

December 2020



North Carolina Supplemental Retirement Plans

SMID Cap Equity Structure
Recommendations

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Basic Tenets of Manager Structure

Guiding Principles

Periodically, plan sponsors should evaluate the investment structures of custom investment options in the context of other reasonable alternatives. The NCSRP Statement of Investment Policy has delegated that responsibility to the Board. Callan believes the following:

- Structure should reflect asset class role
 - Equity provides growth as the result of higher risk
 - Asset classes that focus on capital growth will have characteristics that differ from those whose role is risk reduction or diversification
- The starting place is neutral to the broad market
 - Style, capitalization, and regional exposure for international equity
 - Deviations are warranted only where there are opportunities to strategically add value
- Simplicity
 - Enough managers to cover all areas of the market and diversify relationships without overlapping mandates
 - Fewer managers simplifies monitoring and reduces cost
- Implementation
 - Be mindful of disruptive changes and transaction costs

Evaluating Structure Alternatives

Practical Considerations

When Callan is evaluating hypothetical multi-manager options, we:

- Do not want performance alone to be the driver of the decision
- Want to minimize unintended bias
- Favor pairings where active positions provide an ability to outperform; but characteristics are not outliers among the peer group
- Look for consistency and improvement in risk-adjusted return
 - Critical to understand drivers of performance and persistence
 - Downside protection is a positive but often comes at the expense of consistency
 - Look for more efficiency in Sharpe Ratio, Alpha, Information Ratio through reductions in risk characteristics
- Look at fees, but place greater emphasis on the cost of the option vs. the peer group

Callan

Small/Mid Cap Equity Structure Options

History and Background

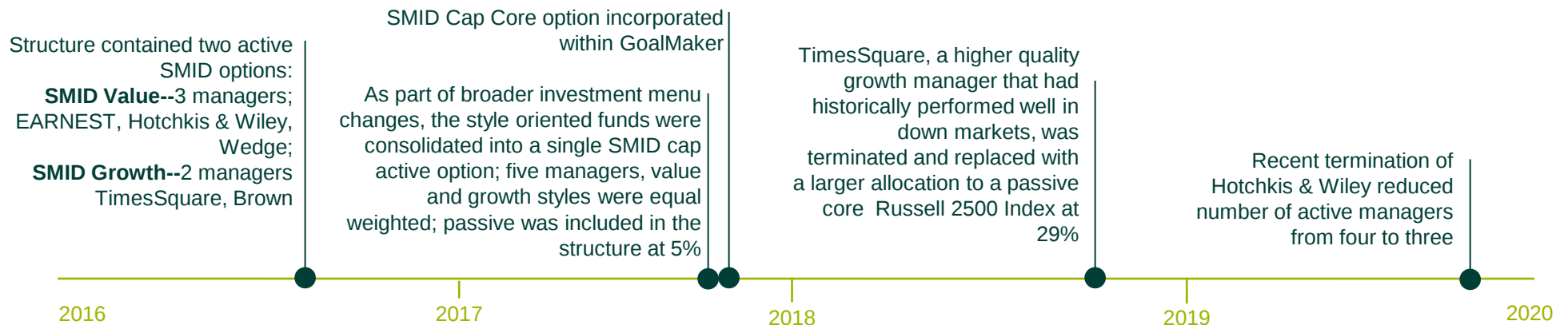
NC SRP SMID Cap Equity Fund

What is the current structure?

- With the recent termination of Hotchkis & Wiley, the NC SRP SMID Cap equity option consists of three underlying active managers and one passive manager: 23.75% Wedge Small Cap Value, 23.75% EARNEST SMID Value, 23.75% Brown Small Cap Growth, 28.75% Blackrock Russell 2500 Index fund

Why are we re-evaluating?

- The Board has a fiduciary obligation to periodically review any structural biases and document whether the biases are intentional and appropriate
- The current structure has a 2:1 value style bias
- The style bias also introduces misfit risk, which is an uncompensated risk (i.e. the benchmark for the option is the Russell 2500, which does not have a 2:1 value bias)
- More optimal structures may exist



Revisiting the Recommendations

North Carolina SMID Cap Equity Fund

Eliminate Style Bias (and Benchmark Tracking Risk)

- Reduce the level of passive management within the “active” option
 - Participants can express their preference for passive implementation through the Passive SMID Cap option
 - The median Institutional Small/Mid cap active manager has generally demonstrated an ability to add value after consideration of fees
 - Historical cash flows have not necessitated a liquidity sleeve (less than 1% over the last year)
- Equal weight value and growth styles
 - Potential addition of an active strategy to complement existing managers in the structure

Methodology

Revisit the existing manager weightings and evaluate whether alternatives exist that improve upon the existing weightings, while at the same time not biasing the existing allocation in terms of the benchmark's market capitalization weighting or style.

We evaluated several hypothetical portfolios, highlighting the following metrics:

- **Information ratio:** in order to assess value (if any) added over the benchmark while also penalizing volatility (in the form of tracking error).
- **Combined Z-Score:** to assess style (growth, core or value) tilts in the existing as well as prospective manager combinations.
- **Tracking Error:** Standalone tracking error will help to assess how closely the portfolio is tracking the respective benchmark.
- **Downside Capture:** This measure details how much a given portfolio decreases relative to the benchmark in a market. For example, a downside capture of 105 indicates the portfolio fell by 5% more than the benchmark.
- **Market Capitalization:** This measure along with the z-score indicates how well a portfolio is matching the benchmark from a size perspective.

Alternative SMID Cap Equity Structures

Neutralize Style Bias

Reduce Passive

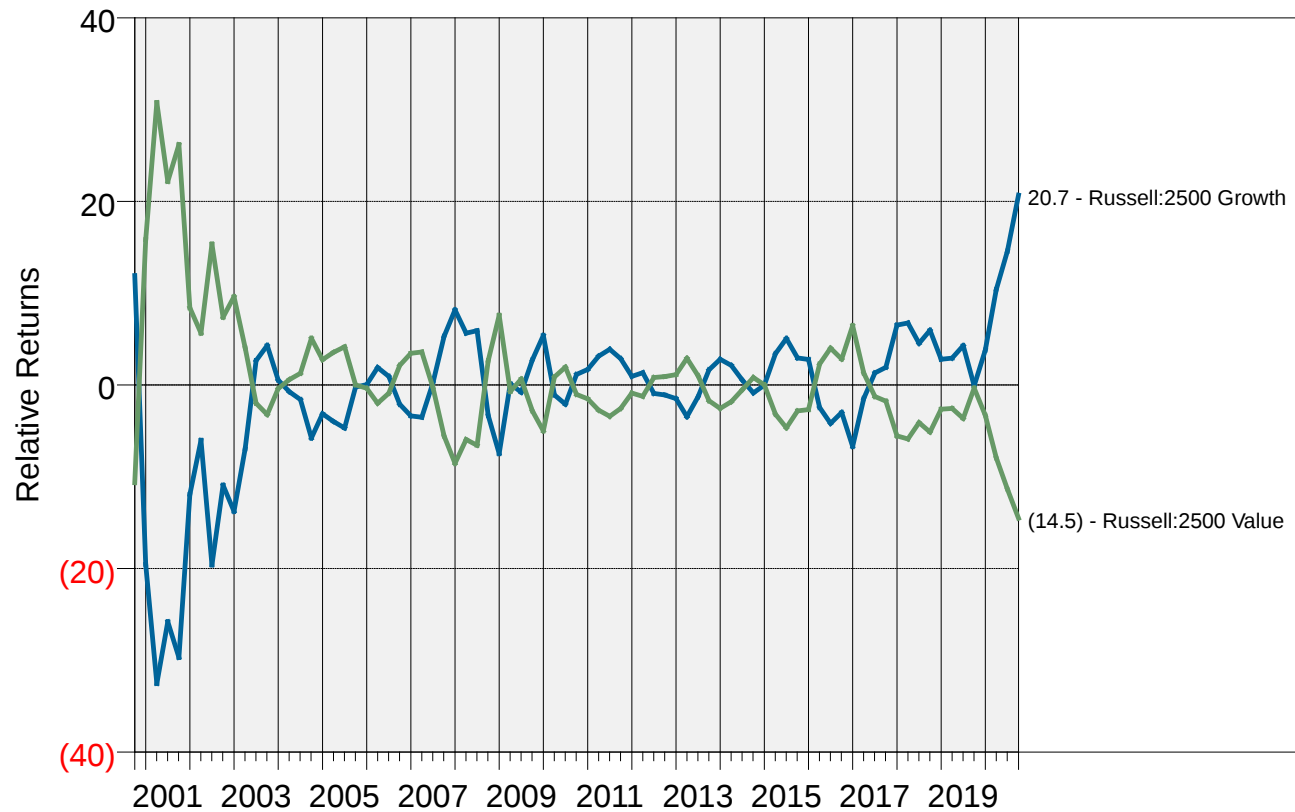
		Mix 1 (4 active managers; 1 passive)		Mix 2 (3 active managers; 1 passive)		Mix 3 (3 active managers; 2 passive)	
Manager	Current Structure	%		%		%	
	% of SMID	%		%		%	
SMID	100.00%	100.00%		100.00%		100.00%	
Russell 2500 value (active)	47.50%	45.00%		30.00%		47.50%	
Russell 2500 growth (active)	23.75%	45.00%		30.00%		23.75%	
Russell 2500 (active core)	--	--		30.00%		--	
Russell 2500 (passive core)	28.75%	10.00%		10.00%		5.00%	
Russell 2500 growth (passive)	--	--		--		23.75%	
Total	100.00%	100.00%		100.00%		100.00%	
		Mix 1		Mix 2		Mix 3	
Statistics (7 years ending 09/20)		Russell 2500 Current					
Standard Deviation	19.88 19.74	19.88		19.28		19.88	
Net Excess Return (annualized)	-- 0.44	1.40		1.21		1.41	
Tracking Error (vs. Russell 2500)	-- 1.53	2.08		1.95		1.94	
MSCI Combined z-score	-0.15 -0.2	-0.02		-0.09		-0.03	
Weighted Median Market Cap	4.35 4.64	4.67		4.05		4.68	
Up Market Capture	-- 104.40	109.99		107.61		110.32	
Down Market Capture	-- 98.25	95.38		95.16		96.19	
Estimated Fees	-- 0.33%	0.44%		0.41%		0.33%	

