

Private Portfolio Attribution Analysis

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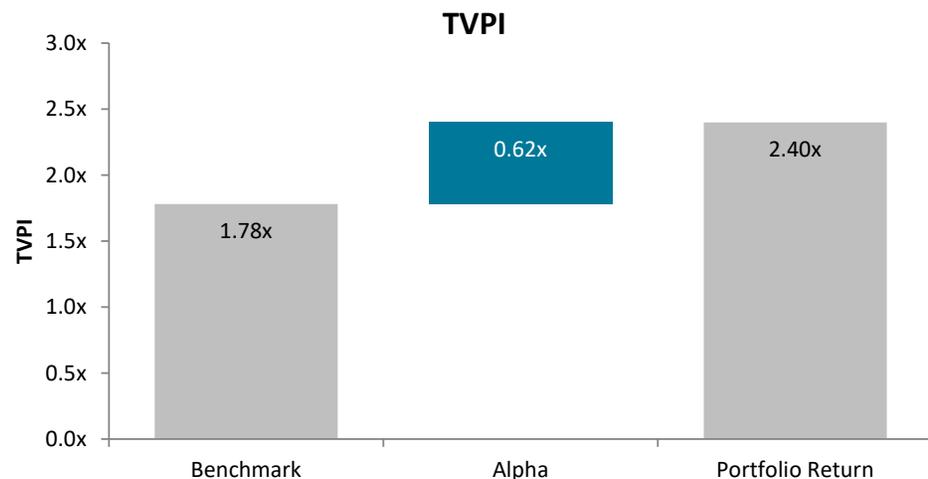
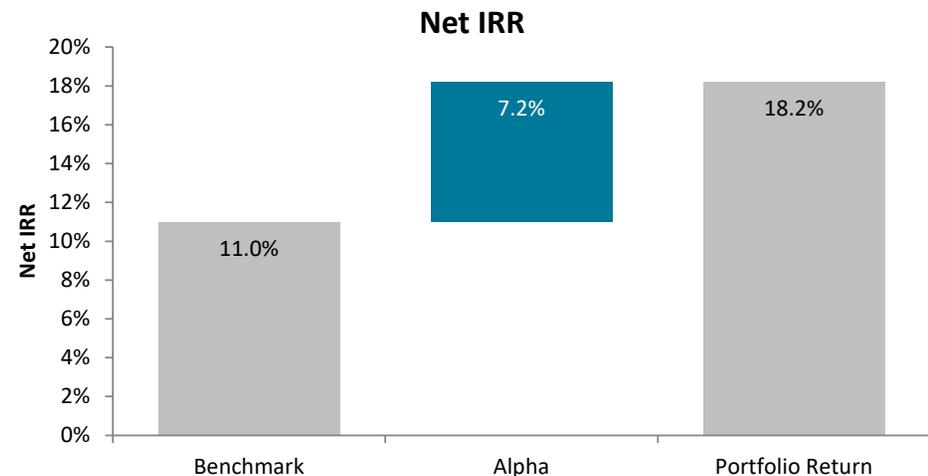
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Traditional Benchmarking

- Traditional benchmarking analysis in private markets focuses on measuring the underperformance or outperformance (i.e., alpha) of a private market portfolio or fund relative to a benchmark, either public or private.
- For private markets, there are a number of benchmark providers available (e.g., Burgiss, Cambridge) to compare funds and portfolios to similar strategies and vintages.
- For public markets, there are several Public Market Equivalent (PME) analyses available to compare the performance of a private market fund or portfolio to a public market index during the same time period.
- In all these methodologies, the end goal is to simply measure alpha by comparing the fund or portfolio to a benchmark.

