

THE ETF INDUSTRY: PAST, PRESENT, AND FUTURE

As Of Date:
4/13/2019

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alpha architect

We Empower Investors Through Education | Affordable Alpha

Structure Matters

row2k features



1 2 3 4

Prepping for Pan Am's
Just one week to go before racing begins at the XVI Pan American Games in Guadalajara. Fourteen US crews, including 6 Beijing Olympians, are set to compete. Check back all week for [news](#) and [interviews](#) with the 2011 Pan Am Team.

DAILY UPDATES

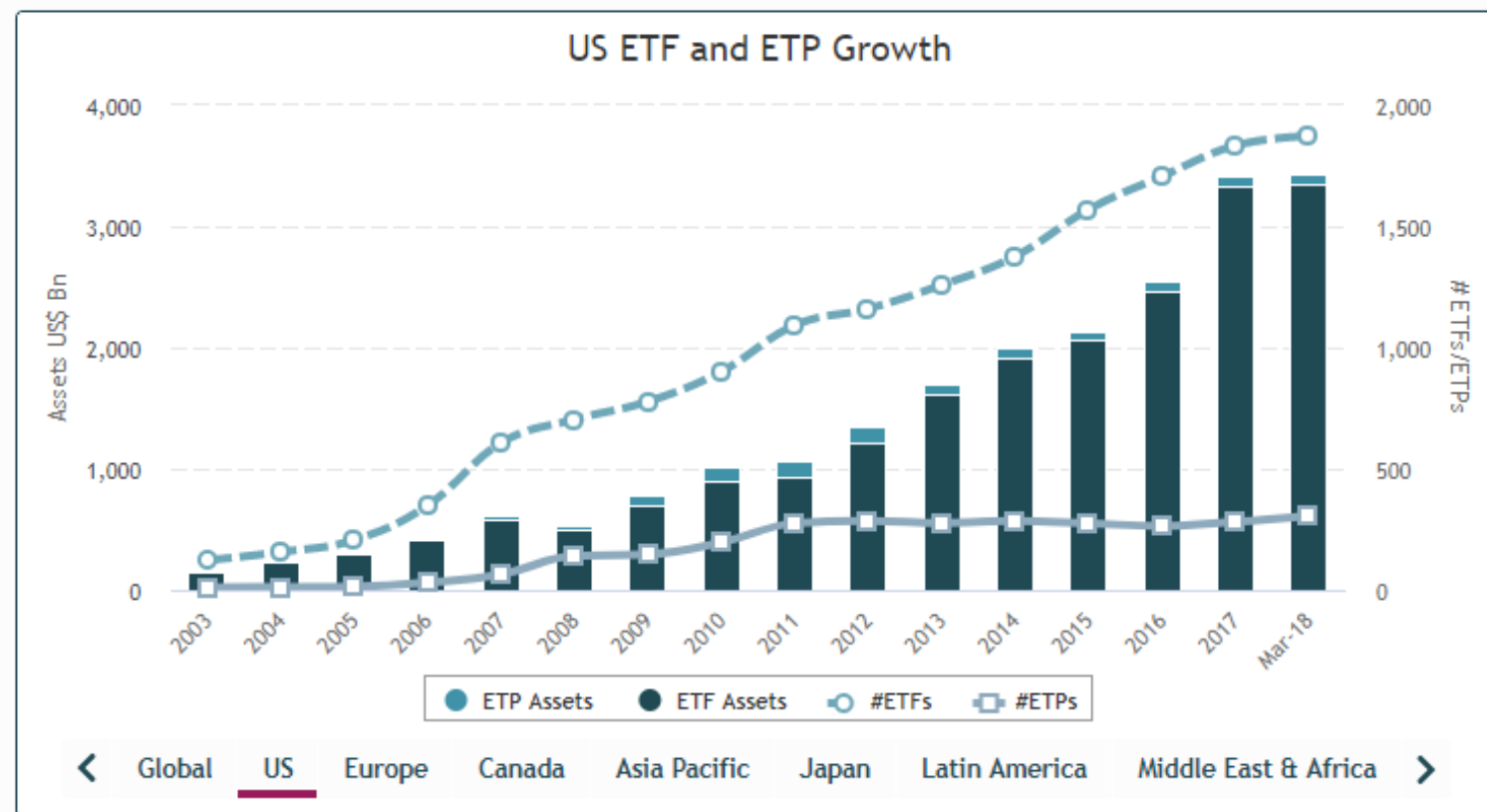


What is an Exchange Traded Fund?



ETFs: Growing Fast

ETFGI ETF/ETP growth charts



Source: ETFGI data sourced from ETF/ETP sponsors, exchanges, regulatory filings, Thomson Reuters/Lipper, Bloomberg, publicly available sources, and data generated in-house.



What Are the Benefits of ETFs?



The Benefits of ETFs

Transparent

Low Cost

Tax Efficient



The Benefits of ETFs

Transparent

Should I invest in the marijuana industry Arnold??



Let it rip bro. There's an ETF for that.



Transparency

THE ETFMG Alternative Harvest ETF(MJ)



**Top Ten
Fund Holdings** as of 11/05/2018

Name	% Total Net Assets	Ticker	Shares Held	Market Value USD
CANOPY GROWTH CORP	8.90	WEED CN	1576433	\$58863237.12
AURORA CANNABIS INC COM	8.71	ACB CN	8197285	\$57562551.70
CRONOS GROUP INC COM	8.30	CRON	6811140	\$54897788.40
TILRAY INC COM CL 2	8.18	TLRY	543656	\$54088335.44
GW PHARMACEUTICALS PLC ADS	6.72	GWPH	305395	\$44441080.40
CORBUS PHARMACEUTICALS HLDGS COM	4.61	CRBP	4187801	\$30487191.28
CANNTRUST HOLDINGS INC	4.28	TRST CN	4096237	\$28264133.86
HYDROPOTHECARY CORP NEW COM	4.15	HEXO CN	5747391	\$27417820.99
EMERALD HEALTH THERAPEUTICS IN COM	3.76	EMH CN	7713147	\$24844269.76
ORGANIGRAM HOLDINGS INC	3.38	OGI CN	4984435	\$22332441.97



