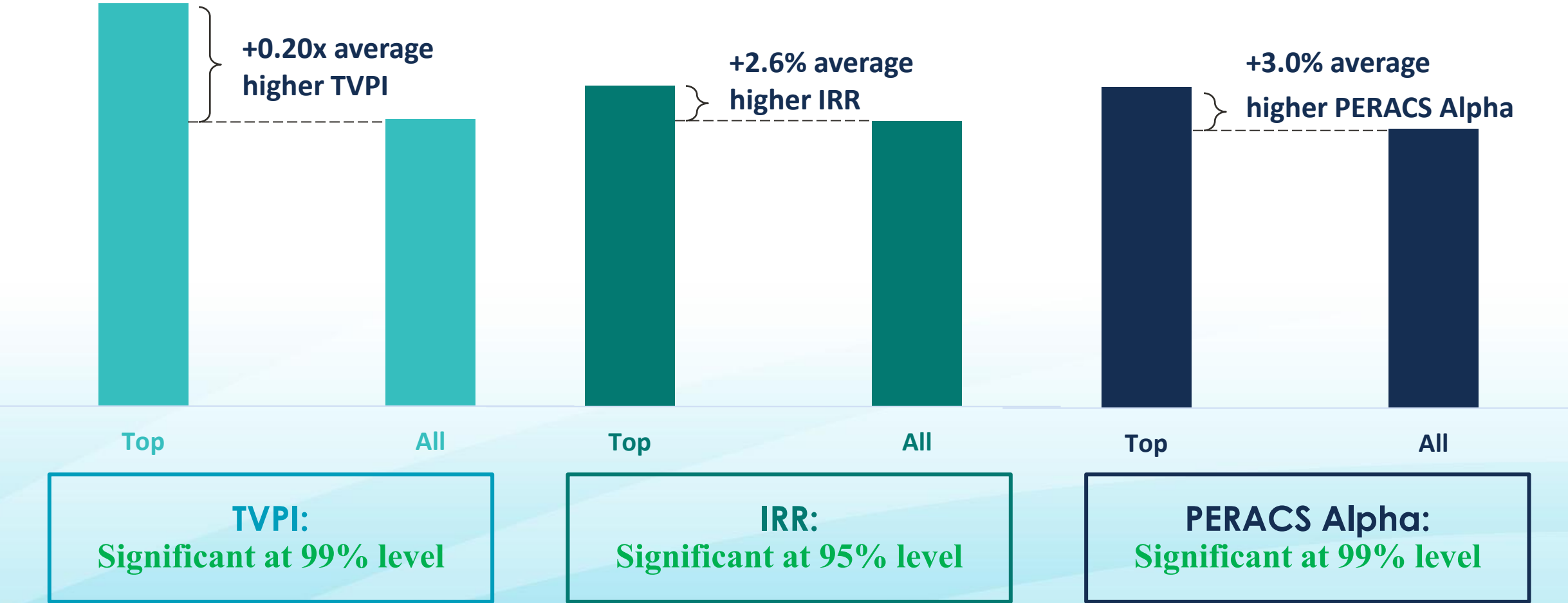
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Economic Magnitude of “real world Persistence fund to fund” – all non-significant

		To Predict		
		TVPI	IRR	PERACS Alpha
Using	TVPI	+0.07x Top vs All Not Significant	+0.64% Top vs All Not Significant	+0.64% Top vs All Not Significant
	IRR	+0.02x Top vs All Not Significant	+0.04% Top vs All Not Significant	+0.23% Top vs All Not Significant
	PERACS Alpha	+0.07x Top vs All Not Significant	+0.66% Top vs All Not Significant	+0.92% Top vs All Not Significant

Using 806 funds’ performance to predict the following funds’ performances.

