



Dale R. Folwell, CPA

INVESTMENT MANAGEMENT

To: North Carolina Supplemental Retirement Board of Trustees

From: Loren de Mey, Assistant Investment Director

Date: February 18, 2020

Subject: Discussion / Action: 401k and 457b Plans – Plan Design Recommendations

At the December 12, 2019 Board of Trustees meeting, Callan identified opportunities for the Board to consider including the following:

1. Neutralize the style bias present in the Small / Mid Cap Equity Fund and evaluate the amount of passive management needed to manage liquidity in the option.
2. Change the benchmark of the two international equity options from MSCI ACWI ex-US to MSCI ACWI ex-US IMI.

Following is a summary of the recommendations and options outlined in Callan's presentation.

NC Small Mid Cap Equity Fund

Callan will be presenting three potential options for the Board's consideration. These options include the following:

1. Option 1: Retains all existing investment strategies and adds an active SMID Cap Growth Manager, re-weighting value and growth to be style neutral. This option decreases the passive allocation within the Fund from 28.75% to 10%.
2. Option 2: Retains all existing managers and changes the Earnest SMID Cap Value mandate to a SMID Cap Core mandate. This change will help to achieve a more neutral style positioning. This option decreases the passive allocation within the Fund from 28.75% to 10%.
3. Option 3: Retains all existing strategies and introduces a new passive exposure, a Russell 2500 Growth Index Fund, and equally weights value and growth styles. This option retains the current passive exposure of 28.75%.

NC International Equity Fund and NC International Index Fund

1. Recommend changing the benchmark for the NC International Equity Fund and the NC International Index Fund from the MSCI ACWI Ex US (consisting of large, mid cap developed and emerging market securities) to the MSCI ACWI es-US IMI (consisting of large, mid-cap and small cap developed and emerging market securities).
2. Recommend selecting one to two international small cap managers to be included within the NC International Equity Fund to increase manager diversification and maximize the potential for excess return.

February 2020



North Carolina Supplemental Retirement Plans

SMID Cap and International Equity
Structure Recommendations

Elizabeth Hood, CFA
Fund Sponsor Consulting

Weston Lewis, CFA, CAIA
Fund Sponsor Consulting

Julia Moriarty, CFA
Capital Markets Research

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

Callan

Small/Mid Cap Equity Structure Options

History and Background

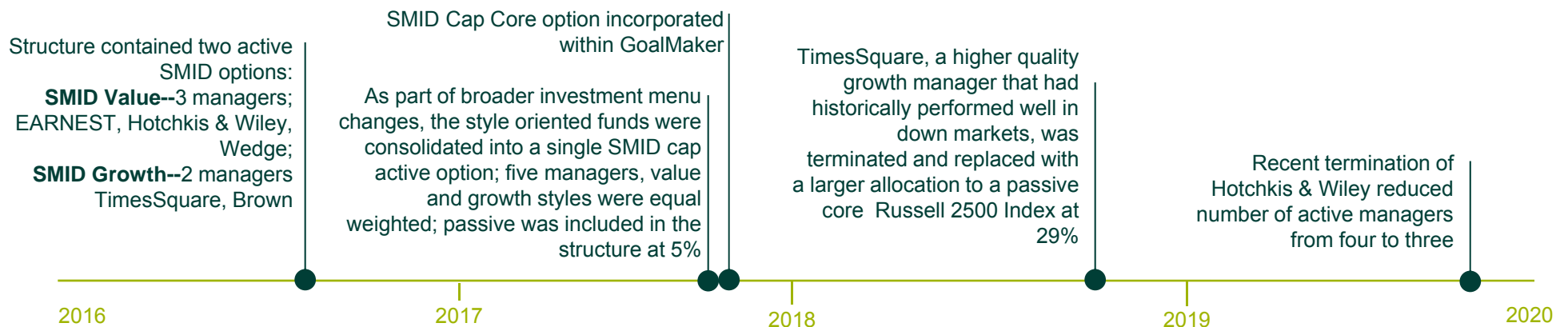
NC SRP SMID Cap Equity Fund

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



Recommendations

North Carolina SMID Cap Equity Fund

Eliminate Style Bias (and Misfit Risk)

- Equal weight value and growth styles
 - Potential addition of an active strategy to complement existing managers in the structure
- 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)

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, prioritizing 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

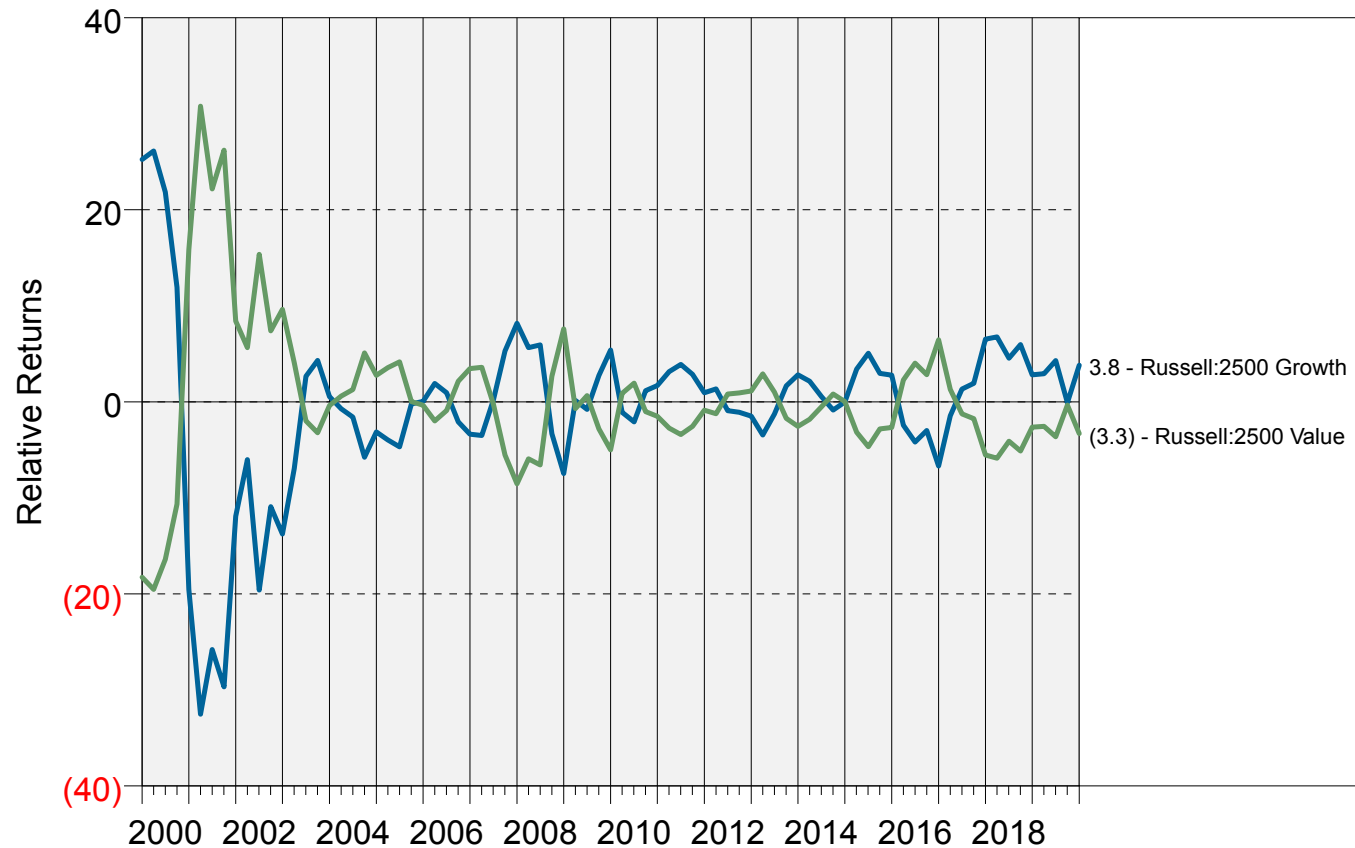
		Mix 1 (4 active managers; 1 passive)		Mix 2 (3 active managers; 1 passive)		Mix 3 (3 active managers; 2 passive)	
Manager	Current Structure % of SMID	% of SMID		% of SMID		% of	
SMID	100.00%	100.00%		100.00%		100.00%	
Russell 2500 value (active)	47.50%	45.00%		30.00%		47.50%	
Russell 2500 growth (active)	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%	
Russell		Mix 1		Mix 2		Mix 3	
Statistics (7 years ending 09/19)	2500 Current						
Standard Deviation	13.04 13.08	13.45		12.92		13.39	
Excess Return (annualized)	-- 1.21	1.91		1.70		1.54	
Tracking Error (vs. Russell 2500)	-- 1.52	2.69		1.80		1.95	
MSCI Combined z-score	-0.04 -0.11	0.02		-0.05		0.07	
Weighted Median Market Cap	4.65 5.28	5.37		6.10		5.30	
Up Market Capture	-- 108.75	114.22		110.44		111.91	
Down Market Capture	-- 96.22	94.33		91.99		96.19	
Estimated Fees	-- 0.35%	0.46%		0.43%		0.35%	

- 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 December 31, 2019

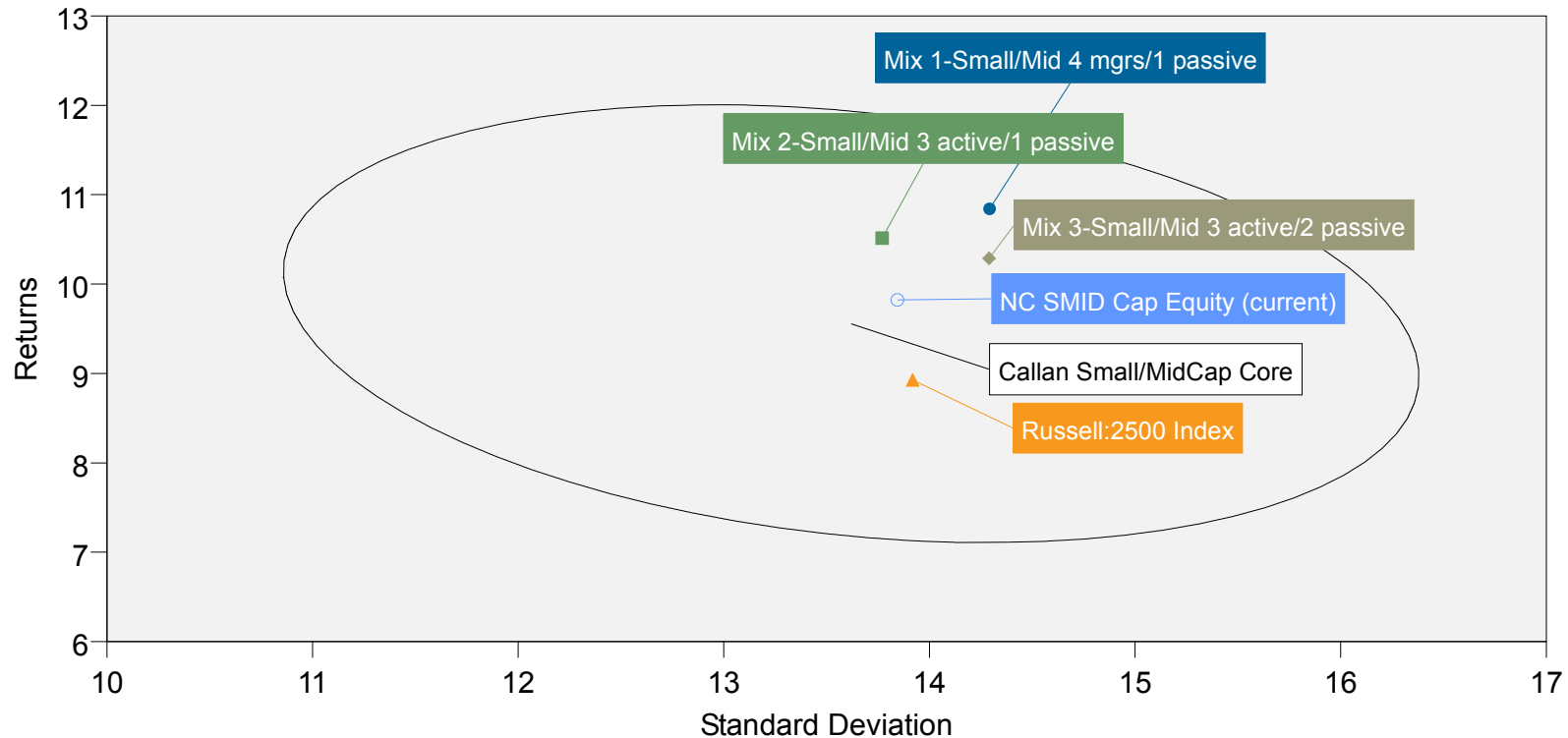


Over time, growth and values styles go in and out of favor

These cycles are not predictable and vary in magnitude and duration

Return vs. Risk

Scatter Chart
for 5 Years Ended December 31, 2019



- Mix 1 has captured greater return (>1% per annum) with modestly more risk (mix 1 standard deviation of 14.3 vs. current standard deviation of 13.84)
- 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	0.96%
SMID Cap Value	Russell 2500 Value	0.79%
SMID Cap Growth	Russell 2500 Growth	1.43%
Small Cap Broad	Russell 2000	1.60%
Small Cap Value	Russell 2000 Value	1.67%
Small Cap Growth	Russell 2000 Growth	1.47%

Based on 20 years of rolling 3 year median manager returns (Period Q3 1999-Q3 2019)

- 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

International Equity Benchmarks

Recommendations

North Carolina International Equity Fund

Transition benchmark to MSCI ACWI ex-US IMI Index

- The current MSCI ACWI ex-US Index benchmark consists of large and mid-cap developed and emerging market securities
- The MSCI ACWI ex-US IMI is an all-capitalization index, representing large, mid, and small-cap developed and emerging market securities
 - This represents a broader international equity opportunity set
 - All Cap exposure is becoming more common in target date funds
 - Small cap represents a meaningful percentage of the non-US market

What is the optimal investment structure?