- Mix 1 retains all existing strategies and adds an active SMID cap growth manager, re-weighting value and growth to be style neutral
- Mix 2 repurposes an active SMID value manager with an active SMID core mandate, for a more neutral style positioning
- Mix 3 introduces a Russell 2500 Growth index fund and equally weights value and growth styles

Long-Term Style Performance

Growth Vs. Value

Rolling 4 Quarter Relative Returns Relative To Russell:2500 Index
for 20 Years Ended September 30, 2020

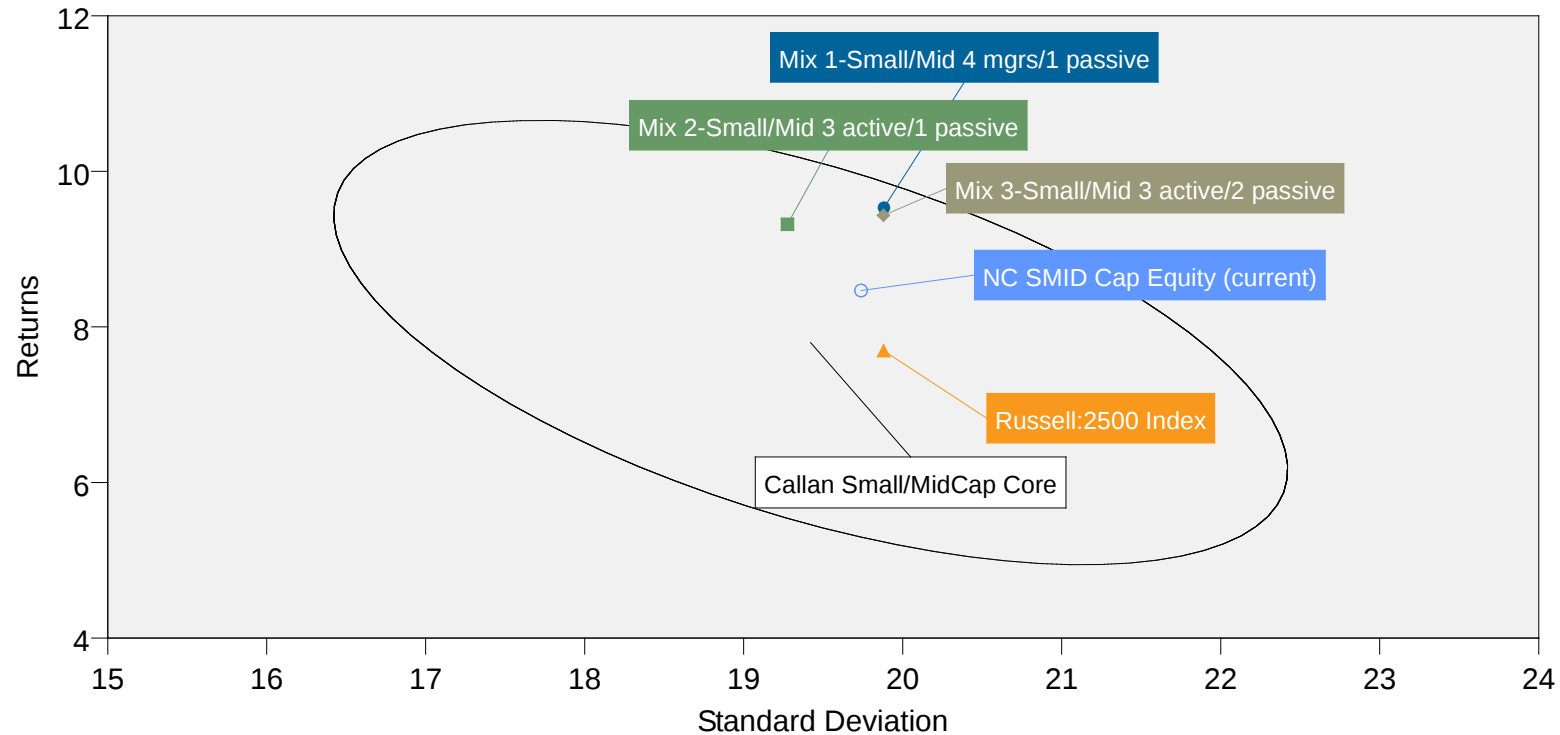


Over time, growth and values styles go in and out of favor

These cycles are not predictable and vary in magnitude and duration

Return vs. Risk

Scatter Chart
for 7 Years Ended September 30, 2020



- Mix 1 has captured greater return (>1% per annum) with modestly more risk (mix 1 standard deviation of 19.88 vs. current standard deviation of 19.74)
- Mix 2 has increased return with modestly less risk (standard deviation)

Active Management Performance

Empirical Data Suggests Small and SMID Equity is a Good Hunting Ground for Alpha

Style Group	Benchmark	Annualized Historical Gross Excess Returns
SMID Cap Broad	Russell 2500	0.65%
SMID Cap Value	Russell 2500 Value	0.66%
SMID Cap Growth	Russell 2500 Growth	0.95%
Small Cap Broad	Russell 2000	1.56%
Small Cap Value	Russell 2000 Value	1.49%
Small Cap Growth	Russell 2000 Growth	1.48%

Based on 20 years of rolling 3 year median manager returns (Period Q4 2000-Q3 2020)

- The median active manager has outperformed its benchmark after fees across the various style groups
- The appendix contains additional detail on active manager performance by style from Callan's manager peer groups

