ACG | ASSET CONSULTING GROUP

FPPTA

Establishing the Investment Portfolio

September 29, 2026

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Establishing the Investment Portfolio

Define and Document Goals and Objectives

Determine Optimal Portfolio Mix

Evaluate/Select Managers and Strategies

Implement Portfolio

Provide Ongoing Oversight, Education and Communication

Keys to an Effective Investment Policy Statement



Definitions of Risk

Risk can mean different things to different investors. A critical step in the portfolio management process is defining risk and developing a budget for how and where available risk can be "spent."

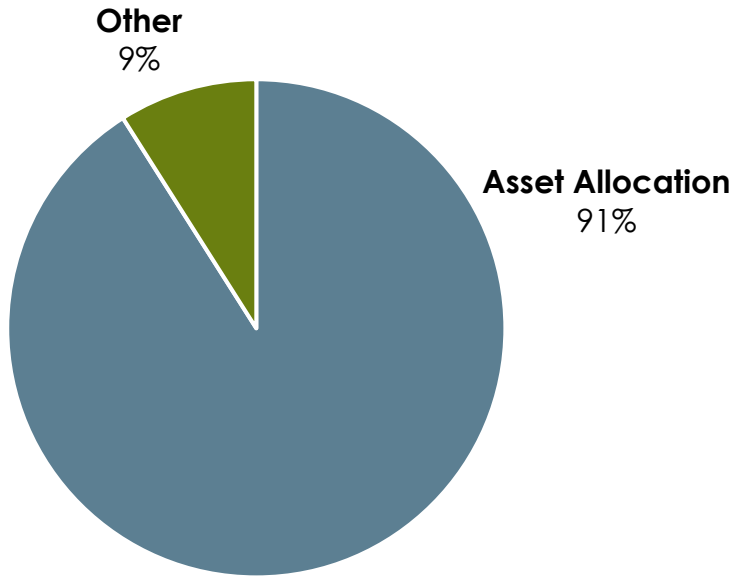
Definitions of Risk – Quantifying and Allocating a Risk Allowance

Actuarial Rate of Return	**Purchasing Power Risk**	**Standard Deviation**	**Principal Risk**
Achieving actuarial rate of return over time	Not keeping pace with inflation	Experiencing volatile returns	Losing Money
Liquidity Risk	**Transparency Risk**	**Benchmark Risk**	**Peer Risk**
Having insufficient liquidity	Not knowing true portfolio exposures	Underperforming a designated benchmark/ return hurdle	Underperforming peers

Asset Allocation

Several studies have concluded that **approximately 90% of an investment portfolio's return (and risk) is due to asset allocation,** and the remaining return is generated by stock selection.

Components of Portfolio Return Variability [1]



Asset allocation is the **process of selecting investment options (e.g. bonds, stocks, real assets) to be included in a portfolio and determining what percentage of the total portfolio to invest in each option**.

[1] Roger G. Ibbotson and Paul D. Kaplan, "Does Asset Allocation Explain 40, 90, or 100 Percent of Performance," *Financial Analysts Journal*, January-February 2000, pp.26-33