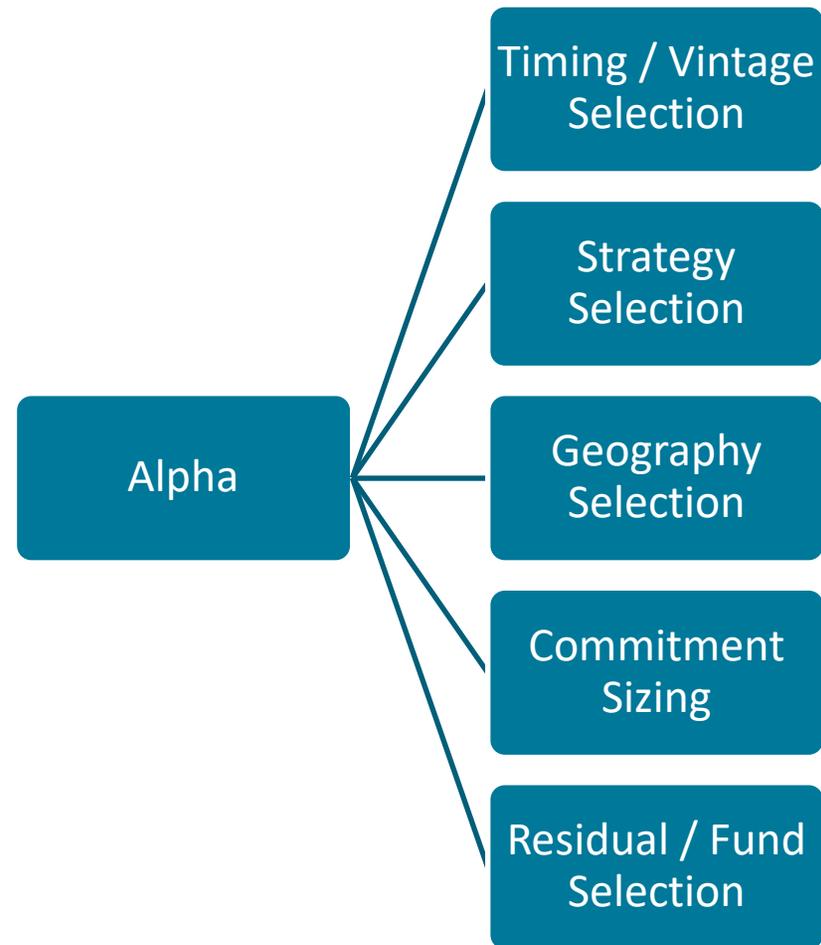


Private Portfolio Attribution Analysis – Overview

- Unlike traditional benchmarking analysis, the goal of the private portfolio attribution analysis is to explain how or why the private market portfolio underperformed or outperformed the benchmark.
- While traditional benchmarking analysis can be run at both the fund and portfolio levels, the attribution analysis is run only at the portfolio level and attempts to quantify alpha created by an LP’s portfolio construction decisions.
- To explain the sources of alpha in the private portfolio, the attribution analysis deconstructs it into various components, including:
 - Timing (i.e., Vintage Year Selection),
 - Strategy Selection,
 - Geography Selection
 - Commitment Sizing
 - Residual / Selection Factors (e.g., Fund Selection)

