
Mind the Gap: Global Investor Returns Show the Costs of Bad Timing Around the World

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Executive Summary

Morningstar has expanded its Mind the Gap study from the United States and Europe to its first ever global look at investor returns across markets and asset classes. Although the five-year investor returns gap ranged widely from negative 1.40% to 0.53% for the year ended 2016, some common themes emerged. Investment vehicles that required systematic investment produced better investor returns. Lower-cost funds also proved to produce better returns and a smaller investor returns gap.

Highlights

- ▶ The investor returns gap in the U.S. shrunk to 37 basis points annualized from 54 basis points during the 10-year period ended 2016.
- ▶ We limited our report on most markets to five years because the monthly share-class level assets under management figures needed for the study were only disclosed in limited amounts 10 years ago. This is also why we consider this data preliminary and expect it to change a fair amount in the early years.
- ▶ Singapore showed the largest investor returns gap with a 1.40% shortfall, while Australian superannuation funds had a 0.53% positive investor returns gap.
- ▶ Luxembourg funds had a negative 0.6% gap for the trailing five years and a 0.74% gap for the trailing 10 years.
- ▶ When sorted on fees, investor returns declined as funds rose in cost, often by more than the difference in costs, suggesting that behavior of investor and manager alike in high-cost funds was poor, while low-cost funds represented a meeting of smarter investors and managers.

Global Mind the Gap

We are expanding our annual investor returns study to markets around the globe. Today, Morningstar displays investor returns for most funds in most markets.

Investor returns are a useful lens for understanding when investors use funds well and when they don't. Although much has been written about active managers lagging their benchmark, there is less attention to investors lagging their funds' performance.

Investor returns are money-weighted returns, as opposed to time-weighted returns, which are the standard way of displaying an investment's total returns. We calculate investor returns for a single fund by adjusting returns to reflect monthly flows and their compounding effect over time to better illustrate the returns captured by the typical fund. Generally, investor returns fall short of a fund's stated time-weighted returns because, in the aggregate, investors tend to buy after a fund has gained value and sell after it has lost value. Thus, they miss out on a key part of the return stream.

The main challenge we face in calculating investor returns globally is that they require monthly flows at the share class level. That data has become readily available in most markets in recent years. We are now able to calculate aggregate investor return data for the trailing five years in many markets. However, the data set is not complete in many markets, and there is insufficient share-class-level data to run 10-year investor returns in most markets outside the U.S. The lack of 10-year data is important as investor return trends become more apparent during longer periods that include both up and down markets. We have calculated the returns for share classes where the data is available to start the discussion while we await more-definitive data.

We also caution against reading too much into any one fund's investor returns. Many things beyond a manager's control, including fund flows and launch dates, can have a large impact on a fund's investor returns. In addition, positive return gaps—where the investor return exceeds the total return—are not always a good thing. A fund that steadily loses money will often have a positive gap because selling at any point during the decline would have been a plus.

To aggregate fund investor returns data, we asset-weight investor returns using average of assets under management during the period being measured. Then we compare the asset-weighted return to the average fund's total return. Essentially, we are comparing the average fund's return in each peer group to the average investor experience. The gap between the two figures tells us how well investors timed their investments in the aggregate. Exchange-traded funds were not included because it is difficult to estimate investor intent.

This global study also considers asset-weighted total returns based on funds' asset sizes at the beginning of the time period, while our previous U.S. studies considered fund sizes at the end of the period. Comparing this with asset-weighted investor returns tells us whether investors made wise changes in the ensuing time period or whether they should have stood pat.

As we did in last year's U.S. investor returns study, we also sorted investor returns based on a few factors to see which appear to have a link with investor returns. This year, we tested fees, Morningstar Risk, standard deviation, and manager tenure. These tests may be the most important part of the study as they suggest which kinds of funds investors use well.

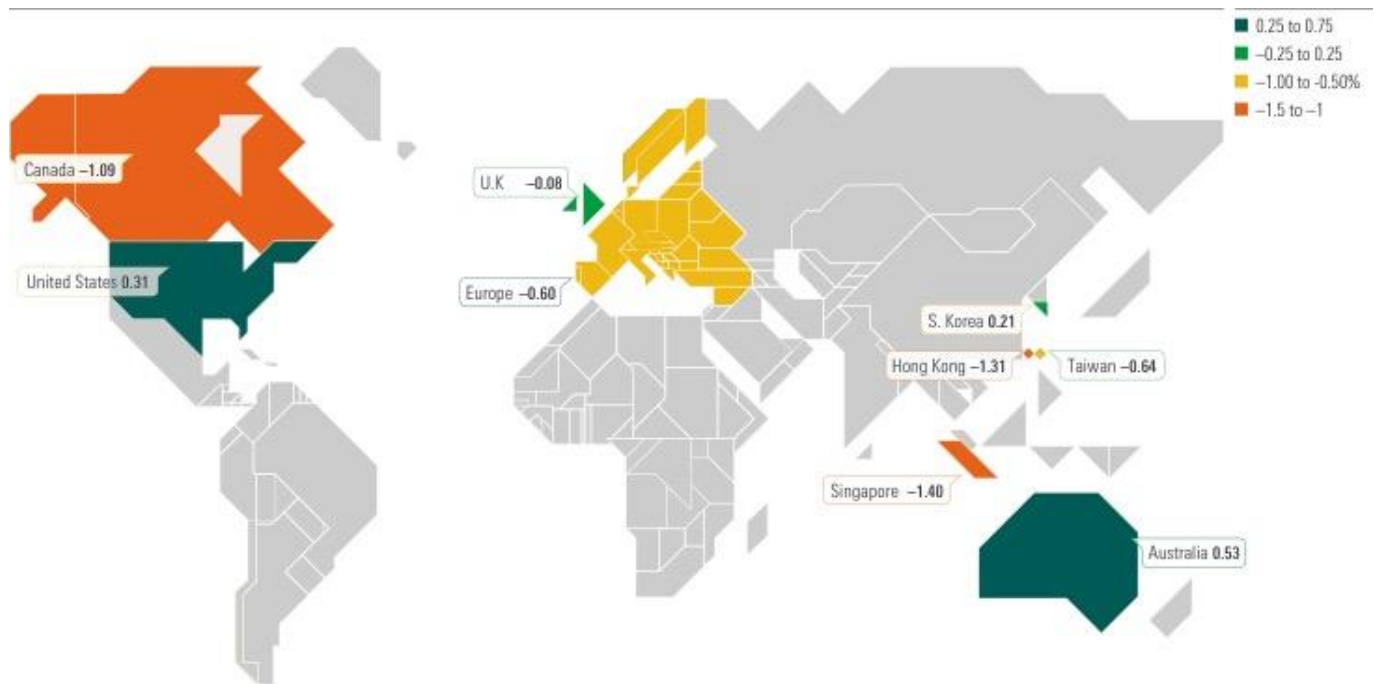
This study also uses global fund groupings. Some of the groupings used in previous U.S. studies, like foreign and muni bond, were rolled into equity and fixed income.

This report was a team effort with contributions from around the globe. David Blanchett, Wing Chan, Simon Dorricott, Andy Jung, Annette Larson, Matias Mottola, Tim Murphy, and Arthur Wu contributed to this report.

Gaps Around the Globe

In the U.S. and Europe, we found declining gaps between investor returns and total returns. In other markets where we calculated investor returns for the first time, we found generally modest gaps of less than 100 basis points. Again, we caution that data in some of these markets is limited and therefore not sufficient to draw strong conclusions.

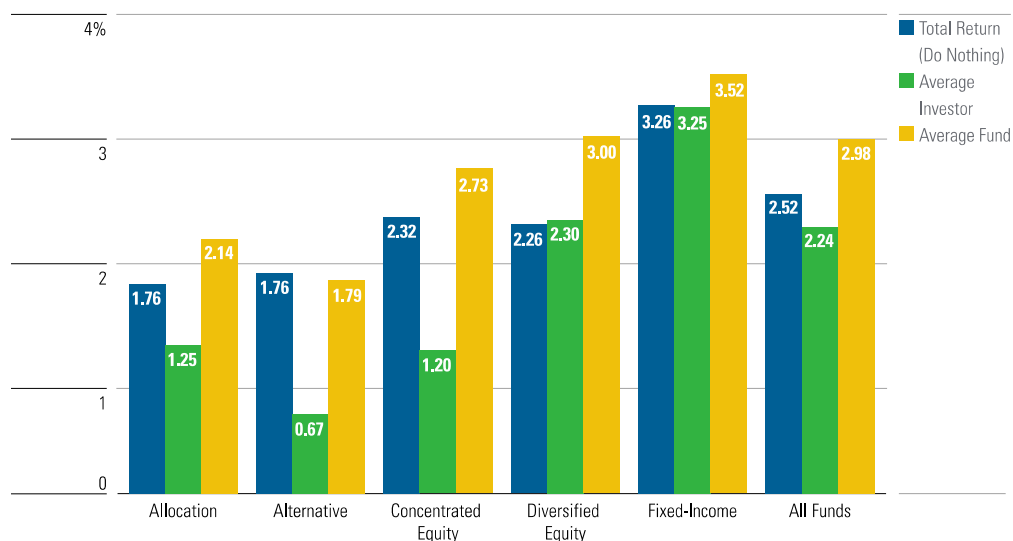
Exhibit 1 Investor Returns Gaps Around the World



Source: Morningstar Inc. Data as of Dec. 31, 2016.

