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Research Paper

The Next Chapter in the Active vs. Passive Debate

An Update to our Analysis of Performance, Consistency and Persistency

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We completed the fifth iteration of our research study titled "The Next Chapter in the Active versus Passive Management Debate" where we evaluate the persistency of top quartile mutual funds[1] in 17 different categories during the ten-year period ended December 2018. Despite the different market environments captured in each of the time periods since the first edition of the paper in 2007, our primary observations remained consistent over time.

However, we made a minor change to the calculation methodology and removed all passively-managed funds (as defined by Morningstar) from peer groups, so actively-managed strategies could be better evaluated without distortion. All passive funds that achieved ten-year track records are independently analyzed in Exhibits 13 and 14. This change was due to the increased prevalence of passive management in the last four years, a higher number of passive funds hitting their ten-year track records and different expectations for passive funds than for actively-managed strategies.

Key Observations:

- *83 percent of ten-year top quartile mutual funds were unable to avoid at least one three-year stretch in the bottom half of their peer groups. This is down from 92, 90, 85 and 89 percent in our 2015, 2012, 2010 and 2007 studies, respectively and represents the lowest figure to date. We attribute the lower percentage to more consistent results in Intermediate Bonds and Large Cap Core equities, which represent a high percentage of the funds analyzed.*

- *54 percent of ten-year top quartile mutual funds were unable to avoid the bottom half during a five-year period. This is roughly in line with our 2015 results of 56 percent, but below our 2012 and 2010 figures of 63 and 62 percent, respectively. It is modestly higher than 51 percent in our initial 2007 study.*
- *Top quartile mutual funds with three-year stretches in the bottom half of their peer group spent, on average, six consecutive quarters below the median. Top quartile funds spent an average of 22 percent of rolling three-year periods in the bottom half of their peer groups.*
- *Owning the 37th percentile mutual fund in all 17 categories would have matched the weighted index return for a 70 percent equity and 30 percent fixed income portfolio during the ten-year period. Our 2015, 2012, 2010 and 2007 studies found the required percentiles to be the 36th, 37th, 52nd and 48th percentiles, respectively, to match the indexed portfolio's return. The trend that more effective manager selection is required to match the weighted index return continued to persist in the recent ten-year period.*
- *Recent data suggests that actively-managed strategies tend to struggle in strong up markets compared to passive strategies, especially in domestic equity asset classes. Many asset classes generate outperformance in the top quartile of their peer group and to a lesser extent the median manager more often in down markets.*
- *Investing passively does not completely insulate investors from volatility in relative performance compared to active peers and in some asset classes has guaranteed sub-par results over the most recent ten-year period.*
- *Falling prey to natural human behavioral tendencies during the manager selection and termination process generally leads to failure. Investors need to make a concerted effort to understand a manager's investment process, sub-style and investment philosophy before investing to develop the confidence and patience required for long-term success.*

Introduction

While volatility spikes occurred sporadically during the last several years, risk-assets such as equities, real estate and high yield bonds have continued to generate strong absolute performance. When compared to our last paper, the most recent ten-year period excludes the fourth quarter of 2008, which was one of the worst investment performance periods in recorded history. Our previous findings remain consistent over the latest period and support our previous conclusion that nearly all of the best managers over long periods periodically struggle over shorter periods.

Exhibit 1

Ten-year top quartile funds[2,3,4] that fell below median during one or more three- and five-year periods

Category	Number of Actively-Managed Funds with 10-Year Track Records	Number of 10-Year Top Quartile Active Managers	Number of 10-Year Top Quartile Active Managers Below Median For a 3-Year Period	Percent of 10-Year Top Quartile Active Managers Below Median For a 3-Year Period	Average Number of Consecutive Quarters Spent In Bottom Half of Peer Group	Percent of 10-Year Top Quartile Active Managers Below Median For a 5-Year Period
Intermediate Bond	200	53	33	62%	7.0	30%
High Yield Bond	111	28	21	75%	7.0	54%
International/Global Bond	47	12	8	67%	4.3	17%
Large Cap Value	235	59	50	85%	5.9	53%
Large Cap Core	244	55	47	85%	6.2	55%
Large Cap Growth	279	65	48	74%	5.3	43%
Mid Cap Value	72	19	18	95%	5.7	84%
Mid Cap Core	79	12	12	100%	7.3	83%
Mid Cap Growth	130	34	26	76%	6.3	44%
Small Cap Value	86	22	21	95%	7.5	73%
Small Cap Core	139	32	26	81%	7.3	56%
Small Cap Growth	148	38	36	95%	6.8	74%
International Value	55	13	12	92%	3.8	69%
International Core	113	32	29	91%	5.3	47%
International Growth	79	20	18	90%	6.7	75%
Emerging Markets	87	23	22	96%	6.8	65%
Real Estate	46	12	10	83%	4.0	42%
Total	**2,150**	**529**	**437**			
Weighted Average				**83%**	**6.2**	**54%**

Source: Morningstar, Fiducient Advisors Analysis

Duration of Manager Underperformance

The duration of below peer group median performance can test the patience of even the most sophisticated investors. We believe many accept the premise that strong long-term performing managers can produce poor results from time to time. However, the length of these poor-performing stretches is often surprisingly long. Exhibit 2 shows that ten-year top quartile funds spent about 22 percent of three-year periods (or about six out of 29) in the bottom half of their peer group. Therefore, had one possessed enough skill (or luck) to have selected top quartile funds in every single category, one would still have suffered through many quarterly performance reviews where approximately one in four of the selected managers underwent three-year below median performance. Over rolling five-year periods, top quartile funds spent 16 percent of the time (or about three out of 21) in the bottom half of their peer groups. The ranges are relatively tight and consistent across all 17 analyzed asset classes.

Exhibit 2

Average percent of three- and five-year periods spent in the bottom half by ten-year top quartile funds

Category	Number of 10 year Top Quartile Active Managers	Average Percent of 3-Year Periods Spent in Bottom Half	Average Percent of 5-Year Periods Spent in Bottom Half
Intermediate Bond	53	18%	11%
High Yield Bond	28	24%	18%
International/Global Bond	12	14%	5%
Large Cap Value	59	24%	18%
Large Cap Core	55	19%	13%
Large Cap Growth	65	16%	12%
Mid Cap Value	19	28%	22%
Mid Cap Core	12	23%	17%
Mid Cap Growth	34	20%	14%
Small Cap Value	22	30%	26%
Small Cap Core	32	21%	14%
Small Cap Growth	38	28%	23%
International Value	13	22%	17%
International Core	32	21%	14%
International Growth	20	27%	20%
Emerging Markets	23	29%	17%
Real Estate	12	16%	9%
Weighted Average		**22%**	**16%**

Once a manager is hired, it is very unlikely that performance will always be strong when revisiting trailing performance on a quarterly basis, even if the next ten-year period is strong enough to place the manager in the top quartile of their peer group. In fact, the only way to ensure your portfolio will always consist of managers with strong performance over trailing periods is to constantly replace your recent underperforming managers with recent more favorable performers. We advise against this because it will likely lead to long-term underperformance as shorter-term relative performance mean-reverts. As behavioral finance suggests, we should often hold when it seems obvious we should sell. Such restraint is often easier said than done, as it requires discipline and patience. Since even the best performing managers periodically struggle, what are the legitimate reasons to consider termination? We believe the answers to the following questions are the most instructive:

1. Has the portfolio manager or team changed the process, investment constraints or style?
2. Does the underperformance align with the historical context of the manager's track record in similar market cycles?
3. Have there been any personnel or organizational changes recently that explain the underperformance?
4. Does the process remain consistent despite near-term struggles?

5. Are alignment of incentives in place to retain strong portfolio managers and supporting analysts?
6. Has the manager's competitive advantage changed as a result of changing market dynamics?

While it may be easier to avoid these difficult questions by simply terminating (and hiring a recent strong-performing manager), we believe doing so is likely to sacrifice long-term performance.

