

Mind the Gap 2024

Investors lost out on about 15% of the return their funds generated.

Portfolio and Planning Research

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Jeffrey Ptak, CFA
 Chief Ratings Officer
Jeffrey.Ptak@morningstar.com

Contributors

Amy Arnott
 Rajat Batra
 Darshit Doshi
 Nicholas Goralka
 Shashwat Malik
 Michael Manetta
 Chetan Rane

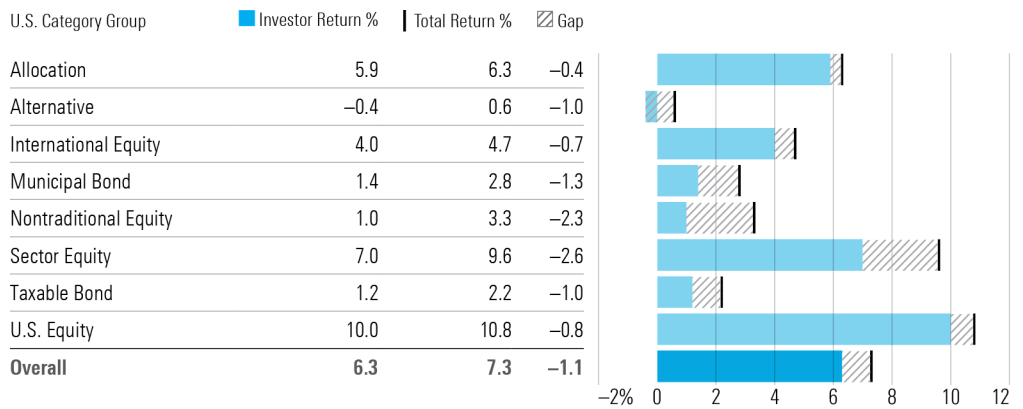
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Executive Summary

We estimate that the average dollar invested in US mutual funds and exchange-traded funds earned 6.3% per year over the 10 years ended Dec. 31, 2023. That is approximately 1.1% per year less than the average fund's total return over the same period assuming an initial lump-sum purchase. The 1.1% "gap" is explained by the timing of investors' purchases and sales of fund shares.

Exhibit 1 Investor Return Gaps by US Category Group (10-Year Returns)



Source: Morningstar. Data as of Dec. 31, 2023. Excludes commodities category group. Gap numbers may not match differences in returns because of rounding.

The gap was persistent. We found shortfalls between the average dollar's return and the average buy-and-hold return in all 10 of the calendar years that comprised the 10-year study period. Investors particularly struggled to navigate 2020's turbulence, adding monies in late 2019 and early 2020, then withdrawing nearly half a trillion dollars as markets fell, only to miss a portion of the subsequent rally.

Drilling down, we found allocation funds, which diversify their assets widely across asset classes, boasted the narrowest gap (negative 0.4% gap per year). This is consistent with our prior findings, suggesting investors have had more success using simple funds that automate routine tasks like rebalancing. Conversely, sector equity funds had the widest gap (negative 2.6% gap annually), with at least some of that gap owing to the funds' higher volatility, which our research suggests can trip up investors.

For the first time, we compared the gaps of open-end funds with exchange-traded funds, finding they were roughly the same at about a negative 1% gap per year. We also compared active funds with index funds, finding the gap was slightly wider for the average dollar invested in active funds (negative 1.2% gap per year) than index funds (negative 0.8% gap). While index mutual funds had almost no gap, the average dollar invested in index ETFs lagged the buy-and-hold return by more than 1 percentage point a year, a difference worth monitoring.

This year's study spanned more than 20,000 fund share classes that accounted in aggregate for more than USD 12 trillion in net assets at the start of the 10-year period and nearly USD 21 trillion by the end. All told, investors withdrew a net USD 1.9 trillion in net assets from the funds included in the study over the decade ended Dec. 31, 2023. (The study includes funds that existed as of Jan. 1, 2014, and thus excludes any funds that launched after that date.)

Key Takeaways

Overall Findings

- ▶ Fund investors earned a 6.3% per year dollar-weighted return ("investor return") over the 10 years ended Dec. 31, 2023, while their fund holdings earned about 7.3% per year ("total return").
- ▶ The 1.1% annual estimated return gap stems from mistimed purchases and sales and is broadly in line with the gaps measured over the four previous rolling 10-year periods in prior studies. (Gap numbers may not match differences in returns because of rounding.)
- ▶ The average dollar's return lagged the average total return in all 10 of the calendar years in the study period; investors appear to have incurred heavy timing costs in 2020 (leading to a negative 2% gap that year).

Morningstar Categories

- ▶ Allocation funds had the narrowest gap (a negative 0.4% gap per year over the 10 years ended Dec. 31, 2023); sector equity funds had the widest (a negative 2.6% gap annually).
- ▶ US stock funds earned the highest investor return, 10.0% per year (a negative 0.8% gap) and alternative funds the lowest at negative 0.2% annually (a negative 0.6% gap)
- ▶ Among the largest fund categories by assets, the foreign large-blend category boasted the narrowest gap (0.0% per year) and large-value funds the widest (a negative 0.9% gap annually).

Fund Types

- ▶ Open-end funds earned a 6.1% investor return per year (negative 1.0% gap) versus 6.9% for ETFs (negative 1.1% gap); gaps were generally narrower for open-end funds than ETFs even when we controlled for asset class.
- ▶ The average dollar invested in index funds earned a 7.6% annual return (negative 0.8% gap) compared with 5.5% per year in active funds (negative 1.2% gap).
- ▶ While there was a small gap for index mutual funds over the 10-year period (negative 0.2% per year), that wasn't true of index ETFs, where the average dollar earned 1.1% less per year than the buy-and-hold return.

Fund Fees and Volatility

- ▶ Though investor return gaps were narrower among cheaper funds in some category groups like US equity and allocation, this wasn't uniform; timing costs don't seem to be directly correlated with fees.
- ▶ The more volatile a fund's returns versus peers, the larger the gaps tended to be; the average dollar invested in the most volatile sector equity funds lagged the buy-and-hold return by over 7 percentage points per year.

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 investors have more dollars invested, which will carry more weight in their overall results. Our annual "Mind the Gap" study compares these dollar-weighted return calculations with time-weighted total returns to see how large the difference has been over time.

