Palm Beach Gardens Case Study - Income

Florida Public Pension Trustees Association

Asset Allocation of Stocks & Bonds

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Shaping the Future - Trustee by Trustee

Establishing Asset Allocation Guidelines

- INPUTS
  - ✓ Historical/Expected Returns for Each Asset Class
  - ✓ Historical/Expected Volatilities for Each Asset Class
  - ✓ Correlation of Returns Across Asset Classes
- OUTPUTS
  - ✓ Long-Term Policy Asset Allocation Mix
  - ✓ Range of Exposures around the Target or Policy Allocation
- Issue of Symmetry of Exposures Relative to Policy

Asset Classes

- Equities (Stocks)
  - ✓ Domestic Large-Capitalization Securities
  - ✓ Domestic Small-Capitalization Securities
  - ✓ International
- Fixed Income (Bonds)
  - ✓Domestic Long-Term Bonds
  - ✓Domestic Intermediate- and Short-Term Bonds
  - ✓International Bonds
- Cash
  - ✓ Domestic Long-Term Bonds
- Real Estate
- Alternative Investments
  - ✓ Hedge Funds
  - ✓ Private Equity
  - ✓ Venture Capital
  - ✓Private Debt

Asset Allocation: Stocks & Bonds

Annualized Rates of Return and Risk in Percent
Averages of Rolling 5- & 10- Year Periods 1900-2024
Five US Stock and US Bond Simulated Portfolios

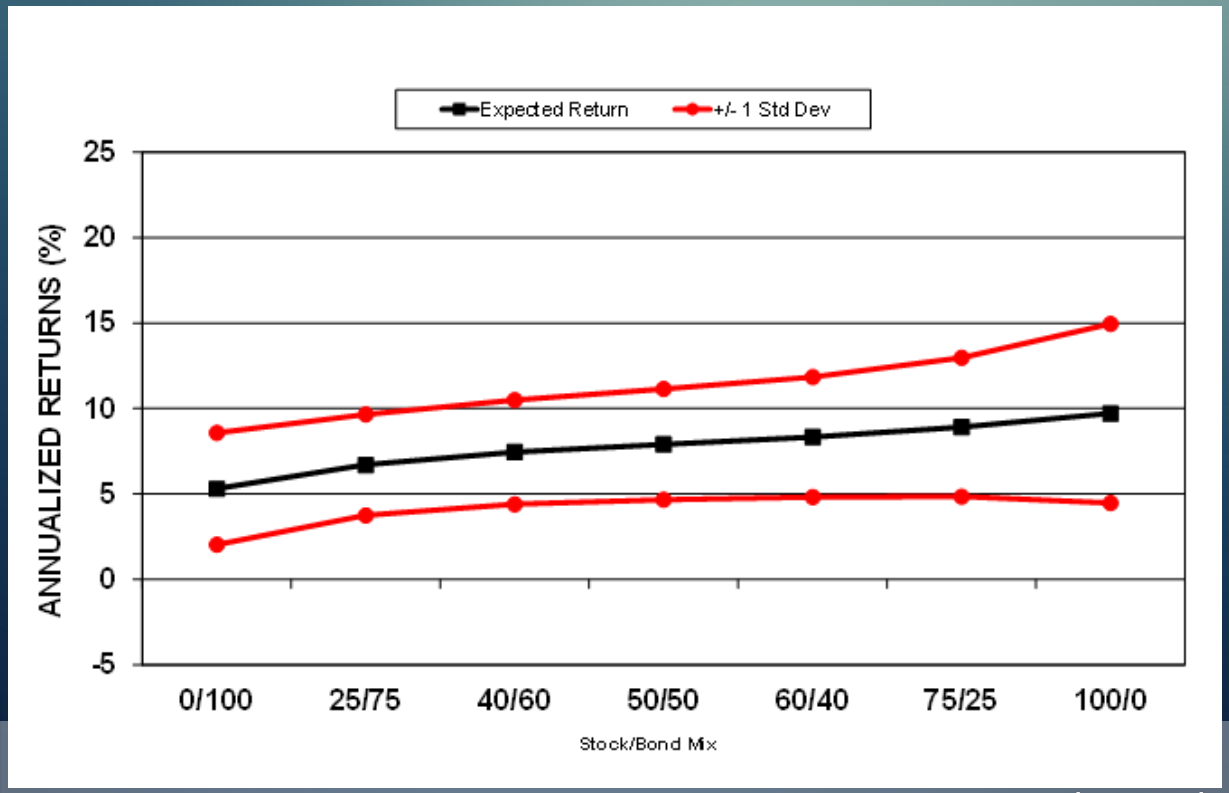
Simulated Portfolios * Stock/Bond	Five-Year Annualized Return	Five-Year Annualized Risk	Proportion of Return and Risk Compared to the Bond Index: Return	Proportion of Return and Risk Compared to the Bond Index: Risk	Proportion of Return and Risk Compared to the Stock Index: Return	Proportion of Return and Risk Compared to the Stock Index: Risk
100%/0%	9.9	7.9	190	203	--	--
75/25	9.0	6.1	173	156	91	77
60/40	8.4	5.1	160	131	84	65
50/50	7.9	4.6	152	118	80	58
40/60	7.4	4.2	142	106	75	52
25/75	6.7	3.8	127	96	67	47
0/100	5.2	3.9	--	--	53	49

Simulated Portfolios * Stock/Bond	Ten-Year Annualized Return	Ten-Year Annualized Risk	Proportion of Return and Risk Compared to the Bond Index: Return	Proportion of Return and Risk Compared to the Bond Index: Risk	Proportion of Return and Risk Compared to the Stock Index: Return	Proportion of Return and Risk Compared to the Stock Index: Risk
100%/0%	9.7	5.2	183	160	--	--
75/25	8.9	4.1	168	124	92	77
60/40	8.3	3.5	157	107	86	67
50/50	7.9	3.2	149	99	81	62
40/60	7.4	3.1	140	93	77	58
25/75	6.7	3.0	126	90	69	56
0/100	5.3	3.3	--	--	55	62

* Invested proportionally in US stocks and US bonds, rebalanced annually.

SOURCE: LSEG/RUSSELL & TWIN CAPITAL

Asset Allocation: Stocks & Bonds
Range of Returns for Various Mixes (10-Year Horizon)



For a given Stock/Bond asset mix, you should expect in 2 out of every 3 ten-year periods, your portfolio to earn a return between the best case in red and the worst case in red.

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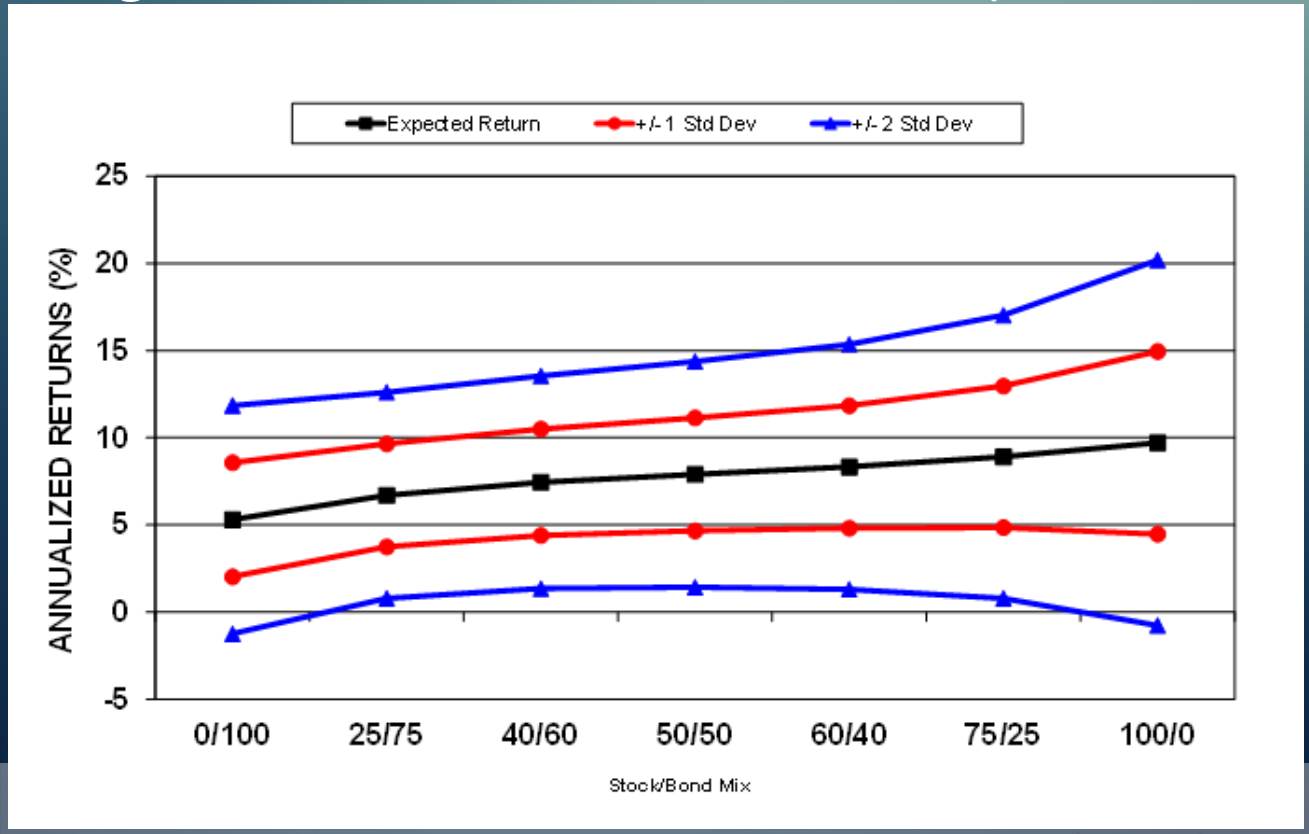
Asset Allocation: Stocks & Bonds
Range of Returns for Various Mixes (10-Year Horizon)



For a given Stock/Bond asset mix, you should expect in 19 out of every 20 ten-year periods, your portfolio to earn a return between the best case in blue and the worst case in blue.

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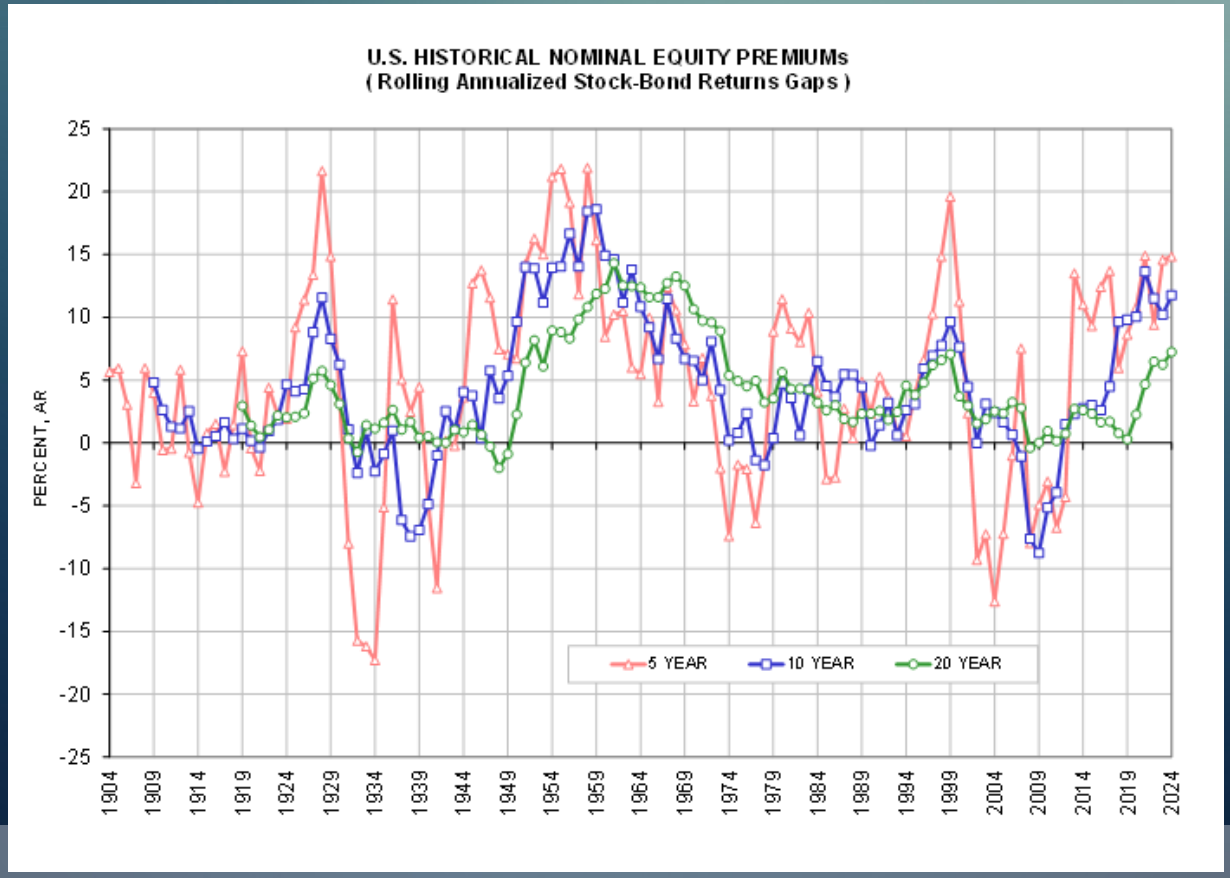
Stocks Beat Bonds For Most Long-Term (20-year) Periods



While there are many 5- and some 10-year periods when Bonds beat Stocks, for most 20-year periods, Stocks have outpaced Bonds.

