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BEYOND ACTIVE AND PASSIVE INVESTING
THE CUSTOMIZATION OF FINANCE

MARC R. REINGANUM
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CFA Institute Research Foundation

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CFA Institute Research Foundation

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BIOS

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Within the industry, Reinganum served as senior managing director at SSGA, managing active equity teams across seven cities on four continents to implement global and regional strategies. He directly managed SSGA's Dynamic Small Cap Fund, which achieved the #1 rank in its Morningstar category over his five years at the helm. Prior to joining SSGA, he was co-head of the Main Street Team at OppenheimerFunds, serving as a senior portfolio manager and director of quantitative research. Reinganum earned an AB with high honors from Oberlin College and an MBA and PhD from the University of Chicago.

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1. INTRODUCTION

The adoption of passive investing in the past half-century has had a vast impact on the investment management landscape. Assets under management (AUM) in index funds represent a simple and transparent measure of the ascendancy of passive investing. In 1989, index funds worldwide contained only $11 billion in assets. In contrast, at the end of 2021, the AUM of index funds worldwide had exploded to $17.3 trillion, more than a 1,500-fold increase from their 1989 levels according to Morningstar data.

The case for passive investing was made well before the first index fund existed. We date 1960 as the year in which the passive versus active debate began. In January of that year, publishing in the *Financial Analysts Journal*, Renshaw and Feldstein proposed a new investment institution: an "unmanaged investment company," which was a company tasked with creating portfolio returns that followed a representative market index, such as the Dow Jones Industrial Average (DJIA). Later in 1960, John B. Armstrong, the pen name for none other than John C. Bogle, retorted that experienced, professional management was a key advantage that mutual funds offered the average investor. Debates about passive versus active approaches have persisted since then. It is not without irony we note that approximately 15 years later, Bogle would go on to found Vanguard, the world's largest index fund company—index funds being the prototype of what Renshaw and Feldstein (1960) refer to as unmanaged investments.

The purposes of this monograph are twofold. First, we document the evolution of passive and active investing approaches using Morningstar worldwide mutual fund and exchange-traded fund (ETF) data from 1989 through 2021, revealing some surprising features that may change some perceptions about the embrace of passive approaches. Second, and perhaps of greater interest to a wider audience of readers, we offer a view on the future of active and passive investing that diverges in substantial ways from the experiences of the past three decades.

The growth in the AUM of passive index funds is indisputable. By the end of 2021, index funds in all asset classes had captured 32% of worldwide fund AUM, although this percentage is not the same across all domiciles or all asset classes. For funds domiciled outside of the United States, this percentage drops to about 20%. On a worldwide basis, the largest asset class by AUM is equities, which in 2021 accounted for 55% of the $54 trillion in all fund AUM. Fixed income comes in as a distant second with 24% of the total.

The adoption of index funds varies across regions and categories. Within US-domiciled equity funds, the AUM of index funds overtook the AUM of active equity funds in 2021 ($10.2 trillion versus $9.4 trillion, respectively), driven in large part by index funds classified as US Large-Cap Blend—that is, large-cap funds showing no growth or value bias. Within growth and value categories, however, active equity is still very much preferred. On a worldwide basis, the dominant category for equity indexing is US Large-Cap Blend, which contained $5.5 trillion in AUM at the end of 2021. The next largest worldwide category was Global Large Cap with $1.9 trillion.

For European-domiciled equity funds, active equity is the revealed preference over index equity in all major equity fund categories but one—US Large-Cap Blend. In all other major categories, the AUM of active equity funds exceeds the AUM of equity index funds, often by a wide margin. In this region, equity index investing had captured only a 31% market share by the end of 2021, a substantially smaller figure than for US-domiciled funds.

Results in the rest of the world (ROW) show a pattern very different to those observed in the United States and Europe. Japan, not the United States, was the country that led the world in the broad acceptance of index funds in the late 1980s and early 1990s. Japan-domiciled funds in that period were focused on Japanese equities; these index funds dominated index funds in all other domiciles in both an absolute sense (total index AUM) and a relative sense (index AUM to active AUM). Although Japan is no longer the index AUM leader, it is by far the market with the most aggressive use of index funds for domestic (in this case, Japanese) equities. Indeed, by the end of 2021, for Japanese equity funds domiciled in Japan, the AUM of index funds was nearly 10 times greater than the AUM of active funds. The broad acceptance of index funds clearly depends on the region of the world and the category of the fund.

The years between 1999 and 2009 were an era of innovation and experimentation in equity index products, not only in terms of AUM but also in terms of the number of different categories of product. Yet, by 2015, investors and firms seemed to be concentrating on a narrow set of equity index products. Indeed, the market share penetration of so-called smart beta or strategic beta equity index products flatlined after 2016; cap-weighted index products continue to substantially dominate the equity index landscape.

Index funds are not nearly as prevalent in fixed income as in equities, neither in dollar terms nor as a proportion of fixed income funds. At the end of 2021, fixed income index funds on a worldwide basis had AUM of $3 trillion, representing about 23% of all fixed income fund AUM. Active funds dominate in fixed income and are likely to continue to do so for some time, particularly given the nature of the underlying assets and the market structure of trading. Fixed income factor strategies that extend beyond just duration and credit quality, however, offer a pathway to a broader adoption of fixed income indexing as they are less constrained in how they access desired exposures than traditional broad market fixed income index funds. It remains to be seen, however, if investors will be any more willing to embrace such approaches in the fixed income space than they have been in equites.

Looking forward, asset management will continue to evolve from offering portfolio products to offering portfolio services that develop low-cost, highly customized portfolios along the lines we describe in Chapter 5—what we refer to as hyper-managed solutions. The biggest challenge and threat to current pooled fund structures comes from the rise of direct or personalized indexing in conjunction with separately managed accounts enabled by technological advances that continue to expand capabilities while reducing costs. Over time, we anticipate that assets currently in pooled fund structures will begin to transition to these hyper-managed accounts. Targeted and specialized active equity funds and fixed income index funds will likely be less susceptible to this shift.

Asset owners will seek providers who not only can handle the traditional challenges of asset allocation but also can simultaneously manage the portfolio construction issues associated with a widely expanded number of unbundled securities within each asset class. Organizations that can provide and implement total portfolio solutions in hyper-managed separate accounts will command a premium in pricing, reflecting the added value generated by the total solution. The winning asset management firms will create smart, prudent, sensible, and proprietary investment processes and decision support systems that facilitate client engagement and the construction of highly customized portfolios.

In the future, active and passive investing will continue to coexist—but, to a greater extent, within hyper-managed separate accounts. In such accounts, assets will be implemented in an unbundled way, rather than through funds, to maximize net economic benefits to the investor and allow for the consideration of unique individual client preferences and objectives. In contrast to Renshaw and Feldstein (1960), we suggest that the unmanaged investment company will give way to the hyper-managed investment company going forward. Put another way, pooled investment vehicles will be subsumed by customized, hyper-managed, active investment solutions.

The remainder of this monograph is organized as follows. In Chapter 2, we begin by framing the active and passive investing debate. In Chapter 3, we present a high-level overview of our empirical research to explain the current state of active and passive investing on a worldwide basis. Chapter 4 presents the full, detailed analysis of the evolution of active and passive funds from 1989–2021 that informed our thinking. In Chapter 5, we offer our views on the future of active and passive investing and the emergence of what we term hyper-managed portfolios. In Chapter 6, we close with a summary of our prognostications and conclusions.

2. FRAMING THE ACTIVE VERSUS PASSIVE DEBATE

Many, if not most, investors may consider the active versus passive investing debate as having been resolved largely in favor of the passive perspective. The multi-decade tidal wave of asset flows in favor of passive investments seems to support this notion. Yet, our assessment of the data and the history of the debate lead to a more nuanced interpretation of how active and passive investing have evolved as well as where they may be headed—pointing to a different path forward. Our view is that we are moving beyond this simplistic, binary view to a more holistic conception of active and passive investing, one that has significant implications for asset managers. Before we describe these implications, we need to first understand the beginnings of the debate.

Early History of Asset Management

In the first half of the twentieth century, investment strategies were not viewed through the lenses of active and passive. Passive investing had not yet been imagined or formulated, not even in a theoretical sense. Instead, investment debates centered around ways to identify securities or firms that offered good future prospects. In 1934, Graham and Dodd famously argued that future prospects are best derived by estimating "intrinsic value," a metric based on a deep dive into factual, measurable data such as earnings and assets. Graham and Dodd contrasted their "fundamental analysis" approach with opinion-based approaches that others advocated at the time. Regardless of the approach taken, they all focused on ways to measure the attractiveness of individual firms or securities.[1] Investing, as a practice, was singularly focused on selecting the most attractive individual assets.

The Birth of Modern Portfolio Theory

In 1952, a 24-year-old graduate student named Harry Markowitz published an article titled "Portfolio Selection" in the *Journal of Finance*. This article, and subsequent related work by Markowitz and others, would completely disrupt the foundations of investment theory and practice. It would also lead to Markowitz being awarded the Nobel Prize in Economics in 1990.

Markowitz argued that investors should not singularly focus on returns but also on risk. He then introduced a framework for constructing efficient portfolios—that is, portfolios that maximize expected return for a given level of risk (and, simultaneously, minimize risk for a given level of expected return). Markowitz created a framework for constructing portfolios that allowed investors to choose how much risk they were willing to bear in the pursuit of return. Because building efficient portfolios involves estimating the correlations among assets as well as each asset's expected return and risk, Markowitz's insights shifted the focus of investing from security analysis to portfolio analysis—an insight that would play a key role in the evolution of both active and passive investing.

Markowitz would provide a more complete exposition of his portfolio construction ideas in his 1959 book titled *Portfolio Selection: Efficient Diversification of Investments*. A general

[1]There was also technical analysis, which had quite a large following if it is defined broadly.

implementation of his portfolio selection methods, however, was still more than a decade away. Markowitz understood that the data required to produce useful covariance matrices for a large number of securities did not exist and that access to computing power was highly limited. To address this challenge, he suggested the development of a model of covariance based on a single-index or one-factor linear model.

2.1. The Capital Asset Pricing Model Emerges

In 1960, the terms "active" and "passive" had yet to be conceived, much less had they become part of the asset management lexicon. In that year, however, another young graduate student named Bill Sharpe would visit Markowitz to discuss ideas for his doctoral thesis. In 1963, Sharpe published a paper titled "A Simplified Model for Portfolio Analysis," which was based on the work he had done for his doctoral thesis in which he introduced a one-factor model of covariance. The following year, he would publish another article titled "Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk." This article presented the capital asset pricing model (CAPM) and introduced the concept of the "market" (cap-weighted) portfolio, contrasted the kinds of risk that should be rewarded by higher return with those that should not, and eventually provided the theoretical foundations for both active and passive investing.

The models developed by Treynor (1962), Sharpe (1964), Lintner (1965), and Mossin (1966) greatly simplified and built on Markowitz's general "efficient portfolio" approach and yielded intuitive results. These new models offered tantalizing hypotheses. For example, in the CAPM, all investors would own the same portfolio of risky assets—the "market portfolio." The market portfolio is defined as a portfolio of all individual risky assets in the market, each weighted by the proportion of the total market the asset represents (i.e., its market capitalization). The risky portion of every investor's portfolio is invested in the market portfolio. The only difference across investors is in the proportion of their wealth invested in a risk-free asset such as US Treasury bills ("cash").

In its most basic form, the weights of the securities in the market portfolio are just one of an infinite number of possible sets of portfolio weights that investors could assign to individual risky assets. From an arithmetic point of view, the market portfolio set of weights should be easy to calculate in principle—one need only observe the market capitalizations of each of the risky assets in the economy. This feature makes the market portfolio an attractive naive benchmark. It does not prove, however, that the market portfolio is the optimal portfolio for every investor in the real world, where investors have heterogeneous expectations (Idzorek and Kaplan 2024). Optimality in perfect capital markets depends on a simple reward-to-risk ratio that is often referred to as the "Sharpe ratio."

$$\text{Sharpe ratio} = \frac{\left\{E(\tilde{R}_p) - R_f\right\}}{\sigma_{\tilde{R}_p}}, \tag{1}$$

where

$E(\tilde{R}_p)$ = the expected return on an investor's risky portfolio p

R_f = the risk-free interest rate

$\sigma_{\tilde{R}_p}$ = the standard deviation of returns for risky portfolio p

The Sharpe ratio is the expected return of an investor's portfolio in excess of the risk-free rate and scaled by the risk of that portfolio as measured by its standard deviation of return. Within Sharpe's CAPM framework, higher Sharpe ratios are always preferred to lower ones—they provide a better portfolio risk–return trade-off. Indeed, investors want the highest possible Sharpe ratio they can attain. Within the Sharpe CAPM, the capitalization-weighted market portfolio is the one and only portfolio that maximizes the value of the Sharpe ratio for every investor. Thus, within the CAPM, the market portfolio assumes a colossal role as both a naively calculable benchmark and the optimal portfolio for all investors. Of course, this elegant theoretical result is a function of a number of assumptions, some of which are realistic while others are less so. Still, it is a good first approximation and point of departure for further research.

In addition to the optimality of the market portfolio for all investors, the Sharpe CAPM also postulates the risk–return relationships among individual risky assets. The expected returns of individual risky assets within the market portfolio of risky assets can be expressed in a simple, linear form:

$$E(\tilde{R}_i) = R_f + \beta_i[E(\tilde{R}_M) - R_f], \tag{2}$$

where

$E(\tilde{R}_i)$ = expected return on risky asset i

β_i = the systematic (beta) risk of risky asset $i = \dfrac{covariance(\tilde{R}_i, \tilde{R}_M)}{variance(\tilde{R}_M)}$

Equation 2 shows that the expected return on a security is equal to the risk-free rate plus the beta of the security multiplied by the expected return of the market portfolio in excess of the risk-free rate. Beta is a measure of the market risk of the security, that part of the security's total risk that is correlated with the risk of the cap-weighted market.

Equation 2 is often called the security market line (SML), the linear relationship between an asset's beta and its expected return. Its simplicity is a manifestation of the mathematics underlying the market portfolio, which is a Markowitz efficient portfolio.

With the benefit of hindsight, the optimality of the market portfolio for all investors as indicated by the CAPM, and the strictly linear relationship between betas and expected returns, would become the intellectual foundations of the passive and active approaches, respectively. But, in the late 1960s and early 1970s, passive and active investment approaches were still not articulated. Much of the academic research focused on determining whether the CAPM, derived with so many simplifying assumptions, was empirically plausible. And most of the empirical research at the time was focused on testing the validity of the SML. By 1973, the academic evidence seemed to be generally consistent with the CAPM (e.g., see Fama and MacBeth 1973).

If the CAPM were literally correct, the asset management industry would need to reinvent itself. For example, the Graham and Dodd traditional stock picking approach would be irrelevant because differences in expected returns would merely reflect differences in betas according to the SML. Even worse, stock picking could potentially lead to more detrimental outcomes by driving investors to hold inefficient (less diversified) portfolios. The only products that investors might request from asset managers in a CAPM world would be (1) a preassembled basket of risky assets with market-cap weights (i.e., the market portfolio); (2) a money market fund; and

(3) guidance on what proportion of their wealth to invest in the risky portfolio and what proportion in the risk-free money market fund (i.e., very simple asset allocation).

The asset management industry did begin to pivot in the early 1970s, almost imperceptibly, to manufacture a preassembled basket of risky assets with market-cap weights. Although offering a market portfolio of all risky assets was out of reach, early efforts were made to mimic the equity weights of the S&P 500 Index, which was designed to reflect the broad performance of the 500 largest companies in the US market. The influence of each company on the index performance was approximately proportional to its stock market capitalization. But the S&P 500 was not an investment product; it was a hypothetical "paper portfolio" intended to provide a measure of the performance of the US equity market. To transform the index into a tangible investment product required implementation expertise.

The S&P 500 could provide the hypothetical investment weights for each of the companies, but asset managers would need to take those weights and attempt to create a real portfolio whose live performance closely matched the performance of the "paper portfolio" index—after implementation and trading costs. The S&P 500 provided the intellectual property of the index weights, and asset managers provided their expertise in trading and managing other engineering challenges associated with implementation.

By the mid-1970s, S&P 500 index products were available to both institutional investors and retail investors. We are not aware, however, of anyone describing these early S&P 500 investment products as "passive." Indeed, the technology, trading, data, and algorithms needed to create these investment products were sophisticated and complex for their time. Later, other index providers and asset managers collaborated to create other broad equity benchmark portfolios, such as ones based on the MSCI World Index or the Russell 3000 Index.

Within the CAPM, there was no room for stock picking or other forms of selective security selection. The only differences in the expected returns were driven by differences in asset betas. Indeed, in an early study of 115 mutual funds over the period from 1945 to 1964, Jensen (1968) reported that, on average, these professionally managed funds failed to exhibit returns in excess of those that would be predicted by their estimated betas. Jensen defined "alpha" as a fund's return in excess of the return predicted by the fund's beta. On average, the mutual funds Jensen studied exhibited no reliable alpha. The stock selection employed by investment professionals managing mutual funds did not seem to improve investment performance on a beta risk-adjusted basis, which was a provocative academic finding.

The view that alpha could not be reliably earned did not last long, even within academic studies. Nonetheless, the SML of the CAPM emerged as the original standard against which claims about alpha were measured. Basu (1977) reported that portfolios of high price-to-earnings ratio stocks ("growth stocks") had underperformed low price-to-earnings ratio stocks ("value stocks") by about 7% per year on a beta risk-adjusted basis over the period he studied. Banz (1981) and Reinganum (1981) identified the "size effect," finding that portfolios of small-market capitalization stocks outperformed portfolios of large-market capitalization stocks after adjusting returns for beta. Other systematic "stock picking" approaches, such as forecasts of unexpected earnings (Latané and Jones 1977) and analyst revisions of earnings (Givoly and Lakonishok 1979), were also documented as violations of the SML. At the end of the 1970s, the debates centered around questions of whether these results reflected informational market inefficiencies or whether they indicated that the CAPM was misspecified as a model of risk and return.

2.2. From Academic Theories to Investment Products

Markowitz's portfolio theory and Sharpe's CAPM advanced both active and passive approaches to investing. The CAPM claim that the capitalization-weighted market portfolio was the only portfolio of risky assets that an investor had to hold clearly developed into passive investing. This "passive" portfolio was optimal for all investors, and all assets were correctly priced because of the equilibrium nature of the model. The active approach exploited insights from the SML of the CAPM. In particular, active strategies attempted to identify individual risky assets that were mispriced relative to the SML or, rather, to assets whose expected returns exceeded the levels implied by their beta risk. The CAPM SML construct served as the arbiter of "true" valuation, and as a result, it was an important metric for quantifying superior returns. Active strategies implicitly assume some state of disequilibrium in prices, perhaps driven by the asymmetry of investor information or other frictions.