Style Analysis

It is important to know both when and by how much active managers are expected to both outperform and underperform. Stylistically, many asset classes exhibit a negative relationship with alpha generation and the level of benchmark return. That is, the greater the benchmark return, the more difficult it is for active managers to keep pace with the benchmark. Index performance rankings are also cyclical and often fluctuate as much as active strategies in the same asset class. In some cycles, indices can be extremely difficult to beat not only by the median manager, but even by a top quartile manager. Exhibit 3 illustrates this concept:

Exhibit 3

Index[5] returns compared to median and top quartile funds

Category	10 Year Index Return	10-Year Index Peer Group Rank	Median Fund Return	Median Fund Excess Return	Top Quartile Fund Return	Top Quartile Fund Excess Return
Intermediate Bond	3.5%	80	4.5%	1.0%	5.2%	1.7%
High Yield Bond	11.1%	8	9.5%	-1.6%	10.1%	-1.0%
International/Global Bond	1.7%	87	3.9%	2.2%	5.2%	3.5%
Large Cap Value	11.2%	43	11.0%	-0.2%	11.8%	0.7%
Large Cap Core	13.1%	19	12.2%	-0.9%	12.9%	-0.2%
Large Cap Growth	15.3%	19	13.7%	-1.6%	15.0%	-0.3%
Mid Cap Value	13.0%	18	11.9%	-1.2%	12.8%	-0.2%
Mid Cap Core	14.0%	6	12.4%	-1.6%	13.2%	-0.9%
Mid Cap Growth	15.1%	16	13.3%	-1.8%	14.4%	-0.7%
Small Cap Value	10.4%	65	11.0%	0.6%	12.2%	1.8%
Small Cap Core	12.0%	39	11.8%	-0.2%	12.7%	0.7%
Small Cap Growth	13.5%	49	13.4%	-0.1%	14.9%	1.4%
International Value	6.6%	19	5.4%	-1.2%	6.2%	-0.4%
International Core	7.1%	21	6.0%	-1.0%	6.8%	-0.3%
International Growth	7.5%	46	7.4%	-0.2%	8.6%	1.1%
Emerging Markets	8.4%	32	7.9%	-0.5%	8.5%	0.1%
Real Estate	12.1%	34	11.8%	-0.4%	12.3%	0.2%

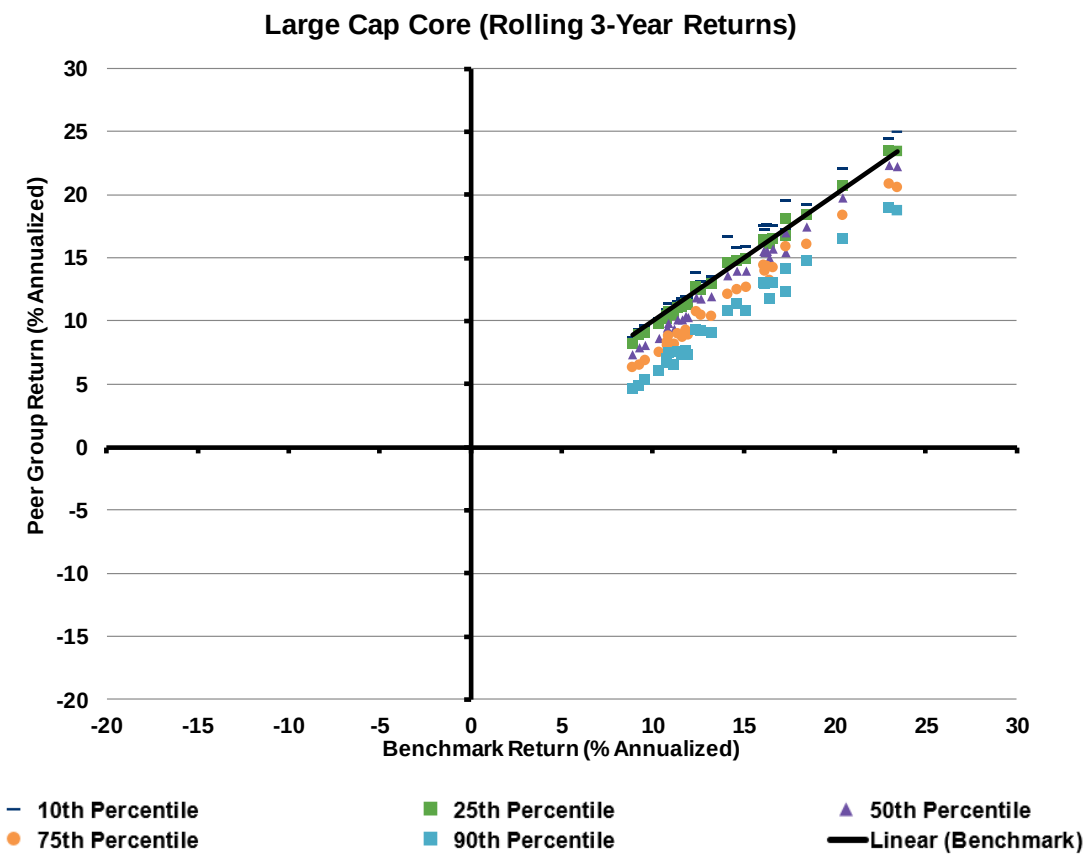
In the case of Small Cap Value, the median manager outperformed its index by approximately 60 basis points and the top quartile manager outperformed by 180 basis points. This outperformance supports active management in the

asset class. For other asset classes such as High Yield, outperforming the benchmark was extremely difficult as only seven percent of all strategies outperformed. Even selecting a top-decile manager would not have been enough to generate excess return. It is worth noting that not all indices can be efficiently tracked by a passive portfolio. Despite the headwind for active managers in High Yield for example, there are only two passive ETFs in the High Yield space and both underperformed the index by 2.4% and 1.9% on an annual basis over the last ten years.

Expanding the analysis further, Exhibit 4 displays a scatterplot of the benchmark return (on a rolling three-year basis) on the horizontal X-axis and multiple peer group returns on the vertical Y-axis. The diagonal line represents the benchmark return and icons above the line indicate outperformance whereas icons below the line indicate underperformance. The Large Cap Core space shows very strong and consistent absolute returns on a rolling three-year basis and benchmark performance around the top quartile of peers in each instance. To contrast with the version of this exhibit for the ten-year period ended December 2014, we saw several negative returns in that period and benchmark performance was more in line more with the median over the negative returning periods. It has been especially difficult for active Large Cap Core managers to outperform the S&P 500 index over the last ten years.

