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Mind the Gap 2021

A report on investor returns in the United States.

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Contents

1 Executive Summary
1 Key Takeaways
2 A Note About This Year's Study
3 Introduction
3 Gaps by U.S. Category Group
5 Trends in U.S. Category Groups
7 Results for Largest Fund Categories
8 Results by Standard Deviation Quintile
10 Results by Expense Ratio Quintile
11 Active Versus Passive
12 Comparing the Results: Dollar-Cost Averaging
13 Learning From the Results
14 Conclusion
16 Appendix
16 Methodology

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Executive Summary

Our annual study of dollar-weighted returns (also known as investor returns) finds investors earned about 7.7% per year on the average dollar they invested in mutual funds and ETFs over the 10 years ended Dec. 31, 2020. This is about 1.7 percentage points less than the total returns their fund investments generated over the same period. This shortfall, or gap, stems from inopportunely timed purchases and sales of fund shares, which cost investors nearly one sixth the return they would have earned if they had simply bought and held.

That investor-return gap is more or less in line with the gaps we found for the four previous rolling 10-year periods. The persistent gap between the returns investors actually experience and reported total returns makes cash flow timing one of the most significant factors—along with investment costs and tax efficiency—that can influence an investor's end results.

Our research imparts a few lessons on how investors can avoid these gaps and capture more of their fund investments' total returns. Investors can improve their results by holding a small number of widely diversified funds, automating mundane tasks like rebalancing, avoiding narrower or highly volatile funds, and embracing techniques that put investing on autopilot, such as dollar-cost averaging.

Key Takeaways

- Fund investors earned a 7.7% investor return (which reflects the impact of cash inflows and outflows on the returns investors actually earn) over the 10 years ended Dec. 31, 2020, while their fund holdings generated a 9.4% annual total return over the same period. Thus, investors suffered a 1.7 percentage point annual return shortfall, or gap, due to mistimed purchases and sales.
- This annual return gap is in line with the gaps we measured over the four previous rolling 10-year periods, which ranged from 1.6 to 1.8 percentage points per year. (For more information on how these figures compare with the return gaps in previous years' studies, see "A Note About This Year's Study.")
- The two largest fund types by net assets, U.S. equity funds and taxable-bond funds, had smaller return gaps than the fund universe as a whole. U.S. stock fund investors saw a 1.2 percentage-point annual gap while taxable-bond fund investors experienced a 1.1 percentage-point gap per year.
- Investors in allocation funds, which combine stocks, bonds, and other asset classes, continued to show the smallest gap, as their dollar-weighted returns lagged the funds' total returns by only 69 basis points per year over the most recent 10-year period.
- On the flip side, investors have struggled to use alternative funds successfully: The average dollar invested in these funds lost about 0.3% annually over the 10 years ended Dec. 31, 2020, which was

more than 4 percentage points lower per year than the funds' total returns and a remarkable 12 percentage points per year less than the dollar-weighted returns for investors in U.S. stock funds.

- Investors in sector equity funds also fared poorly, as their dollar-weighted returns lagged the funds' reported total returns by about 4 percentage points per year over the 10 years ended Dec. 31, 2020. Specialized funds were doubly disappointing. Not only did their total returns lag those of diversified U.S. equity funds by a wide margin to begin with, but investors also failed to capture the full benefit of those lower returns.
- Investors in alternative, sector equity, and international-equity funds would have done significantly better by dollar-cost averaging, which involves investing the same dollar amount on a regular schedule. Although dollar-cost averaging generally yields lower returns than a buy-and-hold approach when overall market returns are positive, it can also help investors avoid making poorly timed moves, such as buying after a market runup or selling after a downturn.
- The more volatile a fund, the more trouble investors tended to have capturing its full return. For example, we found that the most volatile quintile of U.S. stock funds had an annual return gap of 1.7 percentage points over the 10 years ended Dec. 31, 2020, while the least-volatile quintile had a far smaller gap of 0.9 percentage points per year. This held for taxable bonds, too, where the most volatile quintile saw a 2.3 percentage-point return gap per year and the least-volatile quintile suffered a gap of only 0.6 percentage points.
- The relationship between return gaps and fees was less clear-cut. While the cheapest quintile of U.S. stock funds did have smaller gaps than the costliest quintile, that wasn't the case for other asset classes like taxable bonds and municipal bonds, where the reverse held true.

A Note About This Year's Study

As explained further in the Methodology section (included in the Appendix), we changed the way we calculate the total returns used as benchmarks for the gap numbers in this year's study. In past studies, we used an equally weighted average, but this year we used an asset-weighted methodology to calculate the average. Because funds with larger asset bases tend to have better performance, this had the effect of increasing the average total return figures used as a benchmark for the gap calculations. (We calculate the gap numbers by using investor returns as a starting point and then subtracting the total returns to measure the difference.)

With a higher benchmark for comparison, this change led to more negative return gaps overall. Under the previous methodology, investor returns landed closer to total returns (leading to a smaller negative return gap), but the new methodology led to a more significant negative gap.

The table included in the Appendix (on page 17) shows what the annual return gap would have been if we had stuck with our former approach of calculating the average total return by equally weighting the returns for individual funds. If we had followed that approach for the 10 years ended Dec. 31, 2020, the annual return gap would have been positive 25 basis points. The new methodology led to significantly different results, but we believe using asset-weighted averages for both dollar-weighted returns and total returns allows for a more apples-to-apples comparison and more-accurate gap numbers overall.

Introduction

Most reported total returns are time-weighted, meaning they assume a lump-sum investment made at the beginning of the measurement term that's held throughout the whole period to the end. But investor returns can be a more telling measure because they include the impact of cash inflows and outflows. Investor returns are essentially an internal rate-of-return calculation that accounts for periods when you have more dollars invested, which will carry more weight in your overall results. Our annual "Mind the Gap" study compares these asset-weighted investor calculations with time-weighted total returns to see how large the gap, or difference, has been over time.

Investor returns will almost always differ from reported total returns unless there are no cash flows in or out of the fund during a given period. To use a simple example, let's say an investor puts $1,000 into a specific fund at the beginning of each year. That fund goes on to earn total returns of 10% the first year, 10% the second year, and negative 10% the third year, which works out to an annualized return of 2.9%. But in dollar-weighted terms, the investor's return is actually negative 0.4%, because there was less money in the account during the first two years of positive returns and more money exposed to the loss during the third year.