As a practical matter, passive investing initially expressed itself in widely diversified index funds. Such index funds were not a major player in the asset management industry even as late as 1990. Today, index funds are central, not ancillary, investment strategies. The relative merits of "active" and "passive" investment approaches continue to be hotly debated. With trillions of dollars of assets under management (AUM) generating hundreds of billions of dollars in fees, the economic stakes of this debate are immense.

The outcomes from this competition continue to fashion both the future of asset management firms and the choices and investment welfare of consumers. From a US-centric perspective, particularly in public equity markets, it might be tempting to conclude that the passive approach has already won the day. In 1989, according to Morningstar data, actively managed funds accounted for more than 93% of the AUM of all US Large-Cap Blend equity funds. But, by the end of 2021, active funds accounted for only 24% of the AUM in this category; the remaining 76% was held in passive index products. These data seem to buttress the popular narrative that passive investing is inexorably supplanting active management. If true, from an evolutionary viewpoint, the question arises as to whether another approach will, in turn, replace the passive approach. What is beyond passive investing?

2.3. The Current State of the Active versus Passive Debate

The current state of the active versus passive debate, however, is more nuanced, complex, and varied than the one playing out in the US Large-Cap Blend category. Overgeneralized inferences about passive investing based on US-centric data can lead to erroneous conclusions. A global view of the data does not support the proposition that passive investing has universally replaced active management. Indeed, our view is that the current concepts of "active" and "passive" will evolve to different constructs, perhaps disappearing entirely. Investors ultimately choose portfolio weights—that is, what proportion of their wealth to allocate to each asset, the critical words being "choose" and "allocate." As long as the real world is not solely inhabited by a representative single investor without any frictions such as taxes, it must be expected that different investors will choose different sets of portfolio allocations. How these choices get implemented will profoundly change the asset management industry.

3. OVERVIEW: EVOLUTION OF ACTIVE AND PASSIVE INVESTING, 1989–2021

To support our view that active and passive investing will evolve to different constructs, it is useful to understand current investor allocations to active and passive approaches. In this chapter, we present a high-level summary of assets under management (AUM) data on active and passive investment funds from 1989–2021. We focus on where allocations stand at the end of 2021 to help us understand how they may continue to change.

3.1. Data and Methodology

We trace the changing landscape of the active versus passive debate through an examination of publicly available funds using data from Morningstar Direct from the beginning of 1989 through the end of 2021. Our analysis focuses on open-end mutual fund and exchange-traded fund (ETF) AUM data across three broad regions: the United States, Europe, and the rest of the world (ROW). **Exhibit 1** presents the countries included in each of the three regions. Money market and closed-end funds were not included as part of the analysis.

Globally, the funds we studied include both retail and institutional open-end mutual funds, which are priced once daily, and ETFs, which are priced regularly throughout the day. The legal structure of funds depends on the listing domicile of the fund. The most prevalent legal structures are open-ended: These include open-ended investment companies (OEICs) in the United Kingdom, FCP (*Fonds commun de placement*) and SICAV (*Société d'investissement à Capital Variable*) in French-speaking countries of Europe, and unit trusts. Within the European Union, funds can also be designated as UCITS (undertakings for collective investment in transferable securities), a regulatory framework that allows funds to be registered and sold in any EU country. The dataset we used includes strategies held within all these structures.

Asset flows and AUM capture different aspects of the fund decision process. Asset flows reveal investors' decisions to switch funds or invest new money in a given type of fund but fail to consider the decision to remain in a particular fund type—which is also an indication of fund preference. Over time, an analysis focusing on AUM not only will reflect the impact of asset flows but also will include the implications of choosing to remain in a fund, along with market appreciation. For the purposes of our analysis, it is not necessary to disentangle these elements but rather to simply show where assets are held within different fund types (active or passive) around the world. Focusing on AUM provides the most direct approach to identifying the types of strategies investors are holding and willing to pay for.

Exhibit 1. Markets within Each Defined Region

United States	Europe	Rest of the World (ROW)
United States	Andorra	Australia
	Austria	Bahamas
	Belgium	Bahrain
	Cyprus	Bermuda
	Czech Republic	Botswana
	Denmark	Brazil
	Estonia	British Virgin Islands
	Finland	Canada
	France	Cayman Islands
	Germany	Chile
	Gibraltar	China, Mainland
	Greece	Colombia
	Guernsey	Hong Kong SAR
	Iceland	India
	Ireland	Indonesia
	Isle of Man	Israel
	Italy	Japan
	Jersey	Kuwait
	Latvia	Lesotho
	Liechtenstein	Malaysia
	Lithuania	Mauritius
	Luxembourg	Mexico
	Malta	Namibia
	Monaco	New Zealand
	Netherlands	Oman
	Norway	Philippines
	Poland	Puerto Rico

(continued)

Exhibit 1. Markets within Each Defined Region *(continued)*

United States	Europe	Rest of the World (ROW)
	Portugal	Qatar
	Russian Federation	Saudi Arabia
	Slovenia	Singapore
	Spain	South Africa
	Sweden	South Korea
	Switzerland	Swaziland
	United Kingdom	Taiwan
		Thailand
		Turkey
		United Arab Emirates
		Vietnam

Sources: Morningstar Direct; Invesco.

Distinguishing fund strategy types can be complicated. What is a passive fund? What appears to be a simple question has been complicated by the advent of factor investing, smart beta, systematic investing, direct indexing, and the indexation of various alternative security groupings. These investing approaches make the distinction much less clear-cut than one might like. Historically, a key distinction between index funds and active funds was that active funds used security selection, based on an analyst's assessment of the investment merits of their individual holdings, to determine security weights. Index funds did not need that information. Instead, they were market-capitalization weighted, for both practical and academic reasons, and were diversified across a broad range of securities. Generally, they were intended to be representative of a broad market index.

As indexes evolved, they started incorporating other information to determine, for example, whether a security should be classified as a value or growth security or to specify sector classifications or other information, such as the location of a company's headquarters. Index funds were no longer representations of a broad market but, rather, specified subsets of broad markets. Some index funds even moved away from market-capitalization weighting to adopt other weighting schemes based on fundamentals or other security characteristics. The dividing line between a broadly diversified, no-information, market-cap-weighted index fund and an information-driven active fund can be a matter of some disagreement. At what point does passive become active? How much information content is used to determine security selection, and how much complexity in weighting is required to distinguish a passive approach from an active one?

For the purposes of this monograph, we have opted to use Morningstar's active versus index categorization framework. Morningstar divides what they call index funds into those that

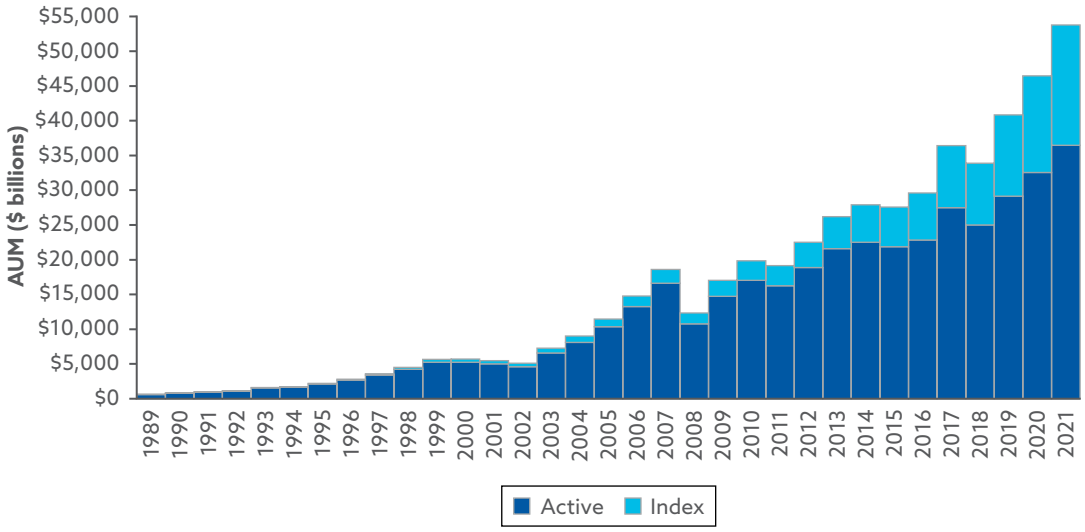
get a "strategic beta" tag and those that do not. Morningstar explains that "the majority of [strategic beta] indexes aim to enhance returns or minimize risk relative to a traditional market-capitalization-weighted benchmark" (Morningstar Research 2018). A strategic beta fund thus differs from a passive cap-weighted index. Some might argue they are semi-active; others might refer to them as active light; and yet others might simply consider them active funds. In any case, this means that some non-cap-weighted, active strategies are classified as index funds, perhaps biasing the AUM in favor of index funds. The extent of this bias depends largely on the reader's point of demarcation between passive and active. In Chapter 4, we provide details on the breakdown between traditional cap-weighted index funds and strategic beta funds.

Using the Morningstar "index" designation as a proxy for passive management, the evolutionary path of the active versus passive choice can be examined. Although a few funds now deemed as passive existed before 1989, the data analysis begins with that year because of the availability of data from Morningstar Direct. Our examination captures trends and patterns for funds domiciled around the globe—not just funds domiciled in the United States. This global perspective is important because perceptions regarding the evolution of the passive and active debate gleaned from US-domiciled fund data alone do not generalize globally and may mask other insights. In this chapter, we highlight the current state (at the end of 2021) of active versus passive funds on a global basis.

3.2. The Ascent of Indexing Worldwide

The inroads index funds have made since 1989 are clear in **Exhibit 2**, where the vertical bars represent worldwide aggregate AUM across all asset classes, separated into active and index funds. At the end of 1989, index funds held only $11 billion of assets, an amount so tiny that

Exhibit 2. Worldwide AUM in Active and Index Funds, All Asset Classes, 1989–2021



Sources: Morningstar Direct; Invesco.

it almost appears to be missing from the graph. In contrast, at the end of 2021, index funds held approximately $17.3 trillion in assets. Index funds experienced more than a 1,500-fold increase in AUM from their 1989 levels. It's no wonder many believe index funds are completely overtaking active funds.

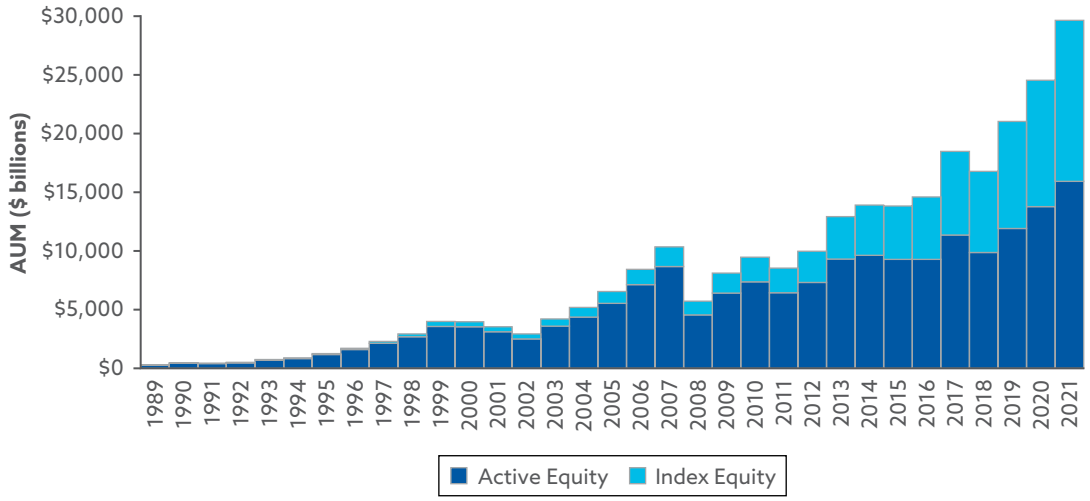
The data in Exhibit 2 also reveal that in terms of AUM, indexing had not overtaken active investing by the end of 2021. Across all global domiciles and asset classes, $36.5 trillion was held in active funds and $17.3 trillion was held in index funds. Even with the growth in indexing, active funds were still more than twice as popular as index funds at the end of 2021.

3.3. Active versus Passive: Equities versus All Other Asset Classes

The data in Exhibit 2 can be refined to reflect AUM in index and active funds within equities on a standalone basis and then, separately, in all other asset classes excluding equities. **Exhibit 3** shows that equity funds contained nearly $30 trillion in AUM in 2021. On a worldwide basis, slightly more than half of this amount was held in active equity funds, but equity index funds did not trail by much.

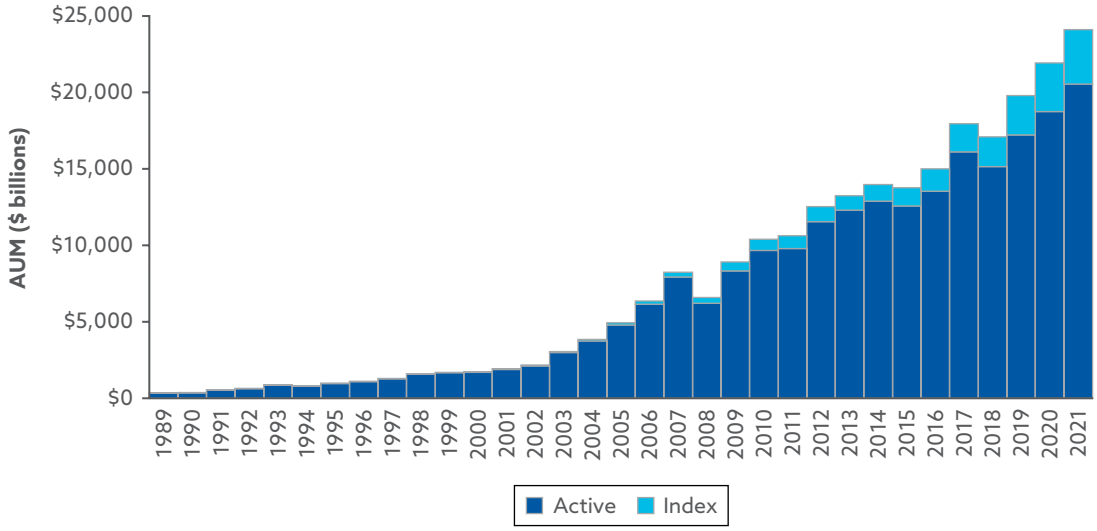
A very different picture emerges from the worldwide AUM data for asset classes that exclude equities (**Exhibit 4**). Globally, all these other asset classes combined contained less than $25 trillion in AUM at the end of 2021—a smaller total amount than equities alone. Furthermore, the split between index funds and active funds is nowhere near the 50/50 split seen in equities. Indeed, on a worldwide basis, active fund AUM was more than four times that of index funds in the non-equity asset classes. Thus, one must be aware of the impact that the equity-only perspective has on arguments and conclusions in the active versus passive debate.

Exhibit 3. Worldwide AUM in Active and Index Funds, Equities, 1989–2021



Sources: Morningstar Direct; Invesco.

Exhibit 4. Worldwide AUM in Active and Index Funds, All Asset Classes Excluding Equities, 1989–2021



Sources: Morningstar Direct; Invesco.

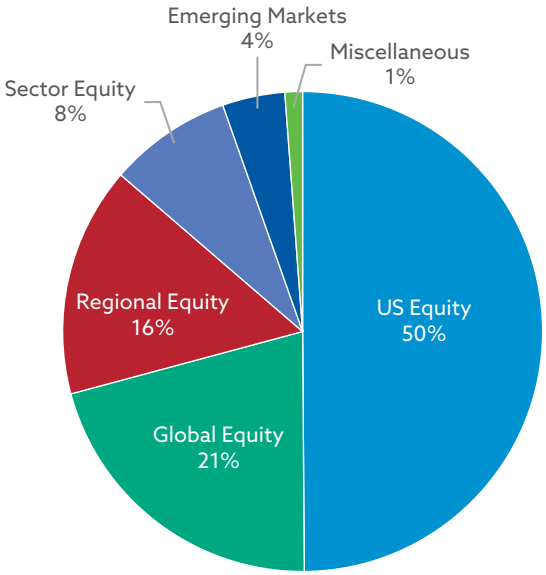
3.4. Active versus Passive within Equities

Given the outsized impact equities have on the passive versus active debate, it makes sense to take a more disaggregated look at equity funds on a worldwide basis. As a first pass, we categorize equity funds into six fund groupings: US Equity, Sector Equity, Regional Equity, Emerging Markets Equity, Global Equity, and Miscellaneous. These groupings are based on Morningstar categories that describe the investment objective of the fund, not the domicile in which the fund is listed. For example, Morgan Stanley sells a US Advantage fund domiciled in Luxembourg, and Invesco sells a QQQ Nasdaq 100 ETF domiciled in Ireland. These funds would both be classified in the US Equity category. Furthermore, a Greater China Equity fund would fall within the regional grouping rather than the Emerging Markets grouping, which is reserved for Morningstar's Global Emerging Markets and European Emerging Markets categories.

In **Exhibit 5**, we break down worldwide equity AUM across the six fund groupings at the end of 2021.[2] Here we see that half of worldwide equity assets were held in US equity funds. The second-largest grouping, at 21% of the total, was global equity. As of 2021, the US portion of the MSCI All Country World Investable Market Index was 58.6%, including the US Equity, the US portion of Global Equity, and the US portion of Sector Equity shown in Exhibit 5 (Ross 2021).

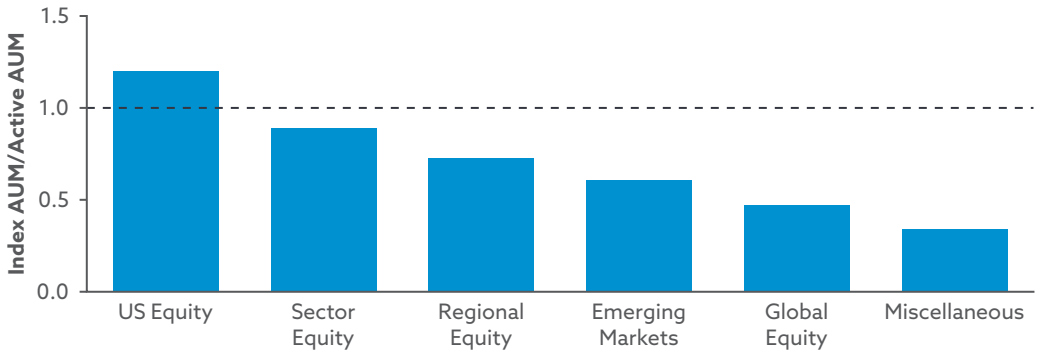
[2]Global Equity includes broad worldwide exposures, such as MSCI EAFA, MSCI World, and MSCI ACWI-type mandates. Regional Equity focuses on specific regions, like Asia and Latin America, and includes developed and emerging market single-country exposures. Emerging Markets Equity includes broad emerging market exposures as delineated by Morningstar.

Exhibit 5. Breakdown of Worldwide Equity AUM across Fund Groupings, 2021



Sources: Morningstar Direct; Invesco.