Exhibit 4

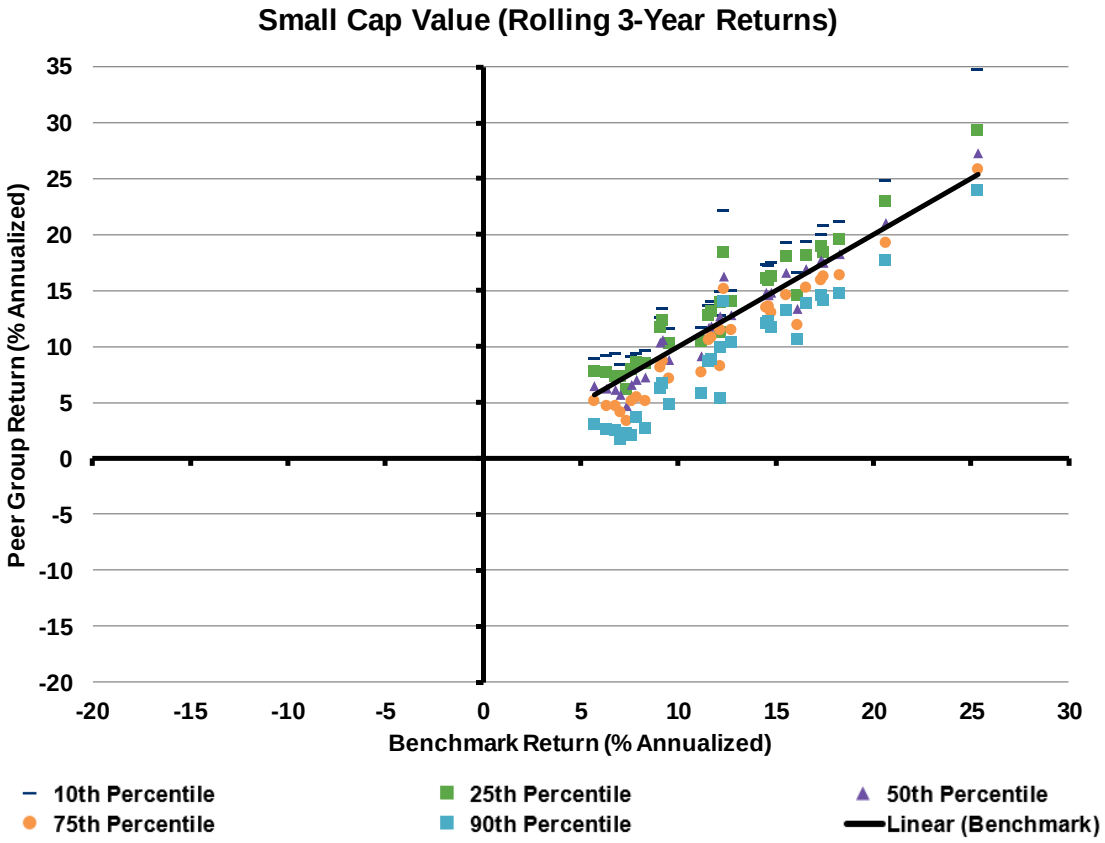
Rolling three-year peer group returns vs. S&P 500



This relationship generally held for large cap and mid cap equities regardless of growth, value or core styles. However, Exhibit 5 shows outperformance of the top quartile across all levels of benchmark returns for Small Cap Value. Since the green boxes were usually above the line, the top quartile Small Cap Value manager consistently outperformed the benchmark regardless of the level of benchmark return.

Exhibit 5

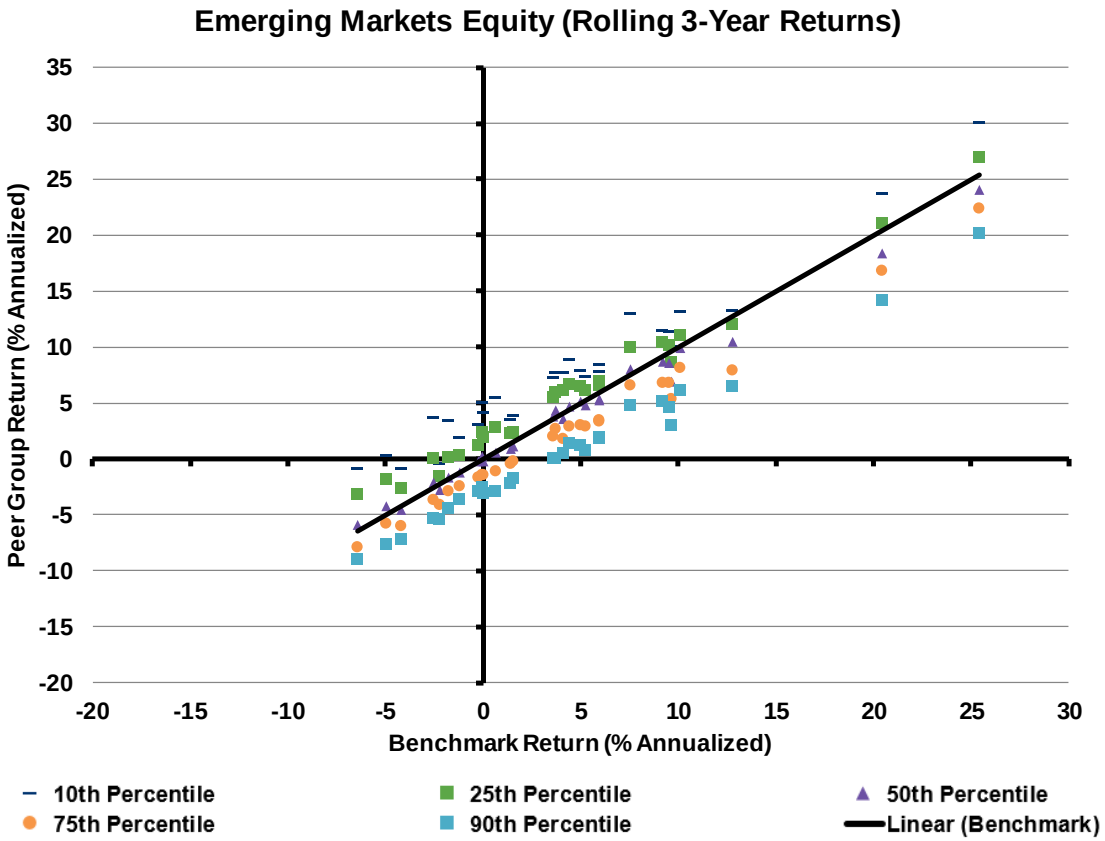
Rolling three-year peer group returns vs. Russell 2000 Value



The same concept holds true for emerging markets equities to some degree as Exhibit 6 shows the top quartile of the Emerging Markets peer group outperformed the benchmark for nearly all levels of the benchmark's absolute return.

Exhibit 6

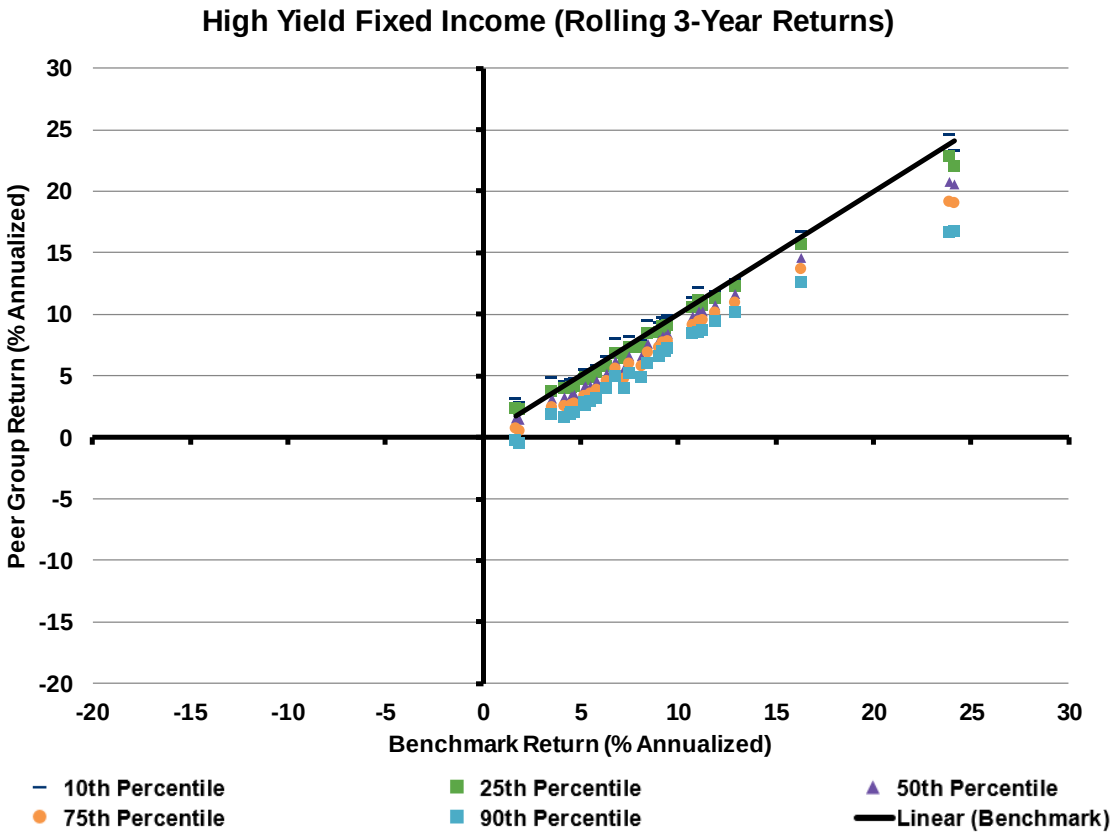
Rolling three-year peer group returns vs. MSCI Emerging Markets



High Yield, Mid Cap Core and Real Estate all displayed persistent historical underperformance for the top quartile at various periods and even occasionally show in line or underperformance of the top decile relative to the benchmark. Exhibit 7 displays High Yield's results as a prime example of just how difficult it has been for active managers in select asset classes to outperform their benchmarks.

