Morningstar's Role in Portfolio Framework

Practical Guidelines for Time Horizon and Position Size

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Key Takeaways

- Morningstar is introducing a new framework that provides practical guidance for investors considering how to use funds in their portfolios. The framework aims to support goals-based planning by focusing on two key dimensions: a recommended minimum holding period and a maximum position size within a portfolio.
- We used Morningstar's holdings-based Category classification system to determine the recommended time horizon and position size.
- To determine the recommended time horizon, we reviewed the historical data on time to recovery and loss frequency for each Morningstar category, as well as data on equity exposure, effective duration, and maximum drawdowns.
- To determine the recommended size within a portfolio, we considered the level of diversification, the size of the asset class, and the annual dispersion of returns, among other factors.
- Because asset class diversification is the primary goal of portfolio construction, target-date funds and allocation categories can often be suitable as stand-alone holdings, while more specialized funds should generally make up a smaller percentage of assets.
- The Role in Portfolio framework can be used in tandem with other practical strategies for allocating assets by time horizon, such as bucket portfolios.

Introduction

Most investors alive today grew up in a world dominated by Modern Portfolio Theory. Ever since Harry Markowitz published his landmark paper[1] in 1952, institutional investors have relied on this framework (also known as mean-variance optimization) to construct portfolios that maximize returns for a given level of risk or minimize risk for a given level of returns. This approach relies on two key assumptions: Investors hold only one portfolio, and there is a single series of portfolios along the efficient frontier that will generate optimal results given a set of key inputs for expected returns, standard deviations, and correlations between asset classes. It defines risk in terms of volatility (or the standard deviation of returns), and defines success based on performance relative to a market benchmark.

Despite the dominance of this theory, the reality that individual investors and financial advisors live in is far messier. Most investors have multiple goals, such as setting up an emergency fund, buying a house, funding a child's college education, making a major purchase such as a car or vacation, and saving for retirement. Each goal has a different time horizon and a different level of importance to the investor as

1 Markowitz, H. (1952), "Portfolio Selection." *The Journal of Finance*, Vol. 7, 77.

an individual. And while investors might find volatility unpleasant, the real risk they face is not having enough assets available to meet their goals.

Academic finance theory has been evolving to reflect this reality. In 1952, A.D. Roy developed a "safety first" framework for individuals faced with uncertainty who need to avoid negative outcomes, or "dread events." Daniel Kahneman and Amos Tversky created the field of behavioral finance in their 1979 paper, which found that most people prefer more-certain payoffs instead of less-certain events with higher potential value. About two decades later, Richard Thaler later described mental accounting, the tendency for people to conceptually divide their financial resources into separate buckets. In 2000, Hersh Shefrin and Meir Statman developed Behavioral Portfolio Theory, which incorporates personal preferences and decision-making into the investment process. Statman later joined forces with Sanjiv Das, Jonathan Scheid, and Harry Markowitz himself for the 2010 paper, "Portfolio Optimization with Mental Accounts." A few practitioners, including Jean Brunel and Ashvin Chhabra, have written about implementing goals-based wealth management from a more practical perspective.

In addition, several practitioners have used strategies called time bucketing to help clients fund goals with different time horizons. The basic idea is to establish multiple asset buckets for short-, medium-, and long-term funding needs. In 2013, Shaun Pfeiffer, John Salter, and Harold Evensky proposed a cash flow reserve bucket strategy, where one year of retirement spending is placed in a cash bucket, and the remaining assets are invested in other buckets with an asset allocation matched to the client's risk tolerance.

Morningstar's own Christine Benz has developed model portfolios that define the time horizon for specific buckets and recommended holdings within each one. For example, Bucket 2 contains five or more years' worth of planned spending and is funded mainly with high-quality fixed-income funds, while Bucket 3 is geared toward long-term funding needs and is mainly invested in stocks.

There are several benefits of using bucket strategies. First, it is easily comprehended by clients. Bucket strategies are essentially creating multiple "accounts" for different time horizons or different financial goals, which aligns with their mental accounting. Second, the conservative assets earmarked to fund near-term financial needs provide peace of mind, which helps the client avoid panic-selling during market downturns. Finally, by separating assets to fund near-term financial needs and to generate long-term capital growth, investors may be more comfortable investing in a risky portfolio that provides higher growth potential.

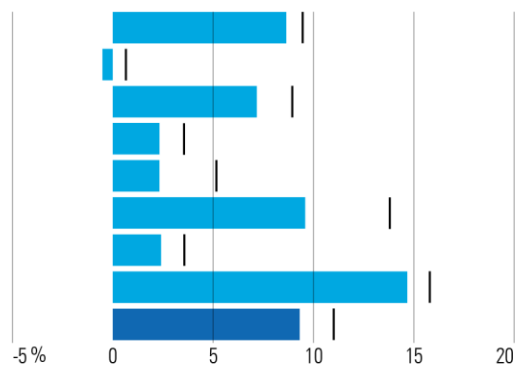
Despite these developments, most investment information (including Morningstar's) still focuses on risk, returns, and underlying holdings for individual funds and asset classes. An individual faced with the task of building a portfolio from the bottom up will often find little practical guidance on how to do so. Even with hundreds of data points available, few if any provide any real-world help in figuring out key questions such as which types of investments are most appropriate for a given time horizon, or how much an investor might want to allocate to a given fund or asset class. This problem is even more challenging given the rapid proliferation of different types of funds and novel investment strategies.

As a result, individual investors often struggle to put together effective portfolios. Many investors accumulate holdings over time, and the percentage allocated to each one may or may not be a good fit for their time horizon and investment goals. Indeed, while most investors need to invest for long-term goals such as retirement, data on redemption rates from the Investment Company Institute suggests the average holding period for mutual funds is relatively short (between four and five years).[2]

In addition, Morningstar's research has found a persistent gap between reported total returns for funds (which assume an investment made at the beginning of the measurement period and held throughout) and investors' actual results (which can be higher or lower than reported total returns depending on the timing of purchases and sales). On average, we found that dollar-weighted returns lagged reported total returns by about 1.7 percentage points for the trailing 10-year period ended in 2021.[3]

Exhibit 1 Investor-Return Gaps by U.S. Category Group (10-Year Returns)

U.S. Category Group	Investor Return %	Total Return %	Gap
Allocation	8.65	9.43	-0.77
Alternative	-0.52	0.65	-1.16
International Equity	7.18	8.93	-1.75
Municipal Bond	2.33	3.54	-1.21
Nontraditional Equity	2.32	5.19	-2.87
Sector Equity	9.59	13.84	-4.25
Taxable Bond	2.41	3.58	-1.17
U.S. Equity	14.67	15.86	-1.19
Overall	**9.31**	**11.04**	**-1.73**



Source: Morningstar. Data as of Dec. 31, 2021. Excludes commodities category group. Gap numbers may not match differences in returns because of rounding.

These gaps are particularly pronounced in more speculative areas like sector funds, which often capture billions of investor dollars after they've already posted strong returns, followed by large outflows after periods of decline. These performance gaps can also be especially damaging for investors in high-profile funds such as ARK Innovation ETF ARKK, which captured billions of inflows after its spectacular runup in 2020, which was followed by disastrous results in 2021 and 2022.

Morningstar's Role in Portfolio Framework

One way to avoid such disasters is to steer clear of focusing too much on a fund's past performance in isolation and instead take a portfolio-focused view, considering how the investment advances a given goal. Investors planning to purchase a specific fund should consider two key questions that likely align with how they think about their goals: 1) What is the appropriate time horizon, or holding period, and 2) What percentage of my portfolio should I allocate to this fund? Getting these two questions right can go

2 https://www.icifactbook.org/pdf/22-fb-table26.pdf

3 https://www.morningstar.com/articles/1101942/are-you-leaving-money-on-the-table-from-your-funds-returns

a long way toward improving investors' results and helping them avoid major mistakes. In both cases, the goal is to provide general guidance for how a given fund might be used effectively.

For both metrics, we provide a range rather than a specific number. This makes the framework flexible enough to accommodate differences in an investor's specific time horizon, goals, risk tolerance, and risk capacity, and acknowledges that investors can frequently adjust the goals based on various factors. We also define the two metrics as a minimum (for time horizon) and maximum (for position size). This accounts for the fact that a given holding or asset class can often fill multiple roles in a portfolio depending on the circumstances. This also helps encourage long-term investment and very limited exposure to less-diversified assets.

We used Morningstar's Category classification system[4] to assign time horizons and roles. The Morningstar Category classifications, first introduced in 1996, are designed to better capture how funds actually invest by dividing the fund universe into peer groups based on their underlying holdings. The underlying principles behind the classification system are as follows:

- ► Individual portfolios within a category invest in similar types of securities and therefore share the same risk factors (for example, style risk, interest-rate risk, or prepayment risk).
- ► Individual portfolios within a category can, in general, be expected to behave more similarly to one another than to portfolios outside the category.
- ► The aggregate performance of different categories differs materially over time.
- ► Categories have enough constituents to form the basis for reasonable peer group comparisons.
- ► The distinctions between categories are meaningful to investors in differentiating risk, return, and diversification level and assisting in their pursuit of investing goals.

In practice, the category classification systems generally reflect major asset classes and subasset classes. In the United States, Morningstar supports 127 categories, which map into nine category groups (U.S. equity, sector equity, allocation, international equity, alternative, commodities, taxable bond, municipal bond, and money market). In the EMEA, Morningstar supports 359 categories, which map into nine category groups (allocation, alternative, commodities, convertibles, equity, fixed income, miscellaneous, money market, and property). For the purposes of our study and looking at the framework from a perspective of an investor based in the United Kingdom, we identified 152 categories that are accessible and relevant to U.K. investors. These were identified by looking at a combination of assets in U.K.-domiciled funds, fund availability on major platforms, and frequency of categories appearing in fund of funds and multi-asset models.

Because a fund's category assignment is based on its underlying holdings, it generally reflects how it should actually perform. As shown in the Exhibit 2 below, we found the Morningstar Category explains a large portion of the variation in the length of time it takes to recover, the maximum drawdown, and

4 https://assets.contentstack.io/v3/assets/blt4eb669caa7dc65b2/bltfc8076091387a8df/morningstar-category-for-fund-definitions.pdf

standard deviation. As a result, the Morningstar category typically provides an excellent starting point for determining a reasonable holding period and position size for a given fund.

Exhibit 2 Explanatory Power of Morningstar Categories on Risk Measurements

	Maximum Drawdown %	Longest Recovery Period %	Loss Standard Deviation %	Standard Deviation %
R-squared	71.42	45.26	78.44	83.02

Source: Morningstar Direct and author's calculations. Data as of Dec. 31, 2022. Sample periods analyzed begin in 1990.

Granted, there are some outliers within categories. Funds that have high levels of systematic or idiosyncratic risk often have different risk and return characteristics than their category groupings might suggest. For example, Invesco S&P 500® High Beta ETF SPHB courts far more risk than the typical large-blend fund and probably wouldn't be suitable as a core holding for most investors. Investors should therefore do additional research on a fund's investment strategy and portfolio holdings to confirm whether it can fill a given role. Morningstar's products, including Morningstar.com and Morningstar Direct, provide extensive information on the portfolio holdings, risk levels, and investment strategies for individual funds.

Recommended Time Horizon

The next two sections describe the two elements of Morningstar's Role in Portfolio framework in more detail.

The first component is a recommended minimum time horizon for a specific fund. Time horizon is a key portfolio consideration because people invest to have money available to meet their goals. Each goal will have an expected time period when investors need to liquidate the investment for a particular purpose.

For example, an investor might want to make a down payment on a house within two years, pay for her child's college education in 10 years, and retire in 30 years. As mentioned in the Introduction, the investor will probably think about the money allocated to each goal in separate mental accounts. Although money is fungible and easily moved across different accounts, investors have legitimate reasons to think of them in separate buckets.

It would be ill-advised, for example, for an investor to liquidate a college fund because she wants to buy a house or draw investments from her 401(k) plan to make tuition payments. In addition, tax considerations often make it impractical to move assets from one type of account to another; for example, investors generally can't withdraw assets from a 401(k) plan prior to retirement without paying ordinary income taxes (plus an additional 10% penalty for those younger than age 59½) on the withdrawal.

Although academic finance traditionally defines risk as volatility (or standard deviation), the real risk investors face is that of not having enough assets available to meet their goals. Specifically, the amount of short-term variation captured by standard deviation matters much less to investors compared with the return outcome over a given period. To gauge the appropriate minimum holding period for each Morningstar category, we looked at returns for different asset classes over rolling periods ranging from one to 10 years. We also considered the frequency and magnitude of losses, as well as how long it took each asset class to recover after a decline.

For bond-fund categories, we also considered duration, which is the weighted average time over which a bond's cash flows will be paid. Although duration doesn't always work as a precise guideline, we generally consider shorter-duration funds most appropriate for shorter holding periods and longer-duration offerings more appropriate for longer holding periods.