Exhibit 6. Ratio of Index to Active Worldwide Equity AUM across Fund Groups, 2021



Sources: Morningstar Direct; Invesco.

To gain a sense of the magnitude of index funds relative to active funds within each of these groupings, we divide index fund total AUM by active fund total AUM as of the end of December 2021. A value of 1.0 indicates that index fund and active fund AUM are at parity or 50–50. A ratio greater than 1.0 means that the index fund has surpassed the active fund in terms of AUM. **Exhibit 6** illustrates that index funds had overtaken active funds only for equity funds with a

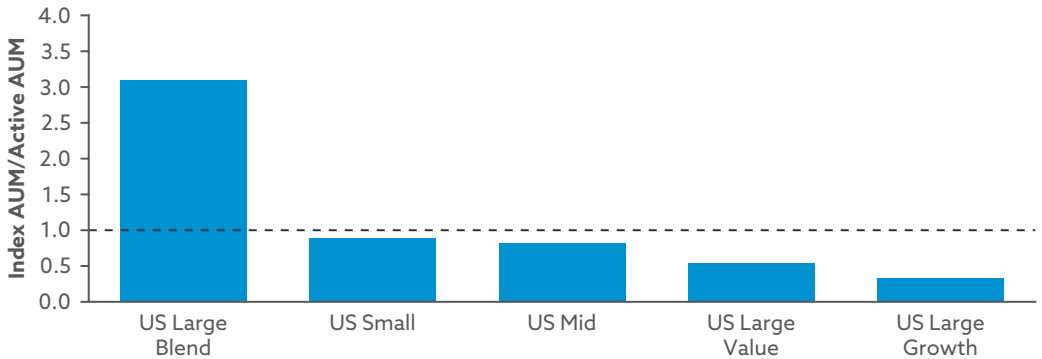
US-centric investment objective. In all other groupings, active funds dominated index funds at the end of 2021. US equity funds are clearly a key driver of the perception that passive investing is overtaking active management.

Of course, the US Equity category is broad and encompasses investment strategies with different objectives. Using Morningstar data, we can decompose US Equity into five general equity categories: US Large-Cap Blend, US Large-Cap Value, US Large-Cap Growth, US Mid Cap, and US Small Cap. The US Large-Cap Blend category represents large-cap core equities with neither a value nor growth bias. The Vanguard 500 Index fund would be an example of an equity fund in the blend category on the passive side, and the American Funds Washington Mutual fund would be an example of a blend fund on the active side.

For US-focused equity funds across all domiciles, the AUM of index funds exceeds the AUM of active funds only in the US Large-Cap Blend category as of 2021. **Exhibit 7** plots the ratio of index AUM to active AUM for five general equity categories within US equity. The popularity of passive index approaches is clearly concentrated in the US Large-Cap Blend category. In this category, index funds had more than three times as much AUM as active funds. This preference for passive is not expressed in all US Large-Cap equity fund categories. Indeed, investors have a distinct and substantial preference for active equity funds in the US Large-Cap Growth category by a margin of nearly three to one over index funds. The perceptions about the success of passive investing approaches seem to be empirically propelled by funds classified as US Large-Cap Blend.

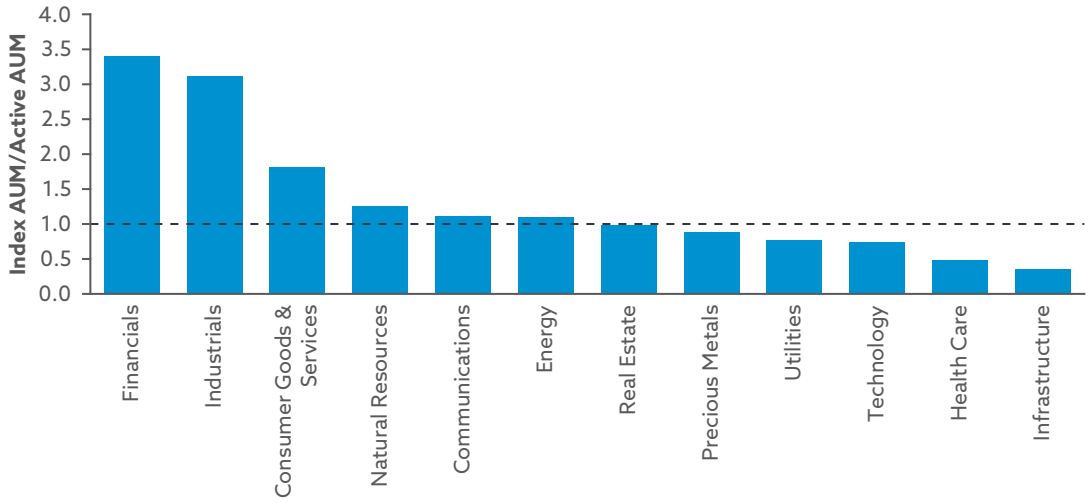
Looking beyond US Equity and into the next two fund groups, Sector Equity (**Exhibit 8**) and Regional Equity (**Exhibit 9**), we can see further evidence of the disparity between active and passive investment approaches across different investment objectives. These differences across exposures may reflect investor preferences, specific investor use cases, salient investment frictions for specific objectives, or any of a number of other reasons. In Exhibit 9, we note that indexing is even more prevalent in Japanese equities than it is in the US Large-Cap Blend Equity category. Overall, it is clear that investor allocations to active versus passive approaches differ quite substantially depending on what asset class or subclass is being analyzed.

Exhibit 7. Ratio of Index to Active Worldwide Equity AUM for US Equity-Focused Funds across Five Major Groups, 2021



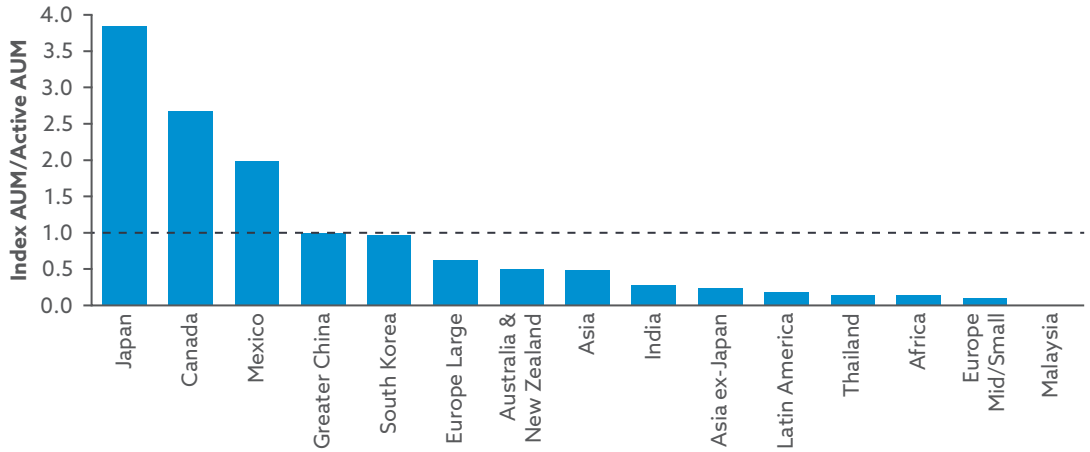
Sources: Morningstar Direct; Invesco.

Exhibit 8. Ratio of Index to Active Worldwide Equity AUM within Sector Funds, 2021



Sources: Morningstar Direct; Invesco.

Exhibit 9. Ratio of Index to Active Worldwide Equity AUM within Regional Funds, 2021



Sources: Morningstar Direct; Invesco.

3.5. The Current State of Active versus Passive Investing

This cursory examination of AUM in active versus index fund strategies across all asset classes, based on data from all domiciles worldwide, yields three important insights.

First, while passive funds have certainly captured notable market share from active funds globally, the data demonstrate that active fund assets under management still far exceed those of passive index funds.

Second, within worldwide equity funds and at a high level of aggregation, passive investing has surpassed active management only among US-centric equity funds.[3] Within US-centric equity funds, the US Large-Cap Blend category is the only category in which investors have demonstrated a clear preference for a passive investment approach. In this segment of the investment universe, passive funds have captured more than three times the AUM of active funds, and this segment accounts for a significant slice of the total AUM for all funds (see Chapter 4 for more detail). In all other broad categories of US-centric equity funds, investors continue to prefer active to passive investing.

Third, the notion that passive investing is overtaking active management is a gross overgeneralization. What is clear from the data is that passive investing has not been adopted uniformly across the investing landscape. Passive investing has made significant advances in some key areas and very little headway in others. We see this across fund groupings, categories, sectors, and regions. A less generalized and more accurate characterization is that passive investing has been overtaking active investing within the US Equity Large-Cap Blend investment objective. At the end of 2021, US Equity Large-Cap Blend index funds made up 67% of all US equity index funds and 40% of all equity index funds worldwide. Perceptions of passive management are clearly closely linked to equity index funds in the US Large-Cap Blend category.

These three insights helped to inform our thinking about the next phases of evolution in active and passive management, which we present in Chapter 5. Our thinking also benefited substantially from our deeper examination of index fund adoption by region and across individual asset classes over the 1989–2021 period, which we share in the following chapter.

[3]We are focused on the six broad groupings presented. Within the Regional Equity grouping (see Exhibit 9), we can clearly see that investors have also expressed a strong preference for passive investing within the Japanese, Canadian, and Mexican equity objectives.

4. DETAILED ANALYSIS: EVOLUTION OF ACTIVE AND PASSIVE INVESTING, 1989–2021

Thus far, we have discussed the current backdrop for the active versus passive debate (Chapter 2) and provided a high-level summary of the current state of active and passive investing around the world (Chapter 3). Those satisfied with the concepts and views already presented may choose to advance to Chapter 5, in which we share our views about the implications of this evolution for the future of asset management. For those who would like to gain a deeper understanding of the context that informed our thinking, we share our detailed analysis of the evolution of active and passive investing in this chapter. This provides a more complete story, which is important to gaining a more nuanced view of the current state of active and passive investing.

4.1. Global Overview: All Asset Classes, All Domiciles

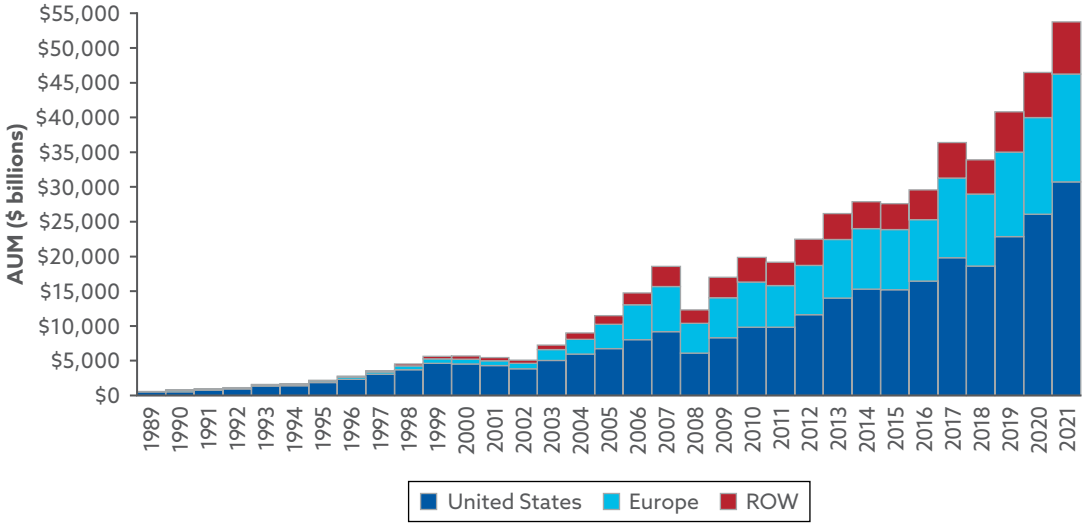
Assets under management (AUM) in all funds across all asset classes and across all domiciles have undergone dramatic changes from 1989 through 2021. At the end of 1989, the AUM of all funds worldwide (excluding money market funds) totaled $612 billion, split very unevenly between active funds (the vast majority) and index funds, as classified by Morningstar. In 1989, AUM were held in traditional open-end funds because exchange-traded funds (ETFs) would not appear until the following decade.[4] **Exhibit 10** presents the growth of total worldwide fund AUM from 1989 through 2021, highlighting the components in three broad geographies: the United States, Europe, and the rest of the world (ROW).

By the end of 2021, the combined AUM of all funds worldwide had grown to nearly $54 trillion, approximately a 90-fold increase from 1989 levels. At this time, ETFs constituted nearly one-half of the AUM of all index funds. In contrast, the AUM for active funds was held almost entirely in traditional open-end structures.

In 1989, more than 85% of the worldwide fund AUM was invested in funds domiciled in the United States (**Exhibit 11**). Until 2000, more than 80% of the assets of the fund industry were in vehicles domiciled in the United States. By 2021, however, that share had declined to about 57%, whereas European-domiciled funds accounted for about 29% and those in ROW domiciles accounted for the remaining 14%. The two largest country domiciles in Europe at the end of 2021 were Luxembourg (about 10%) and Ireland (about 5%); similarly, the top two ROW country domiciles were Brazil (about 3%) and Japan (about 2.5%). By 2021, more than 40% of the worldwide fund AUM was domiciled outside of the United States. Hence, one should exercise care when drawing inferences about the future of active and passive strategies based upon US-domiciled fund data alone.

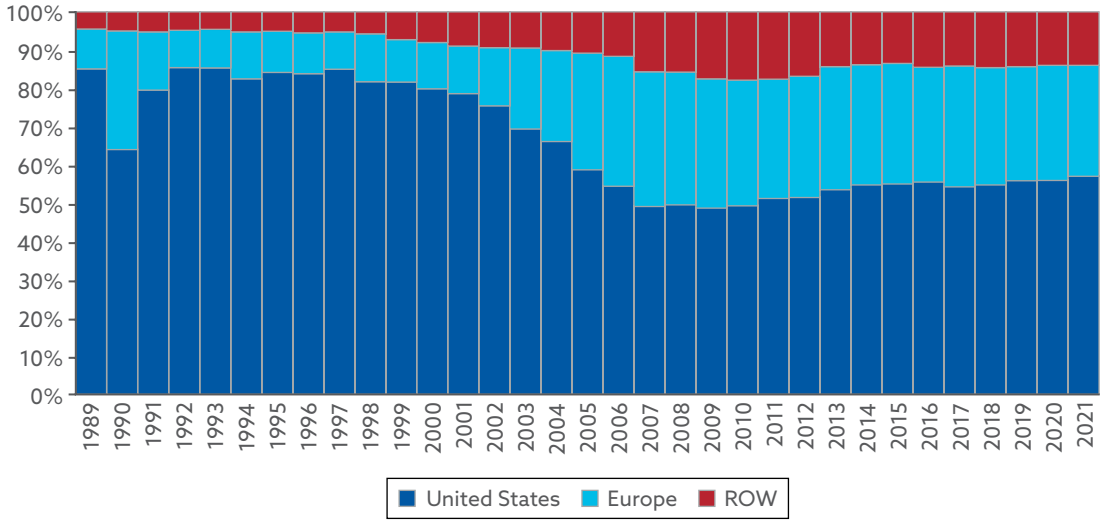
[4]Traditional closed-end funds, unit trusts, and other fund structures that are not open-end existed but were not large enough to matter for this study, and we do not cover them.

Exhibit 10. Total Worldwide Fund AUM by Domicile, 1989–2021



Sources: Morningstar Direct; Invesco.

Exhibit 11. Proportion of Total Worldwide Fund AUM by Fund Domicile, All Asset Classes, 1989–2021



Sources: Morningstar Direct; Invesco.

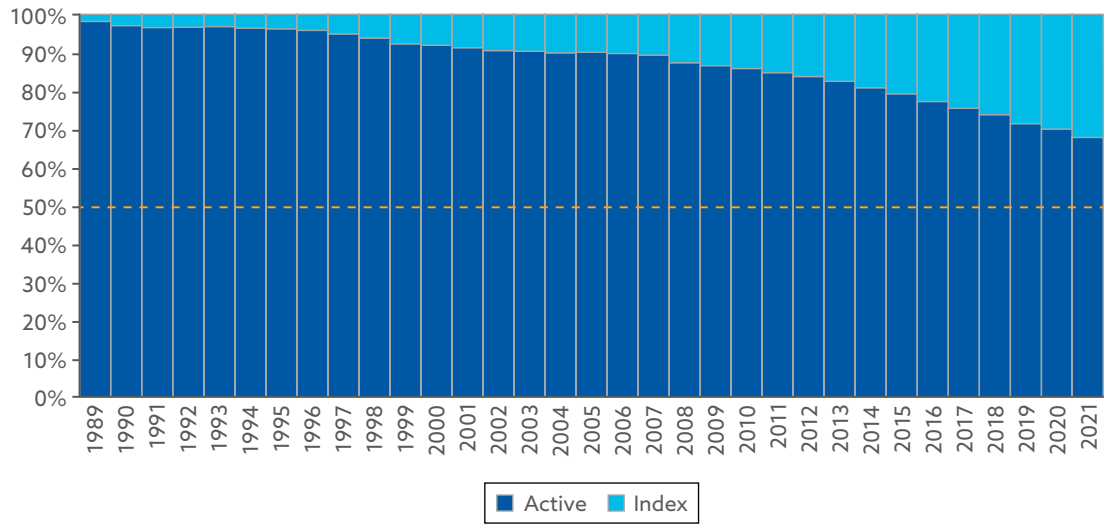
4.1.1. Index versus Active: All Worldwide Funds

The relative market shares of active and index funds based on worldwide fund AUM data (raw data in Exhibit 2) are plotted in **Exhibit 12**. In 1989, index funds constituted less than 2% of AUM. By the end of 2021, index funds had garnered more than 32% of worldwide fund AUM. Although the popularity of index funds has experienced a meteoric ascent, active funds are nowhere near dead. Indeed, at the end of 2021, active funds still accounted for more than 68% of total worldwide fund AUM. Investors have clearly embraced index funds, but this does not mean they have abandoned active investing.