The Benefits of ETFs

Low Cost

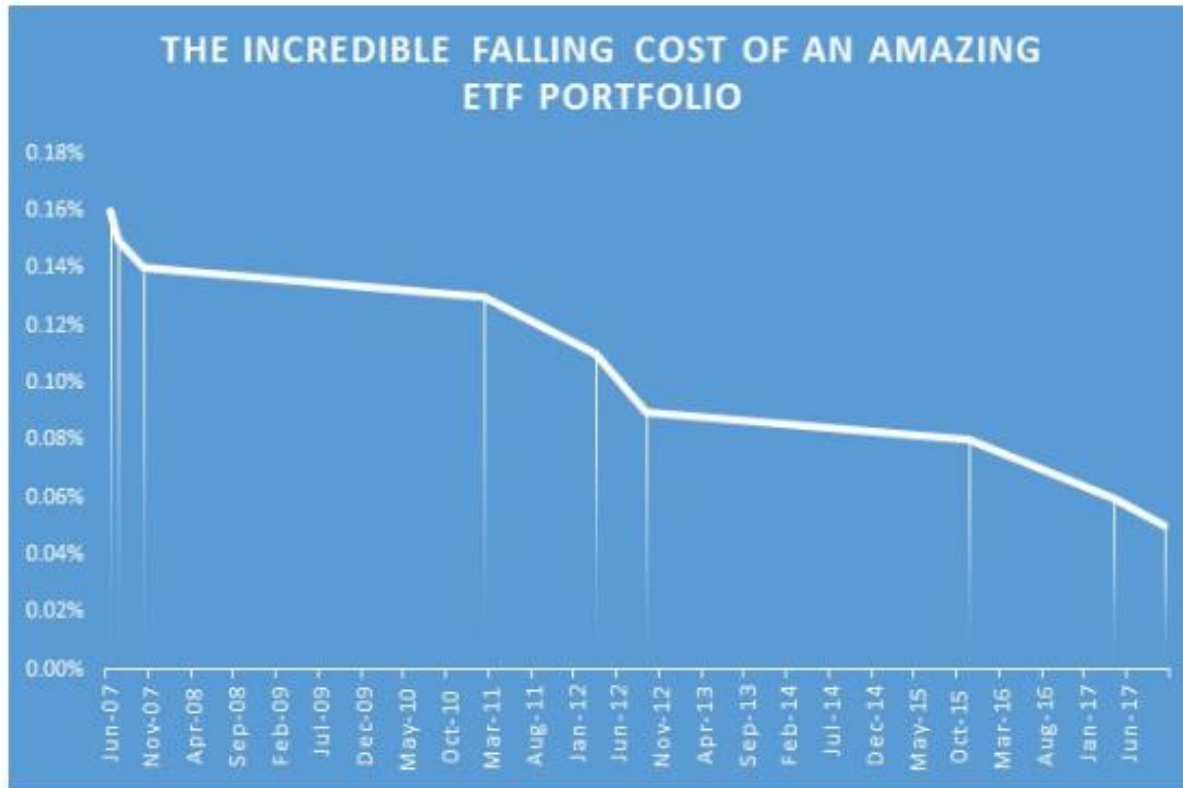


Lower costs

World's Lowest-Cost ETF Portfolio				
Asset Class	Weight	Fund	Ticker	ER
U.S. Equity	40%	iShares Core S&P Total U.S. Market ETF	ITOT	0.03%
Developed Markets Equity	30%	Schwab International Equity ETF	SCHF	0.06%
		SPDR S&P World ex-US ETF	GWL	0.04%
Emerging Markets Equity	5%	Schwab Emerging Markets Equity	SCHE	0.13%
		SPDR Portfolio Emerging Markets ETF	SPEM	0.11%
Fixed Income	15%	Schwab U.S. Aggregate Bond	SCHZ	0.04%
REITs	5%	Schwab U.S. REIT ETF	SCHH	0.07%
Commodities	5%	GraniteShares Bloomberg Commodity Broad Strategy No K-1 ETF	COMB	0.25%
COMBINED FEE				0.06% 0.05%



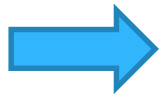
Lower costs



Source: Hougan 10/19//2017 <https://www.etf.com/sections/blog/worlds-lowest-cost-portfolio-hits-005-fee>

Cutting Costs: How To Cut Your Arm Off To Save Your Life





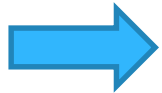
June 2018, GraniteShares gains traction:

Bloomberg

Markets

Tiny Gold ETF Wages Fee War to Reap 10-Fold Surge in Assets

By Luis Aguilar



End of June 2018, State Street Responds:

Gold ETF fee war continues, as new fund undercuts rivals

Published: June 26, 2018 11:51 a.m. ET



October 2018:

Low-cost gold ETF GraniteShares cuts fees as price rivalry hots up REUTERS



The Benefits of ETFs



Tax Efficient



Tax Efficiency

Latest Distribution History - VSIGX		
	S/T Capital Gain	L/T Capital Gain
2017	\$0.00	\$0.00
2016	\$0.00	\$0.02
2015	\$0.00	\$0.01
2014	\$0.00	\$0.00
2013	\$0.01	\$0.06
2012	\$0.07	\$0.16
2011	\$0.02	\$0.02
2010	\$0.21	\$0.00

Latest Distribution History - IEF		
	S/T Capital Gain	L/T Capital Gain
2017	\$0.00	\$0.00
2016	\$0.00	\$0.00
2015	\$0.00	\$0.00
2014	\$0.00	\$0.00
2013	\$0.00	\$0.00
2012	\$0.00	\$0.00
2011	\$0.00	\$0.00
2010	\$0.00	\$0.00



Tax Efficiency

EXHIBIT 8

Average Tax Consequences for ETFs and Mutual Funds, 1993–2017

Panel A: Average Annual Capital Gains Tax Burden, by Fund Type

Fund Type	% of Funds			Average Burden
	No CG Distributions	0%–1% Burden	>1% Burden	
Mutual Fund	4.9%	54.9%	40.2%	0.9%
ETF	53.3%	46.7%	0.0%	0.0%

Panel B: Average Annual Capital Gains and Dividend Tax Burden, by Fund Type

Fund Type	% of Funds			Average Burden
	No CG or Div Distributions	0%–1% Burden	>1% Burden	
Mutual Fund	2.3%	48.9%	48.8%	1.1%
ETF	5.3%	94.4%	0.3%	0.3%

Source: Research Affiliates, LLC, using data by Morningstar Direct.

*The results are hypothetical results and are NOT an indicator of future results and do NOT represent returns that any investor actually attained. Please see disclosures for additional information. Additional information regarding the construction of these results is available upon request. Indexes are unmanaged, do not reflect management or trading fees, and one cannot invest directly in an index.