We set up four broad groupings for time horizon, ranging from one to two years to more than 10 years. The goal was to provide investors with general guidance for the minimum time-horizon range appropriate for each Morningstar Category.

The text below describes each of the four time horizon buckets, starting with the shortest and most conservative and moving toward the longest time horizon.

Short term (1-2 years): This group applies to assets an investor will need relatively soon, such as for an upcoming vacation, new car purchase, or major home improvement. Because the time horizon is too short to allow for asset values to recover after a significant loss, investors should focus on Morningstar Categories with shorter times to recovery, as well as less risk of major losses. This group only includes Morningstar's ultrashort bond category, which has an average effective duration of 0.7 years. While cash equivalents such as CDs and money market funds are typically most appropriate for cash needed within an even shorter period (up to 12 months), some investors (particularly those already in retirement) might want to include cash holdings here, as well.

Short/intermediate term (2-6 years): This group is for assets that will be needed over a slightly longer time horizon, such as saving up for home down payment in a few years, planning a wedding, or upcoming tuition payments for a child currently several years away from college. This group mainly includes fixed-income funds, such as intermediate core-bond and intermediate-term government, but also includes some conservative-allocation funds, such as the allocation—15% to 30% equity category.

Intermediate/long term (6-10 years): This group targets assets for somewhat longer-term goals, such as college savings for a child in elementary school or purchasing a vacation home upon retirement. The group includes some bond funds with longer durations or higher levels of drawdown risk, such as the long-term bond, corporate bond, high-yield bond, and emerging-markets bond. The group also includes several allocation categories, such as the allocation—50% to 70% equity category, and target-date fund categories, such as the target-date 2030 and 2035 categories.

Long term (>10 years): This time horizon range is appropriate for investor goals that may extend many years into the future, such as building assets for retirement or investing to leave a legacy to children, grandchildren, or charity. Nearly all equity-focused Morningstar categories land in this group, which has the highest equity level, the greatest risk of loss, and the longest time to recover from a loss, and thus the longest expected time horizon.

The table below is a sample of some of the largest Morningstar categories (based on asset size) included in each time horizon group.

Exhibit 3 Minimum Recommended Time Horizon for Selected Morningstar Categories (U.S.)

Short (1-2 years)	Short/Intermediate (2-6 years)	Intermediate/Long (6-10 years)	Long (>10 years)
Ultrashort Bond	Intermediate Core Bond	Allocation—50% to 70% Equity	Large Blend
Money Market	Intermediate Core-Plus Bond	High-Yield Bond	Large Growth
	Muni National Intermediate	Global Allocation	Large Value
	Multisector Bond	Inflation-Protected Bond	Foreign Large Blend
	Short-Term Bond		Diversified Emerging Markets
			Small Blend

Source: Morningstar. Data as of Feb. 28, 2023. Note: Please refer to the Appendix for a complete list of time horizon assignments.

Exhibit 4 Minimum Recommended Time Horizon for Selected Morningstar Categories (U.K.)

Short (1-2 years)	Short/Intermediate (2-6 years)	Intermediate/Long (6-10 years)	Long (>10 years)
GBP Money Market	Global Corporate Bond	GBP High-Yield Bond	Global Large-Cap Blend Equity
	Global Bond - GBP Hedged	GBP Government Bond	UK Equity Income
	GBP Allocation 20-40% Equity	GBP Allocation 60-80% Equity	US Large-Cap Growth Equity
	GBP Flexible Bond	GBP Allocation 40-60% Equity	UK Large-Cap Equity
	GBP Allocation 0-20% Equity	GBP Flexible Allocation	UK Small-Cap Equity
		GBP Corporate Bond	GBP Inflation-Linked Bond
		GBP Diversified Bond	Global Emerging-Markets Equity
			Europe ex-UK Equity
			Japan Large-Cap Equity

Source: Morningstar. Data as of Feb. 28, 2023. Note: Please refer to the Appendix for a complete list of time horizon assignments.

The section below describes the principles we used to assign each category to a recommended minimum holding period in more detail. We used a mosaic approach that considered several different factors for each category instead of programmatically mapping them to a time horizon group based on one factor in isolation. For example, intermediate-term bond funds would land in the intermediate/long group based on duration alone, but they've historically been able to bounce back relatively quickly after suffering losses. As a result, we included them in the short/intermediate-term group.

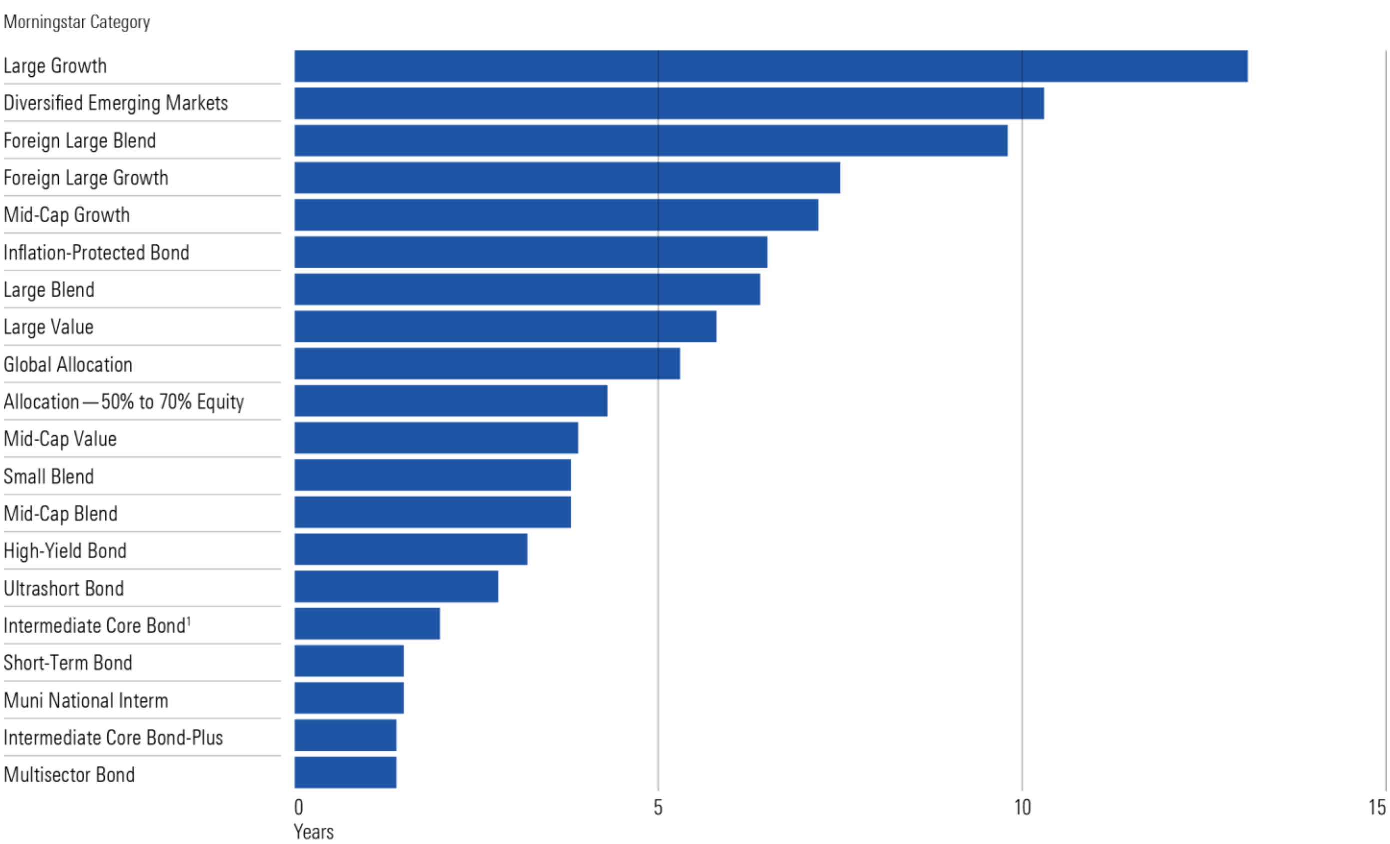
Investors should use historical market data—including worst-case scenarios for time to recovery—as a reference point for the recommended holding period.

This approach is relatively conservative but should help investors avoid problems such as taking on too much equity risk for shorter-term goals, or conversely, not taking on enough equity risk to generate the returns needed for longer-term goals.

When it comes to investing, history is an imperfect guide. There are no guarantees that the future will match the past, and asset classes that once seemed invincible over multiple years (such as gold, bonds, and technology stocks) can later suffer dramatic changes in fortune. That said, historical data is one of the few tools investors have for making decisions. It can also be a valuable gut-check for worst-case scenarios.

When reviewing the historical data for time to recovery, we focused on the periods with the worst outcomes for each asset class. Although this could be considered overly conservative, it builds in a margin of safety that should reduce the possibility that investors won't have enough assets available to fund their goals. (Note: All the data shown here is based on nominal returns; recovery times would generally be longer after adjusting for inflation.)

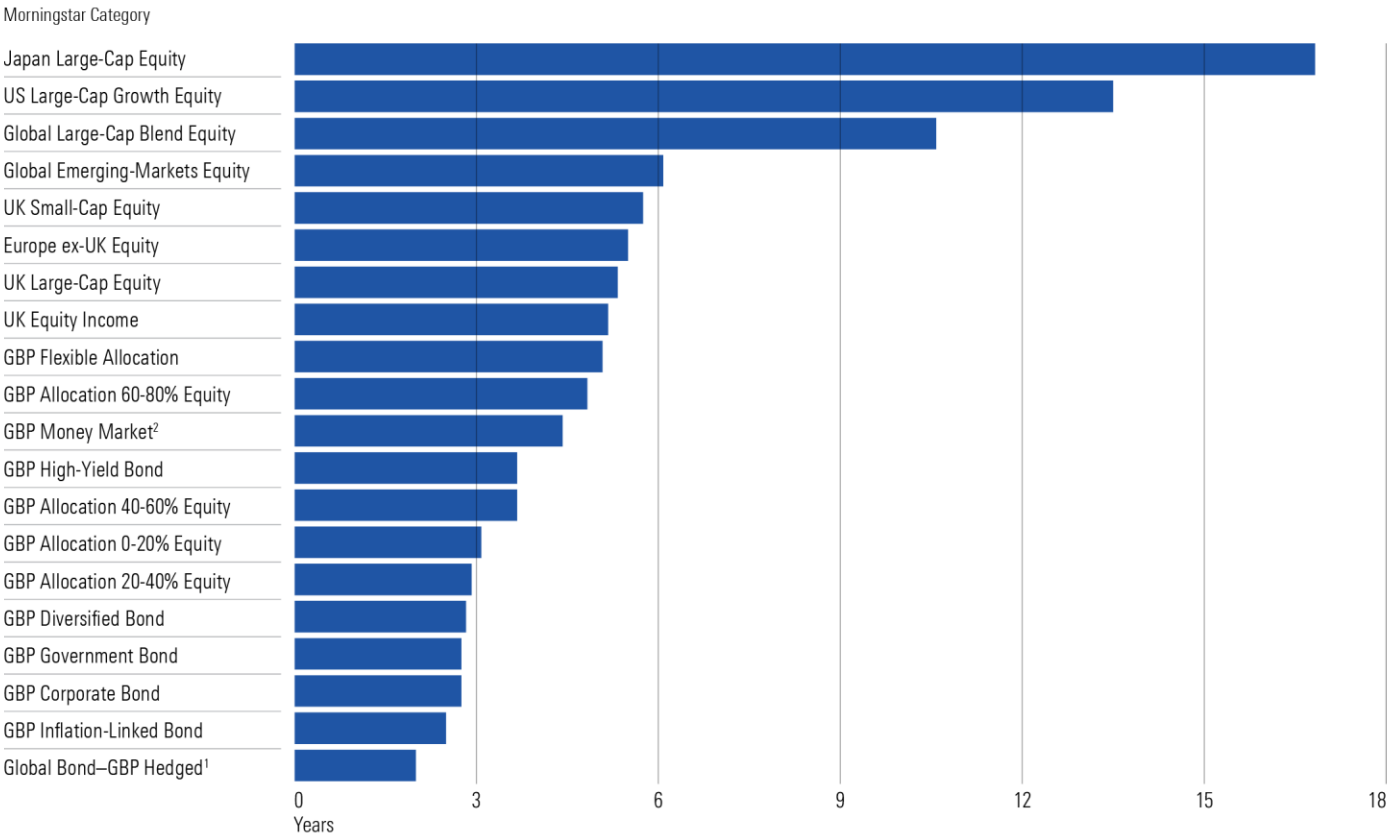
Exhibit 5 Maximum Time to Recovery for Selected Morningstar Categories (U.S.)



Morningstar Direct and author's calculations. Data as of Dec. 31, 2022. Sample periods analyzed start in January 1990.