As mentioned above, bad decisions such as trading too often, buying funds after they've already run up, and selling in a panic after market declines can all chip away at investor returns. But even perfectly reasonable approaches to managing a portfolio—such as investing a portion of every paycheck or shifting more assets toward fixed-income assets as you approach retirement—can open a gap between investor results and reported total returns.

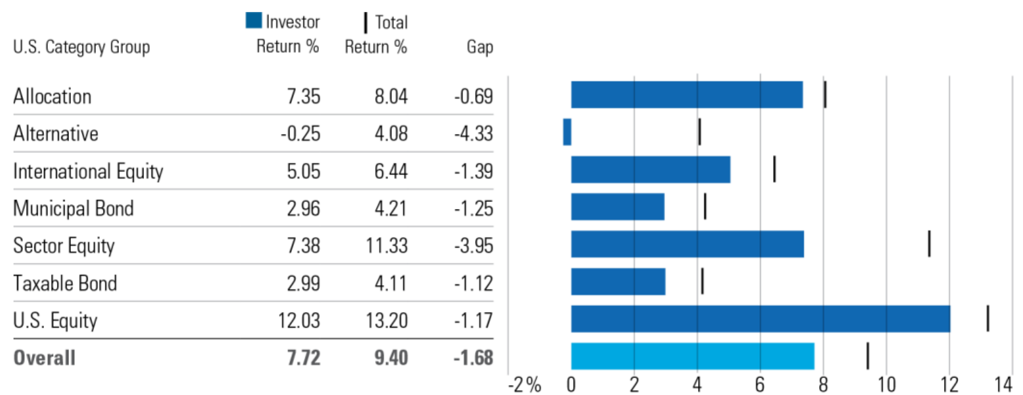
Investor returns will never perfectly match total returns because few investors can simply buy and hold over every time period. But the negative return gaps for the majority of investor dollars suggest there's still room for improvement. Investors can increase their odds of success by taking a more disciplined approach and trying to avoid some of the most common pitfalls, such as buying high and selling low.

Gaps by U.S. Category Group

Overall, the difference between investor returns and reported total returns has remained fairly stable in recent years. As a whole (weighted by asset size), the returns investors experienced lagged reported total returns by about 168 basis points per year over the trailing 10-year period, which is in line with the average over the past five rolling 10-year periods.

Under the surface, though, there's a wide range of results for different category groups. Investors have fared the worst in alternative funds, which have actually experienced negative returns in dollar-weighted terms, falling more than 4 percentage points behind reported total returns, which were relatively low to begin with. Monthly asset flows for alternatives funds have been the most volatile of any category group, but all of this trading activity has been counterproductive. Not only have alternative funds failed to live up to their promise, they've also proved difficult for investors to use effectively.

Exhibit 1 The Gap by U.S. Category Group (10-Year Returns)



U.S. Category Group	Investor Return %	Total Return %	Gap
Allocation	7.35	8.04	-0.69
Alternative	-0.25	4.08	-4.33
International Equity	5.05	6.44	-1.39
Municipal Bond	2.96	4.21	-1.25
Sector Equity	7.38	11.33	-3.95
Taxable Bond	2.99	4.11	-1.12
U.S. Equity	12.03	13.20	-1.17
Overall	**7.72**	**9.40**	**-1.68**

Source: Morningstar Direct. Data as of Dec. 31, 2020. Excludes commodities category group. Gap numbers may not match differences in returns because of rounding.

Sector equity funds have also generated exceptionally poor results in dollar-weighted terms. On average, investors gave up close to 4 percentage points per year due to poorly timed fund flows. Sector funds are particularly prone to performance-chasing, with investors often piling into popular sectors after a strong showing and then bailing out when they fall out of favor. The specialty-financial category, for example, attracted large inflows in 2007 and 2008, followed by billions in outflows in the wake of damage from the financial crisis. Healthcare funds experienced significant asset growth from 2013 through 2015, but many of those assets fled after the medical sector lagged in 2016.

Allocation funds—which combine stocks, bonds, and other asset classes—continued to show the narrowest return gaps. Two main reasons explain this pattern. First, by virtue of their diversified approach, allocation funds tend to have more-stable performance and are easier to own than funds that are subject to more-dramatic performance swings. Second, these funds are often used as core holdings for employer-sponsored retirement plans, such as 401(k)s. Retirement plan participants typically invest a set percentage of each paycheck, leading to more-consistent cash flows into the underlying funds.

Investor returns for taxable-bond funds lagged total returns by 112 basis points, on average, for the trailing 10-year period. The category group enjoyed significant net inflows in both 2019 and 2020 (including about $237 billion in 2020 alone). While returns have generally been strong, robust inflows mean fewer assets were around to benefit from strong performance over the full period.

Dollar-weighted returns for U.S. equity funds lagged total returns by a similar margin (117 basis points). The sheer size of this group helps buffer the impact of any cash inflows or outflows. For example, despite early 2020's coronavirus market panic, there were net outflows from U.S. equity funds of only $374 billion during the year, equivalent to just more than 4% of total assets.

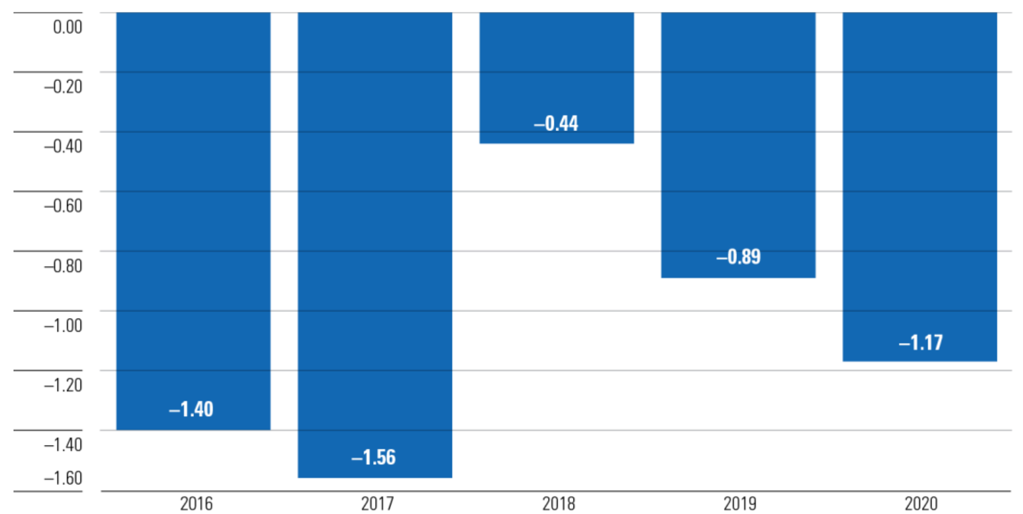
International equity funds fared a bit worse, with investor returns lagging reported total returns by about 1.4 percentage points over the trailing 10-year period. The group has also suffered from some missteps over time, such as when strong asset flows in 2013 were followed by negative returns in 2014, along with inconsistent returns within the group since then. Large net outflows in 2020 also kept investors from taking full advantage of the rebound in global equity markets after the first-quarter bear market.