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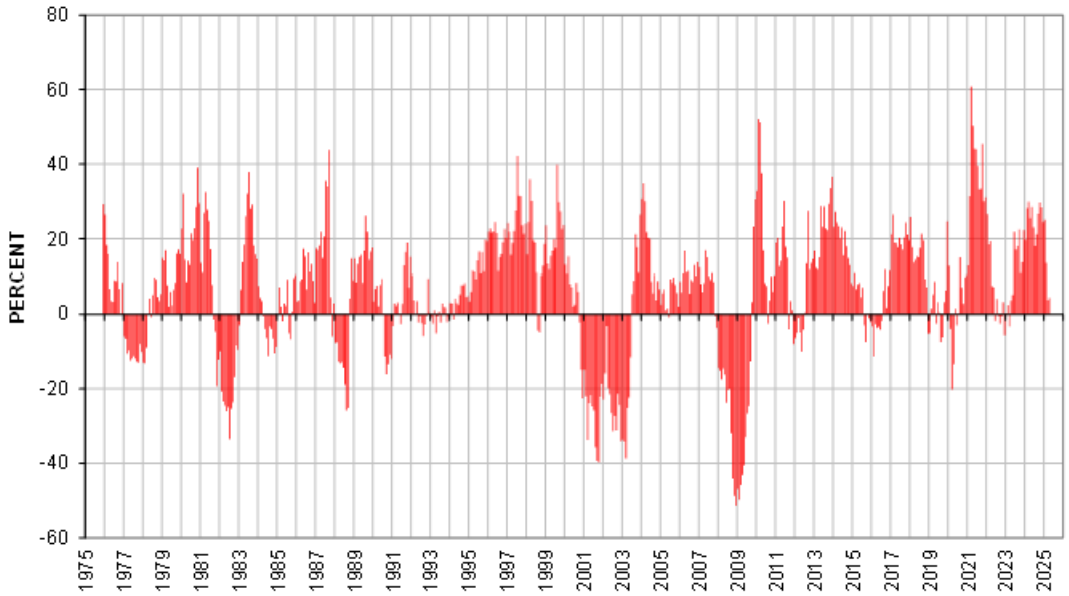
Shaping the Future - Trustee by Trustee

Bonds Can Outperform Stocks
Over Shorter-term (12-month Rolling) Periods



While the 20-year Equity Premium has ranged from -2% to +15% (annualized), the rolling 12-month spread between stock and bond returns has ranged from a -51% to +52%.

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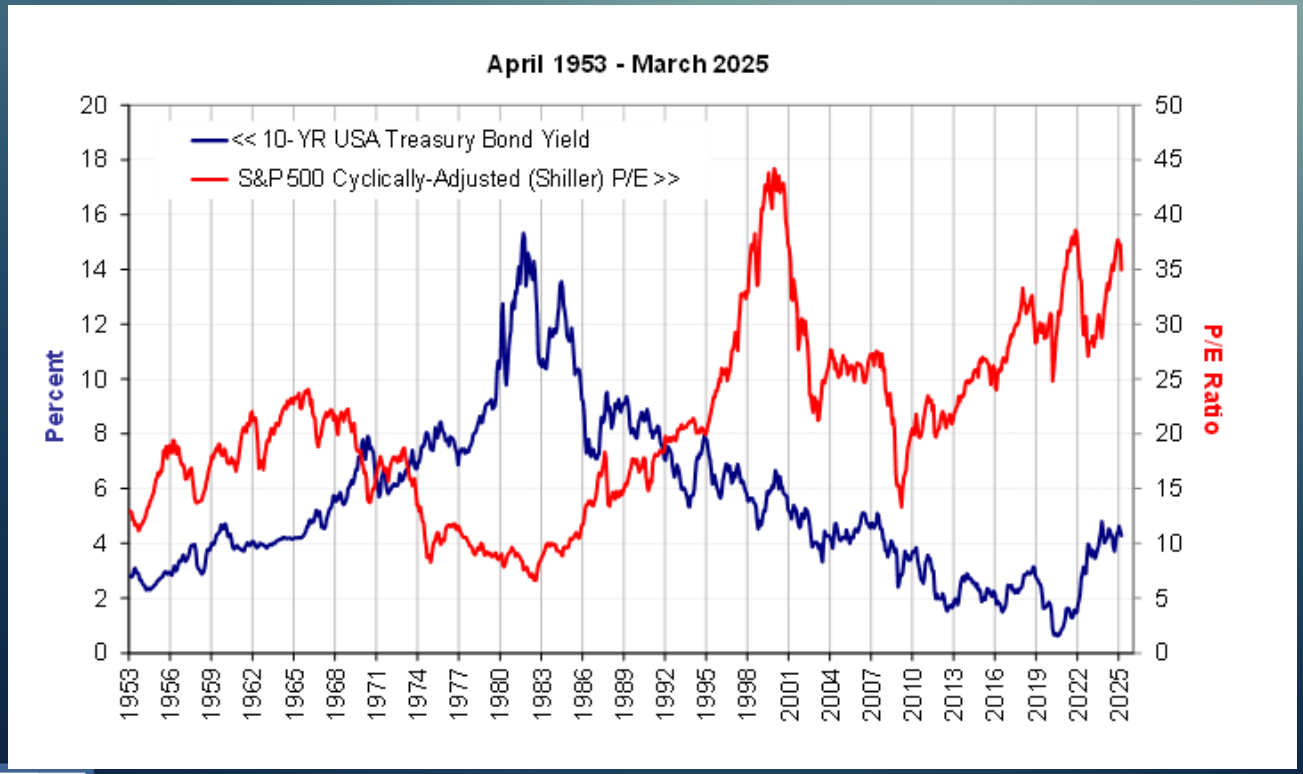
Equity Valuations Stretched as Bond Yields Rise

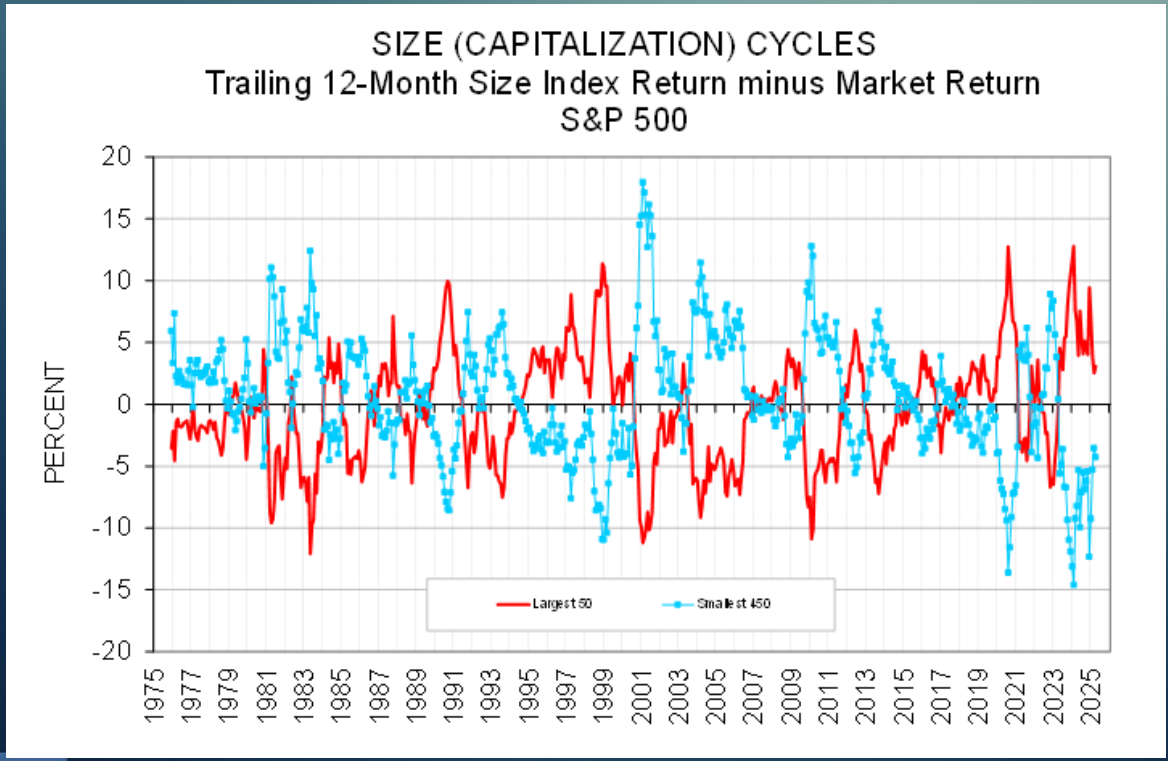


While not at the highest level, the P/E ratio on the S&P 500 is close to its all-time high even though interest rates have risen over the past few years.

Sub-Asset Classes

- Equities
  - —Large-Cap vs. Mid/Small-Cap
  - —Value vs. Growth
  - —Low Volatility vs. High Volatility
  - —International Developed vs. Emerging Markets
- Fixed Income
  - —Government vs. Corporate
  - —Investment Grade vs. High Yield
  - —Distressed
- Real Estate
  - —Public (REIT) vs. Private
  - —Commercial vs. Residential
  - —Diversified vs. Specialized

Another Year of Mega-Cap Leadership?



In 2024, the largest 50 S&P 500 stocks beat the remaining 453 stocks by 21.7%. In 2023, the largest 50 won by 22.5%. The 12-month gap narrowed to 7% in April 2025.

Capitalization Group Performance

S&P 500® TOTAL RETURNS (%) BY CAPITALIZATION DECILE

		TOP 50				<< DECILES >>					BOTTOM 50
YEAR	S&P 500®	1	2	3	4	5	6	7	8	9	10
2000	-9.1	-18.7	-5.0	8.4	19.5	16.4	18.0	17.7	21.0	19.2	1.1
2001	-11.9	-14.5	-15.6	-21.6	-11.3	-0.2	2.1	8.7	18.7	29.5	30.4
2002	-22.1	-22.5	-26.2	-22.6	-20.6	-19.1	-10.8	-12.1	-20.9	-23.0	-6.3
2003	28.7	22.9	33.2	29.6	33.9	38.5	39.3	34.0	46.8	61.3	59.8
2004	10.9	5.7	13.3	12.2	22.6	22.4	24.1	17.1	16.5	17.6	18.8
2005	4.9	-0.3	8.5	9.2	10.0	15.1	10.7	18.5	9.3	4.7	2.7
2006	15.8	17.4	10.0	14.4	14.4	21.6	16.7	11.0	15.2	24.1	15.0
2007	5.5	6.4	7.8	9.6	2.2	7.5	2.9	2.2	-3.8	-9.2	-11.9
2008	-37.0	-32.7	-43.0	-37.2	-35.6	-44.0	-37.7	-38.6	-45.9	-42.8	-45.4
2009	26.5	18.6	27.5	29.3	39.3	37.1	41.8	36.9	43.2	88.6	90.2
2010	15.1	10.5	16.3	17.4	15.7	24.0	27.2	27.7	28.0	22.5	28.8
2011	2.1	4.0	-2.3	6.5	0.7	-3.0	1.8	-1.8	-1.4	3.7	-4.7
2012	16.0	15.4	17.3	16.8	13.9	20.2	17.1	17.1	15.7	16.2	26.4
2013	32.4	28.8	38.3	35.1	34.5	33.4	35.0	39.1	31.7	38.6	45.6
2014	13.7	11.8	15.0	12.5	19.5	19.2	14.7	12.3	12.6	14.0	9.9
2015	1.4	5.1	-0.3	0.4	-2.0	-1.7	-6.1	-6.1	-1.3	1.5	-10.5
2016	12.0	10.1	9.7	12.4	14.6	15.4	17.0	14.8	14.3	17.3	23.0
2017	21.8	23.2	24.3	19.5	24.5	15.6	24.2	11.6	18.2	23.4	4.6
2018	-4.4	-1.6	-7.5	-2.7	-6.4	-11.6	-10.1	-8.5	-10.0	-10.1	-6.5
2019	31.5	32.4	30.4	29.3	33.1	30.6	35.5	32.4	28.7	24.8	23.2
2020	18.4	25.5	13.4	10.7	7.9	12.6	18.3	5.8	23.2	11.5	2.3
2021	28.7	29.6	25.1	22.1	25.9	32.1	26.9	32.7	35.5	26.8	32.3
2022	-18.1	-24.9	-10.1	-8.5	-7.7	-11.2	-4.4	-18.2	-12.9	-6.0	-15.9
2023	26.3	37.2	19.7	13.0	13.6	16.8	10.9	4.3	11.6	16.6	13.1
2024	25.0	34.7	15.0	16.8	13.3	10.4	13.6	9.3	19.4	4.6	5.3
2025 YTD	-4.3	-7.8	1.9	2.7	0.8	1.5	-2.7	-2.6	0.4	-2.9	-3.1

Annualized Average	S&P 500®	Dec1	Dec2	Dec3	Dec4	Dec5	Dec6	Dec7	Dec8	Dec9	Dec10
2000-2024 (25 yrs)	7.7	7.1	6.7	7.8	9.5	10.0	11.6	9.1	10.4	12.2	10.2

>Worst Performance Decile
>Best Performance Decile

*2025 YTD through 3/31/25

The largest 50 S&P 500 stocks have been the best performing capitalization group in four of the most recent seven calendar years.