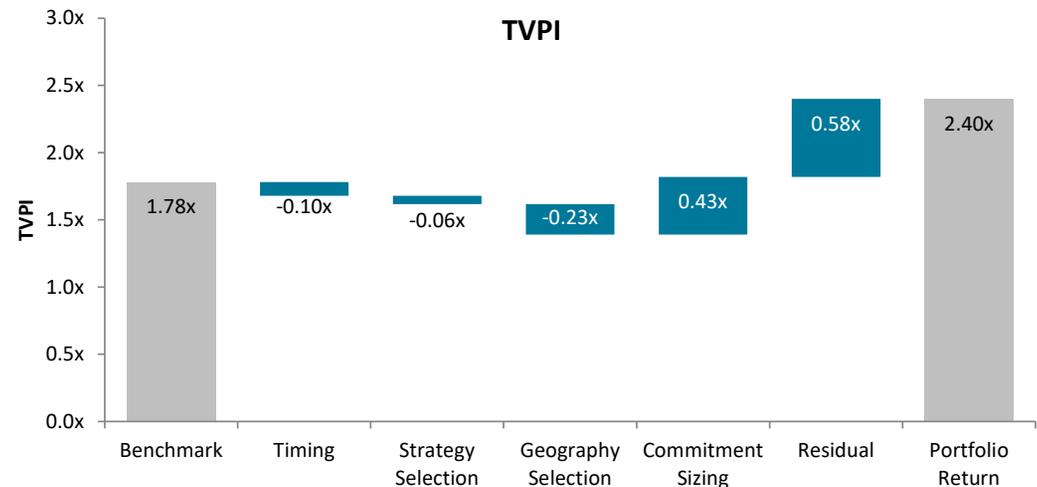
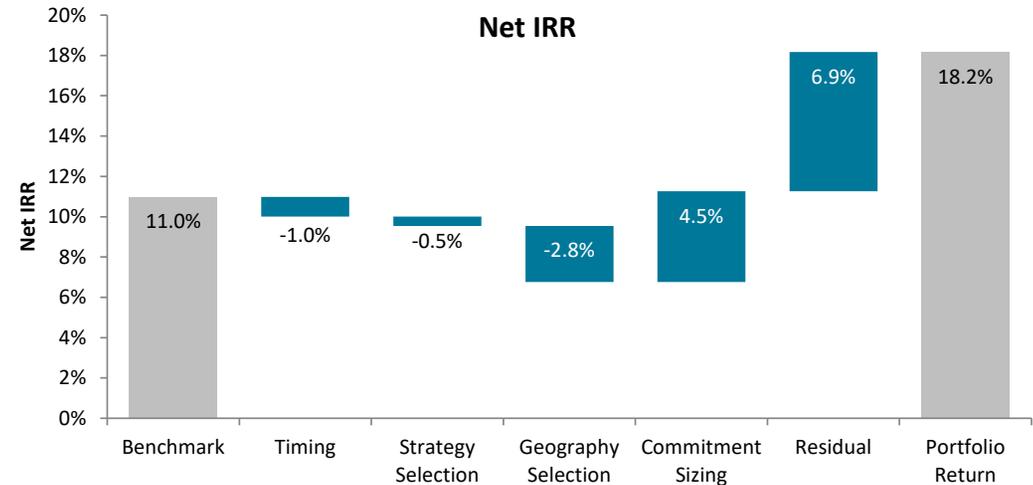
Traditional Analysis

Attribution Analysis



Private Portfolio Attribution Analysis – Components

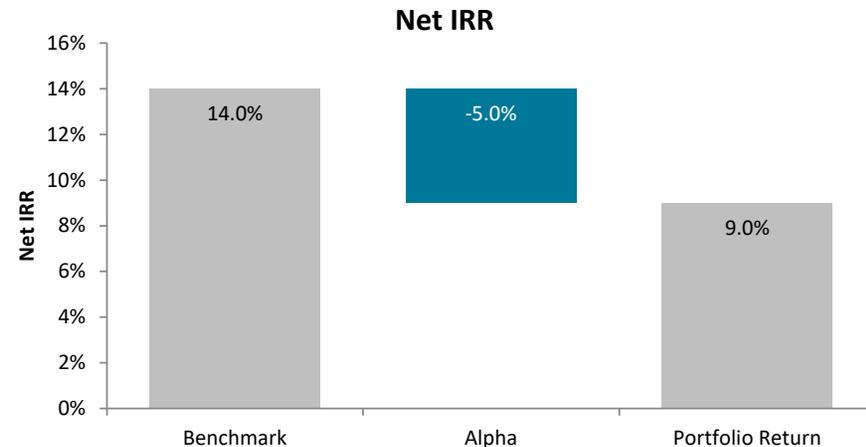
- Timing
 - Applies the portfolio’s vintage year weights to the benchmark’s returns.
- Strategy Selection
 - Applies the portfolio’s strategy weights to the benchmark’s returns. For each strategy, weights are calculated and applied for each vintage year, due to the performance of a particular strategy being largely dependent on timing.
- Geography Selection
 - Similar to Strategy Selection, applies the portfolio’s geography weights to the benchmark’s returns.
- Commitment Sizing
 - Explains if the LP overallocated to the better-performing funds in their portfolio. Compares the portfolio’s actual performance to its performance if it equally sized commitments to all funds.
- Selection and Residual Factors
 - A plug to the portfolio’s actual returns to capture all other factors. This component is heavily impacted by fund selection (i.e., selecting the better-performing funds within a particular vintage, strategy, geography, etc.), but it can also be impacted by other characteristics.