Tax Efficiency Potentially Matters

Hypothetical Growth of 100k, Net of Fees

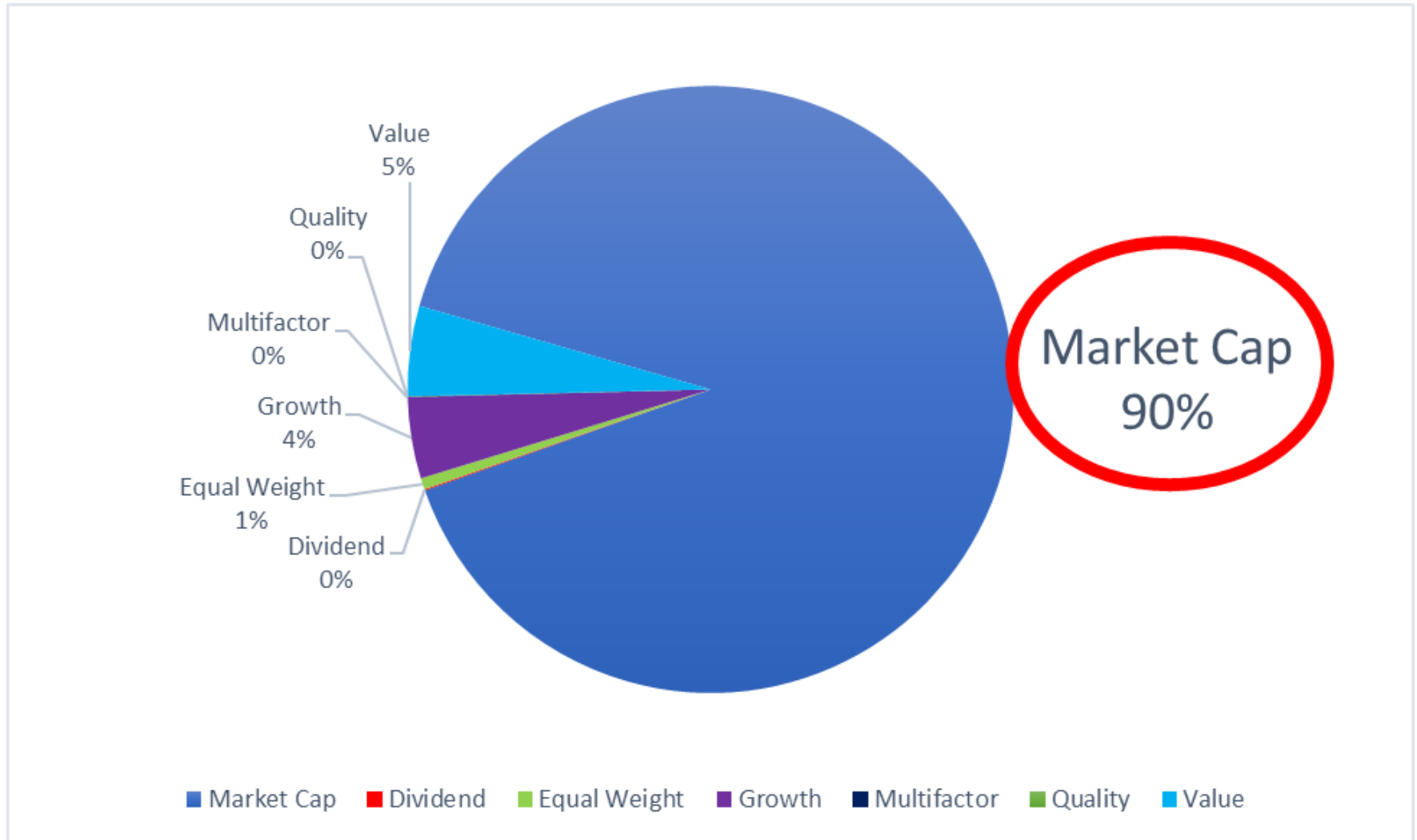


Hypothetical example, for discussion purposes only

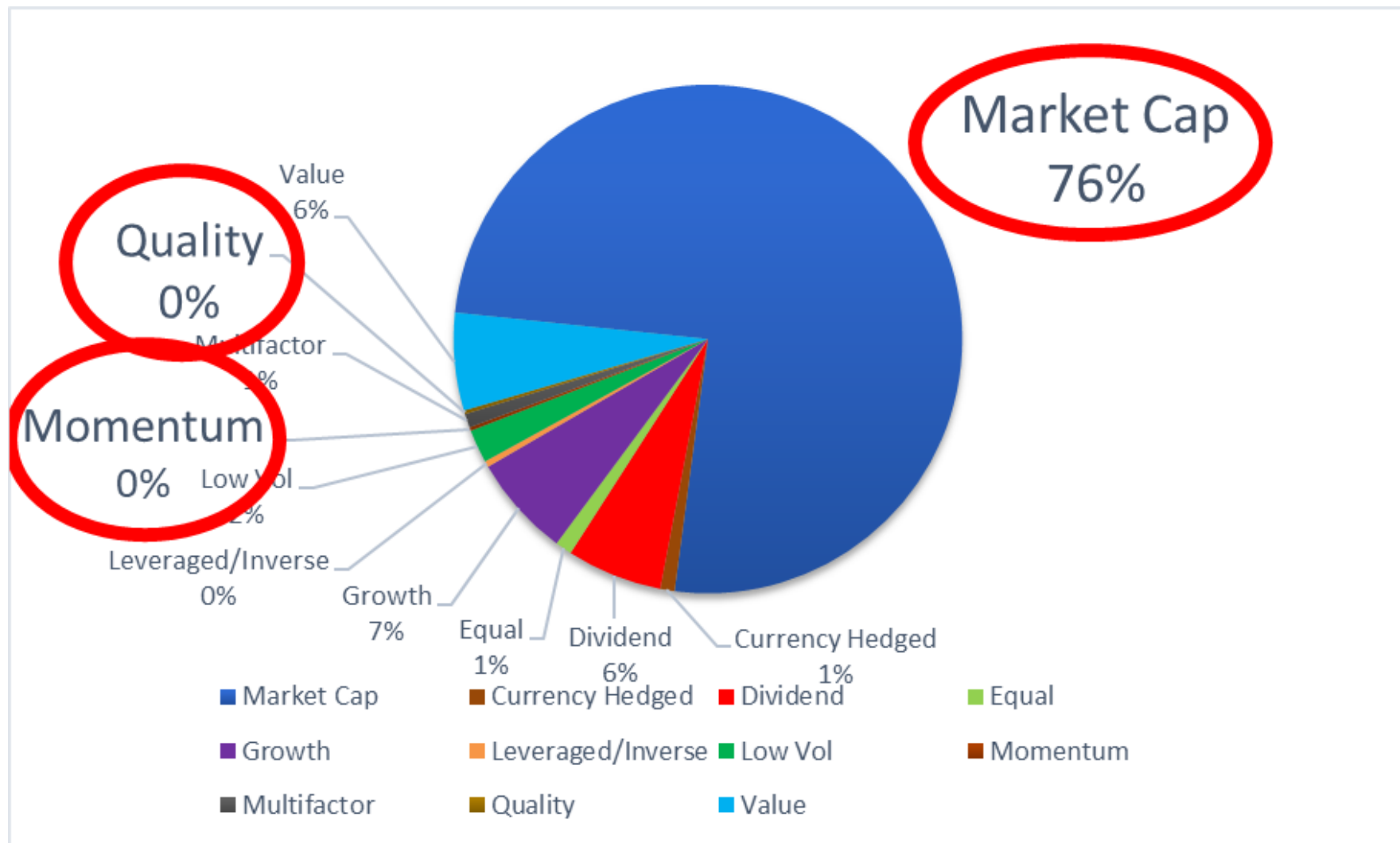
How Did We Get Here?



2005: Beta to the World



2017: Fine Tuning Factors (“Smart Beta”)



Is Factor Investing Next?



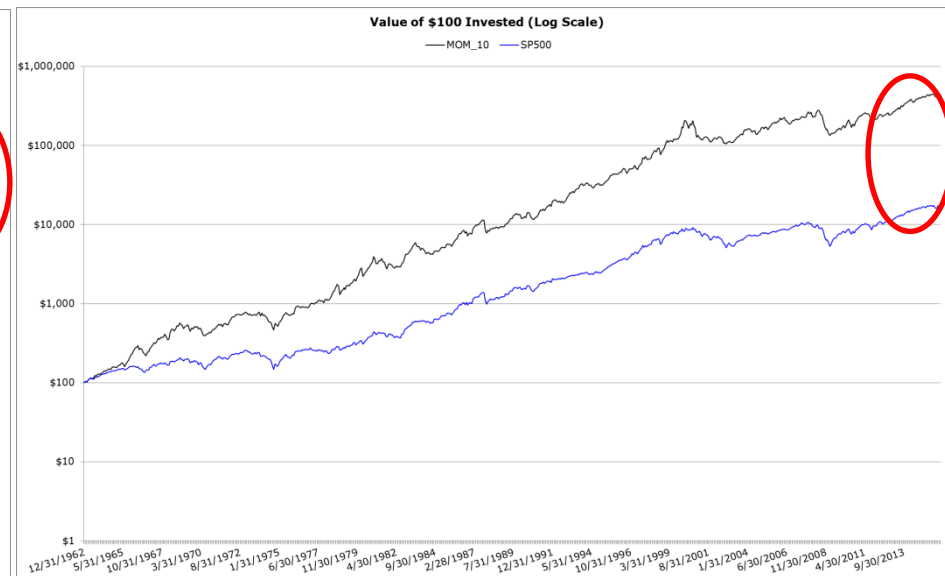
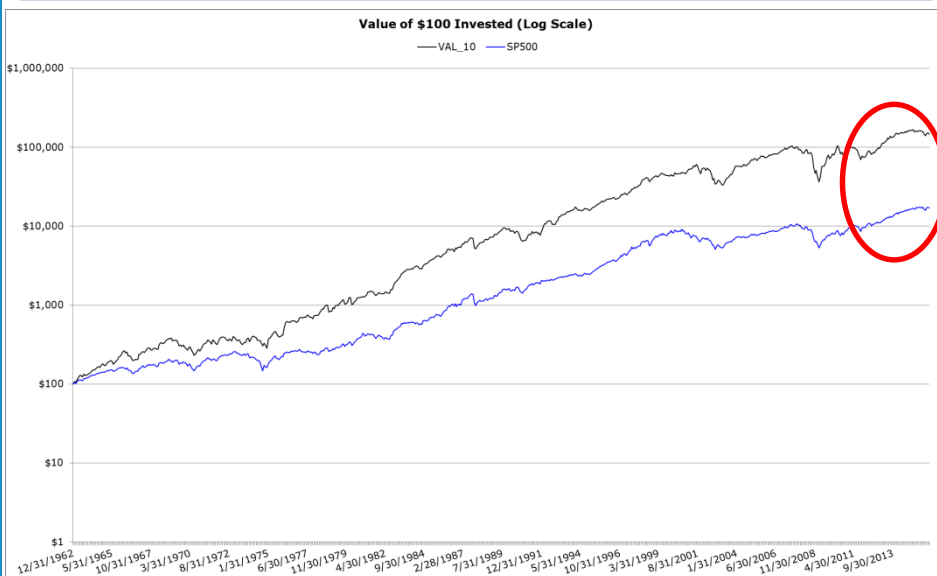
Hold on, What's a factor?