Economic Magnitude of “Persistence pooled performance to fund”, by perf measure

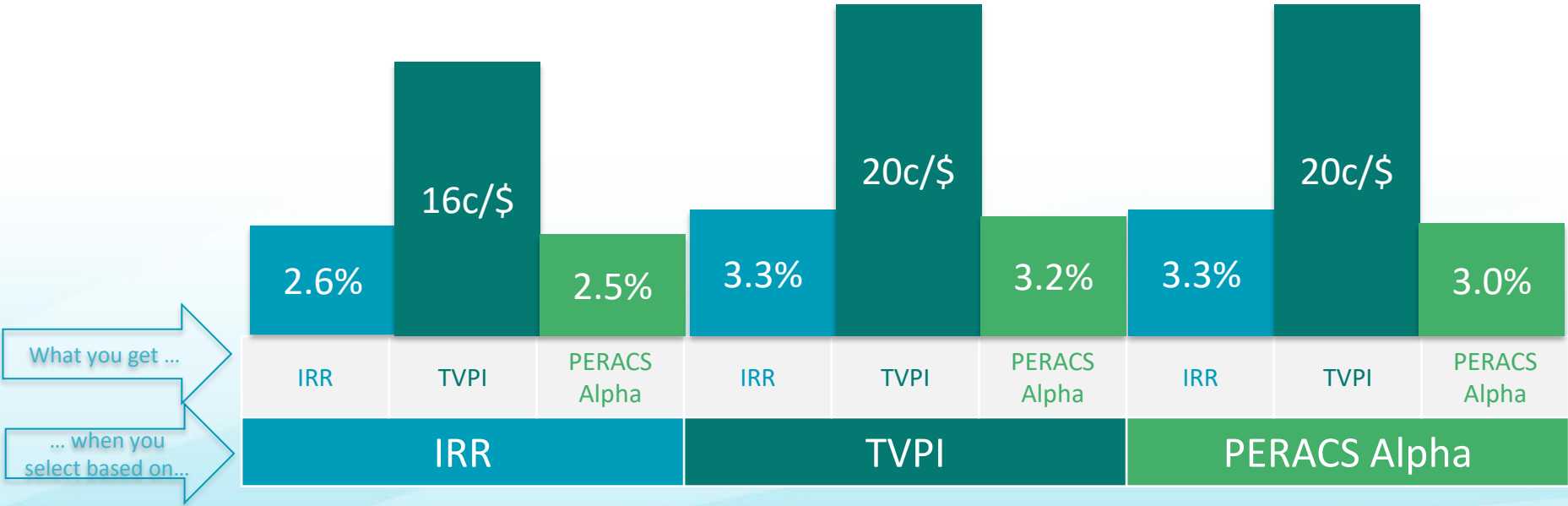


Based on 326 performance pools, observing a 7-year cycle to predict the following funds’ performances.

Economic Magnitude of “Persistence pooled performance to fund”, by performance measure: buyout funds

We can measure also the “economic” relevance of return persistence by measuring the performance increase (during the subsequent period) of a portfolio made up of GP Strategies identified (in the early period) as a “Top Quartile GP Strategy”

Performance Gain from investing in Top Quartile Gp Strategies according to ...