Investor returns for municipal-bond funds lagged total returns by about 1.25 percentage points per year, on average. Municipal-bond fund investors have been somewhat prone to bad timing, pouring an estimated $52 billion in net flows into the funds included in the study in 2012 and then getting hit by negative returns in 2013 when interest-rate and credit concerns weighed on the market. The same pattern happened in reverse when municipal-bond investors pulled out an estimated $60 billion in 2013 and then missed out on stronger returns in 2014.

Trends in U.S. Category Groups

Overall, investor returns for most category groups fared a bit worse over the most recent 10-year period. This likely reflects increased volatility in fund flows during 2020's turbulent market. Investor return gaps have also widened slightly for most category groups compared with the previous four 10-year periods, but the trend wasn't uniformly negative. Let's drill down to some of the biggest groups to see why.

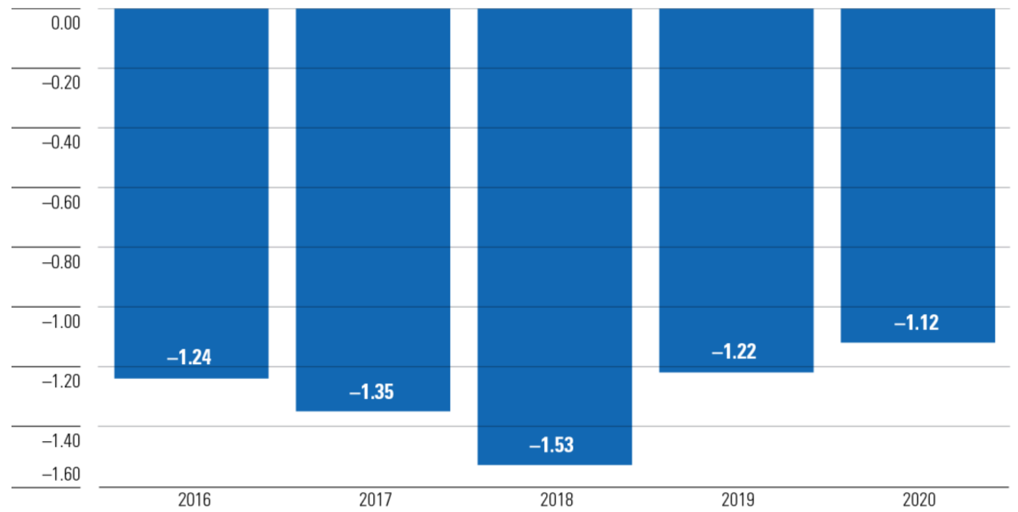
Exhibit 2 U.S. Equity Funds: 10-Year Return Gaps Over Time



Source: Morningstar Direct. Data as of Dec. 31, 2020.

For U.S. equity funds, the gap between investor returns and total returns widened by 28 basis points for the most recent 10-year period, after also widening for the 10-year period ended in 2019. The group experienced net outflows in both 2019 and 2020, with total outflows for funds included in the study totaling about $237 billion in 2019 and $374 billion in 2020. This was a negative for investor returns, because investors who sold off equity funds missed out on generally strong market performance, notwithstanding the COVID-19-driven bear market in the first quarter of 2020.

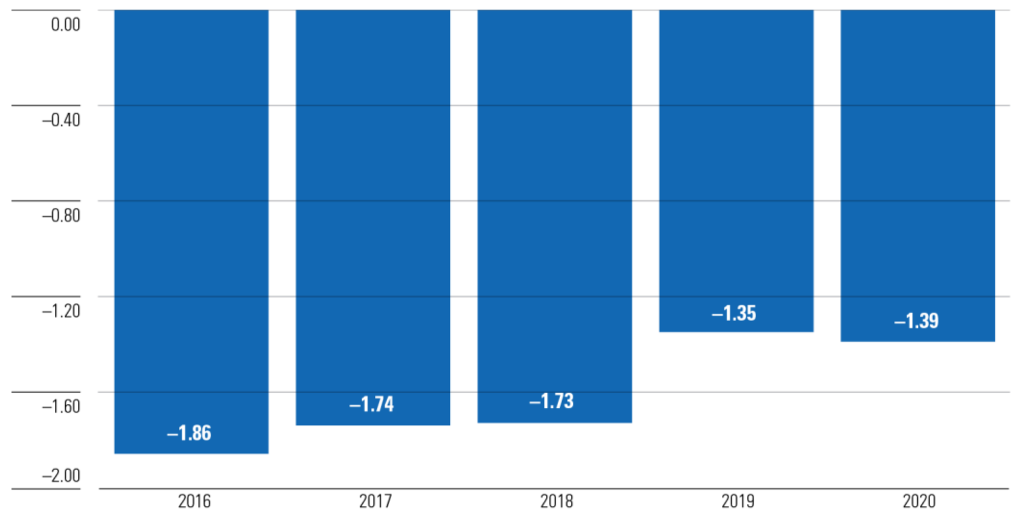
Exhibit 3 Taxable-Bond Funds: 10-Year Return Gaps Over Time



Source: Morningstar Direct. Data as of Dec. 31, 2020.

Taxable-bond funds, on the other hand, showed a narrowing trend in return gaps for the two most recent 10-year periods. The group has consistently enjoyed positive net inflows over the past seven years, which should be beneficial during periods of improving returns. At the same time, though, only a portion of the total assets as of the end of 2020 were around to benefit from some of the strongest returns in previous years, such as in 2012. That has kept the group's overall return gap in negative territory.