Exhibit 7

Rolling three-year peer group returns vs. MSCI Emerging Markets



For the remaining asset classes not explored here, please refer to the Appendix for the scatterplots of all 17 asset classes.

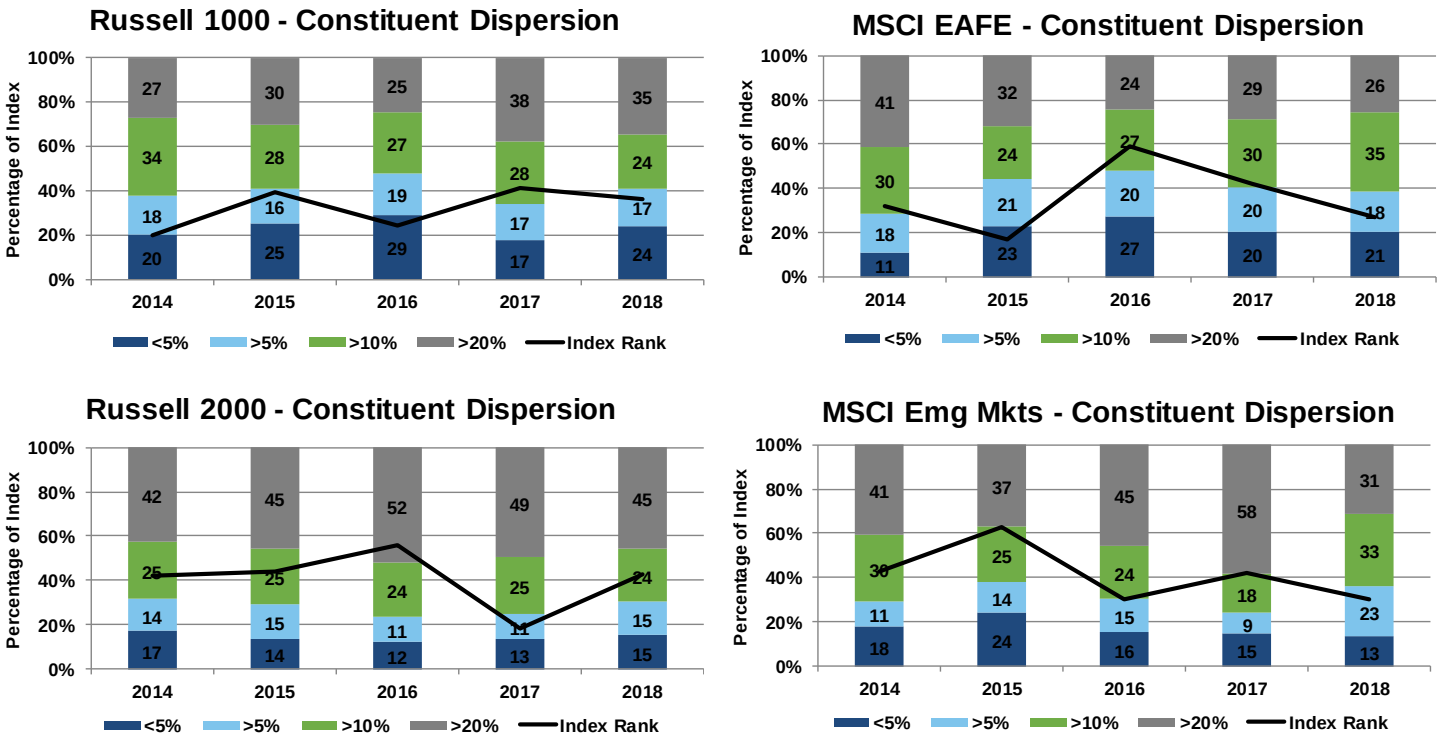
Interpreting these results yields an obvious question: with many active managers seeking to outperform their benchmarks, why do an overwhelming number fail in a particular asset class? On the equity side, since many benchmarks are market capitalization weighted, the largest companies in each benchmark greatly influence the benchmark's returns. Domestic equity indices tend to have some very large and concentrated positions and a manager unwilling to hold such concentrated positions will be at a disadvantage if those stocks happen to perform well. Moreover, active managers generally keep some cash on hand to meet redemptions in their funds, so "cash drag" hurts in momentum-driven markets like the recent domestic equity market run.

So what environment is ideal for active managers? A key ingredient for a skilled active manager to have success is the dispersion of returns across the securities in a particular opportunity set. That is, the more the constituents of an index generate different returns from the overall benchmark return over time, the better the chance skilled active

managers have to positively differentiate themselves from the index. In Exhibit 8, we evaluated return dispersion of the constituents of the Russell 1000, Russell 2000, MSCI EAFE and MSCI Emerging Markets benchmarks. For each calendar year, each stock's return was calculated and the index's return was subtracted from each to gauge how differently the opportunity set was from the overall index in a particular year. The Russell 2000 and MSCI Emerging Markets benchmarks have consistently had higher weights of securities with returns that were more than 20 percent different from the overall benchmark's return in a particular calendar year. Additionally, a persistently worse index peer ranking (higher percentile in Exhibit 8) for the Russell 2000 and MSCI Emerging Markets compared to the Russell 1000 and MSCI EAFE suggests a modest inverse relationship between the amount of dispersion and how the index itself ranks relative to peers. While this is not the only dynamic at play, return dispersion is an important consideration and supports the efficacy of active management in small cap and emerging market equities assuming skilled managers can be identified.

Exhibit 8

Index breakout by return dispersion[6]



Source: Bloomberg, Russell, MSCI

Exhibit 9 displays each asset class' rolling three-year batting average over the last decade to measure the relationship between relative performance versus the benchmark and peer group rankings. In the example of High Yield, the top quartile active manager generated an excess return of 0 percent to -2 percent during 93 percent of the 29 three-year periods over the last ten years. Large Cap Core was similar as 93 percent of rolling three-year periods produced an

excess return of 0 percent to -2 percent. Both serve as reminders that benchmark outperformance is not always guaranteed for strategies that achieve competitive rankings relative to their peers.

Exhibit 9

Batting averages of rolling three-year periods over the last ten years

	% of Rolling 3-year periods:					
	Below -4% excess return	Between -2% and -4% excess return	Between 0% and -2% excess return	Between 0% and +2% excess return	Between +2% and +4% excess return	Above +4% excess return
Intermediate Bond						
25% percentile				**83%**	10%	7%
50% percentile			10%	**83%**	7%	
75% percentile			41%	59%		
High Yield Bond						
25% percentile			**86%**	14%		
50% percentile		7%	**93%**			
75% percentile	7%	10%	**83%**			
International/Global Bond						
25% percentile			3%	24%	31%	41%
50% percentile			10%	45%	38%	7%
75% percentile		3%	31%	48%	17%	
Large Cap Value						
25% percentile			24%	72%	3%	
50% percentile			**90%**	10%		
75% percentile		69%	31%			
Large Cap Core						
25% percentile			45%	55%		
50% percentile		3%	**93%**	3%		
75% percentile		59%	41%			
Large Cap Growth						
25% percentile			62%	38%		
50% percentile		28%	72%			
75% percentile	24%	69%	7%			
Mid Cap Value						
25% percentile			55%	45%		
50% percentile		24%	**76%**			
75% percentile	10%	**83%**	7%			
Mid Cap Core						
25% percentile			62%	38%		
50% percentile		24%	**76%**			
75% percentile	38%	62%				
Mid Cap Growth						
25% percentile			28%	72%		
50% percentile		17%	**83%**			
75% percentile	7%	**86%**	7%			