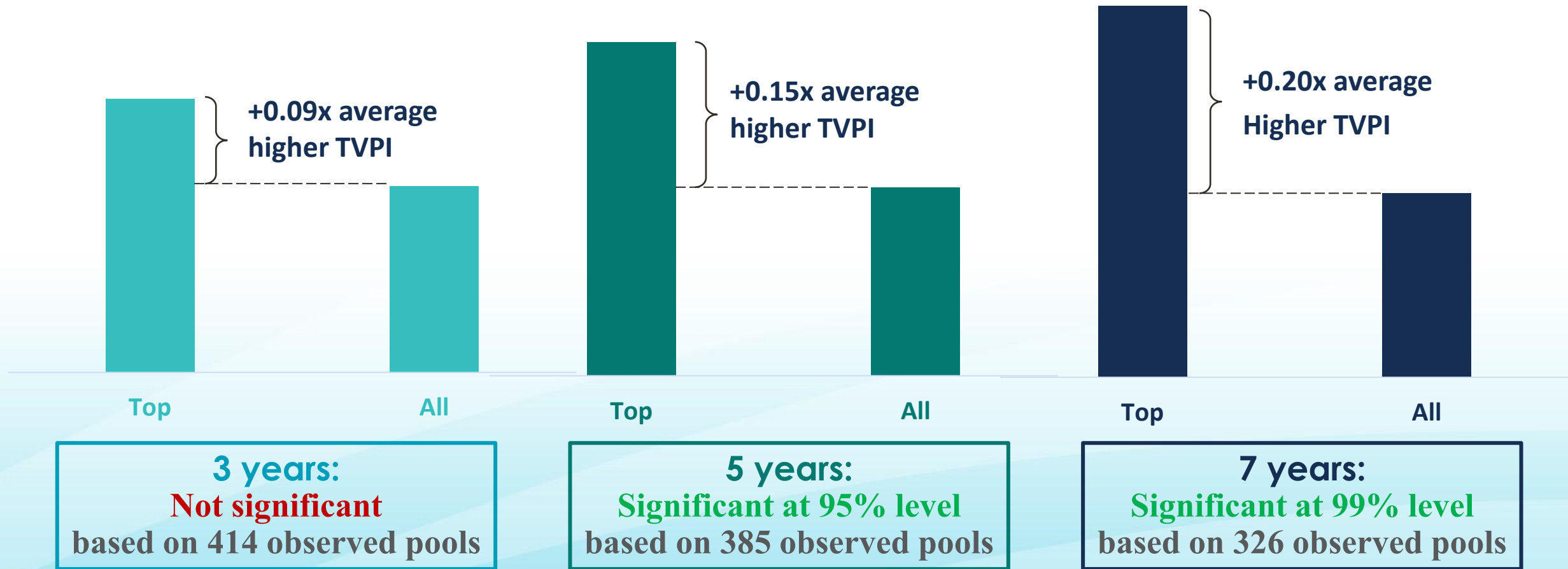


Illustrative Example:

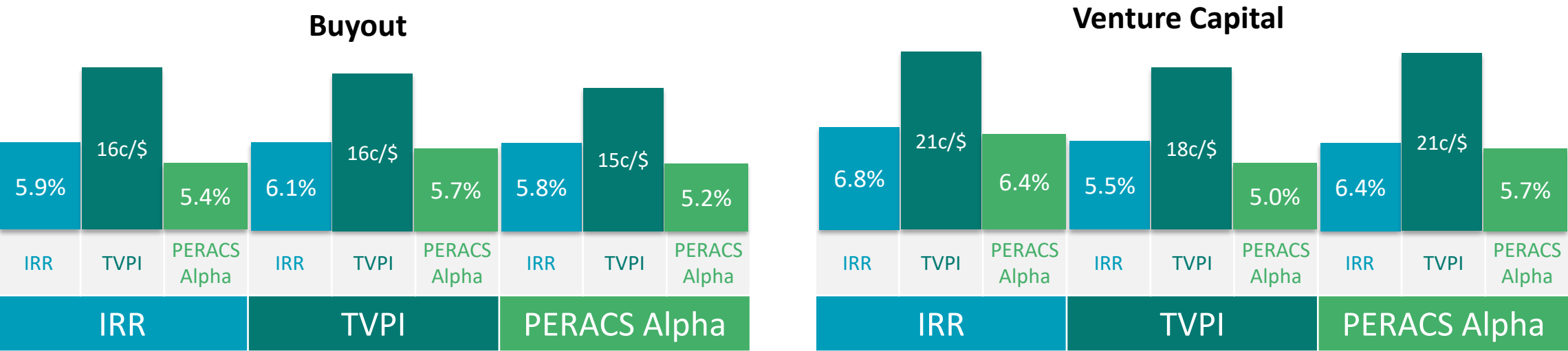
13 scenarios in which a 7-year early period is compared to a 7-year subsequent period

Source: Blackrock/preqin data, PERACS analysis, buyout funds only

Economic Magnitude of “Persistence pooled performance to fund”, TVPI by cycle length of “early” period