We Believe in Focused Value and Momentum Factors

Value Strategy: "Buy Cheap"

Momentum Strategy: "Buy Strong"



- **VAL_10** = Top Decile Value, mid/large cap
 - Ranked on book-to-market
 - Annually rebalanced
- **SP500** = SP500 Total Return Index
- **Simulated Performance:** 1/1/1963 to 12/31/2015
- **Net of fees:** 1% mgmt. fee, .5% transaction costs
- Total returns, including dividends and distributions

- **MOM_10** = Top Decile Momentum
 - Ranked on cumulative 12 months, skip last month
 - Monthly rebalanced
- **SP500** = SP500 Total Return Index
- **Simulated Performance:** 1/1/1963 to 12/31/2015
- **Net of fees:** 1% mgmt. fee, 2.5% transaction costs
- Total returns, including dividends and distributions

Value and momentum are anchored in risk and mispricing



We believe factors are more effective when they are Focused

Job Security or Alpha? **Pick One.**

Long-only generic momentum portfolios: CAGR

		Number of Stocks Selected each month								
		50	100	150	200	250	300	500	Universe	
Holding Period for each Stock	Alpha?	1	17.36%	15.85%	15.49%	14.01%	13.51%	12.95%	12.12%	10.27%
		2	16.35%	15.41%	15.05%	13.92%	13.28%	12.83%	12.12%	10.27%
		3	15.97%	14.68%	14.09%	13.35%	12.84%	12.53%	11.90%	10.27%
		4	15.25%	13.86%	13.58%	12.94%	12.61%	12.30%	11.78%	10.27%
		5	14.79%	13.53%	13.35%	12.71%	12.31%	12.15%	11.74%	10.27%
		6	14.15%	13.07%	13.01%	12.55%	12.20%	11.96%	11.61%	10.27%
		7	13.87%	12.86%	12.87%	12.41%	12.04%	11.81%	11.52%	10.27%
		8	13.47%	12.72%	12.70%	12.25%	11.89%	11.67%	11.43%	10.27%
		9	13.06%	12.37%	12.37%	11.97%	11.61%	11.45%	11.29%	10.27%
		10	12.57%	12.11%	12.06%	11.74%	11.42%	11.26%	11.17%	10.27%
		11	11.94%	11.73%	11.73%	11.42%	11.18%	11.05%	11.04%	10.27%
		12	11.42%	11.35%	11.39%	11.12%	10.89%	10.82%	10.89%	10.27%

- + Focused Factors **Increase** Expected Performance
- Focused Factors **Increase** Tracking Error & Volatility

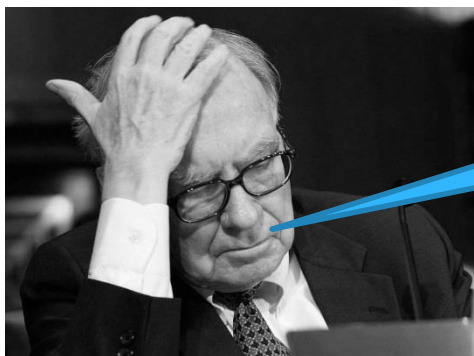
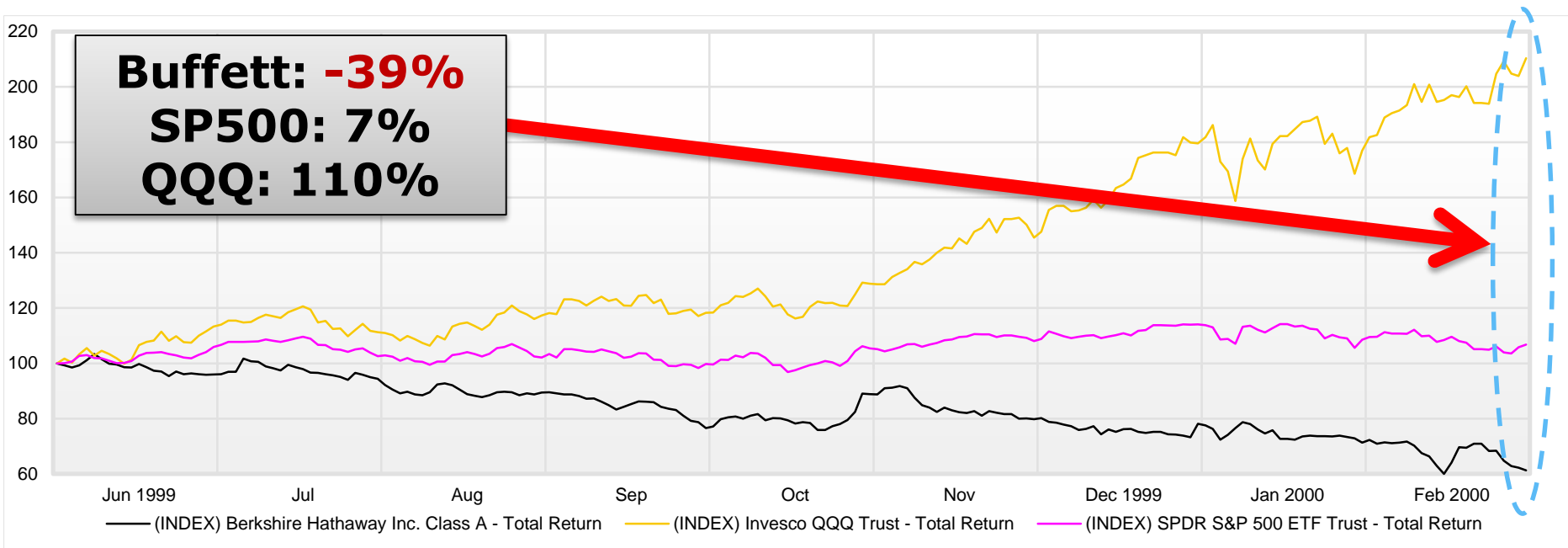


*The results are hypothetical results and are NOT an indicator of future results and do NOT represent returns that any investor actually attained. Additional information regarding the construction of these results is available upon request. Sample is from 1970 to 2016. Results are associated with a generic 2-12 momentum index strategy. Indexes are unmanaged, do not reflect management or trading fees, and one cannot invest directly in an index. All returns are gross total returns and include the reinvestment of distributions (e.g., dividends).

Great, Where Do I Sign Up?



Career Risk is Real – Value in the Late ‘90s



Charlie, should we buy tech?