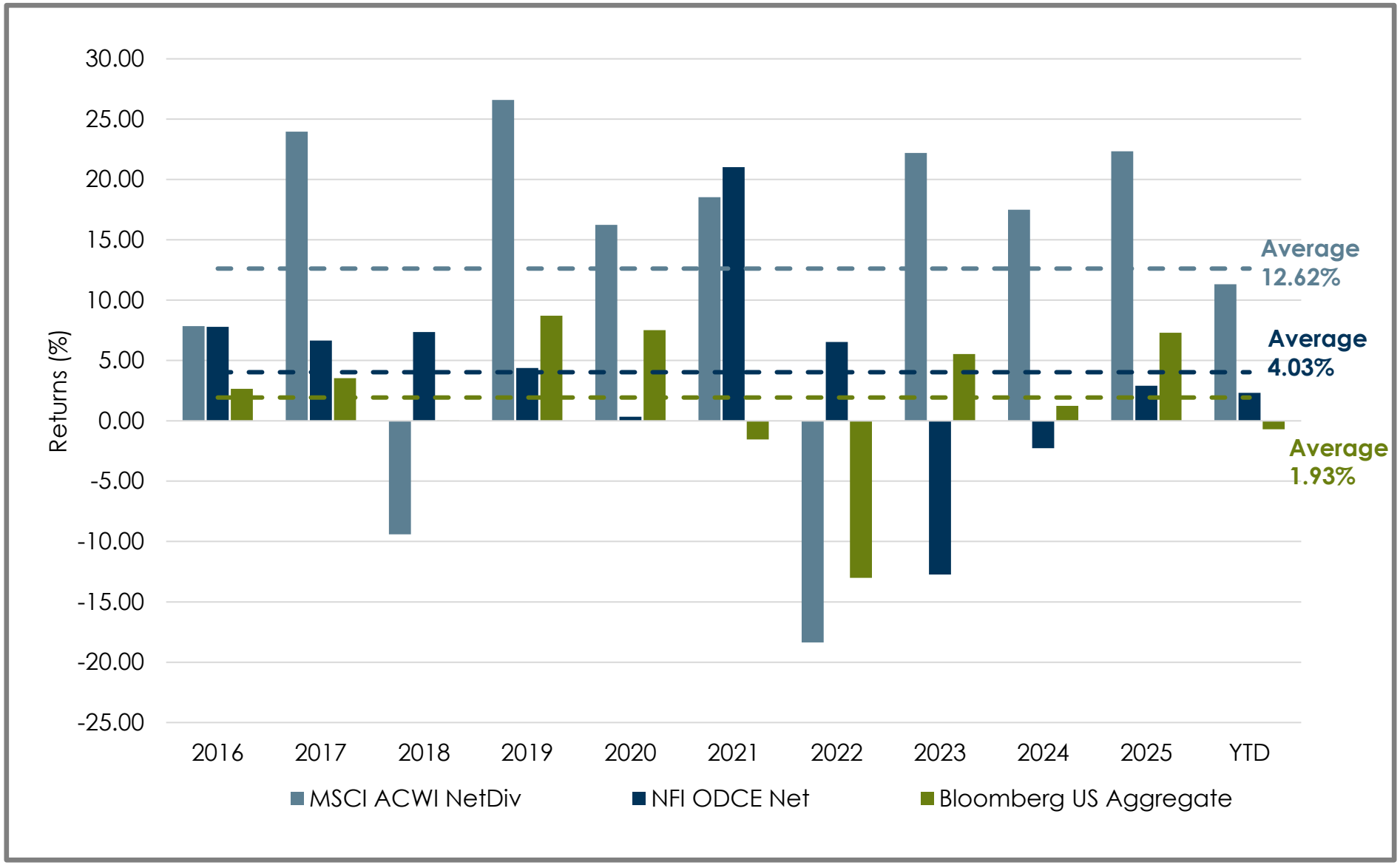
Broad Asset Allocation

Objective: Determine the optimal allocation to broad asset classes

Broad Asset Classes:

- **Equity:** provides growth opportunities and preserves purchasing power of assets
- **Fixed Income:** provides income & preserves principal value of assets
- **Real Assets:** provides return enhancement and/or risk reduction

Calendar Year Returns



YTD data through July 31, 2026. NFI ODCE Net through June 30, 2026.

Sub-Asset Class Review

Objective: Define eligible sub-strategies, target allocation and ranges

Equity	Fixed Income	Real Assets
– Large Cap	– Cash	– Real Estate
– Mid Cap	– Core Fixed Income	– Timber
– Small Cap	– Core Plus	– Commodities
– Non-U.S. Developed	– High Yield	
– Emerging Markets	– Non-Dollar	
– Equity Long/Short	– Alternative Fixed	
– Private Equity		

Asset Allocation – Why Diversify?