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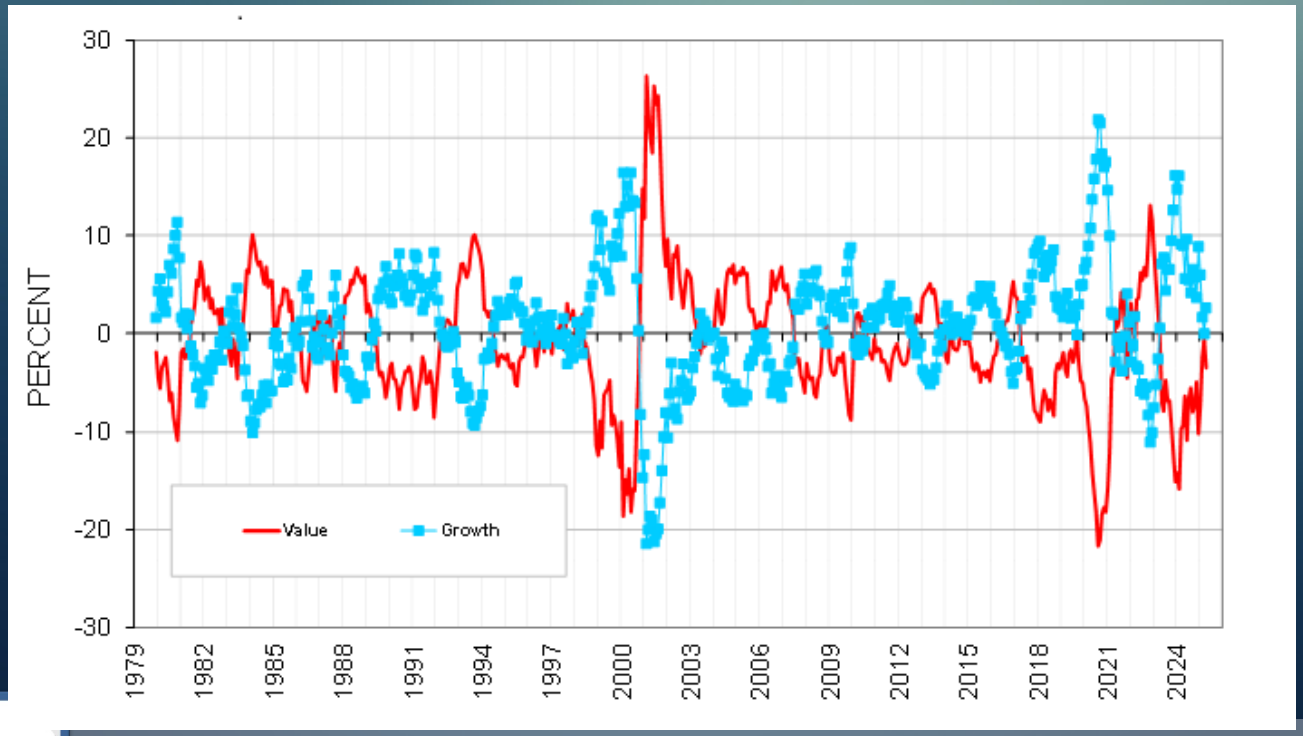
Style Cycles – Value vs. Growth

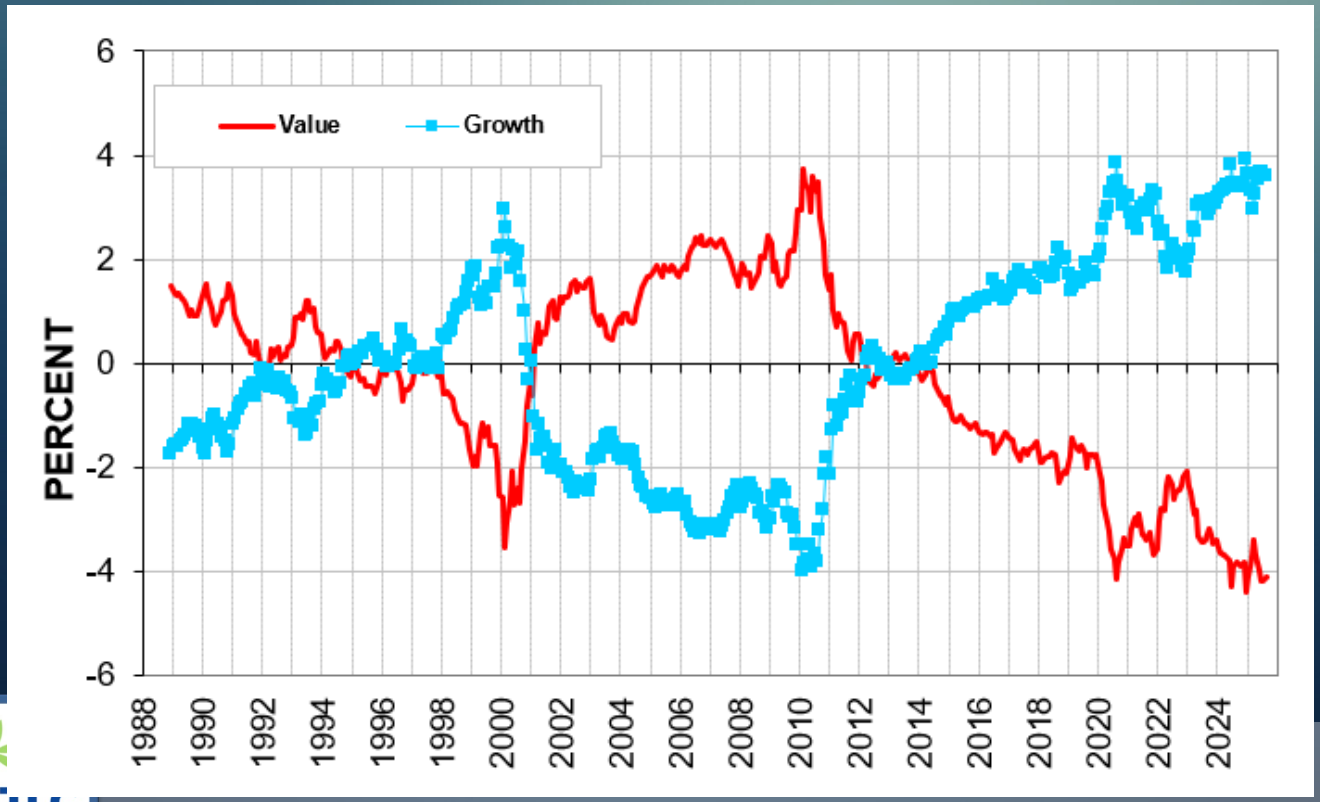
Trailing 12-Month Style Index Return Minus Market Return
Russell 1000



Growth stocks outpaced Value stocks significantly (31.2%) in 2023. The annual gap in 2024 was 19.0% in favor of Growth. The 12-month cumulative gap continued to narrow in 2025.

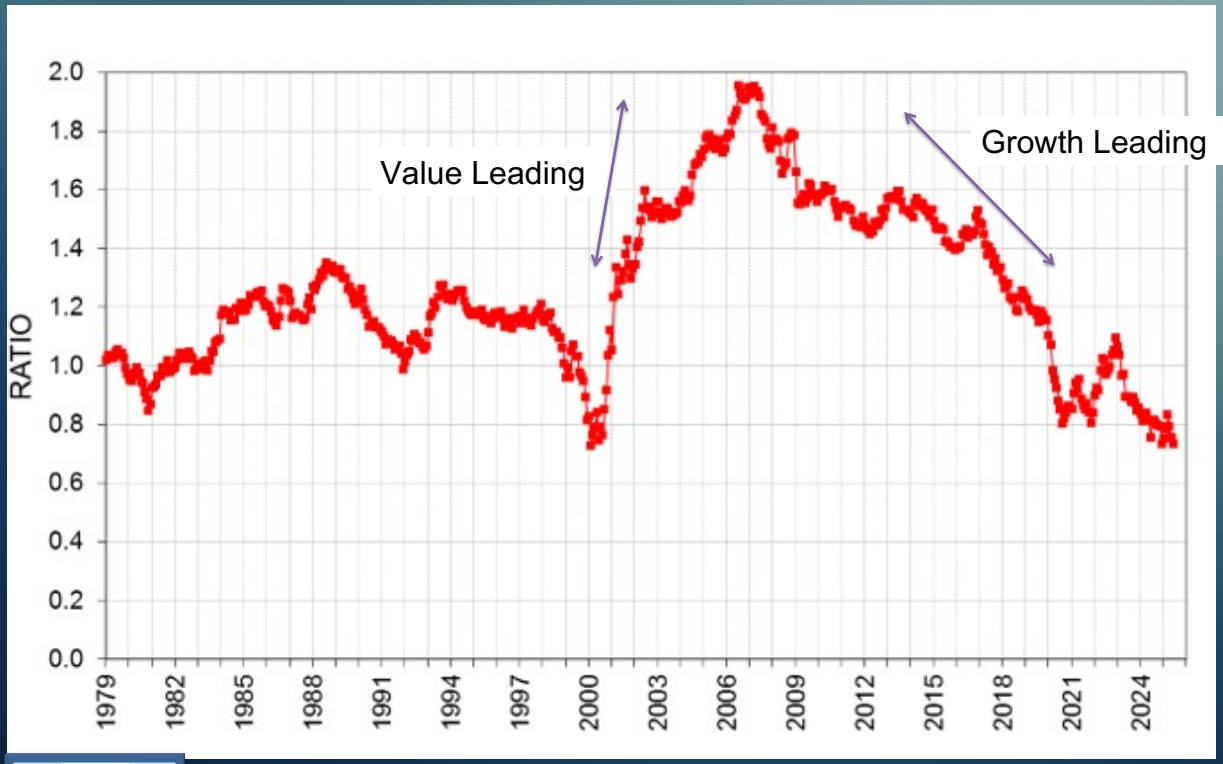
Style Cycles – Value vs. Growth

Trailing 10-Year Style Index Return Minus Market Return
Russell 1000



Growth stocks outpaced Value stocks significantly over the past 10 years. At the end of 2024, the 10-year gap in favor of Growth was at its highest value ever. Will this continue?

Russell 1000 Value/Growth Style Ratio Moves in Cycles

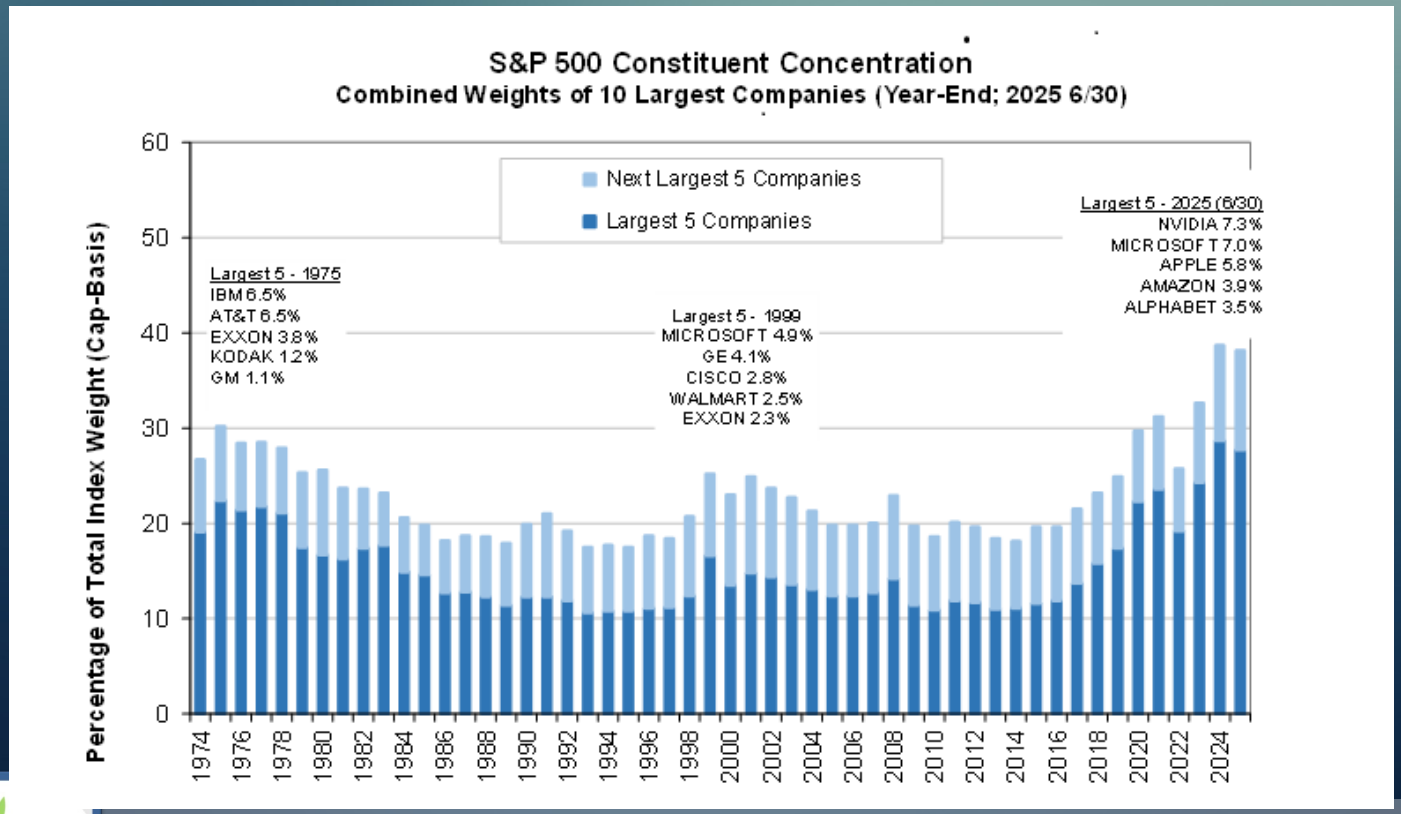


The current ratio of 0.7328 is the lowest since 0.7277 in February 2000. From March 2000 through July 2006, Value beat Growth by 15.5% per year. From January 2017 though July 2025, Growth beat Value by 10.2% per year.