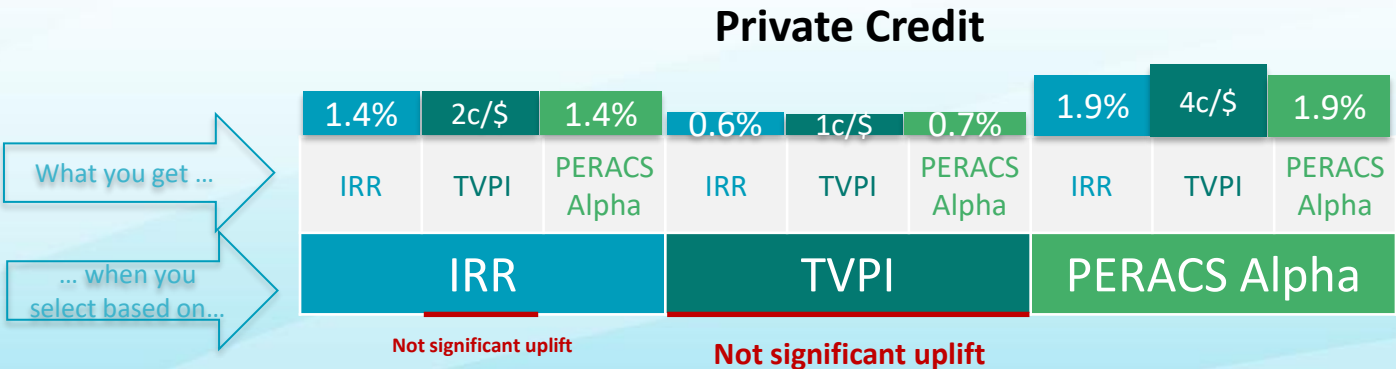


Economic Magnitude of “Persistence pooled performance to pooled performance”, by performance measure by Asset Class



Based on 1130 observations. All significant at >99.9% level

Based on 461 observations. All significant at >99.9% level



Based on 302 observations. Unless specified, significant at >95% level

Observing pooled performance over 7 year window and predicting performance over succeeding 5 year window