Callan

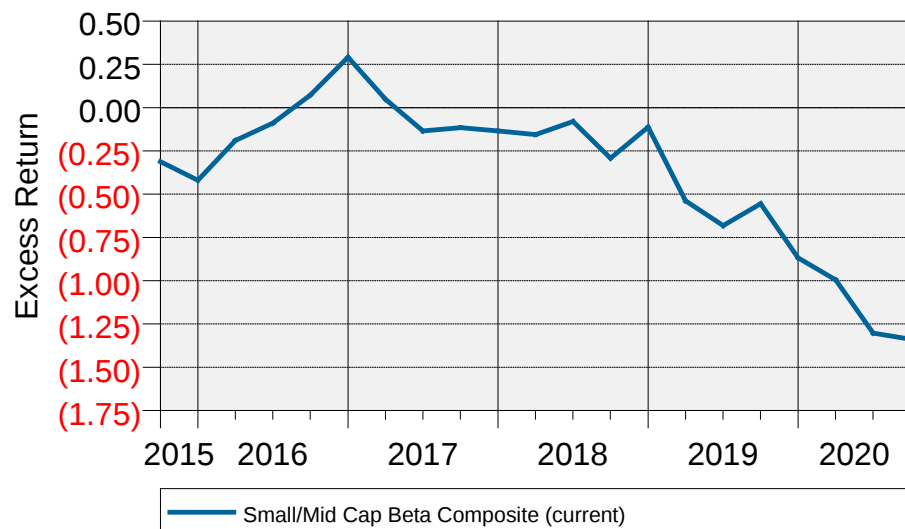
Appendix

North Carolina Small/Mid Cap Equity

Benchmark Tracking Risk

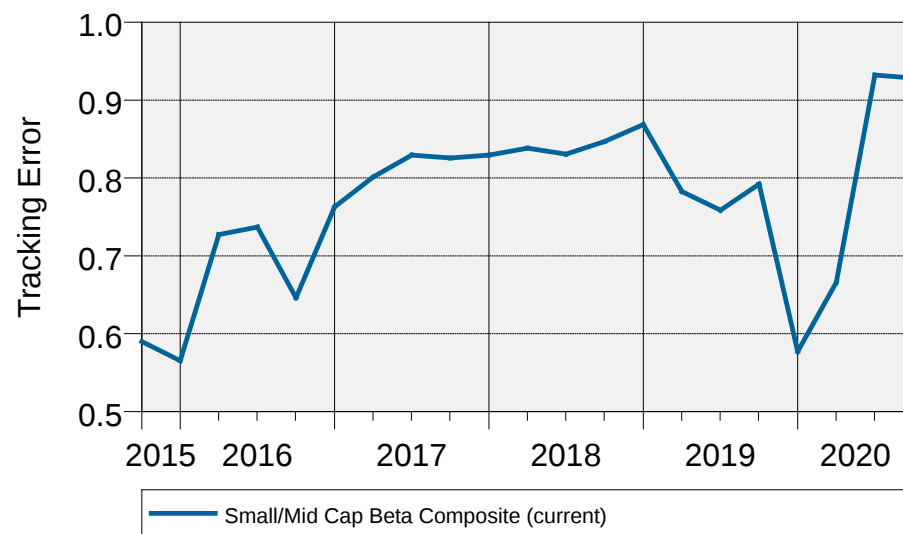
Excess Return

Rolling 12 Quarter Excess Return Relative To Russell:2500 Index for 5 Years Ended September 30, 2020



Tracking Error

Rolling 12 Quarter Tracking Error Relative To Russell:2500 Index for 5 Years Ended September 30, 2020



The Beta Composite represents the underlying benchmarks of the strategies relative to the Russell 2500 Index

Beta Composite = 47.5% Russell 2500 Value; 28.75% Russell 2500; 23.75% Russell 2500 Growth

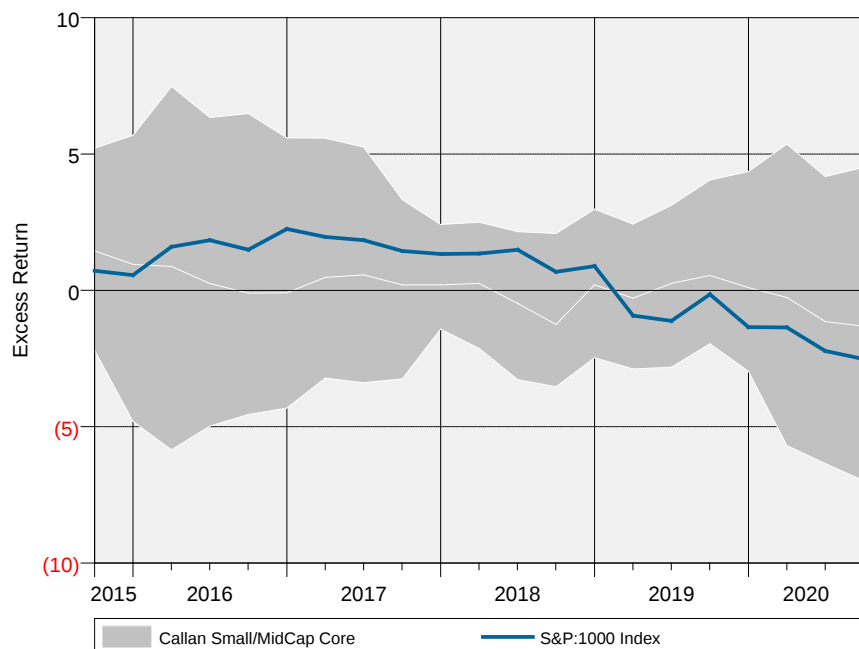
Before accounting for the performance of the active managers, approximately 1.3% of underperformance was caused by the 2:1 value bias

Between 33% to 50% of the Tracking Error of the current portfolio is a result of the 2:1 value bias—this is not a compensated risk

Index Quality

Broad Small/Mid Index

Rolling 12 Quarter Excess Return Relative To Russell:2500 Index
for 5 Years Ended September 30, 2020



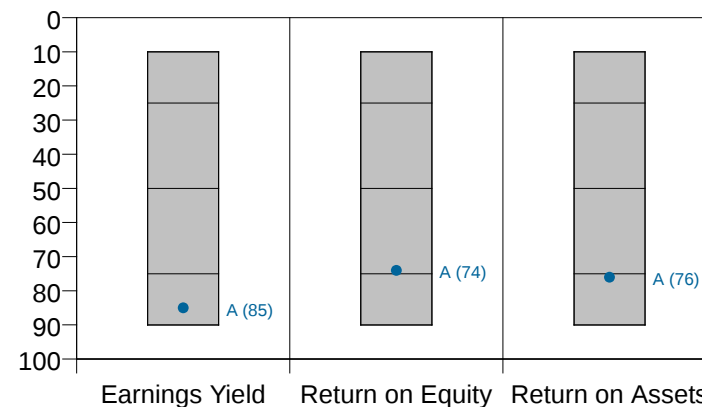
Comparison of Russell 2500 Index to the S&P 1000 Index, which is a small/mid cap index that has an earnings requirement for inclusion, suggests quality has underperformed since 2019.

S&P Index series does not typically own early stage technology and biotech companies

Statistics

for 1 Quarter Ended September 30, 2020

Group: Callan Small/MidCap Broad



	Earnings Yield	Return on Equity	Return on Assets
10th Percentile	4.77	14.22	3.53
25th Percentile	3.75	11.57	2.70
Median	2.69	8.16	1.16
75th Percentile	1.74	4.83	(0.57)
90th Percentile	0.45	0.81	(1.40)
Russell:2500 Index • A	1.14	5.06	(0.66)

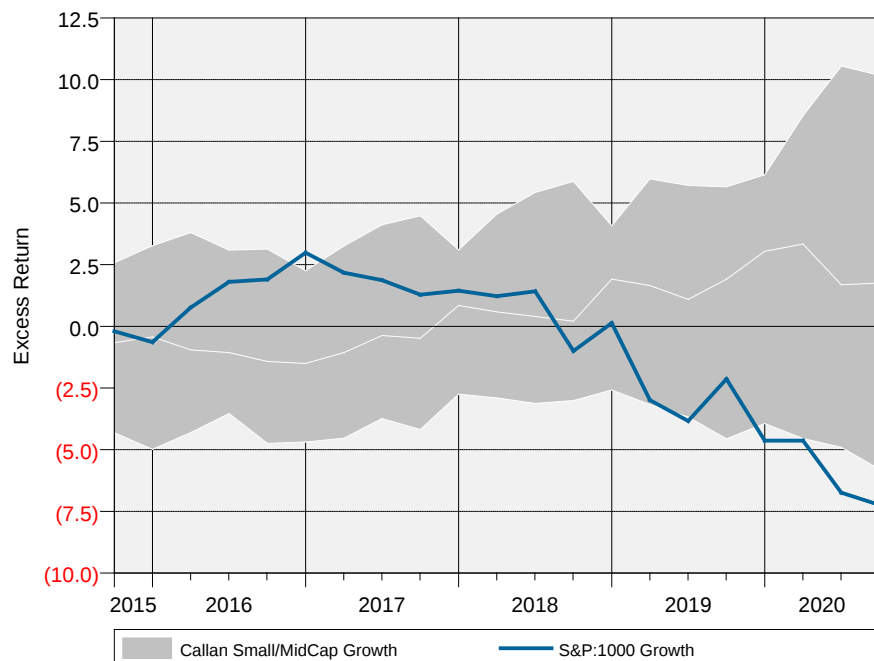
The Earnings Yield on the R2500 index has is lower (i.e. higher P/E) than most of peer group

Return on equity and return on assets below median of peers, suggesting lower quality; both metrics at multi-year lows for the index