To be sure, inopportune timed purchases and sales—buying high or selling low on impulse, for instance—can chip away at investor returns. But even laudable practices like investing a portion of every paycheck or regularly rebalancing can open a gap between investor results and reported total returns. Given that nuance, it's not advisable to view this study's findings as a parable of "dumb money" or evidence of individual investors' fallibility.

What "Mind the Gap" does aim to address is the question of where investors succeeded in capturing most of their funds' returns. While such insights will not necessarily shrink or even close the gap between investor and total returns, they might help investors avoid circumstances that our data suggests have bedeviled them in the past, leading to poor dollar-weighted returns.

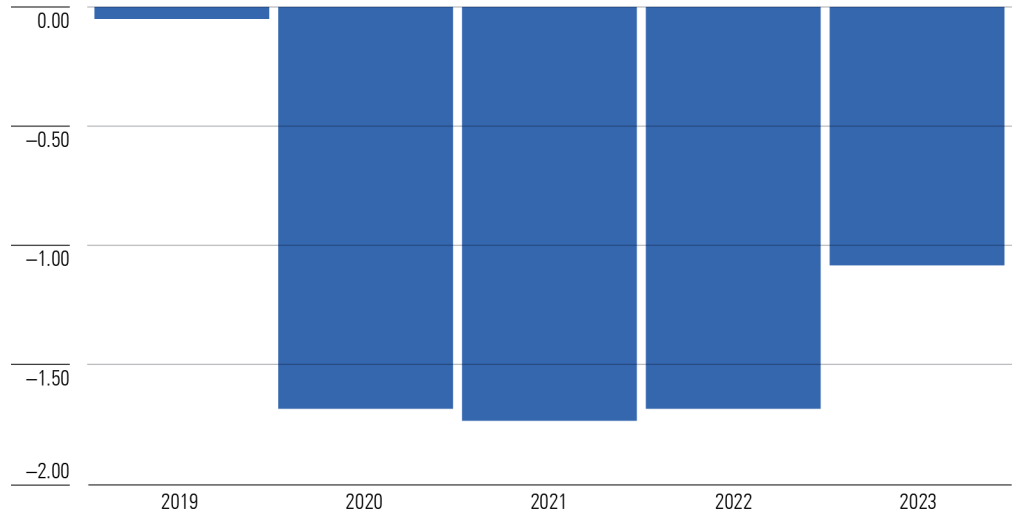
With that in mind, this study interrogates not just the question of how wide the investor return gap is but also how it can vary based on numerous important factors. Those factors might include the type of fund, its particular investing style, its investment type (open-end fund versus ETF; active versus index), how volatile it's been, the fees it levies, and more.

And, so, in the pages that follow, this study delves into those factors, the key findings surrounding them, and the implications they might have for investors seeking to capture as much of their funds' returns as possible.

Overall Findings

We estimate fund investors earned a 6.3% annual investor return over the 10 years ended Dec. 31, 2023, while their fund holdings earned a 7.3% annual total return. The 1.1% annual return gap is broadly in line with the gaps estimated for the four previous rolling 10-year periods examined in prior studies.

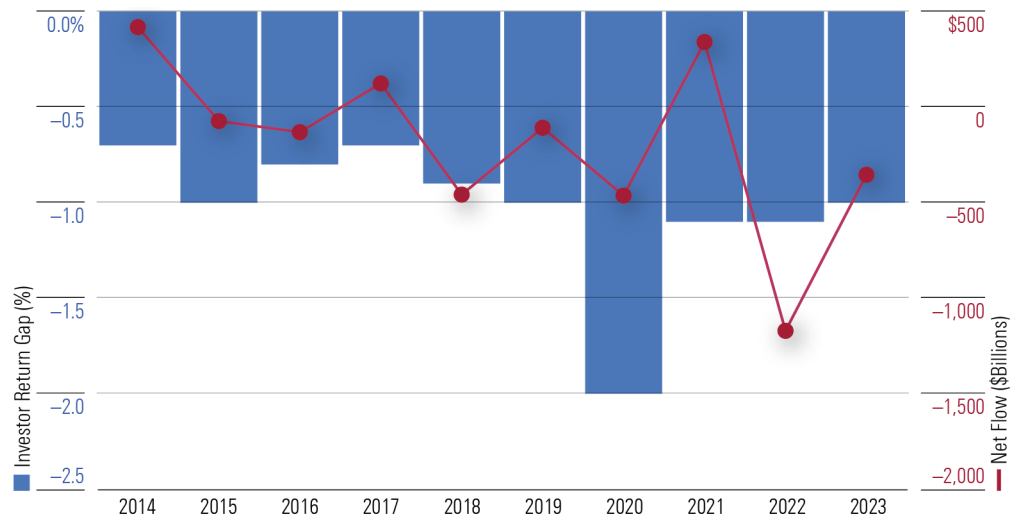
Exhibit 2 All Funds: 10-Year Investor Return Gaps Over Time (Ending in Year Shown)



Source: Morningstar. Data as of Dec. 31, 2023.

The average investor return lagged the average total return in all 10 of the calendar years that made up the decade we examined, underscoring the persistence of timing costs.

Exhibit 3 All Funds: Investor Return Gaps and Net Flows by Calendar Year



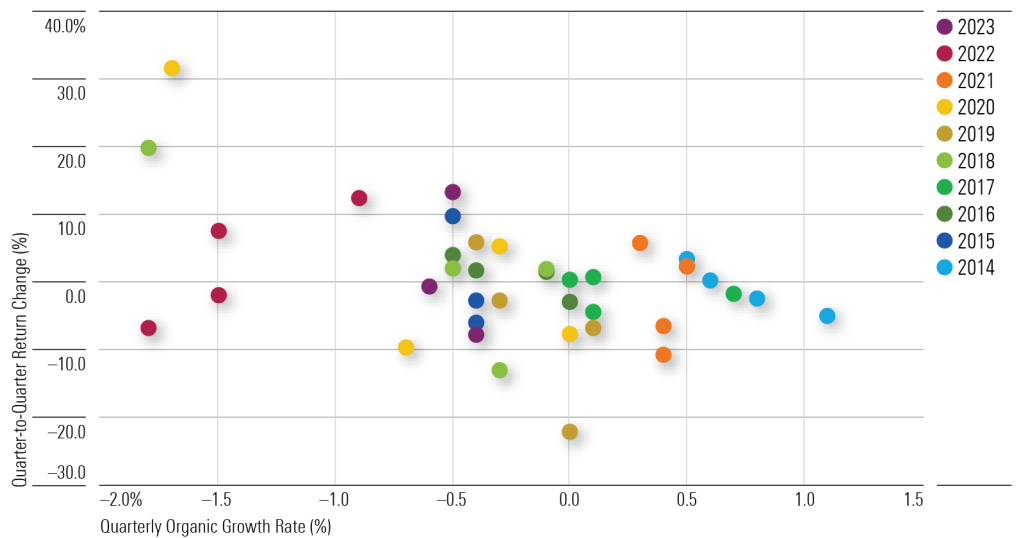
Source: Morningstar. Data as of Dec. 31, 2023.