- Selecting one to two international small cap managers to manage in the North Carolina International Equity Fund would add manager diversification and maximize potential for excess return
- While expanding the mandates of Baillie Gifford and Mondrian are a possibility:
 - Mondrian product does not generally include companies domiciled in emerging markets
 - Baillie Gifford has a limited live track record in small cap
- Transition to the MSCI ACWI ex-US IMI index for North Carolina International Index Fund

International Small Cap: Summary of Considerations

Opportunity Set: Including international small cap provides exposure to the broadest opportunity set, including local sector themes.

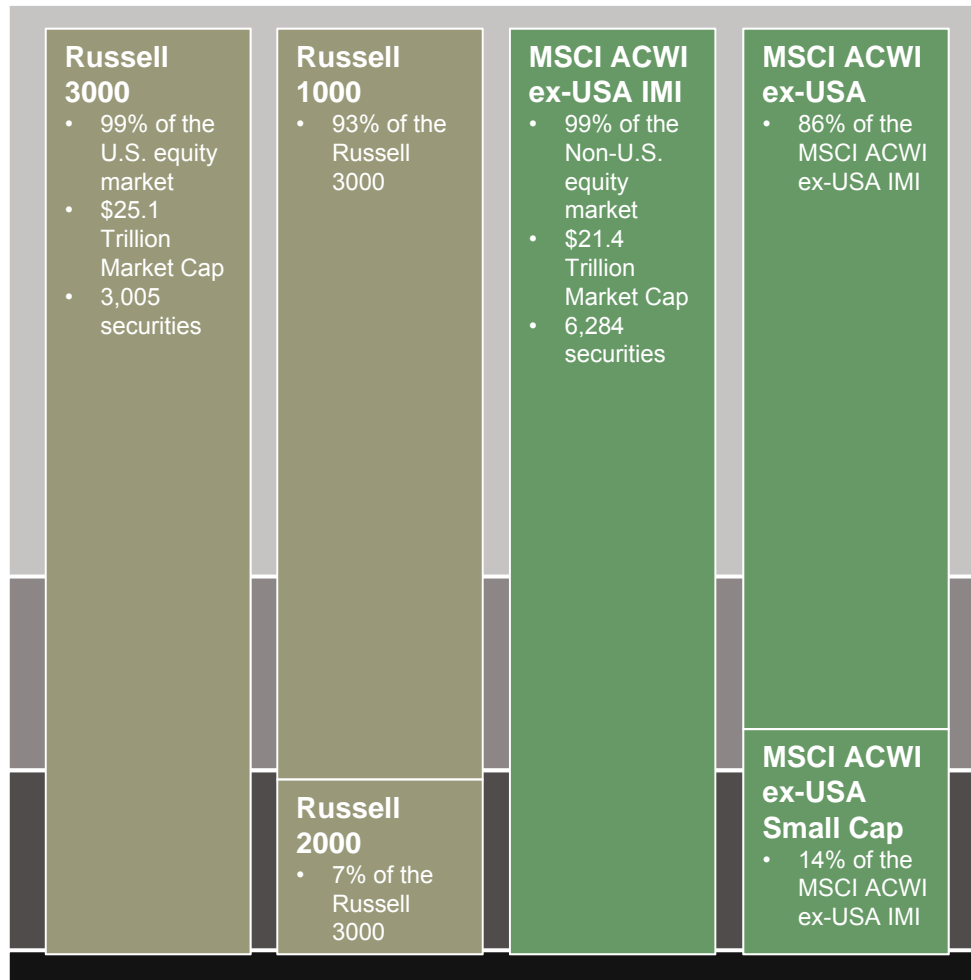
Availability: The product marketplace has evolved for international small cap. There is larger product availability in the institutional marketplace than previously and active managers have proven an ability to deliver alpha in this category.

Returns: International small cap indices have delivered higher returns than the MSCI ACWI ex-US (which is comprised of large and mid cap Non-US stocks), but accompanied by higher volatility.

Fees: Active international small cap strategies come at higher fees than those focused on large and mid cap stocks.

Consistency: Many off-the-shelf target date funds are including the full capitalization spectrum—notably, the Vanguard Target Date funds implement international exposure via the Vanguard Total International Stock Index, which tracks the FTSE Global All Cap ex US Index.

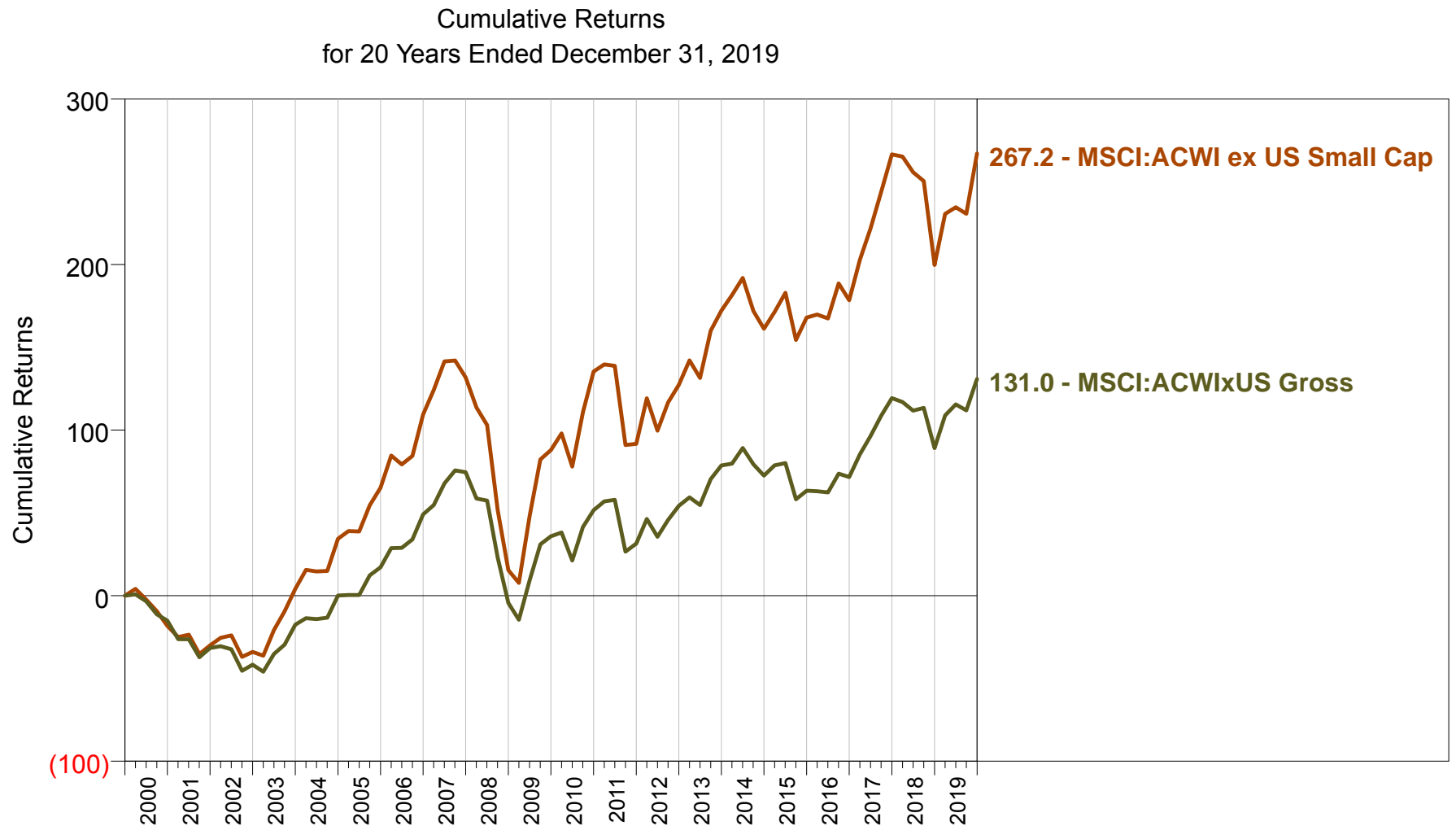
Non-US Equity Opportunity Set is Vast



Sources: Callan, Russell, and MSCI

- The Russell 3000 and MSCI ACWI ex-USA IMI are capitalization weighted indices that include large, mid, and small cap stocks
- The indices assign different break points between their large/mid and small cap sub-indices
- Number of stocks
 - Russell 3000 = 3,005 stocks
 - Russell 2000 = 2,028 stocks
 - ACWI ex-USA IMI = 6,284 stocks
 - ACWI ex-US Small Cap = 4,133 stocks
- Market capitalization
 - Russell 3000 = \$25.1 trillion
 - Russell 2000 = \$1.8 trillion
 - ACWI ex-USA IMI = \$ 21.4 trillion
 - ACWI ex-US Small Cap = \$3 trillion

