

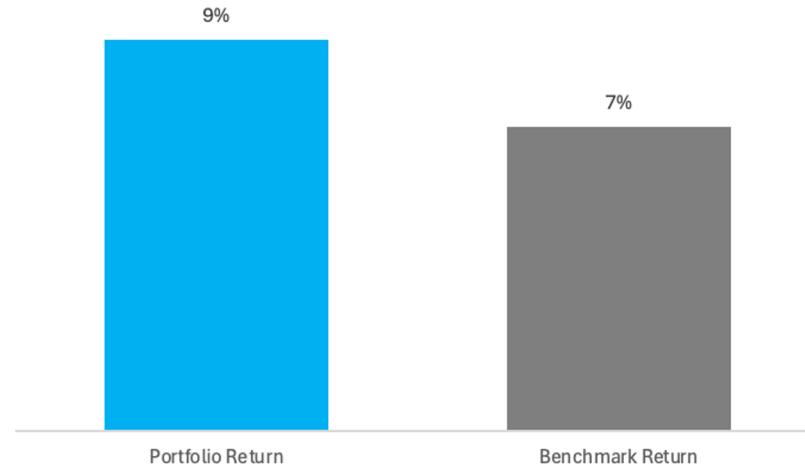
Performance Attribution

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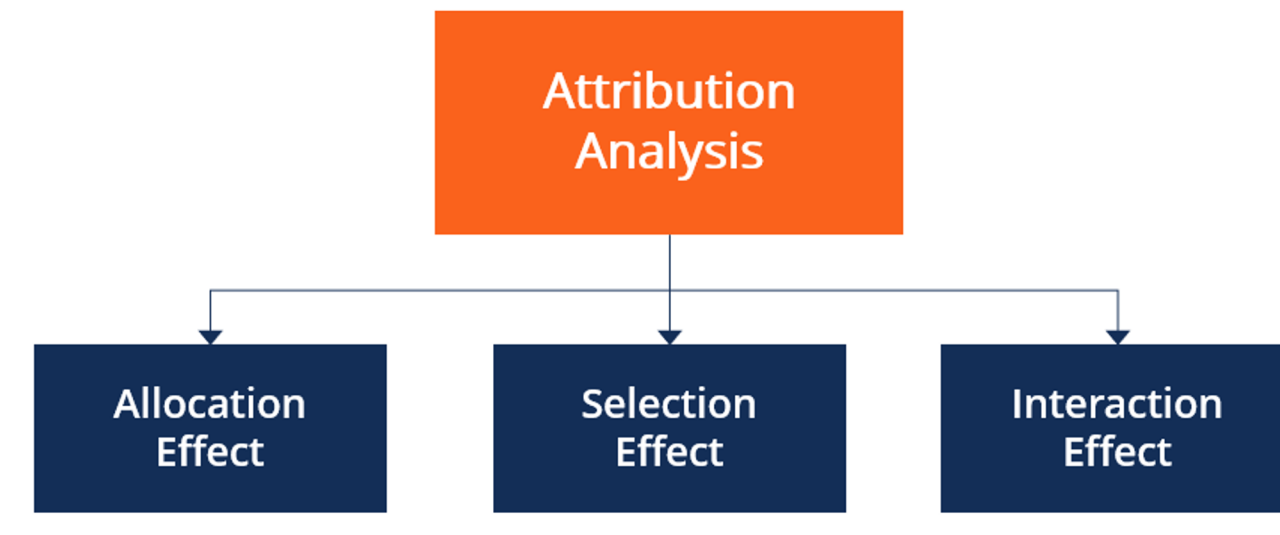
Why Performance Attribution Matters?



- After measuring performance, attribution tells us why those results really happened
- Why it matters:
 - Shows whether outperformance came from strategy or market exposure
 - Separates skill from luck
 - Reveals which decisions added or hurt performance
- Goal for SMIF: Connect results to measurable sources of return



What is Performance Attribution?



Performance attribution explains why a portfolio's return differs from its benchmark by breaking excess return into three effects:

- Allocation Effect – Measures the performance impact resulting from overweighting or underweighting specific sectors and or asset classes relative to the benchmark.
- Selection Effect – Quantifies the value added or subtracted by selecting specific securities within each sector and or asset class compared to the benchmark.
- Interaction Effect – Combined influence of both allocation and selection effect.