(Note the calendar-year investor return gaps will not necessarily compound to an amount that approximates the 10-year compound annual investor return gap, as the cash flows aren't evenly distributed across the years. Nevertheless, the calendar-year gaps should give a sense of the direction and magnitude of the gap in a particular year and how it might have contributed to the 10-year gap.)

Broadly speaking, negative return gaps can arise in two scenarios: when investors add monies and returns proceed to deteriorate (or show no improvement) or when they withdraw assets and returns improve (or fail to erode). The opposite holds for positive return gaps.

This relationship becomes more apparent if we plot funds' quarterly organic growth rate (that is, net flows in that quarter divided by net assets at the end of the prior quarter) against the change in their average total return (that is, that quarter's total return minus the prior quarter's return). The upper-left and lower-right quadrants of the plot below represent the scenarios in which investors are withdrawing assets as returns improve or adding monies as performance erodes, respectively.

Exhibit 4 All Funds: Quarterly Organic Growth Rate vs. Quarter-to-Quarter Return Change



Source: Morningstar. Data as of Dec. 31, 2023.

While not perfectly correlated, the plot's downward slope indicates investors were more often redeeming assets amid improving performance or adding assets as returns eroded than they were the reverse. For instance, investors appear to have incurred heavier timing costs in 2020, adding assets before the market slid and then withdrawing monies only for markets to rally over the ensuing months.

All told, investors added (or withdrew) around USD 2.1 trillion in assets in quarters when performance slipped (or improved). This exceeded the roughly USD 1.5 trillion they added (or redeemed) in quarters when returns improved (or eroded).

Exhibit 5 All Funds: Cumulative Quarterly Net Flows by Change in Quarterly Returns

	Returns Improved (\$B)	Returns Worsened (\$B)
Added Assets	340.7	531.6
Withdrawn Assets	-1,616.1	-1,179.1

Source: Morningstar. Data as of Dec. 31, 2023.

This imbalance was magnified by the difference in average return change in these four scenarios. For instance, in those quarters in which investors withdrew assets but returns improved (USD 1.6 trillion in outflows total), the average return improvement was 9.0 percentage points. Whereas returns worsened to a lesser degree (negative 7.1 percentage points), on average, in quarters in which investors withdrew assets.

Exhibit 6 All Funds: Average Quarterly Return Change by Direction of Quarterly Net Flows

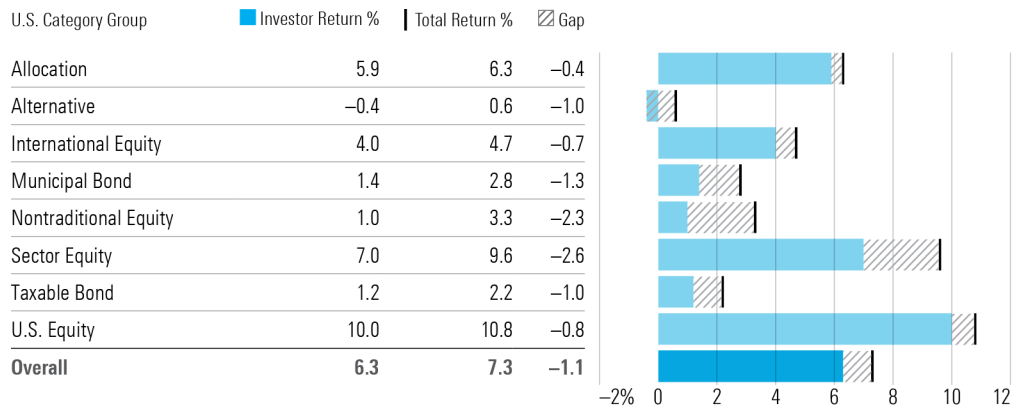
	Returns Improved (p.p.)	Returns Worsened (p.p.)
Added Assets	2.1	-5.5
Withdrawn Assets	9.0	-7.1

Source: Morningstar. Data as of Dec. 31, 2023.

By Fund Categories

Investor returns lagged total returns in every category group over the 10 years ended Dec. 31, 2023, but to varying degrees. As in past studies, allocation funds had the narrowest gap (negative 0.4% gap per year). On the flip side, sector equity funds saw the widest gap (negative 2.6% gap annually).

Exhibit 7 Investor Return Gaps by US Category Group (10-Year Returns)

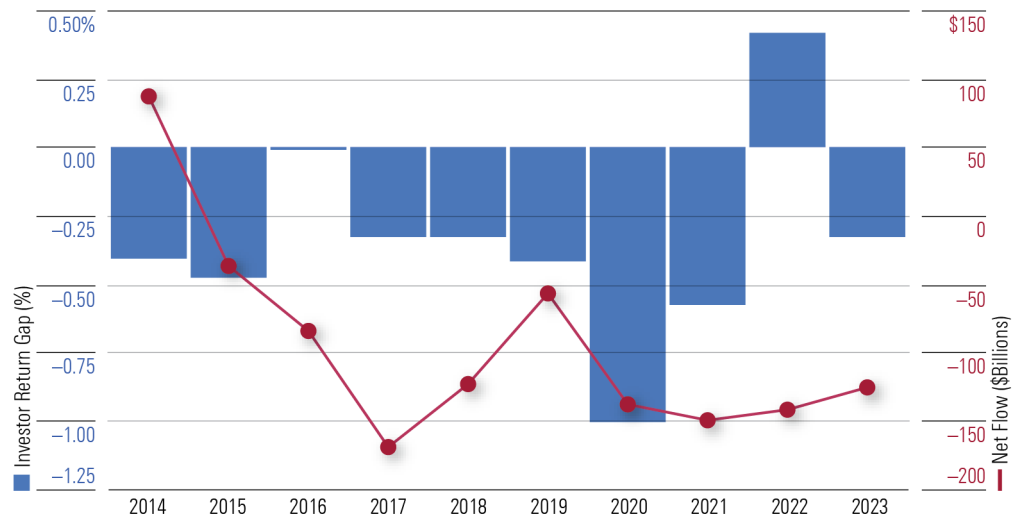


Source: Morningstar. Data as of Dec. 31, 2023. Excludes commodities category group. Gap numbers may not match differences in returns because of rounding.