International Small Cap: Performance Potential

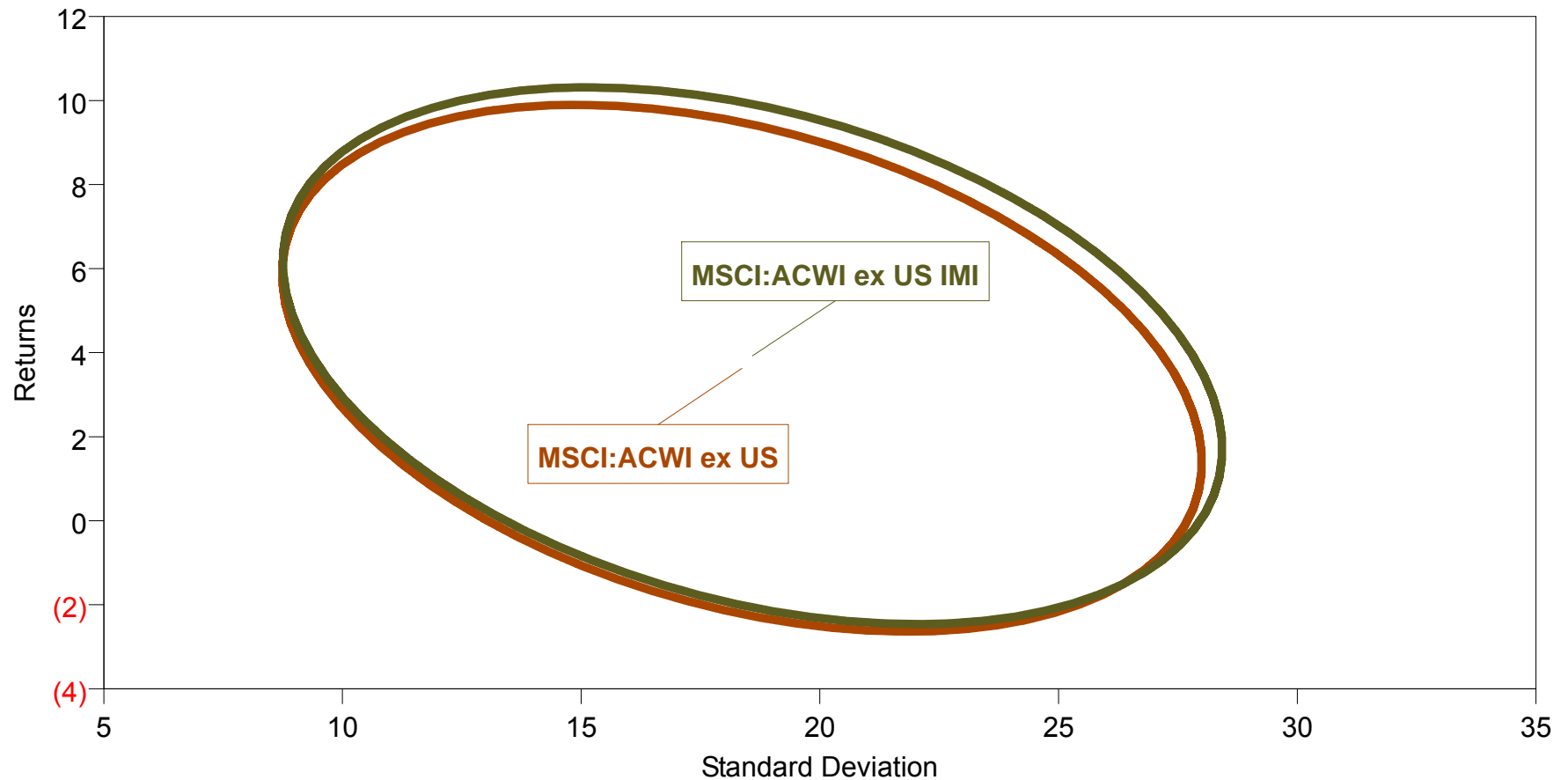


- International small cap has outperformed international large cap over time

Sources: Callan, MSCI

International Small Cap: Risk/Return

Rolling 20 Quarter Scatter Chart
for 10 Years Ended December 31, 2019



- The additional risk is muted when considering the broader index

Sources: Callan, MSCI

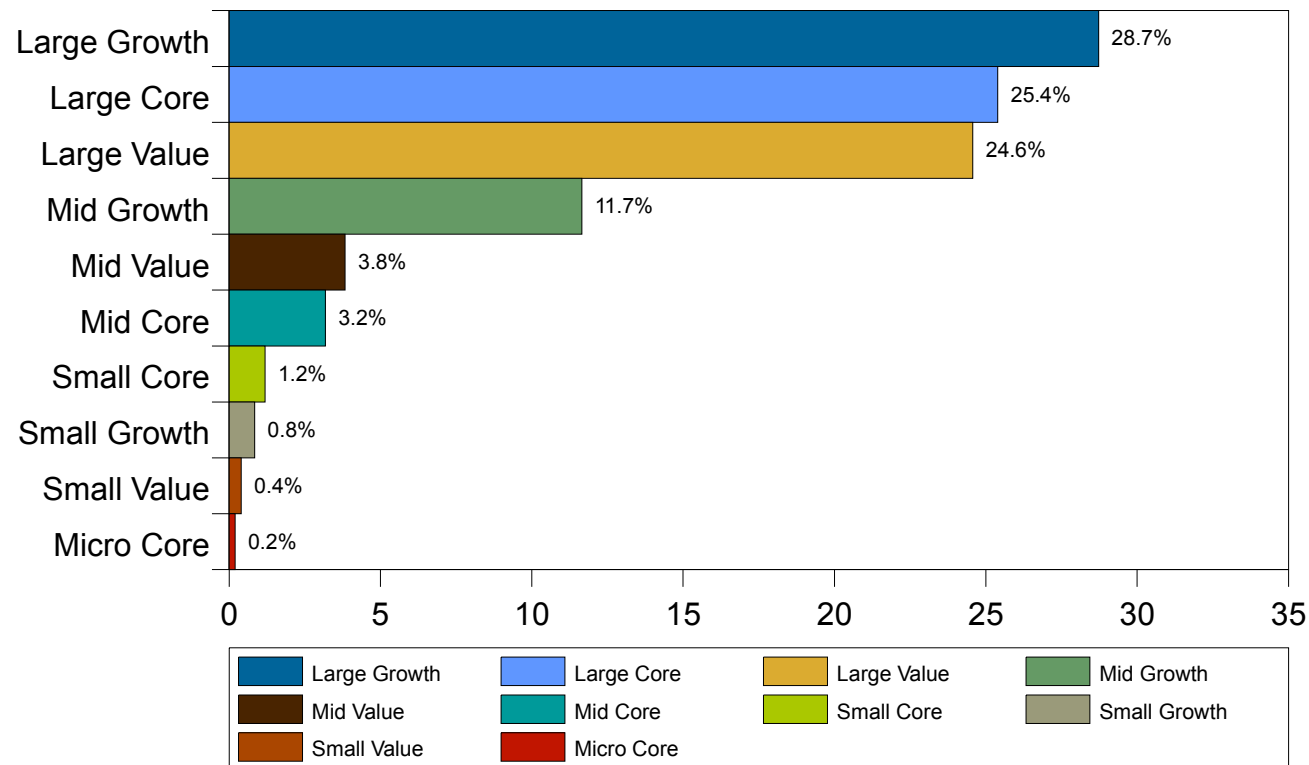
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Alternative Structures for Consideration

North Carolina International Equity Option

Capitalization and Style Exposures

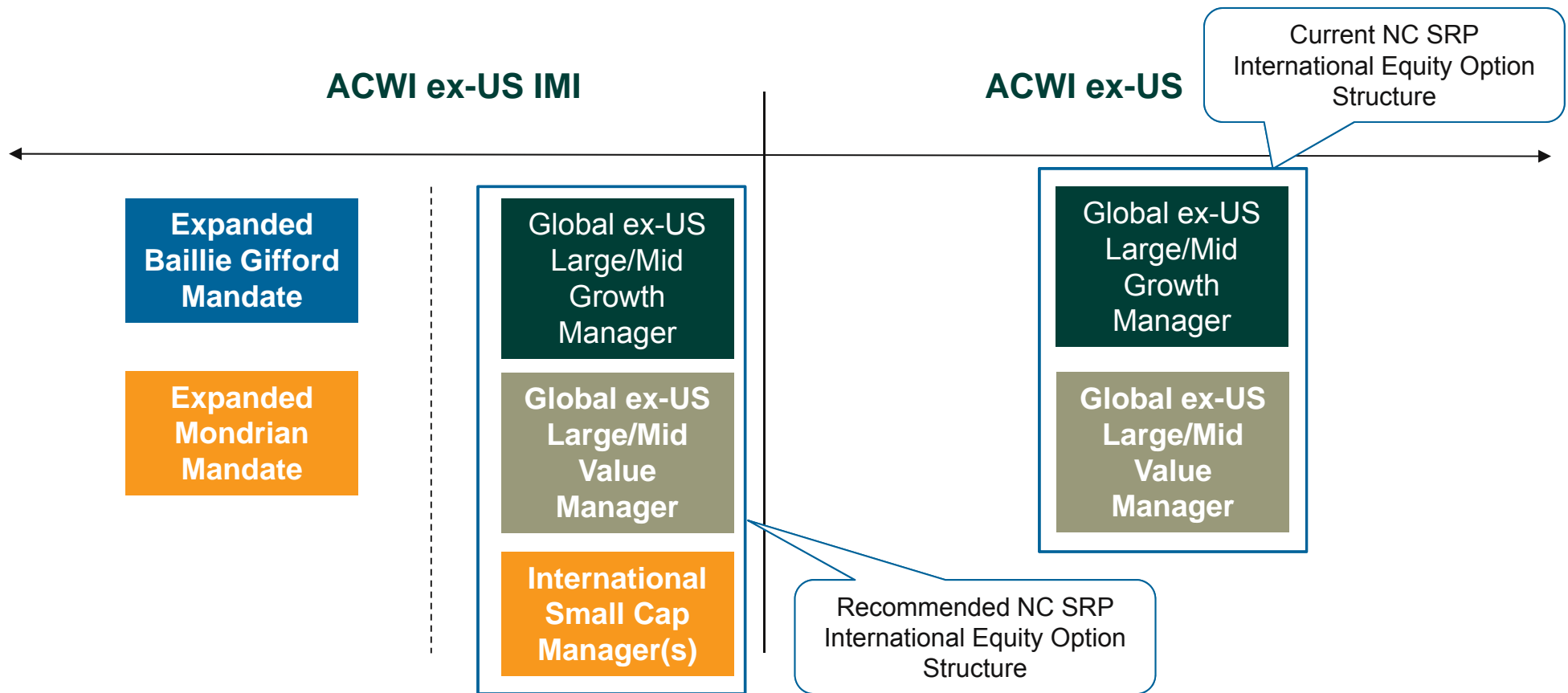
Caps and Styles
for 1 Quarter Ended December 31, 2019
NC International Equity



Small Cap Exposure*			
	NC SRP Intl Eq Fnd	ACWI ex US	ACWI ex US IMI
Core	1.4%	1.0%	4.3%
Growth	0.8%	0.8%	4.5%
Value	0.4%	1.6%	4.1%
Total	2.6%	3.4%	12.9%

*includes micro cap exposure

Possible International Equity Structures



- The first consideration is structure: expanding the opportunity set to an ACWI ex-US IMI benchmark is consistent with the exposures offered in tier II Core US Equity options
- The second consideration is implementation: how best to gain small cap exposure:
 - Callan recommends conducting a search for one or two international small cap managers
 - If the Board believes that the current two manager structure remains appropriate it would involve an expansion of the Baillie Gifford and Mondrian mandates.
 - Note that Mondrian manages an EAFE Small Cap product (developed only)
 - Live Baillie Gifford track record in small cap is short

Callan

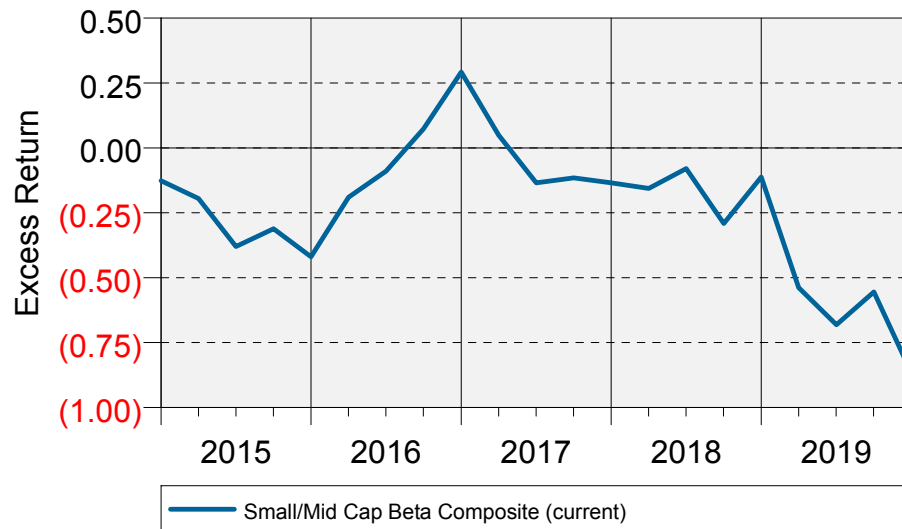
Appendix: US Small/Mid Cap Equity

North Carolina Small/Mid Cap Equity

Benchmark Tracking Error Risk

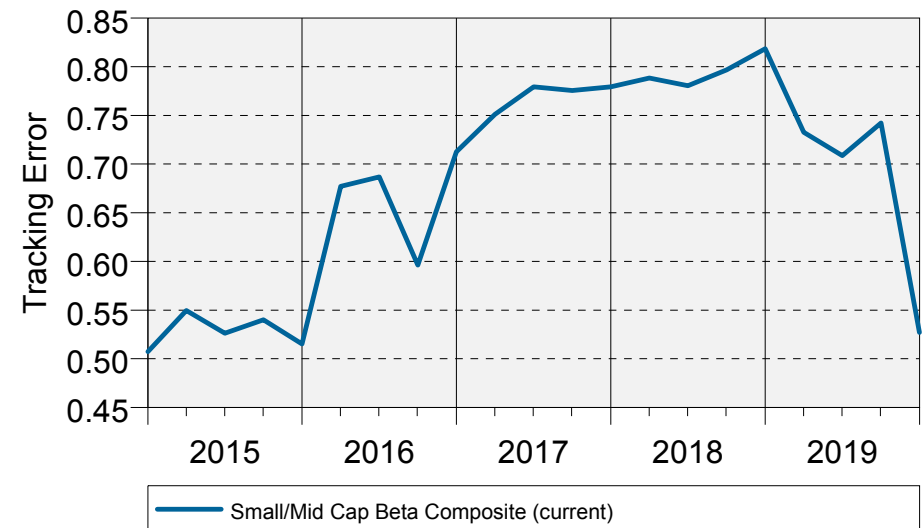
Excess Return

Rolling 12 Quarter Excess Return Relative To Russell:2500 Index for 5 Years Ended December 31, 2019



Tracking Error

Rolling 12 Quarter Tracking Error Relative To Russell:2500 Index for 5 Years Ended December 31, 2019



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

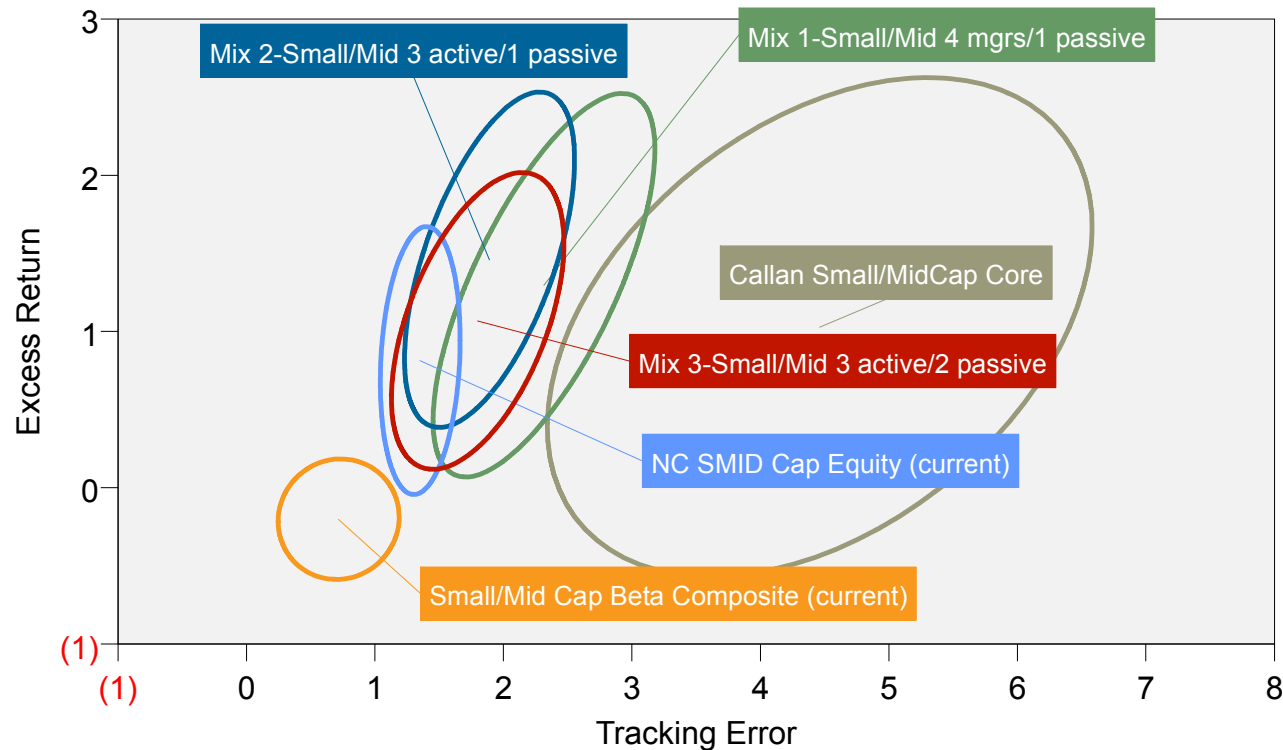
Before accounting for the performance of the active managers, approximately 0.6% of underperformance was caused by the 2:1 value bias

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

North Carolina Small/Mid Cap Equity

Outperformance and Risk (Tracking Error)