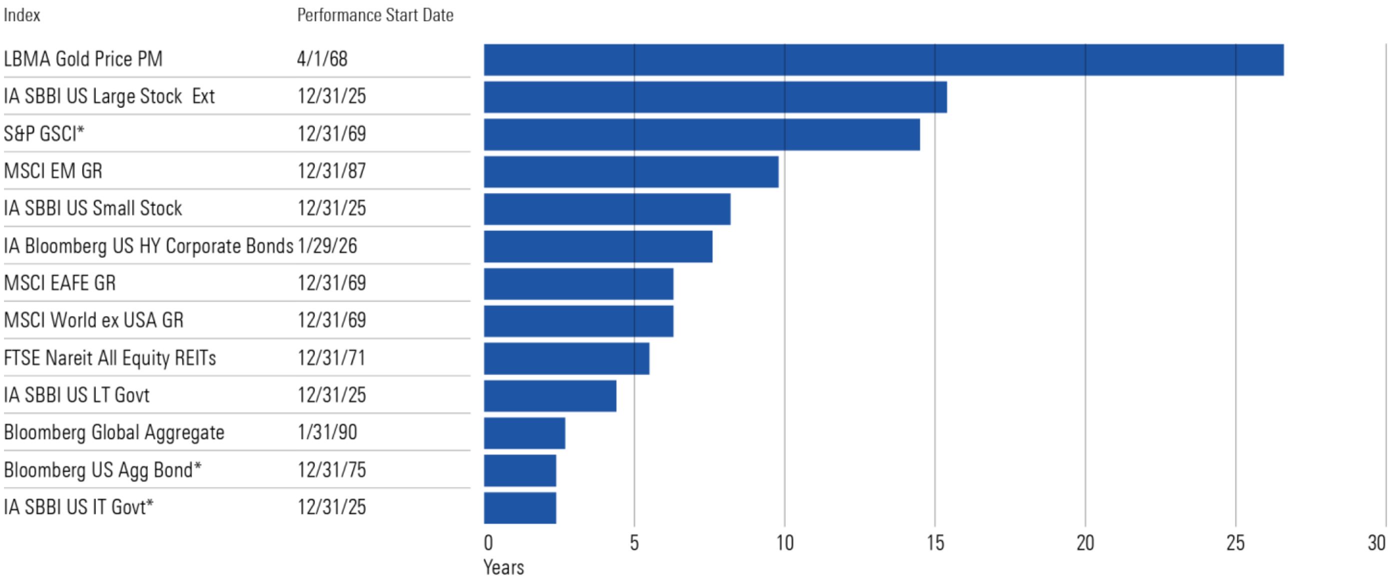
[1] Maximum time to recovery includes the most recent market drawdown, from which the category has yet to recover. Previously, the maximum time to recovery was 1.5 years.

Exhibit 6 Maximum Time to Recovery for Selected Morningstar Categories (U.K.)



Morningstar Direct and author's calculations. Data as of Dec. 31, 2022. Sample periods analyzed start in January 1990.
[1] Maximum time to recovery includes the most recent market downturn, from which the category has yet to recover. Previously, the maximum time to recovery was 1.67 years.
[2] Maximum time to recovery appears long for money market funds because of their low return potential. The maximum drawdown in pounds over the period was 1.57%, and the return for the worst month was negative 0.22%.

Exhibit 7 Maximum Time to Recovery for Selected Asset Classes



Morningstar Direct and author's calculations. Benchmark returns are based on total returns in U.S. dollars unless otherwise noted. Data as of Dec. 31, 2022.
* Maximum time to recovery reflects the most recent market downturn, from which the benchmark has yet to recover. The previous maximum times to recovery were 1.4 years for the Bloomberg US Aggregate Bond Index, 1.8 years for the IA SBBI US IT Government Index, and 5.5 years for the S&P GSCI.

To better gauge the risk of loss over various periods, we also looked at returns for different asset classes and Morningstar categories over rolling periods ranging from one to 10 years. In both cases, we reviewed historical data going back as long as possible—typically starting in 1926 for the broadest asset classes using the IA SBBI indexes, starting in 1976 for other major asset classes, and starting in 1990 for most Morningstar categories.

Exhibit 8 Frequency of Losses (%) Over Rolling Periods for Selected Morningstar Categories (U.S.)

	Length of Rolling Period (Years)									
Morningstar Category	1	2	3	4	5	6	7	8	9	10
Large Blend	21.0	15.3	17.7	21.2	18.1	6.2	2.6	5.0	6.2	9.0
Large Growth	20.8	17.4	17.7	20.3	18.4	10.2	9.9	7.3	9.3	10.1
Large Value	21.6	13.9	15.5	15.5	12.8	0.6	2.2	3.3	2.8	2.2
Foreign Large Blend	34.0	24.7	23.3	22.3	18.4	13.5	3.5	6.0	8.0	2.5
Intermediate Core Bond	15.8	5.6	2.2	0.9	1.2	0.6	0.0	0.0	0.0	0.0
Intermediate Core-Plus Bond	13.3	3.2	1.9	0.3	0.6	0.0	0.0	0.0	0.0	0.0
Allocation—50% to 70% Eq.	20.0	13.7	12.7	9.2	2.4	0.0	1.0	2.0	2.1	0.4
Diversified Emerging Mkts	36.4	35.4	25.8	22.9	23.7	19.7	14.1	11.6	10.4	0.7
Short-Term Bond	7.5	4.0	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Small Blend	26.0	14.5	10.5	8.9	5.6	0.3	1.0	0.7	0.4	0.0
Mid-Cap Growth	23.4	14.7	15.0	16.3	9.2	3.1	2.9	5.3	5.5	5.8
Foreign Large Growth	30.6	20.9	21.6	22.3	19.6	9.5	4.5	4.3	5.5	5.1
Mid-Cap Blend	24.4	13.9	12.2	8.3	4.2	0.0	1.0	1.7	0.7	0.0
Ultrashort Bond	7.8	6.4	2.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mid-Cap Value	22.1	12.6	9.7	8.6	3.9	0.3	1.0	0.3	0.0	0.0
High-Yield Bond	23.4	15.5	10.8	6.6	4.5	0.0	0.0	0.0	0.0	0.0
Muni National Interm	14.3	3.2	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Global Allocation	22.1	15.8	10.8	3.4	1.8	0.0	0.0	0.0	0.0	0.0
Multisector Bond	14.0	5.4	3.6	1.7	0.0	0.0	0.0	0.0	0.0	0.0
Inflation-Protected Bond	19.0	10.2	5.0	5.4	3.6	2.5	0.0	0.0	0.0	0.0

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Source: Morningstar Direct and author's calculations. Data as of Dec. 31, 2022. Sample periods analyzed start in January 1990.

Exhibit 9 Frequency of Losses (%) Over Rolling Periods for Selected Morningstar Categories (U.K.)

Morningstar Category	**Length of Rolling Period** (Years) 1	2	3	4	5	6	7	8	9	10
Global Large-Cap Blend Equity	22.2	13.5	11.8	8.3	9.1	8.5	5.0	3.9	3.5	4.1
UK Equity Income	19.4	10.3	11.8	6.7	2.8	0.0	0.0	0.0	0.0	0.0
US Large-Cap Growth Equity	24.6	16.5	14.5	14.2	11.3	9.1	8.7	7.9	6.7	6.8
UK Large-Cap Equity	23.2	14.0	13.6	10.0	8.5	2.3	0.8	2.0	2.3	1.1
UK Small-Cap Equity	24.4	15.0	14.1	7.4	2.3	0.0	0.0	1.2	0.8	0.0
GBP Inflation-Linked Bond	13.8	3.1	2.1	1.9	1.7	1.5	0.6	0.3	0.0	0.0
Global Emerging-Markets Equity	38.3	34.2	23.9	23.4	17.5	12.5	11.4	10.7	5.2	5.1
Europe ex-UK Equity	25.3	18.9	10.8	9.6	9.5	0.6	0.0	0.8	1.5	0.0
Japan Large-Cap Equity	40.0	29.9	25.7	25.7	24.8	23.2	24.4	24.1	21.4	24.7
GBP High-Yield Bond	19.6	12.6	6.5	3.7	1.3	0.0	0.0	0.0	0.0	0.0
GBP Government Bond	16.6	5.3	2.6	1.9	1.7	1.5	0.9	0.2	0.0	0.0
GBP Allocation 60-80% Equity	18.9	9.2	8.7	5.9	1.1	0.0	0.0	0.0	0.0	0.0
GBP Allocation 40-60% Equity	23.4	11.7	10.3	1.6	0.3	0.0	0.0	0.0	0.0	0.0
GBP Flexible Allocation	27.8	14.9	11.9	7.0	4.1	0.0	0.0	0.0	0.6	0.0
GBP Diversified Bond	14.0	5.8	3.4	2.0	1.5	1.0	0.2	0.0	0.0	0.0
Global Bond–GBP Hedged	13.0	3.0	1.9	1.3	1.3	1.3	0.0	0.0	0.0	0.0
GBP Allocation 20-40% Equity	17.7	7.7	4.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0
GBP Corporate Bond	16.0	8.6	5.2	3.5	2.3	1.2	0.2	0.0	0.0	0.0
GBP Allocation 0-20% Equity	16.1	9.6	7.0	2.1	0.4	0.0	0.0	0.0	0.0	0.0
GBP Money Market	10.8	8.6	8.3	8.6	6.3	2.1	0.0	0.0	0.0	0.0

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Source: Morningstar Direct and author's calculations. Data as of Dec. 31, 2022. Returns are in British pound sterling. Sample periods analyzed start in January 1990.

Exhibit 10 Frequency of Losses (%) Over Rolling Periods for Selected Asset Classes

		Length of Rolling Period (Years)									
Index	Performance Start Date	1	2	3	4	5	6	7	8	9	10
Bloomberg US Agg Bond	12/31/75	12.1	3.3	1.5	0.4	0.4	0.5	0.0	0.0	0.0	0.0
Bloomberg Global Aggregate	1/31/90	20.8	12.4	8.9	5.2	2.1	2.5	0.6	2.3	1.4	1.8
FTSE Nareit All Equity REITs	12/31/71	21.0	10.3	8.1	8.1	3.9	0.5	0.5	0.0	0.0	0.0
IA Bloomberg US HY Corporate Bonds	1/29/26	22.2	19.8	15.6	11.9	8.1	5.0	3.8	2.3	1.5	1.6
IA SBBI US IT Govt	12/31/25	12.7	3.5	1.2	0.0	0.2	0.2	0.0	0.0	0.0	0.0
IA SBBI US Large Stock Ext	12/31/25	24.4	16.3	15.0	14.1	11.9	8.4	5.0	3.4	4.1	5.7
IA SBBI US LT Govt	12/31/25	24.0	15.2	10.5	8.2	7.0	5.9	4.3	2.8	1.7	0.9
IA SBBI US Small Stock	12/31/25	28.9	18.8	14.7	13.2	10.6	7.0	5.2	4.9	3.6	3.0
LBMA Gold Price PM	4/1/68	45.4	45.1	43.3	41.7	42.9	46.3	46.5	46.4	41.0	37.1
MSCI EAFE GR	12/31/69	31.5	23.4	19.3	17.9	11.5	7.7	2.3	2.1	3.3	0.5
MSCI EM GR	12/31/87	33.7	33.8	25.7	23.3	21.3	17.5	12.8	11.7	7.4	0.3
MSCI World ex USA GR	12/31/69	31.1	23.4	19.1	17.3	10.0	6.8	1.6	1.9	2.4	0.5
S&P GSCI	12/31/69	38.7	39.2	35.5	32.4	33.9	34.6	31.9	33.5	28.5	25.4

< 2 4 10 15 20 >

Morningstar Direct and author's calculations. Data as of Dec. 31, 2022.

Equity exposure is a key consideration for the recommended holding period.

The historical data analysis above is particularly relevant for stocks. Despite their higher growth potential versus bonds or cash, stocks are more likely to suffer negative returns over shorter time periods, making them less suitable for investors with short-term goals. Losses on stocks are not only more frequent, but also greater in magnitude. In addition, stocks usually take longer to recover after a decline. All of these factors increase the likelihood that assets invested in stocks won't be sufficient to reach an investor's desired funding level, especially over shorter time periods.

As shown in the table above, for stocks, nearly one fourth of all rolling one-year periods landed in negative territory. The frequency of losses generally decreases over longer rolling periods, dropping from about 16% over two-year periods to 8.7% over six-year periods.

Interestingly, the frequency of losses decreases after seven years but then increases again after 10 years. This reflects a few periods such as the "Lost Decade" of the 2000s. After the implosion in dot-com stocks that started in early 2000, stocks gradually recovered starting in early 2003 and reached parity with their previous levels by September 2006. That recovery proved short-lived, though, as it was quickly followed by the global financial crisis in late 2007, which pushed stocks down again to the tune of more than 40% over a period of about 16 months. As a result, stock returns were negative over numerous rolling 10-year periods that spanned both bear markets.