The Brinson-Fachler Model (1985)

$$A_i = (w_i - W_i)(b_i - R_B)$$

Allocation Effect = [Portfolio weight – Benchmark weight] × [(Benchmark return – Total benchmark return)]

$$S_i = w_i(r_i - b_i)$$

Selection Effect = [Portfolio weight] × [Portfolio return – Benchmark return]

$$I_i = (w_i - W_i)(r_i - b_i)$$

Interaction Effect = [Portfolio weight – Benchmark weight] × [Portfolio return – Benchmark return]

w_i = portfolio weight

W_i = benchmark weight

r_i = portfolio return

b_i = benchmark return

R_B = total benchmark

- The Brinson–Fachler (BF) model refines the original attribution framework.
- It measures allocation, selection, and interaction effects, but adjusts the allocation effect to compare each sector's return to the total benchmark return (R_B).
- This makes it a relative attribution model – evaluating whether managers overweighted sectors that outperformed the benchmark overall.
- The allocation effect rewards overweighting outperforming sectors and penalizes overweighting underperforming ones.
- The selection and interaction effects are identical to the BHB model.
- Because the BF model evaluates returns on a relative basis, it provides a more accurate measure of the manager's active decisions.



The Brinson-Hood-Beebower Model (1986)

$$A_i = (w_i - W_i)b_i$$

Allocation Effect = [Portfolio weight – Benchmark weight] × [Benchmark return]

$$S_i = w_i(r_i - b_i)$$

Selection Effect = [Portfolio weight] × [Portfolio return – Benchmark return]

$$I_i = (w_i - W_i)(r_i - b_i)$$

Interaction Effect = [Portfolio weight – Benchmark weight] × [Portfolio return – Benchmark return]

w_i = portfolio weight

W_i = benchmark weight

r_i = portfolio return

b_i = benchmark return

R_B = total benchmark

- The **Brinson-Hood-Beebower (BHB)** model simplifies the Fachler version.
- Uses each sector's own benchmark return (b_i) rather than the total benchmark return (R_B).
- This makes the model easier to compute and explain, especially for client communication.
- The allocation effect now measures whether the manager overweighted sectors that had strong absolute returns, not just those that outperformed the market.
- The selection and interaction effects are defined the same way as in the BF model.
- Although slightly less precise, the BHB model became the industry standard for reporting performance attribution due to its simplicity and clarity.



Step 1: Separate Equities into Sectors

Sector	Holdings	Benchmark ETF
Communication Services	META, T	XLC
Consumer Discretionary	NKE, VCR	XLY
Consumer Staples	WMT	VDC
Core Bonds	AGG	AGG
Energy	LNG	XLE
Financials	V	XLF
Health Care	UNH, ABBV, ABT, JNJ, CVS	XLV
Industrials	MMM, HII	XLI
Information Technology	AAPL, MSFT, QCOM	VGT
International Developed	VEA	VEA
Materials	SOLV	XLB
Real Estate	PSA	XLRE
US Large Cap	VOO	VOO