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PERACS Quartile Benchmarks

HYPOTHETICAL EXAMPLE
NO CLIENT DATA

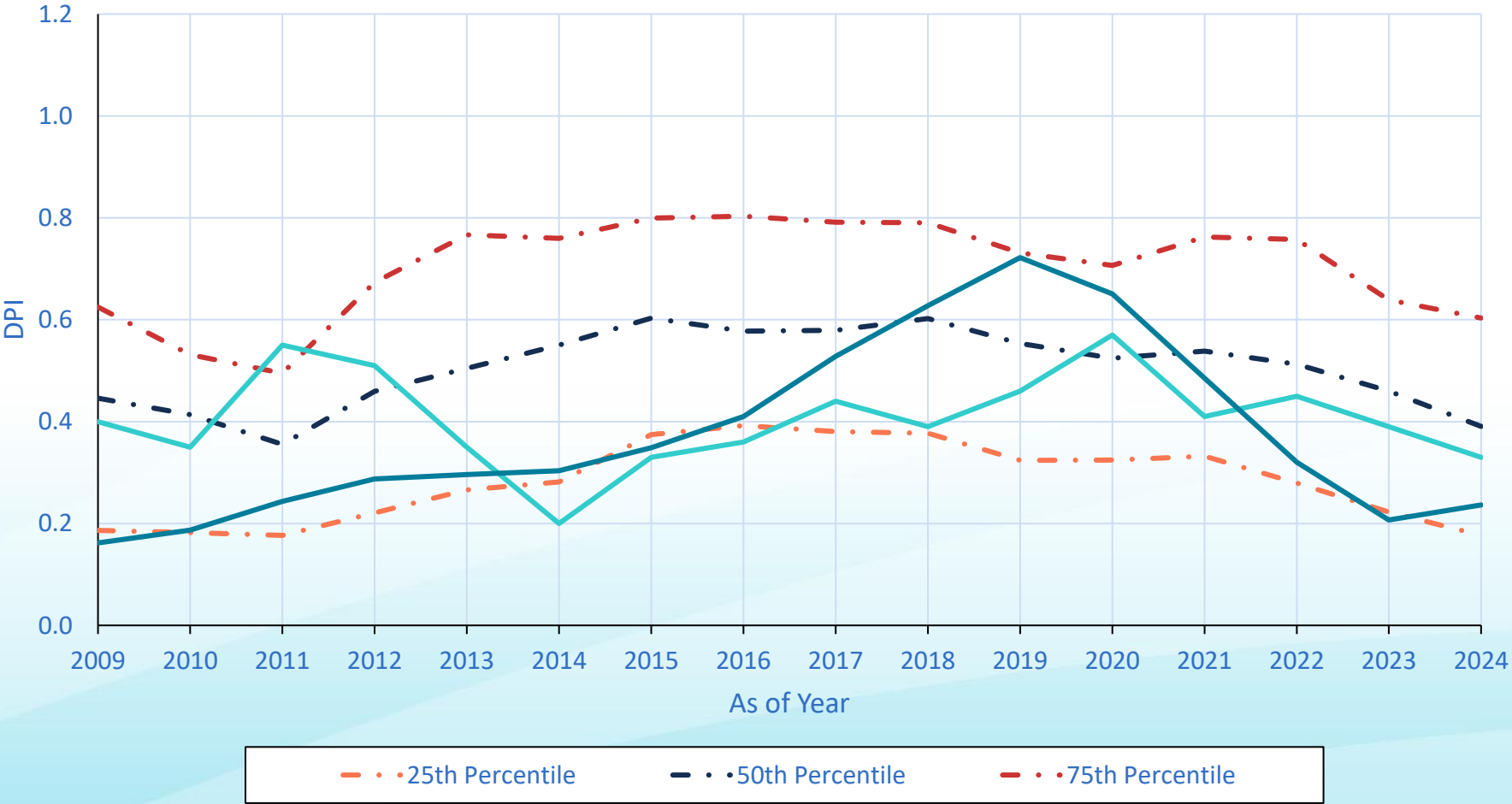
Net Analysis

Fund	Vintage (3 Year)	PERACS Alpha			Net IRR			DPI			TVPI		
Fund A	2009	10.8%	2 nd Best Quartile	10/37	15.1%	2 nd Best Quartile	10/37	2.8x	Top Quartile	5/37	2.9x	Top Quartile	5/37
Fund B	2013	16.3%	Top Quartile	13/77	22.7%	Top Quartile	14/77	3.3x	Top Decile	1/77	3.5x	Top Decile	2/77
Fund C	2017	2.8%	3 rd Best Quartile	41/61	7.9%	3 rd Best Quartile	43/61	0.7x	Top Quartile	11/61	1.7x	3 rd Best Quartile	32/61
Fund D	2021	-4.3%	3 rd Best Quartile	55/81	-1.1%	Bottom Quartile	63/81	0.1x	Bottom Quartile	81/81	0.6x	Bottom Quartile	64/81

Quartiling tables inherently show a downward trend over time, but is it really deteriorating performance, or just the J-Curve effect coupled with conservation valuation policy?