Index Quality

Russell 2500 Growth Index

Rolling 12 Quarter Excess Return Relative To Russell:2500 Growth
for 5 Years Ended September 30, 2020

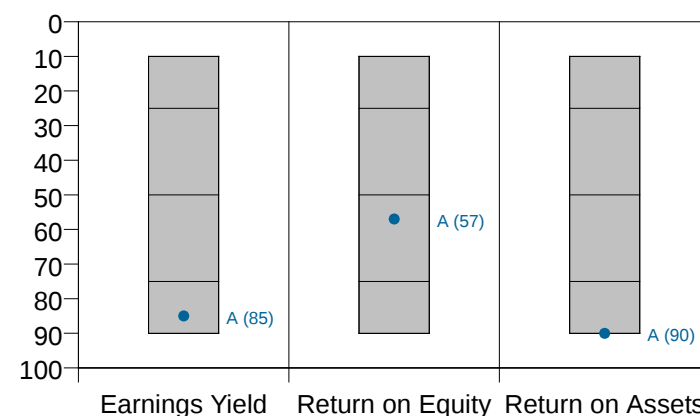


The performance dispersion between the Russell 2500 Growth Index to the S&P 1000 Growth Index is even more acute due to the higher proportion of non-earners in the Russell 2500 Growth

Statistics

for 1 Quarter Ended September 30, 2020

Group: Callan Small/MidCap Growth



10th Percentile	1.86	5.58	0.96
25th Percentile	1.66	5.00	(0.06)
Median	0.91	3.38	(0.73)
75th Percentile	0.38	(2.23)	(1.15)
90th Percentile	(0.29)	(2.35)	(2.20)

Russell:2500 Growth ● A (0.01) 1.98 (2.17)

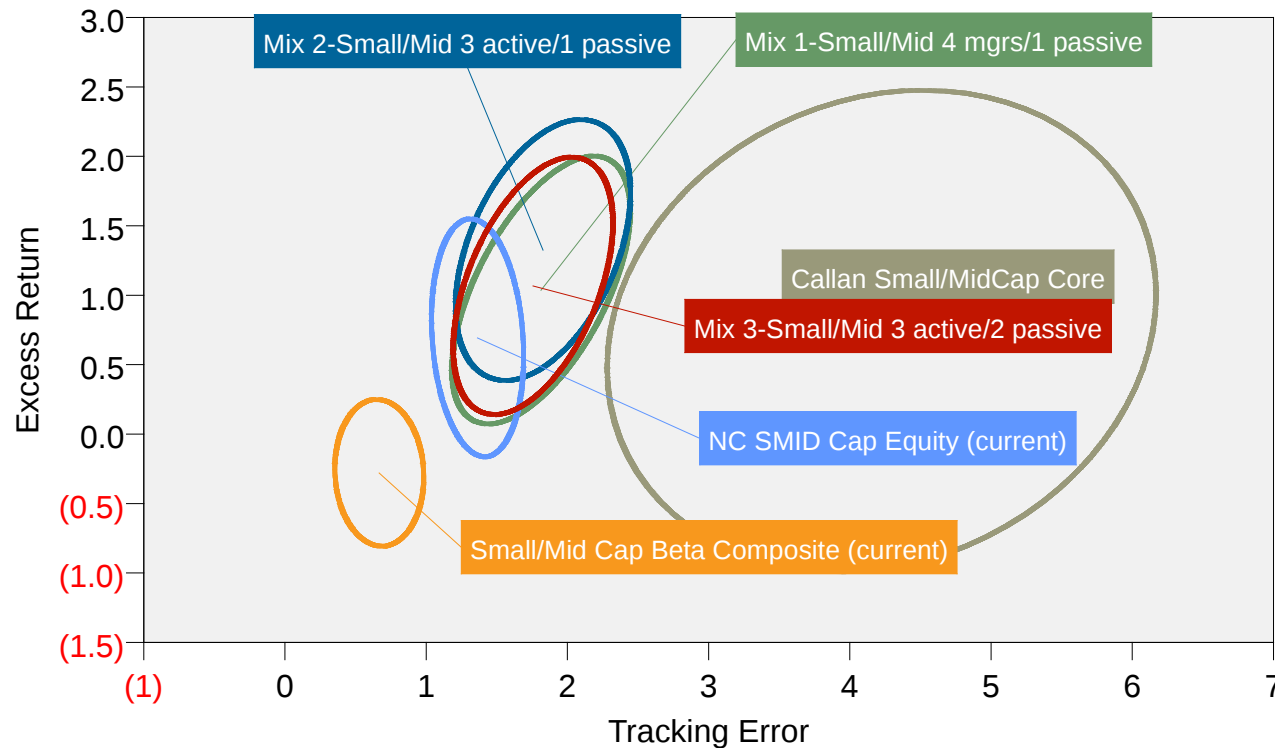
The Earnings Yield on the R2500 Growth index has turned negative, and is more expensive than 85% of active managers in the peer group

Return on equity and return on assets below median of peers, suggesting most active managers are higher quality than that of the index; both at historical lows

North Carolina Small/Mid Cap Equity

Outperformance and Risk (Tracking Error)

Rolling 12 Quarter Scatter Chart
for 10 Years Ended September 30, 2020
Benchmark:



Despite the larger allocation to passive management in the current structure--the consistency (as measured by batting average) is not improved and relative drawdowns are mixed

The tracking error of the current structure is lower as a result of the large allocation to passive R2500 index

The Beta composite demonstrates the uncompensated risk inherent in the value bias

Hypothetical Portfolio Inputs

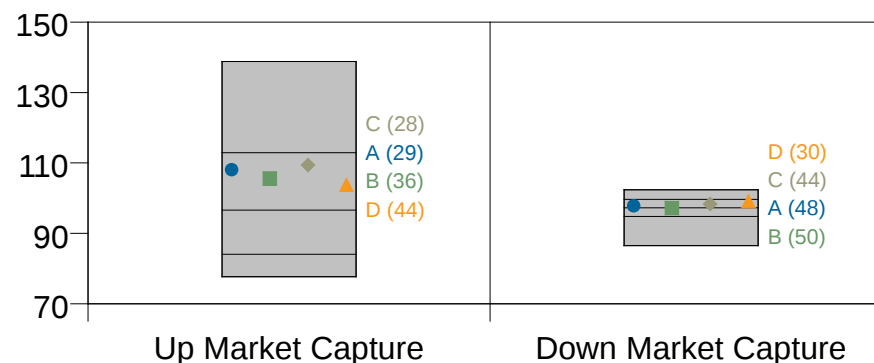
Manager	Current	Mix 1	Mix 2	Mix 3
Earnest Partners SMID Value	23.75%	22.50%		23.75%
Wedge SMID Value	23.75%	22.50%	30.00%	23.75%
Brown Advisory SMID Value	23.75%	22.50%	30.00%	23.75%
Russell 2500 Index	28.75%	10.00%	10.00%	5.00%
New Active SMID Growth Manager (Median of SMID Growth Peer Group)		22.50%		
Earnest Partners SMID Core			30.00%	
Russell 2500 Growth Index				23.75%

Composites used for historical return, risk, fees and characteristics

All portfolios assume quarterly rebalancing

Up Market / Down Market Capture

Statistics relative to Russell:2500 Index
for 12 Years Ended September 30, 2020
Group: Callan Small/MidCap Core



10th Percentile	138.83	102.40
25th Percentile	112.96	99.69
Median	96.63	97.30
75th Percentile	84.12	94.87
90th Percentile	77.72	86.53