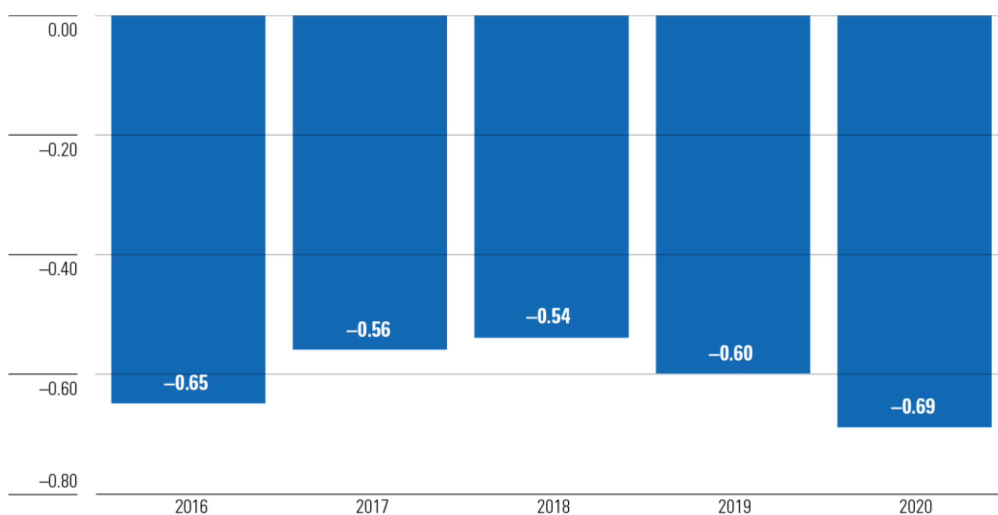
Exhibit 4 International Equity Funds: 10-Year Gaps Over Time



Source: Morningstar Direct. Data as of Dec. 31, 2020.

Investor return gaps for international equity funds have shown some improvement but remained in negative territory. Investor returns have been lower than time-weighted total returns partly because of the flood of assets into international funds from 2003 through 2007, when total assets more than tripled. Unfortunately, those newer dollars were fully exposed to the downdraft in 2008, when the average fund was down about 44%. Asset flows since then have been more muted but have still suffered from some timing issues. In 2017, for example, international equity funds included in our study pulled in an estimated $71 billion in net inflows, but that was followed by a poor performance in 2018, when the average international fund lost about 14%. Conversely, massive outflows of over $223 billion in 2020 amid COVID-19 worries cost investors because they missed out on stronger returns later in the year.

Exhibit 5 Allocation Funds: 10-Year Gaps Over Time



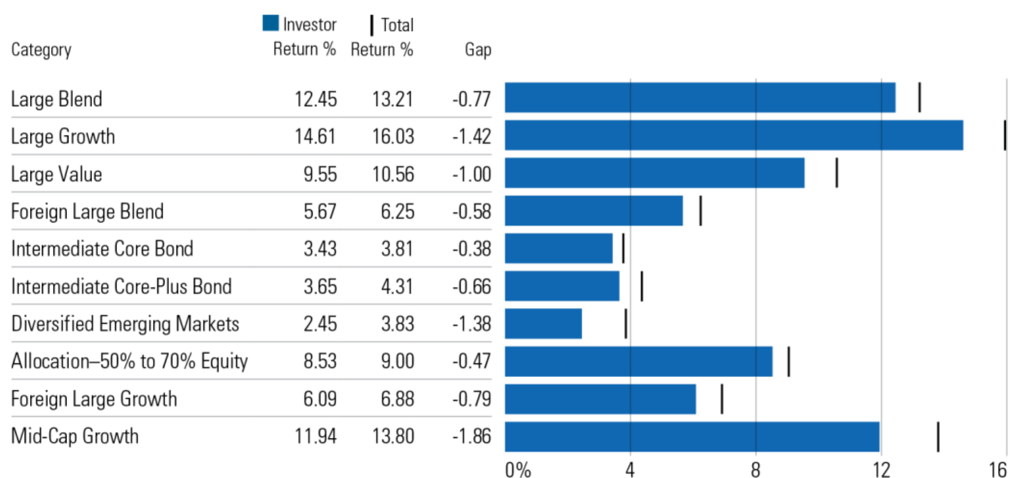
Source: Morningstar Direct. Data as of Dec. 31, 2020.

Finally, allocation funds have consistently shown better-than-average investor return gaps, although the gap widened slightly for the 10-year period ended in 2020. This group includes target-date funds, which often experience annuity-like cash flows as investors make regular contributions through retirement plans such as 401(k)s. Despite the popularity of target-date funds, however, the growth rate for the allocation group as a whole has been negative over the past few years. Cash outflows have cut into investor returns in recent years, because investors who sold missed out on strong returns in years such as 2019 and 2020. Even so, net outflows have remained relatively small in percentage terms, limiting the damage to dollar-weighted returns.

Results for Largest Fund Categories

The categories that are home to the most investor assets generally had narrower-than-average investor return gaps. On average, investor returns for the 10 largest categories were about 93 basis points lower than their reported total returns.

Exhibit 6 10-Year Return Gaps for Biggest Fund Categories



Category	Investor Return %	Total Return %	Gap
Large Blend	12.45	13.21	-0.77
Large Growth	14.61	16.03	-1.42
Large Value	9.55	10.56	-1.00
Foreign Large Blend	5.67	6.25	-0.58
Intermediate Core Bond	3.43	3.81	-0.38
Intermediate Core-Plus Bond	3.65	4.31	-0.66
Diversified Emerging Markets	2.45	3.83	-1.38
Allocation–50% to 70% Equity	8.53	9.00	-0.47
Foreign Large Growth	6.09	6.88	-0.79
Mid-Cap Growth	11.94	13.80	-1.86

Source: Morningstar Direct. Data as of Dec. 31, 2020.

The intermediate core bond-fund category—the largest fixed-income category based on asset size—was home to some of the best results for the 10-year period ended in 2020. These funds are often used as core holdings for buy-and-hold investors and aren't as prone to poorly timed asset flows as other areas. The allocation fund--50% to 70% equity Morningstar Category also fared well, with investor returns lagging total returns by less than 50 basis points, on average. As discussed earlier, these funds tend to be easier to own because they combine both stocks and bonds and are often used as core holdings for buy-and-hold investors. Funds in the U.S. large-blend category, Morningstar's largest category by asset size, posted a return gap of 77 basis points. Net outflows weighed down investor returns in 2020, but the category's inflows and outflows have generally been small, keeping investor returns fairly close to reported total returns.