Rolling 12 Quarter Scatter Chart
for 10 Years Ended December 31, 2019
Benchmark: Russell:2500 Index



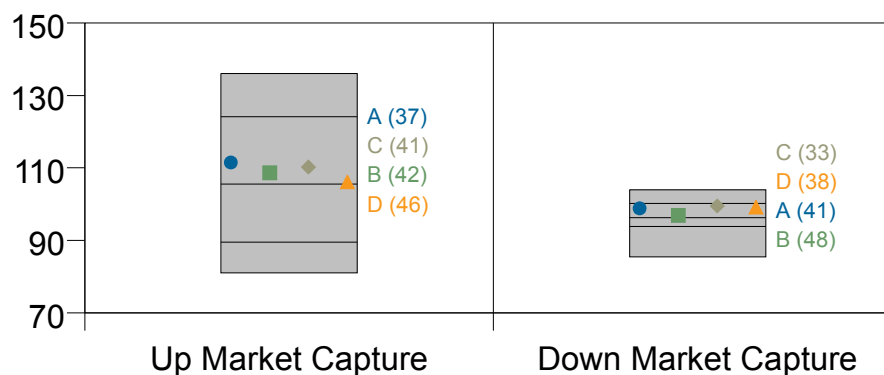
Despite the larger allocation to passive management in the current structure--the consistency (as measured by batting average) is not improved and relative drawdowns are mixed

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

Up Market / Down Market Capture

Statistics relative to Russell:2500 Index
for 12 Years Ended December 31, 2019
Group: Callan Small/MidCap Core



	Up Market Capture	Down Market Capture
10th Percentile	136.06	104.03
25th Percentile	124.20	100.25
Median	105.58	96.31
75th Percentile	89.55	93.83
90th Percentile	81.02	85.47

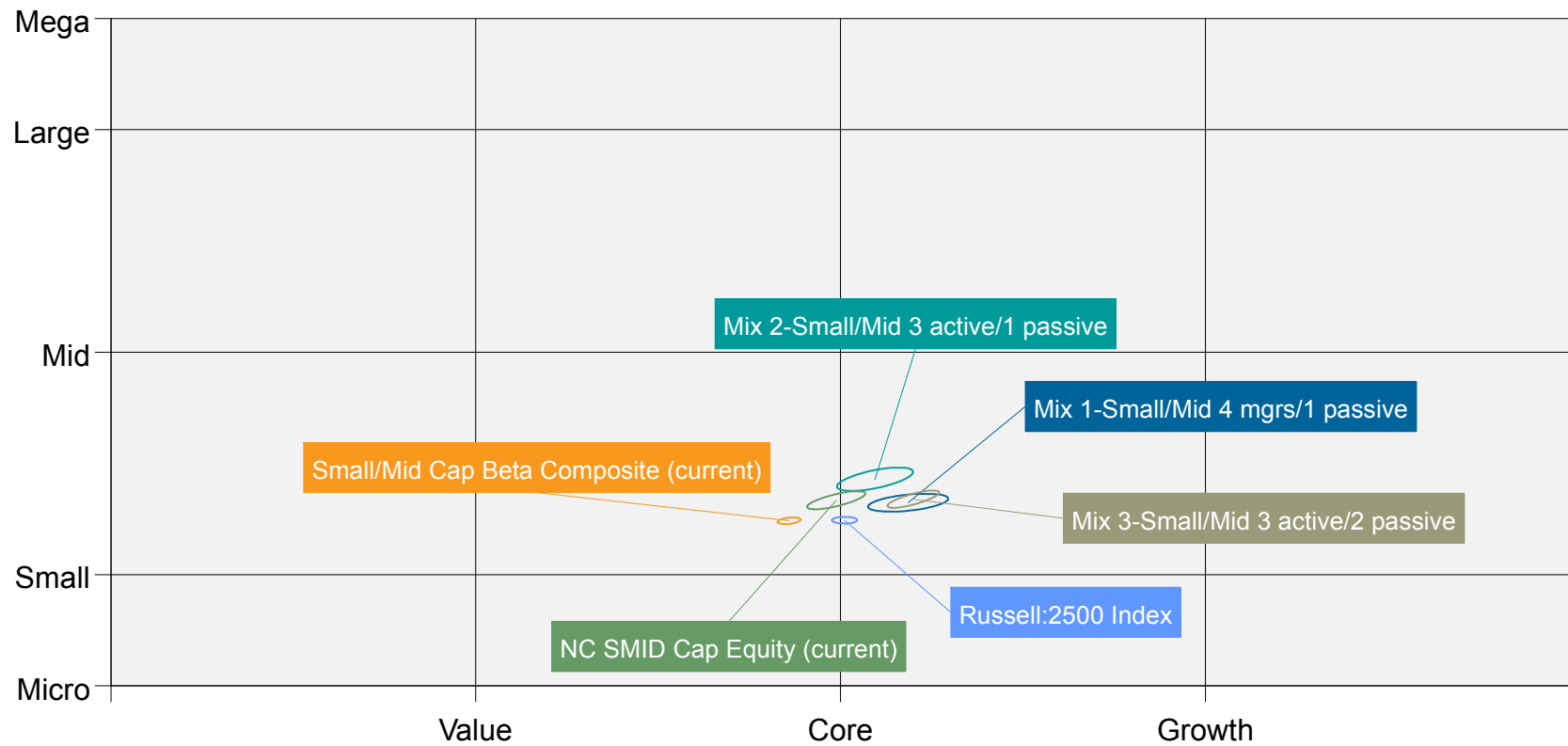
Mix 1-Small/Mid 4 mgrs/1 passive	● A	111.50	98.89
Mix 2-Small/Mid 3 active/1 passive	■ B	108.71	96.89
Mix 3-Small/Mid 3 active/2 passive	◆ C	110.29	99.55
NC SMID Cap Equity (current)	▲ D	106.20	99.23

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

Hypothetical performance is represented by the median manager—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 December 31, 2019



Diversifying Alpha Sources

Mix 1 Strategy Correlations

Excess Return Correlations – 12/31/19

Excess Correlation Table
Benchmark: Russell:2500 Index
for 5 Years Ended December 31, 2019

Brown Inv:Small Cap Growth	1.0000			
Callan Sm/MidCap Growth	0.5690	1.0000		
EARNEST:SMID Value	(0.0902)	(0.1840)	1.0000	
WEDGE:Sm/Mid Cap Value	(0.6158)	(0.7530)	0.2959	1.0000
	Brown Inv:Small Cap Growth	Callan Sm/MidCap Growth	EARNEST:SMID Value	WEDGE:Sm/Mid Cap Value

Excess Return Correlations – 12/31/12

Excess Correlation Table
Benchmark: Russell:2500 Index
for 5 Years Ended December 31, 2012

Brown Inv:Small Cap Growth	1.0000			
Callan Sm/MidCap Growth	0.6036	1.0000		
EARNEST:SMID Value	0.3033	0.0526	1.0000	
WEDGE:Sm/Mid Cap Value	(0.7448)	(0.5710)	(0.3277)	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 does not share a high correlation with Brown

Diversifying Alpha Sources

Mix 2 Strategy Correlations

Excess Return Correlations – 12/31/19

Excess Correlation Table
Benchmark: Russell:2500 Index
for 5 Years Ended December 31, 2019

Brown Inv:Small Cap Growth	1.0000		
EARNEST:SMID Core	(0.0815)	1.0000	
WEDGE:Sm/Mid Cap Value	(0.6158)	0.0320	1.0000
	Brown Inv:Small Cap Growth	EARNEST:SMID Core	WEDGE:Sm/Mid Cap Value

Excess Return Correlations – 12/31/12

Excess Correlation Table
Benchmark: Russell:2500 Index
for 5 Years Ended December 31, 2012

Brown Inv:Small Cap Growth	1.0000		
EARNEST:SMID Core	0.4195	1.0000	
WEDGE:Sm/Mid Cap Value	(0.7448)	(0.2290)	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 – 12/31/19

Excess Correlation Table
Benchmark: Russell:2500 Index
for 5 Years Ended December 31, 2019

Brown Inv:Small Cap Growth	1.0000			
EARNEST:SMID Value	(0.0902)	1.0000		
WEDGE:Sm/Mid Cap Value	(0.6158)	0.2959	1.0000	
Russell:2500 Growth	0.6786	(0.1280)	(0.8444)	1.0000
	Brown Inv:Small Cap Growth	EARNEST:SMID Value	WEDGE:Sm/Mid Cap Value	Russell:2500 Growth

Excess Return Correlations – 12/31/12

Excess Correlation Table
Benchmark: Russell:2500 Index
for 5 Years Ended December 31, 2012

Brown Inv:Small Cap Growth	1.0000			
EARNEST:SMID Value	0.3033	1.0000		
WEDGE:Sm/Mid Cap Value	(0.7448)	(0.3277)	1.0000	
Russell:2500 Growth	0.7682	0.0388	(0.5538)	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 Value Equity Style vs. Russell 2500 Value

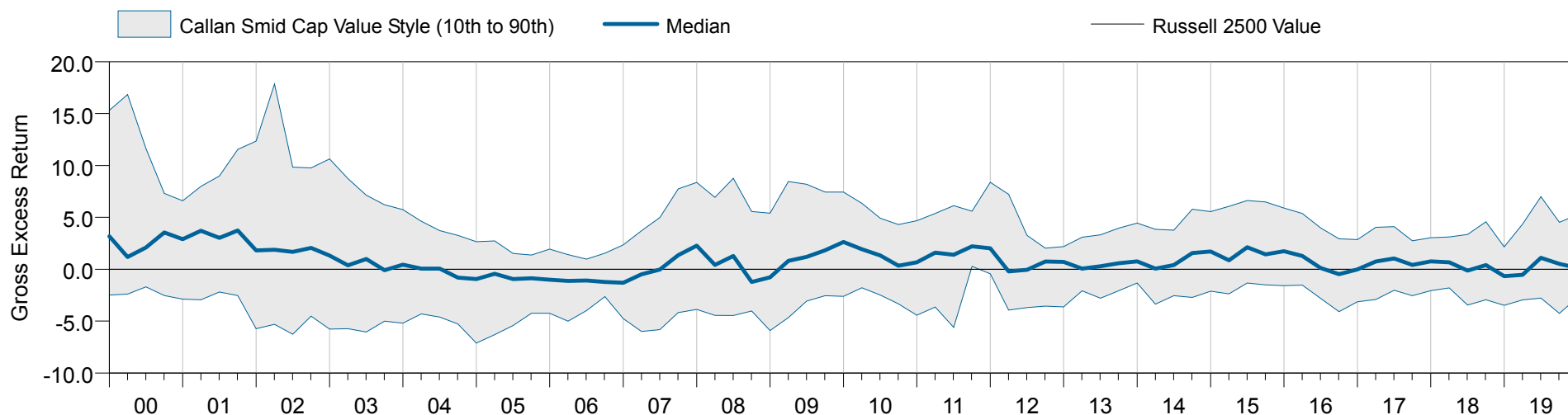
How often Manager Beat Benchmark by more than Fee Hurdle in Rolling 3-Year Periods over last 20 Years

Fee Hurdle	0.35%	0.40%	0.45%	0.50%	0.55%	0.60%	0.65%	0.70%	0.75%	0.80%
Median	63%	61%	55%	55%	54%	53%	53%	50%	49%	44%
45th Percentile	76%	75%	75%	71%	69%	68%	64%	61%	60%	60%
40th Percentile	80%	80%	79%	78%	76%	76%	76%	76%	74%	73%
35th Percentile	86%	86%	86%	83%	83%	79%	79%	79%	79%	78%
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:

0.75%

Rolling 3-Year Gross Excess Return relative to Russell 2500 Value for 20 Years ended December 31, 2019



Smid Cap Growth Equity Style vs. Russell 2500 Growth

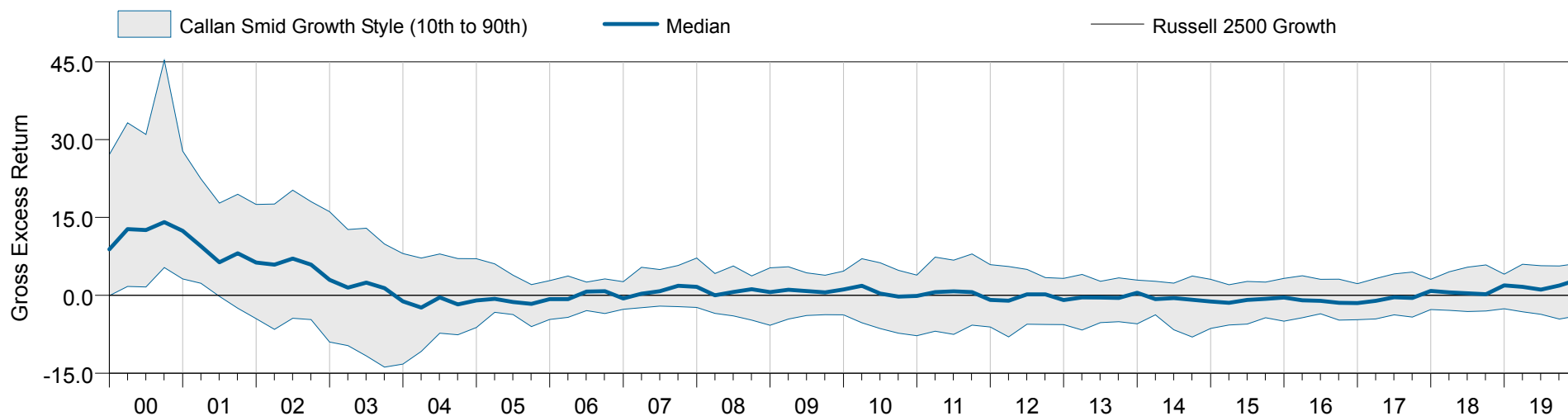
How often Manager Beat Benchmark by more than Fee Hurdle in Rolling 3-Year Periods over last 20 Years