We will be watching one interesting contrast: The gaps for investor and total returns in diversified equity and allocation funds. In Australia, Luxembourg, and the U.S., the gaps for allocation funds were positive, comparing favorably with diversified equity. In the United Kingdom, investors' timing into allocation funds was worse than with equity funds. In the tables and text above we refer to the 10-year data for U.S. and Luxembourg, but for this graphic we show five-year gaps for those two markets for the sake of consistency. We use Luxembourg as a proxy for Europe except for the U.K.

Exhibit 2 10-Year Investor Returns in Luxembourg



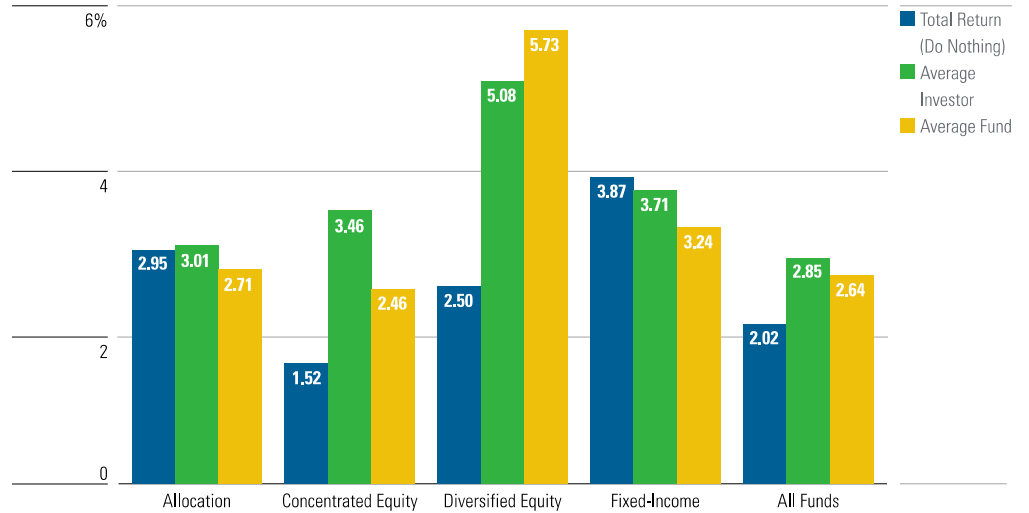
Source: Morningstar Inc. Data as of 31/12/2016.

Strong Results for Automatic Investment Plans

In South Korea, investors had particularly good timing in fixed-income funds. In Australia, superannuation funds enjoyed positive gaps. In the U.S., allocation funds had positive gaps. The link across these markets were automatic investment plans. In the U.S., target-date funds have consistently had positive gaps because U.S. investors contribute to their 401(k) savings with every paycheck. In South Korea, general savings plans feature automatic monthly investments, though they are not the only means of investing in funds. These relatively simple plans work wonders at keeping investors on track and preventing them from unwise market-timing moves. Seeing this work in three different investment cultures is a strong endorsement for the practice worldwide.

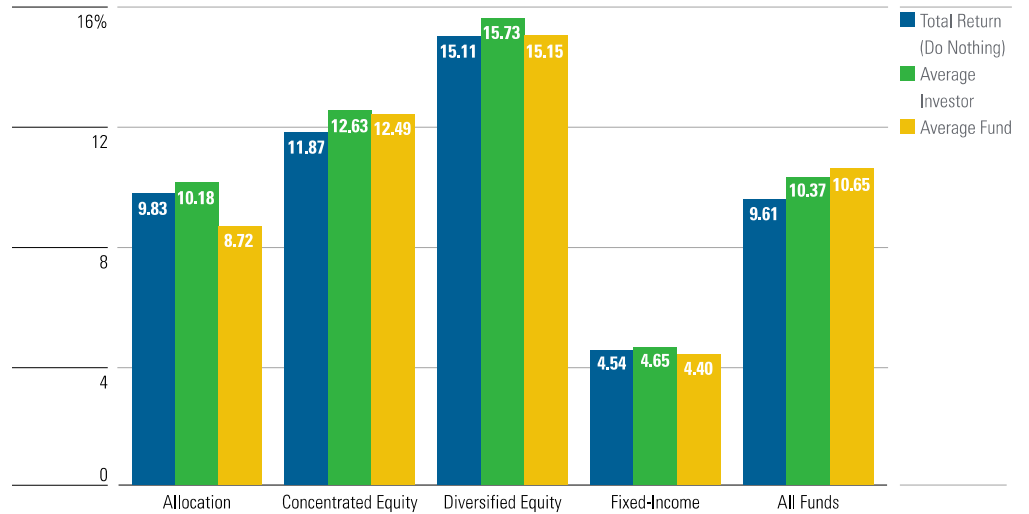
This is a structure that many regulators around the world are considering as a way to encourage retirement savings. The most recent example is the launch of the Default Investment Strategy, or DIS, on April 1, 2017, by Hong Kong's Mandatory Provident Fund Schemes Authority. The evidence suggests the idea has merit for its ability to help investors realize the potential of retirement plans. In a sense, it combines some of the strengths of defined-benefit plans and defined-contribution plans by making low-cost diversified investments the default option.

Exhibit 3 5-Year Investor Returns in South Korea



Source: Morningstar Inc. Data as of Dec. 31, 2016.

Exhibit 4 5-Year Investor Returns in Australia

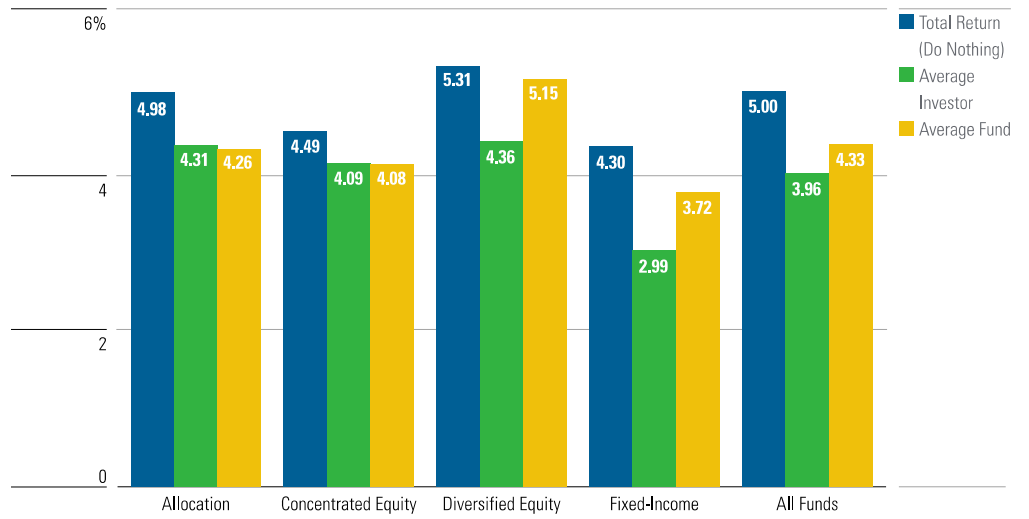


Source: Morningstar Inc. Data as of Dec. 31, 2016.

The overall 10-year gap in the U.S. has shrunk from 55 basis points at the end of 2015 to 37 basis points at the end of 2016. Adding another year of solid market returns likely helps. A second factor that is driving the aggregate gap lower over the long haul is that yearly flows have not kept pace with the growth in assets under management. Thus, in the aggregate mutual fund investors are making fewer

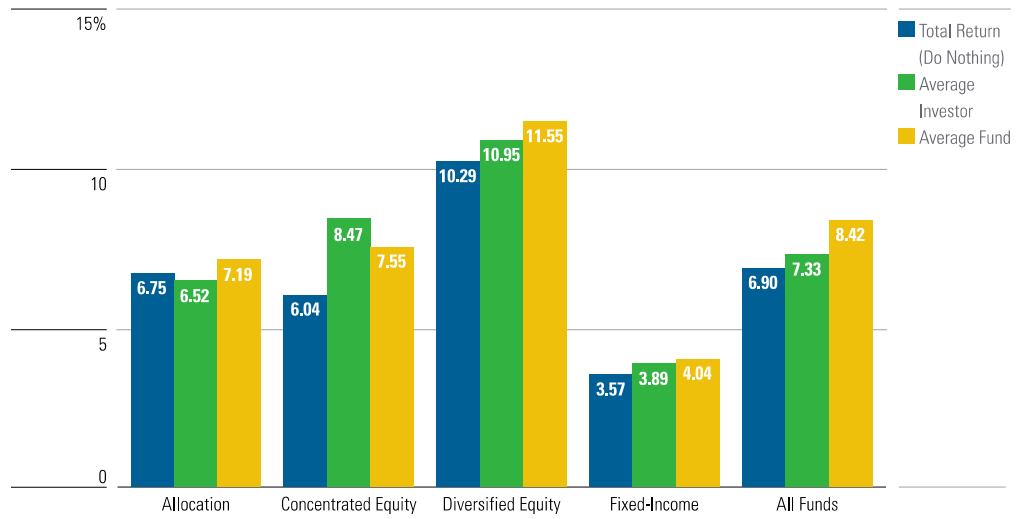
market-timing calls that can harm results. However, that doesn't mean the challenge for individual investors has diminished, as they can still do as much harm to their portfolios as before.

Exhibit 5 10-Year Investor Returns in the U.S.