Because of the nonzero risk of loss even over longer periods, we consider 10 years a reasonable minimum holding period for equity-focused portfolios. As a result, we assigned a minimum recommended holding period of 10 years to most equity-focused Morningstar categories.

We also used the level of equity exposure as a key consideration for assigning a recommended time horizon to the categories included in Morningstar's Allocation category group, which include a mix of both stocks and bonds. The table below shows how we mapped the time-horizon ranges for selected allocation categories with different levels of equity exposure.

Exhibit 11 Average Equity Exposure and Recommended Time Horizon for Allocation Categories (U.S.)

Morningstar Category	Average Equity Weighting (% of assets)	Recommended Minimum Time Horizon
Allocation—15% to 30% Equity	12.8	2-6 years
Allocation—30% to 50% Equity	32.0	2-6 years
Allocation—50% to 70% Equity	56.2	6-10 years
Allocation—70% to 85% Equity	74.3	>10 years
Allocation—85%+ Equity	89.5	>10 years
Global Allocation	54.0	6-10 years
Tactical Allocation	38.4	6-10 years
Target-Date 2000-2010	34.5	2-6 years
Target-Date 2015	38.9	2-6 years
Target-Date 2020	40.6	2-6 years
Target-Date 2025	44.7	2-6 years
Target-Date 2030	54.4	6-10 years
Target-Date 2035	65.6	>10 years
Target-Date 2040	75.0	>10 years
Target-Date 2045	80.1	>10 years
Target-Date 2050	83.5	>10 years
Target-Date 2055	86.0	>10 years
Target-Date 2060	87.6	>10 years
Target-Date 2065+	85.2	>10 years
Target-Date Retirement	29.0	2-6 years

Source: Morningstar. Data as of Dec. 31, 2022.

Exhibit 12 Average Equity Exposure and Recommended Time Horizon for Allocation Categories (U.K.)

Morningstar Category	Average Equity Weighting (% of assets)	Recommended Minimum Time Horizon
GBP Allocation 0-20% Equity	23.1	2-6 years
GBP Allocation 20-40% Equity	25.3	2-6 years
GBP Allocation 40-60% Equity	43.4	6-10 years
GBP Allocation 60-80% Equity	64.9	6-10 years
GBP Allocation 80%+ Equity	69.0	>10 years
GBP Flexible Allocation	25.5	6-10 years

Source: Morningstar. Data as of Dec. 31, 2022.

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Investors should consider fixed-income duration as a general (but not necessarily precise) guideline for the recommended holding period bond assets.

The principle of duration matching for assets and liabilities is well-established in the institutional investment world. This guideline is especially relevant for pension funds, where investment managers need to ensure they have enough highly liquid assets to meet each year's pension obligations. For an individual, matching up maturity dates between assets and planned spending helps ensure that you'll have access to liquid assets when you need them. If you plan to make a down payment on a house in five years, for example, you might invest in bonds with five-year maturity dates.

In the context of funds, though, the relationship between duration and the recommended holding period is less exact. A fund's overall duration reflects the average duration of the underlying bonds in its portfolio. Unlike an individual bond, though, a fund's duration doesn't decrease over time. Portfolio managers typically buy and sell bonds to maintain a given duration range.

In addition, a fund manager who holds bonds with many different maturity dates will reinvest the proceeds as they mature. That allows for clipping more-generous coupons during periods of rising interest rates, leading to better future returns. As a result, a fund's stated duration doesn't necessarily translate into the length of time it will take to recover after a period of rising interest rates. For example, Morningstar's intermediate core-bond fund category has an average duration of about six years, but returns have nearly always been positive over rolling six-year periods.

We therefore used duration as a general guideline, but also considered the magnitude of losses and historical times to recovery. The table below highlights some of this data for selected bond-fund categories.

Exhibit 13 Average Effective Duration and Recommended Time Horizon for Selected Bond-Fund Categories (U.S.)

Morningstar Category	Average Effective Duration (Years)	Maximum Drawdown (%)	Maximum Time to Recovery (Years)	Recommended Minimum Time Horizon
Intermediate Core Bond	6.1	-17.2	2.0[1]	2–6 years
Intermediate Core-Plus Bond	6.1	-16.7	1.4	2–6 years
Intermediate Government	5.4	-15.2	2.4[2]	2–6 years
Long-Term Bond	12.1	-29.2	1.5	6–10 years
Long-Term Government	17.2	-40.1	2.8	>10 years
Short-Term Bond	2.5	-7.3	1.5	2–6 years
Short-Term Government	2.9	-7.0	2.0	2–6 years
Ultrashort Bond	0.7	-8.7	2.8	1–2 years

Source: Morningstar. Data as of Dec. 31, 2022. Sample periods analyzed start in January 1990.
[1] Maximum time to recovery includes the most recent market downturn, from which the category has yet to recover. Previously, the maximum time to recovery was 1.5 years.
[2] Maximum time to recovery includes the most recent market downturn, from which the category has yet to recover. Previously, the maximum time to recovery was 2.3 years.

Exhibit 14 Average Effective Duration and Recommended Time Horizon for Selected Bond-Fund Categories (U.K.)

Morningstar Category	Average Effective Duration (Years)	Maximum Drawdown (%)	Maximum Time to Recovery (Years)	Recommended Minimum Time Horizon
EAA Fund GBP Government Bond	9.4	-28.9	2.8	6–10 years
EAA Fund GBP High Yield Bond	3.6	-20.7	3.7	6–10 years
EAA Fund GBP Inflation-Linked Bond	14.6	-38.0	2.5	>10 years
EAA Fund Global Corporate Bond	5.4	-12.7	4.8	2–6 years
EAA Fund GBP Flexible Bond	2.23	-11.2	3.3	2–6 years
EAA Fund GBP Diversified Bond	7.5	-23.4	2.8	6–10 years
EAA Fund GBP Corporate Bond	7.7	-25.8	2.8	6–10 years
EAA Fund Global Bond - GBP Hedged	4.3	-13.8	2.0	2–6 years

Source: Morningstar. Data as of Dec. 31, 2022. Returns are in British pound sterling. Sample periods analyzed start in January 1990.
[1] Maximum time to recovery includes the most recent market downturn, from which the category has yet to recover. Previously, the maximum time to recovery was 1.67 years.

Investors should also consider the frequency and magnitude of losses, including the risk of "fat tail" events, to determine an appropriate time horizon.

Standard deviation gives investors some idea of what to expect for future returns, assuming that they follow a normal bell-curve distribution. If you know an investment's standard deviation and mean return, you would normally expect returns to fall within a range of one standard deviation above or below the mean about two thirds of the time.

In practice, investment returns end up on the positive or negative end of the curve more often than statistics would predict.[5] (This characteristic is often described as "fat tails.") The coronavirus-driven market downturn in early 2020—when stocks declined more than 20% over a one-month period—is a prime example. To account for the potential impact of extreme events, we assigned longer

5 https://www.morningstar.com/articles/983922/where-risk-models-can-miss-the-mark

recommended holding periods for Morningstar categories that have historically suffered large drawdowns, such as high-yield bond, digital assets, commodities, and derivative income.

Role (Size) in Portfolio

In addition to the time horizon considerations discussed above, investors confront another major question when determining how an investment fits into their portfolios: How large a position it should be as a percentage of the whole? Investors often spend more time thinking about whether a fund is worth buying than they do about how to use it—that is, how much space it should occupy within a portfolio. They then might end up with a large assortment of funds, with each one occupying a different percentage of assets depending on when it was purchased and how well it performed since that date.

Some investors also follow a so-called "naïve diversification"[6] or 1/n strategy, which involves splitting available assets in equal amounts between a given number of available investment options. This approach often shows up in the context of 401(k) plans, where participants typically have access to a preset short list of investment options but may have no idea how to go about splitting up existing assets and new contributions between them.

Neither of these two approaches is ideal. Instead, we believe the size of a position should be based on several different factors, as outlined below.

Note: The discussion below assumes investors have already set up an emergency fund, which can be considered outside of this framework. An emergency fund should be kept in safe, highly liquid assets and should be large enough to cover at least three to six months' worth of basic living expenses. For investors in the accumulation phase, the size of an emergency fund usually doesn't need to change too much in dollar terms after it's set up. As investors continue funneling assets toward other goals—such as retirement savings or college funds for kids—the emergency fund will typically shrink as a percentage of total assets over time. Because the emergency fund is relatively static in dollar terms but not in percentage terms, it exists outside of the position-size framework outlined below.

The Role in Portfolio focuses on the size of long-term positions relative to the total portfolio. We map Role in Portfolio assignments at the category level because a fund's category assignment is based on its underlying holdings, which ultimately determine how it performs. As mentioned in the Introduction section, a fund's Morningstar category typically explains a large portion of a fund's performance, including risk, returns, and time to recovery.

We set up four groups for the Role in Portfolio, as described below.[7] Our approach is more descriptive than prescriptive: We lay out general guidelines for the relative size of a holding but limited our framework to a small number of size groupings. The size of each bucket spans a wide range, which gives investors and financial advisors significant leeway to fine-tune the percentage weighting for a given

6 Benartzi, S., & Thaler, R. H. (2001). "Naive Diversification Strategies in Defined Contribution Saving Plans." *The American Economic Review*, *91*(1), 79-98. http://www.jstor.org/stable/2677899

7 Morningstar's analysts previously assigned a similar set of role descriptions to individual funds, but the framework was less defined.

fund. We also tried to set the thresholds with a view toward how practitioners allocate assets in practice.

Main/Stand-Alone: These funds are broadly diversified across asset classes and would be suitable as either the main holding in a portfolio (consuming 80% to 100% of assets) or as the only holding in a portfolio. The only fund categories that land in this group are diversified by asset class, including most of Morningstar's allocation and target-date categories.

Core: These funds are broadly diversified across a major asset class, such as large-cap stocks or investment-grade bonds. We consider core funds suitable for an allocation as large as 40% to 80% of the total portfolio, meaning that they will carry significant weight in determining how the overall portfolio performs. Investors who want to follow a simplified portfolio approach (such as the three-fund portfolio)[8] will normally want to concentrate on core holdings and use the relative weightings between each core holding as the main lever for managing risk. For example, a younger investor might start out with an 80% weighting in a large-blend fund, with a smaller position in an intermediate core-bond fund. As the investor approaches retirement, he or she will want to reduce equity exposure and increase fixed-income exposure.

Building Block: These funds focus on medium-sized areas of the market, generally one degree removed from a major asset class. For example, we include large-growth and large-value funds in the Building Block group. Some building-block funds also focus on a particular geographic region that is relatively large but not the investor's home market, such as the Europe stock and diversified Pacific/Asia categories for investors based in the United States. As the name implies, investors can use these funds as components to put together diversified portfolios. We consider 15% to 40% an appropriate weighting range for a building-block fund.

Limited: These funds focus on more specialized areas of the market and/or areas that are difficult to use in a portfolio. Our framework recommends allocating no more than 15% of assets to a given fund in this group. Sector funds, country- and region-specific funds, and funds focusing on relatively small asset classes (such as commodities, high-yield bonds, and convertible bonds) are examples of funds that land in this group.

8 https://www.morningstar.com/articles/871546/the-3-fund-portfolio

Exhibit 15 Role in Portfolio Groupings for Selected Morningstar Categories (U.S.)

Stand-Alone (80% to 100%)	Core (40% to 80%)	Building Block (15% to 40%)	Limited (0 to 15%)
Most Allocation Categories	Large Blend	Large Growth	Diversified Emerging Markets
All Target-Date Categories	Foreign Large Blend	Large Value	Small Blend
	Intermediate Core Bond	Foreign Large Growth	Mid-Cap Growth
	Intermediate Core-Plus Bond	Mid-Cap Blend	Mid-Cap Value
	Short-Term Bond	Inflation-Protected Bond	High-Yield Bond
	Ultrashort Bond	Multisector Bond	All Sector-Fund Categories
	Muni National Intermediate		

Source: Morningstar. Data as of Feb. 28, 2023. Note: Please refer to the Appendix for a complete list of category assignments.

Exhibit 16 Role in Portfolio Groupings for Selected Morningstar Categories (U.K.)

Stand-Alone (80% to 100%)	Core (40% to 80%)	Building Block (15% to 40%)	Limited (0 to 15%)
All Allocation Categories	Global Large-Cap Blend Equity	GBP Corporate Bond	Global Emerging-Markets Equity
All Target-Date Categories	US Large-Cap Blend Equity	GBP Inflation-Linked Bond	UK Small-Cap Equity
	UK Large-Cap Equity	Global Bond - GBP Hedged	GBP High-Yield Bond
	UK Equity Income	Other major equity regions	Style variations of Building Block equity regions
	GBP Diversified Bond	Style variations of Core equity regions	Sector Funds
	GBP Flexible Bond		Commodities and Alternatives

Source: Morningstar. Data as of Feb. 28, 2023. Note: Please refer to the Appendix for a complete list of category assignments.