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:

1.35%

Rolling 3-Year Gross Excess Return relative to Russell 2500 Growth for 20 Years ended December 31, 2019



Smid Cap Equity Style vs. Russell 2500

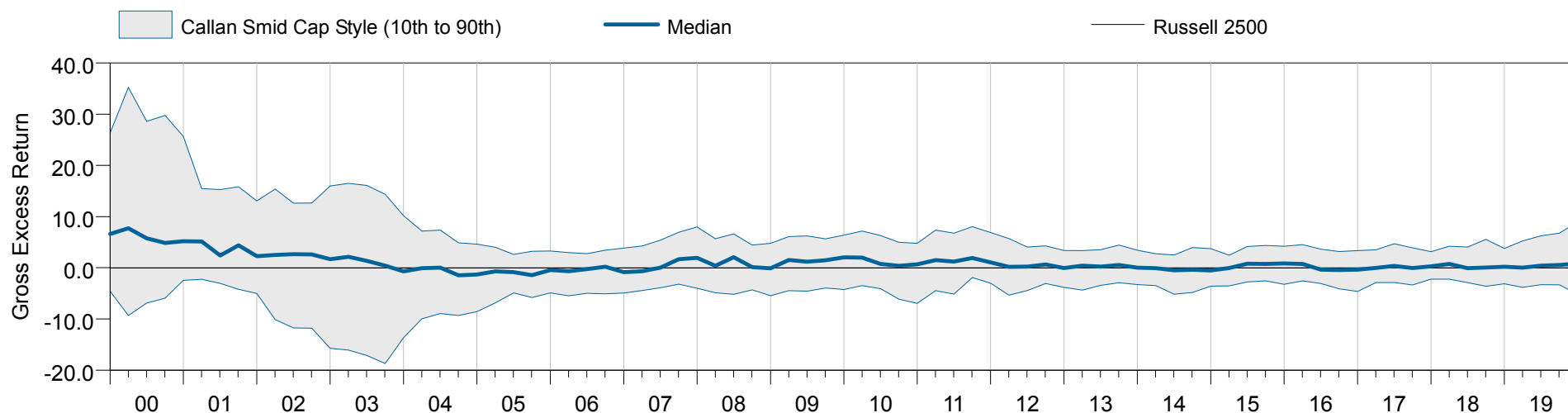
How often Manager Beat Benchmark by more than Fee Hurdle in Rolling 3-Year Periods over last 20 Years

Fee Hurdle	0.35%	0.40%	0.45%	0.50%	0.55%	0.60%	0.65%	0.70%	0.75%	0.80%
Median	54%	53%	46%	46%	44%	44%	43%	41%	41%	36%
45th Percentile	73%	70%	68%	65%	63%	59%	58%	58%	56%	53%
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:

0.88%

Rolling 3-Year Gross Excess Return relative to Russell 2500 for 20 Years ended December 31, 2019



Small Cap Value Equity Style vs. Russell 2000 Value

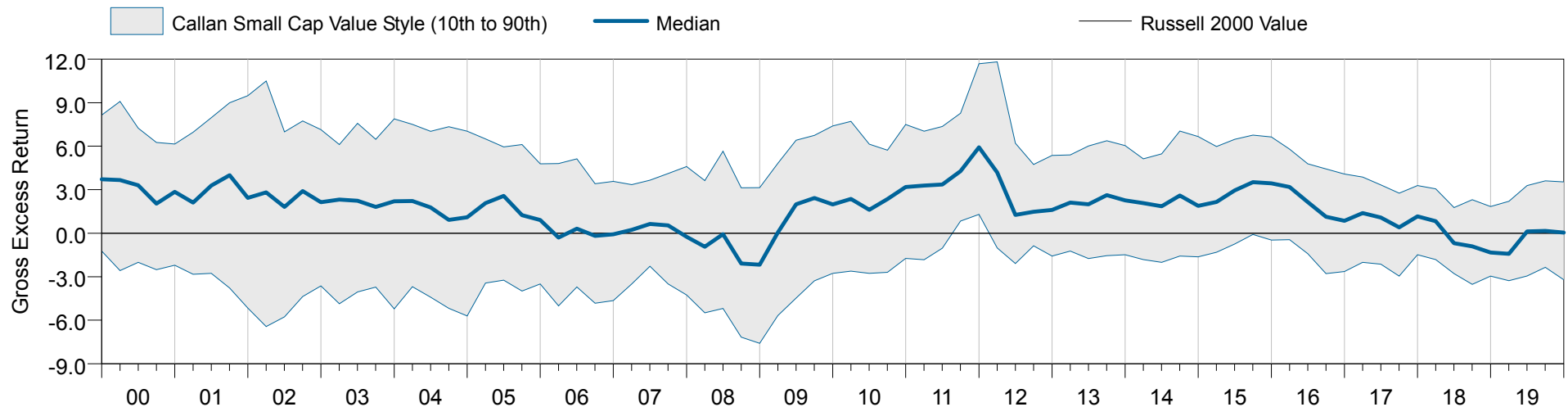
How often Manager Beat Benchmark by more than Fee Hurdle in Rolling 3-Year Periods over last 20 Years

Fee Hurdle	0.50%	0.55%	0.60%	0.65%	0.70%	0.75%	0.80%	0.85%	0.90%	0.95%
Median	76%	76%	75%	74%	74%	74%	74%	73%	71%	69%
45th Percentile	78%	78%	78%	78%	76%	76%	75%	74%	74%	74%
40th Percentile	86%	85%	84%	84%	83%	80%	79%	79%	79%	79%
35th Percentile	93%	93%	91%	88%	88%	88%	86%	85%	85%	85%
30th Percentile	94%	94%	94%	94%	94%	94%	93%	90%	89%	89%
25th Percentile	95%	95%	95%	95%	95%	95%	95%	95%	94%	94%

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

1.62%

Rolling 3-Year Gross Excess Return relative to Russell 2000 Value for 20 Years ended December 31, 2019



Small Cap Growth Equity Style vs. Russell 2000 Growth

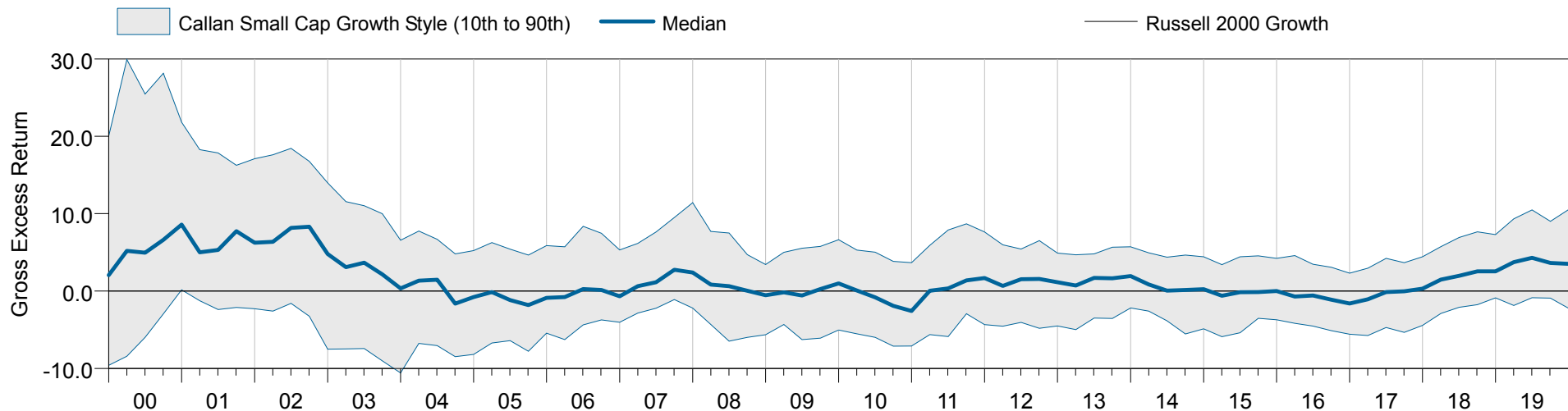
How often Manager Beat Benchmark by more than Fee Hurdle in Rolling 3-Year Periods over last 20 Years

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%	50%	49%	49%	48%	46%	46%
45th Percentile	68%	64%	61%	60%	60%	59%	58%	58%	58%	55%
40th Percentile	86%	85%	85%	85%	81%	78%	75%	73%	71%	70%
35th Percentile	89%	88%	88%	88%	88%	88%	88%	88%	86%	86%
30th Percentile	95%	95%	95%	94%	94%	94%	94%	94%	94%	93%
25th Percentile	100%	100%	100%	99%	99%	99%	99%	99%	98%	96%

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

1.49%

Rolling 3-Year Gross Excess Return relative to Russell 2000 Growth for 20 Years ended December 31, 2019



Small Cap Core Equity Style vs. Russell 2000

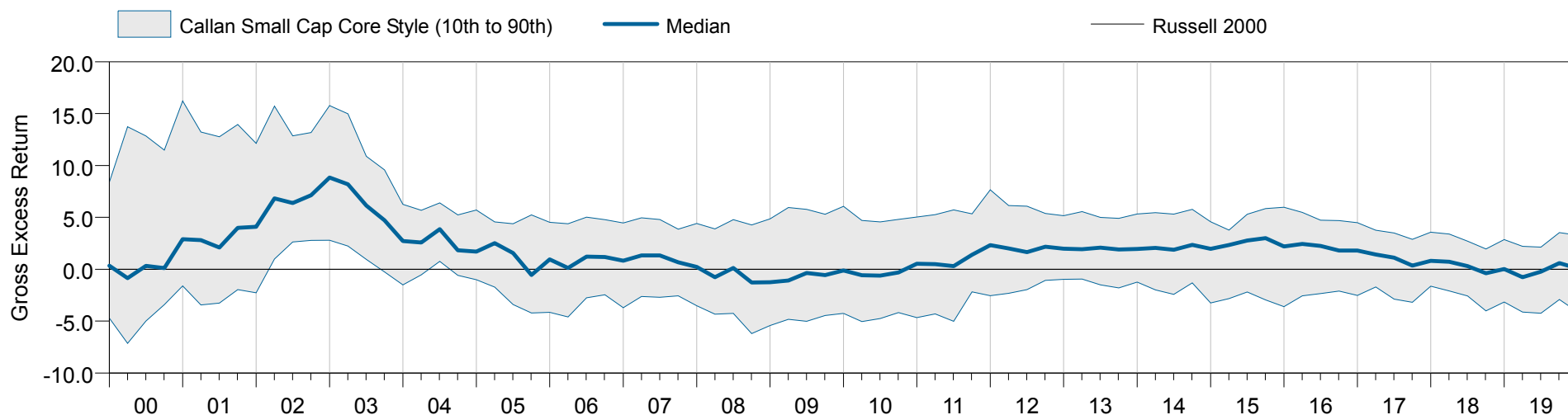
How often Manager Beat Benchmark by more than Fee Hurdle in Rolling 3-Year Periods over last 20 Years

Fee Hurdle	0.50%	0.55%	0.60%	0.65%	0.70%	0.75%	0.80%	0.85%	0.90%	0.95%
Median	68%	66%	66%	65%	64%	63%	63%	60%	60%	60%
45th Percentile	76%	75%	73%	71%	71%	70%	70%	69%	69%	65%
40th Percentile	83%	83%	79%	79%	78%	76%	75%	74%	74%	74%
35th Percentile	89%	86%	86%	85%	84%	83%	81%	80%	80%	79%
30th Percentile	96%	96%	95%	94%	93%	91%	91%	89%	89%	89%
25th Percentile	99%	99%	99%	96%	96%	96%	96%	96%	95%	95%

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

1.66%

Rolling 3-Year Gross Excess Return relative to Russell 2000 for 20 Years ended December 31, 2019



Callan

Appendix: International Equity

International Equity Strategies

• Non-US Developed

- Managers whose portfolio holdings and characteristics are similar to those of the broader developed market as represented by the MSCI EAFE or MSCI World ex-US, with the objective of adding value over and above the index typically from country, sector, or issue selection
- Exposure to emerging markets and smaller capitalization stocks is typically limited and opportunistic

• Non-US All Country

- Managers whose portfolio holdings and characteristics are similar to those of the broader developed and emerging markets as represented by MSCI ACWI ex USA or MSCI ACWI ex USA IMI (which includes small cap), with the objective of adding value over and above the index typically from country, sector, or issue selection
- Exposure to emerging markets and smaller capitalization stocks can be significant

• Small cap

- Managers focused on selecting smaller capitalization stocks within the broader developed and/or emerging markets as generally represented by the MSCI World ex USA Small Cap and MSCI ACWI ex USA Small Cap Indices
- Portfolios are diversified across countries and exposure to emerging markets varies dramatically