Exhibit 9 continued

	% of Rolling 3-year periods:					
	Below -4% excess	Between -2% and -4%	Between 0% and -2%	Between 0% and +2%	Between +2% and +4%	Above +4% excess
Small Cap Value						
25% percentile			17%	59%	17%	7%
50% percentile		14%	34%	45%	7%	
75% percentile	10%	28%	55%	3%	3%	
Small Cap Core						
25% percentile			14%	66%	21%	
50% percentile		3%	55%	41%		
75% percentile		38%	62%			
Small Cap Growth						
25% percentile			3%	**76%**	21%	
50% percentile			**79%**	21%		
75% percentile		72%	28%			
International Value						
25% percentile		7%	7%	38%	38%	10%
50% percentile		14%	21%	45%	21%	
75% percentile	10%	3%	52%	31%	3%	
International Core						
25% percentile			14%	48%	38%	
50% percentile		7%	31%	55%	7%	
75% percentile	10%	14%	59%	17%		
International Growth						
25% percentile				41%	55%	3%
50% percentile			41%	48%	10%	
75% percentile		10%	72%	17%		
Emerging Markets						
25% percentile			7%	66%	28%	
50% percentile			45%	55%		
75% percentile		14%	**86%**			
Real Estate						
25% percentile			59%	41%		
50% percentile			**93%**	7%		
75% percentile		7%	**93%**			

Color Key: Dark Green: >=75%

Light Green: 50-74%

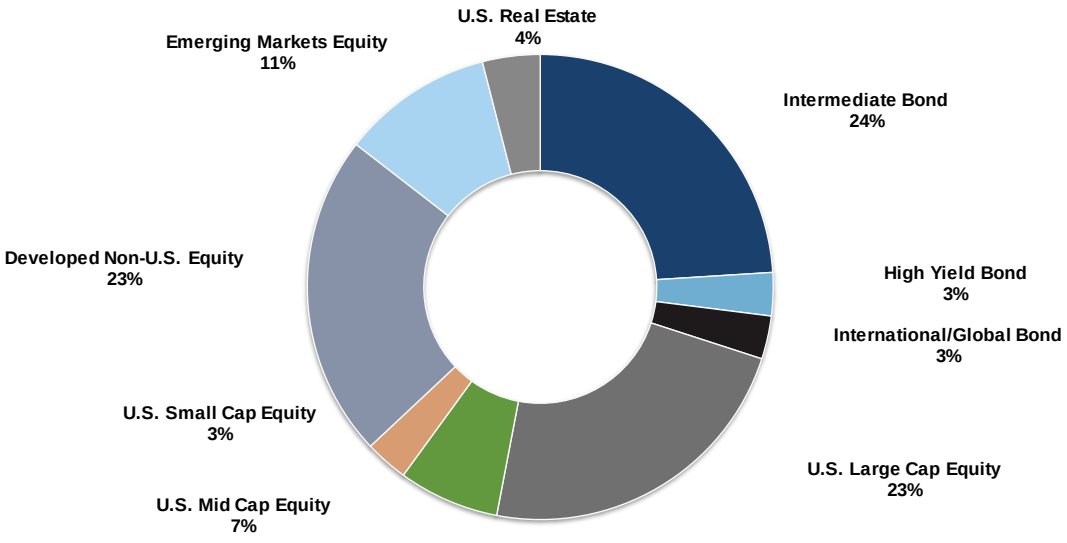
Yellow: 25-49%

Peer Group Rank Required to Match the Benchmark Return

For a hypothetical 70 percent equity and 30 percent fixed income portfolio highlighted in Exhibit 10, the required peer group ranking of each of the 17 asset classes to match the weighted index return[7] is the 37th percentile. One can see in Exhibit 11 that simply matching the median return in each asset class was not good enough to beat the weighted benchmark return.

Exhibit 10

Hypothetical 70/30 Portfolio



Source: Fiducient Advisors Frontier Engineer®

Exhibit 11

Fund return and excess return by asset class and ranking

Category	Asset Mix	10-Year Index Return	Index Peer Group Rank	Absolute Top Funds		Top Quartile Funds		37th Percentile Funds *(Required to Match Indices)*		Median Funds		Bottom Quartile Funds		Absolute Bottom Funds	
				Return	Excess Return	Return	Excess Return	Return	Excess Return	Return	Excess Return	Return	Excess Return	Return	Excess Return
Intermediate Bond	24%	3.5%	80	7.2%	3.7%	5.2%	1.7%	4.8%	1.3%	4.5%	1.0%	3.7%	0.2%	1.5%	-2.0%
High Yield Bond	3%	11.1%	8	12.0%	0.8%	10.1%	-1.0%	9.6%	-1.5%	9.5%	-1.6%	8.6%	-2.5%	2.5%	-8.6%
International/Global Bond	3%	1.7%	87	8.2%	6.5%	5.2%	3.5%	4.6%	2.9%	3.9%	2.2%	2.3%	0.6%	-0.2%	-1.9%
Large Cap Value	8%	11.2%	43	14.6%	3.5%	11.8%	0.7%	11.2%	0.0%	11.0%	-0.2%	10.1%	-1.1%	5.2%	-6.0%
Large Cap Core	8%	13.1%	19	16.6%	3.5%	12.9%	-0.2%	12.5%	-0.7%	12.2%	-0.9%	11.2%	-1.9%	4.1%	-9.1%
Large Cap Growth	8%	15.3%	19	18.8%	3.5%	15.0%	-0.3%	14.4%	-0.9%	13.7%	-1.6%	12.5%	-2.8%	2.5%	-12.8%
Mid Cap Value	2%	13.0%	18	14.9%	1.8%	12.8%	-0.2%	12.1%	-0.9%	11.9%	-1.2%	10.7%	-2.3%	7.4%	-5.6%
Mid Cap Core	2%	14.0%	6	14.7%	0.7%	13.2%	-0.9%	12.6%	-1.4%	12.4%	-1.6%	11.0%	-3.0%	4.6%	-9.4%
Mid Cap Growth	2%	15.1%	16	19.0%	3.8%	14.4%	-0.7%	13.9%	-1.3%	13.3%	-1.8%	12.5%	-2.7%	5.2%	-9.9%
Small Cap Value	1%	10.4%	65	14.9%	4.5%	12.2%	1.8%	11.4%	1.0%	11.0%	0.6%	9.9%	-0.5%	5.5%	-4.9%
Small Cap Core	1%	12.0%	39	15.1%	3.1%	12.7%	0.7%	12.0%	0.0%	11.8%	-0.2%	11.0%	-1.0%	3.9%	-8.0%
Small Cap Growth	1%	13.5%	49	18.0%	4.4%	14.9%	1.4%	14.2%	0.7%	13.4%	-0.1%	12.4%	-1.1%	-2.7%	-16.2%
International Value	8%	6.6%	19	10.0%	3.4%	6.2%	-0.4%	5.5%	-1.1%	5.4%	-1.2%	4.7%	-1.8%	0.5%	-6.0%
International Core	8%	7.1%	21	9.8%	2.7%	6.8%	-0.3%	6.3%	-0.8%	6.0%	-1.0%	5.3%	-1.8%	2.3%	-4.8%
International Growth	8%	7.5%	46	11.5%	4.0%	8.6%	1.1%	7.8%	0.3%	7.4%	-0.2%	6.6%	-1.0%	3.6%	-4.0%
Emerging Markets	11%	8.4%	32	11.6%	3.3%	8.5%	0.1%	8.1%	-0.3%	7.9%	-0.5%	7.0%	-1.4%	3.5%	-4.9%
Real Estate	4%	12.1%	34	15.8%	3.7%	12.3%	0.2%	11.8%	-0.4%	11.8%	-0.4%	11.3%	-0.9%	7.0%	-5.2%
Aggregate Excess Return of Managers					**3.42%**		**0.55%**		**0.00%**		**-0.29%**		**-1.18%**		**-5.63%**

In Exhibit 12, we calculate a "fee bogey" for active managers (on a weighted basis) by estimating the expense drag of employing all the most competitively priced passive funds for each asset class. The active managers in this example would have to generate approximately 0.36 percent more in annual return to make active management advantageous. Otherwise, an investor would be better off by simply hiring a passive strategy for each portfolio allocation.