On the negative side, the mid-cap growth and large-growth Morningstar Categories had the widest negative return gaps among the largest fund categories. That said, investor returns were still high in absolute terms, suggesting that fund investors still fared relatively well even with less-than-optimal cash flow timing. Investors in the diversified emerging-markets category also fared worse than average thanks to poorly timed flows. In 2012, for example, emerging-markets funds included in our study attracted about $50 billion in net inflows, but that was followed by a downturn in performance over the next three years. Similarly, significant inflows in 2017 were followed by double-digit losses in 2018, while outflows in 2020 likely missed out on recovering markets in the latter part of last year.

Results by Standard Deviation Quintile

Our past research indicated that funds with lower volatility (as measured by standard deviation) generally had better investor returns than funds with higher volatility. This pattern held true again this year, with six of the seven categories included in the study following the expected pattern. The general trend makes intuitive sense, as funds that expose investors to less volatility should be easier to own and less prone to erratic cash flows.

Exhibit 7 Less Volatility Means Better Results

U.S. Category Group	Standard Deviation Quintile	Average Return % Investor	Total	Gap
Allocation	1	5.53	6.14	**-0.61**
	2	7.16	7.90	**-0.74**
	3	6.99	7.68	**-0.69**
	4	8.45	8.99	**-0.54**
	5	9.12	9.55	**-0.43**
Alternative	1	1.47	2.09	**-0.62**
	2	-4.53	-2.43	**-2.10**
	3	-5.04	0.66	**-5.70**
	4	-2.9	2.29	**-5.19**
	5	11.83	24.62	**-12.79**
International Equity	1	6.84	8.43	**-1.59**
	2	4.67	6.46	**-1.79**
	3	6.5	6.88	**-0.38**
	4	3.54	5.30	**-1.76**
	5	1.17	3.57	**-2.40**
Municipal Bond	1	1.51	2.25	**-0.74**
	2	2.9	4.08	**-1.18**
	3	2.99	4.39	**-1.40**
	4	3.9	4.91	**-1.01**
	5	4.45	6.16	**-1.71**
Sector Equity	1	11.99	14.96	**-2.97**
	2	12.65	15.43	**-2.78**
	3	7.02	10.31	**-3.29**
	4	4.47	8.41	**-3.94**
	5	3.14	7.66	**-4.52**
Taxable Bond	1	1.59	2.16	**-0.57**
	2	2.96	3.70	**-0.74**
	3	3.85	4.53	**-0.68**
	4	2.84	4.43	**-1.59**
	5	3.73	6.04	**-2.31**
U.S. Equity	1	11.84	12.72	**-0.88**
	2	12.9	13.73	**-0.83**
	3	11.78	13.38	**-1.60**
	4	11.46	13.05	**-1.59**
	5	9.87	11.54	**-1.67**

Source: Morningstar Direct. Data as of Dec. 31, 2020. We grouped funds by their trailing three-year standard deviation within each category and then tracked their results over the following 10-year period. We show the least-volatile quintile first, down to the most-volatile quintile.

There were anomalies, though. Allocation funds followed the opposite pattern, with funds in the most-volatile quintile posting the narrowest return gap. (This dovetails with research done by T. Rowe Price suggesting investors in target-date funds seem to tolerate higher equity weightings [and therefore higher volatility] without selling at inopportune times.) But all of the return gaps fell in a pretty narrow range, so differences in investor returns didn't have a major effect on investors' end results. Municipal-bond funds showed the expected pattern at both ends of the volatility spectrum, with the least-volatile quintile posting significantly better results than the most volatile. The middle quintiles didn't show a clear pattern, though, making it difficult to attribute gaps in investor returns to volatility alone.

Results by Expense Ratio Quintile

The results for expense ratios were a bit messier. Return gaps for two of the category groups (U.S. equity and allocation) followed the expected pattern, with funds in the lowest-expense quintile posting better investor returns than their higher-cost counterparts. International-equity funds also showed better investor returns for cheaper funds and bigger return gaps for more-expensive offerings. For taxable-bond funds, though, the lowest-cost funds had wider return gaps. This likely reflects the flood of assets into lower-cost funds, including passively managed offerings. Paradoxically, strong asset flows for the lowest-cost funds mean that fewer assets were around for the full 10-year period, which can dampen dollar-weighted returns during a generally positive market environment.

Exhibit 8 Lower Fees (Usually) Mean Better Results

		Average Return %		
U.S. Category Group	Fee Quintile	Investor	Total	Gap
Allocation	1	7.88	8.31	**-0.43**
	2	7.53	8.30	**-0.77**
	3	6.37	7.41	**-1.04**
	4	5.96	7.01	**-1.05**
	5	4.97	6.28	**-1.31**
Alternative	1	-0.32	3.65	**-3.97**
	2	0.43	6.24	**-5.81**
	3	-4.25	-0.55	**-3.70**
	4	2.76	6.82	**-4.06**
	5	1.17	2.74	**-1.57**
International Equity	1	5.09	6.52	**-1.43**
	2	4.9	6.61	**-1.71**
	3	4.28	6.06	**-1.78**
	4	5.13	6.90	**-1.77**
	5	3.59	5.72	**-2.13**
Municipal Bond	1	2.88	4.20	**-1.32**
	2	2.92	4.25	**-1.33**
	3	3.56	4.24	**-0.68**
	4	2.5	3.67	**-1.17**
	5	2.86	4.11	**-1.25**
Sector Equity	1	7.43	11.66	**-4.23**
	2	8.63	12.28	**-3.65**
	3	7.22	10.91	**-3.69**
	4	4.62	8.19	**-3.57**
	5	1.5	5.66	**-4.16**
Taxable Bond	1	3.01	4.20	**-1.19**
	2	3.01	3.98	**-0.97**
	3	3.16	4.30	**-1.14**
	4	2.62	3.48	**-0.86**
	5	2.37	3.18	**-0.81**
U.S. Equity	1	12.43	13.47	**-1.04**
	2	11.63	13.23	**-1.60**
	3	10.8	12.42	**-1.62**
	4	10.34	12.18	**-1.84**
	5	9.01	10.96	**-1.95**

Source: Morningstar Direct. Data as of Dec. 31, 2020. We grouped funds by their expense ratios within each category and then tracked their results over the following 10-year period. We show the least-expensive quintile first, down to the most-expensive quintile.

Other areas, such as alternatives, municipal-bond, and sector-equity funds, didn't show a strong relationship between investor returns and the level of costs.

Active Versus Passive

The results for actively managed versus passively managed offerings show some unexpected trends. Index funds actually had lower investor returns for six out of the seven category groups.