4.1.2. Index versus Active: US-Domiciled Funds

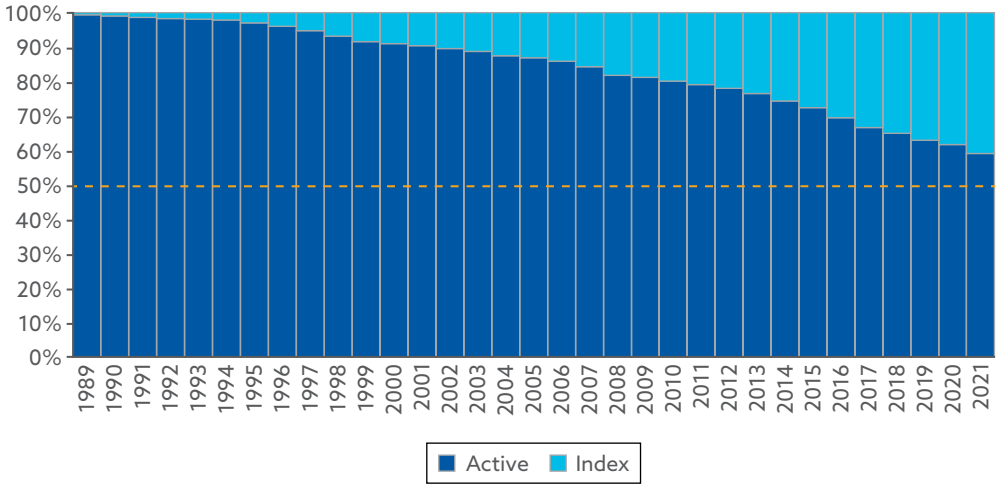
The embrace of index funds has not been uniform across the three broad geographic fund domiciles. **Exhibit 13** isolates the index versus active split for the AUM of funds domiciled in the United States. In 1989, index funds held only slightly more than $3 billion in assets—just a hair over 0.5% of the $522 billion total. Not until 2002 would index fund market share in the United States surpass 10%. At that time, the total US fund AUM was about $3.9 trillion, of which US index funds represented $401 billion. By the end of 2021, index funds accounted for nearly 41% of the AUM for all US-domiciled funds. Index funds held about $12.6 trillion in assets, while active funds held about $18.2 trillion.

Exhibit 12. Proportion of Worldwide AUM for Active and Index Funds, All Asset Classes, 1989–2021



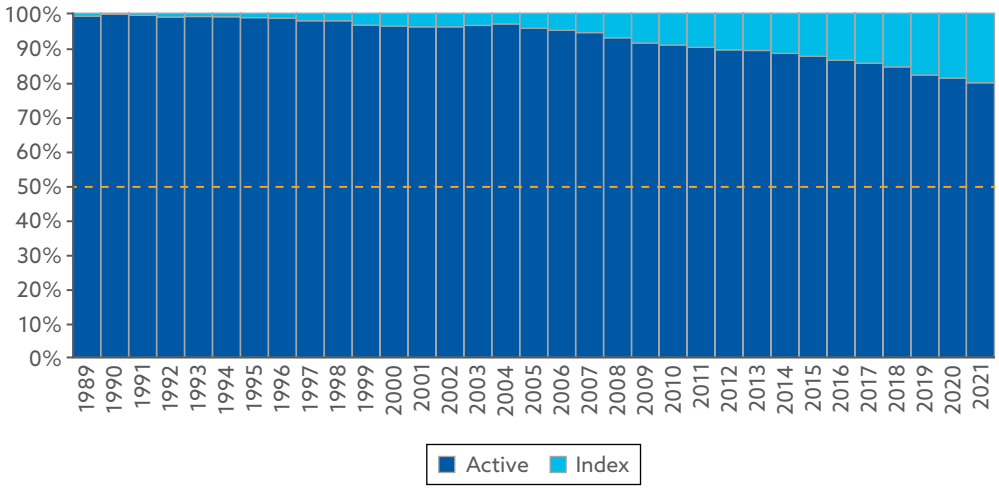
Sources: Morningstar Direct; Invesco.

Exhibit 13. Proportion of US-Domiciled AUM for Active and Index Funds, All Asset Classes, 1989–2021



Sources: Morningstar Direct; Invesco.

Exhibit 14. Proportion of European-Domiciled AUM for Active and Index Funds, All Asset Classes, 1989–2021

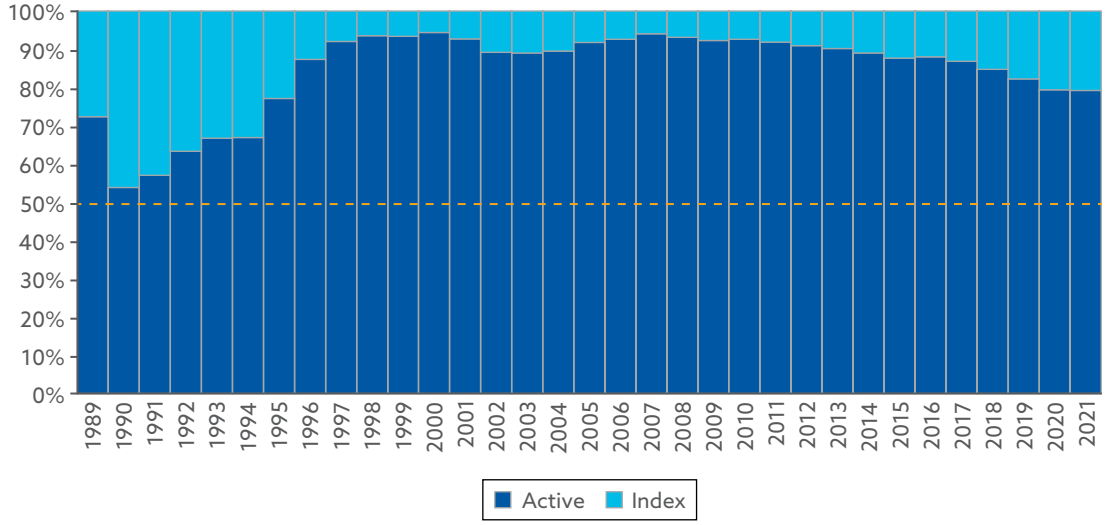


Sources: Morningstar Direct; Invesco.

4.1.3. Index versus Active: European-Domiciled Funds

Index funds domiciled outside the United States have not gained the same level of penetration as those in the United States. In Europe, index funds constituted only about 20% of the total fund AUM at the end of 2021 (**Exhibit 14**). In 2021, European index funds held about $3.1 trillion

Exhibit 15. Proportion of ROW-Domiciled AUM for Active and Index Funds, All Asset Classes, 1989–2021



Sources: Morningstar Direct; Invesco.

in assets, whereas European active funds held about $12.4 trillion. Even though index funds have gained market share in Europe, active fund managers continue to thrive. These data perhaps suggest that preferences for active fund management within Europe remain stronger than in the United States.

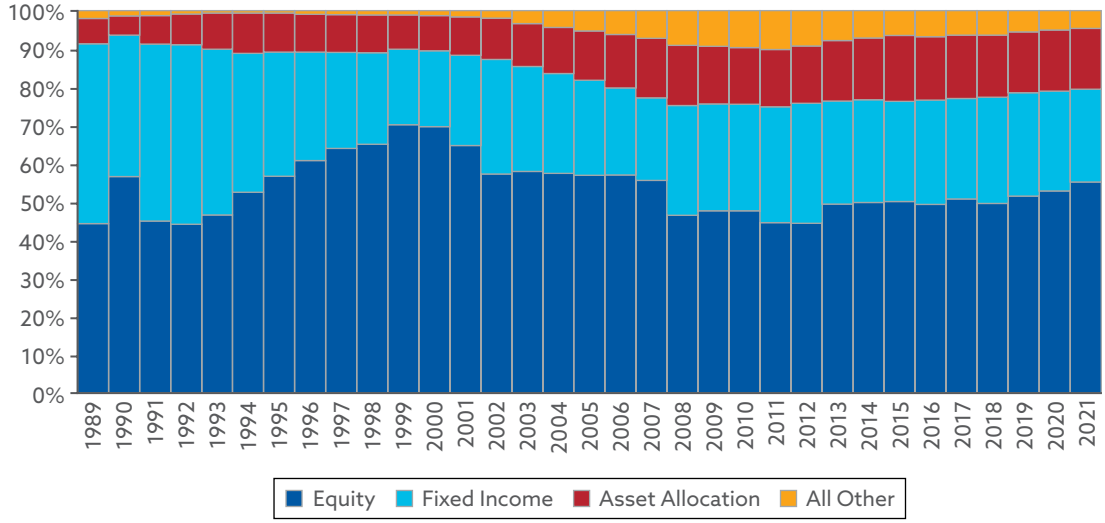
4.1.4. Index versus Active: ROW-Domiciled Funds

In the ROW, index funds constituted about 21% of the total fund AUM at the end of 2021 (**Exhibit 15**), nearly the same penetration as in Europe. In 2021, the index fund AUM in the ROW was $1.56 trillion, whereas active fund AUM stood at $5.95 trillion. The pattern of index versus active investing in the ROW domiciles differs over time from the linear increase in index AUM observed in the United States and Europe. In the late 1980s and early 1990s, index funds were a more prominent component of total AUM in the ROW (primarily Japan) than they were in either the United States or Europe. The data indicate that the earliest and most notable broad acceptance of index funds occurred in the ROW, not in the United States or Europe.

4.2. The Asset Class Perspective

Exhibit 16 plots asset class AUM as a percentage of total worldwide fund AUM from 1989 through 2021. Naturally, the two biggest asset classes are equity and fixed income. At the end of 2021, equity and fixed income amounted to approximately 80% of the total worldwide fund AUM; in US dollar terms, equity funds held $29.7 trillion, whereas fixed income funds held $13.1 trillion. In the early 1990s, these two asset classes accounted for an even greater proportion, approximately 90%, of the total worldwide fund AUM.

Exhibit 16. Proportion of Worldwide Fund AUM by Asset Class, 1989–2021



Sources: Morningstar Direct; Invesco.

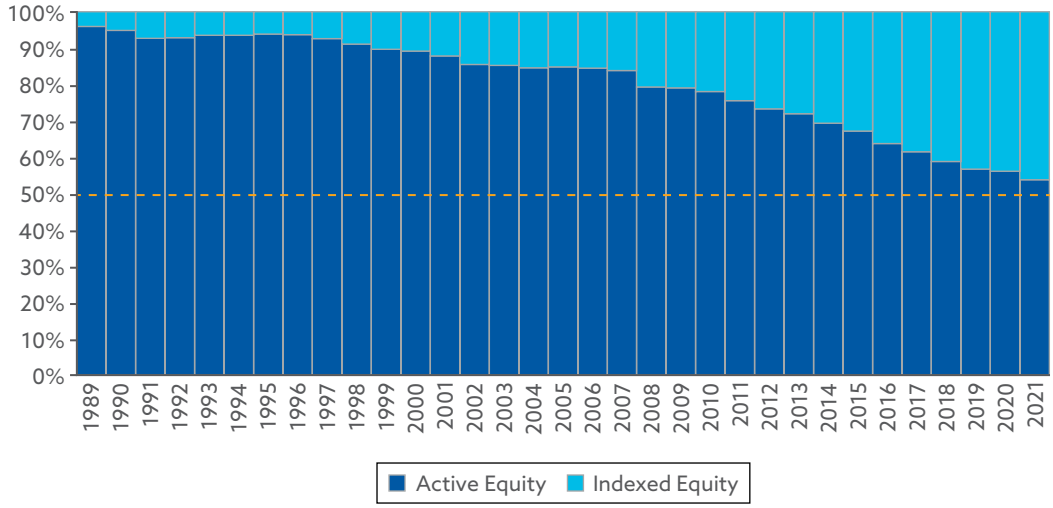
Where did the 10% decline in market share for equity and fixed income go? The answer is that it shifted mostly into asset allocation funds, which at the end of 2021 accounted for approximately 16% of the total worldwide fund AUM, or slightly more than $8.5 trillion. This was double the share held in the early 1990s, when asset allocation funds accounted for about 8% of total AUM.

The proportions of AUM by asset class vary over time. The peak for equities as a percentage of the total for all asset classes occurred in 1999–2000, the height of the dot-com era; equity funds accounted for 70% of all worldwide fund AUM. The 1999–2000 period also corresponded to the lowest point for fixed income funds, which then contained only about 20% of worldwide fund AUM. In the years following and through the Global Financial Crisis of 2008–2009 (GFC), equity fund AUM did see a decline but never dipped below 44%. In contrast, the fixed income fund AUM has never exceeded 32%. Interestingly, the share of AUM in asset allocation funds remained fairly steady throughout the GFC and in the years afterward, fluctuating between about 15% and 17%.

4.2.1. Index versus Active within Equities: All Domiciles

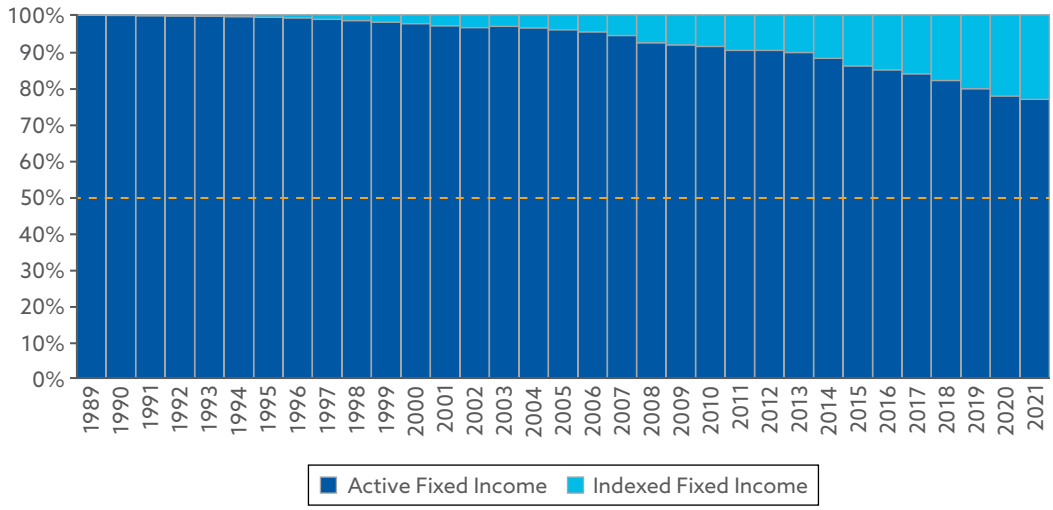
To further understand the evolution of active and index investing, it makes sense to analyze the two largest asset classes, equities and fixed income, separately. **Exhibit 17** focuses on equity funds. The indexed share of equity funds experienced a notable increase over the 1989–2021 period—from a market share of about 4% in 1989 to more than 46% in 2021. At the end of 2021, the aggregate AUM held in equity index funds on a worldwide basis stood at $13.7 trillion; the aggregate AUM held in active equity funds was $15.9 trillion. The market share of equity index funds doubled from 1999 to 2009, going from 10% to about 21%, and then doubled again by the end of 2019.

Exhibit 17. Proportion of Worldwide AUM, Active and Indexed Equity Funds, 1989–2021



Sources: Morningstar Direct; Invesco.

Exhibit 18. Proportion of Worldwide AUM, Active and Indexed Fixed Income Funds, 1989–2021



Sources: Morningstar Direct; Invesco.

4.2.2. Index versus Active within Fixed Income: All Domiciles

Exhibit 18 focuses on all fixed income funds on a worldwide basis over the 1989–2021 time period. Fixed income index funds have not enjoyed the same level of market share penetration

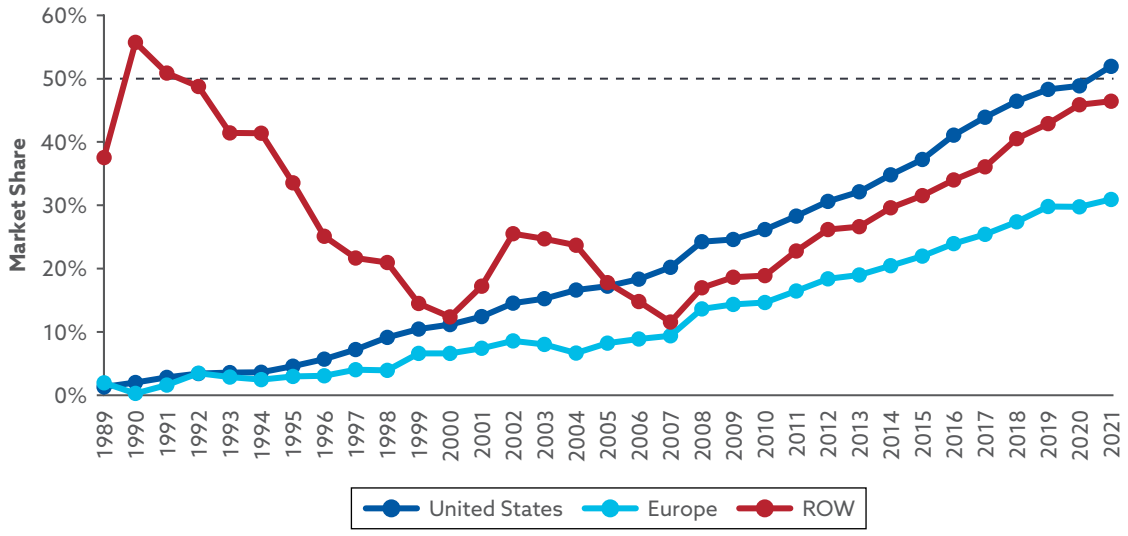
as equity index funds. In 1989, fixed income index funds constituted less than 1% of worldwide fixed income fund AUM. This proportion increased every year and achieved a 23% market share at the end of 2021—a nontrivial number, but only about half the market share of equity index funds. In 2021, fixed income index funds on a worldwide basis held $3 trillion in AUM, substantially less than the $10 trillion held in active fixed income funds.

4.2.3. Index Market Shares within Equities: United States, Europe, and ROW

Although active equity funds still maintained the AUM edge over indexed equity funds worldwide in 2021, the active versus index choice differs from one broad geographic domicile to another. **Exhibit 19** presents the market shares of equity index funds within each of the three domiciles over the 1989–2021 period. Each line displays the proportion of index equity fund AUM relative to total equity fund AUM within each particular geographic domicile. For example, at the end of 2021, equity index funds in the United States held approximately 52% of total US equity fund AUM. In the United States, 2021 was the first year in which the equity index AUM market share exceeded 50%. At the end of 2021, equity index funds in the United States held $10.2 trillion compared with $9.4 trillion in active equity funds.

European-domiciled equity index funds each garnered just under 2% total equity fund AUM in 1989. By the end of 2021, index funds represented 31% of all equity fund AUM in that region. European active equity funds contained more than $5 trillion at the end of 2021, whereas European equity index funds amounted to $2.3 trillion. Within European-domiciled equity funds, index funds are still not close to overtaking active funds—unlike what has occurred in the United States. The US experience has not been universal.

Exhibit 19. Index Market Share of Total Equity Fund AUM within Domiciles, 1989–2021



Sources: Morningstar Direct; Invesco.