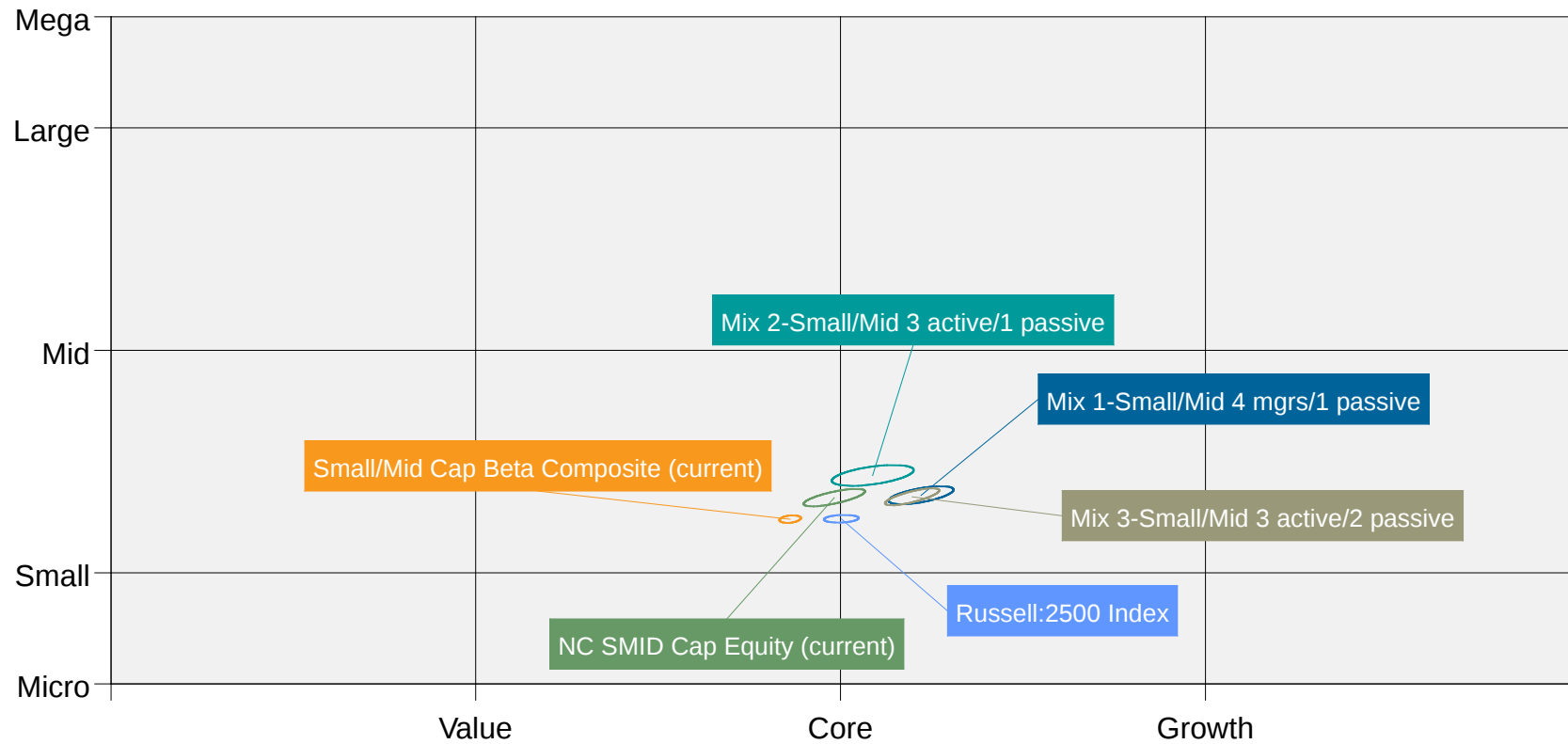
Mix 1-Small/Mid 4 mgrs/1 passive	● A	108.16	97.87
Mix 2-Small/Mid 3 active/1 passive	■ B	105.62	97.25
Mix 3-Small/Mid 3 active/2 passive	◆ C	109.44	98.37
NC SMID Cap Equity (current)	▲ D	103.85	99.22

Mix 1 modestly improves up market capture with no deterioration of down market capture

Hypothetical performance is represented by the median manager and your existing managers—we anticipate selection of a manager that would serve as a complement to Brown that may further improve protection in down markets