Exhibit 12

Difference in fees for an all active vs. all passive portfolio[8]

Category	Allocation	Example Discretionary Tax Exempt Portfolio	Applicable Index Fund Expense Ratio	Δ Expenses
Intermediate Bond	24%	0.47	0.05	0.42
High Yield Bond	3%	0.78	0.40	0.38
International/Global Bond	3%	0.40	0.11	0.29
Large Cap Value	8%	0.04	0.05	-0.01
Large Cap Core	8%	0.04	0.04	0.00
Large Cap Growth	8%	0.04	0.05	-0.01
Mid Cap Value	2%	0.05	0.07	-0.02
Mid Cap Core	2%	0.05	0.05	0.00
Mid Cap Growth	2%	0.05	0.07	-0.02
Small Cap Value	1%	0.85	0.07	0.78
Small Cap Core	1%	0.85	0.05	0.80
Small Cap Growth	1%	0.85	0.07	0.78
International Value	8%	0.75	0.11	0.64
International Core	8%	0.75	0.11	0.64
International Growth	8%	0.75	0.11	0.64
Emerging Markets	11%	0.83	0.14	0.69
Real Estate	4%	0.07	0.12	-0.05
Total	100%			
Weighted Average		0.45	0.09	0.36

Passive Fund Options

Based solely on fees, passive strategies have their advantages. However, Exhibit 13 displays the characteristics of all passively-managed funds with ten-year track records in the same manner as Exhibit 1 does for actively-managed strategies. If we define success as achieving the top quartile over the last ten years, Exhibit 13 paints a far less rosy picture for passive investing. For example, there are 11 Intermediate-Term Bond passive funds that have achieved ten-year track records yet none of them finished in the top quartile over the last ten-year period. International Core, Emerging Markets and Real Estate have 14, 3 and 1 passive funds with ten-year track records, respectively, yet each failed to have a single passive fund achieve the top quartile as well. Small Cap Value and Small Cap Core had some winning passive funds, but they had slightly higher rates of below median performance than their actively-managed peers. In fact, the only asset class that is the exception is Large Cap Core, which had a whopping 37 percent of its funds achieve the top quartile with a very high level of persistency since only 15 percent of the funds had a three-year period below the median of the peer group. In retrospect, hiring a low-cost passive strategy in Large Cap Core was a clear winning strategy over the last ten years, but passively-managed strategies in all other asset classes have been significantly less effective to varying degrees. This supports our “pragmatic rather than dogmatic” thesis that the active vs. passive decision ought to be made asset class by asset class.

Exhibit 13

Passive Strategies (Open-Ended Mutual Funds Only)[9]

Category	Number of Passive Funds with 10-Year Track Records	Number of 10-Year Top Quartile Passive Funds	Number of 10-Year Top Quartile Passive Funds Below Median For a 3-Year Period	Percent of 10-Year Top Quartile Passive Funds Below Median For a 3-Year Period	Average Number of Consecutive Quarters Spent In Bottom Half of Peer Group	Percent of 10-Year Top Quartile Passive Funds Below Median For a 5-Year Period
Intermediate Bond	11	0	NA	NA	NA	NA
High Yield Bond	0	0	NA	NA	NA	NA
International/Global Bond	0	0	NA	NA	NA	NA
Large Cap Value	9	3	2	67%	7.0	67%
Large Cap Core	54	20	3	15%	2.3	5%
Large Cap Growth	15	9	4	44%	1.8	0%
Mid Cap Value	1	0	NA	NA	NA	NA
Mid Cap Core	17	12	10	83%	3.6	17%
Mid Cap Growth	2	0	NA	NA	NA	NA
Small Cap Value	4	1	1	100%	1.0	0%
Small Cap Core	19	8	7	88%	1.6	13%
Small Cap Growth	3	0	NA	NA	NA	NA
International Value	1	1	1	100%	9.0	100%
International Core	14	0	NA	NA	NA	NA
International Growth	0	0	NA	NA	NA	NA
Emerging Markets	3	0	NA	NA	NA	NA
Real Estate	1	0	NA	NA	NA	NA
Total	**154**	**54**	**28**			
Weighted Average				**52%**	**2.8**	**13%**

When further analyzing the performance of passively-managed strategies, we'd expect the gross of fee return to exactly match the underlying index and net of fee the fund should underperform the index solely by its fee. Exhibit 14 takes all open-ended passively-managed mutual funds and ETFs that track mainstream benchmarks (e.g. Standard & Poor's, Russell, MSCI, CRSP, FTSE, etc.) and calculates the excess return over the last ten years of each strategy over its stated benchmark. If we then back out each fund's expense ratio, we can determine which asset classes performed in line with the theoretical expectation of passively-managed funds. In some examples such as Large Cap Core equities, the average passive fund underperformed its benchmark by almost exactly its fee. However, High Yield was the opposite where the two applicable passive strategies underperformed their stated benchmarks by more than 0.80 percent after deducting fees, which is evidence of a difficult to replicate index. Further, asset classes such as International Growth, Real Estate and Emerging Markets each underperformed their benchmarks by far more than their fees, which ought to underwhelm investors favoring passive strategies across the board.

Exhibit 14

Passive Performance[10]

Category	Number of Open-Ended Index Funds & ETFs	Average Expense Ratio	Lowest Expense Ratio	Highest Expense Ratio	Average Net Excess Return Over Stated Benchmark	Excess Retun less Average Expense Ratio
Intermediate Bond	10	0.25	0.04	0.57	(0.32)	(0.07)
High Yield Bond	2	0.45	0.40	0.49	(1.29)	(0.84)
Large Cap Value	4	0.29	0.06	0.74	(0.34)	(0.05)
Large Cap Core	49	0.27	0.02	1.58	(0.25)	0.02
Large Cap Growth	6	0.21	0.04	0.74	0.11	0.32
Mid Cap Value	5	0.50	0.07	1.78	(0.65)	(0.15)
Mid Cap Core	18	0.41	0.04	1.54	(0.43)	(0.01)
Mid Cap Growth	6	0.46	0.07	1.57	(0.33)	0.13
Small Cap Value	1	0.24	0.24	0.24	(0.13)	0.11
Small Cap Core	22	0.44	0.04	1.63	(0.47)	(0.03)
Small Cap Growth	2	0.16	0.07	0.24	0.32	0.47
International Value	1	0.38	0.06	0.74	(0.19)	0.19
International Core	12	0.29	0.06	0.60	(0.31)	(0.03)
International Growth	1	0.40	0.40	0.40	(0.28)	(0.36)
Emerging Markets	2	0.49	0.31	0.67	(0.99)	(0.50)
Real Estate	1	0.08	0.08	0.08	(0.77)	(0.69)
Total / Average	**142**				**(0.34)**	**(0.01)**