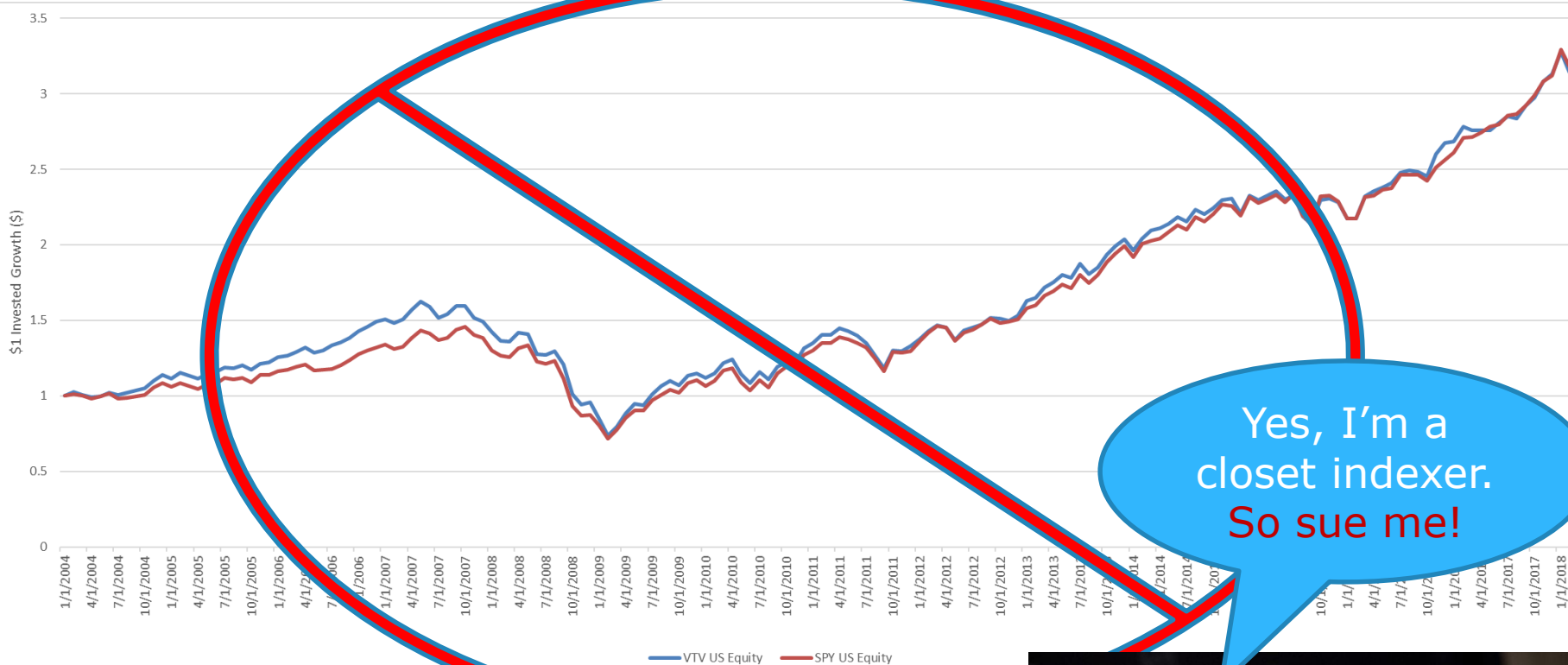


"Warren Buffett may be losing his magic touch."

Sustainable Investing Requires Perspective

Source: Factset. 6/1/1999 to 2/29/2000. The results are hypothetical results and are NOT an indicator of future results and do NOT represent returns that any investor actually attained. Please see disclosures for additional information. Additional information regarding the construction of these results is available upon request.

Closet Indexes Won't Deliver the Academic Factor Results



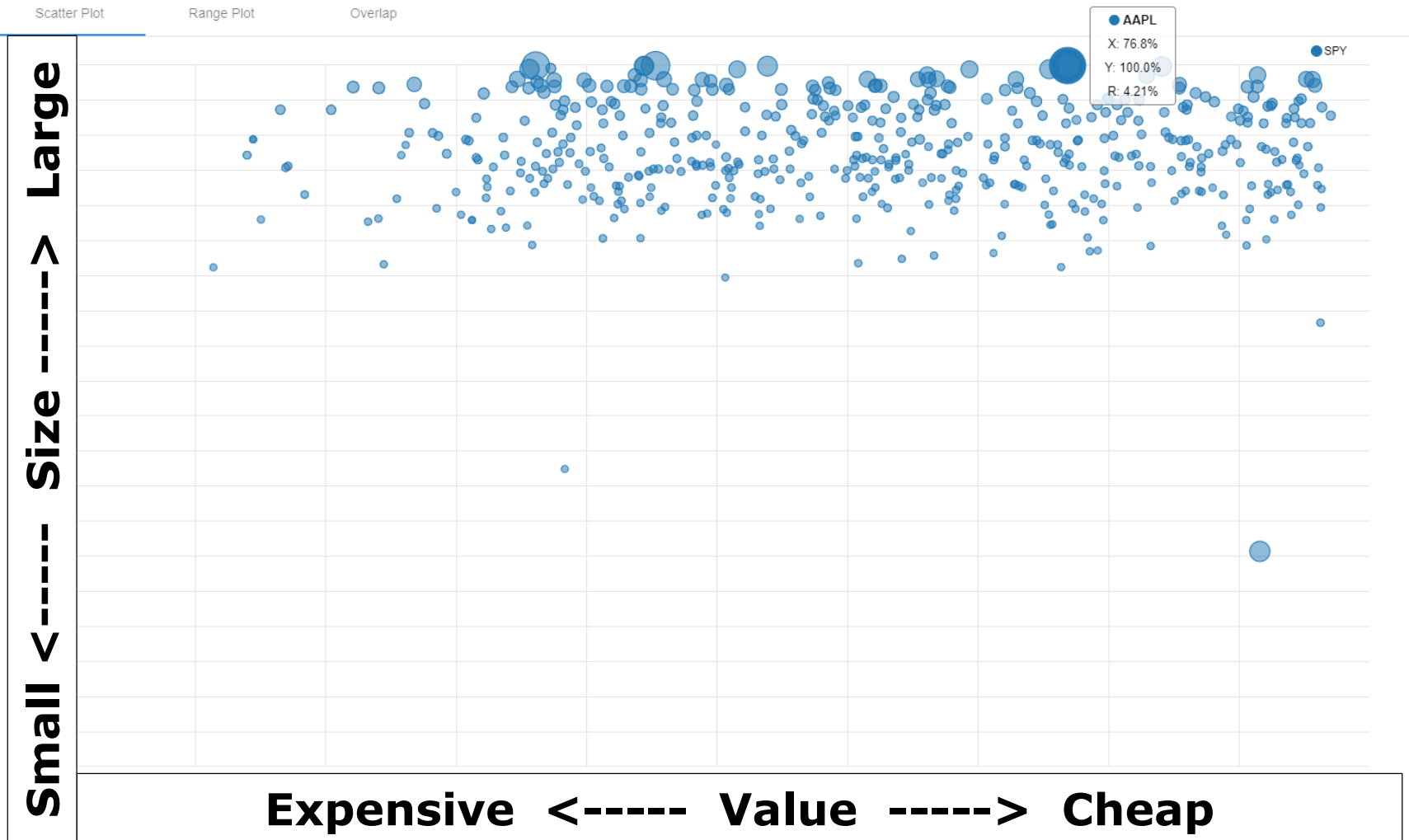
- **VTV US Equity** = Vanguard Value ETF
- **SPY US Equity** = SPDR S&P 500 ETF Trust
- **Simulated Performance:** 1/1/2004 to 2/28/2018
- Total returns, including dividends and distributions
- Past performance is not indicative of future results, which may vary. Source: Bloomberg, LP