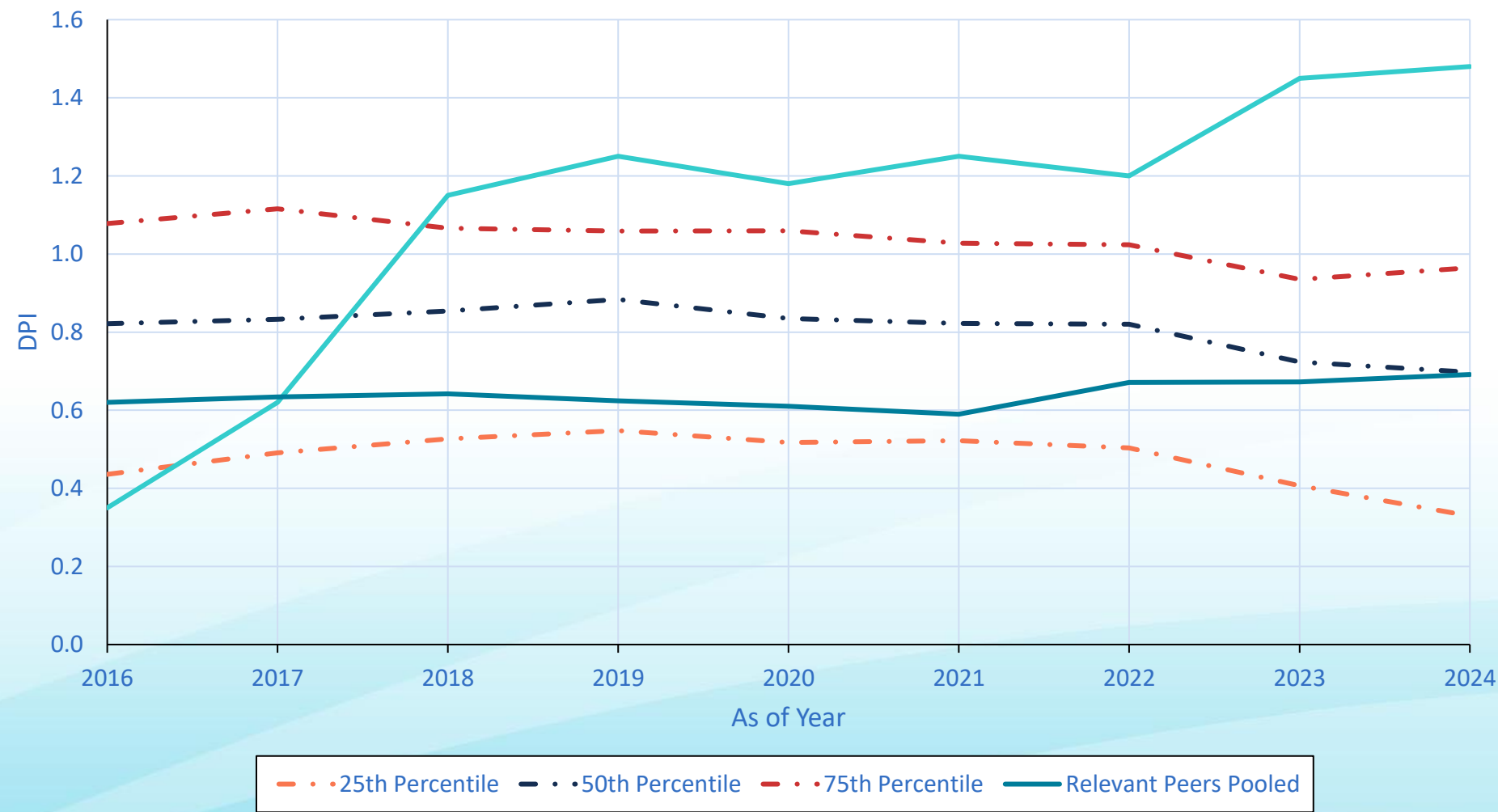
DPI Percentiles for 5-Year Window

HYPOTHETICAL EXAMPLE
NO CLIENT DATA



DPI Percentiles for 5-Year Window

HYPOTHETICAL EXAMPLE
NO CLIENT DATA



Long-Term Outperformance of GP over relevant peers and vintage year benchmarks are visible across performance measures

GP's performance, measured over 7-year cycles, is top quartile and substantially above that of its closest competitors in terms of TVPI, DPI, IRR and PERACS Alpha