Exhibit 9 Investor Return Gaps: Active Funds Versus Passive Funds

		Average Return %		
U.S. Category Group	Management Style	Investor	Total	Gap
Allocation	Active	7.36	8.04	-0.68
	Passive	2.75	7.06	-4.31
Alternative	Active	0.49	1.53	-1.04
	Passive	-1.29	5.77	-7.06
International Equity	Active	5.92	7.18	-1.26
	Passive	3.19	4.87	-1.68
Municipal Bond	Active	3.02	4.22	-1.20
	Passive	1.16	3.72	-2.56
Sector Equity	Active	7.95	11.09	-3.14
	Passive	6.75	11.69	-4.94
Taxable Bond	Active	3.12	4.09	-0.97
	Passive	2.59	4.11	-1.52
U.S. Equity	Active	11.67	13.01	-1.34
	Passive	12.62	13.65	-1.03

Source: Morningstar Direct. Data as of Dec. 31, 2020.

This doesn’t necessarily indicate poorly timed changes in asset flows. Instead, it mainly reflects the rising tide of assets flowing into passively managed offerings. Larger net flows as a percentage of assets generally lead to a wider gap between investor returns and total returns. In periods when returns are positive, larger net flows mean that fewer dollars were around to experience the full benefit of those returns—leading to a negative gap between investor returns and total returns. (This is the same pattern we often see with dollar-cost averaging, where results lag when market returns are generally positive.)

The taxable-bond category group illustrates how this pattern can work in practice. Over the past 10 years, asset flows to actively managed funds in the group have been slightly positive overall, but annual inflows and outflows have been small in percentage terms. As a result, dollar-weighted returns have lagged reported total returns by a smaller margin. Passively managed funds, on the other hand, have garnered double-digit annual inflows as a percentage of assets during most of the past 10 years. That means the majority of assets were only around to experience part of the group’s annualized return of 4.1% over the same period.

The municipal-bond and international equity groups showed similar patterns, where larger inflows into passively managed offerings resulted in bigger performance gaps. Investor returns for sector equity funds also lagged, but partly because of poorly timed flows. Asset flows to passively managed offerings

were generally positive, but the group experienced net outflows in 2018 and 2019, causing some investors to miss out on strong returns in both 2019 and 2020.

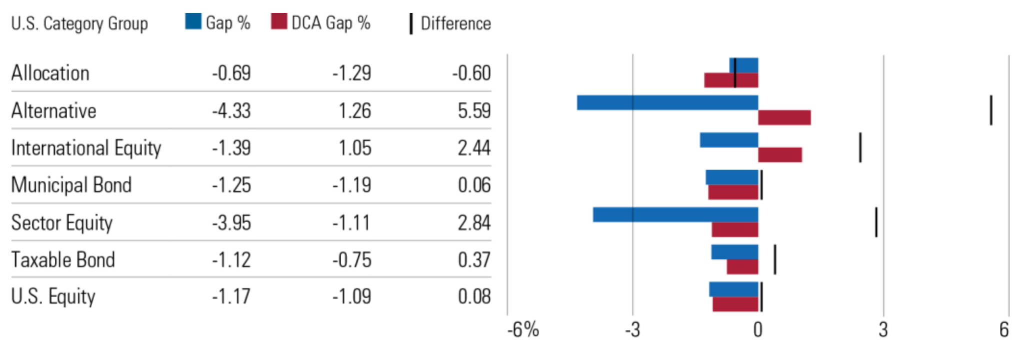
Investor returns for passively managed funds didn't fall behind in every category group. For U.S. equity funds, asset flows to actively managed funds have been negative overall, which cut into investor returns during the generally strong market. At the same time, asset flows to passively managed offerings were mostly positive, but relatively small as a percentage of assets. As a result, investor returns for passive funds outpaced those for actively managed offerings.

Comparing the Results: Dollar-Cost Averaging

As we did in last year's report, we added a series of returns to see how the results would look in a hypothetical scenario in which an investor contributed equal monthly investments (dollar-cost averaging) to funds in each broad category group. By comparing investor returns with what they would have been assuming steady monthly investments, we can zero in on the impact of cash flow timing on investor returns.

Dollar-cost averaging doesn't usually lead to better results compared with a buy-and-hold approach. In fact, because market returns are positive more often than not, dollar-cost averaging often leads to lower returns. This simply reflects the underlying math of total returns: If returns are generally positive, investors are typically better off making a lump-sum investment and holding it for the entire period. As mentioned earlier, investors who buy and hold can take full advantage of performance trends when total returns are positive, but investors who contribute smaller amounts over time often have fewer dollars invested during periods with strong returns.

Exhibit 10 Another View of the Data: Investor Return Gaps Versus Dollar-Cost Averaging Gaps



U.S. Category Group	Gap %	DCA Gap %	Difference
Allocation	-0.69	-1.29	-0.60
Alternative	-4.33	1.26	5.59
International Equity	-1.39	1.05	2.44
Municipal Bond	-1.25	-1.19	0.06
Sector Equity	-3.95	-1.11	2.84
Taxable Bond	-1.12	-0.75	0.37
U.S. Equity	-1.17	-1.09	0.08

Source: Morningstar Direct. Data as of Dec. 31, 2020. We estimate the results for dollar-cost-averaging by assuming equal monthly investments made within each category and then calculating an internal rate of return.

But dollar-cost averaging can help investors avoid some of the ill effects of poorly timed cash flows by enforcing a more disciplined approach. In fact, following a systematic investment approach would have improved investors' results in six of the seven major category groups. With international equity and sector equity funds, for example, investor returns based on dollar-cost averaging came out more than 2

percentage points per year ahead of investors' actual returns. Dollar-cost averaging pulled even further ahead for the alternative category group. Investors in these funds tend to make frequent purchases and sales, but all of that trading activity hasn't led to better results. Following a more disciplined approach would have improved returns by more than 5 percentage points per year.

Learning From the Results

The persistent gap between investors' actual results and reported total returns may seem daunting, but investors can take away a few key lessons about how to improve their results.

Focus on holding a small number of widely diversified funds. As the fund industry has grown, asset-management firms have rolled out more and more highly specialized funds. Theme-based sector funds, alternative funds of various stripes, leveraged factor portfolios, and single-country funds are just a few examples. But investors have fared far better by keeping things simple and sticking with plain-vanilla, broadly diversified funds. More broadly defined offerings, such as U.S. equity and taxable-bond funds, have fared significantly better than narrower offerings, such as sector funds and alternatives.