Best Performing

2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
US Small Cap 21.31%	Emerging Markets 37.28%	Private Real Estate 7.36%	US Large Cap 31.49%	US Small Cap 19.96%	US Large Cap 28.71%	Commodities 16.09%	US Large Cap 26.29%	US Large Cap 25.02%	Emerging Markets 33.57%
High Yield Bonds 17.13%	Int'l Developed 25.03%	Cash 1.82%	US Mid Cap 30.54%	US Large Cap 18.40%	Commodities 27.11%	Private Real Estate 6.54%	Int'l Developed 18.24%	US Mid Cap 15.34%	Int'l Developed 31.22%
US Mid Cap 13.80%	US Large Cap 21.83%	Core Bonds 0.01%	US Small Cap 25.52%	Emerging Markets 18.31%	US Mid Cap 22.58%	Cash 1.52%	US Mid Cap 17.23%	Hedged Equity 11.87%	US Large Cap 17.88%
US Large Cap 11.96%	US Mid Cap 18.52%	FOF Absolute Return -0.88%	Int'l Developed 22.01%	Hedged Equity 17.90%	Private Real Estate 21.02%	FOF Absolute Return 0.08%	US Small Cap 16.93%	US Small Cap 11.54%	Hedged Equity 17.05%
Commodities 11.77%	US Small Cap 14.65%	High Yield Bonds -2.08%	Emerging Markets 18.42%	US Mid Cap 17.10%	US Small Cap 14.82%	Hedged Equity -10.13%	High Yield Bonds 13.44%	High Yield Bonds 8.19%	Commodities 15.77%
Emerging Markets 11.19%	Hedged Equity 13.29%	Non-US Bonds -2.15%	Emerging Market Bonds 15.04%	Non-US Bonds 10.11%	Hedged Equity 11.67%	High Yield Bonds -11.18%	Hedged Equity 11.36%	Emerging Markets 7.50%	Emerging Market Bonds 14.30%
Emerging Market Bonds 10.15%	Non-US Bonds 10.51%	Emerging Market Bonds -4.26%	High Yield Bonds 14.32%	Int'l Developed 7.82%	Int'l Developed 11.26%	Core Bonds -13.01%	Emerging Market Bonds 11.09%	Emerging Market Bonds 6.54%	US Small Cap 12.81%
Private Real Estate 7.79%	Emerging Market Bonds 10.26%	US Large Cap -4.38%	Hedged Equity 13.69%	Core Bonds 7.51%	FOF Absolute Return 7.63%	Int'l Developed -14.45%	Emerging Markets 9.83%	FOF Absolute Return 6.41%	US Mid Cap 10.60%
Hedged Equity 5.47%	High Yield Bonds 7.50%	Hedged Equity -7.14%	Core Bonds 8.72%	High Yield Bonds 7.05%	High Yield Bonds 5.26%	US Mid Cap -17.32%	Non-US Bonds 5.72%	Commodities 5.38%	Non-US Bonds 8.85%
Core Bonds 2.65%	Private Real Estate 6.66%	US Mid Cap -9.06%	Commodities 7.69%	FOF Absolute Return 6.46%	Cash 0.04%	Emerging Market Bonds -17.78%	Core Bonds 5.53%	Cash 5.32%	High Yield Bonds 8.62%
FOF Absolute Return 1.88%	FOF Absolute Return 4.12%	US Small Cap -11.01%	FOF Absolute Return 6.31%	Emerging Market Bonds 5.26%	Core Bonds -1.54%	US Large Cap -18.11%	FOF Absolute Return 5.48%	Int'l Developed 3.82%	FOF Absolute Return 8.14%
Non-US Bonds 1.49%	Core Bonds 3.54%	Commodities -11.25%	Non-US Bonds 5.09%	Cash 0.54%	Emerging Market Bonds -1.80%	Non-US Bonds -18.70%	Cash 5.14%	Core Bonds 1.25%	Core Bonds 7.30%
Int'l Developed 1.00%	Commodities 1.70%	Int'l Developed -13.79%	Private Real Estate 4.39%	Private Real Estate 0.35%	Emerging Markets -2.54%	Emerging Markets -20.09%	Commodities -7.91%	Private Real Estate -2.27%	Cash 4.29%
Cash 0.26%	Cash 0.82%	Emerging Markets -14.57%	Cash 2.21%	Commodities -3.12%	Non-US Bonds -7.05%	US Small Cap -20.44%	Private Real Estate -12.73%	Non-US Bonds -4.22%	Private Real Estate 2.89%