Conclusion

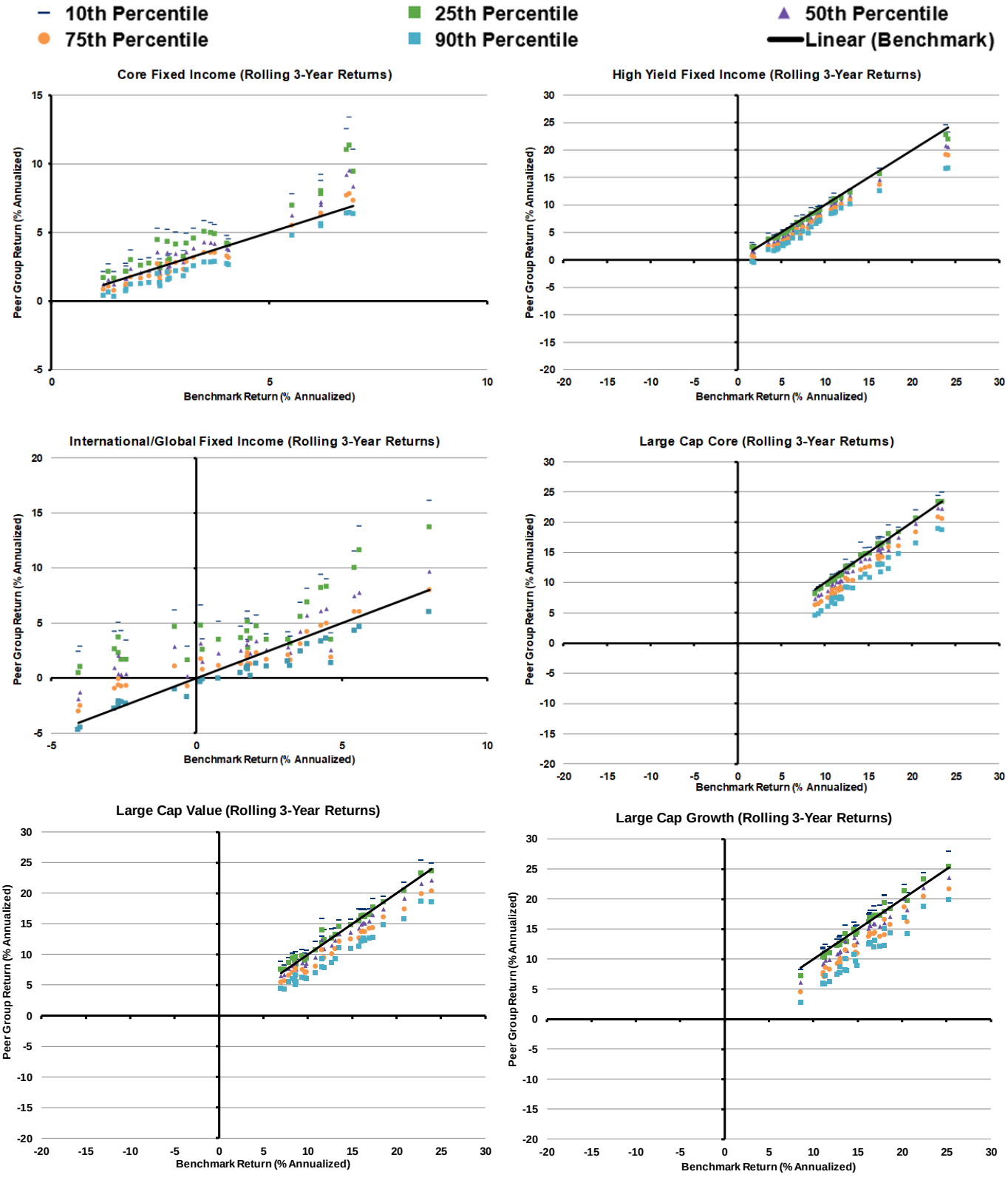
Regardless of whether an active or passive strategy is selected, an investor should understand that poor results are not an if, but rather a when. Performance lulls are inevitable. Patience will eventually be tested whether an active or passive strategy is employed. Simply choosing a passive strategy does not insulate from poor peer group rankings and might even guarantee exclusion from top quartile performance over longer periods.

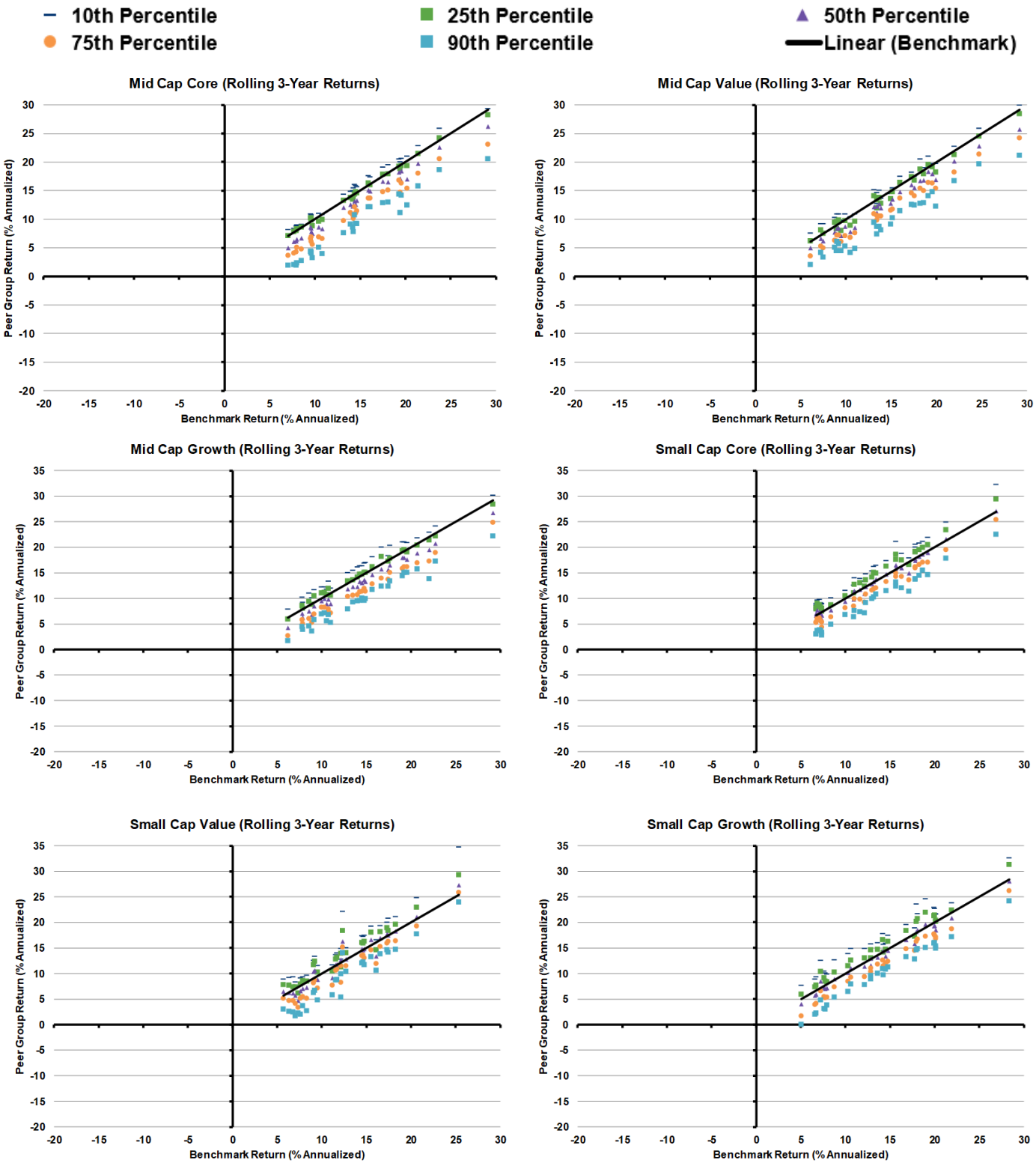
In due course, great long-term performing managers will fall to the bottom half of peer groups over multiple three- and five-year periods. In order to generate strong long-term results, investors must stay invested through the lulls. Moving to a passively managed strategy during difficult periods often does not work either and switching between the two based on trailing returns can be counterproductive. No matter what path an investor takes, patience continues to be a prerequisite for success.