Simpler has also been better when it comes to specific Morningstar categories. The broadest categories, such as large blend, intermediate core bond, and foreign large blend, have generally fared better than more narrowly defined categories. From a portfolio-construction perspective, that means investors should lean heavily on these areas as core holdings and avoid narrowly defined funds that tend to have the widest return gaps.

Funds that offer built-in asset-class diversification also excelled in our study. Morningstar has often sung the praises of target-date funds, which provide a preset blend of exposure to major asset classes that shifts over time. These funds and other asset-allocation offerings, such as balanced funds, have consistently shown some of the smallest investor return gaps. Not only are these funds easy to use, but they're also easy to live with. Investors tend to buy and hold them for long periods, or make investments on a regular schedule that enforces investment discipline and helps them avoid the temptations—and pitfalls—of trading at the wrong time.

Automate mundane tasks, such as setting asset-allocation targets and periodically rebalancing. Investors can easily get caught in a cycle of analysis paralysis by fretting over how much to buy or sell at various times. The endless drumbeat of market and economic news can make it tempting—even for professional investors and financial advisors--to feel like they should be doing something to respond to shifting market conditions. But for the most part, the time and energy that investors spend on trading decisions is wasted effort—and often counterproductive. Our study found that areas with the most volatile cash flows often suffered the widest gaps in investor returns. Investors can improve their results by setting a rational asset allocation, buying low-cost funds, and just sticking with the plan. It also makes sense to set a strict schedule for rebalancing, such as rebalancing once per year or when your portfolio's allocations drift significantly away from target levels.

Avoid narrow or highly volatile funds. As a corollary to focusing on broadly diversified funds, it's also important to avoid highly specialized or volatile offerings. As mentioned above, dollar-weighted returns for the most specialized category groups and categories often fall behind those of more broadly diversified offerings. Within each category, investors also generally experienced narrower return gaps in less-volatile offerings. With only a few exceptions, funds that expose investors to less volatility are easier to own and less prone to erratic cash flows.

Embrace techniques that put investment decisions on autopilot, such as dollar-cost averaging. Dollar-cost averaging often gets a bad rap because it creates a drag on returns when market returns are generally positive. Investors who have a lump sum available will usually earn better results by putting it all to work as soon as possible instead of investing it gradually over time (which means keeping some assets on the sidelines). Investors who have the means—and the temperament—to buy and hold over the long term will likely enjoy the best results.

The buy-and-hold approach depends on two key things, though: 1) having money available to invest all at once, and 2) having enough discipline to buy and hold despite the vagaries of the market. Unless they're fortunate enough to have large sums of money available via inherited wealth or other windfalls, though, most investors can only invest a little at a time as money becomes available—for example, setting aside a certain percentage of each paycheck to invest for retirement. This approach isn't technically considered dollar-cost averaging, but it has the same effect because it involves making systematic investments over time.

Our study suggests that this approach can significantly improve investors' results. While systematic investing may not be ideal compared with buy-and-hold investing, it can still improve investors' actual results because it helps them avoid the pitfalls of poorly timed inflows and outflows.

Conclusion

Overall, this year's results show there's a persistent gap between the returns investors actually experience and reported total returns. This gap makes cash flow timing one of the most significant factors—along with investment costs and tax efficiency—that can influence an investor's end results.

In aggregate, the return gap widened slightly for the most recent 10-year period, but remained in line with the longer-term average. Under the surface, though, there's a more-nuanced story. More-specialized areas with the most volatile cash flows—namely alternative funds and sector equity funds—fared much worse than average and pulled down the aggregate results. The more mainstream areas that are home to the majority of investor assets—such as U.S. equity funds and taxable-bond funds—fared much better, with return gaps of about 1 percentage point per year. Allocation funds also continued to excel, suggesting that their built-in asset-class diversification makes them easier for investors to buy and hold over time.

Our study also shines more light on the merits of keeping things simple, favoring broadly diversified funds, and following a disciplined investment approach. While following a buy-and-hold approach will

generally lead to the best results for investors who have enough assets available, dollar-cost averaging can be an excellent way to enforce investment discipline and avoid the perils of poorly timed cash flows.

Whether they invest a lump sum up front or follow a dollar-cost averaging system, investors who follow a consistent investment approach and avoid chasing performance will likely reap rewards over time.

Appendix

Methodology

Morningstar's annual "Mind the Gap" study is designed to compare dollar-weighted internal rate-of-return calculations with time-weighted total returns to see how large the gap, or difference, has been over time.

We use a portfolio-based methodology for rolling up fund flows to an aggregate level. This method combines all of the monthly inflows, outflows, and assets from a given category or category group into one portfolio to better capture investors' asset-weighted returns. In contrast to total returns, investor returns account for all cash flows into and out of the fund to measure how the average investor performed over time.

We include funds that were merged or liquidated during each time period by building a category-level portfolio of net flows and returns, including extinct funds, up until their final partial month. In other words, the methodology is designed to make sure the averages don't exclude results for poorly performing funds that later disappeared. We treat the final net assets before the fund is liquidated or merged as a sale. If those dollars went into another fund, we treat those incoming assets as a buy. Because fund mergers almost always occur within the same category group, those figures should be a wash on an asset-class basis.

While the study attempts to correct for survivorship bias as much possible, it does not correct for creation bias. The data set only captures net assets, cash flows, and returns for funds that were created at least 10 years ago.

Once all of the monthly cash flows are available for the period in question, we calculate investor returns. The calculation is similar to an internal rate of return, or IRR, and measures the compound growth rate of the value of all dollars invested in the fund over the evaluation period. As with an IRR calculation, investor return is the constant monthly rate of return that makes the beginning assets equal to the ending assets with all monthly cash flows accounted for. We derive investor returns by using an iterative process, running a program that attempts to solve for the constant rate of return and adjusting the estimate up and down until it converges on a solution. After calculating investor returns for each month, we link them together to calculate an annualized return for the 10-year period.

We use time-weighted total returns as a benchmark for comparison with investor returns. We refer to the difference between investor returns and total returns as the gap or investor return gap. As discussed above, we previously calculated average total returns as a simple average that equally weighted each fund's total returns. We changed the methodology for this year's study to use an asset-weighted average that weights each fund's return based on its asset size at the end of each month. We believe the new methodology provides a more apples-to-apples comparison with the investor return figures, which are also weighted by asset size. The table below shows the total returns and gap figures for both the current and previous methods.