Worst Performing

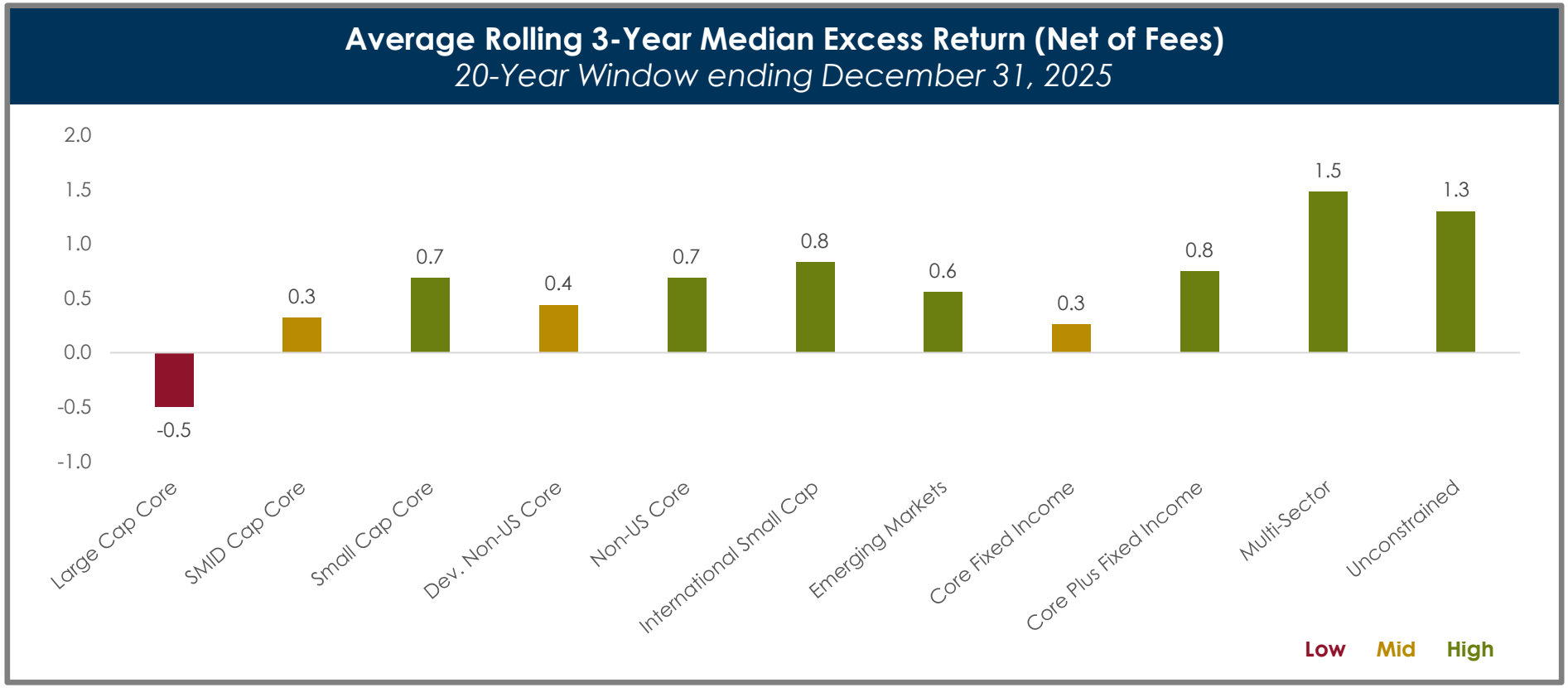
Manager Selection and Implementation

Objective: Determine the appropriate implementation

Investment Manager Considerations

- Active vs Passive
- Bottom-up vs Top-down
- Fundamental vs quantitative, etc.