Style Cycles Have Lengthened

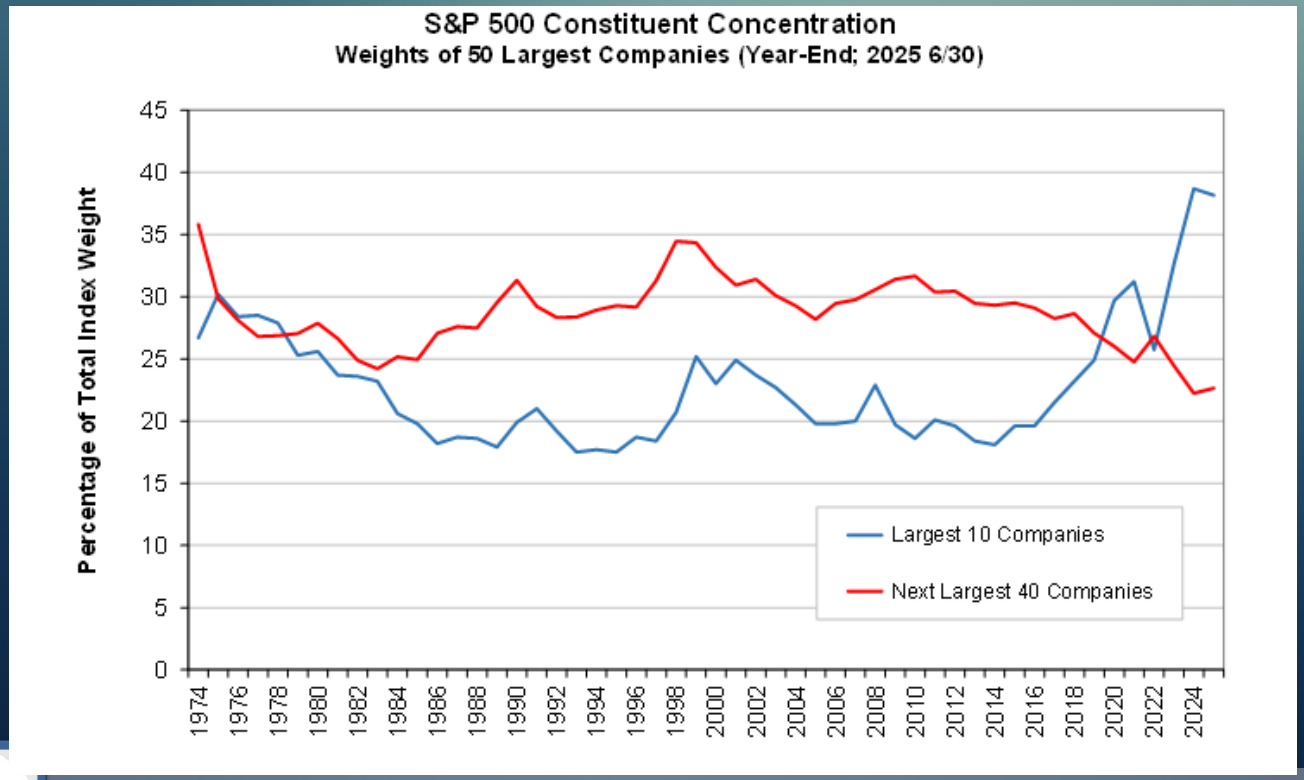
- In January 1979, the ratio between the Russell 1000 Value and Growth indices was 1.0
- Since 2000, style cycles have lengthened with Value winning big from March 2000 through July 2006 and the ratio between the two indices nearly doubled
- However, starting in 2007, Growth has generally led the market, driving the ratio to a historic low of 0.72
- With the ratio at its lowest level ever, investors may wonder:
  - ✓Are we nearing a style inflection point where Value regains leadership?
  - ✓Or will innovations like Artificial Intelligence continue to fuel Growth's outperformance?
  - ✓Put another way – could the ratio between the two indices fall further to 0.5, or begin reverting toward 1.0?

Market Leaders Shift Over Time



At the end of 2024, the collective weight (28.7%) of the largest 5 companies in the S&P 500 was the largest since 1974.

The Passive Index is the Most Concentrated Ever



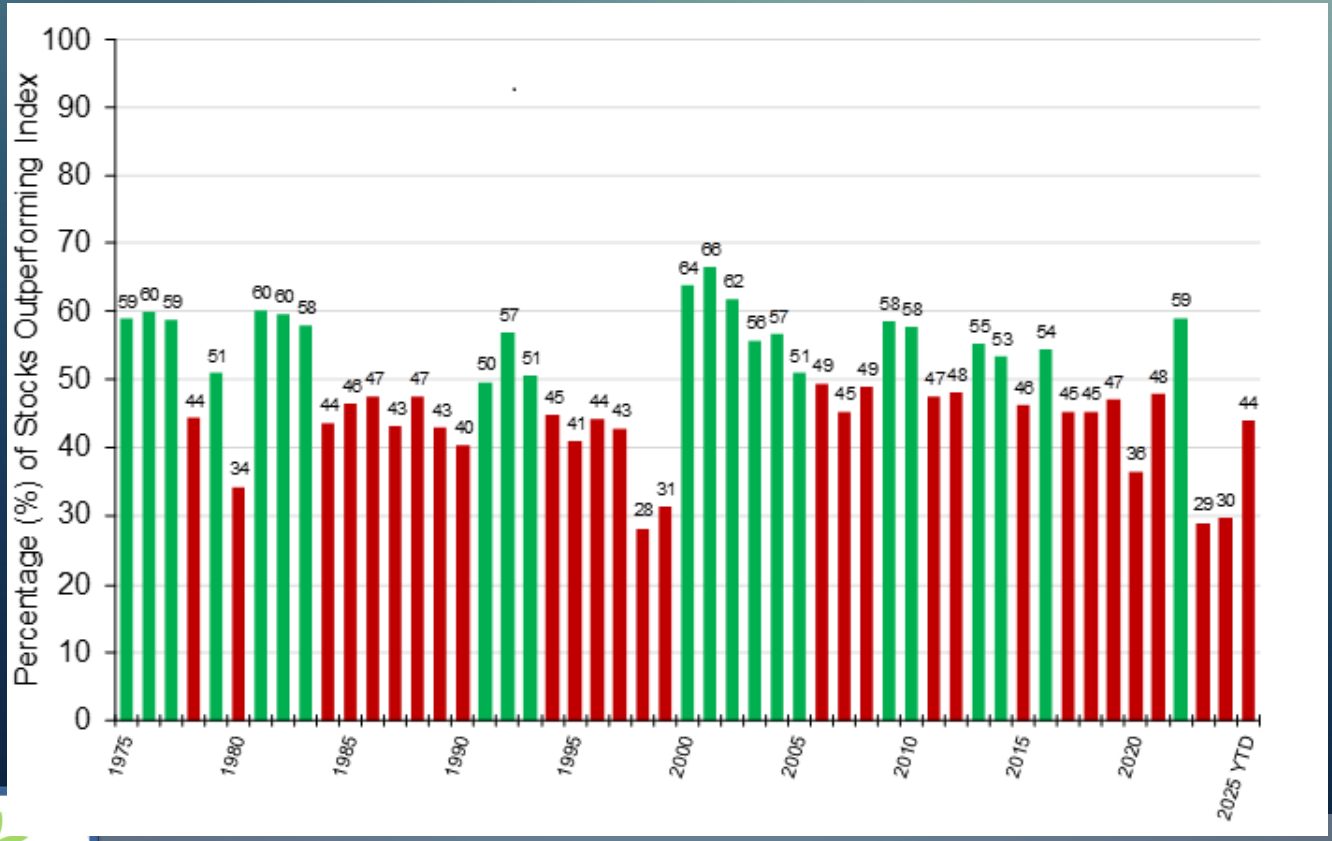
At year-end 2024, the 10 largest stocks in the S&P 500 index represented their largest weight (37%) while the next 40 largest constituted the lowest (23%) weight over the past 50 years.

Only One of Eleven S&P 500 Sectors Have Outperformed for the 10-years Ending August 2025

TOTAL RETURNS (WITH INCOME) % THROUGH AUGUST 2025						ANNUALIZED		
INDEX	Weight (09/23/2025)	PAST MONTH	PAST 3 MOS	YEAR TO DATE	PAST 12 MOS	PAST 36 MOS	PAST 60 MOS	PAST 120 MOS
SAP 500/GICS® SECTORS								
INFO TECH	34.6	0.3	15.9	14.0	22.5	31.4	20.2	24.2
FINANCIALS	13.6	3.1	6.4	12.6	19.9	20.0	18.8	13.2
CONS DISCRETIONARY	10.5	3.4	8.5	2.0	24.8	16.0	9.1	13.3
COMMUNIC SVC	10.4	3.6	13.8	17.9	34.3	30.7	14.9	13.1
HEALTH CARE	8.8	5.4	4.0	0.8	-11.1	5.1	6.6	8.8
INDUSTRIALS	8.3	0.0	6.7	16.1	17.3	19.8	16.2	13.4
CONS STAPLES	4.9	1.6	-2.7	5.5	3.0	8.1	8.5	9.2
ENERGY	2.9	3.6	11.8	7.5	2.1	7.7	25.7	7.5
UTILITIES	2.3	-1.6	3.6	13.0	13.8	7.7	10.8	10.7
REAL ESTATE	1.9	2.2	2.2	5.7	0.5	4.1	6.8	7.8
MATERIALS	1.8	5.8	7.7	11.6	0.3	9.4	10.2	10.2
S&P 500®		2.0	9.6	10.8	15.9	19.5	14.7	**14.6**

As the only sector to beat the market for the most recent 10-year period, Information Technology has more than 2.5 times the weight of the next largest S&P 500 sector.

S&P 500 Breadth

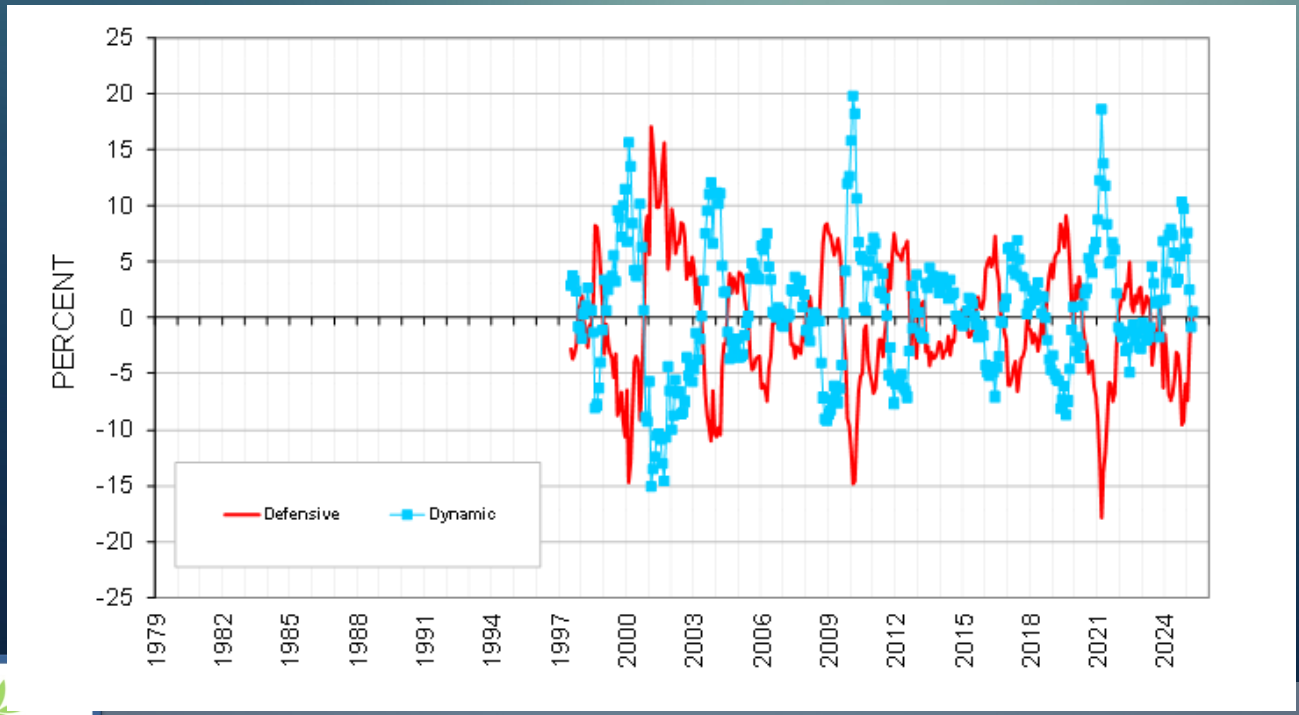


The S&P 500 has been highly concentrated in 2023 & 2024 as only 29% and 30%, respectively, of stocks outperformed the market. The recent two years feature the lowest readings of all calendar years since 1998.

Style Cycles – Defensive vs. Dynamic

Trailing 12-Month Style Index Return Minus Market Return

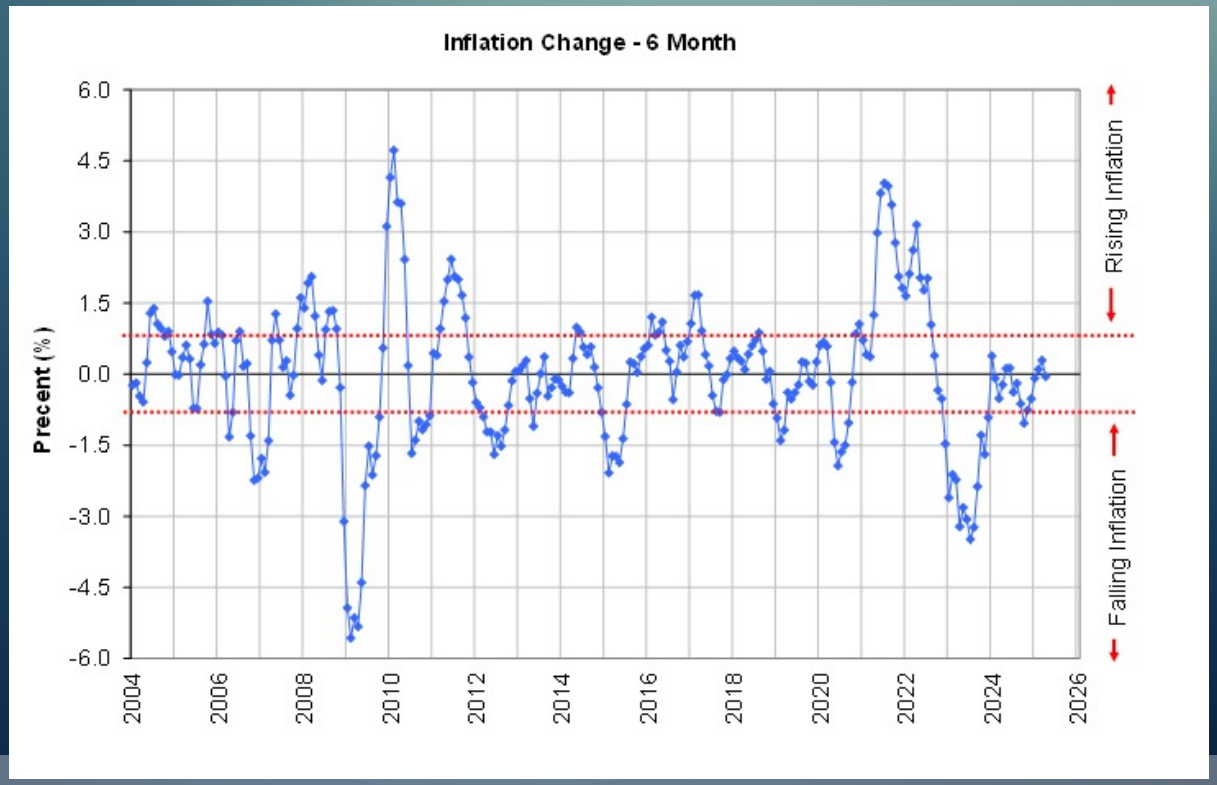
Russell 1000



Dynamic stocks outpaced Defensive stocks significantly 2023 (13.1%) and 2024 (12.1%). Dynamic stocks have outperformed Defensive stocks on a trailing 12-month basis since July 2022, although the latest gap inverted to favor Defensive stocks in March.