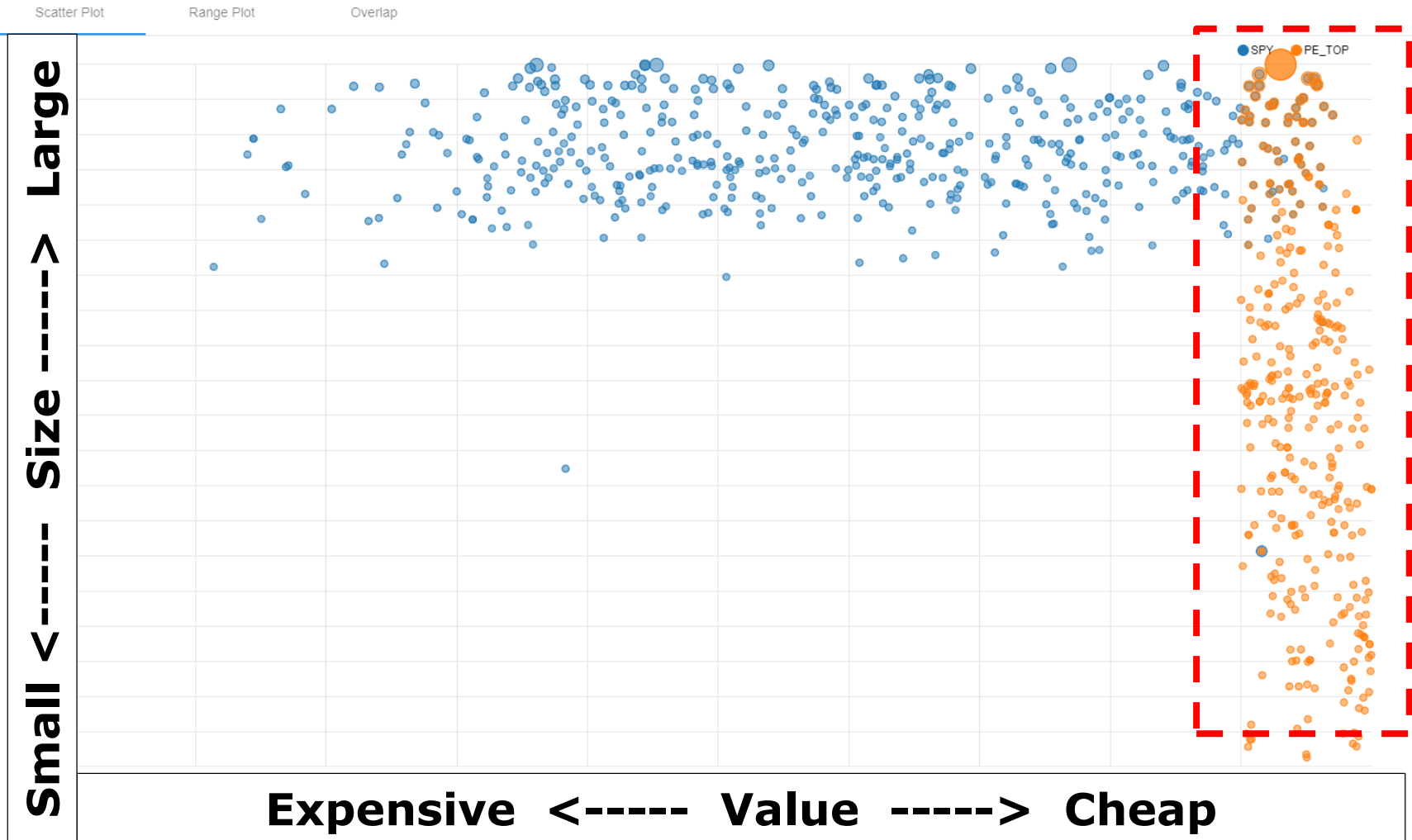
Yes, I'm a closet indexer. So sue me!