Performance Summary

=== Period Totals ===

Start-End: 2024-09-01 → 2025-10-20

Portfolio Return: 0.225710

Benchmark (S&P500) Return: 0.260799

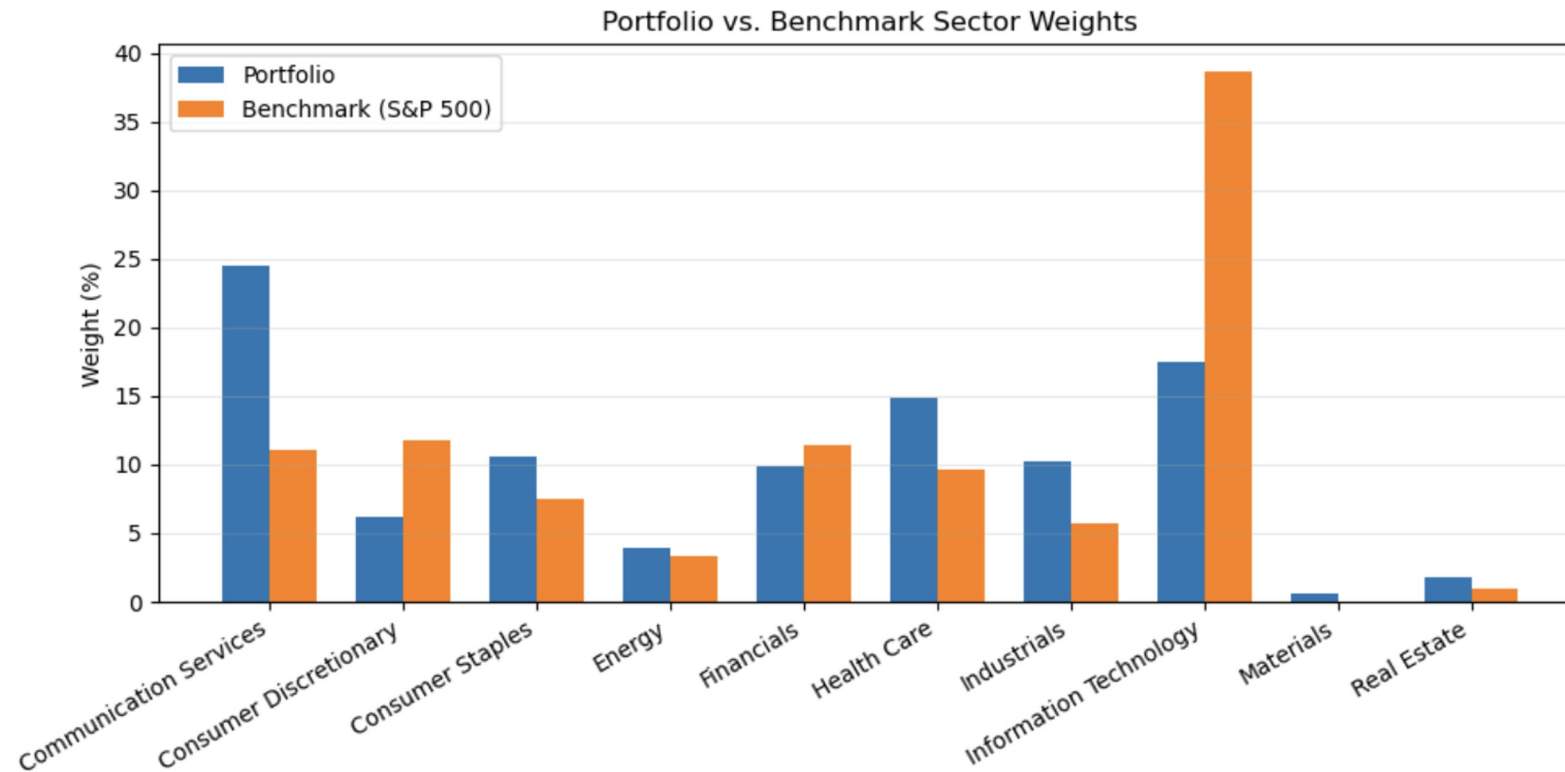
Active Return: -0.035089

RB (bench total): 0.260799

The portfolio underperformed the S&P 500 by 8.1% over the period. Attribution analysis identifies Technology underweighting and weak stock selection as primary reasons.