Inflation Change Environments

Jan 1981 – Apr 2025



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Performance in Alternative Inflationary Regimes

Average Monthly Returns, %

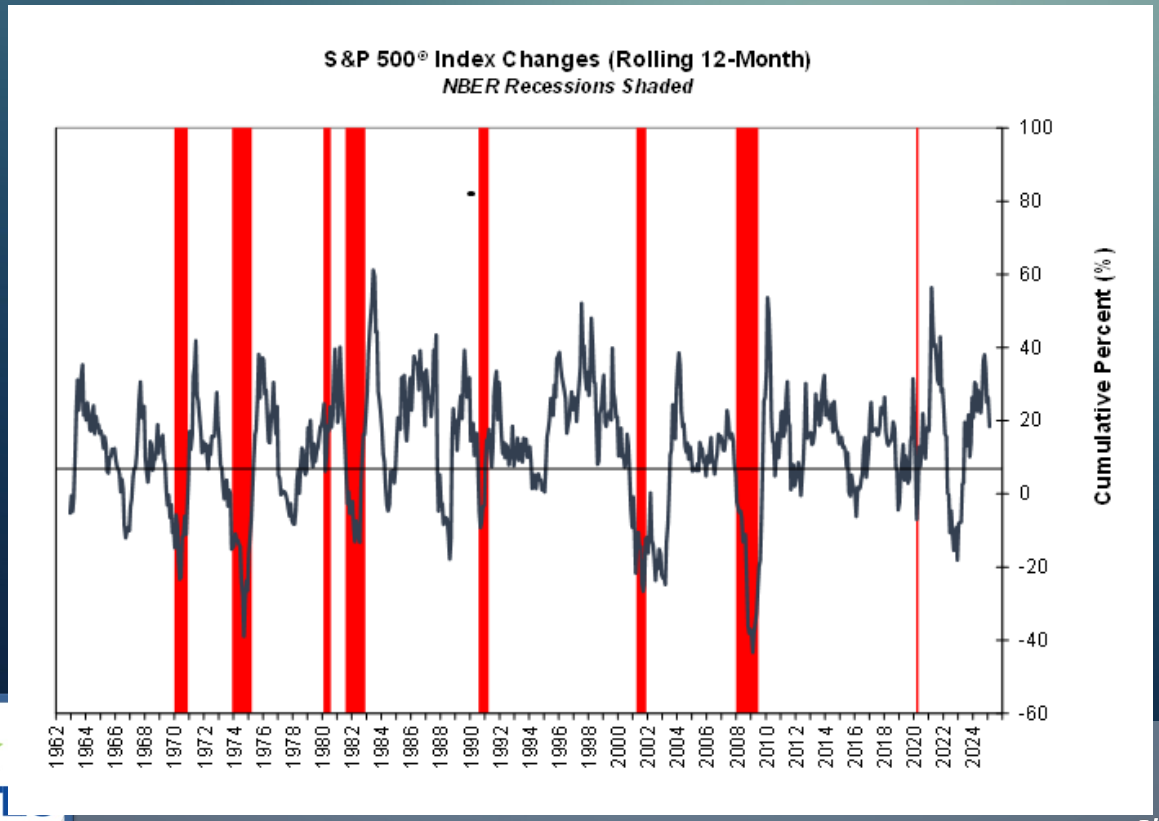
Inflation Inflection Regime	# Months	R1K Value	R1K Growth	Prime
Falling (6m Chg -0.75%)	65	1.39	2.21	1.82
Stable	124	0.64	0.84	0.83
Rising (6m Chg +0.75%)	66	0.39	0.20	0.39
ALL 2004-01 -- 2025-03	255	0.76	1.02	0.97

Average Monthly R1K Relative Returns, %

Inflation Inflection Regime	# Months	Value Outperformance	Growth Outperformance	Prime Value-Added
Falling (6m Chg -0.75%)	65	-0.42	0.39	0.01
Stable	124	-0.11	0.09	0.09
Rising (6m Chg +0.75%)	66	0.11	-0.09	0.11
ALL 2004-01 -- 2025-03	255	-0.13	0.12	0.07

Value Stocks & Enhanced Index Strategy (Prime) have out-performed the Market Index on average in Rising Inflation Regime months.

The Worst 12-Month Equity Returns Happen During Recessions



There have been 14 times beginning in 1962 when the S&P 500 Index declined by more than 25% cumulatively over a 12-month period. ALL 14 instances occurred during a recession. Equities typically fall prior to a recession and rebound before the recession is over.

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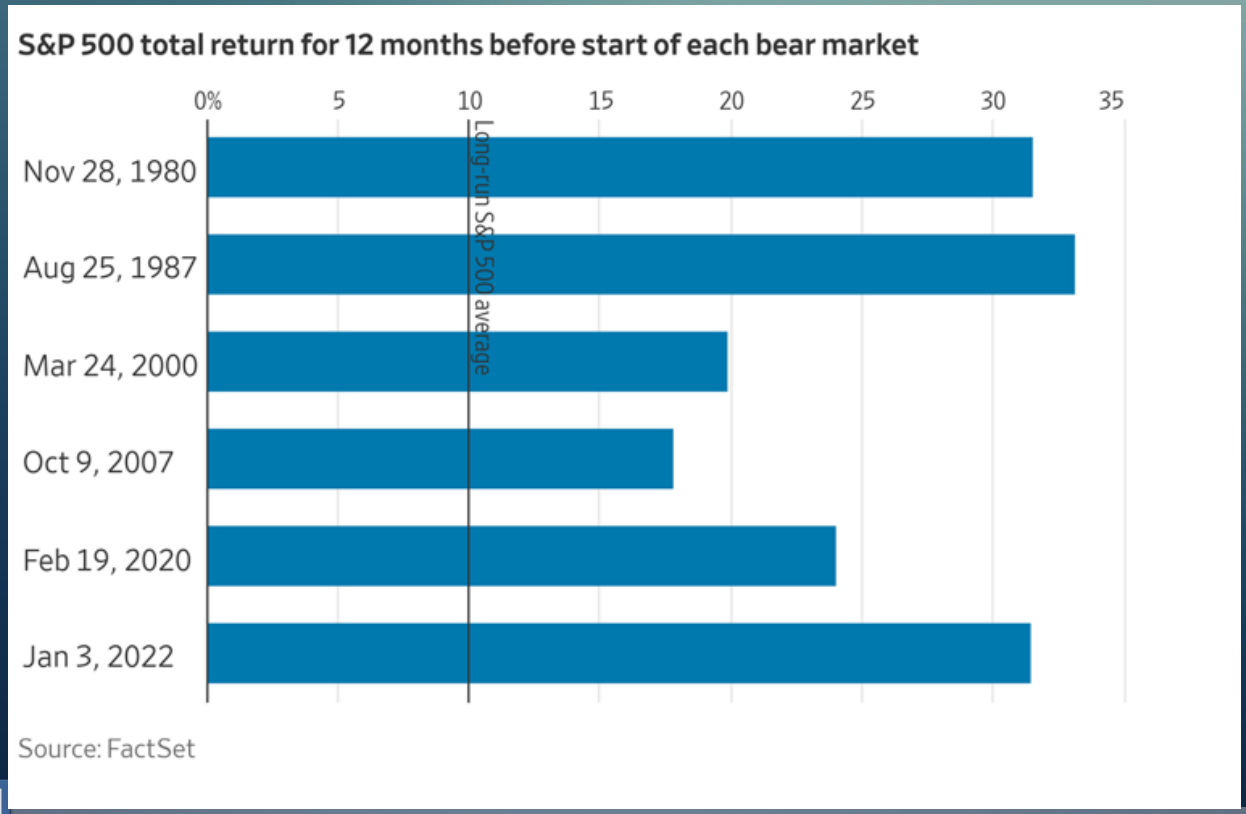
Unfortunately, there is No Market-Warning of Recessions



There have been 6 bear markets since 1980, and in all 6 cases, the S&P 500 was up more than average for the 12-months preceding the bear market.

Tactical Investment Decisions

- Reinforcing vs. Rebalancing decisions are being made whenever the current allocation is different than the policy allocation
- Reasons for tactical shifts away from the policy allocation include:
  1. Valuations different from historical values (i.e., an asset class or sub-asset class is cheaper or more expensive relative to its history and/or relative to other asset class or sub-asset class alternatives)
  2. Extreme absolute and/or relative performance leads to an overbought or oversold asset class (or sub-asset class)
  3. Macroeconomic/regulatory environment shifts

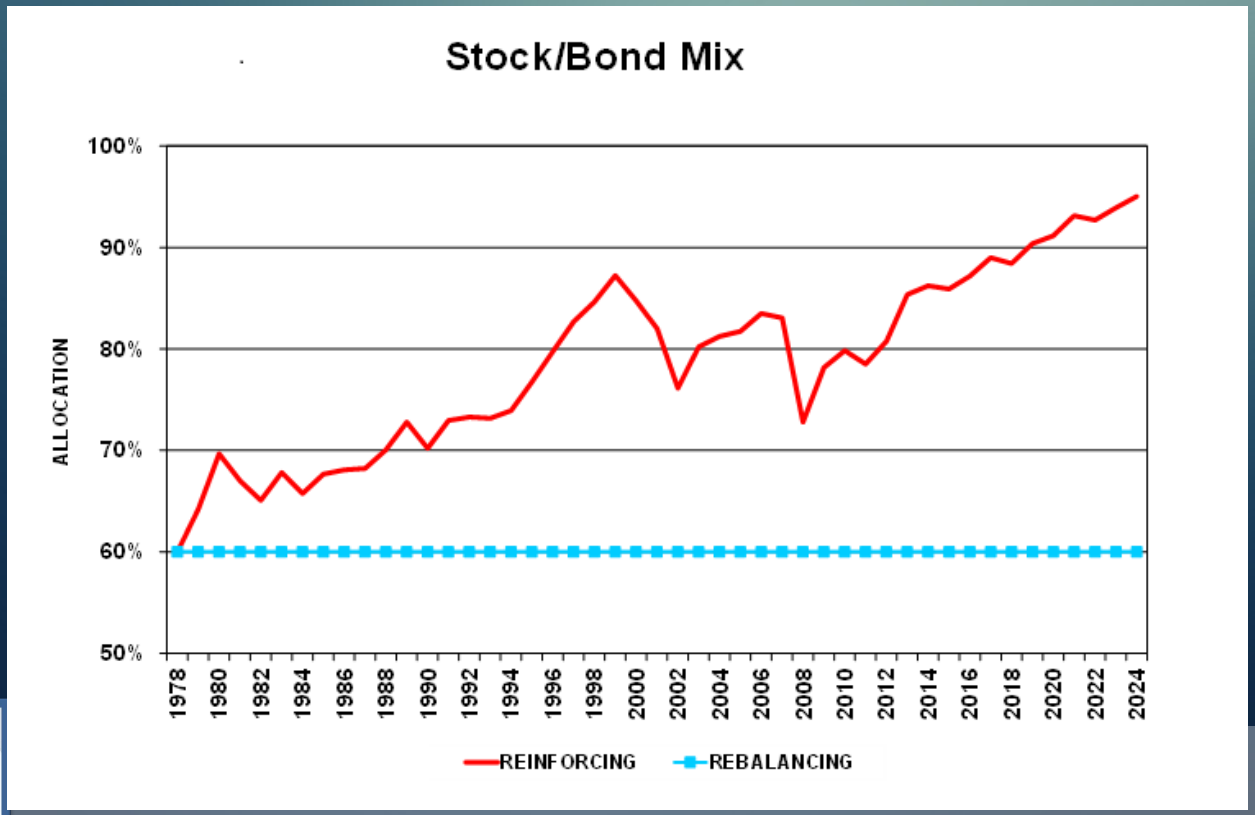
Reinforcing Vs. Rebalancing Strategies

- Reinforcing
  - —Trend Follower; Momentum Play
  - —“Let It Ride”
- Rebalancing
  - —Mean Reverting; Contrarian Play
  - —“Take Your Profits Off The Table”
- Tax implications
  - —Reinforcing has Tax Advantages
  - —Rebalancing Reduces After-Tax Returns

- Typically, Rebalancing strategies lower volatility of returns, but increase taxes.
- The greater the number of trend reversals, the more potential value-added exists from Rebalancing.
- If no reversals, Reinforcing strategy would be preferred, especially on after-tax basis.

Stock Allocation Under Alternative Stock/Bond Strategies

Russell 1000 & Bloomberg US Treasury Index



Without Rebalancing on a regular basis, the current asset allocation mix can get very far from the target or policy allocation.