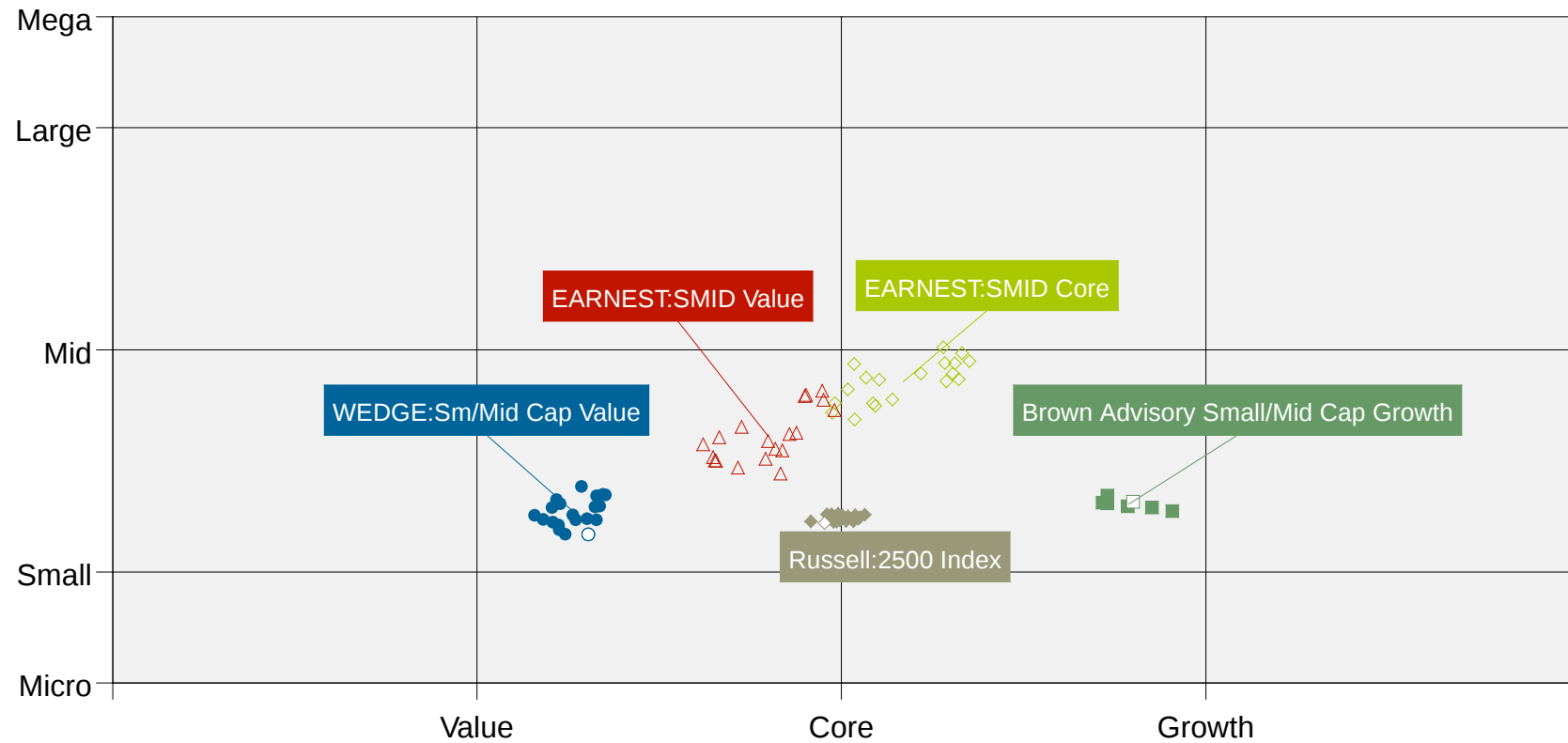
Style Map

Domestic Equity Style Map
for 5 Years Ended September 30, 2020



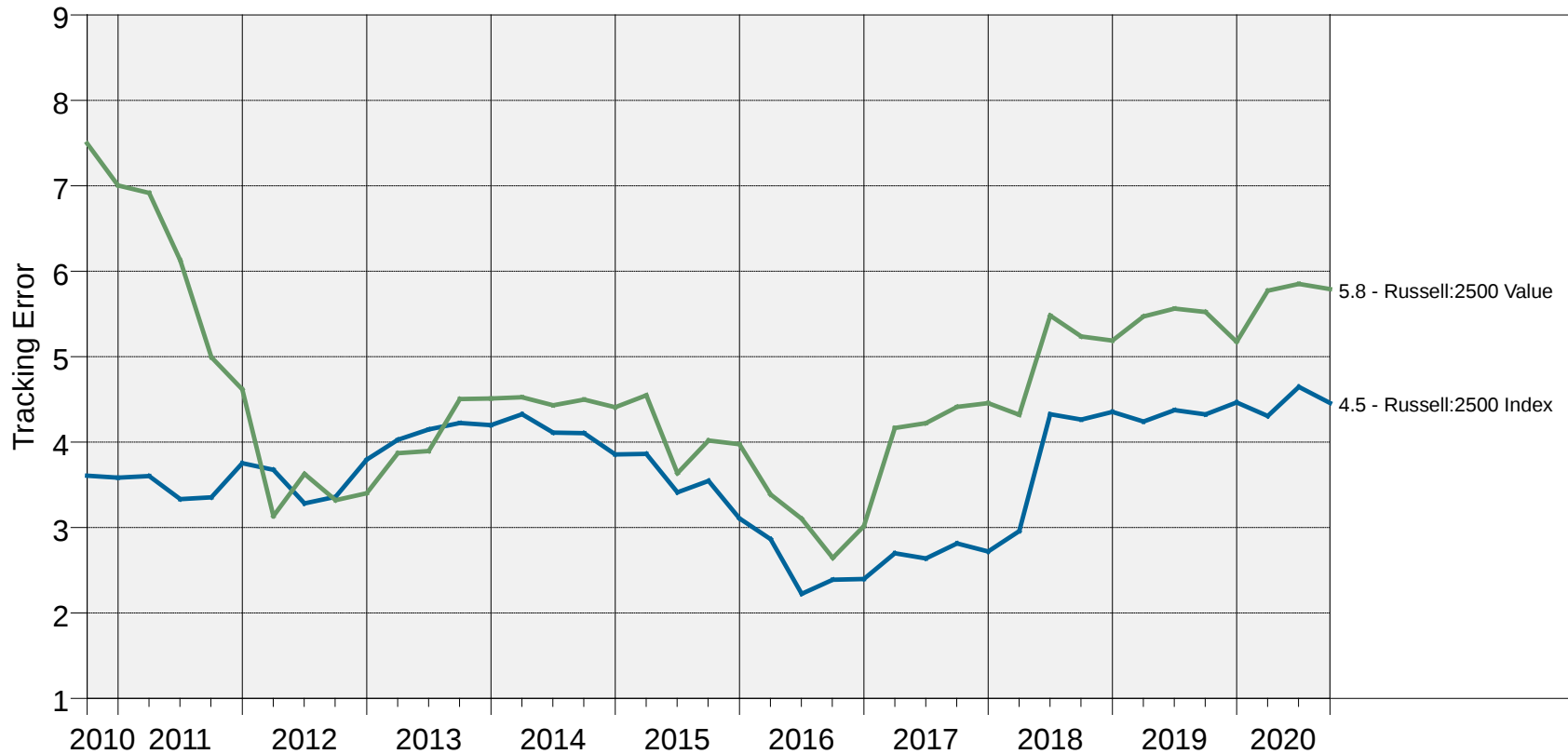
Style Map

Style Map
for 5 Years Ended September 30, 2020



Closer Look at EARNEST SMID Value

Rolling 12 Quarter Tracking Error Relative To EARNEST:SMID Value
for 10 Years Ended September 30, 2020



Core benchmark arguably a tighter fit for existing EARNEST Partners strategy

Diversifying Alpha Sources

Mix 1 Strategy Correlations

Excess Return Correlations – 9/30/20

Excess Correlation Table
Benchmark: Russell:2500 Index
for 5 Years Ended September 30, 2020

Brown Inv:Small Cap Growth	1.0000			
Callan Sm/MidCap Growth	0.6332	1.0000		
EARNEST:SMID Value	(0.0993)	(0.2301)	1.0000	
WEDGE:Sm/Mid Cap Value	(0.6753)	(0.8745)	0.2545	1.0000
	Brown Inv:Small Cap Growth	Callan Sm/MidCap Growth	EARNEST:SMID Value	WEDGE:Sm/Mid Cap Value

Excess Return Correlations – 9/30/13

Excess Correlation Table
Benchmark: Russell:2500 Index
for 5 Years Ended September 30, 2013

Brown Inv:Small Cap Growth	1.0000			
Callan Sm/MidCap Growth	0.5393	1.0000		
EARNEST:SMID Value	0.2396	0.0023	1.0000	
WEDGE:Sm/Mid Cap Value	(0.7358)	(0.4958)	(0.2551)	1.0000
	Brown Inv:Small Cap Growth	Callan Sm/MidCap Growth	EARNEST:SMID Value	WEDGE:Sm/Mid Cap Value

Mix 1 contemplates a new SMID growth strategy to complement existing strategies

Excess return correlation is represented by the Callan Sm/MidCap Growth peer group; a search would be performed for a diversifying strategy that would complement Brown

Diversifying Alpha Sources

Mix 2 Strategy Correlations

Excess Return Correlations – 9/30/20

Excess Correlation Table
Benchmark: Russell:2500 Index
for 5 Years Ended September 30, 2020

Brown Inv:Small Cap Growth	1.0000		
EARNEST:SMID Core	(0.0327)	1.0000	
WEDGE:Sm/Mid Cap Value	(0.6753)	(0.0629)	1.0000
	Brown Inv:Small Cap Growth	EARNEST:SMID Core	WEDGE:Sm/Mid Cap Value

Excess Return Correlations – 9/30/13

Excess Correlation Table
Benchmark: Russell:2500 Index
for 5 Years Ended September 30, 2013

Brown Inv:Small Cap Growth	1.0000		
EARNEST:SMID Core	0.4636	1.0000	
WEDGE:Sm/Mid Cap Value	(0.7358)	(0.0822)	1.0000
	Brown Inv:Small Cap Growth	EARNEST:SMID Core	WEDGE:Sm/Mid Cap Value

Mix 2 contemplates changing to a core mandate for EARNEST.

Excess return correlations over multiple time frames are consistent with expectations that the strategies are complementary in nature

Diversifying Alpha Sources

Mix 3 Strategy Correlations

Excess Return Correlations – 9/30/20

Excess Correlation Table
Benchmark: Russell:2500 Index
for 5 Years Ended September 30, 2020

Brown Inv:Small Cap Growth	1.0000			
EARNEST:SMID Value	(0.0993)	1.0000		
WEDGE:Sm/Mid Cap Value	(0.6753)	0.2545	1.0000	
Russell:2500 Growth	0.7166	(0.2065)	(0.9078)	1.0000
	Brown Inv:Small Cap Growth	EARNEST:SMID Value	WEDGE:Sm/Mid Cap Value	Russell:2500 Growth

Excess Return Correlations – 9/30/13

Excess Correlation Table
Benchmark: Russell:2500 Index
for 5 Years Ended September 30, 2013

Brown Inv:Small Cap Growth	1.0000			
EARNEST:SMID Value	0.2396	1.0000		
WEDGE:Sm/Mid Cap Value	(0.7358)	(0.2551)	1.0000	
Russell:2500 Growth	0.7451	(0.0224)	(0.3995)	1.0000
	Brown Inv:Small Cap Growth	EARNEST:SMID Value	WEDGE:Sm/Mid Cap Value	Russell:2500 Growth

Mix 3 minimizes style bias by introducing a Russell 2500 Growth index fund for much of the current Russell 2500 index.

Relative to other mixes, there is more positive excess return correlation, suggesting less diversification of value add sources

Smid Cap Equity Style vs. Russell 2500

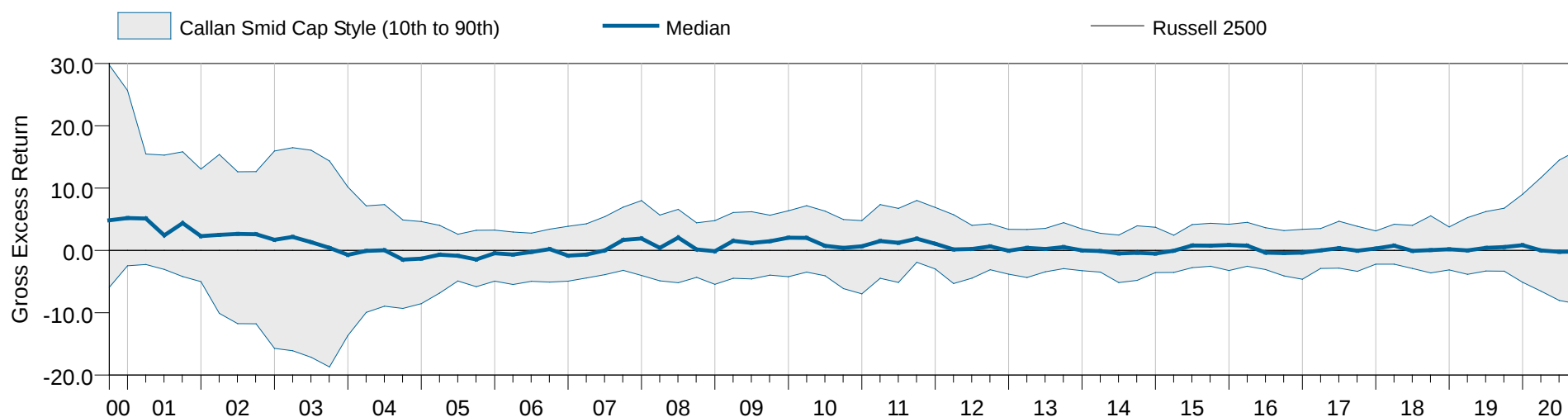
How often Manager Beat Benchmark by more than Fee Hurdle in Rolling 3-Year Periods over last 20 Years