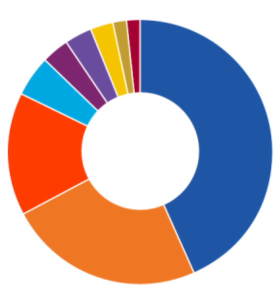
The text below describes the principles behind how we classified different Morningstar categories into each of these four groups in more detail.

Asset class diversification is the primary goal of portfolio construction.
Asset class diversification is the starting point for our framework. At the highest level, there are three major asset classes: stocks, bonds, and cash. These three are fundamentally different from each other. Stocks are the riskiest because they represent ownership in a company's residual assets, with equityholders only getting paid after bondholders and other lenders or claimants. Bonds are inherently less risky because their owners receive periodic interest payments in exchange for lending money to the bond issuer. Bondholders get more of their cash flows up front and have more certainty about receiving a given value at maturity. Bonds also rank higher in the capital structure than stocks, meaning their owners are among the first to be paid in the event of bankruptcy. Cash, meanwhile, is the safest asset because it's a short-term asset that normally carries little credit risk, interest-rate risk, or liquidity risk.

These fundamental differences mean that cash, stocks, and bonds have different performance characteristics and usually don't move in tandem with each other. As a result, most investors will benefit from diversifying their portfolios by asset class. By definition, fund categories that include exposure to more than one asset class provide the best diversification. As a result, we consider multi-asset portfolios—such as allocation and target-date funds—the best stand-alone holdings.

Investors should use the global market portfolio as a reference point for asset allocation.
Just as few active managers have managed to consistently produce better returns than passively managed market indexes, few asset allocators have managed to outperform by making bets on specific asset classes. The global market portfolio is based on the current market value of each asset class and reflects the market's collective wisdom about how much each asset class is worth. It also reflects the amount of liquidity available because markets with a greater number and dollar value of securities traded will account for a larger percentage of the market's total assets.

Exhibit 17 Global Market Portfolio



Provider	USD Billion	% of Total
Equity	77,842	43.5
Government Bonds	42,880	24.0
Investment-Grade Credit	26,716	14.9
Real Estate	8,804	4.9
Private Equity	6,294	3.5
Emerging-Markets Debt	5,944	3.3
Gold	4,622	2.6
Inflation-Linked Bonds	3,433	1.9
High-Yield Bonds	2,477	1.4
Total Global Market Portfolio	**179,012**	**100**

Source: https://www.ssga.com/library-content/pdfs/global/global-market-portfolio-value-of-investable-assets-touch-all-time-high.pdf.
Data as of Dec. 31, 2021.

This doesn't mean that investors should precisely match their allocations to the market portfolio. As mentioned above, adjusting the portfolio's broad asset mix (between stocks, bonds, and cash) is the main way to calibrate risk. But within each asset class, it makes sense to focus on the largest, most-liquid asset types and allocate smaller percentages to smaller, less-liquid asset types. For example, a fixed-income investor will normally want to focus on intermediate core-bond holdings rather than high-yield bond funds. Any deviation from the global market portfolio within each broad asset class should be considered an active asset-allocation bet.

With the global market portfolio as a reference point, we consider the largest asset types within an asset class to be Core holdings, the next largest considered as Building Blocks, and smaller subasset classes considered Limited. For example, we consider large-blend funds Core holdings, large-value and growth funds Building Blocks, and sector-specific funds Limited.

The appropriate role for a given fund category depends on the investor's home country and home currency.
An investor's location is a key consideration for portfolio construction. Investors save and invest to meet goals that they will eventually pay for by using whatever currency applies to their home market. As a result, the majority of an investor's assets should normally be invested in assets from the same home market and home currency where he or she lives.

In practice, this means we assigned category roles based on the home domicile of the intended investor. For example, a category like USD Government Bond plays a much smaller role for a U.K. investor than for one based in the United States, and subsequently would be Limited in the U.K. context, where we see from AUM data and our Morningstar Allocation Categories that investors prefer a mix of GBP and global debt. Home bias is also present in equities. Whilst the U.K. is only a small portfolio of the global market, our data, along with our recent Global Investor Portfolio Study, or GIPS,[9] indicate that U.K. investors hold a material home bias. Research undertaken as part of the GIPS study also shows that U.K. investors are more likely to build portfolios that incorporate major developed regions, such as Europe or Japan, compared with the United States, where investors often allocate their equity positions between U.S. and non-U.S. categories.

Investors should generally limit alternative funds.
Any fund types that involve active trading or active market bets should make up a smaller percentage of the portfolio. For asset classes outside of traditional equities, bonds, cash, and multi-asset portfolios, we took a holistic approach based around the ease of use to an average or novice investor. When used correctly, many of these nontraditional assets (from now on known as alternatives) can be additive to the risk-adjusted return of a portfolio. This was evidenced keenly in 2022 when the traditional 60/40 portfolio suffered significant losses on both legs.

9 https://www.morningstar.com/lp/global-investor-portfolio-study, Pages 17 and 41. Further work undertaken for the study showed the proclivity for U.K. investors to own regional developed funds.

However, the dispersion of returns (discussed in more detail below) within several alternative categories is wide. As a result, when determining category roles, we have taken a conservative approach and categorized them all as Limited. Additionally, many of these strategies, especially those categorized as true liquid alternatives—such as multistrategy, event-driven, and market neutral—come with a degree of complexity beyond what the average investor would be reasonably expected to know, making it difficult for an average investor to choose a fund and size a position in these assets that is not going to suffer prolonged periods of underperformance and shortfall risk. This complexity makes alternative funds difficult to use effectively in a portfolio.

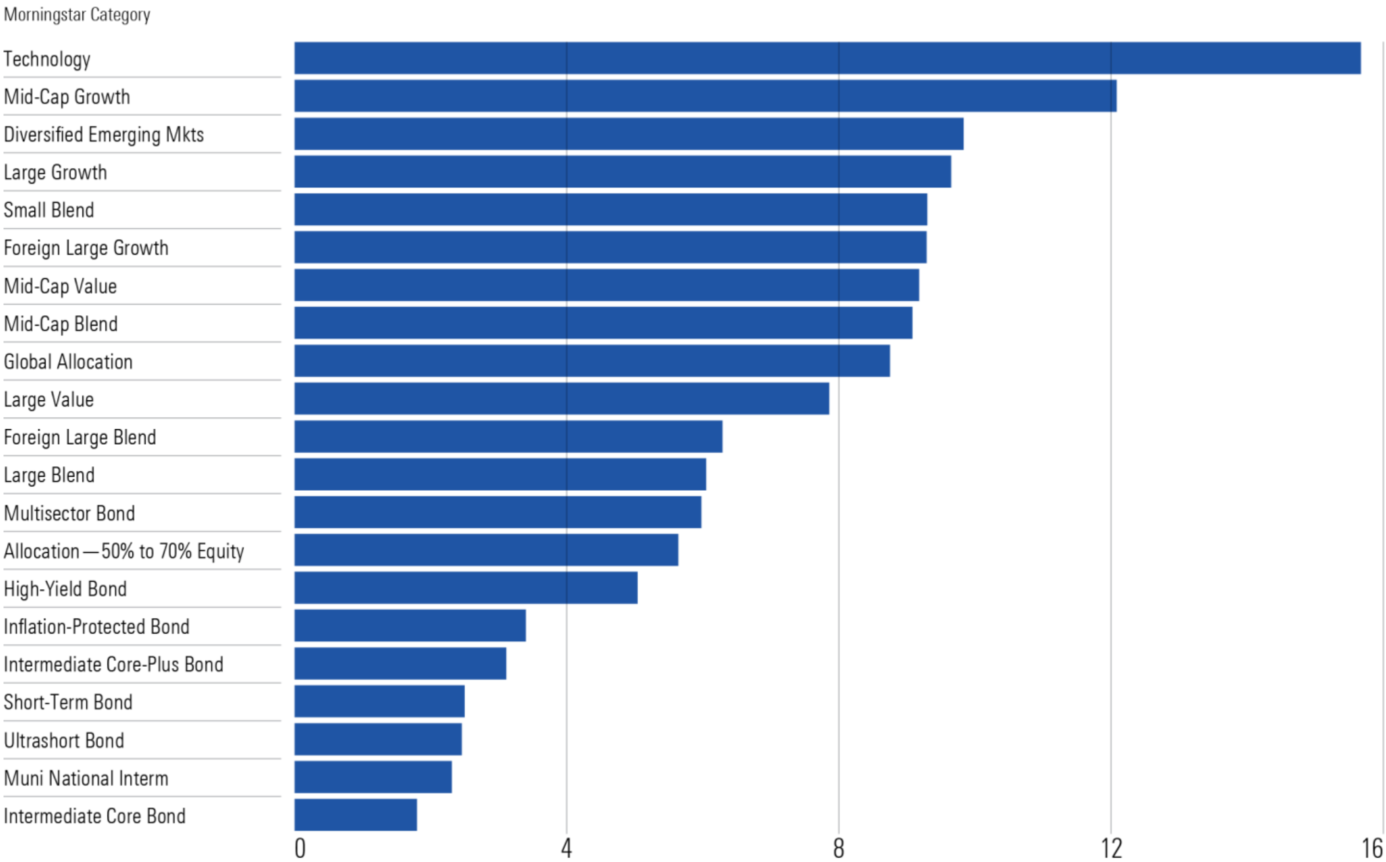
A given category's Role in Portfolio should be aligned with institutional best practices.
We also considered best practices for prudent portfolio construction by reviewing the percentage of assets typically allocated to a given asset class by target-date funds. For example, both REITs and high-yield bond funds typically make up less than 5% of assets for target-date portfolios, although there are some exceptions.

Fund categories with a wide dispersion of returns should make up a smaller percentage of the portfolio's total assets.
Dispersion of returns—the range of annual returns within a given category—is another factor we considered. Fund categories and asset classes with a large dispersion of returns are inherently less predictable and more difficult to use in a portfolio and should therefore make up smaller portions of an investor's portfolio.

Tilting toward larger subasset classes also tends to lead to more predictable returns. While the returns of any subasset class are inherently unpredictable, narrow areas of the market often end up with a wide range of results, as shown in the table below. A wider dispersion of returns is basically a double layer of uncertainty: the returns of the category itself, plus how a given fund performs relative to its category.

To calculate the dispersion of returns, we looked at the range of annual returns within each category over each of the past 10 years, defining annual dispersion as the range between the highest and lowest return within a given year. We then averaged the annual dispersion numbers over the past 10 years.

Exhibit 18 Annual Dispersion of Returns for Selected Morningstar Categories



Source: Morningstar. Data is based on the average dispersion of returns for the 10 calendar years ending in 2022.

As shown in the graph above, the dispersion numbers span a wide range—from a low of 1.8% per year for intermediate core-bond funds to a high of 15.7% for the technology category. We generally assigned categories with the highest dispersion of returns to the Limited role.

A role of "Limited" does not mean the asset class should be avoided entirely.

A role of Limited being assigned to a Morningstar Category is not a recommendation that the asset type should be discounted entirely, rather that it bears a level of risk, difficulty, or complexity too great to warrant a portfolio weighting in the Building Block range (15% to 40%). In fact, many categories in this segment can be useful tools for expressing a view, increasing diversification, or boosting long-term returns for investors happy to take on the additional risk.

Some examples of these would be small-cap, high-yield bonds, and emerging-markets stocks. All of these would be fairly commonplace to see in well-diversified portfolios, but the level of risk they come with demands this be at a lower weight, as not to increase relative risk within a diversified portfolio or increase risk of deep drawdowns beyond an investor's risk tolerance. Another example would be sector funds. These are generally too concentrated for most investors but can be useful tools for expressing a view on market opportunities, increasing/decreasing risk to an equity portfolio, or seeking greater income.

As mentioned above, alternatives often carry a degree of complexity off-putting to many investors, but as we saw in 2022 with stocks and bonds selling off, uncorrelated assets can be an additive bucket to maintain. Overall, we are not saying these asset classes should be ignored, just that the average investor should be careful of the weight they assign to them in their portfolio.

How the Framework Works in Practice
With the principles above as a guideline, we assigned each Morningstar category to one of the four maximum position sizes, or potential roles within a portfolio.

It's worth emphasizing that we think of each range as a maximum, and the appropriate size of an investor's actual allocation can vary over time. As mentioned above, a younger investor might start out with an 80% weighting in a large-blend fund, with a smaller position in an intermediate core-bond fund. As the investor approaches retirement, he or she will want to reduce equity exposure and increase fixed-income exposure.

This size framework also allows for the likelihood that different investors might use the same fund in different ways. For example, a short-term bond fund might be an appropriate Core holding for an investor with a two- to six-year time horizon, but investors with a longer time horizon would probably want to hold smaller positions in this type of fund.