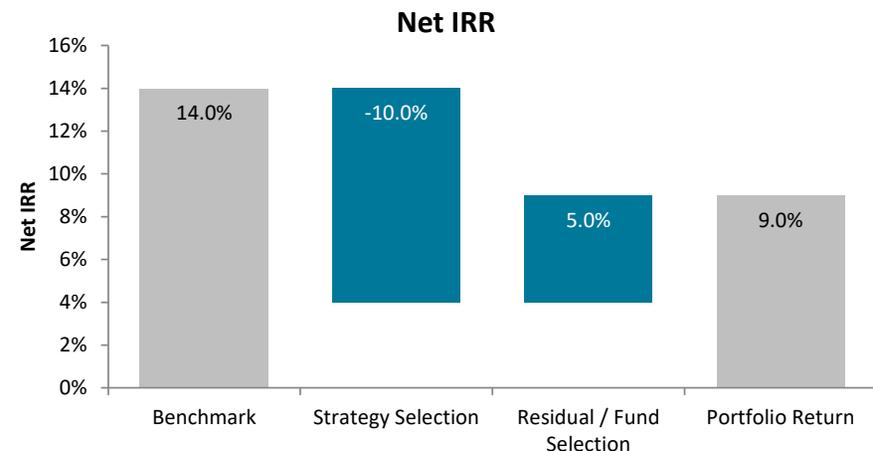
Private Portfolio Attribution Analysis – Simplified Example

- To the right is a simplified example of a private market portfolio, illustrating how the attribution analysis is different than traditional benchmarking analysis and what additional insights the attribution analysis provides to LPs. For simplification purposes, we have ignored some components in the attribution analysis.
- In this example, the LP allocates heavily to a strategy that significantly underperforms other strategies in a given vintage year; however, it selects one of the better performing funds for that strategy.
- While both analyses will show the same end results (-5% of alpha), the attribution analysis has better explanatory power by quantifying the alpha lost from selecting the wrong strategy at the wrong time but also showing a positive residual component, due in large part to superior fund selection.

Traditional Analysis



Attribution Analysis



Note: Timing, Geography Selection, and Commitment Sizing excluded to simplify the example

Further Unravelling Luck and Skill

- Differentiating luck from skill requires an analysis of variation in actual data. To estimate approximate historical confidence intervals for each attribute, we undertook a historical simulation analysis with Burgiss data.
- We generated 1,000 portfolios that each invested in 10 randomly selected funds every vintage year. Then, we conducted the attribution analysis on these random portfolios. Since all the variation in performance is by chance (by construction), we can utilize the distribution of attributions and see where actual values for a specific portfolio land. This gives a notion of statistical confidence for a given attribution.
- For portfolios of all funds (buyout and VC) we find confidence intervals in the range of $\pm 2.3\%$ to $\pm 5.9\%$ for all but fund selection which has a much wider interval of $\pm 10.7\%$.
 - However, most of the variation is driven by VC funds, so inference is much easier with portfolios of just buyout funds.

Approximate 90% IRR Confidence Intervals

<u>Metrics</u>	<u>Timing</u>	<u>Strategy Selection</u>	<u>Geography Selection</u>	<u>Commitment Sizing</u>	<u>Fund Selection</u>
All Funds	$\pm 2.6\%$	$\pm 5.9\%$	$\pm 2.3\%$	$\pm 4.5\%$	$\pm 10.7\%$
Buyouts Only	$\pm 1.5\%$		$\pm 1.2\%$	$\pm 2.1\%$	$\pm 4.8\%$
VC Only	$\pm 10.8\%$		$\pm 4.8\%$	$\pm 5.5\%$	$\pm 27.2\%$

Note: See paper for exact confidence intervals which are generally not symmetric around zero.