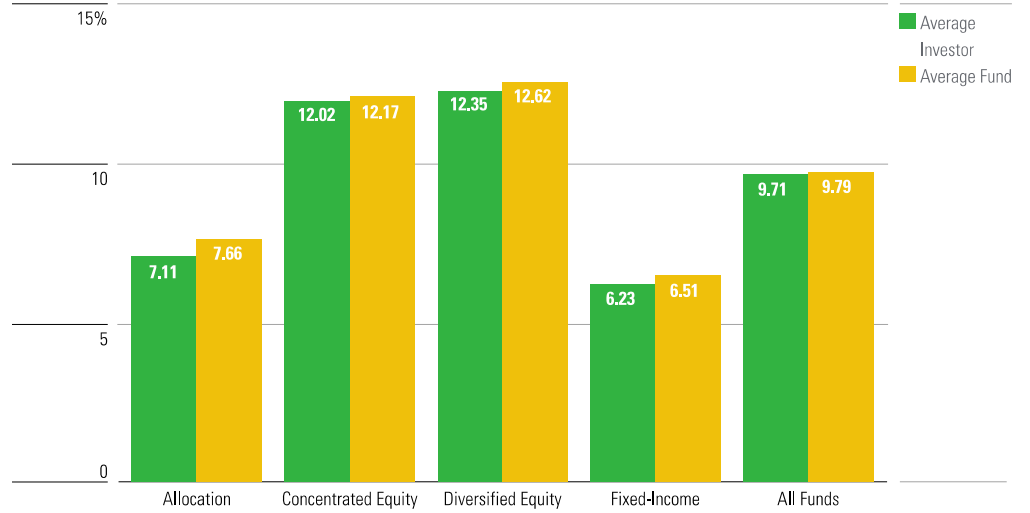
Source: Morningstar Inc. Data as of Dec. 31, 2016.

Exhibit 6 5-Year Investor Returns in Canada



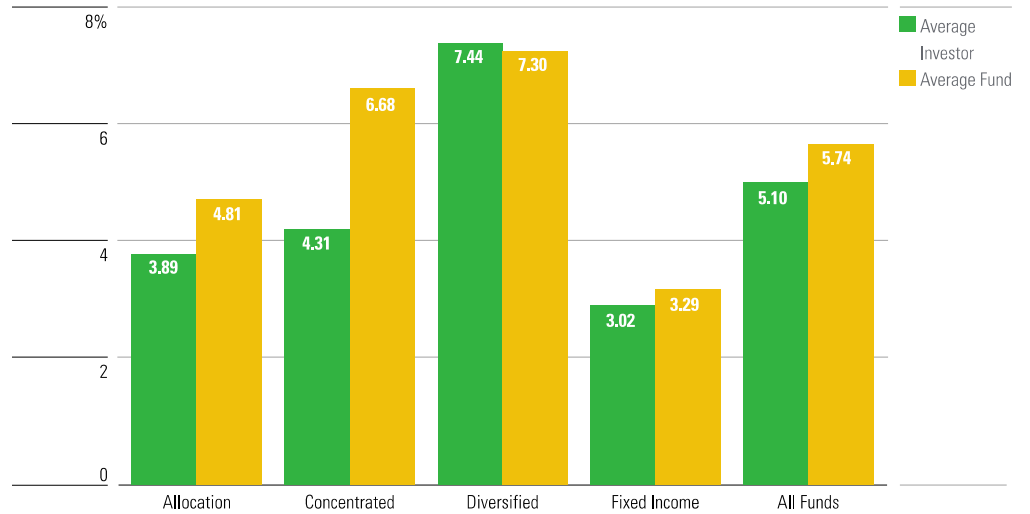
Source: Morningstar Inc. Data as of Dec. 31, 2016.

Exhibit 7 5-Year Investor Returns in the U.K.



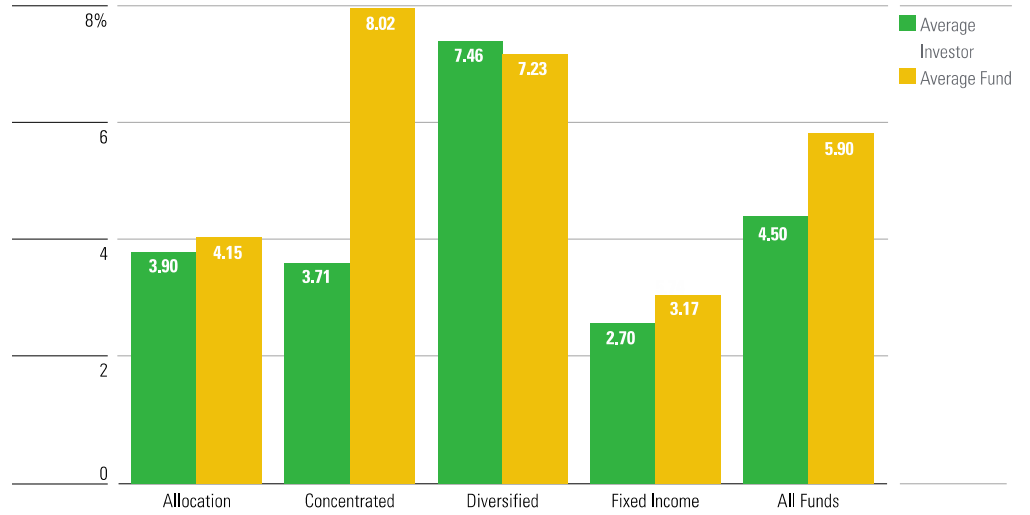
Source: Morningstar Inc. Data as of Dec. 31, 2016.

Exhibit 8 5-Year Investor Returns in Taiwan



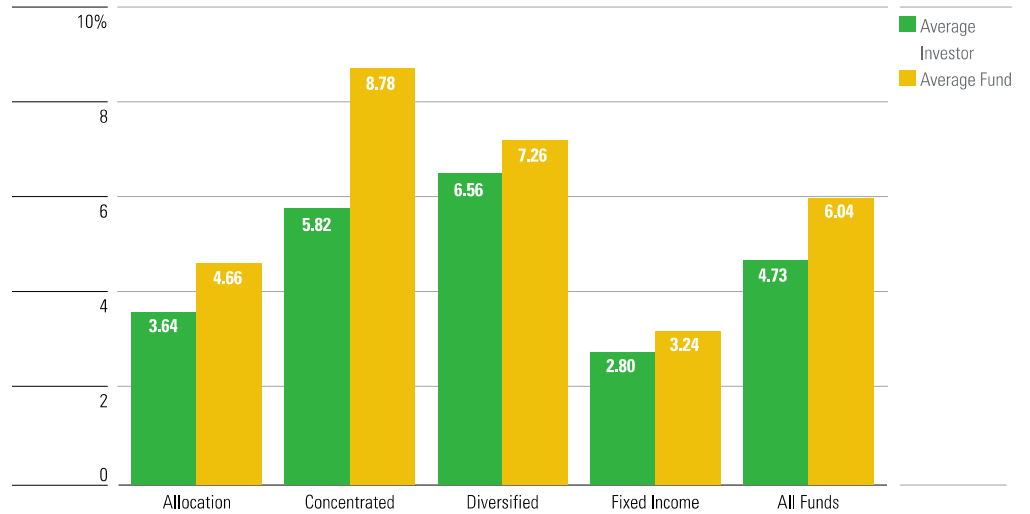
Source: Morningstar Inc. Data as of Dec. 31, 2016.

Exhibit 9 5-Year Investor Returns in Singapore



Source: Morningstar Inc. Data as of Dec. 31, 2016.

Exhibit 10 5-Year Investor Returns in Hong Kong



Source: Morningstar Inc. Data as of Dec. 31, 2016.

Exhibit 11 5-Year Returns in Asia Cross Border

Source: Morningstar Inc. Data as of Dec. 31, 2016.

The Do Nothing Portfolio

The Do Nothing Portfolio uses fund total returns that are asset-weighted using assets at the beginning of the time period. Essentially, it tells you what would have happened if investors had left their portfolios untouched. This allows us to isolate the changes investors made during the time period in question by comparing the typical investor return (as measured by investor returns that are asset weighted using an average for the entire time period in question) with the Do Nothing Portfolio.

Performance for this measurement was mixed around the globe, but in the U.S. it performed surprisingly well. In the U.S., the portfolio weighted with beginning-of-the-period assets produced better results than either investor returns or a straight average of returns in each asset class. For example, the typical diversified equity fund investor would have had a return of 5.31%, topping the 5.15% average fund return and the 4.36% average investor return.

For U.S. bond funds, the Do Nothing return was 4.30% compared with 2.99% for the average investor return and 3.72% for the average fund return.

For allocation funds, the Do Nothing Portfolio and investor returns were nearly identical and both were ahead of the average fund. The reason, as stated above, is that target-date funds are a fast-growing segment of the allocation group.

Factor Sort Results

For our factor tests, we grouped funds into quintiles based on the data at the beginning of the time period and we ranked within the mapping group. For example, we ranked fees within concentrated equity from five years ago and then tracked investor returns for each quintile's subsequent results. Funds of funds were excluded, so the dataset for the factor tests was slightly different from the broad asset class gap figures. The number of funds to survive the time period declines sharply as you move to higher-cost groups. As a result, the negative impact of higher costs is understated because many high-cost failures are eliminated by fund companies.