Fee Hurdle	0.35%	0.40%	0.45%	0.50%	0.55%	0.60%	0.65%	0.70%	0.75%	0.80%
Median	50%	49%	43%	43%	41%	40%	39%	38%	38%	33%
45th Percentile	71%	68%	65%	63%	60%	56%	55%	55%	54%	50%
40th Percentile	88%	88%	86%	86%	85%	83%	80%	78%	76%	74%
35th Percentile	93%	93%	93%	93%	91%	89%	88%	88%	88%	86%
30th Percentile	100%	99%	99%	99%	99%	99%	98%	96%	95%	94%
25th Percentile	100%	100%	100%	100%	100%	100%	99%	99%	99%	99%

Average Annualized 3-Year Excess Return (gross) – Median Manager:

0.65%

Rolling 3-Year Gross Excess Return relative to Russell 2500 for 20 Years ended September 30, 2020



Smid Cap Growth Equity Style vs. Russell 2500 Growth

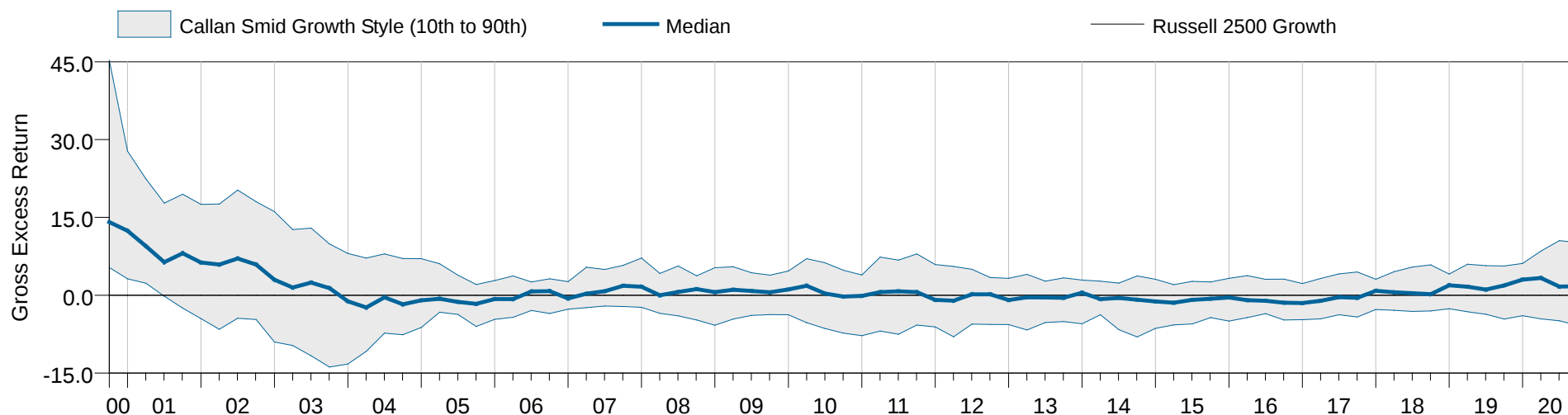
How often Manager Beat Benchmark by more than Fee Hurdle in Rolling 3-Year Periods over last 20 Years

Fee Hurdle	0.35%	0.40%	0.45%	0.50%	0.55%	0.60%	0.65%	0.70%	0.75%	0.80%
Median	51%	50%	49%	48%	48%	45%	41%	40%	40%	38%
45th Percentile	59%	59%	59%	59%	58%	56%	55%	54%	53%	51%
40th Percentile	64%	64%	63%	63%	63%	63%	63%	61%	60%	60%
35th Percentile	78%	78%	78%	76%	75%	70%	70%	69%	69%	69%
30th Percentile	90%	86%	85%	85%	85%	83%	83%	78%	76%	74%
25th Percentile	98%	98%	96%	95%	95%	94%	94%	94%	94%	91%

Average Annualized 3-Year Excess Return (gross) – Median Manager:

0.95%

Rolling 3-Year Gross Excess Return relative to Russell 2500 Growth for 20 Years ended September 30, 2020



Smid Cap Value Equity Style vs. Russell 2500 Value

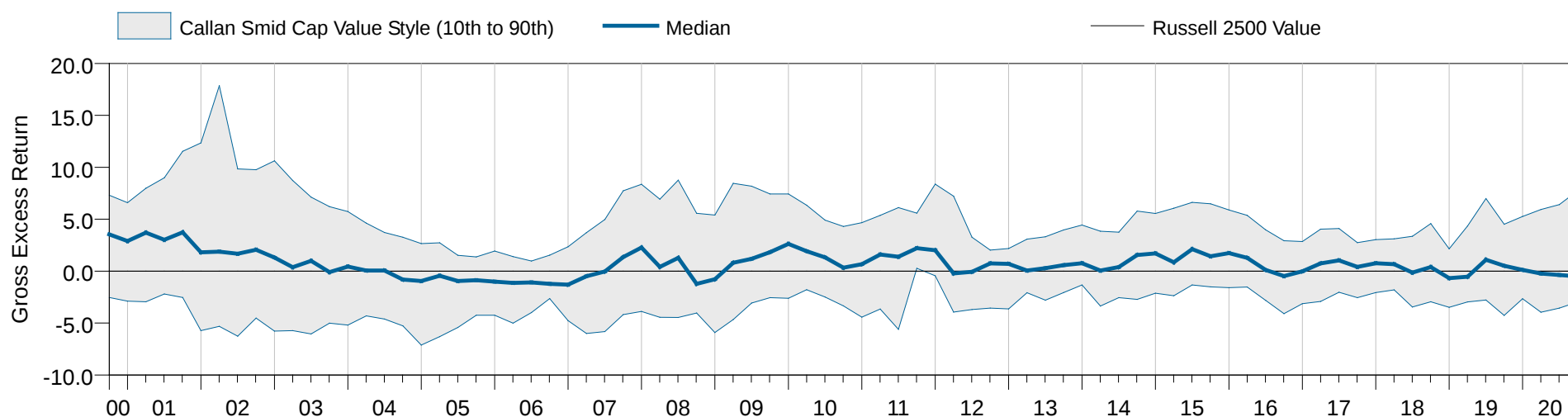
How often Manager Beat Benchmark by more than Fee Hurdle in Rolling 3-Year Periods over last 20 Years

Fee Hurdle	0.35%	0.40%	0.45%	0.50%	0.55%	0.60%	0.65%	0.70%	0.75%	0.80%
Median	59%	58%	51%	51%	50%	49%	49%	46%	45%	40%
45th Percentile	74%	73%	71%	68%	65%	64%	60%	58%	56%	56%
40th Percentile	80%	80%	78%	76%	75%	75%	74%	74%	71%	70%
35th Percentile	86%	86%	86%	83%	83%	79%	79%	79%	79%	76%
30th Percentile	90%	90%	86%	86%	86%	85%	85%	83%	83%	83%
25th Percentile	96%	95%	94%	93%	93%	93%	90%	89%	86%	86%

Average Annualized 3-Year Excess Return (gross) – Median Manager:

0.66%

Rolling 3-Year Gross Excess Return relative to Russell 2500 Value for 20 Years ended September 30, 2020