Investment Manager Value Add

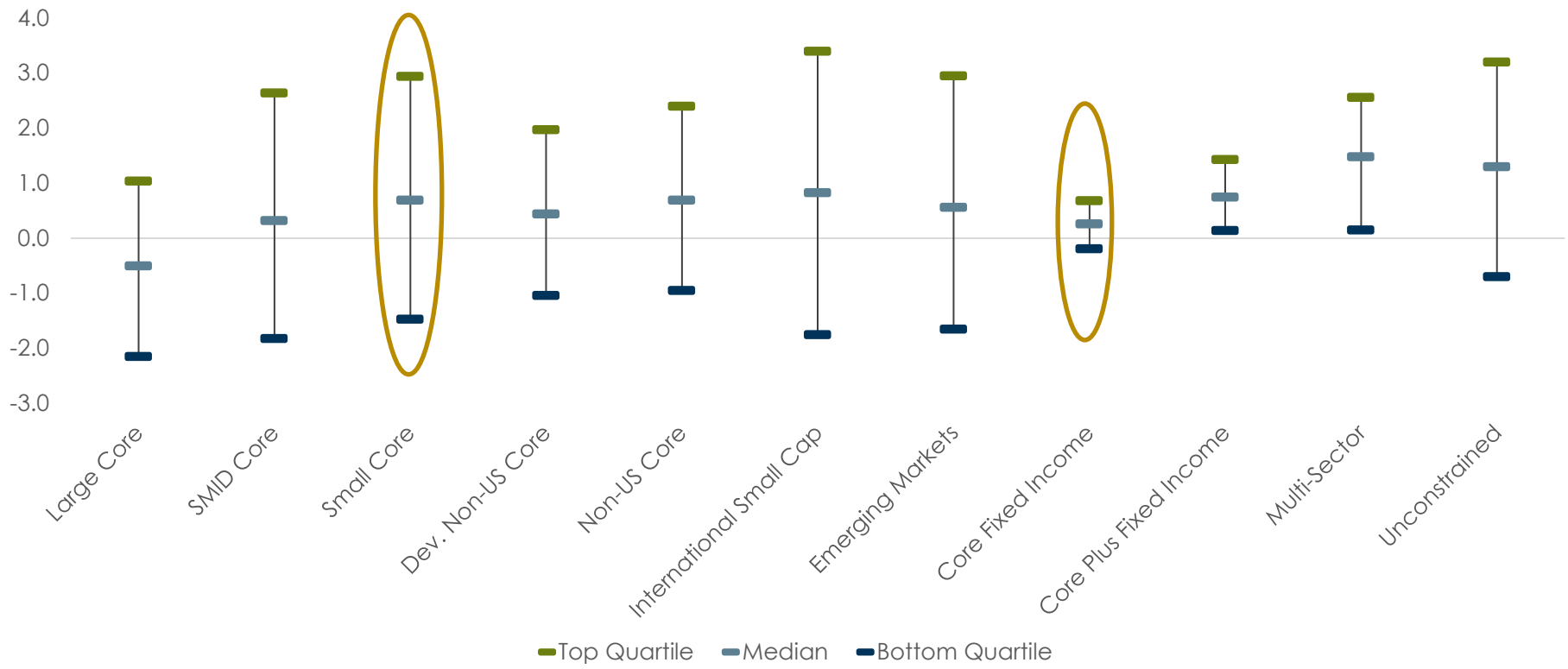


Excess Return is calculated as the average of the peer group median's rolling three-year excess return over the most recent 20-year window.

- The chart above illustrates the average, net of fees, excess return of active managers over rolling three-year periods.
- This analysis encompasses a 20-year window of quarterly observations and includes inactive strategies to minimize survivorship bias.
- **Key Takeaway: each asset class has a unique opportunity set, it is more difficult for active managers to add value in efficient asset classes**.

Investment Manager Value Add

Rolling 3-Year Manager Dispersion (Net of Fees)
20-Year Window ending December 31, 2025



Excess Return is calculated as the average of the peer group's median, top-, and bottom-quartile average excess returns over the most recent 20-year window.

- The dispersion of returns amongst the top, median, and bottom quartile manager is unique to each asset class.
- The goal is to identify the breadth of the asset class opportunity set.
- **Key Takeaway: a wide dispersion of results and positive skew suggest a higher opportunity for value add and manager selection.**

Statistical Measures Used to Evaluate Performance

- ***Standard Deviation*** – A measure of the portfolio's volatility; a high standard deviation relative to the benchmark indicates higher volatility.

- ***Correlation*** – The degree to which two securities or asset classes move in relation to each other. Correlation coefficients range between -1.0 and 1.0.

- ***Sharpe Ratio*** – A measure of return per unit of risk (i.e., what is the compensation for the risk you've assumed?)
  - Sharpe ratios are a relative measure; a Sharpe ratio is only meaningful when it is compared to another Sharpe ratio.

The Effect of Volatility on Compounded Returns

Standard Deviation – **A measure of the portfolio's volatility; a high standard deviation relative to the benchmark indicates higher volatility.**

- The two investments below have the **same average return** for any single year.

Period	Investment A Return	Investment B Return
Year 1	25%	50%
Year 2	25%	-25%
Year 3	25%	50%
Average Return	**25%**	**25%**
Standard Deviation	**0.0%**	**43.3%**

- Over a multi-year period, the two investments would be expected to **deliver different annualized compound rates of return due to their different levels of volatility** (standard deviations).