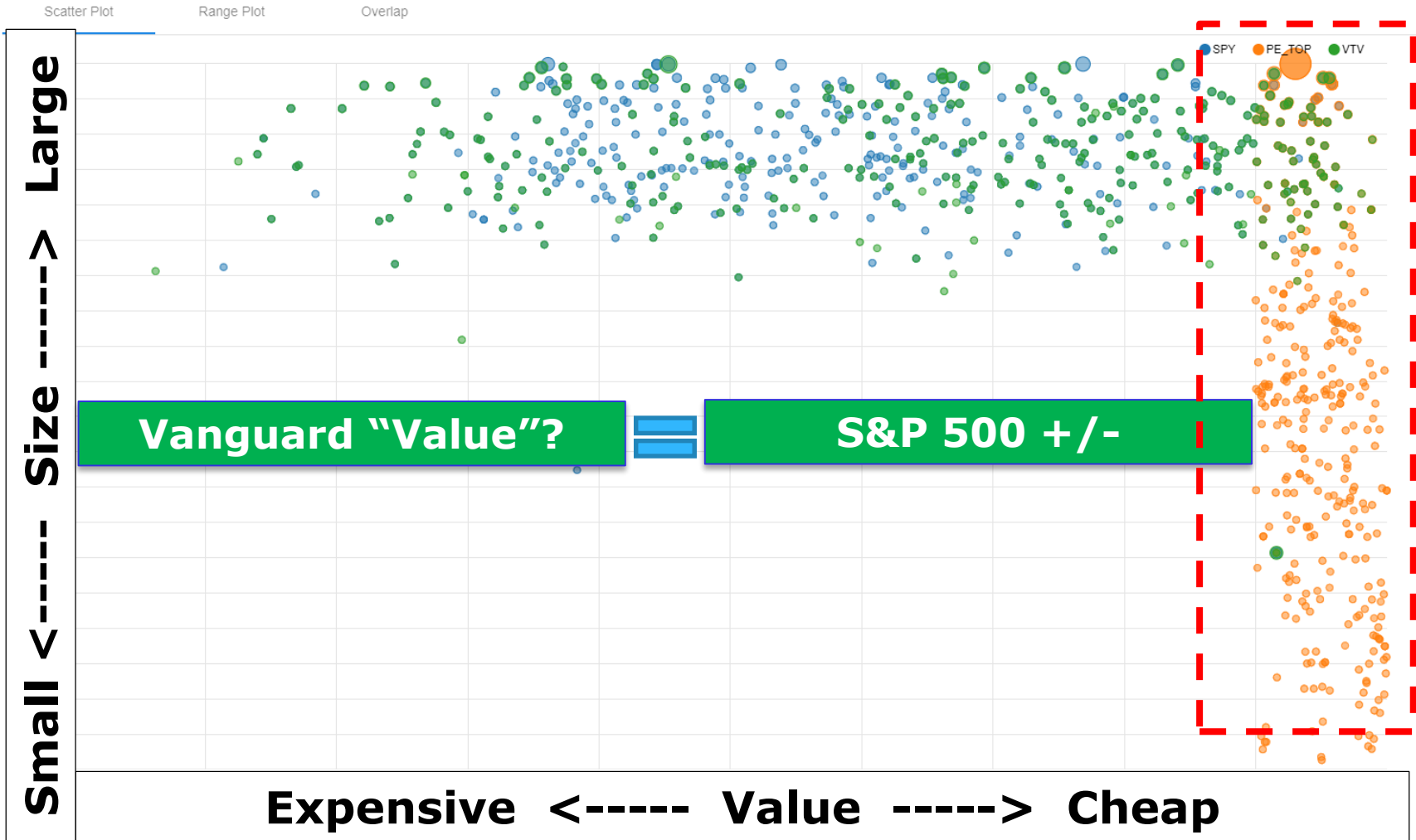
Visual Active Share



Visual Active Share

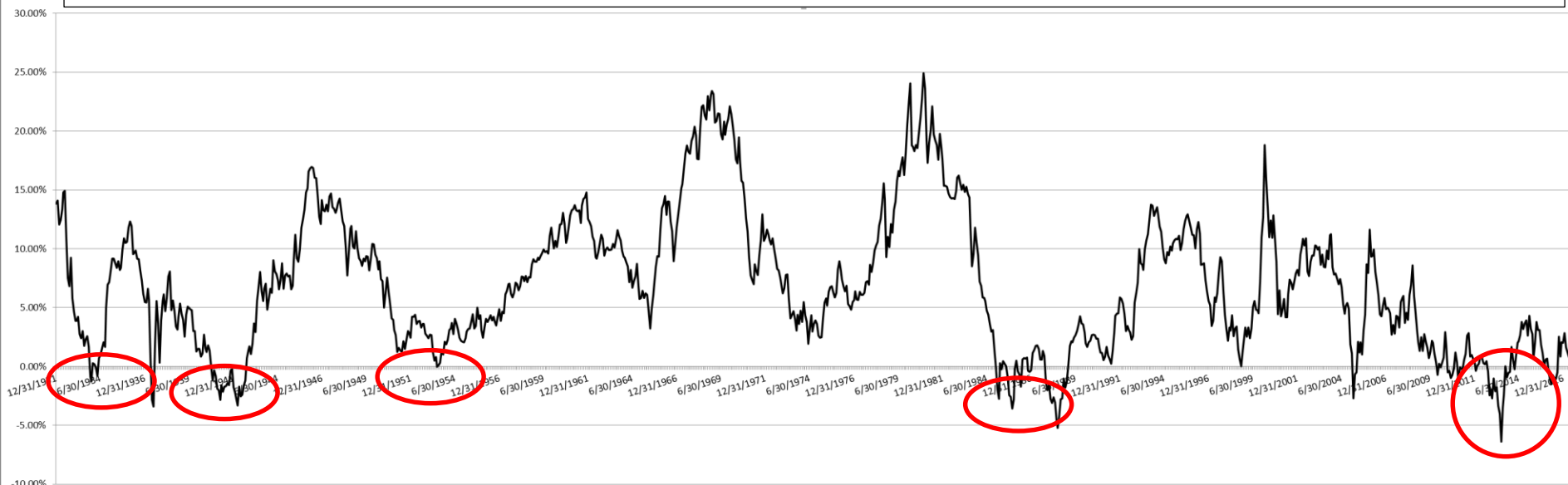


Visual Active Share



Risky: Long-only momentum portfolios can underperform!

5-Year Rolling CAGR Relative to S&P 500



High Relative Risk

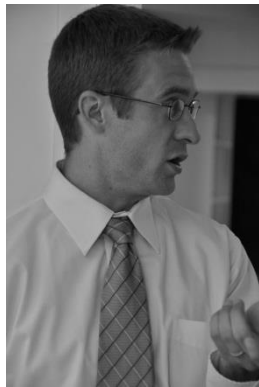
- **FF_MOM** = Top Decile Momentum
 - Ranked on cumulative 12 months, skip last month
 - Monthly rebalanced
- **SP500** = SP500 Total Return Index
- **Simulated Performance:** 1/1/1927 to 12/31/2016, Gross of fees, total returns, including dividends and distributions



Performance figures contained herein are hypothetical, unaudited and prepared by Alpha Architect, LLC; hypothetical results are intended for illustrative purposes only. Past performance is not indicative of future results, which may vary. Index returns are for illustrative purposes only and do not represent actual fund performance. Index performance returns do not reflect any management fees, transaction costs, or expenses, which would reduce returns. Indexes are unmanaged and one cannot invest directly in an index. Source: [Ken French Data](#) and Bloomberg.

Firm Mission

We Empower **Investors** Through **Education**

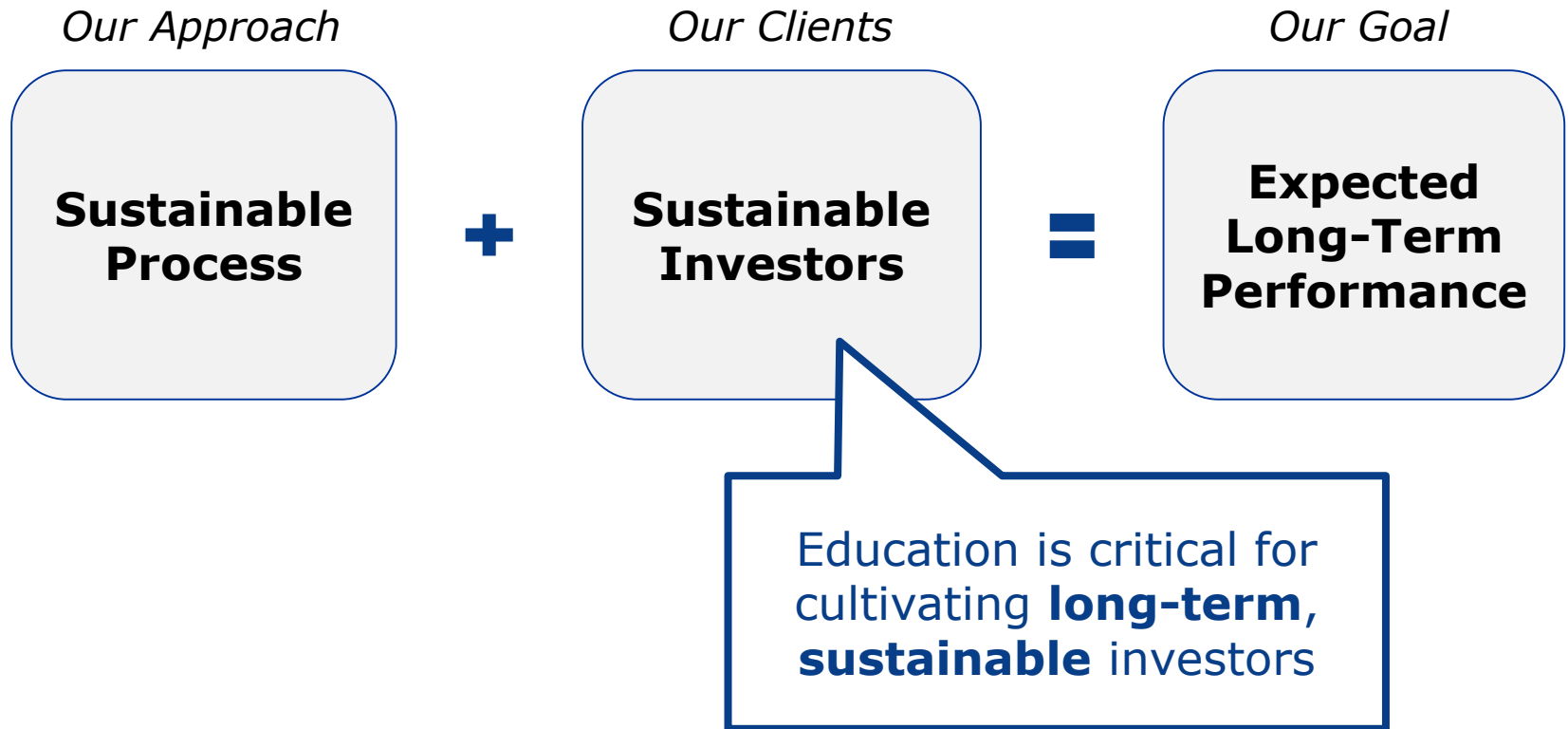


In order to

Develop Sustainable Investors



Patience and Discipline *are* “Alpha”



“Alpha” is Earned via Patience & Discipline

APPENDIX

We are Systematic Value and Momentum Thought Leaders



Wesley R. Gray, Ph.D.