Exhibit 11 10-Year Investor Return Gaps: Current vs. Previous Methodology

	Current			Previous		
End Date	Investor Return %	Total Return % (Asset-Weighted)	Gap	Investor Return %	Total Return % (Equal-Weighted)	Gap
12/31/16	3.9	5.67	-1.77	3.9	4.61	-0.71
12/31/17	4.61	6.38	-1.77	4.61	5.29	-0.68
12/31/18	8.18	9.79	-1.61	8.18	8.49	-0.31
12/31/19	7.64	9.20	-1.56	7.64	7.71	-0.07
12/31/20	7.72	9.40	-1.68	7.72	7.47	0.25

Source: Morningstar Direct. Data as of Dec. 31, 2020. For this year's study, we changed the methodology to use an asset-weighted total return as the benchmark for investor returns, instead of the equal-weighted total return benchmark used in previous studies. For comparison, the table shows the total returns and gap figures for both the current and previous methods. All return numbers are annualized.

The study includes investor returns and total returns for both mutual funds and exchange-traded funds. Our ETF data doesn't capture all day-to-day activity in ETFs, though. ETFs are often used as trading vehicles, but our data uses monthly asset data rather than daily data. We used the month-end asset data compared with the underlying total return to estimate a net inflow or outflow for the month. Investor returns for ETFs would likely be lower if we captured all the intramonth trades as well as newly created funds.

Because investor returns over shorter periods aren't as meaningful, we focus the study on long-term results. The aggregate numbers shown in the study are based on the 10-year period ended Dec. 31, 2020, but we also show results for each of the most recent five 10-year periods. This historical data allows investors to see trends in investor return gaps over time.

We run the data based on category groups instead of broad asset classes, which allows for a more detailed view of investor return patterns across different types of funds. We exclude the commodities category group because that area's extremely volatile cash flows make it difficult to measure investor returns.

Finally, we include data to see how investor returns would look if an investor contributed equal monthly investments (dollar-cost averaging). Within each category group, we assume a constant monthly

investment and divided that amount among all the funds that were active during the month. If a fund became obsolete, we took the balance and divided it among the remaining funds. We then calculate total balances for each fund as well as the deposits made to calculate an internal rate of return for the category group.

Exhibit 12 Summary Data: Annual Organic Growth Rates, Total Returns, and Assets by Category Group

Annual Organic Growth Rates (%)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Allocation	11.97	0.61	3.78	6.07	4.52	5.64	4.98	2.89	-2.02	-3.34	-3.49	-5.59	-3.00	-5.69
Alternative	29.54	35.29	51.76	25.42	16.99	4.86	20.96	-6.89	-8.02	-7.76	-2.40	-6.55	-13.52	2.66
International Equity	12.12	-3.72	5.11	4.56	0.33	2.77	8.66	3.85	5.54	-3.04	3.52	-2.08	-4.08	-8.75
Municipal Bond	2.63	2.14	21.52	2.72	-2.13	10.30	-9.99	5.16	2.31	4.00	1.51	-3.99	10.68	3.29
Sector Equity	3.27	5.01	13.34	6.44	5.74	5.80	13.10	9.91	1.64	-1.88	-0.74	-5.48	-6.35	2.31
Taxable Bond	9.73	2.88	26.73	14.15	8.01	12.18	-3.71	1.00	-2.36	3.39	5.69	-2.67	7.21	7.48
U.S. Equity	0.16	-1.13	-2.34	-1.70	-2.29	-3.11	1.98	0.87	-3.57	-2.89	-3.38	-2.92	-3.95	-5.05

- > 12.12
- 4.57 to 12.12
- –2.12 to 4.56
- –5.58 to –2.13
- < –5.58

Annual Total Returns (%)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Allocation	6.96	-28.10	25.23	12.32	0.39	12.74	16.01	5.86	-1.55	8.23	14.81	-5.36	19.88	12.27
Alternative	2.58	-15.77	-0.95	-1.77	-4.59	-0.32	3.36	-0.15	-1.39	-0.81	3.48	-2.80	7.33	3.16
International Equity	17.03	-43.71	41.68	13.28	-13.54	19.05	16.24	-2.32	-3.37	4.47	28.01	-13.90	23.51	16.19
Municipal Bond	1.23	-8.84	16.04	2.08	9.08	7.32	-2.95	8.36	2.78	0.41	4.83	1.35	7.15	4.43
Sector Equity	10.40	-35.86	40.57	22.19	-1.33	13.73	18.47	15.60	0.38	10.11	17.27	-5.10	30.27	18.79
Taxable Bond	5.72	-4.43	16.47	8.50	5.12	8.52	-0.32	3.97	-0.68	4.91	4.57	-0.54	8.92	7.24
U.S. Equity	7.09	-38.50	32.11	17.23	-1.19	16.12	34.09	10.69	0.31	11.80	21.45	-5.52	29.84	21.36

- > 21.36
- 11.81 to 21.36
- 0.40 to 11.80
- –5.35 to 0.39
- < –5.35

Average Assets (USD Tril)	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Allocation	1.11	1.03	0.99	1.22	1.36	1.51	1.81	2.06	2.09	2.08	2.19	2.11	2.14	2.35
Alternative	0.03	0.04	0.06	0.09	0.11	0.11	0.13	0.13	0.12	0.11	0.10	0.09	0.09	0.09
International Equity	1.52	1.31	1.10	1.43	1.45	1.50	1.83	2.02	2.02	2.02	2.33	2.40	2.36	2.59
Municipal Bond	0.37	0.36	0.40	0.48	0.50	0.55	0.55	0.54	0.58	0.60	0.62	0.63	0.66	0.74
Sector Equity	0.32	0.28	0.27	0.35	0.39	0.42	0.51	0.64	0.69	0.70	0.76	0.75	0.76	0.89
Taxable Bond	1.07	1.13	1.35	1.79	2.10	2.45	2.60	2.57	2.56	2.59	2.80	2.84	2.97	3.38
U.S. Equity	3.88	3.22	2.76	3.33	3.50	3.64	4.50	5.42	5.54	5.62	6.30	6.39	6.71	7.91

- > 3.38
- 2.11 to 3.38
- 0.63 to 2.10
- 0.12 to 0.62
- < 0.12

Source: Morningstar Direct. Data as of Data as of Dec. 31, 2020. Includes assets, fund flows, and total returns for funds created before Jan. 1, 2011. Total returns are asset-weighted. Excludes commodities category group. Annual organic growth rates are based on estimated net flows for each category group divided by total assets as of Dec. 31 of the previous year. Average assets are based on the year-end values for the current year and the previous year.

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