Small Cap Equity Style vs. Russell 2000

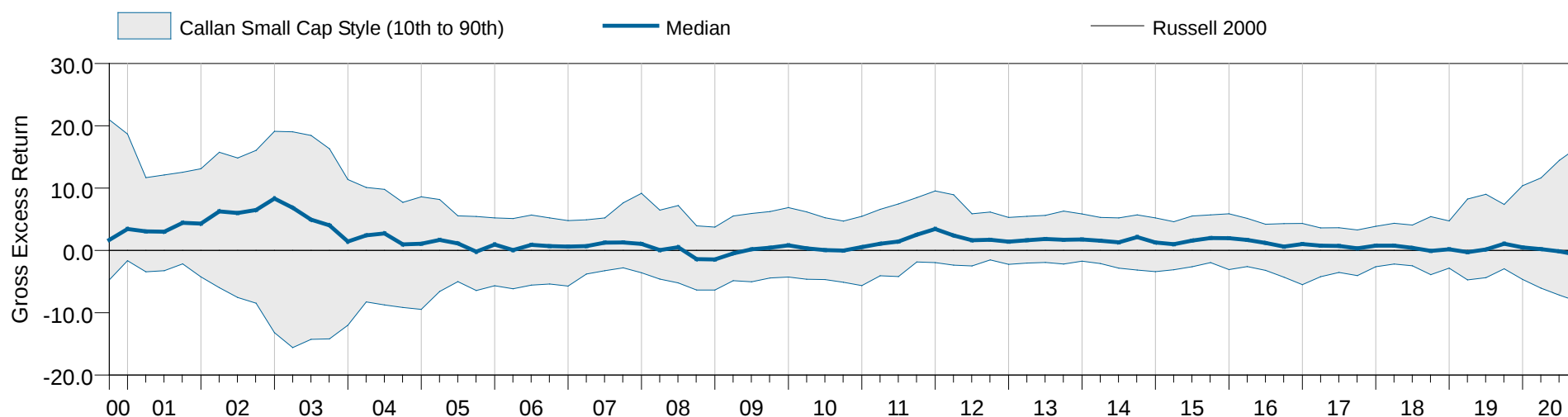
How often Manager Beat Benchmark by more than Fee Hurdle in Rolling 3-Year Periods over last 20 Years

Fee Hurdle	0.50%	0.55%	0.60%	0.65%	0.70%	0.75%	0.80%	0.85%	0.90%	0.95%
Median	74%	73%	71%	69%	69%	65%	61%	60%	60%	59%
45th Percentile	89%	89%	89%	85%	84%	81%	80%	80%	80%	78%
40th Percentile	98%	98%	98%	98%	96%	96%	94%	89%	86%	86%
35th Percentile	98%	98%	98%	98%	98%	98%	98%	98%	98%	98%
30th Percentile	99%	98%	98%	98%	98%	98%	98%	98%	98%	98%
25th Percentile	100%	100%	100%	100%	100%	99%	99%	99%	99%	99%

Average Annualized 3-Year Excess Return (gross) – Median Manager:

1.56%

Rolling 3-Year Gross Excess Return relative to Russell 2000 for 20 Years ended September 30, 2020



Small Cap Growth Equity Style vs. Russell 2000 Growth

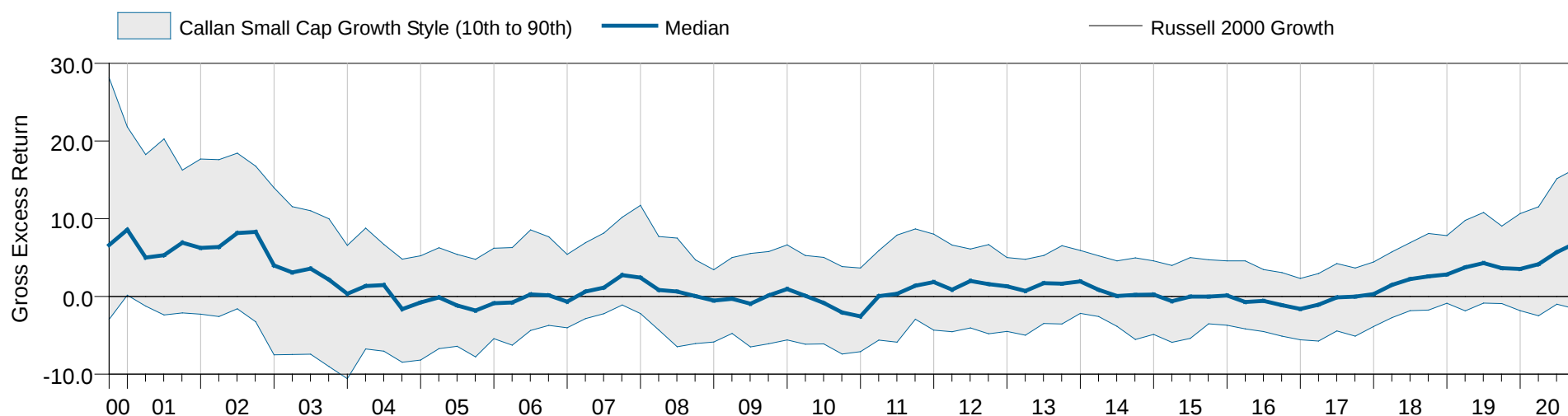
How often Manager Beat Benchmark by more than Fee Hurdle in Rolling 3-Year Periods over last 20 Years

Fee Hurdle	0.50%	0.55%	0.60%	0.65%	0.70%	0.75%	0.80%	0.85%	0.90%	0.95%
Median	54%	54%	54%	51%	51%	50%	50%	49%	46%	46%
45th Percentile	66%	64%	64%	64%	63%	60%	58%	58%	58%	55%
40th Percentile	85%	84%	83%	81%	79%	78%	76%	74%	74%	73%
35th Percentile	90%	89%	89%	89%	89%	88%	86%	86%	85%	85%
30th Percentile	94%	94%	94%	94%	94%	94%	94%	94%	94%	93%
25th Percentile	99%	99%	99%	99%	99%	99%	99%	99%	98%	96%

Average Annualized 3-Year Excess Return (gross) – Median Manager:

1.48%

Rolling 3-Year Gross Excess Return relative to Russell 2000 Growth for 20 Years ended September 30, 2020



Small Cap Value Equity Style vs. Russell 2000 Value

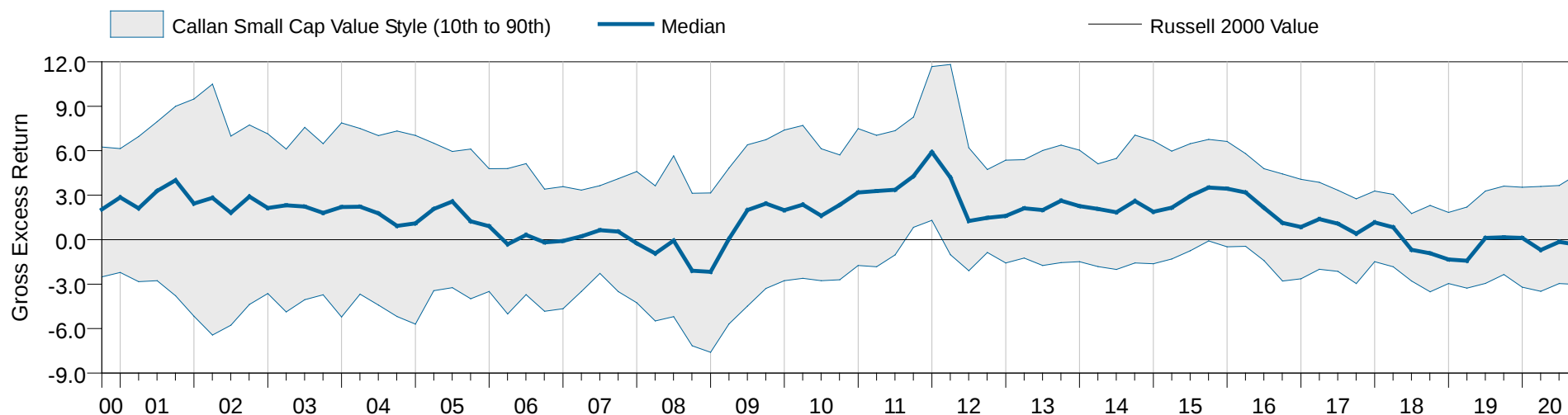
How often Manager Beat Benchmark by more than Fee Hurdle in Rolling 3-Year Periods over last 20 Years

Fee Hurdle	0.50%	0.55%	0.60%	0.65%	0.70%	0.75%	0.80%	0.85%	0.90%	0.95%
Median	73%	73%	71%	70%	70%	70%	70%	69%	68%	65%
45th Percentile	74%	74%	74%	74%	73%	73%	71%	70%	70%	70%
40th Percentile	83%	81%	80%	80%	79%	76%	75%	75%	75%	75%
35th Percentile	90%	90%	89%	85%	85%	85%	84%	83%	81%	81%
30th Percentile	94%	94%	94%	94%	94%	93%	90%	88%	86%	86%
25th Percentile	95%	95%	95%	95%	95%	95%	95%	95%	94%	94%

Average Annualized 3-Year Excess Return (gross) – Median Manager:

1.49%

Rolling 3-Year Gross Excess Return relative to Russell 2000 Value for 20 Years ended September 30, 2020



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