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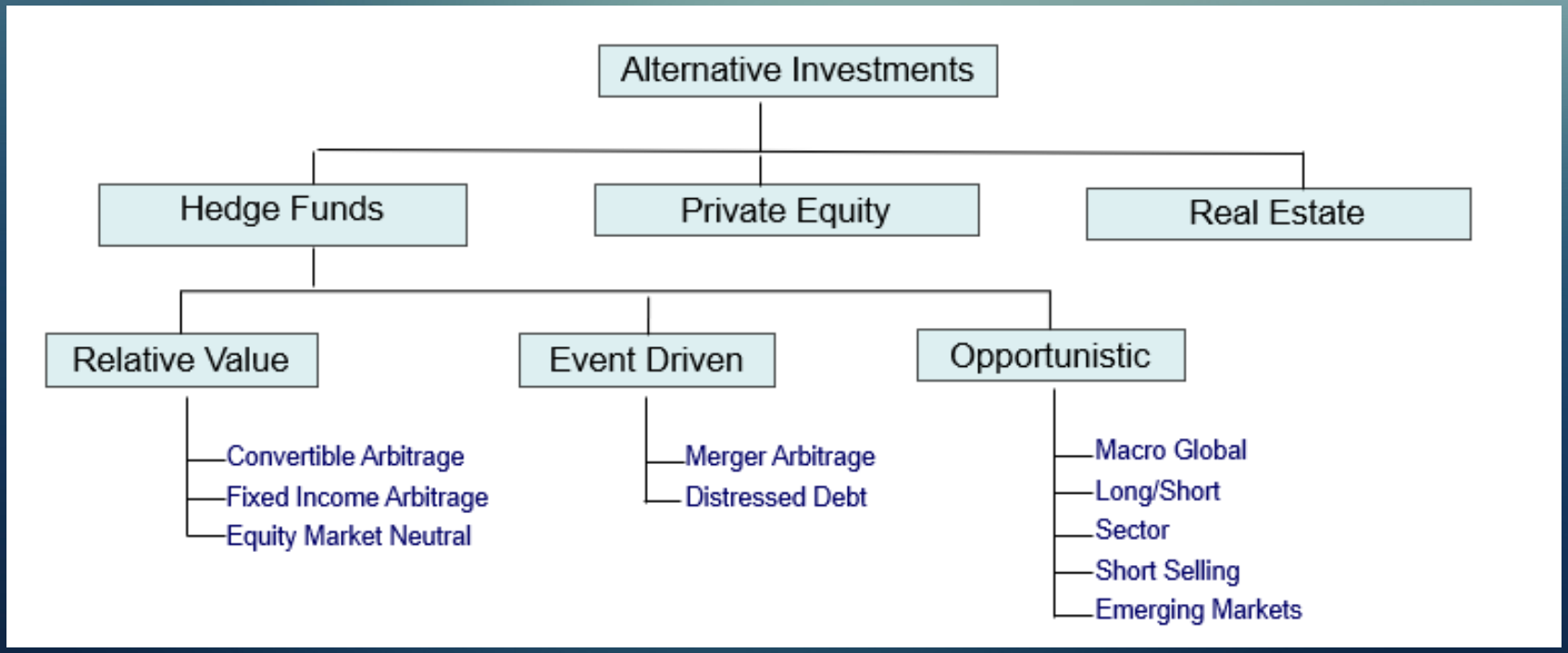
Stocks Vs. Bonds Allocation
Annual Rebalancing Vs. Annual Reinforcing Strategy (1979 – 2024)

	Annual Return (%)	Annual Risk (%)
Stocks (Russell 1000)	12.26	16.66
Bonds (Bloomberg US Tr)	6.21	7.61
60% Stocks/40% Bonds		
Reinforce	11.14	13.62
Rebalance	10.24	10.59

Rebalancing back to Policy or Target Allocations will always reduce risk!

Diversifying Assets Can Reduce Risk



Risks Associated with Hedge Funds

- Regulatory risk:
  - There is little oversight into investment strategy or SEC governance since some are not registered investment advisers.
- Liquidity risk:
  - Partnerships have some liquidity restrictions depending on the type of securities they are buying. Generally, annual or quarterly withdrawals are the norm.
- Investor risk:
  - The Fund can be impacted by flows of investors. In 2008, the demand for liquidity impacted several funds.
- Leverage:
  - Some portfolios can use leverage to increase risk and return.
  - Long/short equities typically have more than 100% of capital working even though the net long/short positions may be only 20-50%.
- Manager risk:
  - Impact of single manager can be huge given risks above.
- Market risk:
  - Strategies may have excessive volatility due to shifts in market dynamics.
- High fees:
  - Fees are asymmetrical: high reward for success, little penalty for failure.

Risks of Hedge Funds

Partial List of Hedge Fund Blow-Ups

Company	Year	Size	Cause
Askin	1994	$600 Million	Excessive leverage/ concentration
Niederhoffer	1997	$130 Million	Excessive leverage/ concentration
Long Term Capital Management	1998	$4.6 Billion	Excessive leverage
Manhattan Fund	2000	$400 Million	Fraud
Lancer Group	2001	$300 Million	Fraud
Lipper Convertible Fund	2002	$350 Million	Fraud
Beacon Hill Asset Mgt	2002	$800 Million	Fraud
Bayou Group	2005	$450 Million	Fraud
Amaranth Advisors	2006	$6.4 Billion	Excessive leverage/ concentration
Sowood	2007	$1.5 Billion	Excessive leverage
Bear Sterns HG Structured Credit	2007	$1.5 Billion	Excessive leverage/ concentration
Madoff	2008	$50 Billion	Fraud

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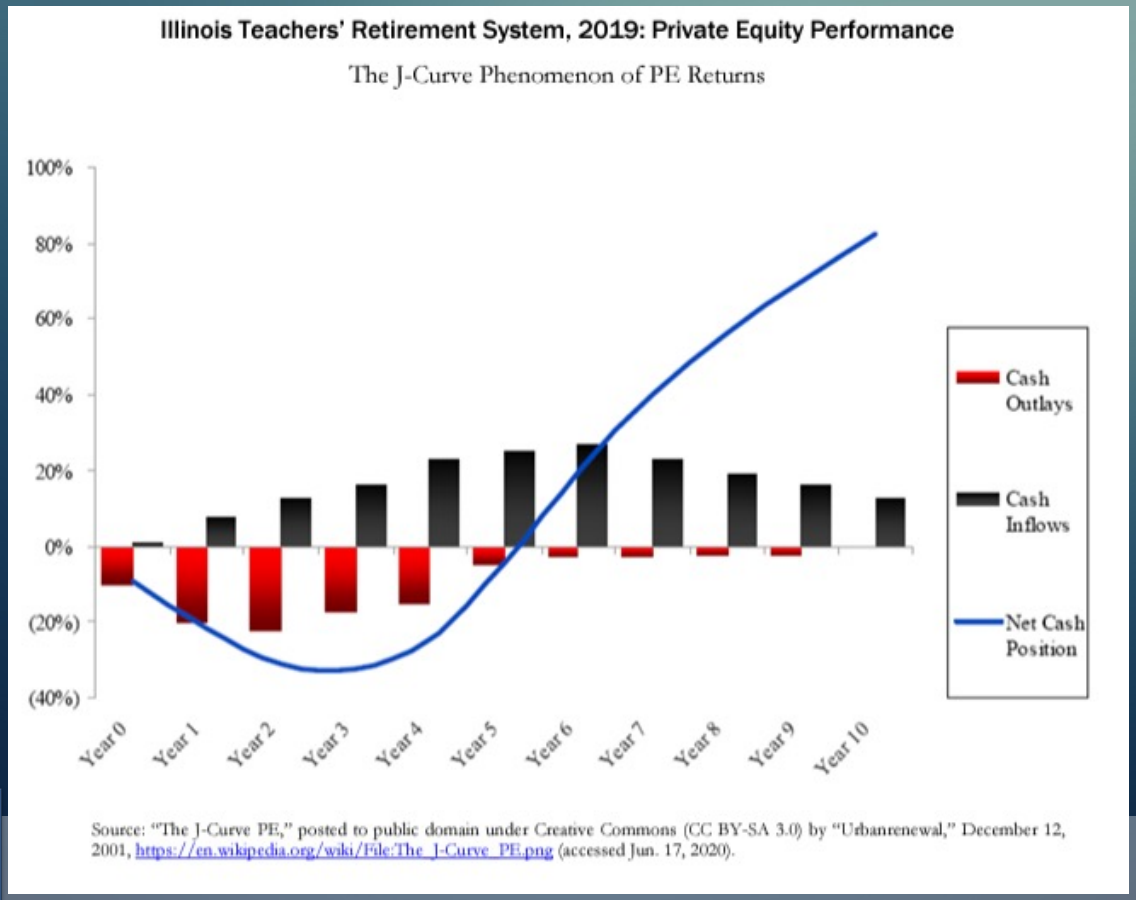
The Private Equity "J-Curve"



Source: "The J-Curve PE," posted to public domain under Creative Commons (CC BY-SA 3.0) by "Urbanrenewal," December 12, 2001, https://en.wikipedia.org/wiki/File:The_J-Curve_PE.png (accessed Jun. 17, 2020).

Returns are negative during the initial years of Private Equity owing to management fees and it takes time to make profitable investments. Over time, the value of investments is expected to rise above original cost, generating unrealized gains. In the final years of the fund, higher valuations could be realized by the partial or complete sale of companies and only at the end of an investment do you truly know the return you received.

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Survey of Capital Market Assumptions (CMA's)

Horizon Actuarial 2025 Survey of Capital Market Assumptions

Average Survey Assumptions

		Expected Returns					*Correlation Matrix*														
		10-Year Horizon		20-Year Horizon		Standard															
	Asset Class	Arith.	Geom.	Arith.	Geom.	Deviation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	US Equity - Large Cap	7.67%	6.39%	8.29%	7.00%	16.54%	1.00																
2	US Equity - Small/Mid Cap	8.87%	6.92%	9.35%	7.38%	20.44%	0.89	1.00															
3	Non-US Equity - Developed	8.58%	7.03%	8.96%	7.35%	18.20%	0.82	0.77	1.00														
4	Non-US Equity - Emerging	9.96%	7.38%	10.63%	7.91%	23.43%	0.71	0.67	0.80	1.00													
5	US Corporate Bonds - Core	5.19%	5.00%	5.28%	5.10%	6.22%	0.32	0.28	0.32	0.29	1.00												
6	US Corporate Bonds - Long Duration	5.61%	5.04%	5.80%	5.28%	10.74%	0.29	0.27	0.28	0.25	0.89	1.00											
7	US Corporate Bonds - High Yield	6.44%	5.97%	6.82%	6.33%	9.77%	0.68	0.68	0.66	0.63	0.53	0.44	1.00										
8	Non-US Debt - Developed	4.19%	3.89%	4.29%	3.99%	7.48%	0.24	0.22	0.35	0.30	0.62	0.61	0.33	1.00									
9	Non-US Debt - Emerging	6.57%	6.03%	6.87%	6.30%	10.62%	0.54	0.51	0.57	0.63	0.60	0.53	0.67	0.50	1.00								
10	US Treasuries (Cash Equivalents)	3.60%	3.58%	3.61%	3.59%	1.47%	(0.01)	(0.04)	0.00	0.00	0.19	0.14	(0.00)	0.18	0.10	1.00							
11	TIPS (Inflation-Protected)	4.63%	4.44%	4.61%	4.41%	6.04%	0.18	0.14	0.19	0.20	0.66	0.61	0.34	0.51	0.43	0.22	1.00						
12	Real Estate	7.52%	6.21%	7.59%	6.38%	16.24%	0.55	0.55	0.48	0.42	0.27	0.23	0.47	0.20	0.39	0.03	0.24	1.00					
13	Hedge Funds	6.25%	5.92%	6.57%	6.24%	7.97%	0.71	0.70	0.69	0.67	0.29	0.24	0.63	0.20	0.51	0.02	0.19	0.42	1.00				
14	Commodities	6.20%	4.67%	6.37%	4.76%	17.83%	0.33	0.34	0.41	0.42	0.07	0.01	0.37	0.12	0.26	0.00	0.20	0.24	0.41	1.00			
15	Infrastructure	8.30%	7.22%	8.65%	7.52%	14.86%	0.65	0.64	0.67	0.61	0.34	0.35	0.59	0.36	0.54	0.04	0.26	0.48	0.57	0.42	1.00		
16	Private Equity	11.51%	9.13%	12.14%	9.63%	22.18%	0.76	0.74	0.68	0.64	0.21	0.19	0.57	0.16	0.45	(0.04)	0.12	0.48	0.64	0.31	0.57	1.00	
17	Private Debt	8.58%	7.91%	8.71%	8.08%	11.75%	0.58	0.58	0.57	0.54	0.22	0.17	0.68	0.12	0.44	(0.04)	0.11	0.41	0.61	0.38	0.51	0.63	1.00
	Inflation	2.39%	2.38%	2.41%	2.40%	1.90%																	

Expected returns over a 10-year horizon include all 41 survey participants.

Expected returns over a 20-year horizon are based a subset of 27 survey participants who provided long-term assumptions.

Horizon's Survey of 41 investment firms in 2025 projects a 2.39% inflation rate over the next 10 years while expecting Large-Cap stocks to produce a 7% to 8% annualized return and Private Equity to produce an 11.5% annualized return. Bonds are expected to produce a 5% to 6% return while Real Estate, Hedge Funds and Commodities are projected to produce marginally higher annualized returns compared to bonds but lower compared to stocks over the next 10 years.