• Emerging markets

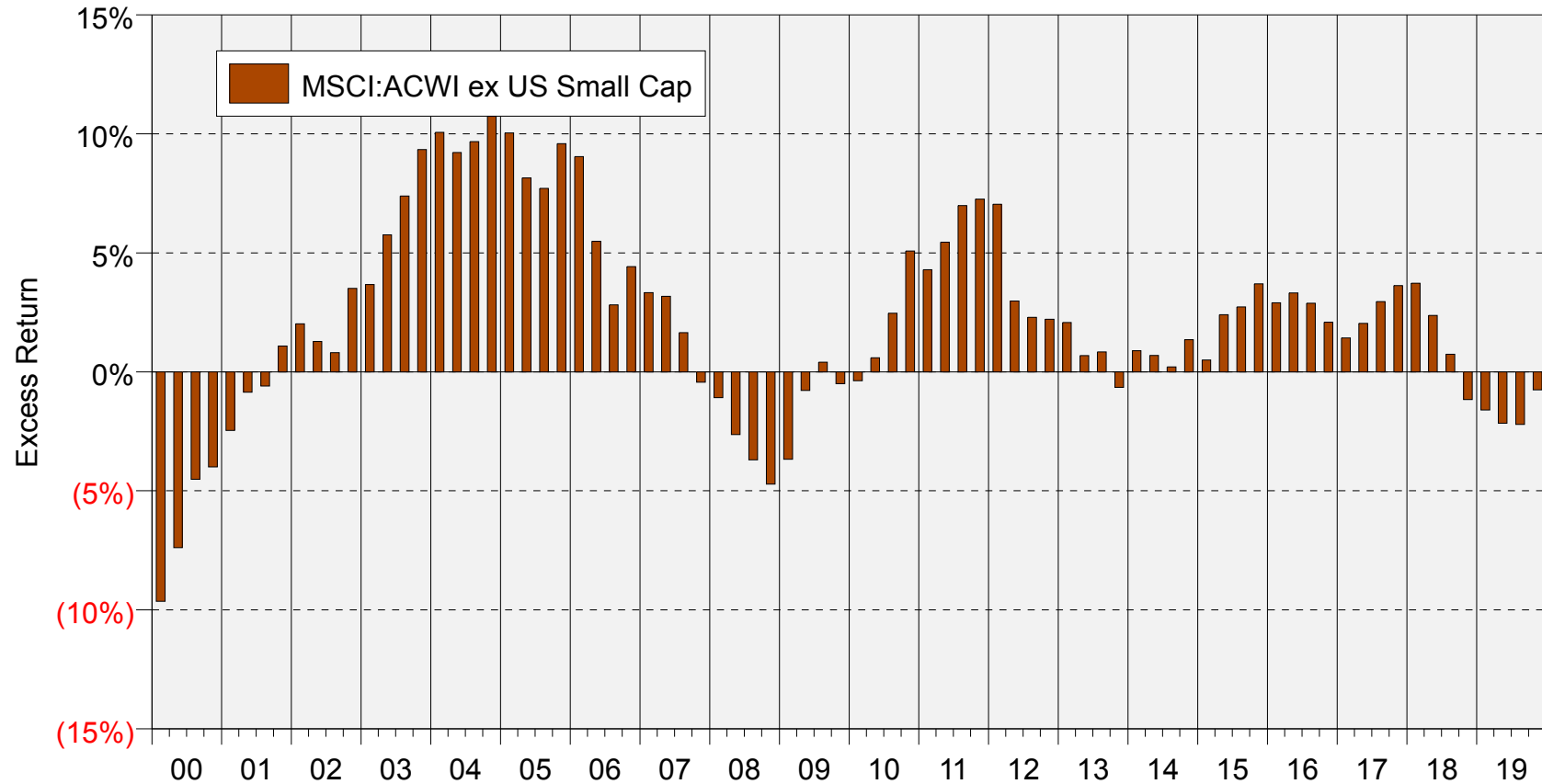
- Managers who invest in emerging markets with portfolios that can resemble or significantly deviate from the characteristics of the broad market as represented by the MSCI Emerging Markets Index
- Portfolios are diversified across countries and exposure to smaller capitalization stocks can be significant

	EAFE Large + Mid Cap	Emerging Large + Mid Cap	ACWI ex-US Large + Mid Cap	ACWI ex-US IMI LC + MC + SC	ACWI Large + Mid Cap	ACWI IMI LC + MC + SC
Europe + Asia	100.00%	0.00%	67.54%	68.19%	30.79%	31.39%
Austria	0.24%		0.16%	0.23%	0.07%	0.10%
Belgium	0.95%		0.64%	0.75%	0.29%	0.34%
Denmark	1.75%		1.18%	1.19%	0.54%	0.55%
Finland	1.04%		0.70%	0.76%	0.32%	0.35%
France	11.10%		7.50%	6.80%	3.42%	3.13%
Germany	8.82%		5.96%	5.71%	2.71%	2.63%
Ireland	0.54%		0.37%	0.37%	0.17%	0.17%
Israel	0.54%		0.36%	0.49%	0.17%	0.22%
Italy	2.26%		1.52%	1.67%	0.70%	0.77%
Netherlands	3.43%		2.32%	2.26%	1.06%	1.04%
Norway	0.73%		0.49%	0.64%	0.23%	0.29%
Portugal	0.16%		0.11%	0.13%	0.05%	0.06%
Spain	3.10%		2.09%	2.06%	0.95%	0.95%
Sweden	2.71%		1.83%	2.13%	0.84%	0.98%
Switzerland	8.65%		5.84%	5.47%	2.66%	2.52%
United Kingdom	16.94%		11.44%	11.67%	5.21%	5.37%
Australia	6.92%		4.68%	4.74%	2.13%	2.18%
Hong Kong	3.91%		2.64%	2.48%	1.20%	1.14%
Japan	24.61%		16.62%	17.45%	7.58%	8.03%
New Zealand	0.23%		0.16%	0.24%	0.07%	0.11%
Singapore	1.37%		0.92%	0.98%	0.42%	0.45%
North America			6.47%	6.49%	57.36%	56.96%
Canada			6.47%	6.49%	2.95%	2.99%
United States					54.41%	53.97%
Emerging Markets		100.00%	26.00%	25.32%	11.85%	11.65%
China		30.41%	7.90%	7.17%	3.60%	3.30%
India		9.39%	2.44%	2.58%	1.11%	1.19%
Indonesia		2.31%	0.60%	0.59%	0.27%	0.27%
South Korea		13.78%	3.58%	3.61%	1.63%	1.66%
Malaysia		2.44%	0.63%	0.64%	0.29%	0.29%
Philippines		1.11%	0.29%	0.28%	0.13%	0.13%
Taiwan		11.39%	2.96%	3.09%	1.35%	1.42%
Thailand		2.42%	0.63%	0.65%	0.29%	0.30%
Brazil		7.49%	1.95%	1.87%	0.89%	0.86%
Chile		1.09%	0.28%	0.29%	0.13%	0.13%
Colombia		0.41%	0.11%	0.10%	0.05%	0.05%
Mexico		2.78%	0.72%	0.71%	0.33%	0.32%
Peru		0.43%	0.11%	0.10%	0.05%	0.05%
Czech Republic		0.17%	0.04%	0.04%	0.02%	0.02%
Greece		0.22%	0.06%	0.08%	0.03%	0.03%
Hungary		0.33%	0.09%	0.08%	0.04%	0.04%
Pakistan		0.03%	0.01%	0.03%	0.00%	0.01%
Poland		1.26%	0.33%	0.31%	0.15%	0.14%
Russia		3.70%	0.96%	0.86%	0.44%	0.39%
Turkey		0.62%	0.16%	0.18%	0.07%	0.08%
Egypt		0.12%	0.03%	0.04%	0.01%	0.02%
Qatar		1.10%	0.29%	0.28%	0.13%	0.13%
United Arab Emirates		0.76%	0.20%	0.19%	0.09%	0.09%
South Africa		6.24%	1.62%	1.56%	0.74%	0.72%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Large + Mid Cap	100.00%	100.00%	100.00%	86.43%	100.00%	87.09%
Small Cap	0.00%	0.00%	0.00%	13.57%	0.00%	12.91%
Number of Stocks	920	1,125	2,136	6,284	2758	8725

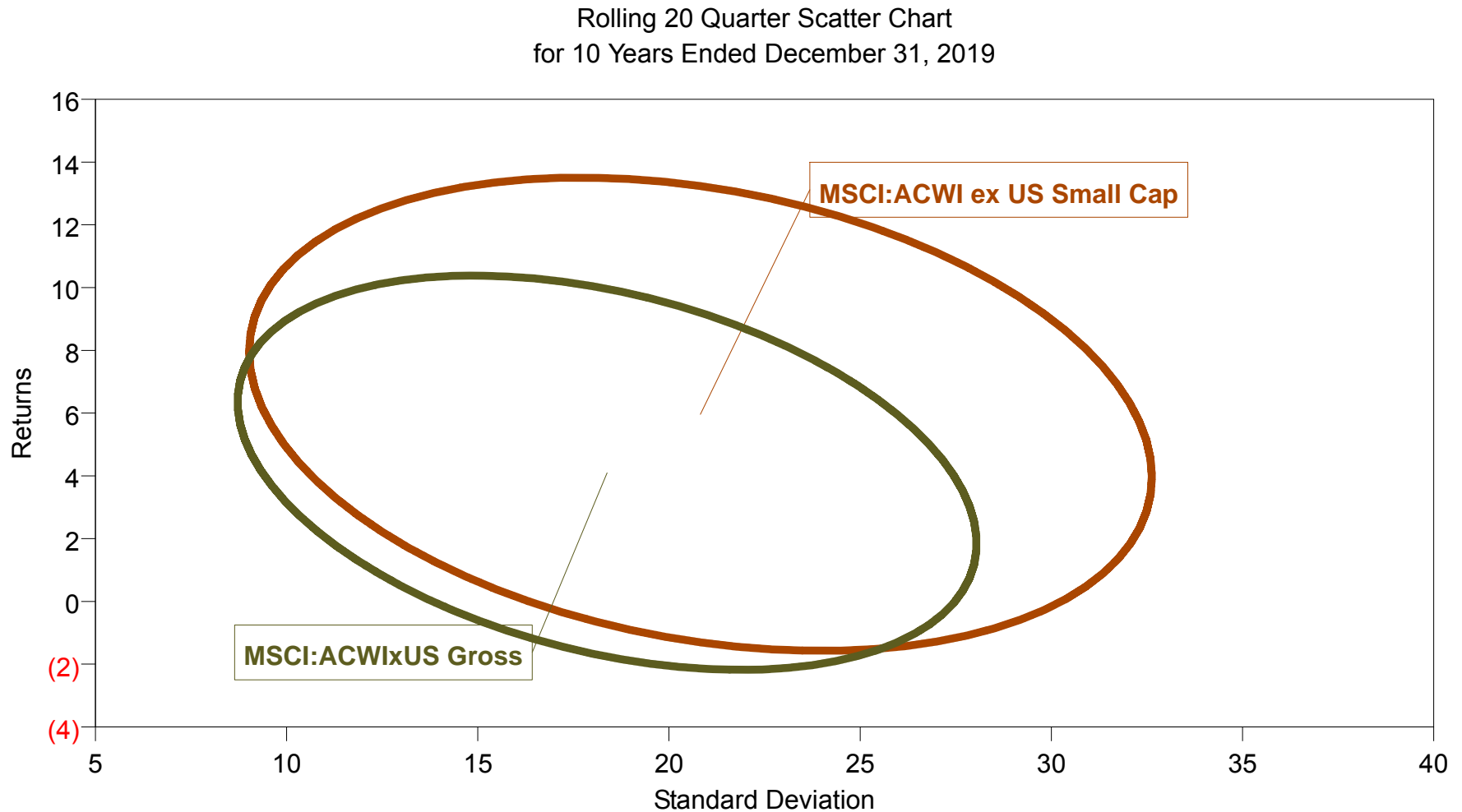
International Small Cap: Performance Potential

Rolling Performance – Small Cap Relative to Large Cap

Rolling 12 Quarter Excess Return Relative To MSCI ACWI exUS



International Small Cap: Risk/Return



- International small cap has exhibited higher volatility and higher median returns than large/mid index

Sources: Callan, MSCI

International Small Cap: Performance Potential

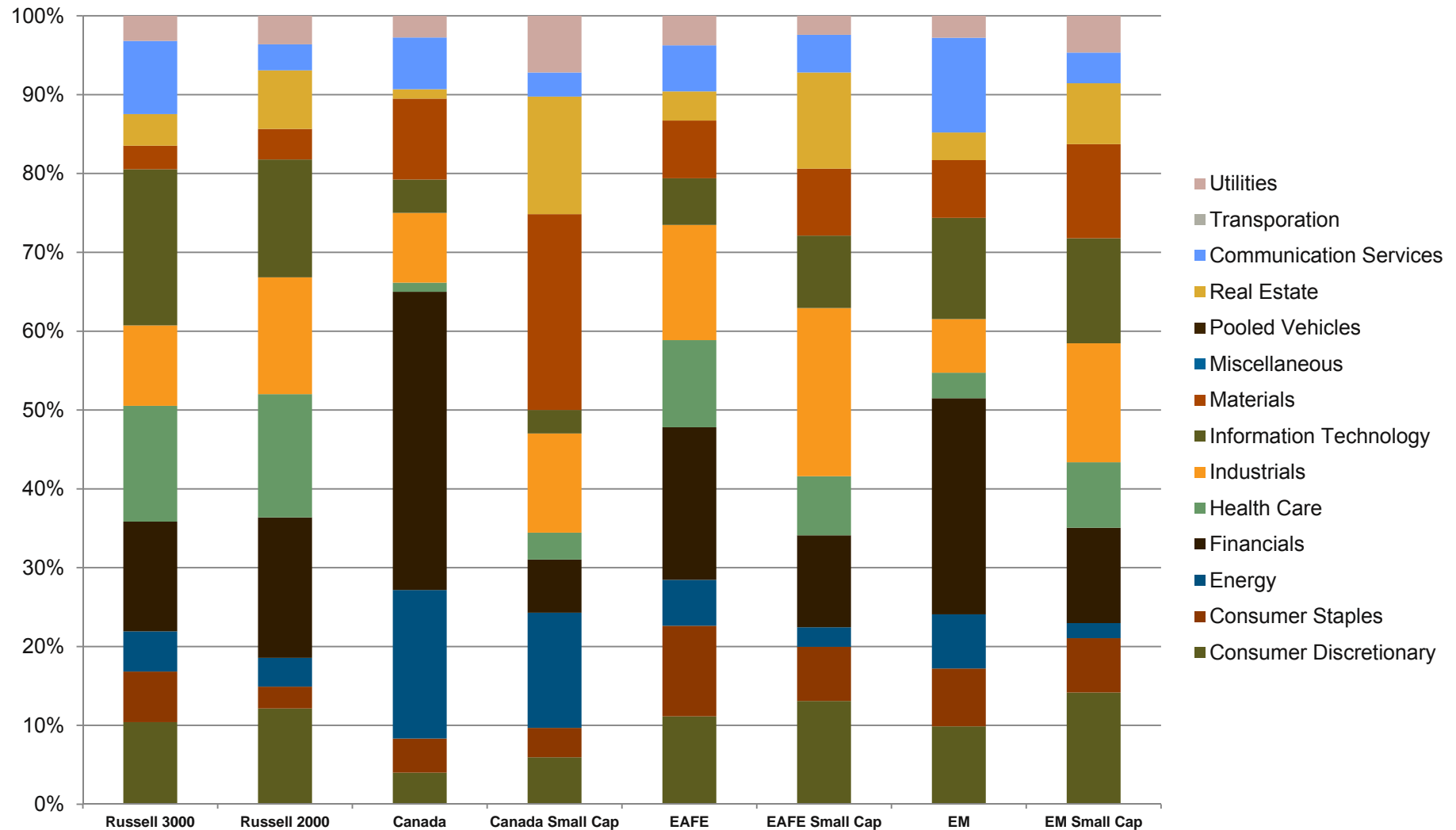
Cumulative Returns for 20 Years Ended December 31, 2019



- International small cap has added value over the broader index.