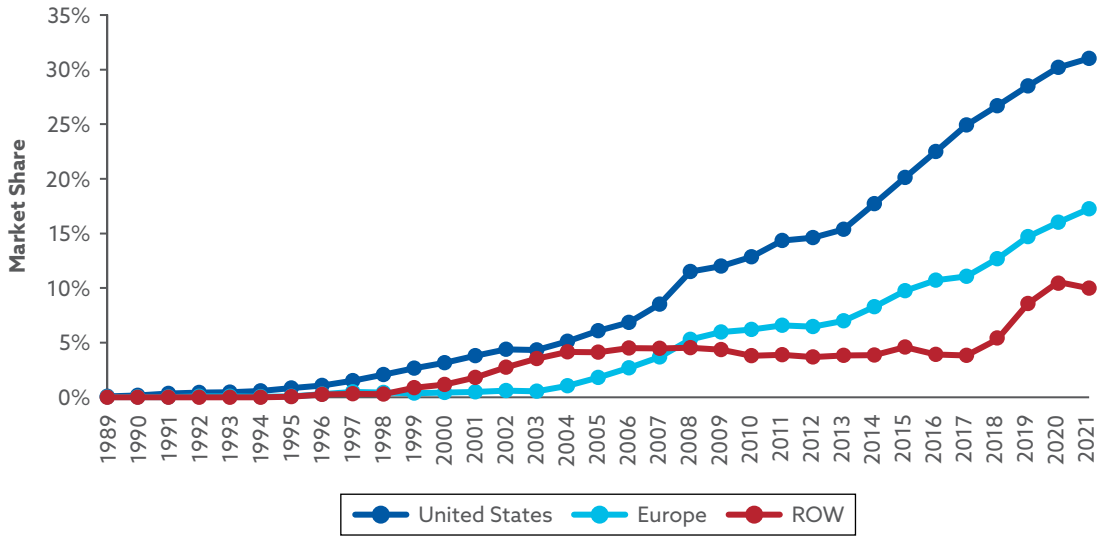
In the ROW at the end of 2021, the total equity AUM was $2.8 trillion, of which $1.3 trillion was in indexed equity products and $1.5 trillion was in active equity products. Perhaps the most surprising fact is that in 1989 and in the early 1990s, index equity funds had a much larger market share in the ROW than in either the United States or Europe. At the end of 1990, equity index funds accounted for nearly 56% of all ROW equity AUM. A closer look at ROW equity index data reveals that equity index funds were almost exclusively domiciled in Japan, where firms such as Nomura, Mitsubishi, Daiwa, and Nikko created and managed equity index products.

4.2.4. Index Market Shares within Fixed Income: United States, Europe, and ROW

Exhibit 20 presents the market shares of fixed income index funds within each of the three domiciles over the 1989–2021 period. At the end of 2021, fixed income index funds had captured 31% of fixed income AUM in the United States. Fixed income index funds domiciled in the United States contained about $2.1 trillion in AUM compared with $4.7 trillion in active fixed income funds. In Europe, the market share of indexed fixed income funds as a percentage of total European fixed income fund AUM was just above 17% in 2021, consisting of $0.7 trillion indexed and $3.4 trillion active. Fixed income index funds domiciled in the ROW are even less popular, relative to active fixed income funds, than they are in either the United States or Europe. At the end of 2021, fixed income index AUM totaled just $0.2 trillion in the ROW, compared with about $1.9 trillion for active funds.

The market share data on index and active funds in equities and fixed income in each broad geography refine the current debate regarding index funds versus active funds. In 2021, there is only one broad geographic region and only one asset class in which index funds are more

Exhibit 20. Index Market Share of Fixed Income AUM within Domiciles, 1989–2021



Sources: Morningstar Direct; Invesco.

widely used than active funds—that region is the United States, and that asset class is equities. Although US-domiciled equity funds constitute about one-third of all the worldwide fund AUM, this means that about two-thirds of all the worldwide fund AUM is non-US, non-equity, or both and thus may experience different dynamics. Care must be exercised in generalizing too much from US equities.

A deeper understanding of the evolution of passive investing can be gleaned by apportioning the AUM of equities and fixed income into more granular groupings. For example, most equity index funds circa 1990 were broad-based, typically concentrating on large-cap stocks in a major geographic area, such as the United States, Japan, or ROW. Most of these equity index funds implemented some type of cap-weighting scheme, which tended to minimize turnover and transaction costs. In 1990, fixed income index funds were almost nonexistent, and the handful that did exist mostly tracked investment-grade intermediate-term bonds. Over the next decade, the types of fixed income index funds offered to investors did not substantially change. The types of equity index funds, however, expanded notably.

4.3. The Rise of Smart Beta

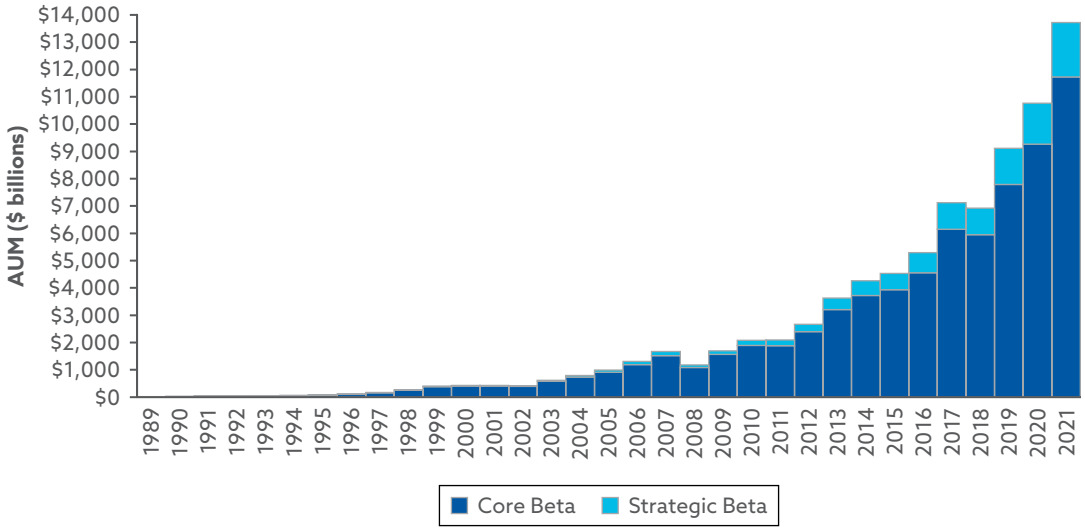
Throughout the 1990s, equity index funds began to incorporate academic research on equities, specifically the effects of size (market capitalization) and valuation metrics (e.g., price/earnings or price/book) on stock returns. By the end of 2000, equity index funds existed for baskets of small-, mid-, and large-cap stocks that were further subdivided into growth and value classifications. These index funds made no pretense about representing "the market," focusing instead on specific segments of the market. This segmentation gave investors the opportunity to target investing exposures more precisely.

During the 2000s, classifying and grouping equity securities into other categories continued. Equity index funds that focused on dividends, momentum, quality, and combinations of multiple factors were created. Asset managers also developed equity index funds based on weights that deviated by design from the cap weights of many of the earlier equity index funds. These alternative weighting schemes were sometimes based on company "fundamentals" (e.g., price/earnings, price/book value, price/cash flow) or risk metrics.

The movement into this newer breed of equity index funds incorporated insight from the world of active equity investing into equity index products. But, unlike active equity products, these newer equity index products tended to be strictly rules based, transparent, and lower cost. These newer equity index products were sometimes called "smart beta," reflecting a divergence from the simple or "core beta" exposures of the original equity index products. Morningstar labeled these newer index funds "strategic beta."

Morningstar also classifies some indexed fixed income products as "strategic beta." Fixed income strategic beta funds tended to focus on particular segments of the fixed income market, such as municipal bonds, emerging markets sovereign debt, high-yield debt, and short-duration debt, among others. As of 2021, strategic beta fixed income index products contained about $0.07 trillion in AUM worldwide; for comparison, strategic beta equity index products held $1.99 trillion in AUM worldwide at that time. The acceptance and spread of strategic beta strategies in indexed fixed income products remains nascent. Therefore, to understand the growth and penetration of strategic beta index products, one should focus on equity index funds.

Exhibit 21. Worldwide AUM in Core Beta and Strategic Beta Equity Index Funds, 1989–2021



Sources: Morningstar Direct; Invesco.

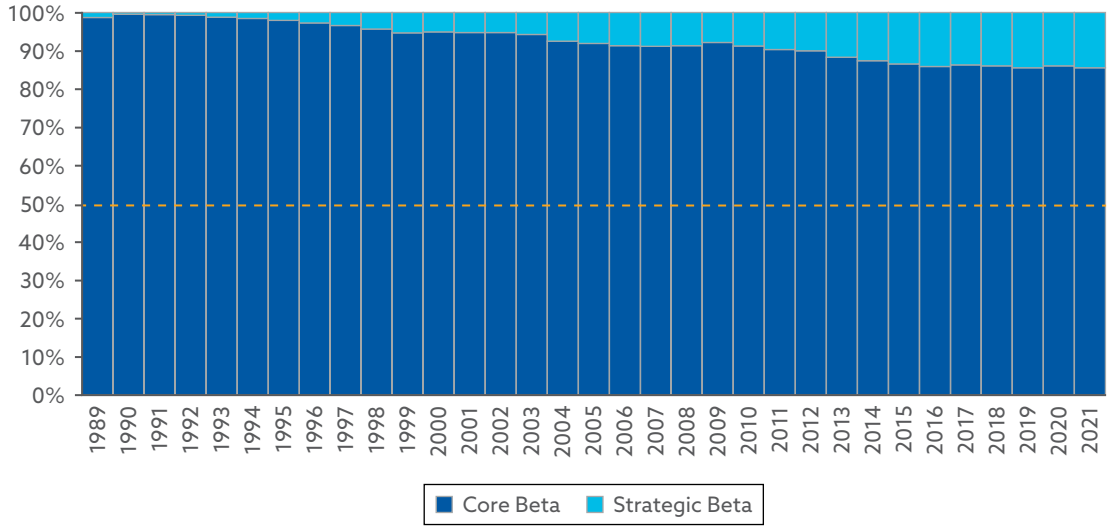
4.3.1. Core Beta versus Strategic Beta: All Worldwide Equity Index Funds

Exhibit 21 presents the growth of equity index fund AUM on a worldwide basis, separated into "core beta" and "strategic beta." Total equity index fund AUM grew from $11 billion in 1989 to more than $13.7 trillion by the end of 2021. Core beta AUM increased from about $10.9 billion in 1989 to more than $11.7 trillion at the end of 2021. Strategic beta AUM grew from about $0.1 billion to just shy of $2 trillion. By 2000, strategic beta index equity funds contained only about $22 billion, a small fraction of the total. The total AUM in equity strategic beta funds surpassed the $1 trillion mark in 2019, whereas core beta funds surpassed the $1 trillion milestone in 2006.

Exhibit 22 displays the market share proportions of equity index fund AUM on a worldwide basis split between core beta and strategic beta categories. From around a 1% market share in the early 1990s, strategic beta funds grew to about a 5% share of all equity index funds on a worldwide basis by 2000. That 5% share grew to around 10% by the end of 2012. Over the subsequent four years, the 10% share grew relatively rapidly to 14% by the end of 2016. Since 2016, the market share of equity strategic beta products on a worldwide basis has remained virtually unchanged, hovering around 14%.

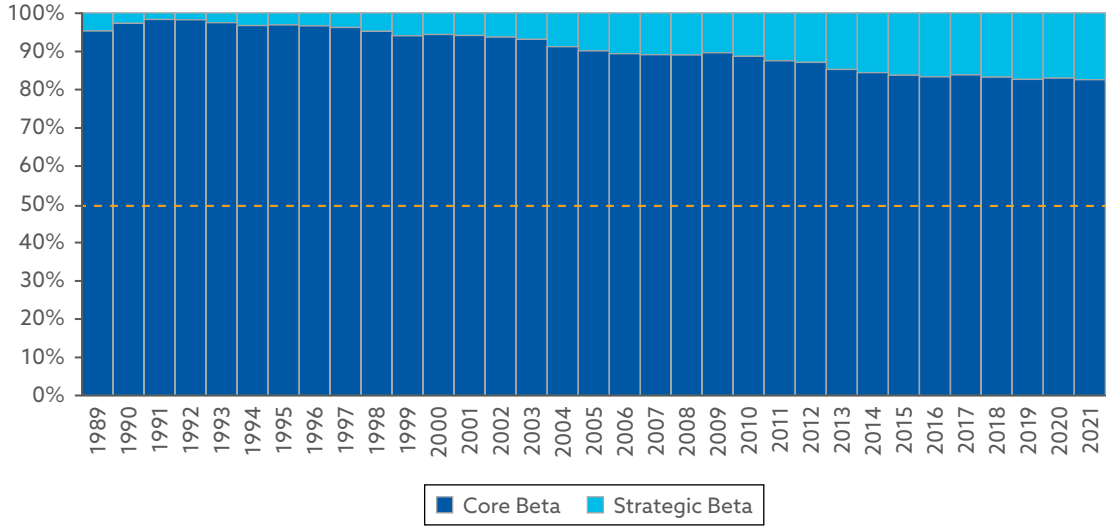
The trend of strategic beta funds gaining market share from core beta funds has thus stalled, and at the end of 2021, equity core beta funds still accounted for about 86% of all equity index AUM. The appetite for "active-like" (or perhaps more accurately, "active-lite") equity index funds seems to be sated, at least on a relative basis. The $1.99 trillion aggregate AUM in equity strategic beta funds worldwide at the end of 2021 is dwarfed by the $11.7 trillion held in core beta funds.

Exhibit 22. Proportion of Worldwide Equity Index Fund AUM, Core Beta and Strategic Beta, 1989–2021



Sources: Morningstar Direct; Invesco.

Exhibit 23. Proportion of US-Domiciled Equity Index Fund AUM, Core Beta and Strategic Beta, 1989–2021



Sources: Morningstar Direct; Invesco.

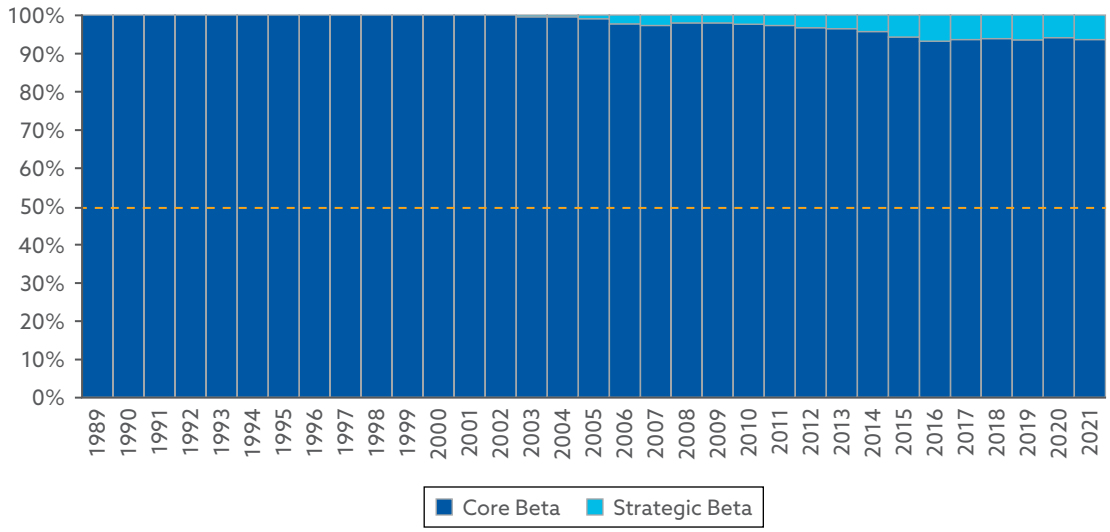
4.3.2. Core Beta versus Strategic Beta: US-Domiciled Equity Index Funds

The adoption of strategic beta versus core beta equity index funds differs by region. For equity index funds domiciled in the United States, **Exhibit 23** presents the split between strategic beta and core beta. Strategic beta funds made notable inroads within the equity indexing space starting in about 2000, when they had a 6% market share, to the year 2014, when their market share had grown to 16%. Since 2014, strategic beta funds neither gained nor lost meaningful market share in the United States.

4.3.3. Core Beta versus Strategic Beta: European-Domiciled Equity Index Funds

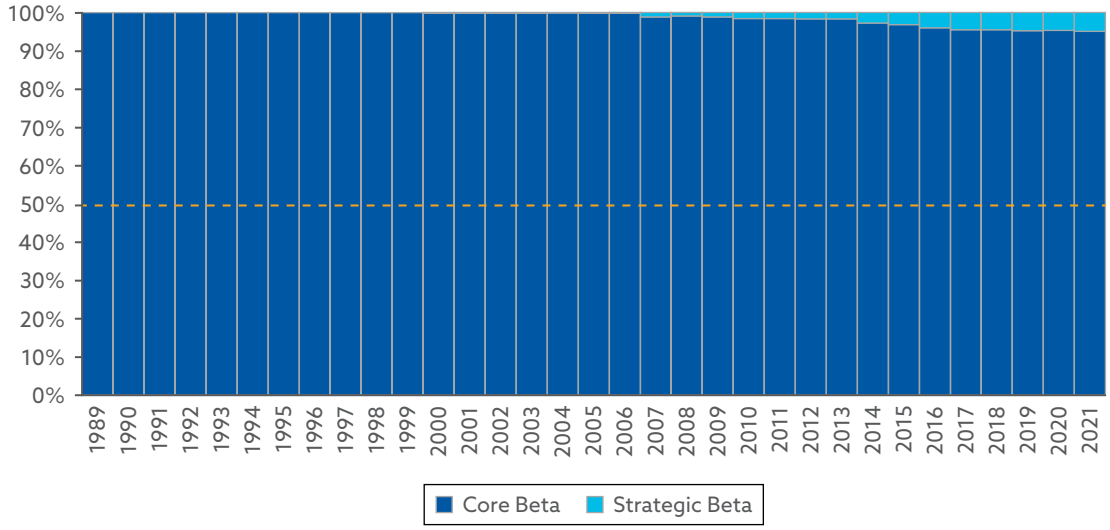
Among European-domiciled equity index funds, strategic beta products are not as widely held, relative to the total, as they are in the United States. The first equity strategic beta index product in Europe did not appear until 2003. It was not until 2015 that the market share of strategic beta exceeded 5%, and it has since hovered around 6% to 7% (**Exhibit 24**). At the end of 2021, equity strategic beta funds accounted for only about 6% of the AUM of all European equity index funds. As of 2021, the total AUM of European equity strategic beta funds totaled $0.15 trillion compared with $2.12 trillion in core beta funds.

Exhibit 24. Proportion of European-Domiciled Equity Index Fund AUM, Core Beta and Strategic Beta, 1989–2021



Sources: Morningstar Direct; Invesco.

Exhibit 25. Proportion of ROW-Domiciled Equity Index Fund AUM, Core Beta and Strategic Beta Equity Index Funds, 1989–2021



Sources: Morningstar Direct; Invesco.

4.3.4. Core Beta versus Strategic Beta: ROW-Domiciled Equity Index Funds

The adoption of equity strategic beta products domiciled in the ROW has been tepid. By the end of 2021, among the ROW equity index funds, the market share captured by strategic beta equity index funds was less than 5% (**Exhibit 25**)—smaller than the market shares of strategic beta for European-domiciled funds and much smaller than for US-domiciled funds.