- PhD/MBA, University of Chicago
- BS Economics, Wharton
- Captain, Marine Corps

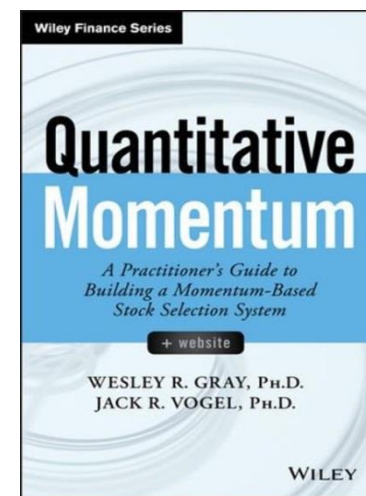
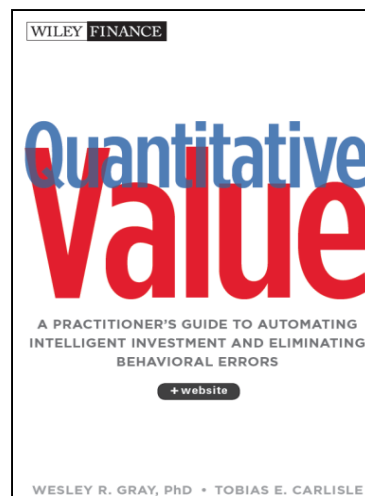
Wesley R. Gray, Ph.D. has been an active participant in financial markets throughout his career. He is the Founder, CEO and Co-CIO for Alpha Architect, an SEC-Registered Investment Advisor. Dr. Gray has published multiple academic articles and books, to include the co-authored books *Quantitative Value*, *DIY Financial Advisor*, and *Quantitative Momentum*.



Jack R. Vogel, Ph.D.

- PhD, Drexel University
- MS Mathematics, Drexel Univ.
- BS Mathematics, U. of Scranton

Jack Vogel, Ph.D., conducts research in empirical asset pricing and behavioral finance, and has collaborated with Dr. Gray on multiple projects. He is the CFO and Co-CIO for Alpha Architect, an SEC-Registered Investment Advisor. Dr. Vogel has published multiple academic articles and co-authored the books *DIY Financial Advisor*, and *Quantitative Momentum*.



"This book [QV] is an excellent primer to quantitative investing..."

--**Alex Edmans, Ph.D.**, Associate Professor of Finance, The Wharton School, University of Pennsylvania

"Gray and Carlisle take systematic value-based investing to the next level."

--**Raife Giovino, Ph.D., CFA**, Research Analyst in Scientific Active Equity, Blackrock

"Anyone interested in systematic investing should read this book [QM]..."

--**Cliff Asness, Ph.D.**, Managing and Founding Principle of AQR

"Anyone who is using, studying or incorporating momentum will find a wealth of information in the pages of *Quantitative Momentum*"

--**Chris Geczy, Ph.D.**, Founder and CEO of Forefront Analytics

"*Quantitative Momentum* is the story of momentum-based stock selection algorithms. Wes and Jack lucidly explain how and why these systems work."

--**Narasimhan Jegadeesh, Ph.D.** Dean's Distinguished Chair in Finance at Goizueta Business School

***The recommendations are directed towards the quality of the book and are not an endorsement of advisory services provided by Alpha Architect, LLC or affiliates. Alpha Architect does not know if the recommenders approve or disapprove of its services. The recommendations were chosen from a list of formal recommendations based on if the author had a PhD or not.



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There are risks involved with investing, including loss of principal. There is no assurance that the objectives of any strategy or fund will be achieved or will be successful. No investment strategy, including diversification, can protect against market risk or loss. Current and future portfolio holdings are subject to risk. Past performance does not guarantee future results.

There is a risk of substantial loss associated with trading commodities, futures, options and other financial instruments. Before trading, investors should carefully consider their financial position and risk tolerance to determine if the proposed trading style is appropriate. Investors should realize that when trading futures, commodities and/or granting/writing options one could lose the full balance of their account. It is also possible to lose more than the initial deposit when trading futures and/or granting/writing options. All funds committed to such a trading strategy should be purely risk capital.

Certain economic and market information contained herein has been obtained from published sources prepared by other parties, which in certain cases have not been updated through the date hereof. While such sources are believed to be reliable, neither Alpha Architect nor its affiliates assumes any responsibility for the accuracy or completeness of such information and such information has not been independently verified by Alpha Architect.

Index returns are for illustrative purposes only and do not represent actual fund performance. References to an index do not imply that the portfolio will achieve returns, volatility or other results similar to that index. The composition of the index may not reflect the manner in which a portfolio is constructed in relation to expected or achieved returns, portfolio guidelines, restrictions, sectors, correlations, concentrations, volatility or tracking error targets, all of which are subject to change. Index performance returns do not reflect any management fees, transaction costs, or expenses, which would reduce returns.

Indexes are unmanaged and one cannot invest directly in an index. There are no active components of indexes; therefore, using them as a proxy can be of limited value because there is no guarantee that the portfolio would have been managed to match the index. Realized returns and/or volatility may come in higher or lower than expected.

Annual performance is calculated based on monthly return streams, geometrically linked as of the end of the specified month end.

Results, unless cited otherwise, are shown gross of fees and do not reflect the effect of investment fees which would lower performance. Performance reflects the reinvestment of dividends and other earnings. The following hypothetical illustrates the compound effect fees have on investment return: For an account charged 1% with a stated annual return of 10%, the net total return before taxes would be reduced from 10% to 9%. A ten year investment of \$100,000 at 10% would grow to \$259,374, and at 9%, to \$236,736 before taxes. For a complete description of all fees and expenses, please refer to Alpha Architect's Form ADV Part 2A.



IMPORTANT INFORMATION - DISCLOSURES

Performance figures contained herein are hypothetical, unaudited and prepared by Alpha Architect, LLC; hypothetical results are intended for illustrative purposes only.

Past performance is not indicative of future results, which may vary.

Hypothetical performance results (e.g., quantitative backtests) have many inherent limitations, some of which, but not all, are described herein. No representation is being made that any fund or account will or is likely to achieve profits or losses similar to those shown herein. In fact, there are frequently sharp differences between hypothetical performance results and the actual results subsequently realized by any particular trading program. One of the limitations of hypothetical performance results is that they are generally prepared with the benefit of hindsight. In addition, hypothetical trading does not involve financial risk, and no hypothetical trading record can completely account for the impact of financial risk in actual trading. For example, the ability to withstand losses or adhere to a particular trading program in spite of trading losses are material points which can adversely affect actual trading results. The hypothetical performance results contained herein represent the application of the quantitative models as currently in effect on the date first written above and there can be no assurance that the models will remain the same in the future or that an application of the current models in the future will produce similar results because the relevant market and economic conditions that prevailed during the hypothetical performance period will not necessarily recur. There are numerous other factors related to the markets in general or to the implementation of any specific trading program which cannot be fully accounted for in the preparation of hypothetical performance results, all of which can adversely affect actual trading results. Hypothetical performance results are presented for illustrative purposes only.

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IMPORTANT INFORMATION - DEFINITIONS

- **CAGR:** Compound annual growth rate
- **Standard Deviation:** Sample standard deviation
- **Downside Deviation:** Sample standard deviation, but only monthly observations below 41.67bps (5%/12) are included in the calculation
- **Sharpe Ratio (annualized):** Average monthly return minus treasury bills divided by standard deviation
- **Sortino Ratio (annualized):** Average monthly return minus treasury bills divided by downside deviation
- **Appraisal Ratio (annualized):** CAPM regression intercept estimate divided by regression residual volatility
- **Worst Drawdown:** Worst peak to trough performance (measured based on monthly returns)
- **Rolling X-Year Win %:** Percentage of rolling X periods that a strategy outperforms
- **Sum (5-Year Rolling MaxDD):** Sum of all 5-Year rolling drawdowns
- **Down %:** The Down Number Ratio is a measure of the number of periods that the investment was down when the benchmark was down, divided by the number of periods that the benchmark was down. The smaller the ratio, the better
- **Up %:** The Up Number Ratio is a measure of the number of periods that the investment was up when the benchmark was up, divided by the number of periods that the benchmark was up. The larger the ratio, the better
- **Tracking Error:** Tracking Error is measured by taking the square root of the average of the squared deviations between the investment's returns and the benchmark's returns
- **Negative Correlation:** Correlation of returns relative to benchmark returns when the benchmark is negative
- **Positive Correlation:** Correlation of returns relative to benchmark returns when the benchmark is positive





QUESTIONS?

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