In absolute terms, US stock funds fared the best, earning a 10.0% per year dollar-weighted return (a negative 0.8% gap). Alternative funds earned the dubious distinction of being the only category group where the average dollar lost money over the decade, as it posted a negative 0.2% annual investor return. This is somewhat ironic considering the sales pitch for some alternative funds is based on their ability to preserve capital come what may in the broader stock and bond markets.

Focusing on allocation funds, the gap between investor and total returns was fairly consistent, exceptions being 2020, when the gap widened significantly, and 2022, when persistent outflows proved beneficial amid a twin stock/bond market pullback. These funds were in redemption for most of the decade, with investors pulling USD 938 billion in total; those outflows stemmed partly from investors aging out of their target-date funds as well as continued conversion of assets to collective investment trusts.

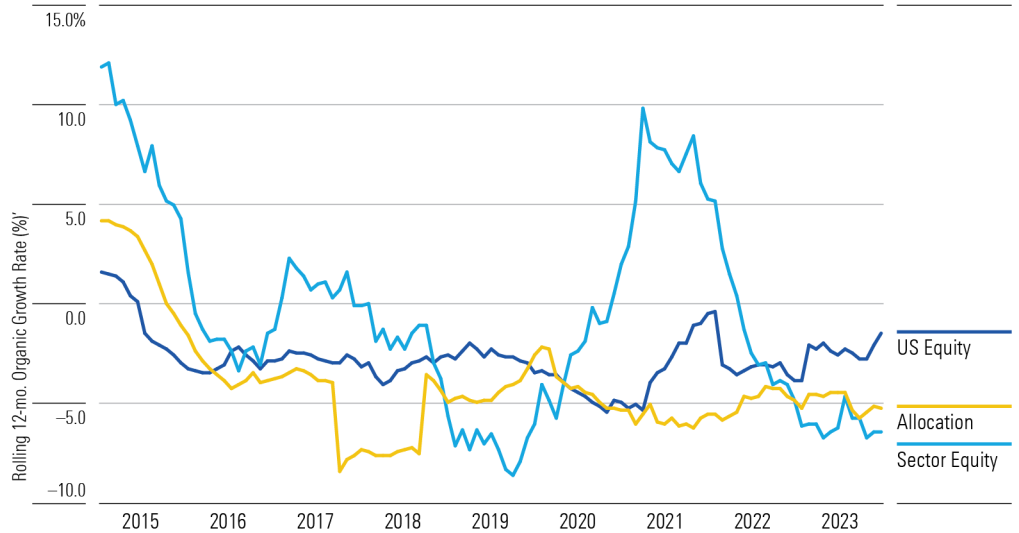
Exhibit 8 Allocation Funds: Investor Return Gaps and Net Flows by Calendar Year



Source: Morningstar. Data as of Dec. 31, 2023.

While outflows coupled with rising markets wouldn't seem to augur well for allocation funds' dollar-weighted returns, the group's generally stable pattern of flows and more-temperate returns are a marked contrast to other asset classes. For instance, flows to sector equity funds were about twice as volatile as allocation funds and returns about 50% more volatile. And though US equity fund flows have been reliably negative, their returns are far more volatile than allocation funds'.

Exhibit 9 Rolling 12-Month Organic Growth Rate (%)



Source: Morningstar. Data as of Dec. 31, 2023.

All told, the category group investor return gaps over the 10 years ended Dec. 31, 2023, are broadly in line with our estimates from prior studies, as shown below.

Exhibit 10 All Funds: 10-Year Investor Return Gaps by Category Group (Ending in Year Shown)

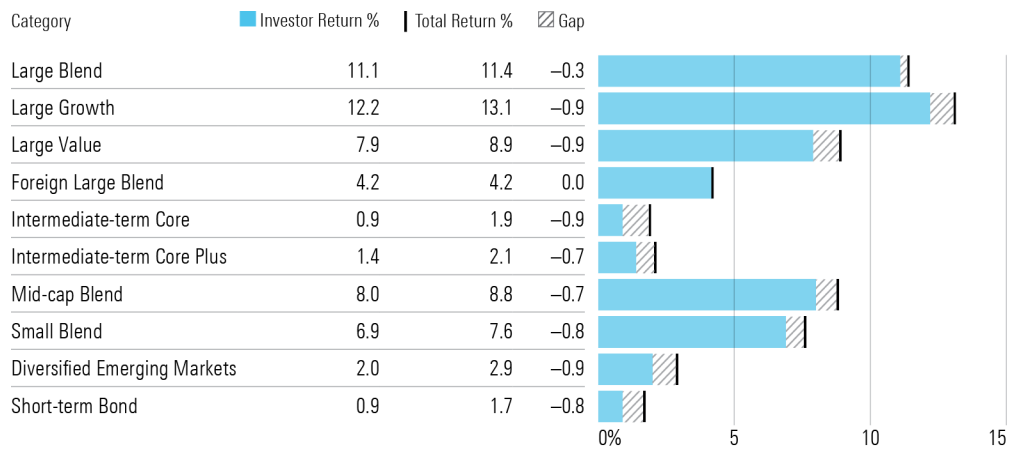
Category	2019	2020	2021	2022	2023	Investor Return Gap (%)
Allocation	0.4	-0.7	-0.8	-0.5	-0.4	■ ≥ 0.5
Alternative	-0.2	-4.3	-1.2	-1.9	-0.6	■ 0.0 to 0.4
International Equity	-1.0	-1.4	-1.8	-1.6	-0.7	■ -0.4 to -0.1
Municipal Bond	-0.9	-1.3	-1.2	-1.4	-1.3	■ -0.9 to -0.5
Nontraditional Equity	N/A	N/A	-2.9	-2.1	-2.3	■ ≤ -1.0
Sector Equity	-1.4	-4.0	-4.3	-4.4	-2.6	
Taxable Bond	-0.8	-1.1	-1.2	-1.4	-1.0	
U.S. Equity	0.3	-1.2	-1.2	-0.8	-0.8	

Source: Morningstar. Data as of Dec. 31, 2023.