The bifurcation of index investing into core beta and strategic (or smart) beta sleeves is a division primarily relevant to equity index products. Within equity index products, the popularity of equity strategic beta product is most pronounced in the United States. The data also suggest that, within the US-domiciled funds, the dominance of indexed equity over active equity products is predominantly driven by classic core beta, not strategic beta, products.

4.4. The Distribution of Active and Passive Investing across Categories and Regions

Morningstar also provides more granularity about the investment opportunity set for both index equity and active equity funds. Morningstar calls these targeted investment opportunity sets "Global Categories." In the data we analyzed, there were 42 categories during the 1989–2021 period. **Exhibit 26** is a list of these Morningstar Global Categories specific to equities. Of all the categories included, one stands out in terms of AUM, particularly for equity index funds domiciled in the United States: the US Equity Large-Cap Blend category.

Exhibit 26. Morningstar Global Equity Categories

Africa Equity	Industrials Sector Equity
Asia Equity	Infrastructure Sector Equity
Asia ex-Japan Equity	Japan Equity
Australia and New Zealand Equity	Korea Equity
Canadian Equity Large Cap	Latin America Equity
Commodities Specified	Long/Short Equity
Communications Sector Equity	Malaysia Equity
Consumer Goods & Services Sector Equity	Mexico Equity
Commodities Specified	Natural Resources Sector Equity
Energy Sector Equity	Precious Metals Sector Equity
Equity Miscellaneous	Real Estate Sector Equity
Europe Emerging Markets Equity	Technology Sector Equity
Europe Equity Large Cap	Thailand Equity
Europe Equity Mid/Small Cap	UK Equity Large Cap
Financials Sector Equity	UK Equity Mid/Small Cap
Global Emerging Markets Equity	US Equity Large-Cap Blend
Global Equity Large Cap	US Equity Large-Cap Growth
Global Equity Mid/Small Cap	US Equity Large-Cap Value
Greater China Equity	US Equity Mid Cap
Health Care Sector Equity	US Equity Small Cap
India Equity	Utilities Sector Equity

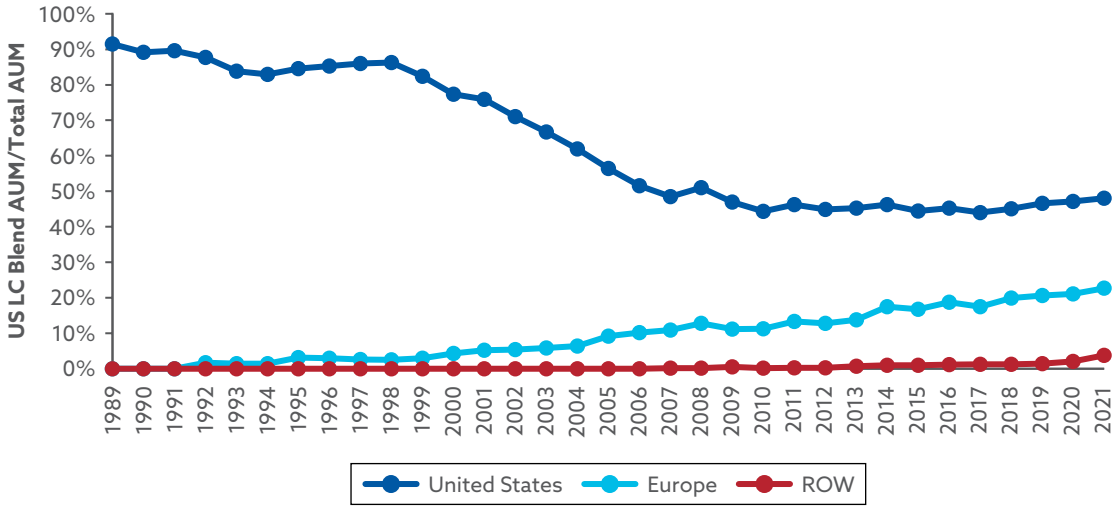
Source: Morningstar.

Some equity funds, both index and active, that are domiciled in regions other than the United States invest primarily in US Large-Cap Blend equities and thus are classified in the US Equity Large-Cap Blend category.

4.4.1. Index Equity Market Shares in US Large-Cap Blend Category: United States, Europe, and ROW

For each of the three broad geographic regions (United States, Europe, and ROW), **Exhibit 27** shows the AUM of US Large-Cap Blend equity index funds as a percentage of the AUM of all

Exhibit 27. Proportion of Equity Index AUM Allocated to US Large-Cap Blend by Domicile, 1989–2021



Sources: Morningstar Direct; Invesco.

equity index funds. For example, among all equity index funds domiciled in the United States, the US Large-Cap Blend variety accounted for more than 90% of equity index AUM in 1989. By 1999, this portion had declined to about 82%. Since around 2009, US Large-Cap Blend equity index funds accounted for between 45% and 50% of all US equity index AUM. At the end of 2021, the AUM of US Large-Cap Blend equity index funds was about $4.9 trillion, representing 48% of all equity index AUM for funds domiciled in the United States. Of that amount, about 95% were in core beta funds. The three largest of these funds (Vanguard Total Stock Market, Vanguard 500 Index, and SPDR S&P 500 ETF) contained about $2.7 trillion of AUM at the end of 2021.

The US Equity Large-Cap Blend category is also found in equity index funds domiciled in Europe and ROW. In Europe, this category has been growing in importance over the 1989–2021 time period. The first US Equity Large-Cap Blend index fund in Europe appeared in 1992 and was offered by Legal and General in the United Kingdom. By the end of 2021, the AUM of European-domiciled US Equity Large-Cap Blend index funds had grown to approximately $512 billion out of $2.3 trillion (about 23%) of AUM for all European-domiciled equity index funds.

In 2021, US Large-Cap Blend equity index funds existed in 13 different European countries, with Ireland-domiciled funds accounting for more than $258 billion of the $512 billion total. The iShares Core S&P 500 UCITS (Undertakings for Collective Investment in Transferable Securities) ETF (Ireland domicile) contained about $60 billion, or about 12%, of the European AUM in this category. For comparison, the largest similar fund domiciled in the United States, Vanguard Total Stock Market, had about $1.4 trillion in assets in 2021, amounting to more than 28% of the total US AUM in this category.

In the ROW, the US Equity Large-Cap Blend category is not substantial in terms of AUM. The first US Equity Large-Cap Blend index fund appeared in 2007 in the ROW and was offered for sale in

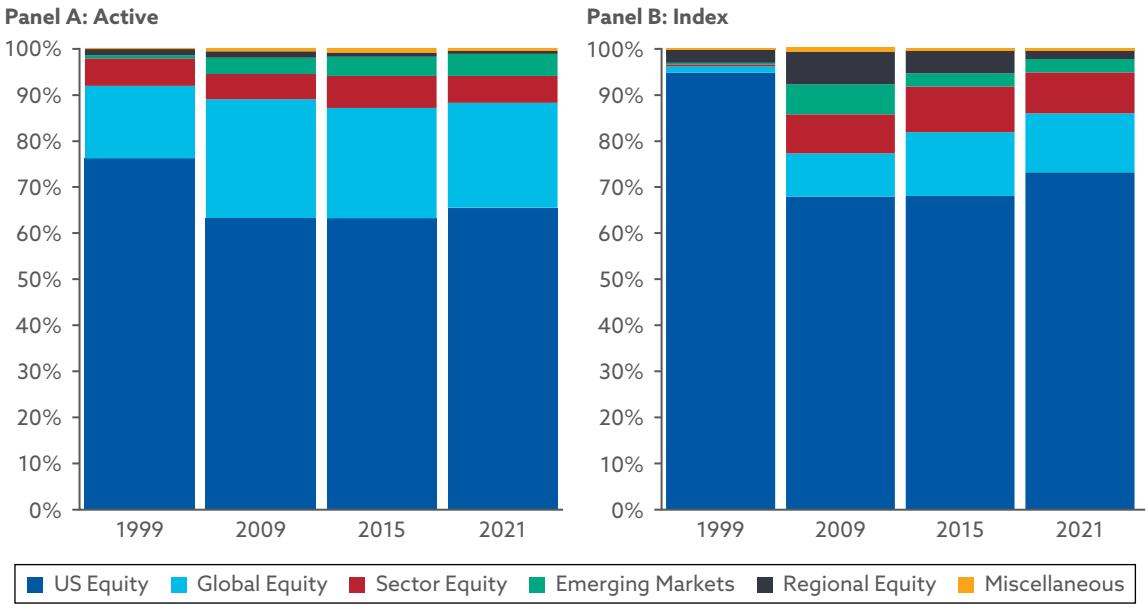
Hong Kong SAR. By the end of 2021, US Equity Large-Cap Blend index funds domiciled in the ROW contained about $48 billion of AUM. This was less than 4% of the total equity index AUM ($1.3 trillion) domiciled in the ROW. Of the $48 billion in US Equity Large-Cap Blend index funds in the ROW, nearly $23 billion were domiciled in Japan, plus another $10 billion in Australia.

Exhibit 27 clearly demonstrates that the US Equity Large-Cap Blend category is responsible for much of the growth in equity index assets on a global basis. In 2021, on a worldwide basis, the AUM of US Equity Large-Cap Blend index funds ($5.4 trillion) accounted for just about 40% of the total AUM for all equity index funds worldwide ($13.7 trillion). But the changes over time in the relative AUMs invested in different categories of equity funds are also revealing (see Exhibit 26). To trace in more detail the evolution of equity index investing, we analyze the global categories with the largest market shares of equity index AUM in select years—1999, 2009, 2015, and 2021—in the United States, Europe, and ROW.

4.4.2. Global Category Market Shares for Index and Active Equity: US-Domiciled Funds

Exhibit 28 collapses the 42 Morningstar categories into just six classifications—US Equity, Global Equity, Emerging Markets Equity, Regional Equity, Sector Equity, and Miscellaneous Equity—for US-domiciled equity funds. In this exhibit, we show the distributions of AUM for active equity funds and index equity funds separately. For example, in 1999, US equity index funds contained 94.9% of the AUM of all (US plus non-US) equity index funds domiciled in the United States. In the same year, 76.2% of the total (US plus non-US) active equity fund AUM domiciled in the

Exhibit 28. Proportion of AUM across Global Categories, US-Domiciled Index and Active Equity Funds for Select Years



Sources: Morningstar Direct; Invesco.

United States was US equity. Since 1999, the proportion of AUM focused on US equities declined and the proportion focused on global equities increased for both index and active equity funds domiciled in the United States.

Exhibit 29 contains the granular line-item details for each classification plotted in Exhibit 28. For example, at the end of 1999, US Equity Large-Cap Blend accounted for 82.4% of total

Exhibit 29. Proportion of AUM across Global Categories, Detail, US-Domiciled Active and Index Equity Funds for Select Years

	Active (%)				Index (%)			
Category	**1999**	**2009**	**2015**	**2021**	**1999**	**2009**	**2015**	**2021**
US Equity	**76.2**	**63.3**	**63.2**	**65.5**	**94.9**	**68.0**	**68.1**	**73.2**
Large-Cap Blend	16.5	14.6	14.3	16.0	82.4	47.0	44.5	48.0
Large-Cap Growth	35.1	19.4	19.3	22.7	6.9	4.7	5.1	7.1
Large-Cap Value	14.1	13.5	14.0	11.8	1.5	3.9	5.4	6.1
Mid Cap	6.8	8.8	9.1	8.6	1.9	6.8	7.7	6.6
Small Cap	3.7	7.0	6.6	6.4	2.2	5.6	5.4	5.4
Global Equity	**15.7**	**25.7**	**23.9**	**22.7**	**1.4**	**9.4**	**13.8**	**12.8**
Large Cap	14.7	23.7	21.7	20.2	1.4	9.1	13.4	12.4
Mid/Small Cap	1.1	2.1	2.2	2.5	—	0.2	0.4	0.4
Sector Equity	**6.0**	**5.5**	**7.0**	**5.8**	**0.4**	**8.5**	**9.9**	**8.9**
Communications	0.3	0.1	0.1	0.1	—	0.1	0.1	0.2
Consumer Goods	0.0	0.1	0.1	0.1	—	0.6	1.2	0.7
Energy	0.1	0.6	0.6	0.3	—	1.0	1.1	0.6
Financials	0.5	0.2	0.2	0.1	—	0.9	1.1	0.9
Health Care	0.9	1.0	2.3	1.6	—	0.9	1.6	1.1
Industrials	0.0	0.0	0.1	0.1	—	0.4	0.3	0.4
Infrastructure	—	0.0	0.2	0.2	—	0.0	0.0	0.1
Natural Resources	0.1	0.7	0.3	0.1	—	0.8	0.3	0.4
Precious Metals	0.1	0.6	0.1	0.1	—	0.5	0.2	0.2
Property-Direct	—	—	—	—	—	—	—	—

(continued)

Exhibit 29. Proportion of AUM across Global Categories, Detail, US-Domiciled Active and Index Equity Funds for Select Years *(continued)*

Category	Active (%)				Index (%)			
	1999	2009	2015	2021	1999	2009	2015	2021
Real Estate	0.2	1.2	1.9	1.4	0.3	1.6	2.4	1.6
Technology	3.2	0.7	0.8	1.5	0.1	1.1	1.3	2.3
Utilities	0.7	0.4	0.4	0.2	0.0	0.5	0.3	0.3
Emerging Markets	**0.7**	**3.5**	**4.2**	**4.8**	**0.3**	**6.5**	**2.9**	**2.9**
Regional Equity	**1.3**	**1.4**	**0.9**	**0.6**	**3.0**	**7.0**	**5.0**	**1.9**
Africa	—	—	—	—	—	—	—	—
Asia	0.1	0.1	0.1	0.1	0.7	0.5	0.2	0.1
Asia ex-Japan	0.2	0.4	0.3	0.2	0.1	0.7	0.2	0.2
Australia and New Zealand	—	—	—	—	0.0	0.2	0.0	0.0
Canada	—	—	—	0.1	0.0	0.3	0.1	0.1
Europe Large Cap	0.6	0.2	0.3	0.1	1.8	1.5	2.3	0.7
Europe Small Cap	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Greater China	0.1	0.3	0.1	0.1	0.0	1.5	0.4	0.3
India	0.0	0.0	0.0	0.0	—	0.2	0.2	0.1
Japan	0.3	0.1	0.1	0.1	0.3	0.5	1.1	0.2
Korea	—	—	—	—	—	0.3	0.1	0.0
Latin America	0.1	0.3	0.0	0.0	—	1.3	0.1	0.1
Malaysia Equity	—	—	—	—	—	—	—	—
Mexico	—	—	—	—	0.0	0.1	0.0	0.0
Thailand	—	—	—	—	—	0.0	0.0	0.0
UK Equity Large Cap	—	—	—	0.0	0.0	0.1	0.1	0.0
UK Equity Mid/Small Cap	—	—	—	—	—	—	—	—
Miscellaneous	**0.4**	**1.7**	**12.4**	**11.4**	**0.0**	**0.6**	**0.3**	**0.3**

Sources: Morningstar Direct; Invesco.

US-domiciled equity index AUM; this amounted to $300 billion. The next largest category on the index side in 1999 is US Equity Large-Cap Growth with 6.9% of the $364 billion total. In 1999, a smattering of US-domiciled equity index AUM was invested in non-US-focused equity index products. The three biggest categories in this group were Europe Large Cap (1.8%), Global Large Cap (1.4%), and Asia (0.7%). In 1999, the top 10 categories shown in the index column in Exhibit 29 accounted for more than 99% of total equity index AUM, and the US-centric investment products accounted for almost 95% of this total.

Ten years later, total AUM for US-domiciled equity index funds stood at nearly $1.2 trillion. US Equity Large-Cap Blend index funds were still king of the index mountain with $562 billion in aggregate AUM, but their share of equity index AUM had shrunk to 47.0%. Larger shares of the equity index total went to Global Equities (9.4%), Sector Equities (8.5%), Emerging Markets (6.5%), and Regional Equities (7.0%). Between 1999 and 2009, US equity index funds proliferated in terms of the number of different global category offerings—clearly reflecting an era of innovation and experimentation in financial index products. This trend was especially evident among sector funds. The AUM market share in any one of these individual categories, however, was quite modest. Indeed, by 2009, the 27 smaller global categories, in aggregate, accounted for only about 12% of the $1.2 trillion aggregate index AUM in the United States.

On the active fund side of Exhibit 29, the relative AUM of active equity funds in the US Large-Cap Growth category dwindled from 35.1% at the end of 1999 to 19.4% in 2009, reflecting in part the high prices of US large-cap growth stocks in 1999 because of the dot-com tech bubble. Over this 10-year span, active global equity funds grew in popularity from a market share of 15.7% of all active equity AUM in the United States in 1999 to 25.7% in 2009.

By the end of 2015, total equity index AUM within US equity index funds had swelled to nearly $3.4 trillion. The top two categories, US Large-Cap Blend and Global Large Cap, remained the same as in 2009 with market shares of more than 44.5% and 13.4%, respectively. The market share of Emerging Markets index funds dropped from a 6.5% in 2009 to 2.9% in 2015. New categories of equity index funds domiciled in the United States did not develop during this period, and the top 10 categories constituted a bigger proportion of the total equity index AUM. By 2015, investors and firms seemed to be concentrating on a narrower set of equity index products.

By the end of 2021, total US-domiciled equity index AUM had exploded to nearly $10.2 trillion. The US Large-Cap Blend category contained about $4.9 trillion of the AUM, approximately 48% of the total. The Global Large-Cap Equity category remained in second place with about $1.3 trillion in AUM, about 12.4% of the total. Positions three through six remained occupied by US Large-Cap Growth, US Mid Cap, US Large-Cap Value, and US Small Cap. The market shares of each of these categories ranged between 5.4% and 7.1%. Even though three sector categories (Technology, Real Estate, and Health Care) made the top 10 in terms of market share AUM, these categories contained only 5% of total US equity index AUM in 2021. Investor interest continued to focus on a narrowing, stable set of equity index fund categories. No category has been as dominant for so long as US Equity Large-Cap Blend.

Although the total AUM in US-domiciled equity index funds surpassed the total AUM for active equity funds in 2021, the composition of equity index AUM is noteworthy. As measured by Morningstar Global Categories, innovation in the equity index space appears to be at a standstill. Creative and new equity index products appear not to have gained substantial traction,

and the stalwart product categories, cap-weighted equity index funds, continue to dominate the landscape. Investors have heartily embraced low-cost, diversified equity index products but only in a limited number of categories within US-domiciled funds.