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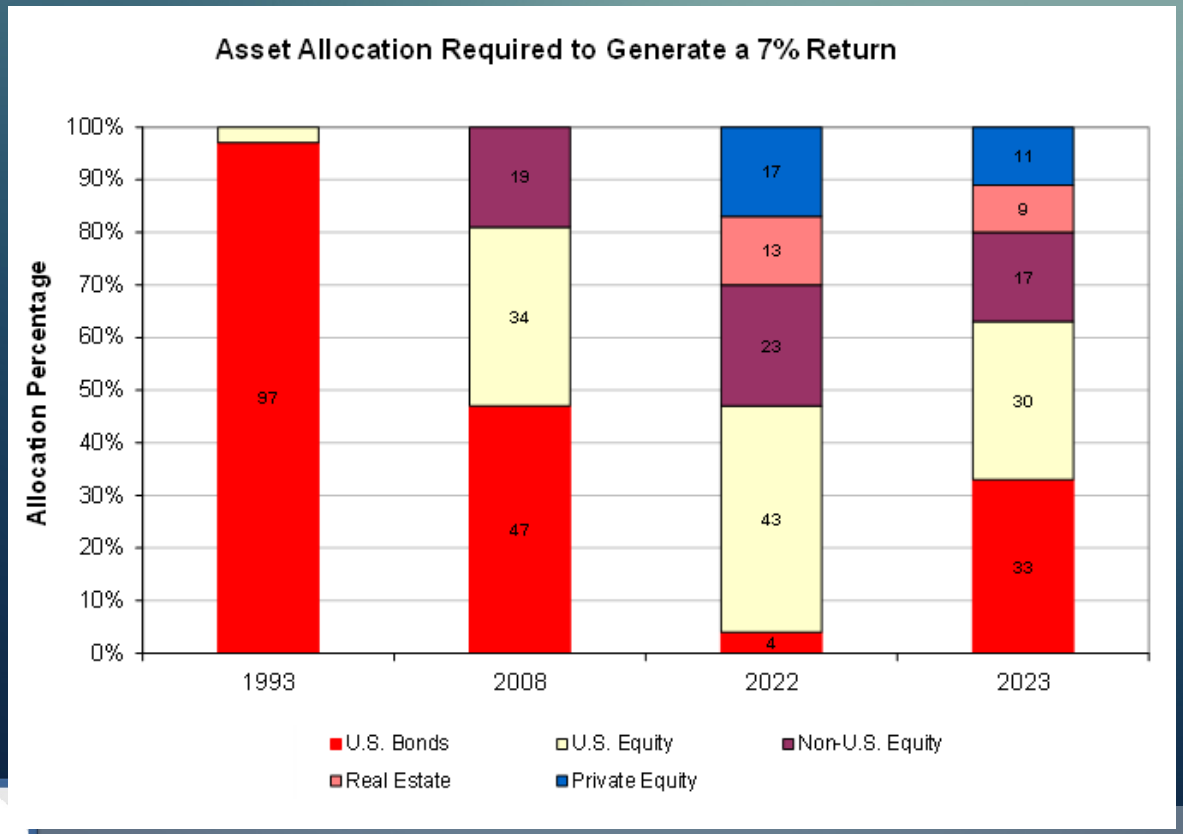
Level of Interest Rates Impacts Asset Allocation Needed to Earn 7%



Based on current expected returns and volatilities, both public & private equity of necessity must be a large part of a portfolio expected to produce a 7% annual return.

Recent drop in expected risk reflects impact of higher interest rates & larger fixed-income allocation.

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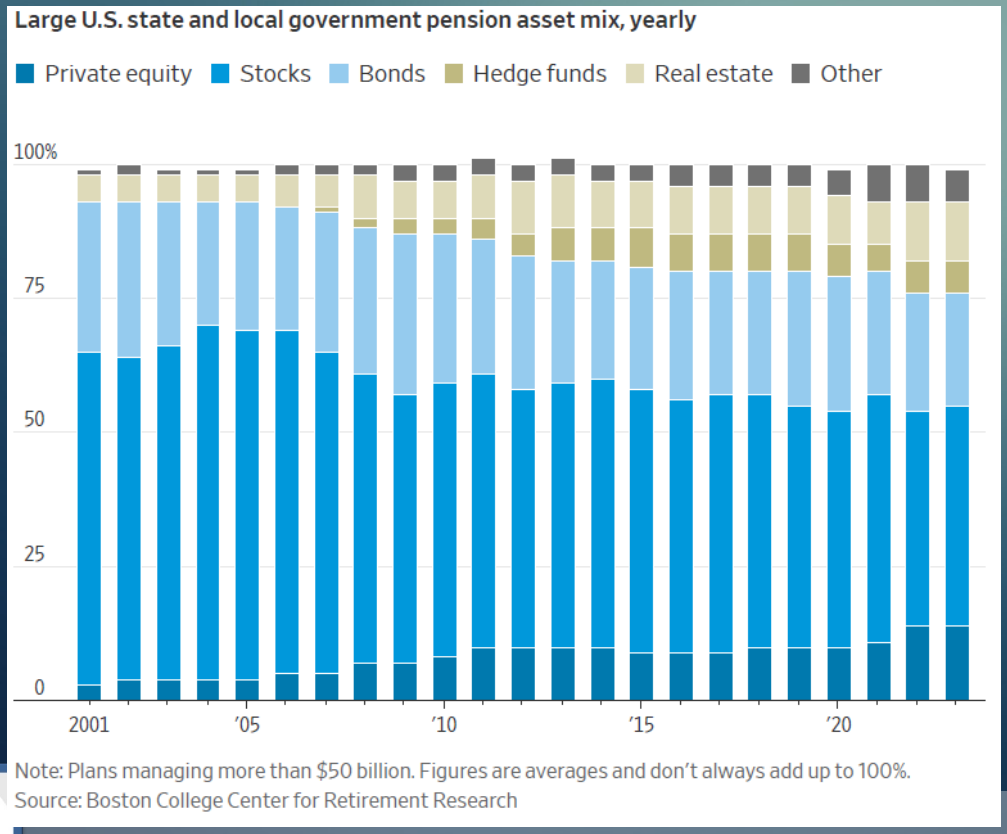
Large Pension Funds Asset Allocation Has Changed Over Time



According to a Wall Street Journal article on June 17, 2024, large public pension plans have an average of 14% of their assets in private equity. Most of this money was committed when low bond yields dragged down pension fund returns and as the article suggests, the honeymoon is over as the ability of private equity managers to make sales and distributions has declined the past few years.

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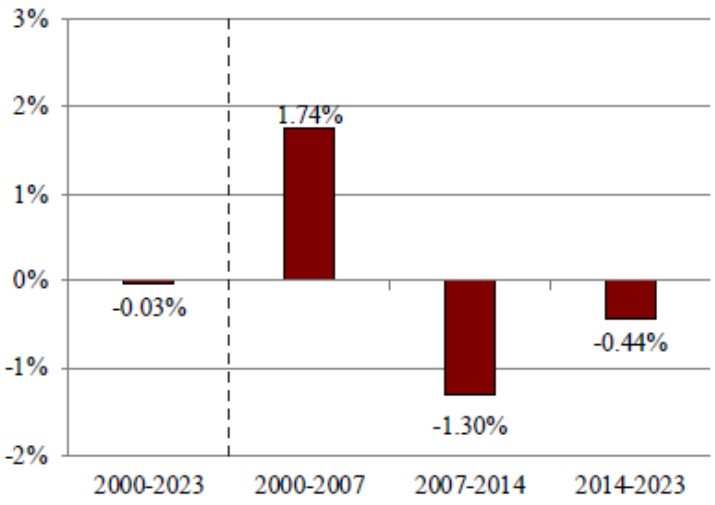
Pension Funds Have Underperformed an Indexed Portfolio Since 2007

FIGURE 2. PENSION FUND ANNUALIZED RETURNS RELATIVE TO AN INDEXED PORTFOLIO, 2000-2023



Note: See Endnote 8.
Sources: Authors' calculations based on PPD and Bloomberg Finance L.P. (2000-2023).

Sources: Authors' calculations from the *Public Plans Database* (PPD) (2001-2022) and recent financial reports (2023).

According to a brief from the Center of Retirement Research at Boston College titled "How Do Public Pension Plan Returns Compare to Simple Index Investing?" the fact that pension plans have been shifting toward more complex alternative investments over the past 2 decades has not dramatically impacted returns over the 24-year period.

However, the authors (Jean-Pierre Aubry and Yimeng Yin) find that all the positive relative performance came prior to the global financial crisis in 2007.

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Private Equity Has Underperformed Public Equity for Past 10 Years

TABLE B1. RETURNS FROM ALTERNATIVE ASSET CLASSES AND EQUITIES, 2000-2023 BY SUBPERIOD

Asset class	2000-2007	2007-2014	2014-2023
Private equity (before fees)	12.8%	13.7%	8.8%
Hedge funds (after fees)	9.3	3.9	3.5
Real estate (before fees)	18.6	3.8	5.9
Commodities (after fees)	11.0	4.3	-2.2
Non-US equities	8.2%	1.7%	3.5%
US equities	3.0	6.5	11.0

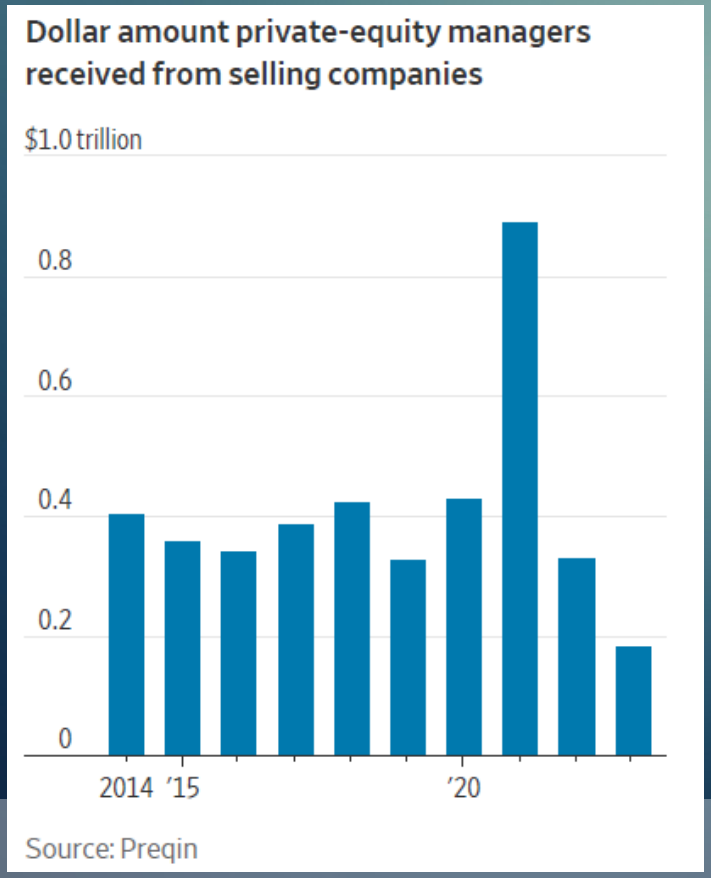
Sources: Author's calculations based on Refinitiv Private Equity Buyout Index, Credit Suisse Hedge Fund Index, Dow Jones U.S. Real Estate Total Return Index, S&P GSCI Index, Russell 3000 Total Return Index, and MSCI ex-USA Index (2000-2023).

Aubry & Yin conclude that the main driver behind public pension plans' performance relative to the index portfolio is the differential in returns of the various alternative investments and non-US equities relative to domestic equities.

Since 2007, Hedge Funds, Real Estate & Commodites have underperformed domestic equities.

Since 2014, Private Equity has underperformed domestic equities.

It's More Difficult For Private Equity Managers to Sell Companies



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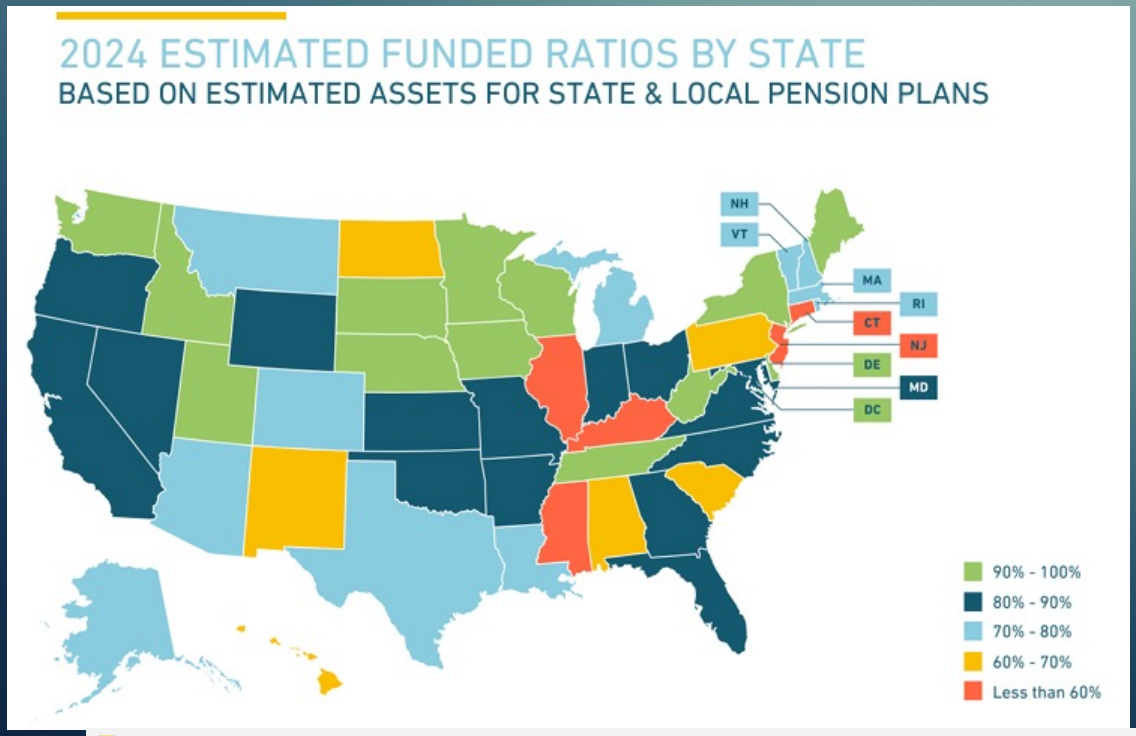
Equable Estimates 10 States with 70% or Less Funded Ratios



The State of Florida has well-funded pension plans (in the 80%-90% range) relative to other Southern States.