Exhibit 12 10-Year U.S. Factor Ranking by Morningstar Category

Group	Factor	Quintile	Average Factor	# of Funds	# of Funds with Subsequent Total Return	Subsequent Return	Asset Weighted Subsequent Investor Return	Subsequent Gap
Allocation	Expense Ratio	1	0.67	225	159	5.04	4.51	-0.52
		2	1.02	215	127	4.66	3.78	-0.88
		3	1.28	217	117	4.54	3.38	-1.16
		4	1.68	214	92	3.86	3.13	-0.73
		5	2.13	207	81	3.92	2.63	-1.29
	Morningstar Risk	1	0.20	356	224	4.46	4.67	0.21
		2	0.27	274	197	3.98	3.71	-0.27
		3	0.32	266	169	4.22	4.18	-0.03
		4	0.36	267	187	4.21	3.99	-0.22
		5	0.61	257	184	4.34	4.03	-0.31
Concentrated Equity	Expense Ratio	1	0.89	281	208	5.66	5.03	-0.63
		2	1.30	282	163	3.93	3.10	-0.83
		3	1.61	263	133	3.85	0.55	-3.30
		4	2.01	267	140	3.30	0.79	-2.51
		5	2.48	263	116	2.80	0.73	-2.07
	Morningstar Risk	1	2.08	220	150	4.18	4.41	0.23
		2	2.54	200	127	4.43	3.93	-0.50
		3	2.84	201	89	4.10	3.88	-0.22
		4	3.32	187	93	4.24	4.54	0.30
		5	4.26	197	134	4.38	4.44	0.05
Diversified Equity	Expense Ratio	1	0.74	2125	1352	5.83	4.59	-1.24
		2	1.11	2048	1136	5.34	4.15	-1.19
		3	1.39	2055	1001	5.15	3.26	-1.89
		4	1.79	2059	881	4.60	2.29	-2.30
		5	2.34	1939	628	4.34	1.78	-2.57
	Morningstar Risk	1	0.78	1558	894	5.51	4.38	-1.13
		2	1.02	1475	801	5.21	4.16	-1.05
		3	1.14	1498	716	5.18	4.51	-0.67
		4	1.37	1418	811	4.86	4.70	-0.16
		5	1.90	1390	779	5.20	3.12	-2.08

Source: Morningstar Inc. Data as of Dec. 31, 2016.

Exhibit 12 10-Year U.S. Factor Ranking by Morningstar Category (Continued)

Group	Factor	Quintile	Average Factor	# of Funds	# of Funds with Subsequent Total Return	Subsequent Return	Asset Weighted Subsequent Investor Return	Subsequent Gap
Fixed-Income	Expense Ratio	1	0.51	1174	787	4.15	3.14	-1.01
		2	0.77	1101	670	4.01	2.87	-1.14
		3	1.01	1084	597	3.89	2.74	-1.15
		4	1.41	1113	565	3.26	2.33	-0.93
		5	1.78	1044	398	3.13	2.34	-0.79
	Morningstar Risk	1	0.06	1352	758	3.34	2.67	-0.67
		2	0.10	866	541	3.96	3.05	-0.91
		3	0.12	894	571	3.83	3.18	-0.65
		4	0.13	673	392	3.67	2.72	-0.96
		5	0.25	585	353	3.99	3.38	-0.61

Source: Morningstar Inc. Data as of Dec. 31, 2016.

We sorted the results in two ways. First, we sorted relative to Morningstar Category, and then we sorted relative to the broad mapping group. For example, the category sort ranked all U.S. large-blend funds against each other and placed them into quintiles. For the broad mapping groups, we compared U.S. large-blend funds against all other diversified equity funds. This a useful exercise particularly for markets where the relative-to-category rankings were less helpful because there was a limited data set of funds with sufficient data in a category. In last year's U.S. Mind the Gap paper, we did something similar, but only for standard deviation, as it appeared that volatility relative to the broad group was more meaningful than within a more narrow peer group. Sorts such as fees and Morningstar Risk make the most sense on a category level, while standard deviation and manager tenure fit better with our broad mapping groups.

Exhibit 13 5-Year Canada Factor by Morningstar Category

Group	Factor	Quintile	Average Factor	# of Funds	# of Funds with Subsequent Total Return	Subsequent Return	Asset Weighted Subsequent Investor Return	Subsequent Gap
Allocation	Expense Ratio	1	0.86	246	192	8.00	6.80	-1.20
		2	1.48	241	166	7.63	6.73	-0.90
		3	2.07	241	184	7.15	6.77	-0.38
		4	2.36	244	196	7.10	6.43	-0.67
		5	2.85	225	147	6.77	6.11	-0.66
	Morningstar Risk	1	2.46	424	348	7.14	6.19	-0.95
		2	3.07	396	339	7.05	6.71	-0.33
		3	3.44	410	286	7.55	7.30	-0.25
		4	3.79	390	277	8.10	6.98	-1.13
		5	4.54	381	273	7.63	6.54	-1.09
Concentrated Equity	Expense Ratio	1	1.01	192	146	9.37	10.27	0.89
		2	1.79	185	96	8.15	9.32	1.17
		3	2.34	187	124	8.25	8.43	0.18
		4	2.64	184	130	7.02	8.60	1.58
		5	3.34	180	103	-0.19	-4.45	-4.27
	Morningstar Risk	1	5.68	164	100	9.07	9.15	0.08
		2	7.00	153	109	9.78	10.71	0.93
		3	7.89	154	103	8.31	8.21	-0.10
		4	8.92	159	104	7.70	7.93	0.22
		5	11.49	151	113	3.38	6.88	3.51
Diversified Equity	Expense Ratio	1	0.94	668	494	13.17	12.23	-0.94
		2	1.63	647	411	12.66	11.30	-1.36
		3	2.24	669	497	11.55	11.01	-0.54
		4	2.57	643	460	12.03	11.52	-0.52
		5	3.01	622	398	11.51	11.86	0.35
	Morningstar Risk	1	3.88	651	403	13.50	13.91	0.41
		2	4.81	631	425	13.20	13.36	0.16
		3	5.43	625	400	12.25	11.68	-0.58
		4	6.10	620	403	11.57	10.86	-0.71
		5	8.09	602	357	11.71	10.85	-0.86
Fixed-Income	Expense Ratio	1	0.58	166	136	3.91	3.54	-0.37
		2	1.08	158	122	3.19	3.39	0.19
		3	1.38	160	124	3.00	3.08	0.08
		4	1.70	158	116	2.48	1.93	-0.56
		5	2.18	154	105	2.94	2.52	-0.42
	Morningstar Risk	1	1.16	126	88	3.12	4.86	1.75
		2	1.33	109	88	2.58	3.30	0.73
		3	1.49	114	85	3.10	3.06	-0.04
		4	1.74	106	82	2.83	3.07	0.24
		5	2.10	100	85	3.25	3.27	0.02

Source: Morningstar Inc. Data as of Dec. 31, 2016.

The data was fairly clear for fees and manager tenure. When we tested fees, we generally saw investor returns decline as we moved from low-cost to pricey returns. In addition, the gap usually grew as we moved up in price. In markets with strong survivorship bias, these results were likely understated because high-cost funds that fail are often eliminated. In addition, five-year figures tend to show less of an effect because there is less time for the fee to compound and drag down returns.

Still, the trend is clear. In Luxembourg's diversified equity group, the five-year investor return in the category rank steadily eroded as fees rose. In the U.S., investor returns shrunk and the gap grew with each step to higher fee levels.

Exhibit 14 5-Year Luxembourg Factor by Morningstar Category

Group	Factor	Quintile	Average Factor	# of Funds	# of Funds with Subsequent Total Return	Subsequent Return	Asset Weighted Subsequent Investor Return	Subsequent Gap
Allocation	Expense Ratio	1	0.74	763	312	5.85	5.39	-0.46
		2	1.34	739	322	5.51	4.89	-0.62
		3	1.75	724	374	4.62	4.43	-0.19
		4	2.16	724	354	4.53	3.83	-0.71
		5	3.16	702	301	3.78	3.47	-0.31
	Morningstar Risk	1	1.92	494	219	3.23	3.11	-0.12
		2	2.40	464	257	4.61	4.62	0.01
		3	2.87	470	276	4.91	4.22	-0.68
		4	3.33	454	283	5.97	5.43	-0.54
		5	4.71	451	277	6.17	4.84	-1.33
Alternative	Expense Ratio	1	0.61	449	119	2.08	-0.06	-2.14
		2	1.21	444	170	2.26	0.93	-1.32
		3	1.55	416	152	2.39	2.17	-0.22
		4	1.98	424	183	1.70	0.72	-0.98
		5	2.85	406	139	1.62	-0.11	-1.73
	Morningstar Risk	1	0.58	211	100	1.65	0.29	-1.35
		2	1.57	166	82	1.39	1.93	0.53
		3	2.10	184	91	1.00	0.52	-0.48
		4	2.48	180	77	1.56	-0.89	-2.46
		5	4.19	182	84	4.16	4.34	0.18
Concentrated Equity	Expense Ratio	1	0.80	828	441	8.69	10.15	1.47
		2	1.53	799	464	8.37	8.40	0.03
		3	1.95	787	452	7.51	4.19	-3.32
		4	2.28	754	409	7.13	6.40	-0.73
		5	3.27	763	381	6.37	7.24	0.86
	Morningstar Risk	1	5.33	567	358	8.81	8.69	-0.12
		2	6.26	515	342	8.96	6.66	-2.30
		3	6.80	514	343	7.66	8.51	0.85
		4	7.82	520	357	7.23	6.97	-0.26
		5	9.69	513	349	8.54	4.10	-4.44
Diversified Equity	Expense Ratio	1	0.60	1506	827	10.73	10.06	-0.67
		2	1.30	1437	824	9.83	7.99	-1.84
		3	1.82	1525	969	9.21	8.75	-0.46
		4	2.18	1383	808	8.66	8.05	-0.60
		5	2.99	1387	719	8.02	7.21	-0.81

Source: Morningstar Inc. Data as of Dec. 31, 2016.