Period	Investment A Return	Growth of $100	Investment B Return	Growth of $100
Year 1	25%	125.0	50%	150.0
Year 2	25%	156.3	-25%	112.5
Year 3	25%	195.3	50%	168.8
Compounded Total Return		95.3%		68.8%
Annualized Return		**25.0%**		**19.1%**

Returns Are Not the Only Consideration

Determining the appropriate asset allocation requires evaluating return, volatility and correlation.

	Long-Term Average Annual Return[1]	Volatility[2]	Core Bonds	US Large Cap Equity	Core Real Estate
Core Bonds	5.3%	4.9%	1	-0.16	-0.24
US Large Cap Equity	10.0%	17.7%		1	0.07
Core Real Estate	9.2%	11.5%			1



- **Correlation of -1:** perfect negative correlation has greatest diversification benefits.
- **Correlation of 0:** no correlation has some diversification benefits.
- **Correlation of 1**: perfect positive correlation has no diversification benefits.

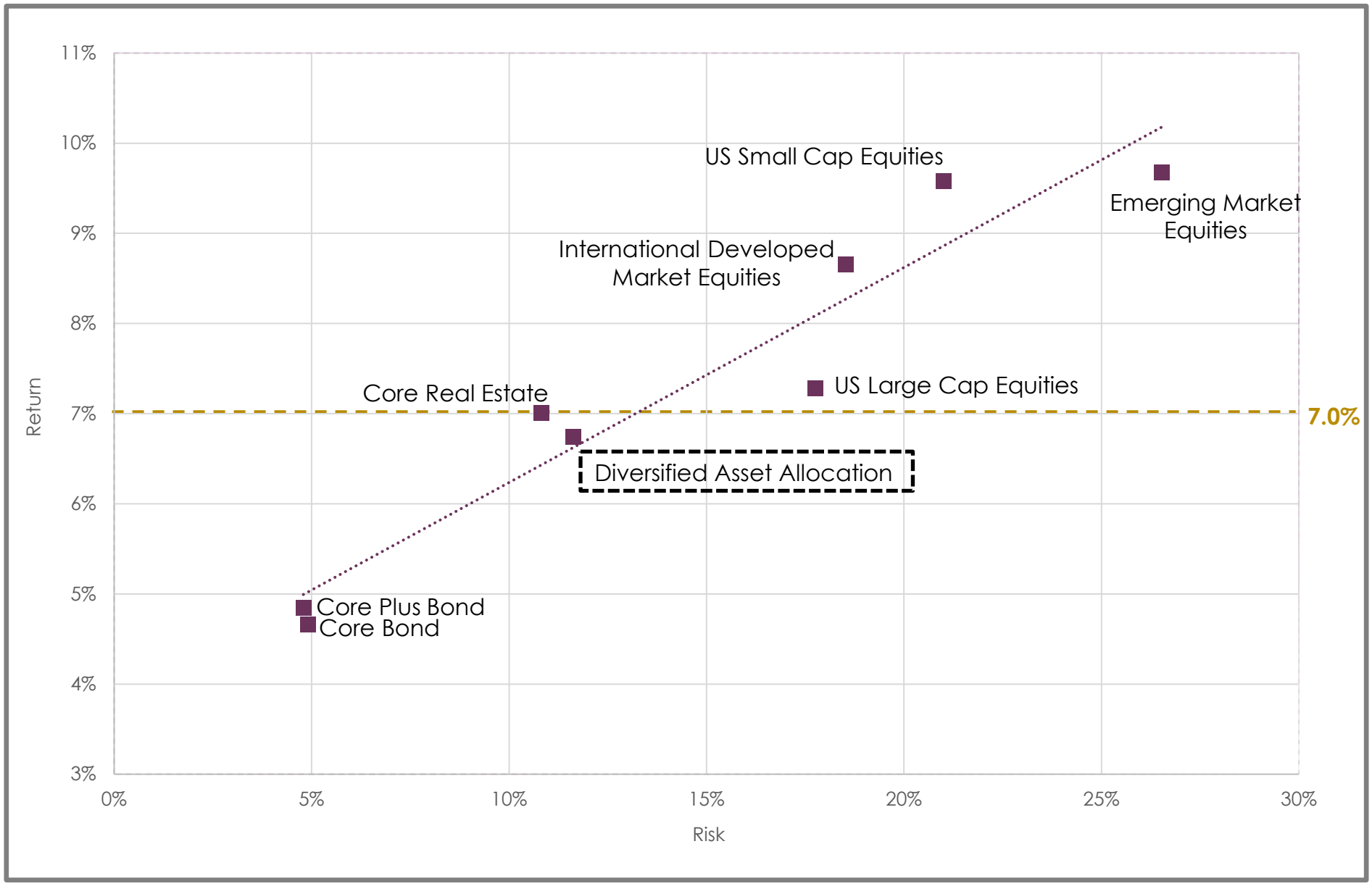
[1] Intermediate-Term Average Annual Return is the arithmetic average return assumption for any given year derived from fundamental return drivers such as yields, inflation, and growth, with potential reversion adjustments for outlier valuations.