4.4.3. Global Category Market Shares for Index and Active Equity: European-Domiciled Funds

For European-domiciled equity funds, we also collapse the 42 Morningstar Global Categories into just six classifications—US Equity, Global Equity, Emerging Markets Equity, Regional Equity, Sector Equity, and Miscellaneous Equity. Of course, the European-domiciled label is not really a singular domicile, as is the case with the United States. At the end of 2021, within the European region, 31 separate domiciles (countries or equivalent) had equity funds. **Exhibit 30** is a list of

Exhibit 30. Morningstar European Fund Domiciles with 2021 Active and Index AUM ($ billions)

	Active AUM	Index AUM		Active AUM	Index AUM
Andorra	0.4	—	Latvia	0.1	—
Austria	31.2	0.2	Liechtenstein	16.4	1.2
Belgium	75.1	6.2	Lithuania	0.0	—
Czech Republic	0.0	—	Luxembourg	2,018.9	336.1
Denmark	79.8	18.8	Malta	1.7	—
Estonia	0.1	—	Monaco	0.3	—
Finland	53.8	12.3	Netherlands	62.4	35.9
France	296.7	50.2	Norway	74.0	44.6
Germany	255.0	66.2	Poland	1.0	—
Gibraltar	0.0	—	Portugal	4.5	—
Greece	1.7	0.0	Slovenia	1.8	—
Guernsey	4.6	—	Spain	72.7	7.3
Iceland	0.6	0.1	Sweden	377.3	106.3
Ireland	583.2	930.7	Switzerland	119.0	244.0
Italy	38.1	—	United Kingdom	870.8	401.0
Jersey	6.1	—			

Source: Morningstar Direct.

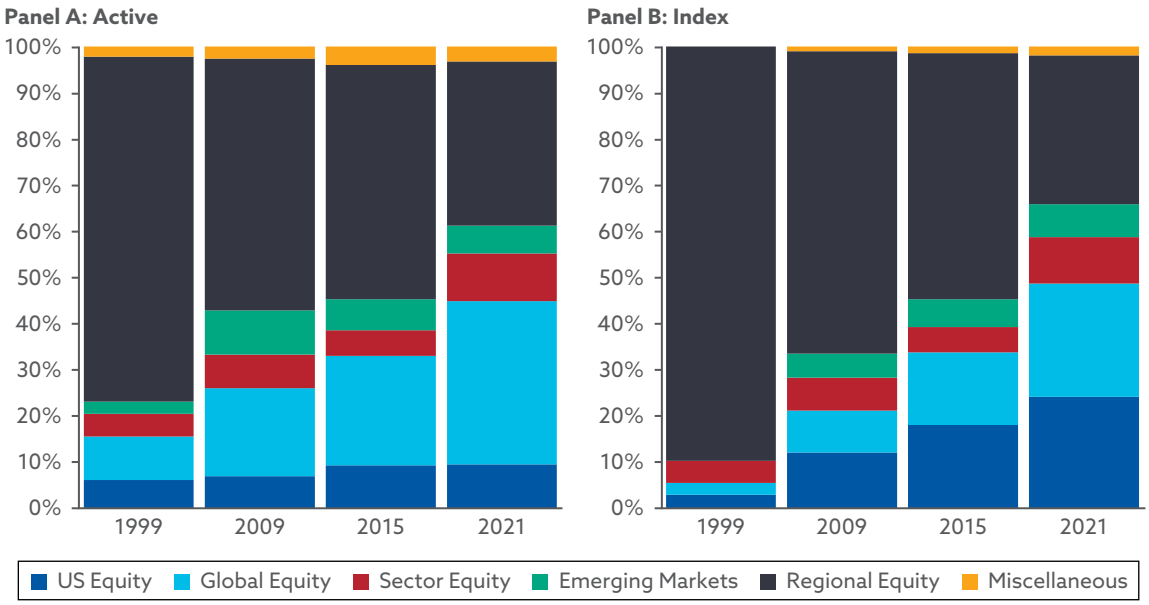
these 31 domiciles. For each domicile, we display the aggregate AUM for active equity funds and equity index funds at the end of 2021.

Of the 31 individual domiciles, only 17 had equity index funds in 2021. In 2021, Ireland was the most preferred habitat for equity index funds in Europe, housing more than 41% of equity index AUM domiciled in the European region. This equates to about $930 billion. The United Kingdom came in second place with $400 billion in equity index AUM at the end of 2021. On the active equity side, Luxembourg was the preferred location in 2021, containing about 40% of European active equity AUM, or slightly more than $2 trillion.

Exhibit 31 aggregates all country domiciles into one region, clarifying the trends in Europe. For both index equity and active equity, the market share of AUM for funds with a regional focus shrank substantially. Between 1999 and 2021, the market share of Regional Equity funds declined from 74.8% to 35.6% among active funds and from 93.0% to 33.2% among index products. Over this period, notable gains in market share were realized in Global Equities for both index and active equity products. US equity funds also gained market share, but much more so among index funds than among active funds.

In 1999, equity index funds domiciled in Europe existed in only eight Morningstar Global Categories; the aggregate AUM of all European-domiciled equity index funds was $21 billion. **Exhibit 32** shows that 93% of this total was invested in Regional Equity index categories. UK Large-Cap Equity index funds by themselves amounted to 60.8% of this total. At the end of 1999, equity index funds domiciled in Europe were not a major economic presence.

Exhibit 31. Proportion of AUM across Global Categories, European-Domiciled Index and Active Equity Funds for Select Years



Sources: Morningstar Direct; Invesco.

Exhibit 32. Proportion of AUM across Global Categories, Detail, European-Domiciled Active and Index Equity Funds for Select Years

	Active (%)				Index (%)			
Category	**1999**	**2009**	**2015**	**2021**	**1999**	**2009**	**2015**	**2021**
US Equity	**6.1**	**6.9**	**9.3**	**9.5**	**3.0**	**12.4**	**18.2**	**24.9**
Large-Cap Blend	4.1	3.9	4.7	4.5	3.0	11.3	16.9	22.7
Large-Cap Growth	0.7	1.5	2.1	3.0	—	0.8	0.5	1.2
Large-Cap Value	0.8	1.0	1.7	1.0	—	0.1	0.2	0.4
Mid Cap	0.1	0.4	0.5	0.4	—	0.0	0.4	0.2
Small Cap	0.4	0.2	0.4	0.6	—	0.1	0.2	0.4
Global Equity	**9.4**	**19.1**	**23.8**	**35.4**	**2.7**	**9.3**	**15.8**	**25.3**
Large Cap	9.3	18.6	23.2	33.8	2.7	9.2	15.5	24.1
Mid/Small Cap	0.2	0.5	0.6	1.6	—	0.1	0.4	1.2
Sector Equity	**4.9**	**7.3**	**5.5**	**10.3**	**1.3**	**5.0**	**5.0**	**7.4**
Communications	1.0	0.1	0.1	0.0	—	0.4	0.1	0.1
Consumer Goods	0.1	0.3	0.3	0.5	—	0.4	0.3	0.3
Energy	0.2	1.0	0.3	0.8	—	0.5	0.2	0.6
Financials	0.3	0.4	0.3	0.4	—	0.8	0.8	0.7
Health Care	0.9	0.8	1.5	2.0	—	0.4	0.4	0.7
Industrials	0.0	0.2	0.1	0.1	—	0.7	0.2	0.3
Infrastructure	—	0.1	0.3	0.6	—	0.2	0.1	0.3
Natural Resources	0.3	1.5	0.3	0.4	—	0.0	0.0	0.0
Precious Metals	0.1	0.7	0.2	0.3	—	0.0	0.1	0.2
Property-Direct	—	—	—	—	—	—	—	—
Real Estate	0.4	1.1	1.2	1.2	—	1.1	2.6	2.4
Technology	1.7	0.5	0.7	3.9	1.3	0.2	0.3	1.8
Utilities	—	0.7	0.3	0.2	—	0.3	0.1	0.1

(continued)

Exhibit 32. Proportion of AUM across Global Categories, Detail, European-Domiciled Active and Index Equity Funds for Select Years *(continued)*

Category	Active (%)				Index (%)			
	1999	2009	2015	2021	1999	2009	2015	2021
Emerging Markets	**2.7**	**9.5**	**6.8**	**6.0**	**—**	**5.3**	**6.1**	**7.4**
Regional Equity	**74.8**	**54.7**	**50.8**	**35.6**	**93.0**	**67.2**	**53.7**	**33.2**
Africa	0.0	0.2	0.1	0.0	—	0.1	0.0	0.0
Asia	2.0	0.9	0.5	0.4	—	0.2	0.2	0.3
Asia ex-Japan	2.4	5.2	4.1	3.7	0.5	2.6	2.1	1.7
Australia and New Zealand	0.5	0.1	0.0	0.0	—	0.1	0.1	0.0
Canada	0.1	0.0	0.0	0.0	—	0.3	0.3	0.3
Europe Large Cap	36.5	24.8	23.8	15.8	28.6	41.1	31.7	19.2
Europe Small Cap	3.5	4.1	4.8	4.8	0.7	1.3	1.5	1.0
Greater China	0.1	2.9	1.8	2.4	—	1.1	0.5	0.5
India	0.2	1.3	0.9	0.5	—	0.6	0.3	0.1
Japan	5.7	2.0	3.2	1.9	2.4	3.5	5.0	3.1
Korea	0.0	0.1	0.0	0.0	—	0.2	0.1	0.1
Latin America	0.4	1.7	0.3	0.2	—	1.2	0.1	0.1
Malaysia Equity	—	0.0	0.0	0.0	—	—	—	—
Mexico	—	—	0.0	0.0	—	—	0.0	0.0
Thailand	0.0	0.0	0.0	0.0	—	—	0.0	0.0
UK Equity Large Cap	21.6	10.4	9.9	4.7	60.8	14.8	11.2	6.3
UK Equity Mid/Small Cap	2.0	1.2	1.3	1.1	—	0.2	0.5	0.5
Miscellaneous	**2.0**	**2.4**	**3.8**	**3.0**	**—**	**0.8**	**1.2**	**1.7**

Sources: Morningstar Direct; Invesco.

Active equity funds domiciled in Europe were a much bigger economic entity in 1999 with aggregate AUM of about $296 billion. Like index funds in Europe, most of these active funds (74.8% of the total) were focused on regional equity. The two largest categories of active equity funds were Europe Large Cap (36.5%) and UK Equity Large Cap (21.6%). Global Equity funds within the active space had a market share of 9.4%, and US Equity funds accounted for 6.1%.

Over the next decade, equity index funds domiciled in Europe experienced explosive growth, both in terms of AUM and in terms of the number of Global Categories offered. The aggregate AUM of equity index funds domiciled in Europe witnessed a 16-fold increase, reaching $341 billion by the end of 2009. The composition of index fund AUM also experienced significant shifts. The biggest loss of market share was experienced by index funds in the UK Equity Large-Cap category: The market share of AUM declined from 60.8% in 1999 to 14.8% in 2009. Market share gainers were Europe Large-Cap index funds (28.6% to 41.1%), Global Large-Cap index funds (2.7% to 9.2%), and US Equity Large-Cap Blend index funds (3.0% to 11.3%).

The types of index offerings also greatly expanded from just 8 categories in 1999 to 36 categories in 2009. Interestingly, even though the number of categories classified as sector equity index grew from 1 in 1999 to 12 in 2009, the aggregate AUM in these 12 categories accounted for only 5% of the total AUM of European equity index funds by 2009.

The composition of AUM within European-domiciled active funds also shifted between 1999 and 2009. At the end of 2009, total AUM in these funds reached $2.01 trillion, up from $0.30 trillion at the end of 1999. Over this 10-year period, the most noticeable active equity market share losers were Europe Large Cap (36.5% to 24.8%) and UK Large Cap (21.6% to 10.4%). Gaining active equity market share were funds in Global Large Cap (9.3% to 18.6%) and Emerging Markets (2.7% to 9.5%).

By the end of 2015, the aggregate value of European-domiciled equity index funds had reached $779 billion, less than half that of active equity in the same space. In the European-domiciled equity index space, the market shares of US Equity Large-Cap Blend and Global Equity Large-Cap categories grew to 16.9% and 15.5%, respectively, surpassing the market share of the UK Large-Cap category, which declined from 14.8% in 2009 to 11.2% in 2015. An even greater market share loss was experienced by Europe Large-Cap active equity funds (41.1% to 31.7%). In aggregate, all of the equity index sector categories, including the Real Estate sector, accounted for only about 5% of European equity index for funds in 2015—unchanged from the market share numbers six years earlier.

In 2015, the total AUM in active equity funds domiciled in Europe had grown to $2.76 trillion. US Equity active funds increased to 9.3% of the total, and Global Equity active funds moved up to 23.8% of the total. These gains were offset by declines in Regional Equity, Emerging Market, and Sector Equity active funds.

By the end of 2021, the AUM of European-domiciled equity index funds grew to $2.26 trillion. Global Equity Large Cap now captured a 24.1% share of the market, and US Equity Large-Cap Blend closely trailed at 22.7%. The market shares of the Europe Large-Cap equity index and the UK Large-Cap equity index continued to decline, reaching levels of 19.2% and 6.3%, respectively. By the end of 2021, the equity index fund AUM in all sector categories accounted for a market share of 7.4%, an increase from the 5.0% level that prevailed in 2015. Among European-domiciled equity index funds, a preference has evolved for index funds with a broader focus outside of Europe (i.e., Global Equity, US Equity, and Emerging Markets Equity).

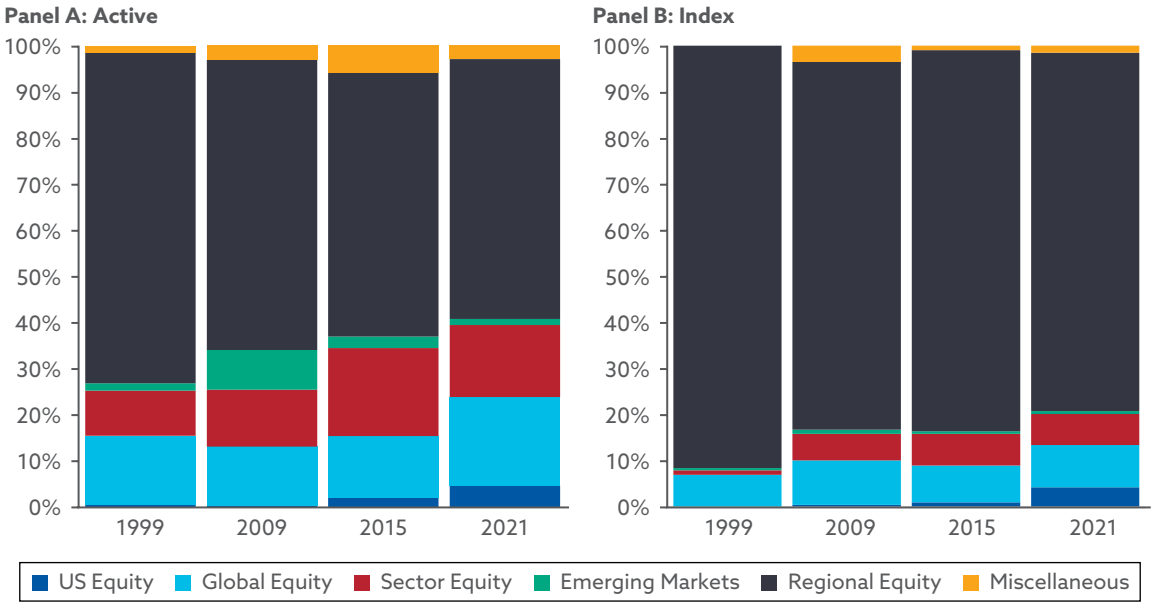
On the active side of European-domiciled funds, AUM totaled $5.05 trillion in 2021. The market share of Global Large-Cap active equity funds continued to expand, reaching a level of 33.8%, up from 23.2% in 2015. Sector equity funds continued to gain market share in the active fund space as well, particularly in the Technology sector, which ended 2021 with a 3.9% market share. Among active equity funds, Europe Large-Cap Equity and UK Large-Cap market shares continued to diminish.

4.4.4. Global Category Market Shares for Index and Active Equity: ROW-Domiciled Funds

The 1989 AUM of equity index funds domiciled in the ROW was $7.5 billion, virtually all of which was in Japanese equity index funds domiciled in Japan. This compares to an ROW-domiciled equity index AUM of about $2.9 billion in the United States and only $0.6 billion in Europe. **Exhibit 33** shows that the bulk of AUM in equity funds domiciled in the ROW continues to be in the Regional Equity grouping for both active and index funds. The market shares of Global Equity and Sector Equity are somewhat greater in active funds than in index funds.

In 1999, the AUM of equity index funds domiciled in the ROW totaled $23.7 billion—a small fraction of the $364.6 billion AUM for US-domiciled equity index funds, but still more than the $21.1 billion in European-domiciled funds. In 1999, about 65.1% of the equity index AUM in the ROW was held in Japan index equities (**Exhibit 34**). Greater China Equity funds, specifically the Tracker Fund of Hong Kong (TraHK) that targeted the Hang Seng Index, accounted for another 19.8% of the market share. Global Large-Cap Equity index funds contained only 7.1% of the equity index AUM.

Exhibit 33. Proportion of AUM across Global Categories, ROW-Domiciled Index and Active Equity Funds for Select Years



Sources: Morningstar Direct; Invesco.