Exhibit 14 5-Year Luxembourg Factor by Morningstar Category (Continued)

Group	Factor	Quintile	Average Factor	# of Funds	# of Funds with Subsequent Total Return	Subsequent Return	Asset Weighted Subsequent Investor Return	Subsequent Gap	
	Morningstar Risk	1	4.79	1058	702	8.94	7.43	-1.51	
		2	5.71	1030	661	9.46	8.70	-0.76	
		3	6.18	1020	700	9.53	10.01	0.48	
		4	6.71	1018	735	9.75	10.31	0.56	
		5	8.02	985	599	9.34	7.83	-1.51	
	Fixed-Income	Expense Ratio	1	0.40	1341	769	4.86	4.61	-0.24
			2	0.84	1267	790	4.57	3.89	-0.68
			3	1.14	1241	811	4.30	3.92	-0.38
			4	1.40	1234	774	4.10	4.03	-0.08
			5	2.01	1188	740	3.61	3.35	-0.26
Morningstar Risk		1	1.46	905	626	3.14	2.84	-0.30	
		2	1.79	758	553	3.90	4.22	0.32	
		3	1.95	765	565	4.15	4.31	0.16	
		4	2.32	723	549	4.84	4.74	-0.10	
		5	3.06	724	489	5.30	4.36	-0.94	

Source: Morningstar Inc. Data as of Dec. 31, 2016.

The impact appears to exceed the stated expense ratio. There are likely two additional factors at work. First, higher-cost funds frequently take on greater risks to overcome their lofty fees. Thus, they may be more prone to inspiring fear and greed in investors, leading to poor timing decisions in both directions. Second, we likely have a meeting of savvy investors and responsible fund companies in cheap funds and a meeting of less-responsible investors and fund companies in the high-cost zone.

Manager tenure results were quite similar across markets. They showed no trend whatsoever when we grouped funds by manager tenure. This isn't much of a surprise, as manager tenure hasn't shown much of a link with returns or risk. Manager tenure does not equate to experience and, more importantly, it does not account for quality of experience.

Exhibit 15 5-Year U.K. Factor by Morningstar Category

Group	Factor	Quintile	Average Factor	# of Funds	# of Funds with Subsequent Total Return	Subsequent Return	Asset Weighted Subsequent Investor Return	Subsequent Gap
Allocation	Expense Ratio	1	0.80	388	287	8.60	7.91	-0.69
		2	1.36	384	298	7.28	7.86	0.57
		3	1.63	377	285	7.56	6.85	-0.70
		4	1.94	381	252	6.81	8.11	1.30
		5	2.51	364	174	7.93	7.73	-0.20
	Morningstar Risk	1	1.69	250	190	5.94	6.01	0.07
		2	2.40	247	175	7.17	7.31	0.15
		3	2.92	252	175	8.34	7.71	-0.63
		4	3.57	244	166	8.94	7.40	-1.54
		5	4.63	236	173	10.19	9.42	-0.77
Concentrated Equity	Expense Ratio	1	0.41	352	246	11.82	11.64	-0.18
		2	0.98	359	258	12.49	11.67	-0.82
		3	1.41	370	238	11.49	11.48	-0.01
		4	1.67	339	244	12.00	12.26	0.26
		5	2.10	325	156	11.25	13.62	2.37
	Morningstar Risk	1	3.77	281	218	12.60	12.70	0.10
		2	4.97	274	197	12.07	12.64	0.57
		3	5.57	278	202	11.33	10.74	-0.60
		4	6.08	275	195	12.39	9.93	-2.47
		5	8.10	262	215	12.70	14.51	1.82
Diversified Equity	Expense Ratio	1	0.49	384	285	14.27	14.43	0.16
		2	1.08	356	251	12.80	12.52	-0.27
		3	1.52	377	258	12.42	12.01	-0.41
		4	1.72	358	270	12.76	12.54	-0.22
		5	2.26	350	165	10.71	9.89	-0.82
	Morningstar Risk	1	3.54	282	213	15.25	14.68	-0.57
		2	4.52	278	210	14.44	12.47	-1.97
		3	5.52	278	213	12.98	13.36	0.38
		4	7.04	279	208	11.41	9.80	-1.60
		5	8.69	266	190	11.11	9.82	-1.29
Fixed-Income	Expense Ratio	1	0.19	234	162	6.84	5.78	-1.07
		2	0.56	238	154	6.38	6.23	-0.14
		3	0.89	250	185	6.57	6.36	-0.21
		4	1.18	215	150	5.97	6.35	0.38
		5	1.64	223	151	7.02	6.88	-0.15
	Morningstar Risk	1	0.82	175	110	4.62	3.08	-1.54
		2	1.45	177	131	6.32	5.81	-0.51
		3	1.90	173	125	7.31	6.84	-0.47
		4	2.47	175	128	7.11	7.52	0.41
		5	3.96	166	142	7.86	8.03	0.17

Source: Morningstar Inc. Data as of Dec. 31, 2016.

We saw mixed results for standard deviation and Morningstar Risk, which is similar to standard deviation except that it penalizes downside volatility more. In the past we've found a fairly strong suggestion that more-volatile equity funds lead to worse investor returns because they are harder to time and trigger emotional responses. Some markets showed this relationship, but others did not. It could be that a relatively smooth market environment in the past five years has rewarded volatility and therefore understates the effect, but that's just a guess. In any case, the least-volatile quintile generally

fared better than the most-volatile quintile, but the quintiles in between did not follow a neat stair-step pattern down the way fees did. Thus, the link between volatility and investor returns remains but appears to be weaker than in past studies.

Limitations of Study

There are two key limitations of our study. First, we covered open-end funds only because we can't infer investor intent from ETF flows. Second, there is survivorship bias in the study because we calculate investor returns only for existing funds. We aim to eliminate the survivorship bias issue in our next study.

Conclusion

More important than the size of the gap are the characteristics of funds that deliver strong investor returns. They suggest where the fund industry needs to go. Clearly, low costs are vital. Second, advisors would do well to steer investors away from the highest-risk funds as such funds tend to have poor investor returns. In addition, it appears simple tactics to prevent performance chasing such as dollar-cost averaging and automatic rebalancing can lead investors back to their plan.

In the coming years, we'll have more conclusive data on what works best for investors, and we look forward to sharing that with the advisors and fund companies working to get clients to use funds wisely. ■■

Related Research

[U.S. Mind the Gap Paper 2016](#)

[Europe Mind the Gap Paper 2016](#)

[Investor Return Methodology Paper](#)

[Investor Returns and Passive Investing](#)

Outside Research

[Jason Hsu on Investor Returns and Factors](#)

Appendix

Exhibit 16 5-Year Taiwan Factor by Morningstar Category

Group	Factor	Quintile	Average Factor	# of Funds	# of Funds with Subsequent Total Return	Subsequent Return	Asset Weighted Subsequent Investor Return	Subsequent Gap
Concentrated Equity	Expense Ratio	1	1.32	206	163	6.91	8.42	1.51
		2	1.74	204	164	7.34	1.62	-5.72
		3	1.98	148	118	6.56	5.17	-1.39
		4	2.15	147	117	7.02	2.37	-4.66
		5	2.76	155	117	5.19	4.06	-1.13
	Morningstar Risk	1	5.56	164	141	6.83	7.15	0.32
		2	6.40	141	111	7.44	2.36	-5.09
		3	7.06	144	118	6.76	5.96	-0.80
		4	7.74	140	118	6.83	6.66	-0.17
		5	9.03	146	120	6.64	0.83	-5.81
Diversified Equity	Expense Ratio	1	1.04	202	163	7.98	6.73	-1.25
		2	1.59	188	159	7.81	8.97	1.16
		3	1.93	186	154	7.42	7.53	0.11
		4	2.16	179	146	6.82	6.34	-0.49
		5	2.83	175	130	5.91	7.14	1.23
	Morningstar Risk	1	5.28	167	149	7.14	5.93	-1.21
		2	5.91	153	124	7.33	9.26	1.93
		3	6.38	156	140	7.47	8.48	1.01
		4	6.92	151	128	7.74	6.83	-0.91
		5	7.94	152	135	7.41	6.65	-0.76
Fixed Income	Expense Ratio	1	0.80	143	126	3.58	4.53	0.95
		2	1.28	134	100	3.66	3.07	-0.59
		3	1.52	122	110	4.09	3.31	-0.78
		4	1.73	124	97	2.82	2.67	-0.15
		5	2.50	120	93	2.72	1.17	-1.55
	Morningstar Risk	1	0.78	68	57	3.78	2.87	-0.92
		2	0.85	82	70	3.27	3.55	0.27
		3	0.95	86	65	3.85	3.86	0.01
		4	1.21	89	78	3.23	3.58	0.35
		5	1.94	84	77	3.17	3.38	0.21

Source: Morningstar Inc. Data as of Dec. 31, 2016.