Sources: Callan, MSCI

International Small Cap: Sector Exposures

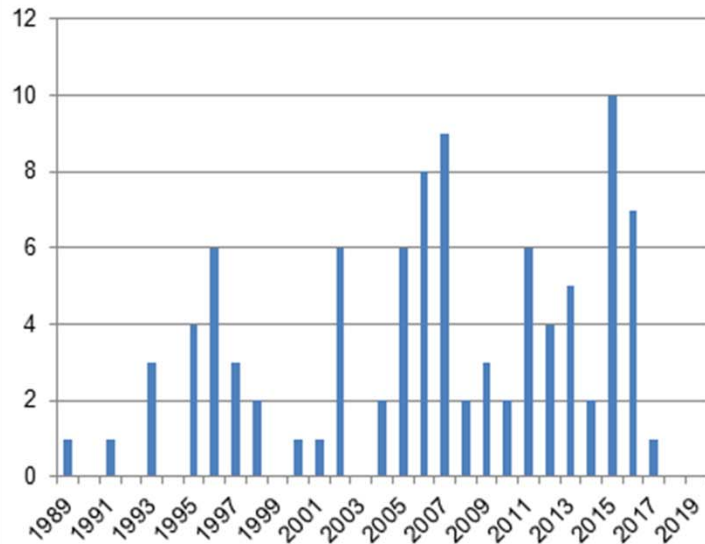


- Sector exposures differ between small and large cap – more local plays in small cap (Consumer Discretionary).

Sources: Callan, MSCI Nov 2016

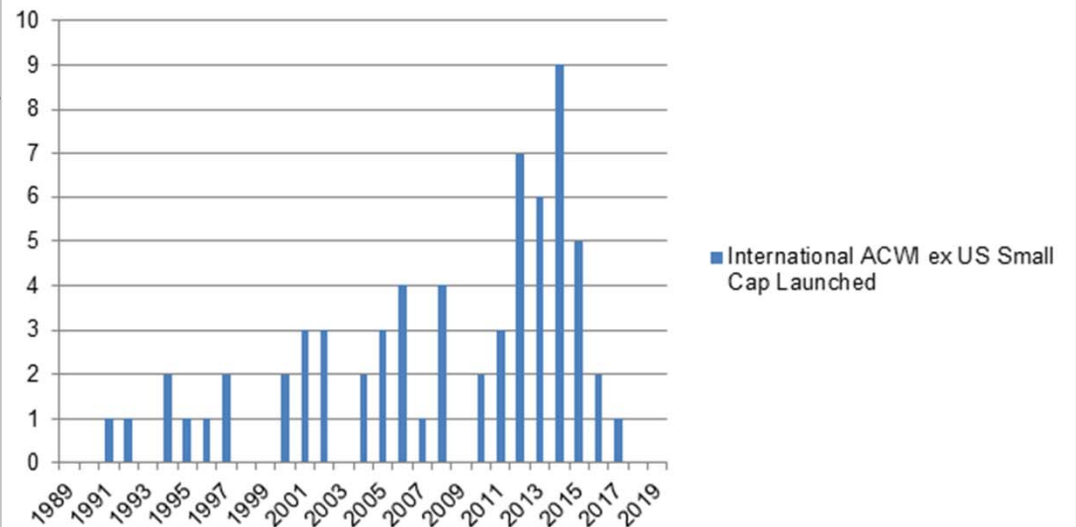
International Small Cap: Product Availability

Developed International Small Cap Launched



- There is larger product availability today in the institutional marketplace than previously

International ACWI ex US Small Cap Launched



Sources: eVestment

Active versus Passive Considerations

- Active and passive strategies can be complementary and can both play important roles in a portfolio
- Passive mandates provide low-cost exposure to the market
- Passive allocations are good liquidity vehicles for rebalancing, transition management, and making cash contributions/distributions
- Passive allocations are simple to monitor with less manager (and business) risk
- Passive mandates provide competitive performance in efficient markets and lower the tracking error for the total portfolio
- There are active managers who outperform the index – the challenge is to identify and hold them throughout their full performance cycle
- Like any style of investing, passive management will go in and out of favor over time

Active Management Performance

Empirical Data Suggests International Equity is a Good Hunting Ground for Alpha

Style Group	Benchmark	Annualized Historical Gross Excess Returns
Global All Country	MSCI ACWI	1.21%
Global Developed	MSCI World	1.75%
Non-US All Country	MSCI ACWI ex USA	1.25%
Non-US Developed	MSCI EAFE	1.47%
Small Cap	MSCI ACWI ex USA Small Cap	2.50%
Emerging Markets	MSCI Emerging Markets	1.07%

Based on 20 years of rolling 3 year median manager returns (Period Q1 2000 - Q4 2019)

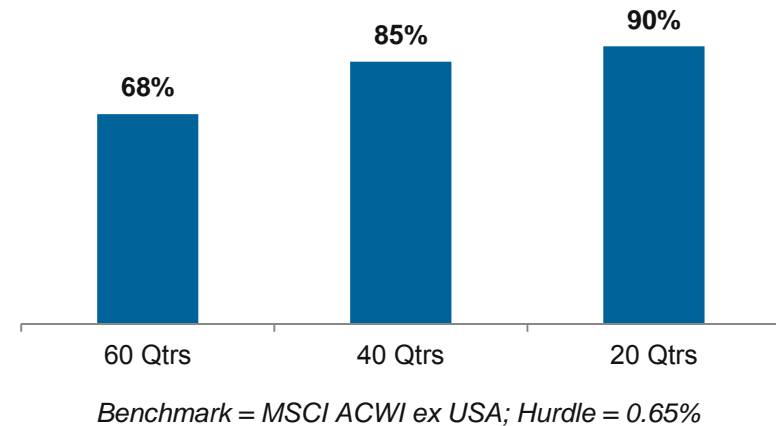
- The median active manager has outperformed its benchmark across the various style groups
 - It is important to note that the small cap style group contains products benchmarked to both the ACWI ex USA and World ex USA Small Cap Indices; the results versus World ex USA Small Cap are very similar
- The following pages contain additional detail on active manager performance by style from Callan's manager peer groups

Active Non-US Managers versus the Index

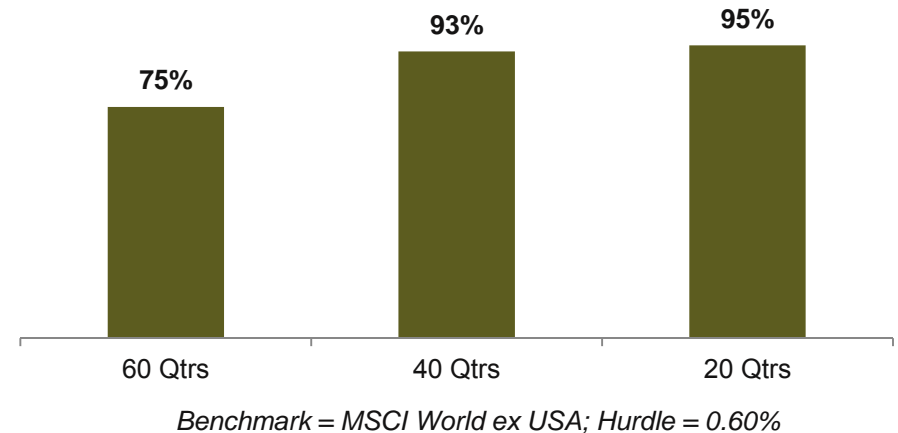
Percent of 3-Year Periods Median Manager Beat the Benchmark by Hurdle

- Non-US managers have been successful in adding value after fees
- The median non-US all country manager has beaten the benchmark by more than 0.65% a majority of the time (90% of the time over the last 20 quarters of rolling three-year periods)
- The median non-US developed markets manager has had more recent success, outperforming the benchmark by more than 0.60% , 95% of the time over the last 20 quarters of rolling three-year periods

Non-US All Country

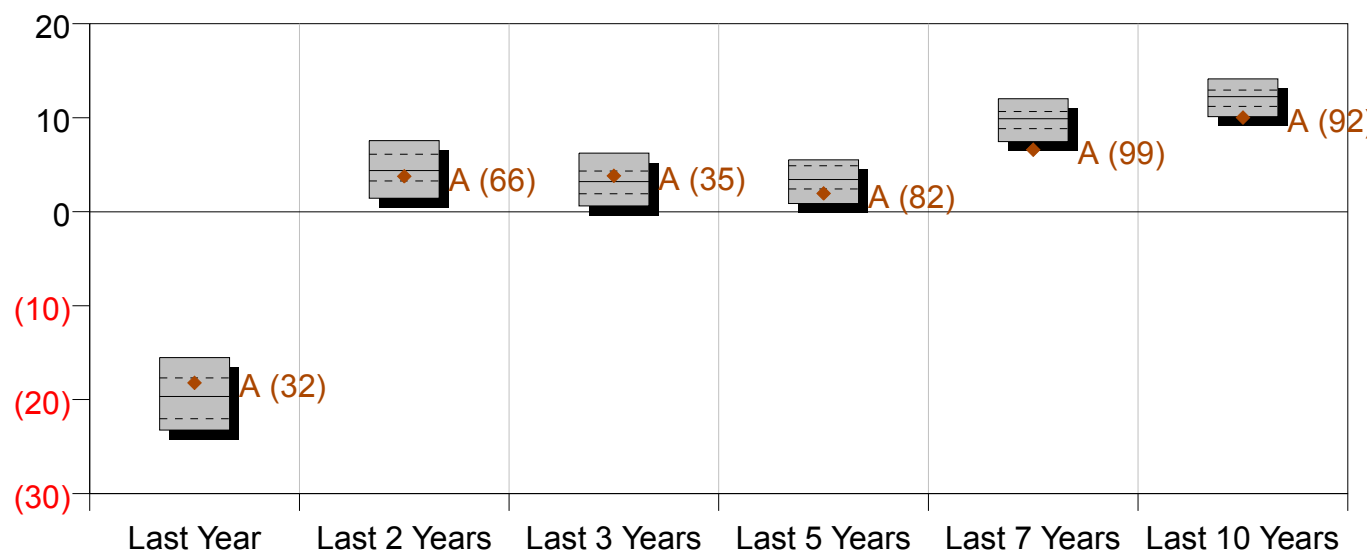


Non-US Developed



International Small Cap: Active Management Returns

Returns
for Periods Ended December 31, 2018
Group: Callan International Small Cap



	Last Year	Last 2 Years	Last 3 Years	Last 5 Years	Last 7 Years	Last 10 Years
10th Percentile	(15.52)	7.58	6.23	5.53	12.03	14.12
25th Percentile	(17.68)	6.13	4.32	4.90	10.66	12.94
Median	(19.66)	4.39	3.20	3.42	9.90	12.25
75th Percentile	(22.02)	3.28	1.92	2.42	8.83	11.22
90th Percentile	(23.23)	1.44	0.63	0.87	7.48	10.13

MSCI:ACWI ex US Small Cap ♦ A (18.20) 3.77 3.82 1.96 6.59 10.02

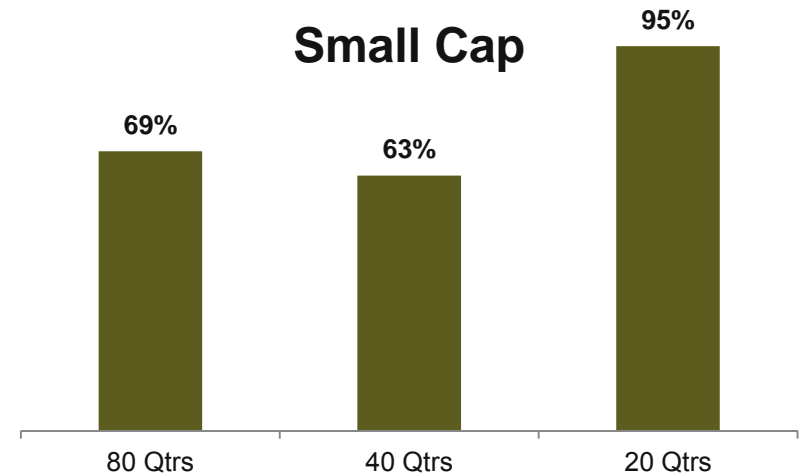
- Active management has shown ability to add value over time