Appendix

Rolling 3-year batting averages for all 17 asset classes[5]

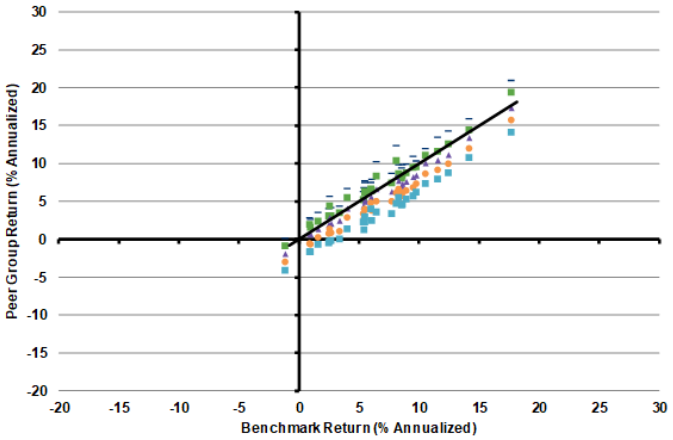
(10 years ending December 31, 2018)



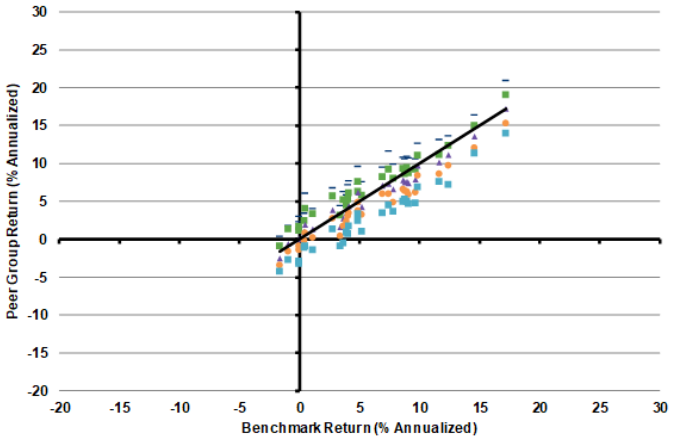

10th Percentile
25th Percentile
50th Percentile
75th Percentile
90th Percentile
Linear (Benchmark)
Mid Cap Core (Rolling 3-Year Returns)
Mid Cap Value (Rolling 3-Year Returns)
Mid Cap Growth (Rolling 3-Year Returns)
Small Cap Core (Rolling 3-Year Returns)
Small Cap Value (Rolling 3-Year Returns)
Small Cap Growth (Rolling 3-Year Returns)
Peer Group Return (% Annualized)
Benchmark Return (% Annualized)

10th Percentile
25th Percentile
50th Percentile
75th Percentile
90th Percentile
Linear (Benchmark)

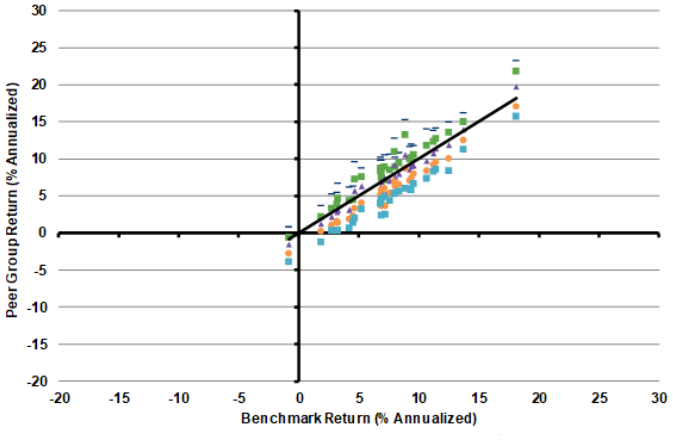
International Large Cap Core (Rolling 3-Year Returns)



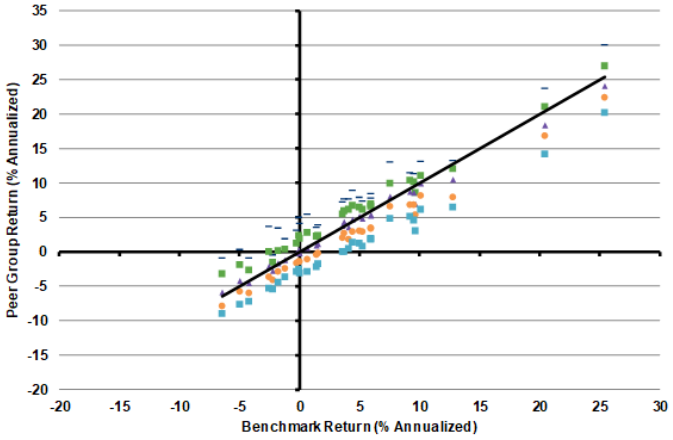
International Large Cap Value (Rolling 3-Year Returns)



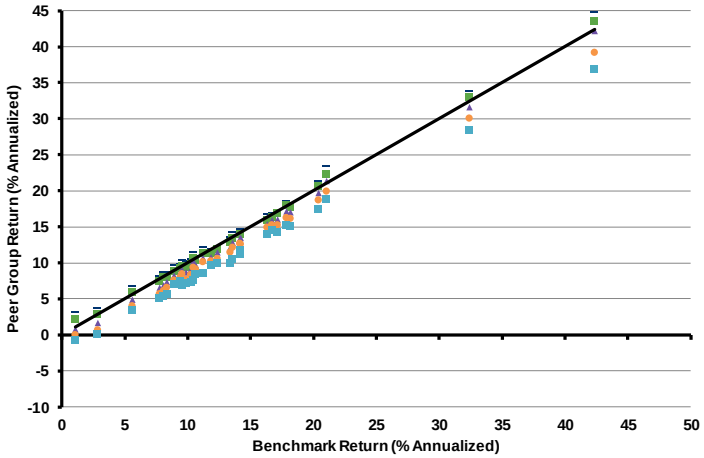
International Large Cap Growth (Rolling 3-Year Returns)



Emerging Markets Equity (Rolling 3-Year Returns)



Domestic Real Estate (Rolling 3-Year Returns)



[1] Distinct portfolio share classes (only) from Morningstar mutual fund database. Not corrected for survivorship bias. All data in all exhibits is sourced as Morningstar and Fiducient Advisors analysis unless stated otherwise.
[2] *Many fund families offer multiple versions of the same fund, but with variations of the fees that are charged and investor qualifications. Morningstar's "distinct portfolio only" feature removes all duplicate options. Morningstar normally designates the oldest share class as the distinct portfolio.*
[3] *Morningstar data is not immune to survivorship bias. Each mutual fund that survived the ten-year stretch was captured regardless of performance. In addition, the Morningstar data generates returns net of expenses.*
[4] *All ten-year calculations across the paper reflect the period from 12/31/08 to 12/31/18.*
[5] *Indices: Barclays Aggregate Bond, Barclays U.S. Corporate High Yield, Barclays Global Aggregate ex U.S., Russell 1000 Value, S&P 500, Russell 1000 Growth, Russell Mid Cap Value, Russell Mid Cap, Russell Mid Cap Growth, Russell 2000 Value, Russell 2000, Russell 2000 Growth, FTSE NAREIT Equity REITs, MSCI EAFE Value, MSCI EAFE, MSCI EAFE Growth, MSCI Emerging Markets.*
[6] These charts measure the cumulative weight of each index based on the annual absolute return difference of each security relative to the index's annual return. The line chart plots the index peer rank for each calendar year, with 1 representing the best rank and 100 representing the worst.
[7] This analysis does not incorporate rebalancing and does not adjust for survivorship bias.
[8] The fees for the "Example Portfolio" are those of our recommended managers in each asset class utilized for a $150 million Non-Profit portfolio with a Discretionary mandate. The applicable passive fund expenses are shown as the lowest cost passive option in each applicable asset class.
[9] The underlying portfolios included in this exhibit are open-ended mutual funds with ten-year track records that are classified as passive strategies based on Morningstar's definition.
[10] Both open-ended mutual funds and ETFs that track mainstream benchmarks (e.g. Standard & Poor's, Russell, MSCI, CRSP, FTSE, etc.) were included in the analysis. Given the theoretical construct that a passively-managed fund ought to underperform its benchmark stated in the prospectus by its fees, we calculate each fund's excess return over the last ten years relative to its stated benchmark and subtract the expense ratio to determine whether a passive strategy achieved its theoretical expectation.