Benchmark & Portfolio Composition

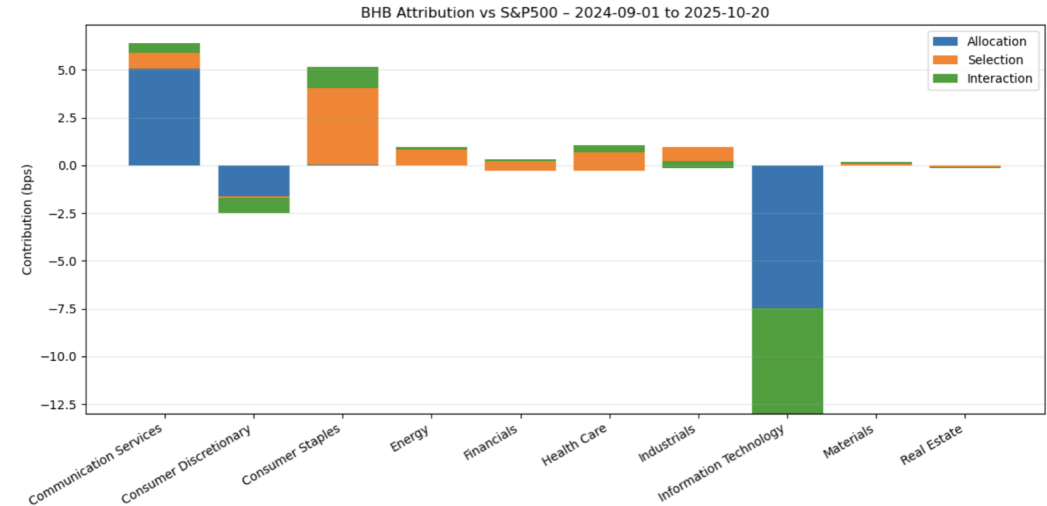
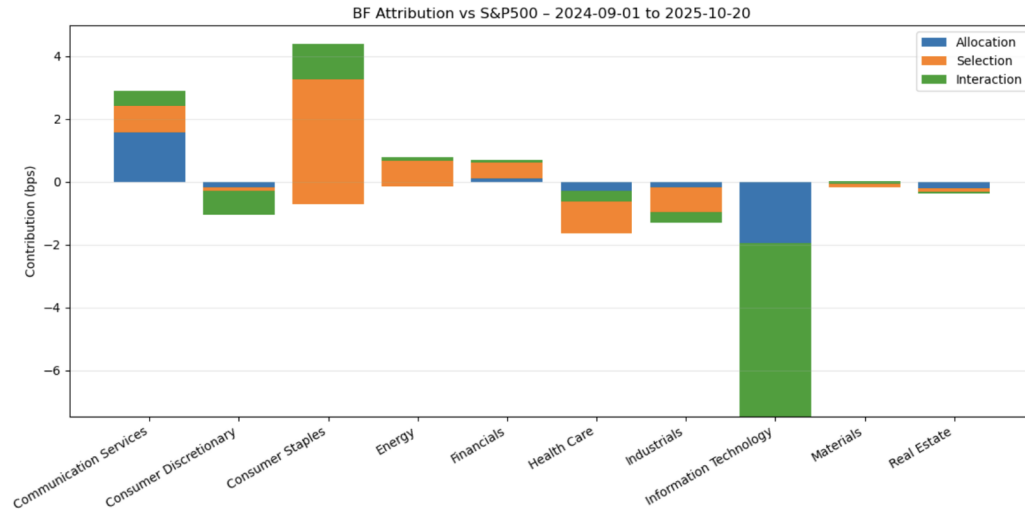


The S&P 500 is heavily concentrated in Information Technology (~28%) and Health Care (~13%).

The portfolio was underweight Technology (15%) and overweight Consumer Staples (12%), influencing performance sensitivity.



Attribution Chart



Sector	Contribution	Key Driver
Information Technology	-6.1 bps	Underweight and underperformance vs VGT
Consumer Staples	+4.4 bps	Overweight during strong performance
Communication Services	+2.9 bps	META outperformance vs XLC
Industrials	-1.3 bps	Stock-specific lag in HII, MMM
Health Care	-0.8 bps	Flat vs XLV
Energy	+0.7 bps	Overweight LNG added value



Table

Sector	Portfolio Weight (%)	Benchmark Weight (%)	Portfolio Return (%)	Benchmark Return (%)	Allocation (bps)	Selection (bps)	Interaction (bps)	Total (bps)
Consumer Staples	10.53	7.55	39.78	2.1	-71.48	396.85	112.33	437.71
Communication Services	24.52	11.08	41.17	37.69	156.05	85.28	46.73	288.05
Energy	3.95	3.31	22.12	1.5	-15.63	81.38	13.11	78.87
Financials	9.88	11.36	24.5	18.59	11.13	58.38	-8.78	60.73
Materials	0.61	0	14.21	-1.25	-16.77	9.48	9.48	2.2
Consumer Discretionary	6.22	11.71	15.4	29.45	-18.52	-87.36	77.23	-28.65
Health Care	14.81	9.63	0.99	-5.84	-165.2	101.12	35.35	-28.73
Real Estate	1.8	0.93	-4.49	1.2	-21.65	-10.25	-4.95	-36.84
Industrials	10.2	5.74	14.26	21.81	-19.09	-76.97	-33.71	-129.78
Information Technology	17.48	38.68	13.88	39.9	-292.86	-454.8	551.4	-196.27



Conclusions and Takeaways

- Underweight in Tech hurt most – S&P Tech drove market returns, and we were 20+% underweight.
- Strong sector calls in Consumer Staples and Communication Services offset part of the drag.
- Stock selection inconsistency – great in some sectors, poor in others (especially Health Care).
- Portfolio not benchmark-aligned – large deviations from S&P sector weights amplified performance differences.

Possible Next Steps

1. Adjust Tech exposure – bring it closer to benchmark weight to avoid missing index-driven upside.
2. Tighten stock selection process in Health Care and Discretionary sectors.
3. Maintain winners in Consumer Staples and Communication Services.
4. Move toward “benchmark-aware” weighting to balance tactical tilts with diversification.
5. Continue attribution tracking quarterly to identify alpha consistency over time.



QUESTIONS?