(Vertical shading in each column indicates range of investor return gaps in the 10-year period ended in the year shown. The figures that appear are those that were reported in the "Mind the Gap" studies at the relevant times. The nontraditional equity category group was newly created in 2022 and was therefore not broken out in the "Mind the Gap" study until the 10 years ended Dec. 31, 2021.)

Among the largest fund categories by assets, the foreign large-blend category boasted the narrowest gap over the 10 years ended Dec. 31, 2023 (0.0% per year), and large-value funds the widest (a negative 0.9% gap annually). The large-growth category saw the heaviest redemptions of assets (nearly USD 800 billion of net outflows), while intermediate-term core bond funds received the most inflows (more than USD 600 billion) among these large peer groups.

Exhibit 11 Largest Fund Categories: 10-Year Investor Return Gaps

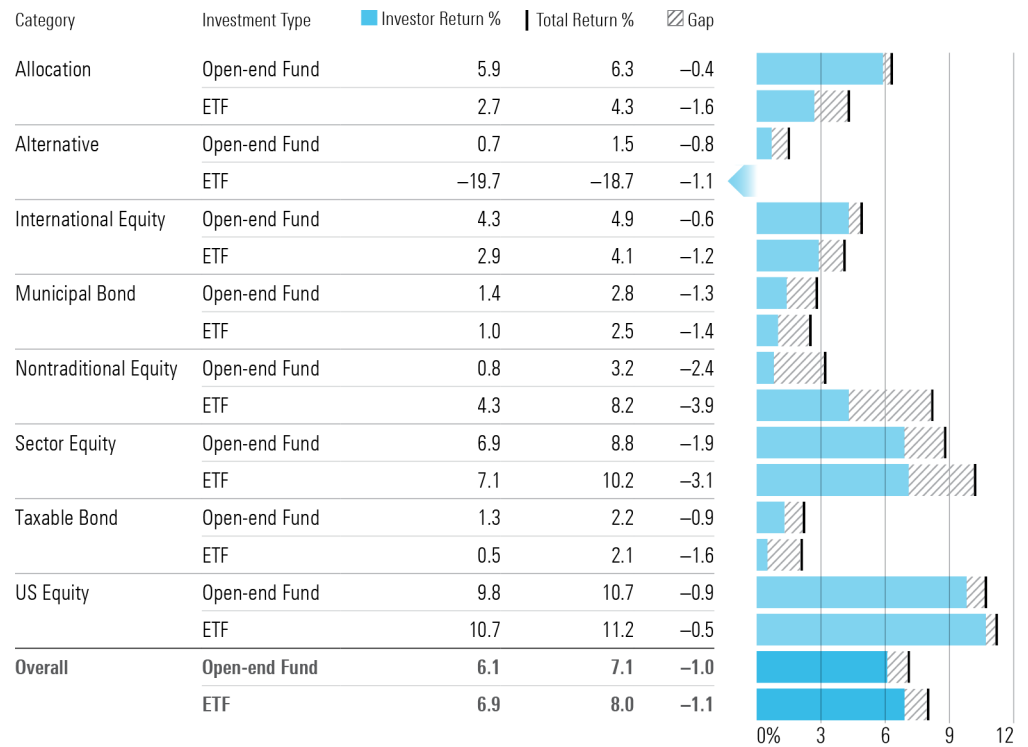


Source: Morningstar. Data as of Dec. 31, 2023.

By Fund Types

For the first time, we separately evaluated the investor returns of open-end funds and ETFs. We estimate that open-end funds earned a 6.1% investor return per year (negative 1.0% gap) over the 10 years ended Dec. 31, 2023, versus 6.9% for ETFs (negative 1.1% gap). Gaps were generally narrower for open-end funds than ETFs even when we controlled for asset class. Over this period, open-end funds saw more than USD 4.5 trillion in outflows, while ETFs racked up roughly USD 2.7 trillion in inflows.

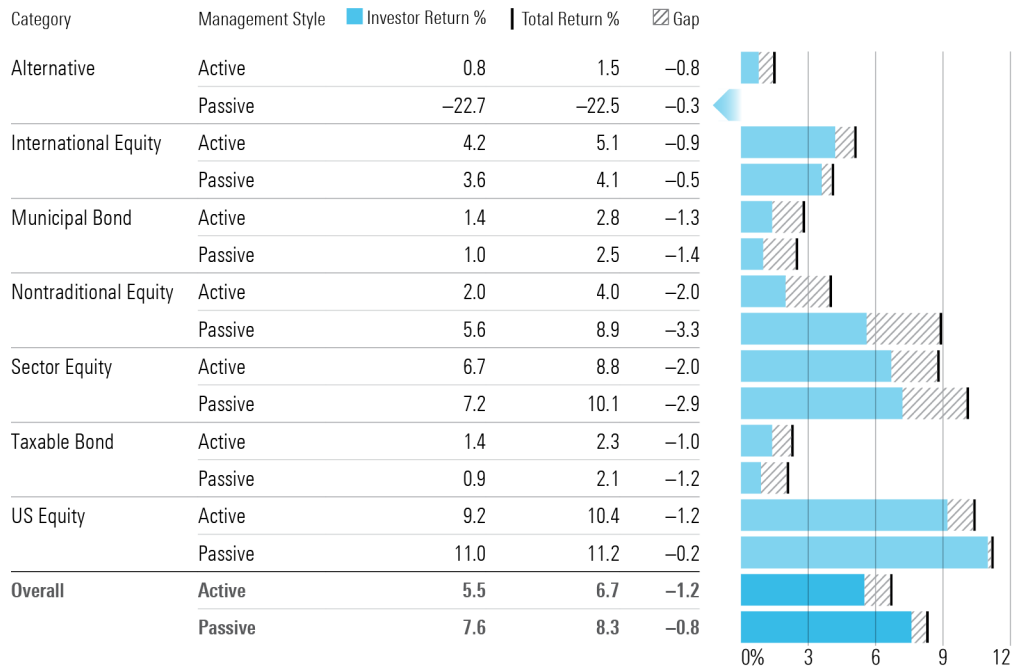
Exhibit 12 Open-End Funds vs. ETFs: Investor Return Gaps by Category Group



Source: Morningstar. Data as of Dec. 31, 2023.