[2] General measure of the average variability around the mean.

Portfolio Mixes

	Liquidity	All Fixed	All Equity	Equity & Fixed	Diversified
Total		**100.00**	**100.00**	**100.00**	**100.00**
Fixed Income		**100.00**	**0.00**	**30.00**	**25.00**
Core Bonds	1	50.00	0.00	15.00	12.50
Core Plus	1	50.00	0.00	15.00	12.50
Equity		**0.00**	**100.00**	**70.00**	**65.00**
US Large Cap Equity	1	0.00	48.00	33.00	31.00
US Small Cap Equity	1	0.00	12.00	9.00	8.00
International Developed Equity	1	0.00	32.000	23.00	21.00
Emerging Market Equity	1	0.00	8.00	5.00	5.00
Real Assets		**0.00**	**0.00**	**0.00**	**10.00**
Core Real Estate	2	0.00	0.00	0.00	10.00
Simulated Portfolio Statistics					
10-Year Median Return		4.56 %	7.09 %	6.63 %	6.74 %
Standard Deviation		4.77 %	17.57 %	12.39 %	11.62 %
Sharpe Ratio		0.44	0.31	0.35	0.38
1st Percentile Return		-3.08 %	-37.94 %	-25.24 %	-23.07 %
Liquidity Breakdown					
1 - High Liquidity (weekly)		100.00 %	100.00 %	100.00 %	90.00 %
2 - Medium Liquidity (1-2 year lock-up)		0.00 %	0.00 %	0.00 %	10.00 %
3 - Illiquidity (5-10 year lock-up)		0.00 %	0.00 %	0.00 %	0.00 %
Weighted Average Liquidity		1.00	1.00	1.00	1.10

Risk and Return Expectations



Return Probabilities

The table below illustrates the probability of achieving annualized returns of 6.50 %, 7.00 %, and 7.50 % or greater over multiple time periods for each asset mix based on simulated returns. Simulated statistics reflect intermediate-term assumptions for the first 10 years.

	1 Year (%)				10 Year (%)			
Hurdle	All Fixed	All Equity	Equity & Fixed	Diversified	All Fixed	All Equity	Equity & Fixed	Diversified
6.50%	29.68	56.82	55.05	55.23	11.55	53.70	51.25	52.25
7.00%	26.52	55.71	53.43	53.67	7.05	50.55	46.75	47.15
7.50%	23.66	54.78	51.97	51.82	3.95	47.00	41.50	42.60

The table below illustrates the probability of returns falling below 0.00%, -5.00%, -10.00% and -20.00% during the worst single year within various time periods for each asset mix based on simulated returns. Simulated statistics reflect intermediate-term assumptions for the first 10 years.

	1 Year (%)				10 Year (%)			
Hurdle	All Fixed	All Equity	Equity & Fixed	Diversified	All Fixed	All Equity	Equity & Fixed	Diversified
0.00%	13.50	29.91	26.63	25.39	<1.00	13.10	5.95	4.65
-5.00%	<1.00	21.74	16.34	14.98	<1.00	2.65	<1.00	<1.00
-10.00%	<1.00	15.46	9.21	7.82	<1.00	<1.00	<1.00	<1.00
-20.00%	<1.00	6.61	2.31	1.77	<1.00	<1.00	<1.00	<1.00

Wrap Up

Going Forward: What to Focus On?

- Maintain realistic expectations
- Conduct periodic reviews of the portfolio's goals and objectives
- Revisit and confirm strategic asset allocation targets
- Maintain a long-term focus

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