TVPI Percentiles for 7-Year Window



DPI Percentiles for 7-Year Window



IRR Percentiles for 7-Year Window



Alpha Percentiles for 7-Year Window

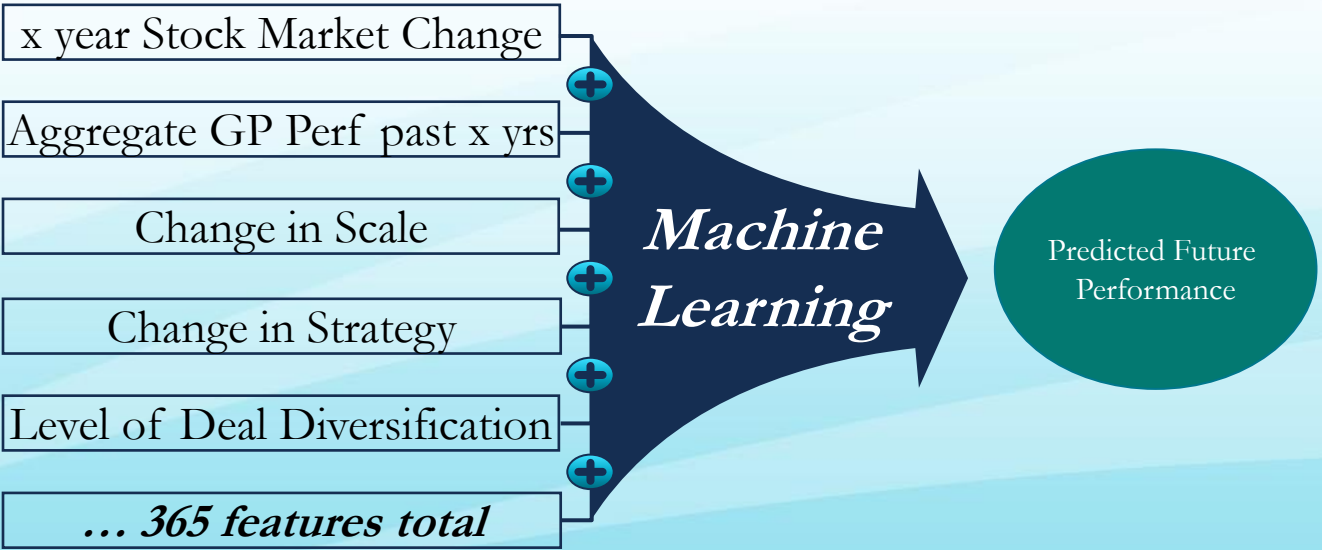
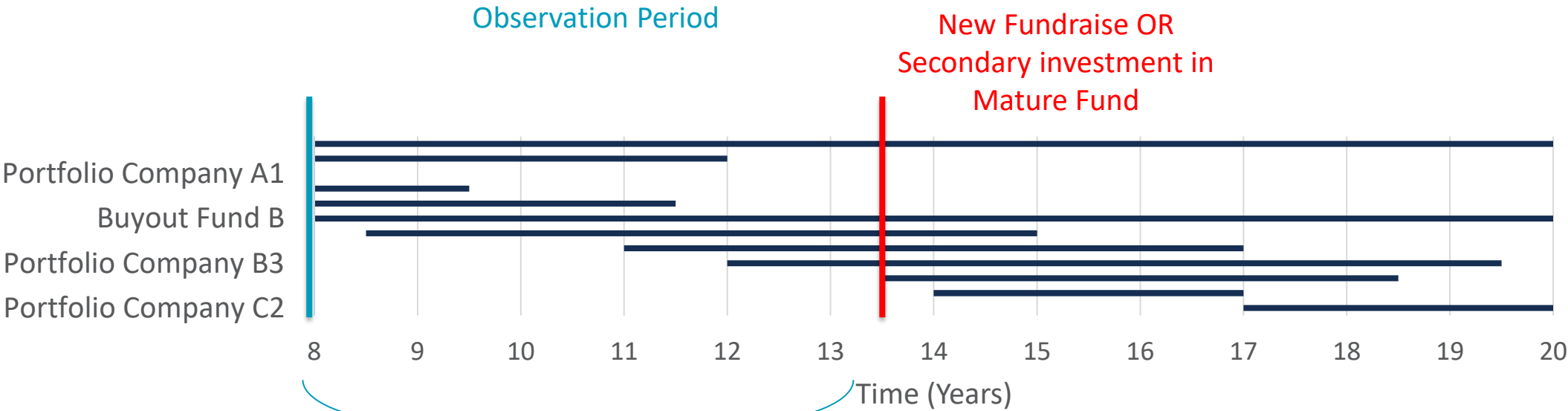


The PERACS Alpha and the weighted average and time-matched market (MSCI ACWI Index) returns add up to the PERACS annualized Rate of Return, which corrects for possible biases of the traditional IRR performance measurement.

Aren't they all a bit top quartile?

- The problem for LPs to act on insights from traditional persistence studies
- HEC Dow Jones PE Ranking: Inspiration to look at longer return cycles
- Aggregate returns over a longer cycle better predict subsequent fund performance
- A superior way to assess return persistence: Comparing longer return periods
- The Economic Relevance of Persistence
- Comparing longer return periods to support Manager Due Diligence
- **Expanding the Scope Beyond one Simple Performance Measure with Machine Learning**
- Conclusions