Turning to active and passive funds, we found the average dollar invested in index funds earned a 7.6% annual return (negative 0.8% gap) compared with 5.5% per year in active funds (negative 1.2% gap). Although the gap for index funds was narrower than active funds in US equity (negative 0.2% versus negative 1.2%) and international equity (negative 0.5% versus negative 0.9%), it was wider in the other category groups, especially sector equity, where there was a nearly 3% annual shortfall between the average dollar's return and the average fund's return. This suggests investors could be forsaking the cost advantage they enjoy in such funds in their zeal to trade.

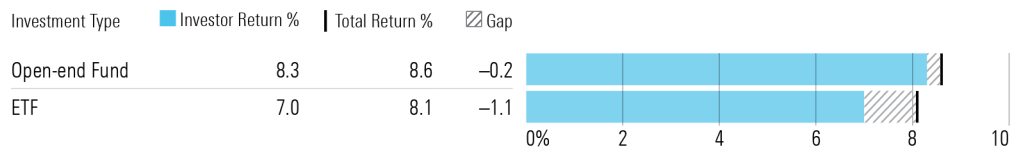
Exhibit 13 Active vs. Passive: Investor Return Gaps by Category Group



Source: Morningstar. Data as of Dec. 31, 2023.

Drilling down further on index funds, we found there was a small gap for index mutual funds over the 10-year period of a negative 0.2% gap per year. But the gap for index ETFs was considerably wider, as the average dollar earned about 1.1% per year less than the buy-and-hold return.

Exhibit 14 Index Funds: Investor Return Gap by Investment Type



Source: Morningstar. Data as of Dec. 31, 2023.

By Fund Fees and Volatility

Though investor return gaps were narrower among cheaper funds in some category groups like US equity and allocation, this relationship didn't hold uniformly. For example, in some cases, the cheapest funds in a category group exhibited return gaps that approximated the gaps for the category group as a whole. All told, timing costs appear to be loosely correlated with fees.

Exhibit 15 All Funds: Investor Return Gaps by Category Group and Fees

U.S. Category Group	Fee Quintile	Average Annual Return %		
		Investor	Total	Gap
Allocation	1	6.5	6.5	0.0
	2	5.9	6.5	-0.6
	3	5.1	5.9	-0.8
	4	4.4	5.3	-1.0
	5	3.9	5.0	-1.1
Alternative	1	0.3	1.1	-0.8
	2	-3.3	-3.1	-0.1
	3	1.1	1.8	-0.7
	4	0.1	-0.3	0.5
	5	-0.5	-0.7	0.2
International Equity	1	4.3	4.8	-0.5
	2	3.6	4.7	-1.0
	3	2.7	4.1	-1.4
	4	3.2	4.6	-1.3
	5	1.9	3.6	-1.7
Municipal Bond	1	1.4	2.7	-1.3
	2	1.2	2.7	-1.4
	3	1.6	3.0	-1.4
	4	1.6	2.6	-1.0
	5	2.1	2.3	-0.2
Nontraditional Equity	1	1.4	4.0	-2.6
	2	-0.3	3.5	-3.8
	3	2.1	4.6	-2.5
	4	1.4	4.1	-2.6
	5	1.8	2.0	-0.2
Sector Equity	1	7.6	10.2	-2.6
	2	6.8	9.1	-2.3
	3	5.6	8.4	-2.7
	4	4.9	7.7	-2.8
	5	2.1	6.1	-4.0
Taxable Bond	1	1.3	2.2	-1.0
	2	1.2	2.3	-1.0
	3	1.4	2.2	-0.7
	4	1.2	1.9	-0.7
	5	1.0	2.0	-1.0
US Equity	1	10.9	11.1	-0.2
	2	8.7	10.0	-1.4
	3	7.7	9.6	-1.9
	4	7.9	9.3	-1.4
	5	6.7	8.1	-1.4

Source: Morningstar. Data as of Dec. 31, 2023. 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.

If the relationship between investor return gaps and fees was somewhat inconclusive, the link between gaps and volatility appears to be stronger. Indeed, we found that the more volatile a fund's returns were compared with peers, the larger its investor return gap tended to be, on average. For instance, the average dollar invested in the most volatile quintile of sector equity funds lagged the buy-and-hold return by more than 7 percentage points per year.

Exhibit 16 All Funds: Investor Return Gaps by Category Group and Volatility

U.S. Category Group	Std Dev Quintile	Average Annual Return %		
		Investor	Total	Gap
Allocation	1	4.9	4.4	0.5
	2	5.7	6.3	-0.6
	3	5.6	6.2	-0.6
	4	6.8	6.8	-0.1
	5	7.1	7.1	0.0
Alternative	1	2.3	2.3	0.0
	2	2.5	3.3	-0.8
	3	1.5	2.8	-1.4
	4	-2.0	-0.2	-1.9
	5	-4.2	-8.6	4.3
International Equity	1	5.9	7.0	-1.1
	2	4.7	5.4	-0.7
	3	4.3	4.3	0.0
	4	2.7	4.1	-1.5
	5	1.8	3.0	-1.2
Municipal Bond	1	0.9	1.6	-0.8
	2	1.5	2.6	-1.1
	3	1.8	3.0	-1.3
	4	1.2	2.9	-1.8
	5	2.1	4.0	-1.9
Nontraditional Equity	1	1.6	2.7	-1.1
	2	-6.4	-1.0	-5.4
	3	2.5	4.4	-2.0
	4	1.2	5.1	-3.9
	5	3.5	7.0	-3.4
Sector Equity	1	7.7	9.8	-2.0
	2	10.2	12.1	-1.9
	3	7.2	8.8	-1.7
	4	6.2	9.5	-3.4
	5	1.3	5.7	-4.4
Taxable Bond	1	1.0	1.5	-0.6
	2	1.1	1.9	-0.7
	3	1.5	2.2	-0.7
	4	1.8	3.0	-1.1
	5	1.3	2.6	-1.3
US Equity	1	10.8	11.2	-0.4
	2	11.0	11.4	-0.5
	3	9.8	10.8	-1.0
	4	8.6	9.6	-1.0
	5	6.3	7.7	-1.4

Source: Morningstar. Data as of Dec. 31, 2023. 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.