Finally, not every portfolio needs to include allocations to each of the four roles. As mentioned above, investors seeking built-in diversification might only need to own a single fund, such as a target-date fund. Investors who want to build a portfolio from the bottom up will typically carve out larger portions for Core holdings, such as large-blend funds or intermediate core-bond funds, while filling in smaller portions with more specialized offerings.

The grids below show where some of the largest Morningstar categories based on asset size end up within the framework.

Exhibit 19 Role in Portfolio Mappings for Selected Morningstar Categories (U.S.)

Lower <— Risk —> Higher

More <— Diversification —> Less

	1–2 years	2–6 years	6–10 years	>10 years
Standalone	None	► Allocation–15% to 30% Equity ► Allocation–30% to 50% Equity ► Target-Date (2000 – 2025) ► Target-Date Retirement	► Allocation — 50% to 70% Equity ► Global Allocation ► Target-Date 2030	► Allocation–70% to 85% Equity ► Allocation–85%+ Equity ► Target-Date (2035–2065+)
Core	► Ultrashort Bond ► Muni National Short ► Money Market	► Interm. Core Bond ► Interm. Core-Plus Bond ► Interm. Government ► Muni National Interm. ► Short Government ► Short-Term Bond	None	► Foreign Large Blend ► Large Blend ► Global Large-Stock Blend
Building Block	None	► Global Bond-USD Hedged ► Multisector Bond ► Most Muni Single State Categories	► Corporate Bond ► Global Bond ► Inflation-Protected Bond ► Long-Term Bond ► Muni CA, NY, and National ► Long ► Tactical Allocation	► Long Government ► Regional-Stock Categories ► Foreign Large Growth ► Foreign Large Value ► Foreign Small/Mid Blend ► Large Growth ► Large Value ► Mid-Cap Blend
Limited	None	► Equity Market Neutral ► Event Driven ► Macro Trading ► Nontraditional Bond ► Multistrategy ► Relative Value Arbitrage ► Systematic Trend	► Convertibles ► High Yield Bond ► Bank Loan ► Long-Short Equity ► Muni Single State Long ► Preferred Stock	► Commodities ► Derivative Income ► Diversified Emerging Markets ► Leveraged Net Long ► Mid-Cap Growth and Value ► Emerging Markets Bond ► Small Blend, Growth, and Value ► All Sector- and Country-Specific Categories

Source: Morningstar. Data as of Feb. 28, 2023.

Exhibit 20 Role in Portfolio Mappings for Selected Morningstar Categories (U.K.)

Lower <— Risk —> Higher

More <— Diversification —> Less

	1–2 years	2–6 years	6–10 years	>10 years
Standalone	None	► GBP Allocation 0-20% Eq. ► GBP Allocation 20-40% Eq.	► GBP Allocation 40-60% Eq. ► GBP Allocation 60-80% Eq. ► GBP Flexible Allocation	► GBP Allocation 80%+ Equity
Core	► GBP Money Market ► GBP Diversified Bond - Short Term	► Global Flexible Bond ► GBP Flexible Bond	► GBP Government Bond ► GBP Diversified Bond	► Global Large-Cap Blend Equity ► UK Equity Income ► UK Large-Cap Equity ► US Large-Cap Blend Equity
Building Block	None	► Global Bond ► GBP Corporate Bond - Short Term ► Global Corporate Bond	► GBP Corporate Bond ► Global Inflation-Linked Bond	► Europe ex-UK Equity ► Japan Large-Cap Equity ► US Large-Cap Growth Equity ► US Large-Cap Value Equity ► GBP Inflation-Linked Bond
Limited	None	► USD Corporate Bond ► Multistrategy GBP ► USD Government Bond ► Macro Trading GBP	► GBP High Yield Bond ► Convertible Bond - Global	► US Small-Cap Equity ► Sector Funds ► Property - Direct UK ► Global Emerging Markets Equity ► Global Emerging Markets Bond

Source: Morningstar. Data as of Feb. 28, 2023.

There are a few key observations from the tables above. First, there are a few squares that don't include any Morningstar Category assignments, notably the one- to two-year range for categories in both the U.S. and U.K. The majority of mutual funds and ETFs are geared toward long-term investors, so investors targeting short-term holdings may want to use other investment types, such as CDs, bank savings accounts, or Treasury bills, which can be purchased either through Treasury Direct or through many brokerage platforms.

The grid also offers some insight into the relative risk levels and diversification of different Morningstar categories. The level of risk generally increases in boxes further to the right, while diversification decreases in boxes moving lower in the grid. In our framework, however, a disproportionate number of fund categories land in the bottom right-hand square, which we would recommend be used only as a small percentage of assets for investors with a long-term time horizon. Close to one third of fund categories in the United States and more than one fourth of fund categories in the United Kingdom have Limited role designations along with a recommended time horizon of at least 10 years. In other words, a large percentage of fund offerings available have limited utility for investors trying to build diversified portfolios, which probably explains why investors often struggle to use funds effectively.

Finally, the Role in Portfolio framework can be used in conjunction with other practical strategies for allocating assets by time horizon, such as bucket portfolios. The Morningstar bucket portfolios developed by Christine Benz, for example, recommend carving out one to two years' worth of spending (Bucket 1) in ultrasafe assets (generally cash). This generally aligns with the one- to two-year time horizon in the Role in Portfolio framework. The next two columns (two to six years and six to 10 years) can be used for Bucket 2, which contains five or more years' worth of planned spending and is funded mainly with high-quality fixed-income funds. Bucket 3, which is geared toward long-term funding needs and is mainly invested in stocks, aligns with the greater than 10-year time horizon. Most investors building bucket portfolios will probably want to focus on the middle two rows of the framework (Core and Building Block) for the sake of simplicity and to facilitate maintaining the buckets over time.

Conclusion

The Role in Portfolio framework doesn't address all of the issues involved in building diversified portfolios. For example, it doesn't consider the level of correlation between asset classes, which is a key consideration for reducing risk at the portfolio level. It also doesn't account for differences in valuations for key asset classes (that is, whether a given asset class is cheap or expensive relative to longer-term averages), which some investors may want to consider as they determine a target mix of asset classes.

Instead, the Role in Portfolio framework is designed to help beginning investors avoid unforced errors—portfolio mistakes that can have permanent negative consequences. It's also designed to encourage long-term investing and broad portfolio diversification. As the investment world becomes increasingly complex, investors can often improve their outcomes by getting a handful of key decisions right: keeping expenses low, matching the time horizon for their specific goals with appropriate portfolio holdings, and avoiding outsize bets on riskier asset classes. The Role in Portfolio framework aims to simplify investment decision-making and improve investor outcomes.

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Appendix

Exhibit 21 Role in Portfolio Mappings for Morningstar's U.S. Fund Categories

Morningstar Category	Role in Portfolio	Recommended Minimum Time Horizon	Asset Allocation Equity % (Net)	Average Effective Duration (Years)	Time to Recovery (Years)		Maximum Drawndown Since 1990 (%)
					Maximum	Average	
Allocation—15% to 30% Equity	Stand-Alone	2-6 years	12.8	4.0	2.4	0.4	-25.7
Allocation—30% to 50% Equity	Stand-Alone	2-6 years	32.0	5.2	2.5	0.5	-25.4
Allocation—50% to 70% Equity	Stand-Alone	6-10 years	56.2	5.3	4.3	0.4	-37.9
Allocation—70% to 85% Equity	Stand-Alone	>10 years	74.3	5.6	5.2	0.5	-45.2
Allocation—85%+ Equity	Stand-Alone	>10 years	89.5	6.3	5.3	0.5	-51.1
Bank Loan	Limited	6-10 years	0.9	0.2	2.8	0.5	-31.8
China Region	Limited	>10 years	98.8	—	10.2	1.8	-63.3
Commodities Broad Basket	Limited	>10 years	1.1	0.1	14.5	1.9	-68.9
Commodities Focused	Limited	>10 years	3.4	0.2	11.7	2.2	-55.0
Communications	Limited	>10 years	99.0	—	20.4	1.1	-80.2
Consumer Cyclical	Limited	>10 years	99.5	—	5.0	0.5	-56.0
Consumer Defensive	Limited	>10 years	99.7	0.0	2.8	0.4	-37.5
Convertibles	Limited	6-10 years	5.1	2.6	3.4	0.5	-39.9
Corporate Bond	Building Block	6-10 years	0.0	6.9	1.7	0.4	-19.5
Derivative Income	Limited	>10 years	95.6	—	13.7	1.1	-69.6
Digital Assets	Limited	>10 years	20.9	—	3.2	1.0	-87.0
Diversified Emerging Mkts	Limited	>10 years	97.9	1.0	10.3	1.7	-63.3
Diversified Pacific/Asia	Building Block	>10 years	98.3	—	7.5	1.5	-57.7
Emerging Markets Bond	Limited	>10 years	0.1	5.2	4.1	0.7	-42.0
Emerging-Markets Local-Currency Bond	Limited	>10 years	0.0	4.7	9.7	1.1	-29.8
Energy Limited Partnership	Limited	>10 years	99.3	—	8.3	1.1	-68.5
Equity Energy	Limited	>10 years	99.0		14.5	1.3	-78.4
Equity Market Neutral	Limited	2-6 years	59.2	1.0	3.9	0.6	-6.6
Equity Precious Metals	Limited	>10 years	96.0	—	11.7	2.0	-74.8
Europe Stock	Building Block	>10 years	99.0	—	9.6	1.0	-61.5
Event Driven	Limited	2-6 years	53.5	3.8	3.3	0.5	-22.9
Financial	Limited	>10 years	98.5	—	8.0	0.7	-66.6
Foreign Large Blend	Core	>10 years	97.4	1.1	9.8	1.2	-57.5
Foreign Large Growth	Building Block	>10 years	96.9	—	7.5	1.2	-57.9
Foreign Large Value	Building Block	>10 years	98.0	1.0	9.9	1.1	-56.8
Foreign Small/Mid Blend	Building Block	>10 years	98.0	3.2	5.9	0.9	-56.5
Foreign Small/Mid Growth	Limited	>10 years	96.6	—	5.9	1.1	-60.4
Foreign Small/Mid Value	Limited	>10 years	99.0	—	6.2	1.0	-60.4
Global Allocation	Stand-Alone	6-10 years	54.0	3.8	5.3	0.6	-39.8
Global Bond	Building Block	6-10 years	0.1	5.7	2.0	0.5	-21.8
Global Bond-USD Hedged	Building Block	2-6 years	0.0	6.9	2.0	0.4	-15.4
Global Large-Stock Blend	Core	>10 years	94.6	11.3	5.5	0.6	-52.9
Global Large-Stock Growth	Building Block	>10 years	96.8	2.8	6.0	0.6	-53.3
Global Large-Stock Value	Building Block	>10 years	97.1	—	5.4	0.6	-50.6

Source: Morningstar Direct and author's calculations. Data as of Dec. 31, 2022. Sample periods analyzed start in 1990.

Exhibit 21 Role in Portfolio Mappings for Morningstar's U.S. Fund Categories (Continued)

					Time to Recovery (Years)		
Morningstar Category	Role in Portfolio	Recommended Minimum Time Horizon	Asset Allocation Equity % (Net)	Average Effective Duration (Years)	Maximum	Average	Maximum Drawdown Since 1990 (%)
Global Real Estate	Limited	>10 years	88.9	—	7.7	1.0	-66.2
Global Small/Mid Stock	Building Block	>10 years	96.5	—	5.4	0.8	-56.9
Health	Limited	>10 years	98.2	—	5.3	0.7	-38.9
High Yield Bond	Limited	6-10 years	0.7	3.4	3.2	0.6	-32.5
High Yield Muni	Limited	6-10 years	0.7	7.8	3.3	0.5	-28.8
India Equity	Limited	>10 years	98.9	—	9.3	1.7	-69.8
Industrials	Limited	>10 years	99.3	—	3.3	0.6	-57.4
Inflation-Protected Bond	Building Block	6-10 years	0.1	5.6	6.5	0.6	-13.8
Infrastructure	Limited	>10 years	96.3	—	5.5	0.6	-48.9
Intermediate Core Bond	Core	2-6 years	0.1	6.0	2.0	0.5	-17.2
Intermediate Core-Plus Bond	Core	2-6 years	0.0	6.1	1.4	0.4	-16.7
Intermediate Government	Core	2-6 years	0.0	5.4	2.4	0.4	-15.2
Japan Stock	Limited	>10 years	99.4	—	21.0	5.4	-68.1
Large Blend	Core	>10 years	97.6	1.2	6.4	0.5	-50.8
Large Growth	Building Block	>10 years	97.5	—	13.1	0.6	-58.5
Large Value	Building Block	>10 years	97.2	1.6	5.8	0.5	-53.3
Latin America Stock	Limited	>10 years	97.7	—	14.6	2.1	-69.4
Leveraged Net Long	Limited	>10 years	97.7	—	n/a	n/a	n/a
Long Government	Building Block	>10 years	0.0	17.2	2.8	0.7	-40.1
Long-Short Equity	Limited	6-10 years	60.3	1.0	5.8	0.6	-22.9
Long-Term Bond	Building Block	6-10 years	0.2	12.1	1.5	0.5	-29.2
Macro Trading	Limited	2-6 years	22.9	3.2	4.3	0.5	-29.6
Mid-Cap Blend	Building Block	>10 years	97.9	0.3	3.8	0.5	-52.7
Mid-Cap Growth	Limited	>10 years	97.0	—	7.2	0.6	-56.2
Mid-Cap Value	Limited	>10 years	97.2	—	3.9	0.5	-53.5
Miscellaneous Region	Limited	>10 years	98.3	5.9	n/a	n/a	n/a
Miscellaneous Sector	Limited	>10 years	88.2	—	n/a	n/a	n/a
Money Market - Non-40 Act	Core	1-2 years	0.0	—	n/a	n/a	n/a
Money Market - Taxable	Core	1-2 years	0.0	0.1	n/a	n/a	n/a
Money Market - Tax-Free	Core	1-2 years	0.0	—	n/a	n/a	n/a
Multisector Bond	Building Block	2-6 years	1.3	4.0	1.4	0.5	-19.0
Multistrategy	Limited	2-6 years	21.6	2.9	3.6	0.5	-26.8
Muni California Intermediate	Core	2-6 years	0.0	4.7	1.4	0.4	-10.9
Muni California Long	Building Block	6-10 years	0.0	6.3	1.7	0.4	-16.3
Muni Massachusetts	Building Block	2-6 years	0.0	4.8	2.6	0.5	-14.2
Muni Minnesota	Building Block	2-6 years	0.0	6.7	1.5	0.4	-13.1
Muni National Interm	Core	2-6 years	0.1	4.9	1.5	0.4	-12.3
Muni National Long	Building Block	6-10 years	0.1	7.0	1.6	0.5	-17.0
Muni National Short	Core	1-2 years	0.2	2.1	1.4	0.3	-4.6