Exhibit 17 5-Year Singapore Factor by Morningstar Category

Group	Factor	Quintile	Average Factor	# of Funds	# of Funds with Subsequent Total Return	Subsequent Return	Asset Weighted Subsequent Investor Return	Subsequent Gap
Allocation	Expense Ratio	1	0.87	74	25	3.98	3.21	-0.77
		2	1.50	54	30	4.82	3.57	-1.25
		3	1.83	64	23	5.14	4.56	-0.58
		4	2.11	51	22	3.49	1.79	-1.70
		5	2.52	50	22	3.09	5.52	2.43
	Morningstar Risk	1	1.10	35	14	2.70	2.76	0.06
		2	1.76	21	10	3.53	3.82	0.29
		3	1.97	27	14	6.09	4.19	-1.90
		4	2.72	19	17	5.34	3.17	-2.17
		5	3.21	28	15	6.14	5.01	-1.12
Concentrated Equity	Expense Ratio	1	1.17	235	100	8.17	7.10	-1.07
		2	1.73	195	81	7.81	6.40	-1.40
		3	1.95	166	90	10.04	8.97	-1.06
		4	2.18	165	84	7.78	-2.90	-10.68
		5	2.78	157	75	6.06	5.27	-0.79
	Morningstar Risk	1	5.59	147	106	9.38	2.44	-6.94
		2	6.35	123	75	7.91	6.49	-1.42
		3	6.78	127	80	7.89	-0.13	-8.02
		4	7.11	124	54	8.74	7.40	-1.34
		5	8.97	130	56	10.80	8.23	-2.57
Diversified Equity	Expense Ratio	1	0.85	293	145	7.71	5.85	-1.86
		2	1.51	280	135	8.42	7.54	-0.88
		3	1.83	266	132	7.64	9.02	1.38
		4	2.04	251	146	6.88	7.97	1.09
		5	2.60	249	135	6.49	5.59	-0.90
	Morningstar Risk	1	5.04	214	138	8.37	7.17	-1.20
		2	5.65	199	100	7.99	9.54	1.55
		3	5.99	205	117	6.73	7.36	0.64
		4	6.52	197	109	6.81	5.22	-1.59
		5	7.75	191	120	8.06	8.83	0.77
Fixed Income	Expense Ratio	1	0.53	121	74	3.19	0.69	-2.50
		2	1.07	132	68	3.36	2.89	-0.47
		3	1.35	121	74	3.28	1.25	-2.03
		4	1.60	119	75	3.47	3.27	-0.20
		5	2.06	104	74	2.17	2.42	0.25
	Morningstar Risk	1	0.67	50	40	3.06	1.55	-1.51
		2	0.82	63	38	3.12	2.71	-0.41
		3	0.99	74	31	2.32	1.53	-0.79
		4	1.36	73	56	2.81	2.77	-0.04
		5	2.16	71	54	3.85	3.24	-0.62

Source: Morningstar Inc. Data as of Dec. 31, 2016.

Exhibit 18 5-Year Hong Kong Factor by Morningstar Category

Group	Factor	Quintile	Average Factor	# of Funds	# of Funds with Subsequent Total Return	Subsequent Return	Asset Weighted Subsequent Investor Return	Subsequent Gap
Allocation	Expense Ratio	1	1.23	44	31	5.54	4.05	-1.48
		2	1.86	45	20	5.16	3.59	-1.57
		3	1.99	43	21	4.80	3.49	-1.31
		4	2.36	38	17	4.02	4.50	0.48
		5	2.74	38	28	3.85	3.25	-0.60
	Morningstar Risk	1	0.92	31	19	3.40	3.21	-0.19
		2	1.58	23	16	4.09	3.78	-0.31
		3	1.95	28	21	4.78	2.58	-2.19
		4	2.44	20	16	5.32	3.11	-2.21
		5	3.24	27	23	4.97	3.18	-1.78
Concentrated Equity	Expense Ratio	1	1.25	205	129	9.21	8.64	-0.56
		2	1.78	195	107	9.18	6.70	-2.48
		3	1.96	176	99	9.09	8.81	-0.28
		4	2.54	177	87	8.43	0.30	-8.12
		5	2.87	173	91	6.73	3.06	-3.67
	Morningstar Risk	1	5.32	155	128	8.75	7.21	-1.54
		2	6.08	145	103	8.39	7.30	-1.09
		3	6.28	140	91	8.80	6.32	-2.48
		4	7.27	144	103	8.09	8.16	0.07
		5	9.10	141	72	10.16	0.03	-10.13
Diversified Equity	Expense Ratio	1	1.11	266	163	7.68	6.17	-1.51
		2	1.70	253	149	7.83	7.42	-0.41
		3	1.90	242	154	7.68	6.09	-1.59
		4	2.12	253	166	7.45	7.35	-0.10
		5	2.75	219	138	6.02	4.50	-1.52
	Morningstar Risk	1	5.11	193	163	7.56	6.49	-1.08
		2	5.88	179	110	6.20	3.29	-2.91
		3	6.31	182	131	7.38	8.42	1.03
		4	6.85	178	112	6.69	6.23	-0.45
		5	7.96	177	132	8.50	7.72	-0.78
Fixed Income	Expense Ratio	1	0.88	188	137	4.17	3.17	-1.00
		2	1.30	182	127	4.08	2.39	-1.69
		3	1.54	174	124	3.87	2.91	-0.96
		4	1.85	168	115	2.19	2.72	0.53
		5	2.47	153	88	2.16	2.16	0.01
	Morningstar Risk	1	0.66	144	106	2.94	2.54	-0.40
		2	1.28	102	69	5.23	4.44	-0.79
		3	1.21	122	86	2.73	1.93	-0.80
		4	1.63	103	85	3.23	2.72	-0.51
		5	2.54	97	79	2.01	3.06	1.05

Source: Morningstar Inc. Data as of Dec. 31, 2016.

Exhibit 19 5-Year Asia Cross-Border Factor by Morningstar Category

Group	Factor	Quintile	Average Factor	# of Funds	# of Funds with Subsequent Total Return	Subsequent Return	Asset Weighted Subsequent Investor Return	Subsequent Gap
Allocation	Expense Ratio	1	1.03	165	77	5.40	4.25	-1.15
		2	1.66	135	70	4.62	3.18	-1.44
		3	1.90	139	61	4.92	4.29	-0.63
		4	2.21	118	61	3.67	2.99	-0.68
		5	2.60	130	78	4.10	4.36	0.26
	Morningstar Risk	1	1.51	89	49	4.12	3.25	-0.87
		2	1.93	59	40	4.49	3.73	-0.76
		3	2.24	72	51	5.30	3.83	-1.47
		4	2.61	54	46	5.48	3.53	-1.96
		5	3.74	70	53	5.78	5.03	-0.75
Alternative	Expense Ratio	1	1.11	84	40	-0.81	-2.73	-1.92
		2	1.64	51	16	-3.91	-4.96	-1.05
		3	1.73	67	43	-2.02	-3.45	-1.43
		4	1.97	30	13	-4.15	-5.27	-1.13
		5	2.32	50	24	-2.70	-5.66	-2.96
	Morningstar Risk	1	1.48	51	36	-0.90	-4.21	-3.31
		2	2.34	27	14	-1.96	-0.71	1.24
		3	3.78	20	10	-5.35	-8.18	-2.83
		4	3.87	21	17	-3.72	-5.32	-1.60
		5	4.33	34	24	-1.62	-2.65	-1.04
Concentrated Equity	Expense Ratio	1	1.32	713	409	7.23	8.07	0.84
		2	1.81	604	328	6.94	4.31	-2.63
		3	1.97	519	308	7.78	6.74	-1.03
		4	2.30	514	289	6.80	-0.21	-7.02
		5	2.79	517	294	6.37	7.73	1.36
	Morningstar Risk	1	6.08	484	371	8.40	6.49	-1.90
		2	6.48	420	266	8.24	5.61	-2.64
		3	6.91	417	284	7.66	3.25	-4.41
		4	7.57	414	278	6.42	6.67	0.25
		5	9.04	433	264	6.76	3.02	-3.75
Diversified Equity	Expense Ratio	1	1.06	1202	770	9.59	7.74	-1.85
		2	1.65	1065	698	9.04	9.98	0.94
		3	1.91	1103	659	8.46	7.47	-0.99
		4	2.14	1007	644	8.21	7.45	-0.76
		5	2.78	986	601	6.64	4.86	-1.78
	Morningstar Risk	1	5.25	869	672	8.26	7.37	-0.88
		2	5.87	786	534	8.17	8.16	-0.01
		3	6.29	783	569	8.27	9.22	0.95
		4	6.79	787	535	8.37	7.64	-0.73
		5	7.89	794	569	9.05	7.40	-1.65
Fixed Income	Expense Ratio	1	0.69	774	581	4.53	4.45	-0.08
		2	1.17	725	497	4.30	3.42	-0.89
		3	1.40	699	491	4.28	2.94	-1.34
		4	1.67	672	484	3.37	2.97	-0.41
		5	2.25	647	434	2.88	2.23	-0.65
	Morningstar Risk	1	0.78	574	443	2.87	2.33	-0.54
		2	1.18	409	302	4.42	4.30	-0.12
		3	1.26	425	279	3.88	3.20	-0.68
		4	1.52	412	332	3.95	3.70	-0.25
		5	2.54	458	373	4.51	3.88	-0.62

Source: Morningstar Inc. Data as of Dec. 31, 2016.