Sources: Callan, MSCI, S&P

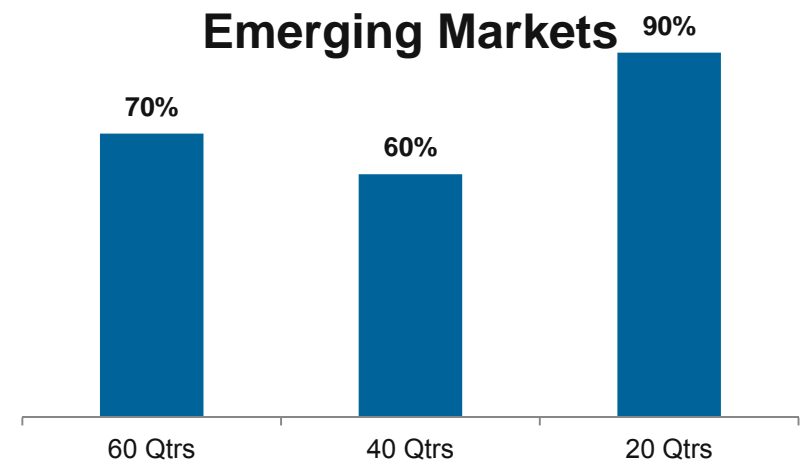
Active Small Cap and Emerging Markets Managers vs the Index

Percent of 3-Year Periods Median Manager Beat the Benchmark by Hurdle

- The median small cap manager has beaten the benchmark by more than 0.85% a majority of the time (95% of the time over the last 20 quarters of rolling three-year periods)
 - The style group contains products benchmarked to both the ACWI ex USA and World ex USA Small Cap Indices
- The median emerging markets manager has outperformed the benchmark by more than 0.80% in almost three-quarters of the periods



Benchmark = MSCI ACWI ex USA Sm Cap; Hurdle = 0.85%



Benchmark = MSCI Emerging Markets; Hurdle = 0.80%

Global ex-U.S. Equity Broad Style vs. MSCI ACWI ex USA

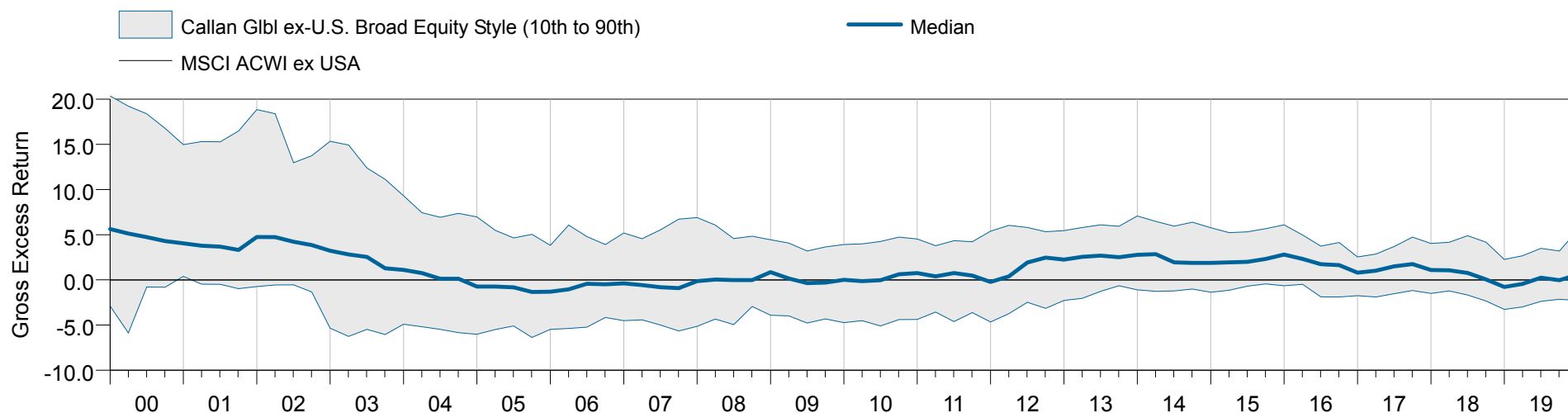
How often Manager Beat Benchmark by more than Fee Hurdle in Rolling 3-Year Periods over last 20 Years

Fee Hurdle	0.45%	0.50%	0.55%	0.60%	0.65%	0.70%	0.75%	0.80%	0.85%	0.90%
Median	60%	59%	59%	58%	56%	56%	56%	50%	50%	49%
45th Percentile	69%	66%	66%	66%	65%	64%	63%	63%	63%	58%
40th Percentile	83%	83%	81%	81%	76%	75%	74%	74%	74%	73%
35th Percentile	93%	93%	91%	90%	89%	89%	85%	84%	80%	80%
30th Percentile	99%	98%	98%	98%	98%	98%	98%	98%	96%	94%
25th Percentile	100%	100%	100%	99%	99%	99%	99%	99%	99%	99%

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

1.25%

Rolling 3-Year Gross Excess Return relative to MSCI ACWI ex USA for 20 Years ended December 31, 2019



Developed-ex U.S. Broad Equity Style vs. MSCI EAFE

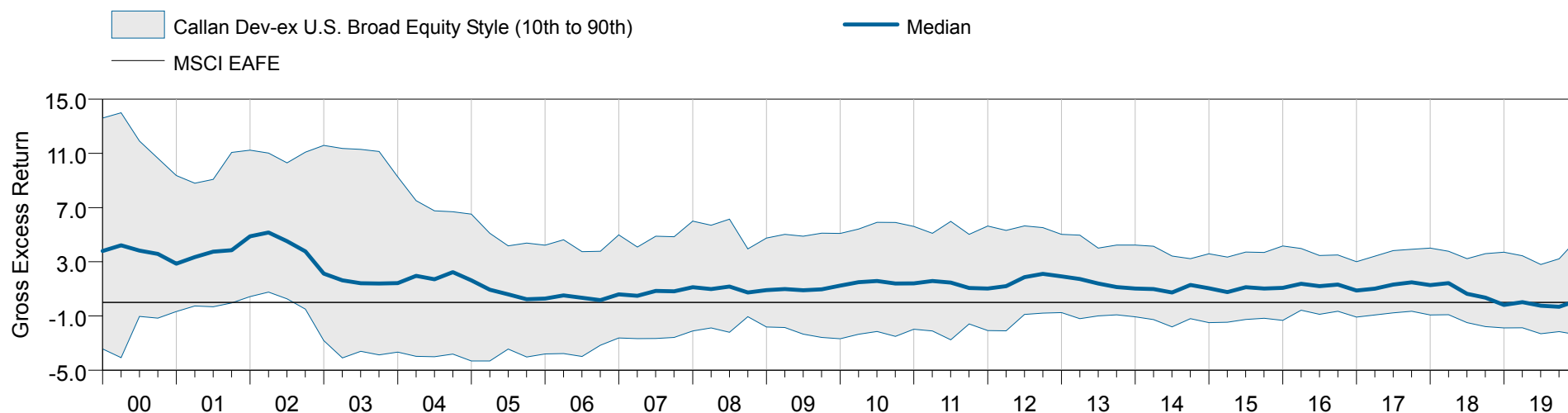
How often Manager Beat Benchmark by more than Fee Hurdle in Rolling 3-Year Periods over last 20 Years

Fee Hurdle	0.45%	0.50%	0.55%	0.60%	0.65%	0.70%	0.75%	0.80%	0.85%	0.90%
Median	88%	86%	85%	83%	81%	81%	79%	78%	76%	74%
45th Percentile	94%	94%	93%	93%	90%	89%	88%	88%	86%	83%
40th Percentile	98%	96%	96%	95%	95%	95%	95%	94%	93%	93%
35th Percentile	100%	99%	99%	98%	98%	95%	95%	95%	95%	95%
30th Percentile	100%	100%	100%	100%	100%	100%	99%	99%	98%	98%
25th Percentile	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

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

1.47%

Rolling 3-Year Gross Excess Return relative to MSCI EAFE for 20 Years ended December 31, 2019



Emerging Market Broad Equity Style vs. MSCI Emerging Markets

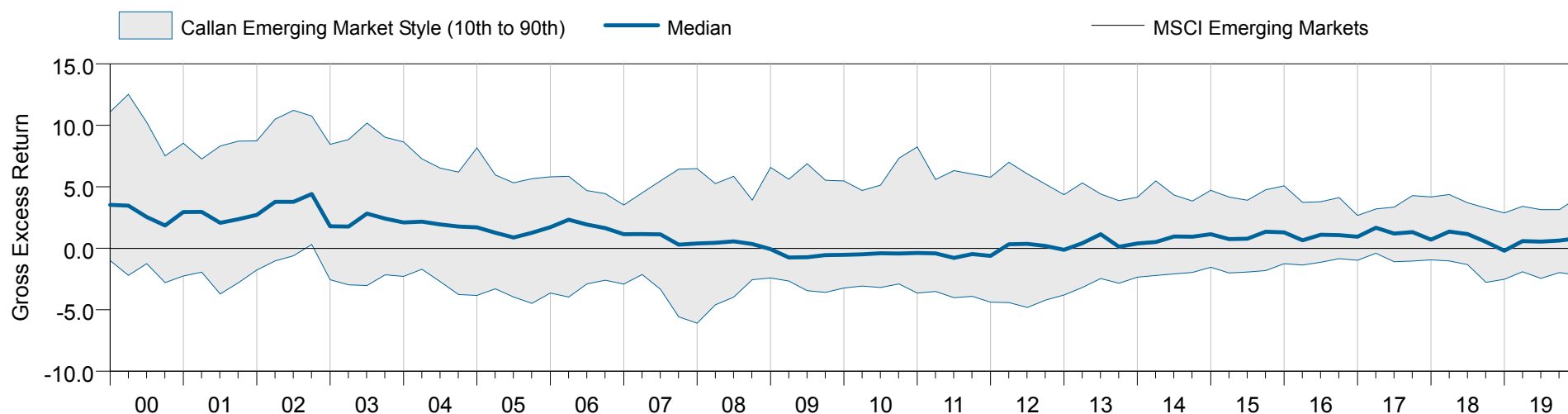
How often Manager Beat Benchmark by more than Fee Hurdle in Rolling 3-Year Periods over last 20 Years

Fee Hurdle	0.70%	0.75%	0.80%	0.85%	0.90%	0.95%	1.00%	1.05%	1.10%	1.15%
Median	60%	58%	56%	55%	54%	51%	50%	50%	49%	43%
45th Percentile	73%	70%	69%	68%	64%	61%	61%	61%	61%	56%
40th Percentile	83%	83%	80%	79%	76%	73%	73%	70%	68%	68%
35th Percentile	91%	91%	90%	90%	88%	86%	85%	85%	83%	81%
30th Percentile	98%	98%	96%	95%	95%	95%	95%	95%	95%	94%
25th Percentile	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

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

1.07%

Rolling 3-Year Gross Excess Return relative to MSCI Emerging Markets for 20 Years ended December 31, 2019



Global ex-U.S. Small Cap Style vs. MSCI ACWI ex USA Small Cap

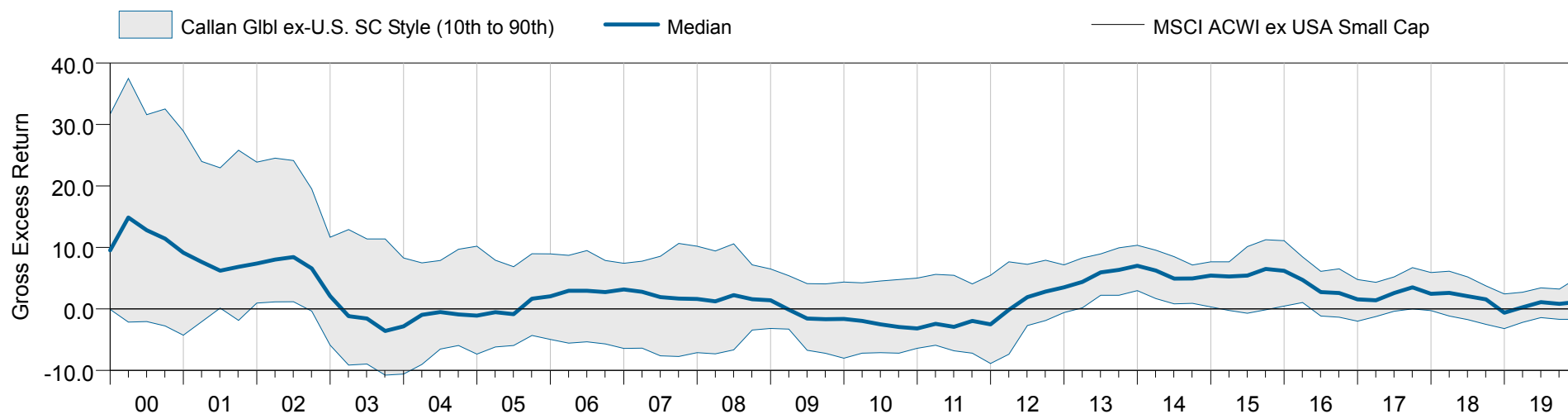
How often Manager Beat Benchmark by more than Fee Hurdle in Rolling 3-Year Periods over last 20 Years

Fee Hurdle	0.75%	0.80%	0.85%	0.90%	0.95%	1.00%	1.05%	1.10%	1.15%	1.20%
Median	69%	69%	68%	68%	68%	68%	68%	68%	65%	65%
45th Percentile	69%	69%	69%	69%	69%	69%	69%	68%	68%	68%
40th Percentile	80%	80%	80%	80%	76%	75%	75%	75%	73%	73%
35th Percentile	83%	83%	83%	81%	81%	81%	80%	80%	80%	80%
30th Percentile	86%	86%	86%	86%	86%	85%	85%	85%	85%	85%
25th Percentile	89%	89%	88%	88%	88%	86%	86%	86%	86%	86%

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

2.50%

Rolling 3-Year Gross Excess Return relative to MSCI ACWI ex USA Small Cap
for 20 Years ended December 31, 2019



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