Why are gaps more correlated with volatility than fees? There are a few possible explanations. For one, given the shift toward the lowest-cost funds, the cheaper quintiles have come to account for an ever-larger share of net assets and flows. As this happens, the investor returns and gaps for these cheaper funds come to drive the investor return and gap figures for the category group as a whole, explaining the similarity between the two figures in some cases and, in turn, the lack of correlation.

By contrast, the least volatile funds will not necessarily account for the lion's share of assets and flows. In fact, given the rise of widely diversified index funds, which tend to exhibit average levels of volatility, one finds that the second and third quintiles soak up most of the flows and assets. Consequently, the distribution of asset and flows by standard deviation quintiles is less skewed than it is with fees.

It's also possible that gaps are more strongly correlated with standard deviation of returns because volatility conveys more about an investor's ability to capture a fund's full return than fees do. Take the case of a cheap but highly volatile high-yield bond fund. While the fund's lower fee should burnish its total returns compared with other funds like it, that's likely to pale in importance to its volatility where investor flows are concerned. Put another way, fee differences are less likely than volatility differences to trigger purchases or sales over shorter time frames, and it's those trades that can give rise to gaps.

Lastly, there's the matter of context. While it's possible a highly volatile fund could be included on a defined-contribution plan menu, it's become less and less likely as plan committees turn to widely diversified options like target-date funds that strike a moderate risk/return profile. (Volatile funds are unlikely to be held by target-date funds, which shy away from strategies that can be hard to mesh into an asset allocation or whose performance could veer in disruptive ways.) In effect, this deprives highly volatile funds of the more predictable patterns of purchases and sales that one finds in a 401(k) context. Absent that, the timing and magnitude of cash flows to these vehicles can be much more erratic, which in turn can cause investor returns to diverge from total returns.

Results of Dollar-Cost Averaging

We also examined how investor returns 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.

In theory, dollar-cost averaging won't usually lead to better results compared with a buy-and-hold approach because market returns are positive more often than not. Given that, it's not too surprising that investor returns lagged total returns in most category groups when we assumed that the investor dollar-cost averaged.

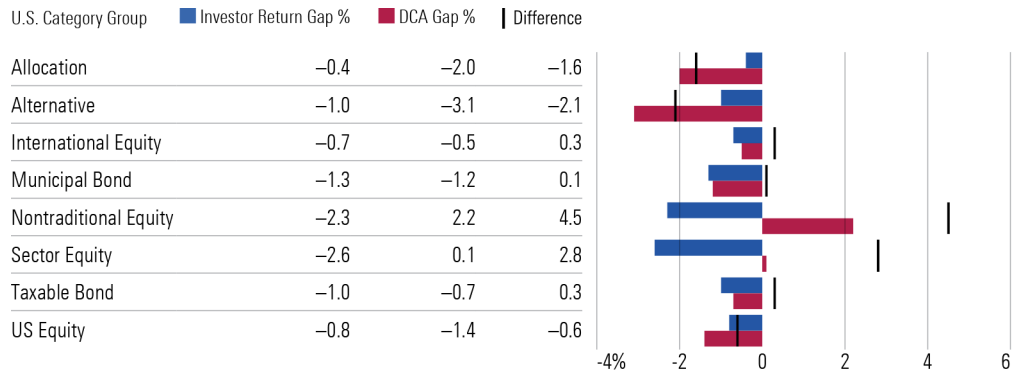
In several large category groups, like international equity and taxable bond, dollar-cost averaging would have shrunk the investor return gap. But it's worth noting that those areas posted generally tepid returns over the 10-year period, marked by several sharp reversals along the way. What's more, flows were flat to international equity funds, while taxable-bond funds saw inflows. Thus, with the benefit of hindsight,

these areas were arguably set up better for an approach like dollar-cost averaging where capital is withheld and only gradually deployed.

Dollar-cost averaging's success in reversing the gap among sector equity funds is perhaps more instructive. Those funds enjoyed relatively strong performance, gaining nearly 10% per year over the 10-year period, but the highest returns came in the back half of the decade. Thus, having larger sums at work later rather than earlier in the period could have been beneficial.

In addition, dollar-cost averaging would have avoided the repeated missteps that it appears investors made in timing their purchases and sales of sector equity funds. For instance, they added monies in 2014 and 2021, only to see performance slide the following year; and they redeemed assets in 2016, 2018, 2019, and 2022, just before returns snapped back. While it's impossible to predict future returns, narrow strategies like sector equity funds are notoriously fickle, perhaps making it worthwhile to consider adopting regimented, do-no-harm approaches like dollar-cost averaging when investing there.

Exhibit 17 All Funds: Investor Return Gaps Based on Actual Flows Versus Hypothetical Dollar-Cost Averaging



Source: Morningstar. Data as of Dec. 31, 2022. We determine the dollar-cost-averaging data by assuming equal monthly investments made within each category and then calculating an internal rate of return.

Conclusion and Lessons From the Study

Based on our estimates, the average dollar underperformed the average fund by 1.1 percentage points per year over the decade ended Dec. 31, 2023. In other words, investors failed to capture around 15% of their funds' total returns, with that shortfall owing to the timing and magnitude of their purchases and sales.

How can investors capture a greater share of their funds' total returns in the future? The study's findings yield some insights into steps investors can take to avoid gaps.