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Palm Beach Gardens Case Study

Florida Public Pension Trustees Association

Monte Carlo Analysis

Shaping the Future - Trustee by Trustee

Palm Beach Gardens Police Case Study
10-Year History of the Pension Formula At Work

Year	Employer & Plan Members Contributions	Supplemental Contributions (185)	Benefit Payments	Plan Administrative Expenses	Refunds	Contributions Minus Benefits, Expenses & Refunds	Net Investment Income/(Loss)	Market Value of Pension Plan Assets	Annual Return
2014								72,626,331	
2015	3,532,259	422,145	3,297,504	116,088	-	540,812	925,753	74,092,896	2.02%
2016	3,541,013	452,421	3,938,855	132,973	8,046	(86,440)	8,107,238	82,113,694	10.83%
2017	3,467,611	515,513	6,532,546	121,211	13,857	(2,684,490)	10,747,480	90,176,684	9.82%
2018	3,499,567	599,553	6,137,826	134,667	12,573	(2,185,946)	9,658,544	97,649,282	8.29%
2019	4,480,064	694,166	6,283,515	144,764	56,045	(1,310,094)	2,046,222	98,385,410	0.75%
2020	4,428,951	755,910	5,982,441	147,675	61,754	(1,007,009)	7,131,158	104,509,559	6.22%
2021	4,865,777	882,102	6,279,976	154,039	32,533	(718,669)	23,717,145	127,508,035	22.01%
2022	5,272,631	854,303	7,042,743	159,383	31,153	(1,106,345)	(14,576,176)	111,825,514	-12.30%
2023	5,712,602	993,453	7,033,082	159,161	118,312	(604,500)	10,633,174	121,749,020	8.87%
2024	6,229,944	1,101,003	6,788,652	197,168	118,820	226,307	23,855,612	145,830,939	19.78%
10-Year Sum	45,030,419	7,270,569	59,317,140	1,467,129	453,093	(8,936,374)	82,246,150	Annualized Return	7.22%
9-Year Average Growth	8.5%	17.9%	11.8%	7.8%					
								Annualized Risk	9.71%

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Shaping the Future - Trustee by Trustee

PBGP Changes to Investment Program 2015 - 2024

- Diversified domestic equity portfolio to include active small- and mid-cap equity investments
- After taking advantage of the strength of large-cap index funds for many years, PBGP began investing in a large-cap core enhanced index strategy
- Rather than focusing on Hedge Funds and Private Equity, PBGP has instead invested in Real Estate and Infrastructure (Real Return Asset Class) in their Alternative Investments portion of their portfolio
- Continual rebalancing back towards policy target allocations through time

PBGP Annual Returns 1990 - 2024

FY End September	Annual Investment Return	FY End September	Annual Investment Return
1990	9.1	2009	6.7
1991	8.6	2010	9.8
1992	8.2	2011	-0.4
1993	8.8	2012	18.0
1994	2.4	2013	14.2
1995	18.2	2014	10.4
1996	5.2	2015	1.3
1997	24.2	2016	10.9
1998	5.3	2017	13.1
1999	11.6	2018	10.7
2000	6.7	2019	2.1
2001	-7.8	2020	7.2
2002	-6.5	2021	22.3
2003	12.7	2022	-11.3
2004	8.6	2023	9.3
2005	9.6	2024	19.2
2006	6.4		
2007	11.5	**35-Year Annualized Return**	**7.18**
2008	-13.9	**35-Year Annualized Risk**	**8.76**
		35-Year Average Annual Return	**6.78**

PBGP Pension Plan has been down in 5 of 35 fiscal years and has outperformed its 7% annual target return in 23 of those 35 years.

FPPTA Asset Allocation Template

Custom Portfolio Return
Using Historical Asset Class Performance from 1998-2024

Asset Class	All Cap	Large Cap	Mid Cap	Small Cap	Developed International Equity	International Small Cap Equity	Emerging Markets Equity	Hedge Funds	Private Equity	Private Debt	High Yield Fixed Income	Real Estate	Farmland	Timber	Aggregate Fixed Income	Global Fixed Income	Intermediate Fixed Income	Government Credit	Cash	Total
Annualized Mean	8.32	8.18	9.52	8.05	4.87	7.72	7.88	6.19	13.39	5.01	6.32	7.31	10.60	6.40	3.75	2.81	3.63	2.87	1.72	
Standard Deviation	17.06	16.44	19.10	21.46	18.39	20.71	23.30	6.70	10.53	8.23	9.99	6.58	6.32	4.55	4.32	6.65	3.41	1.93	0.91	
Percent Weight	0	33.5	9	5	0	8	2	0	0	7.5	0	12.5	0	0	22.5	0	0	0	0	100

Custom Portfolio 26 Year Results (1998-2024)	Annualized Mean	Standard Deviation	Risk Assets	Safety Assets
	7.43	10.38	65.00	35.00

Rather than Using CMA's (Capital Market Assumptions), you can also use past return history to determine the return and risk you would have achieved for a given allocation (assuming a quarterly rebalancing)

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Shaping the Future - Trustee by Trustee

PBGP Monte Carlo Simulation

Pension Formula Calculator — Palm Beach Gardens Police Pension Fund

HIT F9 BUTTON TO REFRESH	2024	2025	2026	2027	2028	2029
Change the scenario using Cells B14 through B19						
Assets (Market Value) - Page 5 Financial Statement	145,830,939	157,480,679	181,138,314	196,731,209	210,736,892	287,476,959
Benefit Payments (Payouts) - Page 5 Financial Statement	6,788,652	7,467,517	8,214,269	9,035,696	9,939,265	10,933,192
Expenses (Payouts) - Page 5 Total Deductions Minus Benefits	315,988	340,635	367,205	395,847	426,723	460,007
Contributions (Receipts) - Page 5 Financial Statement	6,229,944	6,653,580	7,106,024	7,589,233	8,105,301	8,656,462
Supplemental Contribution - Page 5 Financial Statement	1,101,003	1,160,600	1,223,422	1,289,645	1,359,453	1,433,039
Income (Portfolio Return) - This is Calculated - Hit F9 to Refresh		8.0%	15.2%	8.9%	7.6%	37.0%

Growth rate of Benefit Payments - Pages 22/23 Financial Statement	10.0%	*Average of 9-Years of Growth (2024/2015)*
Growth rate of Expenses - Pages 22/23 Financial Statement	7.8%	*9-Year Average Growth (2024/2015)*
Growth rate of Contributions - GRS Page 37	6.8%	*Average of 9-Years of Growth (2024/2015)*
Growth of supplemental contribution (Contributions) - GRS Page 37	5.4%	*2025/2023 Growth Rate GASB 67 Pg 37 - 2 year*
Portfolio expected return (Income)	7.4%	*Use either Historical 35-Year or From Input Asset Allocation*
Portfolio standard deviation (Risk)	10.4%	*Use either Historical 35-Year or From Input Asset Allocation*
Does the Plan Go to Negative Assets at or before 2051?	No	

Annual Total Contributions	7,814,180	8,329,446	8,878,879	9,464,754	10,089,501
Annual Total Income	11643712	23909663	16145559	14906917	78043766
Annual Total Benefit Payments	7,467,517	8,214,269	9,035,696	9,939,265	10,933,192
Annual Total Expenses	340,635	367,205	395,847	426,723	460,007
Total Contributions & Income Minus Benefit Payments & Expenses	11,649,740	23,657,635	15,592,895	14,005,683	76,740,068

Average Annual Returns	
2024-2028 (5-Year)	15.3%
2024-2033 (10-Year)	13.8%
2024-2038 (15-Year)	11.2%
2024-2043 (20-Year)	9.1%
2024-2050 (27-Year)	9.3%

Assets = [(Prior Year Assets * Portfolio Return) - (Benefit Payment + Expenses) + Contributions + Supplemental Contributions]

FPPTA Monte Carlo Simulation Template allows for a pension plan to project all possible cases (good & bad) given the Portfolio's Expected Return and Risk.

This template will allow for "what-if" testing - like the impact of adding a COLA.

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Key Takeaways

- In 2015, the Palm Beach Gardens Police Officers' Pension Fund (PBGP) faced a challenging reality as the fund held $74.1 million in assets with a funded ratio of 77.0% and payroll for covered employes totaled $4.9 million
- By the end of fiscal year 2024, the PBGP Pension Fund had undergone a remarkable turnaround as assets had grown to $145.8 million, almost double the 2015 level while payroll for covered employes more than doubled to $10.8 million
- At the end of FY 2024, the funded ratio climbed to 99.9%, essentially achieving full funded status

Key Takeaways

- Three trustees served throughout this period, providing continuity and informed decision-making
- Working with their actuary, attorney and investment managers, the trustees made strategic choices about contributions, benefits and funding policies
- The Board successfully negotiated contracts, finding ways to enhance participant benefits while maintaining fiscal discipline
- The Board also revisited and refined actuarial assumptions to better reflect economic realities and position the fund for growth
- On the income side, the Board focused on asset allocation as the engine of growth while balancing risk and return, supporting both benefit payments and long-term growth

Important Disclosures

PAST PERFORMANCE IS NOT NECESSARILY INDICATIVE OF FUTURE RESULTS. INVESTMENTS ARE NOT GUARANTEED AND MAY LOSE VALUE.

Unless other wise noted, the performance of all indices and composites referenced herein include reinvested dividends and income. All indices referenced herein are passive, and do not reflect fees or expenses. Investors may not be able to invest in the indices directly. Graphs and charts included in this material are for informational purposes only and are not intended to serve as the basis for any investment decision. Where market, index and/or company financial data is presented, it has been obtained from a variety of sources deemed reliable. These sources may include some or all of the following: FTSE Russell, Standard & Poor's, FactSet Research Systems & Ford Equity Research. TCM assumes no responsibility for the accuracy of this data. All information is provided for informational purposes only. Frank Russell Company ("Russell") is the source & owner of the trademarks, service marks and copyrights related to the Russell Indexes. Russell is a trademark of Frank Russell Company. Standard & Poor's, S&P, 500 and 400 are registered trademarks of Standard & Poor's Financial Services LLC, a division of S&P Global (S&P"). These trademarks have been licensed to S&P Dow Jones Indices LLC. None of the owners or suppliers of data featured in this report promote, sponsor or endorse the content of this communication, nor accept responsibility for errors or omissions in the underlying data. Further distribution of the index data contained in this report is prohibited.

INDEX INFORMATION

The **Dividend Select Club** is a custom collection of companies with a rising dividend stream thought to be less at-risk than the stream from typical dividend-paying stocks. Stocks in the S&P 500 with at least 10 years of history are screened to insure the latest indicated annual dividend is at least as large as the level one year ago, and strictly progressively increasing over intervals of prior 10, 5, 3 and 1 years. In addition, the indicated annual dividend must be less than recent reported trailing 12-month operating earnings and the 12-month forward consensus analyst earnings estimate. The S&P 500 Index is a float-capitalization-weighted representative measure of leading large-cap companies created and maintained by Standard & Poor's. The Dividend Select Club is constructed and maintained by TCM as a hypothetical portfolio and is not a publicly available index. TCM reconstitutes the stocks in the Dividend Select Club at each quarter-end based on current dividend & earnings trends. Stock weights reflect market capitalization. Overly large weights are capped at a threshold for diversification purposes. While the stocks remain the same throughout the subsequent calendar quarter, the weight of each company in the benchmark is reset monthly based on the latest data at each month-end. Returns are computed using a bottom-up, buy and hold computation, based on prior month-end holdings in the Dividend Select Club portfolio. Stocks in the S&P 500 not in the Dividend Select Club at reconstitution are assigned to one of two distinct alternative group portfolios: Other Dividend Paying Stocks (provided the latest indicated annual dividend is strictly positive) or Non-Dividend Paying Stocks. Group weights and returns are constructed in an analogous manner to those of the Dividend Select Club.

Important Disclosures

INDEX INFORMATION (Continued)
The S&P 500 Index is a representative measure of 500 leading companies from leading industries; the index is a benchmark for the large-cap segment of U.S. equity market. Company weights in the index are proportional to firms' available market capitalization (price times available shares outstanding). A Committee at Standard and Poor's maintains the index with a focus on liquidity and investability. The S&P 500 Low-Volatility Index consists of the 100 least-volatile stocks in the S&P 500 at each quarterly reconstitution date as measured by daily realized returns variability over the 12 months prior to reconstitution, weighted in proportion to the inverse of the realized volatility score. The S&P 500 Top 50 is a custom portfolio managed by TWIN consisting of the 50 largest stocks in the S&P 500 by index weight, reconstituted each quarter. The Bottom 450 portfolio consists of the remaining S&P 500 constituents not in the Top 50. Russell Investments produces and maintains a family of U.S. equity indexes. In the determination of index membership, Russell calculates capitalization and other category breakpoint values based on ranks of U.S. common stocks at each annual reconstitution period using market value of freely-available outstanding shares (as of the last day of May each year). Stocks exceeding the breakpoint established for the largest 3,000 stocks become constituents in the Russell 3000 Index (with some adjustments to the constituent list to reduce category changes). Similarly, the largest approximately 1,000 stocks become the Russell 1000 Index. The Russell Top 200 Index consists of the approximately 200 largest stocks in the Russell 1000; the Midcap Index is composed of the remaining stocks in the Russell 1000. Style category breakpoints based on an objective scoring algorithm are used to assign fractions of Russell Index constituents' capitalization to value & growth sub-indices. The Russell stability indices employ an objective scoring algorithm to assign constituents to defensive and dynamic sub-indices based on a comprehensive measure of risk incorporating volatility and accounting-based measures of quality. The TWIN Equity Universe (Large/Mid Cap) is a custom portfolio of large- & mid-cap stocks chosen from the Russell 1000 and S&P 900 indices.

HYPOTHETICAL RETURNS & PERFORMANCE
The long-run performance presented by TCM for the **TWIN Dividend Select Club**, other dividend-related groupings of stocks and other custom benchmarks is hypothetical. Prospective investors are advised to consider a number of important factors when reviewing this type of back-tested information. The reported performance was derived from the retroactive application of sets of rules with the benefit of hindsight. There are inherent limitations with this type of data (e.g., performance results do not represent actual trading) and results are sensitive to the period of analysis chosen. TCM did not offer the trading strategies throughout the entire periods presented and different economic conditions might have impacted the adviser's decision-making when using the rules to manage actual client accounts. While the sets of rules have been applied consistently to generate the latest results, these rules and associated trading strategies have evolved over time. The performance presented does not reflect the deduction of advisory fees, brokerage or other commissions, mutual fund exchange fees, and other expenses a client would have paid. Investors are reminded of the potential for loss as well as profit.