Source: Morningstar Direct and author's calculations. Data as of Dec. 31, 2022. Sample periods analyzed start in 1990.

Exhibit 21 Role in Portfolio Mappings for Morningstar's U.S. Fund Categories (Continued)

Morningstar Category	Role in Portfolio	Recommended Minimum Time Horizon	Asset Allocation Equity % (Net)	Average Effective Duration (Years)	**Time to Recovery** (Years) Maximum	Average	Maximum Drawndown Since 1990 (%)
Muni New Jersey	Building Block	2-6 years	0.0	3.6	1.8	0.4	-14.1
Muni New York Intermediate	Core	2-6 years	0.0	4.7	1.7	0.4	-12.2
Muni New York Long	Building Block	6-10 years	0.0	—	1.8	0.5	-17.2
Muni Ohio	Building Block	2-6 years	0.7	—	2.5	0.5	-13.6
Muni Pennsylvania	Building Block	2-6 years	0.8	4.3	1.7	0.4	-14.4
Muni Single State Interm	Building Block	2-6 years	0.0	4.7	2.3	0.4	-11.8
Muni Single State Long	Limited	6-10 years	0.1	7.9	2.3	0.5	-14.9
Muni Single State Short	Building Block	2-6 years	0.0	2.5	1.4	0.4	-6.5
Muni Target Maturity	Building Block	n/a	0.0	2.6	1.4	0.4	-8.5
Natural Resources	Limited	>10 years	98.2	—	13.8	1.1	-59.8
Nontraditional Bond	Limited	2-6 years	0.6	3.5	2.6	0.6	-16.3
Options Trading	Limited	n/a	109.2	5.9	5.2	0.5	-33.8
Pacific/Asia ex-Japan Stk	Limited	>10 years	98.2	—	9.8	1.7	-63.3
Preferred Stock	Limited	6-10 years	0.7	5.1	2.9	0.5	-47.8
Prime Money Market	Building Block	1-2 years	0.0	0.0	n/a	n/a	n/a
Real Estate	Limited	>10 years	84.0	2.6	6.0	0.6	-68.9
Relative Value Arbitrage	Limited	2-6 years	-6.1	1.9	3.3	0.4	-17.2
Short Government	Core	2-6 years	0.3	2.5	2.0	0.4	-7.0
Short-Term Bond	Core	2-6 years	0.1	2.9	1.5	0.3	-7.3
Single Currency	Limited	n/a	0.0	0.0	n/a	n/a	n/a
Small Blend	Limited	>10 years	97.8	1.5	3.8	0.6	-54.8
Small Growth	Limited	>10 years	96.7	—	6.2	0.7	-54.3
Small Value	Limited	>10 years	97.9	1.1	3.8	0.6	-54.6
Systematic Trend	Limited	2-6 years	1.2	-9.2	13.3	1.9	n/a
Tactical Allocation	Building Block	6-10 years	38.4	5.6	4.2	0.6	-34.1
Target Maturity	Building Block	n/a	0.0	3.8	2.0	0.6	-11.2
Target-Date 2000-2010	Stand-Alone	2-6 years	34.5	—	3.0	0.5	-31.0
Target-Date 2015	Stand-Alone	2-6 years	38.9	5.7	4.3	0.5	-38.5
Target-Date 2020	Stand-Alone	2-6 years	40.6	5.8	4.9	0.5	-40.2
Target-Date 2025	Stand-Alone	2-6 years	44.7	—	5.2	0.5	-46.4
Target-Date 2030	Stand-Alone	6-10 years	54.4	—	5.3	0.6	-47.7
Target-Date 2035	Stand-Alone	>10 years	65.6	—	5.3	0.5	-49.8
Target-Date 2040	Stand-Alone	>10 years	75.0	—	5.4	0.6	-50.6
Target-Date 2045	Stand-Alone	>10 years	80.1	—	5.3	0.5	-51.3
Target-Date 2050	Stand-Alone	>10 years	83.5	—	5.3	0.6	-51.4
Target-Date 2055	Stand-Alone	>10 years	86.0	—	5.3	0.6	-51.6
Target-Date 2060	Stand-Alone	>10 years	87.6	—	1.3	0.4	-25.0
Target-Date 2065+	Stand-Alone	>10 years	85.2	—	1.0	0.4	-25.2
Target-Date Retirement	Stand-Alone	2-6 years	29.0	—	2.9	0.4	-24.9

Source: Morningstar Direct and author's calculations. Data as of Dec. 31, 2022. Sample periods analyzed start in 1990.

Exhibit 21 Role in Portfolio Mappings for Morningstar's U.S. Fund Categories (Continued)

Morningstar Category	Role in Portfolio	Recommended Minimum Time Horizon	Asset Allocation Equity % (Net)	Average Effective Duration (Years)	**Time to Recovery** (Years) Maximum	Average	Maximum Drawndown Since 1990 (%)
Technology	Limited	>10 years	97.1	—	17.3	0.7	-82.7
Trading—Inverse Commodities	Limited	n/a	-5.9	—	n/a	n/a	n/a
Trading—Inverse Debt	Limited	n/a	-23.7	—	n/a	n/a	n/a
Trading—Inverse Equity	Limited	n/a	-143.5	0.8	n/a	n/a	n/a
Trading—Leveraged Commodities	Limited	n/a	44.9	—	n/a	n/a	n/a
Trading—Leveraged Debt	Limited	n/a	5.6	—	n/a	n/a	n/a
Trading—Leveraged Equity	Limited	n/a	119.4	—	n/a	n/a	n/a
Trading—Miscellaneous	Limited	n/a	0.6	—	n/a	n/a	n/a
Ultrashort Bond	Core	1-2 years	0.0	0.7	2.8	0.6	-8.7
Utilities	Limited	>10 years	101.5	—	5.3	0.6	-46.0

Source: Morningstar Direct and author's calculations. Data as of Dec. 31, 2022. Sample periods analyzed start in 1990.

Exhibit 22 Role in Portfolio Mappings for Selected Morningstar Categories (U.K)

Morningstar Category	Role in Portfolio	Recommended Minimum Time Horizon	Asset Allocation Equity % (Net)	Average Effective Duration (Years)	**Time to Recovery** (Years) Maximum	Average	Maximum Drawndown Since 1990 (% in GBP)
ASEAN Equity	Limited	>10 years	97.2	—	13.3	1.4	-72.8
Asia Bond	Limited	6-10 years	0.3	4.3	5.3	0.9	-26.5
Asia ex-Japan Equity	Limited	>10 years	93.3	—	12.0	1.0	-63.2
Asia ex-Japan Small/Mid-Cap Equity	Limited	>10 years	99.3	—	6.0	1.0	-59.6
Asia-Pacific Equity	Limited	>10 years	94.8	—	7.2	1.1	-51.5
Asia-Pacific ex-Japan Equity	Limited	>10 years	95.8	—	11.8	1.1	-61.1
Asia-Pacific ex-Japan Equity Income	Limited	>10 years	97.2	—	3.9	0.8	-59.1
Brazil Equity	Limited	>10 years	86.0	—	12.0	1.5	-67.4
BRIC Equity	Limited	>10 years	96.8	—	8.7	1.4	-61.1
Capital Protected	Stand-Alone	n/a	35.8	1.6	0.1	0.1	n/a
China Equity	Limited	>10 years	95.8	—	8.3	1.9	-66.9
China Equity - A Shares	Limited	>10 years	91.4	—	7.1	1.1	-51.6
Commodities - Broad Agriculture	Limited	>10 years	0.0	—	14.8	6.1	-61.5
Commodities - Broad Basket	Limited	>10 years	2.5	—	14.5	6.2	-60.1
Commodities - Energy	Limited	>10 years	0.0	—	14.5	4.5	-93.2
Commodities - Grains	Limited	>10 years	0.0	—	14.5	2.6	-67.5
Commodities - Industrial & Broad Metals	Limited	>10 years	0.0	—	11.1	1.7	-55.9
Commodities - Livestock	Limited	>10 years	0.0	—	16.2	16.2	-53.9
Commodities - Other	Limited	>10 years	14.6	—	0.1	0.1	n/a
Commodities - Precious Metals	Limited	>10 years	0.1	0.8	12.1	1.9	-58.3
Commodities - Softs	Limited	>10 years	0.0	—	11.8	2.3	-59.9
Convertible Bond - Global	Limited	6-10 years	0.7	1.5	4.9	0.7	-17.8
Convertible Bond - Global, GBP Hedged	Limited	6-10 years	3.8	—	2.2	0.7	-27.8
Currency	Limited	n/a	-0.1	0.5	0.1	0.1	n/a
Emerging Europe Equity	Limited	>10 years	36.4	—	13.8	2.0	-64.0
EUR Government Bond	Limited	6-10 years	0.0	6.0	5.4	1.0	-20.6
Europe Equity Income	Building Block	>10 years	96.5	—	6.3	0.9	-47.7
Europe ex-UK Equity	Building Block	>10 years	95.6	—	5.5	0.7	-50.3
Europe ex-UK Small/Mid-Cap Equity	Limited	>10 years	98.4	—	6.0	0.7	-60.3
Europe Flex-Cap Equity	Limited	>10 years	97.0	—	6.0	0.8	-53.7
Europe Large-Cap Blend Equity	Building Block	>10 years	93.9	—	6.3	0.6	-49.9
Europe Large-Cap Growth Equity	Limited	>10 years	96.3	—	6.7	0.6	-52.8
Europe Large-Cap Value Equity	Limited	>10 years	95.0	—	6.0	0.7	-44.6
Europe Mid-Cap Equity	Limited	>10 years	95.8	—	5.8	0.7	-54.2
Europe Small-Cap Equity	Limited	>10 years	95.5	—	6.1	0.8	-62.8
Eurozone Flex-Cap Equity	Limited	>10 years	94.8	—	6.4	0.9	-51.3
Eurozone Large-Cap Equity	Building Block	>10 years	97.5	—	6.5	0.8	-52.4
Eurozone Mid-Cap Equity	Limited	>10 years	93.8	—	5.3	0.8	-47.9
Eurozone Small-Cap Equity	Limited	>10 years	94.5	—	7.2	0.9	-66.2
Event Driven	Limited	>10 years	77.2	—	0.1	0.1	n/a

Source: Morningstar Direct and author's calculations. Data as of Dec. 31, 2022. Sample periods analyzed start in 1990.