Expanding the Scope Beyond one Simple Performance Measure with Machine Learning



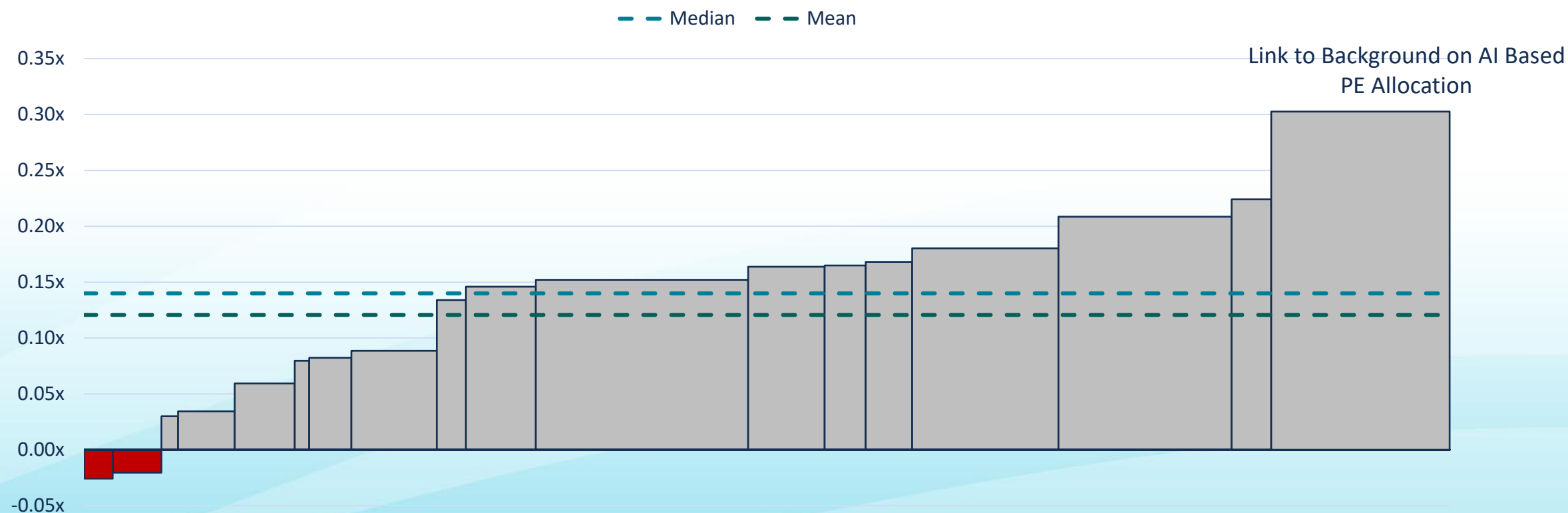
Link to Background on AI Based
PE Allocation

Machine Learning Edge in Primary Fund Selection

ML predictions filter a portfolio to the 'Top Portfolio' Set of best performers

Figure 3: ML predicted Top Portfolio selection effect - TVPI gains for public pension fund

TOTAL: 15.1B USD



Machine Learning Edge in Secondary Fund Investing



Pricing models calibrated based on available data at the time to opportunities in 2019-2022

Year	NAV (€Mn)	Discount	Price Paid	IRR (unlevered)	IRR (Levered)	TVPI (Levered)	ML Performance vs 2019 Vintage Benchmark
2019	756.9	7.8%	0.92	17%	26%	1.97x	
2020	425.0	5.2%	0.95	14%	20%	2.16x	
2021	164.0	15.9%	0.84	11%	16%	1.37x	
2022	113.9	13.2%	0.87	11%	15%	1.75x	
2019/2020	1181.9	6.8%	0.93	16%	24%	2.04x	
2020/2021	589.0	8.2%	0.92	13%	19%	1.94x	
Total	1,459.8	8%	0.92	15%	22%	1.94x	

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Summary and Implications

- Traditional ways to document return persistence are unsuitable to provide practical insights to future performance
- Looking at the aggregate cash flow data for multiple funds by a given “GP Strategies” adds a novel and insightful perspective to better understand persistence
- Across a wide range of sensitivities regarding observation periods and lag intervals, PERACS Alpha shows significant levels of return persistence and is an antecedent of higher IRR and TVPI
- Aggregating past performance across multiple funds over longer time periods provides a powerful guide to future outperformance of new and mature funds
- Aggregating past performance across multiple funds over longer time periods is a more accurate reflection of GP skill and should be part of manager due diligence