Exhibit 20 10-Year U.S. Factor by Broad Group

Group	Factor	Quintile	Average Factor	# of Funds	# of Funds with Subsequent Total Return	Subsequent Return	Asset Weighted Subsequent Investor Return	Subsequent Gap
Allocation	Std Deviation	1	3.33	291	185	3.96	4.86	0.90
		2	4.63	284	178	4.59	4.95	0.36
		3	5.34	289	190	4.42	3.42	-1.00
		4	6.24	288	201	4.17	4.26	0.09
		5	8.11	268	207	4.12	3.68	-0.44
	Mgr Tenure	1	13.54	398	340	4.60	3.81	-0.79
		2	5.41	389	326	4.23	4.28	0.04
		3	3.05	416	357	3.96	4.66	0.70
		4	1.66	374	345	4.19	4.40	0.21
		5	0.48	376	313	4.36	6.00	1.64
Concentrated Equity	Std Deviation	1	8.32	205	117	5.57	6.69	1.12
		2	12.24	204	130	6.09	6.99	0.89
		3	15.65	198	120	5.22	5.50	0.28
		4	17.36	205	95	4.68	2.74	-1.94
		5	24.38	193	131	0.52	-1.35	-1.87
	Mgr Tenure	1	11.59	216	190	3.26	4.06	0.80
		2	7.42	151	136	4.55	3.56	-0.99
		3	4.52	180	166	4.45	4.09	-0.36
		4	2.12	177	155	3.80	3.64	-0.16
		5	0.74	172	153	4.51	4.84	0.33
Diversified Equity	Std Deviation	1	6.65	1486	767	5.83	4.84	-0.99
		2	8.32	1482	802	5.44	4.95	-0.49
		3	9.99	1483	829	4.02	2.75	-1.27
		4	11.82	1480	798	5.41	4.16	-1.25
		5	15.18	1408	805	5.42	3.77	-1.66
	Mgr Tenure	1	14.54	1226	1094	5.24	4.39	-0.85
		2	7.27	1224	1077	5.11	4.16	-0.94
		3	4.58	1221	1070	5.06	3.96	-1.10
		4	2.34	1220	1040	5.20	5.11	-0.09
		5	0.85	1138	996	5.12	4.73	-0.39
Fixed-Income	Std Deviation	1	1.42	889	533	2.57	1.68	-0.90
		2	2.61	887	476	3.33	2.74	-0.59
		3	3.03	912	564	3.67	3.25	-0.42
		4	3.37	853	497	4.17	3.58	-0.60
		5	4.99	829	545	4.86	3.69	-1.17
	Mgr Tenure	1	15.92	745	672	3.61	3.27	-0.34
		2	9.13	744	653	3.71	2.63	-1.08
		3	5.93	736	634	3.89	2.84	-1.05
		4	3.33	716	629	3.76	3.00	-0.76
		5	1.01	700	605	3.68	2.78	-0.89

Source: Morningstar Inc. Data as of Dec. 31, 2016.

Exhibit 21 5-Year Canada Factor by Broad Group

Group	Factor	Quintile	Average Factor	# of Funds	# of Funds with Subsequent Total Return	Subsequent Return	Asset Weighted Subsequent Investor Return	Subsequent Gap
Allocation	Std Deviation	1	4.75	409	367	5.32	4.91	-0.41
		2	7.04	403	346	7.21	6.96	-0.25
		3	8.57	400	293	8.27	7.48	-0.79
		4	10.15	405	340	8.85	8.09	-0.76
		5	15.95	384	177	9.29	8.11	-1.18
	Mgr Tenure	1	11.28	545	453	7.82	7.37	-0.45
		2	6.05	536	431	7.49	7.20	-0.29
		3	4.04	577	411	7.78	6.87	-0.91
		4	2.04	537	451	6.49	5.89	-0.60
		5	0.58	480	408	6.56	5.93	-0.64
Concentrated Equity	Std Deviation	1	11.40	158	110	10.75	11.47	0.72
		2	14.45	157	128	10.79	11.04	0.25
		3	17.87	158	122	11.13	10.97	-0.16
		4	21.82	157	99	5.89	4.20	-1.69
		5	28.38	151	70	-7.29	-9.67	-2.38
	Mgr Tenure	1	14.54	172	145	5.67	6.64	0.97
		2	7.91	169	138	4.58	4.06	-0.52
		3	4.72	171	137	7.42	7.71	0.30
		4	2.04	170	143	9.10	10.09	0.99
		5	0.41	159	128	10.46	12.04	1.58
Diversified Equity	Std Deviation	1	11.07	632	479	12.91	12.12	-0.79
		2	13.18	631	507	13.48	12.56	-0.93
		3	15.01	636	486	11.87	11.30	-0.57
		4	17.54	628	417	11.54	11.87	0.33
		5	23.18	602	99	11.61	11.00	-0.61
	Mgr Tenure	1	13.69	748	527	12.09	11.89	-0.20
		2	7.32	758	549	12.72	12.41	-0.31
		3	4.30	730	553	12.37	11.35	-1.01
		4	2.28	756	588	12.19	11.76	-0.43
		5	0.56	683	471	11.57	11.81	0.23
Fixed-Income	Std Deviation	1	1.84	112	99	1.84	2.17	0.33
		2	3.02	117	96	2.57	3.28	0.71
		3	3.28	107	89	2.41	2.57	0.16
		4	5.60	112	86	4.02	4.56	0.54
		5	10.46	107	58	4.97	8.72	3.75
	Mgr Tenure	1	15.37	190	157	2.86	3.18	0.32
		2	6.84	216	180	2.94	3.29	0.35
		3	3.88	171	140	2.98	3.83	0.84
		4	1.75	166	133	3.30	3.13	-0.17
		5	0.54	174	132	3.82	4.27	0.44

Source: Morningstar Inc. Data as of Dec. 31, 2016.

Exhibit 22 5-Year U.K. Factor by Broad Group

Group	Factor	Quintile	Average Factor	# of Funds	# of Funds with Subsequent Total Return	Subsequent Return	Asset Weighted Subsequent Investor Return	Subsequent Gap
Allocation	Std Deviation	1	7.67	257	170	7.00	7.41	0.41
		2	9.37	244	165	7.44	7.77	0.33
		3	10.43	252	197	8.06	7.73	-0.33
		4	11.58	241	182	8.22	7.37	-0.85
		5	14.19	235	165	9.54	7.38	-2.16
	Mgr Tenure	1	11.70	303	272	8.37	7.37	-1.00
		2	5.73	330	297	7.47	6.90	-0.57
		3	3.07	329	274	7.91	8.60	0.69
		4	1.43	349	274	6.76	7.62	0.87
		5	0.49	280	231	8.36	9.02	0.66
Concentrated Equity	Std Deviation	1	15.28	291	229	12.71	12.66	-0.05
		2	16.57	274	212	11.42	11.66	0.25
		3	17.48	267	188	11.30	8.84	-2.46
		4	18.61	274	195	12.48	11.99	-0.49
		5	20.89	264	203	12.99	15.68	2.69
	Mgr Tenure	1	15.60	189	164	11.82	10.50	-1.32
		2	7.69	301	260	12.98	12.49	-0.49
		3	5.04	354	317	12.06	12.59	0.53
		4	2.74	305	268	11.17	11.81	0.65
		5	0.97	188	177	12.36	13.07	0.71
Diversified Equity	Std Deviation	1	15.89	301	228	13.18	11.77	-1.40
		2	17.95	268	197	12.75	13.06	0.30
		3	19.19	277	212	12.85	12.37	-0.48
		4	20.13	270	196	12.91	12.56	-0.35
		5	21.88	267	201	13.29	12.02	-1.27
	Mgr Tenure	1	15.50	222	180	12.08	11.00	-1.08
		2	7.81	323	284	13.14	12.03	-1.11
		3	4.80	377	330	12.70	12.53	-0.16
		4	2.15	348	318	13.12	14.52	1.40
		5	0.50	215	188	12.19	14.86	2.67
Fixed-Income	Std Deviation	1	5.70	199	134	5.89	6.00	0.12
		2	7.16	172	135	6.47	6.22	-0.25
		3	8.02	169	126	6.64	5.85	-0.79
		4	9.16	163	120	7.12	7.27	0.15
		5	11.12	163	121	7.78	7.69	-0.08
	Mgr Tenure	1	13.54	131	115	7.09	6.62	-0.47
		2	8.00	192	173	6.67	6.38	-0.29
		3	4.21	283	243	6.51	6.08	-0.43
		4	2.26	196	172	6.75	6.08	-0.67
		5	0.76	127	109	6.07	6.58	0.51

Source: Morningstar Inc. Data as of Dec. 31, 2016.