Exhibit 22 Role in Portfolio Mappings for Selected Morningstar Categories (U.K.) (Continued)

Morningstar Category	Role in Portfolio	Recommended Minimum Time Horizon	Asset Allocation Equity % (Net)	Average Effective Duration (Years)	Time to Recovery (Years) Maximum	Time to Recovery (Years) Average	Maximum Drawndown Since 1990 (% in GBP)
Fixed Term Bond	Limited	n/a	0.1	1.4	0.1	0.1	n/a
GBP Allocation 0-20% Equity	Stand-Alone	2-6 years	23.1	—	3.1	0.5	-21.0
GBP Allocation 20-40% Equity	Stand-Alone	2-6 years	25.3	—	2.9	0.5	-19.9
GBP Allocation 40-60% Equity	Stand-Alone	6-10 years	43.4	—	3.7	0.6	-26.3
GBP Allocation 60-80% Equity	Stand-Alone	6-10 years	64.9	—	4.8	0.5	-31.6
GBP Allocation 80%+ Equity	Stand-Alone	>10 years	69.0	—	5.1	0.5	-32.5
GBP Corporate Bond	Building Block	6-10 years	0.1	7.7	2.8	0.4	-25.8
GBP Corporate Bond - Short Term	Building Block	2-6 years	0.1	2.5	2.5	0.5	-10.9
GBP Diversified Bond	Core	6-10 years	1.1	7.5	2.8	0.5	-23.4
GBP Diversified Bond - Short Term	Core	1-2 years	0.0	0.7	2.0	0.4	-5.2
GBP Flexible Allocation	Stand-Alone	6-10 years	25.5	—	5.1	0.7	-38.4
GBP Flexible Bond	Core	2-6 years	1.3	—	2.3	0.4	-16.3
GBP Government Bond	Core	6-10 years	0.0	9.4	2.8	0.5	-28.9
GBP High Yield Bond	Limited	6-10 years	0.2	3.6	3.7	0.5	-20.6
GBP Inflation-Linked Bond	Building Block	>10 years	0.0	14.6	2.5	0.4	-38.0
GBP Money Market	Core	1-2 years	0.1	0.4	4.3	2.0	-1.6
GBP Money Market - Short Term	Core	1-2 years	0.0	0.1	2.3	1.2	-0.2
Global Bond	Building Block	2-6 years	0.0	5.0	3.0	0.6	-13.6
Global Bond - GBP Biased	Building Block	2-6 years	0.0	1.8	3.3	0.5	-22.4
Global Bond - GBP Hedged	Building Block	2-6 years	0.0	4.3	2.0	0.4	-13.8
Global Bond - USD Biased	Limited	2-6 years	0.0	2.7	3.3	0.8	-13.0
Global Corporate Bond	Building Block	2-6 years	0.0	5.4	4.8	0.8	-12.7
Global Corporate Bond - GBP Hedged	Building Block	2-6 years	0.0	4.4	2.3	0.5	-18.6
Global Emerging Markets Bond	Limited	>10 years	0.0	5.6	3.6	0.7	-27.9
Global Emg Mrkts Bond - Local Currency	Limited	>10 years	-0.1	4.7	3.7	0.6	-28.6
Global Emerging Markets Corporate Bond	Limited	>10 years	0.1	4.3	2.4	0.7	-12.6
Global Emerging Markets Equity	Limited	>10 years	95.6	—	6.1	1.4	-50.6
Global Emg Mrkts Small/Mid-Cap Equity	Limited	>10 years	96.2	—	5.0	1.1	-50.5
Global Equity Income	Core	>10 years	94.9	—	4.8	0.5	-34.1
Global Flex-Cap Equity	Building Block	>10 years	94.7	—	5.3	0.7	-46.1
Global Flexible Bond	Core	2-6 years	0.1	—	3.3	0.6	-11.2
Global Flexible Bond - GBP Hedged	Core	2-6 years	0.6	—	2.1	0.4	-17.8
Global Frontier Markets Equity	Limited	>10 years	92.8	—	7.8	1.4	-55.8
Global High Yield Bond	Limited	6-10 years	0.1	3.7	2.1	0.6	-21.1
Global High Yield Bond - GBP Hedged	Limited	6-10 years	-0.1	3.7	1.3	0.5	-28.6
Global Inflation-Linked Bond	Building Block	6-10 years	0.2	8.6	3.3	0.8	-11.8
Global Inflation-Linked Bond - GBP Hedged	Building Block	6-10 years	0.0	10.1	2.7	0.6	-13.8
Global Large-Cap Blend Equity	Core	>10 years	122.3	—	10.6	0.6	-50.4
Global Large-Cap Growth Equity	Building Block	>10 years	96.8	—	12.8	0.6	-55.1
Global Large-Cap Value Equity	Building Block	>10 years	90.1	—	5.1	0.6	-37.7

Source: Morningstar Direct and author's calculations. Data as of Dec. 31, 2022. Sample periods analyzed start in 1990.

Exhibit 22 Role in Portfolio Mappings for Selected Morningstar Categories (U.K.) (Continued)

Morningstar Category	Role in Portfolio	Recommended Minimum Time Horizon	Asset Allocation Equity % (Net)	Average Effective Duration (Years)	**Time to Recovery** (Years) Maximum	Average	Maximum Drawndown Since 1990 (% in GBP)
Global Small/Mid-Cap Equity	Building Block	>10 years	97.8	—	4.9	0.6	-42.8
Greater China Equity	Limited	>10 years	97.3	—	5.3	1.2	-61.0
Guaranteed Funds	Stand-Alone	n/a	19.4	1.3	0.1	0.1	n/a
India Equity	Limited	>10 years	93.7	—	5.3	1.0	-62.2
Infrastructure Direct	Limited	>10 years	0.0	—	0.1	0.1	n/a
Japan Flex-Cap Equity	Limited	>10 years	98.6	—	13.3	1.1	-62.2
Japan Large-Cap Equity	Building Block	>10 years	96.4	—	16.8	1.3	-60.2
Japan Small/Mid-Cap Equity	Limited	>10 years	95.6	—	14.9	1.0	-61.8
Korea Equity	Limited	>10 years	87.4	—	16.3	1.9	-81.4
Latin America Equity	Limited	>10 years	92.4	—	12.0	1.3	-52.4
Long/Short Equity - Global	Limited	>10 years	25.7	—	3.3	0.5	-18.7
Long/Short Equity - UK	Limited	>10 years	15.4	—	0.1	0.1	n/a
Long/Short Equity - US	Limited	>10 years	132.6	—	0.1	0.1	n/a
Macro Trading GBP	Limited	2-6 years	11.7	—	3.1	0.6	-5.7
Multistrategy GBP	Limited	2-6 years	10.7	—	9.6	1.6	-23.2
Options Trading	Limited	n/a	7.1	0.2	0.1	0.1	n/a
Other	Limited	n/a	39.2	0.5	0.1	0.1	n/a
Other Bond	Limited	n/a	0.4	3.2	0.1	0.1	n/a
Pacific ex-Japan Equity	Limited	>10 years	98.6	—	7.9	0.8	-51.5
Property - Direct UK	Limited	>10 years	9.6	—	7.9	0.9	-30.5
Property - Indirect Europe	Limited	>10 years	89.9	—	7.8	0.9	-55.7
Property - Indirect Eurozone	Limited	>10 years	97.4	—	4.3	0.8	-45.2
Property - Indirect Global	Limited	>10 years	93.4	1.0	5.7	0.9	-53.3
Property - Indirect North America	Limited	>10 years	94.9	0.1	5.0	0.7	-59.9
Relative Value Arbitrage	Limited	2-6 years	52.1	4.5	0.1	0.1	n/a
Russia Equity	Limited	>10 years	69.3	—	11.1	1.4	-89.1
Sector Equity Agriculture	Limited	>10 years	96.8	—	2.4	0.6	-45.6
Sector Equity Alternative Energy	Limited	>10 years	96.1	—	12.4	1.8	-68.4
Sector Equity Biotechnology	Limited	>10 years	95.2	—	12.5	1.2	-64.0
Sector Equity Communications	Limited	>10 years	88.1	—	21.2	1.5	-78.3
Sector Equity Consumer Goods & Services	Limited	>10 years	91.3	—	4.7	0.6	-29.0
Sector Equity Ecology	Limited	>10 years	95.9	—	7.2	0.8	-54.4
Sector Equity Energy	Limited	>10 years	91.4	—	11.2	0.9	-56.5
Sector Equity Financial Services	Limited	>10 years	89.8	—	9.3	0.8	-58.6
Sector Equity Healthcare	Limited	>10 years	95.0	—	10.4	0.6	-42.4
Sector Equity Industrial Materials	Limited	>10 years	82.7	—	9.3	0.9	-45.6
Sector Equity Infrastructure	Limited	>10 years	90.7	—	6.8	0.9	-56.3
Sector Equity Natural Resources	Limited	>10 years	96.0	—	11.0	1.2	-59.1
Sector Equity Precious Metals	Limited	>10 years	94.0	—	12.0	2.4	-74.7
Sector Equity Private Equity	Limited	>10 years	36.4	—	6.5	0.7	-50.8

Source: Morningstar Direct and author's calculations. Data as of Dec. 31, 2022. Sample periods analyzed start in 1990.

Exhibit 22 Role in Portfolio Mappings for Selected Morningstar Categories (U.K.) (Continued)

Morningstar Category	Role in Portfolio	Recommended Minimum Time Horizon	Asset Allocation Equity % (Net)	Average Effective Duration (Years)	Time to Recovery (Years) Maximum	Time to Recovery (Years) Average	Maximum Drawndown Since 1990 (% in GBP)
Sector Equity Technology	Limited	>10 years	95.3	—	17.7	0.8	-82.3
Sector Equity Utilities	Limited	>10 years	97.5	—	6.7	0.9	-37.5
Sector Equity Water	Limited	>10 years	97.4	—	4.1	0.5	-40.0
Systematic Trend USD	Limited	2-6 years	1.5	-2.2	5.8	0.9	-38.0
Target Date 2016 - 2020	Stand-Alone	2-6 years	27.5	0.8	4.9	0.8	-35.5
Target Date 2021 - 2025	Stand-Alone	2-6 years	30.2	0.5	5.6	0.7	-39.9
Target Date 2026 - 2030	Stand-Alone	6-10 years	58.2	—	5.3	0.7	-43.1
Target Date 2031 - 2035	Stand-Alone	6-10 years	67.4	1.6	5.8	0.6	-44.7
Target Date 2036 - 2040	Stand-Alone	>10 years	81.3	1.7	12.5	0.9	-58.1
Target Date 2041 - 2045	Stand-Alone	>10 years	91.7	3.5	10.6	0.8	-55.5
Target Date 2046+	Stand-Alone	>10 years	95.4	6.4	10.5	0.9	-55.5
Trading - Leveraged/Inverse Commodities	Limited	n/a	0.1	—	0.1	0.1	n/a
Trading - Leveraged/Inverse Equity	Limited	n/a	18.9	—	0.1	0.1	n/a
Trading - Leveraged/Inverse Fixed Income	Limited	n/a	0.0	3.0	0.1	0.1	n/a
Trading - Leveraged/Inverse Other	Limited	n/a	3.1	0.8	0.1	0.1	n/a
UK Equity Income	Core	>10 years	95.3	—	5.2	0.6	-40.6
UK Flex-Cap Equity	Building Block	>10 years	96.6	—	4.3	0.7	-45.1
UK Large-Cap Equity	Core	>10 years	95.2	—	5.3	0.7	-42.5
UK Mid-Cap Equity	Building Block	>10 years	92.7	—	4.3	0.7	-43.8
UK Small-Cap Equity	Limited	>10 years	94.9	—	5.8	0.8	-50.9
US Equity Income	Core	>10 years	98.2	—	12.6	0.7	-60.7
US Flex-Cap Equity	Building Block	>10 years	96.6	—	10.3	0.8	-48.6
US Large-Cap Blend Equity	Core	>10 years	88.2	—	12.8	0.6	-51.1
US Large-Cap Growth Equity	Building Block	>10 years	94.5	—	13.5	0.7	-56.1
US Large-Cap Value Equity	Building Block	>10 years	97.2	—	6.8	0.6	-38.5
US Mid-Cap Equity	Building Block	>10 years	97.1	—	7.1	0.8	-46.9
US Small-Cap Equity	Limited	>10 years	96.0	—	5.6	0.7	-45.5
USD Corporate Bond	Limited	2-6 years	1.7	3.9	2.8	0.7	-11.8
USD Diversified Bond	Limited	2-6 years	0.1	3.9	6.7	0.8	-15.0
USD Government Bond	Limited	2-6 years	0.0	2.5	6.6	0.9	-15.9
USD High Yield Bond	Limited	6-10 years	0.3	3.3	2.5	0.6	-15.9
Venture Capital	Limited	>10 years	51.8	—	0.1	0.1	n/a

Source: Morningstar Direct and author's calculations. Data as of Dec. 31, 2022. Sample periods analyzed start in 1990.

About Morningstar Portfolio and Planning Research

Morningstar Portfolio and Planning Research provides independent, fundamental analysis on topics like portfolio construction, retirement planning, personal finance, and investment strategy. The analysis seeks to frame the critical choices that investors face in designing and implementing a financial plan and offers practical solutions covering areas like setting goals, allocating assets, selecting investments, and withdrawing retirement income. The research takes various forms, including articles on Morningstar's flagship research platforms as well as in-depth studies of topics that are particularly relevant to investors seeking to build cohesive portfolios or achieve other financial goals like retirement security.

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