- ▶ **Less is more:** If there's only one lesson to take away from "Mind the Gap," it's that investors seem to have enjoyed greater success using widely diversified, all-in-one allocation funds. Investors have captured most of these funds' returns. And why? There are multiple reasons, but these strategies automate mundane tasks like rebalancing. That means less transacting, and less transacting appears to have conferred higher dollar-weighted returns than otherwise.
- ▶ **Context counts:** Important as ease-of-use is to shrinking investor return gaps, context also matters. This is evident when it comes to allocation funds, which are often used in defined-contribution plans. How is that context helpful? It mechanizes investing, avoiding the potentially large timing costs investors can incur when making large, ad hoc transactions. It's also apparent in the larger gaps common to narrower funds, like sector equity strategies, which aren't typically offered in such contexts and thus see more irregular purchases and sales that can weigh on dollar-weighted returns.
- ▶ **Maintenance not needed:** The narrower the strategy, the harder time investors seemed to have in capturing its total return. Narrow funds are usually more volatile by their very nature, and our findings suggest a link between higher volatility and wider investor return gaps. But volatility aside, these strategies are usually higher-maintenance, forcing investors to make buy or sell decisions at what can be fraught times. Imagine the stand-alone tech sector fund that gets crushed in a selloff and needs to be topped back up to target. For some investors, that purchase will be too much to stomach.
- ▶ **Fees matter (to a point):** Investors have ample reason to choose low-cost funds, which are far likelier to earn higher total returns in the future. But we didn't find a strong link between fees and investor return gaps in the study. To be sure, that doesn't undercut the case to pinch pennies. But it does suggest cost can be subordinate to other factors—like a fund's simplicity, the context in which it's used, and the maintenance it requires—when it comes to capturing a fund's full return. You can pick the cheapest of a hard-to-use fund type and still come up well shy of earning its total return by transacting inopportunistly.
- ▶ **Convenience comes at a cost:** One of the more striking findings in this year's "Mind the Gap" study is the gap between index ETFs' dollar-weighted returns and their total return. It was quite a bit wider than the gap for index open-end funds. To be fair, ETFs don't enjoy the benefit of being directly available in defined-contribution plans or being held by target-date funds that are often fixtures of such plans. But it does raise the question of whether some of the convenience ETFs afford—that is, they trade like stocks and can be bought and sold at any time markets are open—comes at a cost. ■■■

Appendix

Methodology

Morningstar's annual "Mind the Gap" study compares funds' dollar-weighted returns with their time-weighted returns to see how large the gap, or difference, has been over time.

We use a portfolio-based methodology for combining fund flows to an aggregate level. This method combines all the monthly flows 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 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 dataset only captures net assets, cash flows, and returns for funds that existed at the start of the study period.

Once all 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 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, weighted by asset size, as a benchmark for comparison with investor returns. (The asset-weighted return average weights each fund's return based on an average of

its asset size at the beginning and end of each month.) We refer to the difference between investor returns and total returns as the *gap* or *investor return gap*.

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. Given that ETFs do not report changes in net assets attributable to dividend reinvestments, we adjust reported flows by an assumed reinvestment rate that's tailored to each category group. (We make the same adjustment for open-end funds if the fund doesn't separately report reinvestments.)

(For more detailed information on Morningstar's approach to estimating funds' monthly net flows, please see Morningstar's ["Estimated Net Cash Flow Methodology"](#) dated Aug. 31, 2018.)

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, 2023, 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. We also exclude the net assets and flows of funds of funds from our calculation of investor and total returns, but we include such funds in our estimates at the category group level.

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 IRR for the category group.

Exhibit A1 Summary Data: Annual Organic Growth Rates, Total Returns, and Assets by Category Group

Annual Organic Growth Rates (%)	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Allocation	4.2	-1.6	-3.8	-7.4	-5.0	-2.6	-5.4	-5.6	-4.9	-5.3	■ ≥ 8.2
Alternative	4.1	-4.1	-12.7	-13.7	-15.1	-12.0	-12.4	21.2	4.4	-20.6	■ 4.3 to 8.1
International Equity	5.2	7.0	-2.4	5.0	-0.9	-3.3	-7.5	1.5	-3.7	-3.0	■ 0.9 to 4.2
Municipal Bond	6.0	2.5	4.5	2.4	-4.2	11.1	3.2	8.6	-14.3	-3.3	■ -2.0 to 0.8
Nontraditional Equity	4.1	-20.4	-22.6	2.4	-20.2	-31.5	-19.6	8.3	15.7	-1.3	■ ≤ -2.1
Sector Equity	12.0	1.6	-1.3	-0.1	-5.7	-6.1	2.0	5.3	-4.9	-6.5	
Taxable Bond	3.0	-0.7	5.0	8.1	-1.9	7.4	6.7	5.4	-7.3	1.1	
US Equity	1.6	-3.3	-2.9	-3.2	-2.6	-3.5	-5.0	-0.5	-3.9	-1.5	

Annual Total Returns (%)	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Allocation	5.6	-1.6	8.1	14.9	-5.5	19.8	12.1	13.7	-13.9	14.6	■ ≥ 10.9
Alternative	1.1	-1.7	-2.2	1.9	-3.5	3.5	2.1	1.4	-1.6	3.8	■ 5.3 to 10.8
International Equity	-2.3	-3.6	4.4	27.9	-13.9	23.1	15.7	8.3	-18.5	16.7	■ 1.3 to 5.2
Municipal Bond	8.3	2.8	0.4	4.8	1.4	7.1	4.2	2.4	-8.7	6.1	■ -2.0 to 1.2
Nontraditional Equity	-2.0	-4.0	5.0	10.6	-9.4	14.5	3.4	14.6	-7.2	11.2	■ ≤ -2.0
Sector Equity	14.2	-1.7	9.0	16.0	-6.1	28.9	16.0	23.6	-14.0	18.3	
Taxable Bond	3.9	-0.8	4.9	4.5	-0.4	8.7	6.8	0.0	-10.9	6.8	
US Equity	10.6	0.2	11.7	21.2	-5.7	29.7	20.8	24.5	-18.9	24.4	

Average Assets (USD Tril)	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	
Allocation	2.2	2.3	2.2	2.4	2.4	2.4	2.4	2.8	2.5	2.4	■ ≥ 3.1
Alternative	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	■ 2.2 to 3.0
International Equity	2.2	2.3	2.2	2.7	3.0	2.8	2.8	3.4	3.0	2.9	■ 0.9 to 2.1
Municipal Bond	0.5	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.7	■ 0.2 to 0.8
Nontraditional Equity	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	■ ≤ 0.1
Sector Equity	0.7	0.8	0.7	0.8	0.9	0.8	0.9	1.2	1.1	1.1	
Taxable Bond	2.8	2.9	3.0	3.3	3.4	3.6	4.0	4.4	4.0	3.8	
US Equity	5.5	5.9	5.7	6.6	7.4	7.5	7.9	10.4	9.7	9.6	

Source: Morningstar. Data as of Dec. 31, 2023. Includes assets, fund flows, and total returns for funds created before Jan. 1, 2014. 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 month-end values for the current year.

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22 West Washington Street
Chicago, IL 60602 USA

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