Exhibit 23 5-Year Luxembourg Factor by Broad Group

Group	Factor	Quintile	Average Factor	# of Funds	# of Funds with Subsequent Total Return	Subsequent Return	Asset Weighted Subsequent Investor Return	Subsequent Gap
Allocation	Std Deviation	1	3.45	472	222	2.44	2.81	0.37
		2	5.80	470	271	4.05	3.20	-0.86
		3	8.09	471	281	5.39	5.50	0.11
		4	10.83	473	281	6.39	7.04	0.65
		5	15.13	448	257	6.54	4.83	-1.71
	Mgr Tenure	1	12.35	545	410	4.77	4.80	0.04
		2	5.10	553	364	5.41	4.72	-0.69
		3	3.63	547	374	4.79	4.49	-0.30
		4	2.24	538	404	4.74	4.66	-0.08
		5	0.60	514	363	4.24	3.74	-0.50
Alternative	Std Deviation	1	2.00	190	102	1.05	0.93	-0.12
		2	3.61	188	91	1.34	0.81	-0.54
		3	4.88	182	78	1.11	-2.26	-3.37
		4	6.75	187	87	3.06	2.50	-0.56
		5	12.92	176	76	3.71	5.55	1.84
	Mgr Tenure	1	8.36	335	181	1.65	0.92	-0.73
		2	4.17	347	156	0.23	-0.60	-0.83
		3	2.67	320	151	3.07	1.86	-1.21
		4	1.52	330	221	2.85	1.97	-0.88
		5	0.46	316	189	2.49	-0.35	-2.84
Concentrated	Std Deviation	1	14.54	530	333	12.18	11.91	-0.28
		2	18.03	532	340	12.34	11.18	-1.16
		3	20.60	532	314	10.89	12.13	1.24
		4	24.91	530	385	6.03	5.76	-0.27
		5	32.48	507	379	1.26	-1.18	-2.44
	Mgr Tenure	1	12.17	629	472	7.86	3.79	-4.07
		2	5.72	620	480	9.03	8.53	-0.50
		3	3.87	634	464	7.36	7.44	0.09
		4	2.38	596	433	7.09	8.81	1.72
		5	0.78	589	450	6.60	9.01	2.41
Diversified	Std Deviation	1	13.70	1040	661	11.85	11.88	0.03
		2	17.06	1031	654	11.38	10.63	-0.75
		3	19.13	1037	725	11.01	10.33	-0.69
		4	21.66	1039	717	9.47	9.00	-0.48
		5	26.92	983	649	3.29	2.35	-0.95
	Mgr Tenure	1	13.59	1175	855	8.77	6.92	-1.85
		2	7.38	1188	884	9.62	9.65	0.03
		3	4.65	1170	834	10.09	10.30	0.21
		4	2.63	1174	848	8.81	8.38	-0.43
		5	0.78	1120	816	9.39	8.53	-0.87
Fixed-Income	Std Deviation	1	1.96	783	501	1.53	1.37	-0.16
		2	3.95	796	576	3.42	3.61	0.19
		3	5.64	772	571	3.93	4.25	0.32
		4	8.60	785	571	4.82	4.94	0.12
		5	13.59	747	569	6.91	5.58	-1.33
	Mgr Tenure	1	12.48	1115	853	4.34	4.27	-0.07
		2	6.60	1107	835	4.71	4.05	-0.66
		3	3.98	1118	785	4.07	3.65	-0.42
		4	2.04	1134	881	4.22	3.85	-0.37
		5	0.60	1027	718	4.27	3.90	-0.38

Source: Morningstar Inc. Data as of Dec. 31, 2016.

Exhibit 24 5-Year Taiwan Factor by Broad Group

Group	Factor	Quintile	Average Factor	# of Funds	# of Funds with Subsequent Total Return	Subsequent Return	Asset Weighted Subsequent Investor Return	Subsequent Gap
Concentrated Equity	Std Deviation	1	15.91	148	119	11.09	9.96	-1.14
		2	20.28	149	113	9.33	10.95	1.61
		3	23.66	148	127	7.22	6.85	-0.37
		4	26.27	148	125	5.04	3.61	-1.43
		5	30.49	142	124	2.18	-2.52	-4.70
	Mgr Tenure	1	11.11	155	127	5.86	-0.77	-6.63
		2	5.45	155	139	6.80	6.64	-0.16
		3	3.48	159	144	6.34	5.67	-0.67
		4	1.72	148	146	6.24	8.17	1.93
		5	0.54	148	137	8.30	9.03	0.73
Diversified Equity	Std Deviation	1	15.07	159	133	11.03	10.86	-0.17
		2	18.67	156	129	9.62	10.31	0.69
		3	21.00	158	141	8.24	8.37	0.13
		4	24.43	158	141	5.18	3.69	-1.49
		5	28.73	150	121	2.59	2.06	-0.53
	Mgr Tenure	1	14.36	180	139	7.27	5.36	-1.91
		2	7.36	181	158	7.70	7.70	0.00
		3	4.43	180	157	8.44	10.03	1.59
		4	2.41	179	156	5.95	6.14	0.19
		5	0.79	172	152	7.07	9.36	2.29
Fixed Income	Std Deviation	1	3.86	85	74	1.97	1.88	-0.09
		2	7.16	81	66	2.35	2.12	-0.23
		3	9.45	83	66	4.15	9.98	5.83
		4	10.98	81	68	5.01	3.85	-1.16
		5	13.94	79	53	6.33	3.88	-2.45
	Mgr Tenure	1	12.99	124	87	4.05	2.92	-1.13
		2	7.06	126	116	4.50	4.02	-0.48
		3	4.66	122	83	3.65	3.36	-0.29
		4	2.20	124	90	3.80	7.11	3.31
		5	0.52	117	103	2.99	1.50	-1.49

Source: Morningstar Inc. Data as of Dec. 31, 2016.

Exhibit 25 5-Year Singapore Factor by Broad Group

Group	Factor	Quintile	Average Factor	# of Funds	# of Funds with Subsequent Total Return	Subsequent Return	Asset Weighted Subsequent Investor Return	Subsequent Gap
Allocation	Std Deviation	1	6.50	26	15	3.17	4.52	1.35
		2	9.65	27	9	7.46	7.32	-0.14
		3	11.62	26	9	5.77	4.02	-1.75
		4	13.57	26	21	4.21	2.45	-1.76
		5	16.76	25	16	5.27	2.24	-3.04
Concentrated Equity	Std Deviation	1	16.17	134	65	12.86	10.68	-2.18
		2	19.41	129	63	11.75	11.86	0.11
		3	22.31	132	79	10.57	7.36	-3.21
		4	26.01	131	92	6.00	5.81	-0.19
		5	31.68	126	72	4.39	-2.46	-6.85
	Mgr Tenure	1	13.84	160	90	6.60	-2.39	-8.99
		2	6.65	169	95	9.82	6.95	-2.87
		3	5.35	135	77	10.18	8.55	-1.62
		4	3.59	156	94	9.31	6.52	-2.80
		5	1.30	136	79	3.94	7.00	3.06
Diversified Equity	Std Deviation	1	14.12	204	97	12.11	11.59	-0.52
		2	17.61	207	110	9.43	10.73	1.30
		3	19.92	198	110	8.95	9.59	0.64
		4	23.12	203	137	6.76	5.41	-1.36
		5	28.39	194	130	2.60	2.54	-0.06
	Mgr Tenure	1	17.89	242	132	5.83	3.23	-2.60
		2	8.62	246	139	7.73	7.93	0.20
		3	4.82	234	146	8.40	9.59	1.18
		4	2.73	247	175	7.11	6.89	-0.21
		5	1.25	220	128	8.62	10.05	1.43

Source: Morningstar Inc. Data as of Dec. 31, 2016.

Exhibit 26 5-Year Hong Kong Factor by Broad Group

Group	Factor	Quintile	Average Factor	# of Funds	# of Funds with Subsequent Total Return	Subsequent Return	Asset Weighted Subsequent Investor Return	Subsequent Gap
Allocation	Std Deviation	1	7.08	26	17	3.41	4.80	1.39
		2	9.41	26	13	3.31	2.13	-1.19
		3	11.97	26	21	5.69	3.90	-1.79
		4	13.40	26	23	4.21	2.53	-1.68
		5	16.25	25	21	5.49	2.68	-2.82
Concentrated Equity	Std Deviation	1	16.16	146	95	12.32	10.79	-1.53
		2	19.52	147	91	12.20	12.27	0.07
		3	22.84	146	99	7.91	5.50	-2.42
		4	26.07	146	112	5.34	5.96	0.62
		5	31.42	140	100	6.32	0.34	-5.98
	Mgr Tenure	1	13.47	184	109	8.47	2.25	-6.23
		2	6.59	186	124	8.50	6.74	-1.77
		3	4.78	192	133	9.47	6.61	-2.85
		4	3.29	177	118	8.62	8.11	-0.51
		5	1.02	169	124	8.73	9.24	0.50
Diversified Equity	Std Deviation	1	15.51	184	119	10.91	9.62	-1.28
		2	18.83	185	134	10.05	10.45	0.40
		3	21.00	184	117	8.31	7.35	-0.96
		4	24.52	185	153	4.68	3.42	-1.26
		5	27.96	175	129	3.30	2.50	-0.79
	Mgr Tenure	1	14.38	255	153	7.19	4.34	-2.85
		2	7.48	235	169	8.04	7.54	-0.50
		3	4.60	247	176	8.13	9.25	1.12
		4	2.43	256	194	6.84	7.16	0.31
		5	0.80	221	165	6.83	7.62	0.79
Fixed Income	Std Deviation	1	4.03	116	101	2.06	1.94	-0.12
		2	7.32	114	85	2.09	2.11	0.03
		3	9.45	114	87	4.48	3.60	-0.87
		4	11.49	115	71	4.59	3.55	-1.04
		5	14.70	110	48	6.20	4.21	-1.99
	Mgr Tenure	1	14.16	193	121	4.20	2.92	-1.28
		2	7.12	187	137	4.31	3.43	-0.88
		3	4.64	192	115	2.80	1.83	-0.97
		4	2.60	207	126	4.32	3.27	-1.05
		5	0.71	154	110	3.80	3.57	-0.23

Source: Morningstar Inc. Data as of Dec. 31, 2016.

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