Exhibit 34. Proportion of AUM across Global Categories, Detail, ROW-Domiciled Active and Index Equity Funds for Select Years

Category	Active (%)				Index (%)			
	1999	2009	2015	2021	1999	2009	2015	2021
US Equity	**0.6**	**0.4**	**2.1**	**4.7**	**—**	**0.6**	**1.1**	**4.4**
Large-Cap Blend	0.5	0.3	1.1	1.8	—	0.5	1.0	3.8
Large-Cap Growth	0.1	0.1	0.6	2.5	—	0.1	0.0	0.3
Large-Cap Value	0.0	0.0	0.2	0.2	—	0.0	0.1	0.3
Mid Cap	—	0.0	0.1	0.1	—	—	—	0.0
Small Cap	0.0	0.0	0.2	0.1	—	—	0.0	0.0
Global Equity	**14.9**	**12.8**	**13.4**	**19.3**	**7.1**	**9.6**	**8.0**	**9.2**
Large Cap	14.6	12.4	13.1	18.6	7.1	9.4	7.9	9.0
Mid/Small Cap	0.3	0.5	0.3	0.6	—	0.2	0.1	0.1
Sector Equity	**9.8**	**12.4**	**19.1**	**15.6**	**1.0**	**5.8**	**6.9**	**6.8**
Communications	2.8	0.0	0.0	0.4	—	0.0	0.0	0.0
Consumer Goods	0.0	0.4	0.4	0.7	—	0.0	0.2	0.1
Energy	0.0	0.5	0.2	0.2	—	0.3	0.4	0.1
Financials	—	0.1	0.0	0.1	—	0.7	0.2	0.1
Health Care	—	0.2	1.5	1.0	—	0.1	0.1	0.1
Industrials	0.0	0.2	0.1	0.4	—	0.2	0.1	0.0
Infrastructure	0.0	1.1	1.9	1.2	—	0.1	0.2	0.3
Natural Resources	0.2	0.8	0.3	0.2	—	—	0.0	0.0
Precious Metals	0.0	0.2	0.0	0.0	—	—	0.0	0.0
Property-Direct	—	—	—	—	—	—	—	0.0
Real Estate	3.3	6.2	12.8	5.3	1.0	4.1	5.7	3.7
Technology	3.4	0.6	0.9	5.5	—	0.2	0.1	2.3
Utilities	0.0	2.0	0.9	0.6	—	0.0	—	—

(continued)

Exhibit 34. Proportion of AUM across Global Categories, Detail, ROW-Domiciled Active and Index Equity Funds for Select Years *(continued)*

Category	Active (%)				Index (%)			
	1999	2009	2015	2021	1999	2009	2015	2021
Emerging Markets	**1.6**	**8.6**	**2.5**	**1.3**	**0.5**	**0.9**	**0.6**	**0.6**
Regional Equity	**71.0**	**60.8**	**55.6**	**54.4**	**91.4**	**79.8**	**82.7**	**77.8**
Africa	3.2	2.9	2.4	1.8	1.1	1.1	0.4	0.3
Asia	0.2	0.4	0.2	0.3	—	—	0.0	0.0
Asia ex-Japan	0.8	3.9	5.1	3.1	—	0.5	0.4	0.5
Australia and New Zealand	14.5	12.0	9.1	7.7	4.3	7.1	4.9	4.2
Canada	—	0.0	0.0	0.0	—	—	—	—
Europe Large Cap	2.3	0.4	1.2	0.5	0.2	0.1	0.4	0.1
Europe Small Cap	0.2	0.0	0.0	0.0	—	—	—	—
Greater China	0.7	11.3	10.5	14.9	19.8	34.3	32.1	23.6
India	—	6.6	6.9	12.5	—	0.6	0.7	3.7
Japan	43.9	5.8	7.9	4.3	65.1	25.3	39.3	42.1
Korea	3.2	8.9	6.3	2.1	—	2.3	2.9	2.0
Latin America	1.5	6.5	1.7	4.7	0.8	2.6	0.4	0.6
Malaysia Equity	—	0.9	1.8	1.0	—	0.2	0.0	0.0
Mexico	—	0.4	0.9	0.2	—	5.3	1.1	0.4
Thailand	0.6	0.7	1.7	1.3	—	0.2	0.2	0.2
UK Equity Large Cap	0.0	0.0	0.0	0.0	—	0.1	0.0	0.0
UK Equity Mid/Small Cap	—	—	—	—	—	—	—	—
Miscellaneous	**2.0**	**5.0**	**7.3**	**4.7**	**—**	**3.3**	**0.7**	**1.3**

Sources: Morningstar Direct; Invesco.

Active equity fund AUM in 1999 totaled $126.7 billion in the ROW, more than five times the AUM in equity index funds. Japan Equity accounted for the largest proportion, 43.9%, of active equity funds. On the active side, Global Large-Cap Equity funds contained 14.6% and Australia and New Zealand funds contained another 14.5%. Active sector equity funds in aggregate held 9.8%, concentrated in the Technology, Real Estate, and Communications sectors.

A decade later, at the end of 2009, the AUM of equity index funds domiciled in the ROW had grown to $155.9 billion. Regional Equity categories still accounted for the bulk of equity index AUM, but the underlying composition of the funds changed. Greater China Equity index funds now constituted 34.3%, up from 19.8% in 1999. In addition, the Greater China Equity index funds were predominantly domiciled in mainland China, not in Hong Kong SAR; and the majority of these funds were sold only in mainland China. The relative proportion of Japan Equity index funds dipped sharply—registering a market share of 25.3%, down from 65.1% 10 years earlier.

Active equity fund AUM in the ROW totaled $661.6 billion at the end of 2009, still more than four times greater than the AUM of index equity funds. Holdings of active Japan Equity cratered. In 2009, only 5.8% of all the active equity AUM was in Japan Equity, down from 43.9% in 1999. Indeed, even on an absolute basis, Japan active equity funds declined, from a level of $55.7 billion in 1999 to just $38.1 in 2009. The sharp decline in Japan active equity was offset by active equity fund gains in emerging markets, including Greater China, India, Latin America (6.5% up from 1.5%), and Korea (8.9% up from 3.2%). Real Estate also became a more popular category (6.2%) for active equity sector funds.

By 2015, the aggregate AUM of equity index funds domiciled in the ROW reached $364.1 billion. Japan Equity index funds regained the market share lead with 39.3%. The Greater China Equity index funds slipped into second place and accounted for 32.1%. In a distant third place was Global Large-Cap Equity with 7.9%. Real Estate sector index funds claimed a 5.7% market share.

Active equity fund AUM in the ROW totaled $786.9 billion at the end of 2015. There were no dramatic swings in the category compositions of active AUM in the ROW. Perhaps the most noteworthy change is in the Real Estate active fund category, in which the AUM of this sector fund category accounted for 12.8% of all AUM active funds—up sharply from a 6.2% share in 2009.

By 2021, the total AUM of equity index funds in the ROW had exploded to a level of $1.27 trillion. The AUM market share ranking of the top three categories of equity index funds remained in the same order as in 2015: (1) Japan Equity (42.1%), (2) Greater China Equity (23.6%), and (3) Global Large-Cap Equity (9.0%). In 2021, however, the Japan Equity index market share had grown to 42.1%, whereas Greater China Equity had slipped to 23.6% and Global Large-Cap Equity to 9.0%. The equity index share in the US Equity Large-Cap Blend category was not nearly as prevalent in the ROW (3.8%) as it was in Europe (22.7%) and in the United States (48.0%).

To summarize the findings regarding the distribution of active and passive investing across categories and regions (section 4.4): Japan led the world, as measured by aggregate AUM, in equity index investing in the late 1980s and early 1990s. By the late 1990s, US-domiciled equity index funds contained more AUM than equity index funds domiciled in either Europe or the ROW (including Japan). Yet, investors gravitated to a fairly narrow set of categories in equity index funds. In particular, the dominant category for equity indexing is US Large-Cap Blend, which at the end of 2021 contained about $5.5 trillion in AUM in funds domiciled around the world. The next biggest category was Global Large Cap with $1.9 trillion in equity index AUM. These two categories alone accounted for nearly 60% of the US-domiciled equity index and 47% of European index fund AUM, but only about 14% of the equity index in the ROW. In the ROW, equity indexing was concentrated in the Japan and Greater China categories.

Although sector equity funds proliferated during this period, their share of AUM accounted for less than 8.5% of worldwide equity index AUM—a level that has remained stable or shrunk slightly over the most recent 10 years. The Equity index AUM has grown the most in equity

index products based on broad and liquid swaths of equities. Narrower, targeted fund categories have not been growing in a relative AUM sense among equity index funds.

4.5. Active versus Passive Investing: A Direct Comparison

Now that we have briefly discussed some features of the distribution of categories within active equity funds, we will directly analyze the particular categories in which index investing may lead active investing, or vice versa, within equities. The data clearly show that equity index fund AUM have grown as a percentage of total equity fund AUM for many years. Indeed, for US-domiciled funds, the AUM of all equity index funds exceeded the AUM of all active equity funds in 2021. Yet, this high-level result does not reveal whether this is true for most equity fund global categories.

At a granular level, the evolution of the active versus index choice, a ratio of the aggregate AUM of equity index funds to aggregate AUM of active equity funds, within each global category is calculated on an annual basis. This ratio is easily interpreted. Values less than 1.0 mean that the aggregate AUM of index equity is less than the aggregate value of active equity (i.e., active equity investing dominates equity index investing in that category). Similarly, if the ratio has a value greater than 1.0, it means the aggregate AUM of index equity exceeds the aggregate value of active equity (i.e., equity index investing dominates active equity investing in that category).

For each of our broad global domiciles (the United States, Europe, and the ROW), this ratio is plotted for the 10 largest equity categories (as measured by the aggregate AUM of each category of equity index funds in 2021) from 1989 through 2021. For clarity, each of these exhibits is split into two panels—one for the five largest AUM categories (Panel A) and one for the next five largest categories (Panel B).

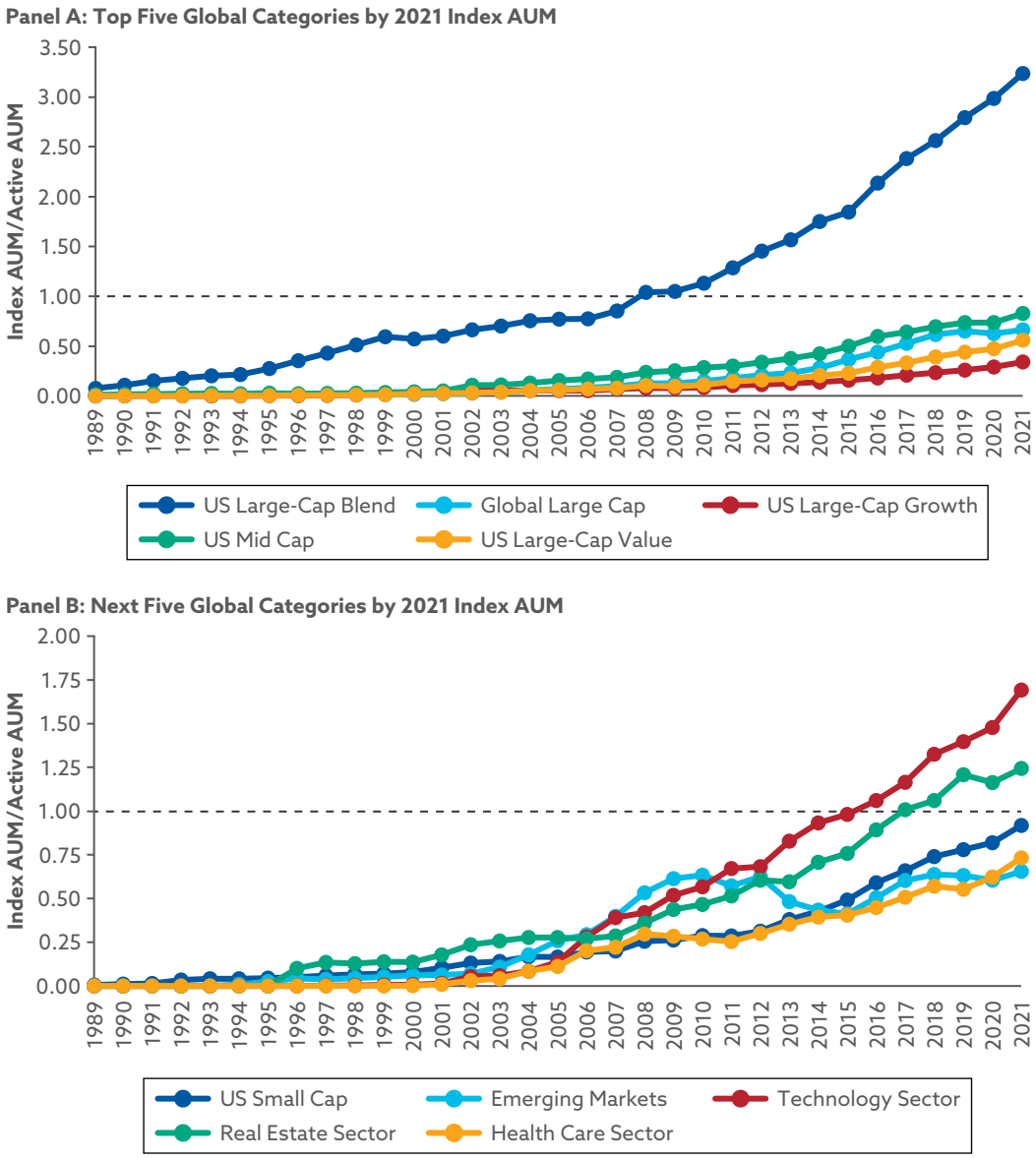
4.5.1. Index versus Active Equity AUM by Global Category: US-Domiciled Funds

For US-domiciled equity funds, the top five AUM global categories in 2021 (**Exhibit 35**, Panel A) were US Large-Cap Blend, Global Equity Large Cap, US Large-Cap Growth, US Mid Cap, and US Large-Cap Value. These five categories accounted for more than 80% of the total AUM of index equity domiciled in the United States in 2021. The US Large-Cap Blend category alone constituted 48%.

Before 2000, equity index assets were negligible relative to active equity assets in four of the top five categories, as seen in Exhibit 35, Panel A. Only in the US Equity Large-Cap Blend category did equity index funds have meaningful AUM relative to active equity funds in the 1990s. For example, in 1998, the aggregate AUM of equity index funds was about 50% of the value of the aggregate AUM of active equity funds.

After 2000, equity index funds grew relative to active equity funds in each of the top five categories. But, among these top five categories, only within the US Large-Cap Blend category did the AUM of equity index funds manage to surpass that of active equity funds. This threshold was crossed in 2008. Since then, the relative share of index equity over active equity has increased dramatically in the US Large-Cap Blend category for funds domiciled in the United States. By the end of 2021, there was 3.25 times the AUM in equity index funds as there was in active equity funds within the US Large-Cap Blend category.

Exhibit 35. Ratio of Index to Active AUM within Categories, US-Domiciled Equity Funds, 1989–2021



Sources: Morningstar Direct; Invesco.

Consider two other categories in the top five—Large-Cap Growth and Large-Cap Value. Like the Large-Cap Blend category, both of these categories focus on large-cap US equities. Although both of these categories witnessed an increase in equity index AUM relative to active equity AUM since the late 1990s, equity index AUM have not surpassed active AUM for either of these categories. As of 2021, for the US Large-Cap Growth category, the aggregate AUM of

active equity funds was nearly three times that of equity index funds ($2.14 trillion versus $0.73 trillion).

Investors continued to prefer active investing in the US Large-Cap Value category. At the end of 2021 in the US Large-Cap Value category, the AUM of active equity funds domiciled in the United States stood at $1.11 trillion compared with $0.62 trillion for the AUM of equity index funds. Although index equity has been growing, active equity still leads significantly within the US Large-Cap Growth and Value categories.

The funds in the US Mid-Cap category are a bit more eclectic and include some value and growth varieties. Morningstar further classifies US Mid-Cap equity funds into blend, growth, and value groups. The AUM of this category is dominated, however, by funds that would be considered mid-cap blend (e.g., Vanguard Mid Cap, iShares Core S&P Mid-Cap, Fidelity Mid Cap, and SPDR S&P Midcap 400). Although these subclassifications are not presented in a separate exhibit, in 2021 the equity index AUM in US Mid-Cap Blend funds exceeded that of active by a factor of about 4.5 times ($383 billion versus $85 billion). This ratio of 4.5 is even greater than the 3.25 ratio in the US Large-Cap Blend category. Conversely, active equity funds dominated equity index funds within mid-cap growth ($463 billion versus $220 billion in 2021) and mid-cap value ($257 billion versus $67 billion). This finding is similar to that in the large-cap space.

Global Large-Cap Equity is the one non-US category among the top five shown in Exhibit 35, Panel A, and the second-most popular category among index funds in 2021. Within the Global Large-Cap category, the AUM of active equity funds dominated the AUM of equity index funds, and this ratio appeared to have stabilized between 2017 and 2021. A deeper look at US-domiciled equity funds in the Global Large-Cap Equity category reveals a more nuanced picture. As with the US Mid-Cap category, Morningstar breaks out Global Large-Cap Equity funds into blend, growth, and value groupings. For Global Large-Cap funds tagged as blend, the AUM of equity index funds was about 1.75 times as much as the AUM of active equity funds at the end of 2021 ($1.18 trillion versus $0.68 trillion). Conversely, for Global Large-Cap funds tagged as growth, the AUM of active equity funds exceeded the AUM of equity index funds by a large multiple ($939 billion versus $25 billion). For US-domiciled Global Large-Cap Equity funds tagged as value, the AUM of active equity funds was far greater than the AUM of equity index funds at the end of 2021 ($269 billion versus $50 billion).

Looking at the top five global categories displayed in Exhibit 35, Panel A, for equity funds domiciled in the United States, investors currently show a distinct preference for equity index funds over active equity funds within blend (core) groupings. This is true for US Large-Cap, US Mid-Cap, and Global Large-Cap equities. However, active equity funds are preferred over equity index funds, often by wide margins, for equity funds tagged as growth and value. Again, this is true in the US Large-Cap, US Mid-Cap, and Global Large-Cap categories. Within the United States, we know that the AUM of equity index funds has overtaken the AUM of active equity funds. But this reflects the fact that blend funds contain more AUM than funds tagged as growth and value combined. Within growth and value categories, active equity is very much preferred.

The next five global categories, plotted in Exhibit 35, Panel B, are in categories that accounted for less than 20% of the total AUM of all US-domiciled equity index funds in 2021. Although the market share of equity index investing has been gaining over that of active equity investing in the US Small-Cap category, the AUM of active equity US Small-Cap funds still exceeded the AUM of equity index US Small-Cap funds in 2021 ($603 billion versus $553 billion).

Morningstar further breaks down US Small-Cap funds into blend, growth, and value groups. In the US Small-Cap Blend group, the total AUM of equity index funds by the end of 2021 was more than twice as great as the total AUM of active equity funds ($401 billion versus $192 billion). However, in the US Small-Cap Growth group, active equity AUM exceeded equity index AUM assets by a factor of more than four ($267 billion versus $62 billion). In the US Small-Cap Value group in 2021, active equity AUM also exceeded equity index AUM ($140 billion versus $90 billion). Like US-domiciled equity funds in US Large Cap, US Mid Cap, and Global Large Cap, equity index funds dominated active equity funds in the blend category of US Small Cap. However, active equity funds led equity index funds in the growth and value segments of US Small Cap.

The market share of index AUM in the Emerging Markets category in 2021 was at about the same level as it was at the end of 2009 and 2010, and active funds continued to be preferred. In 2021, the aggregate AUM of active equity funds stood at $454 billion, whereas the aggregate AUM of equity index funds was about $297 billion. From 2010 through 2015, the market share of index funds in Emerging Markets did dip, but it has mostly recovered and remained flat since 2018. For both Emerging Market and Global Equity funds domiciled in the United States, investors have shown a preference for active equity funds over index ones, and this preference has been stable for the past several years.

At the end of 2021, Technology, Real Estate, and Health Care index funds accounted for about 5% of all equity index AUM domiciled in the United States. In the Technology sector, equity index funds have overtaken active equity funds in terms of total AUM since 2016. As of 2021, equity index Technology sector funds contained about $237 billion AUM, whereas active equity Technology sector funds accounted for $140 billion. Most of the active equity Technology sector funds are available only in an open-end fund structure, whereas most of the equity index Technology sector funds are in the more recently developed ETF structure.

Interestingly, the prospectus benchmark for about 80% of the active equity Technology sector funds is stated as either the S&P 500 or S&P Total Market indexes, not a narrower Technology benchmark. According to data from Morningstar Direct, as of 2021, the AUM-weighted expense ratio for equity index funds in the Technology sector was about 24 basis points compared with about 91 basis points for active equity funds in the same sector. Also, the active equity Technology sector funds were available for sale only in the United States, whereas some of the very largest Technology sector equity index funds domiciled in the United States were available globally. Some of these facts may account for the greater AUM in Technology sector equity index funds by 2021.

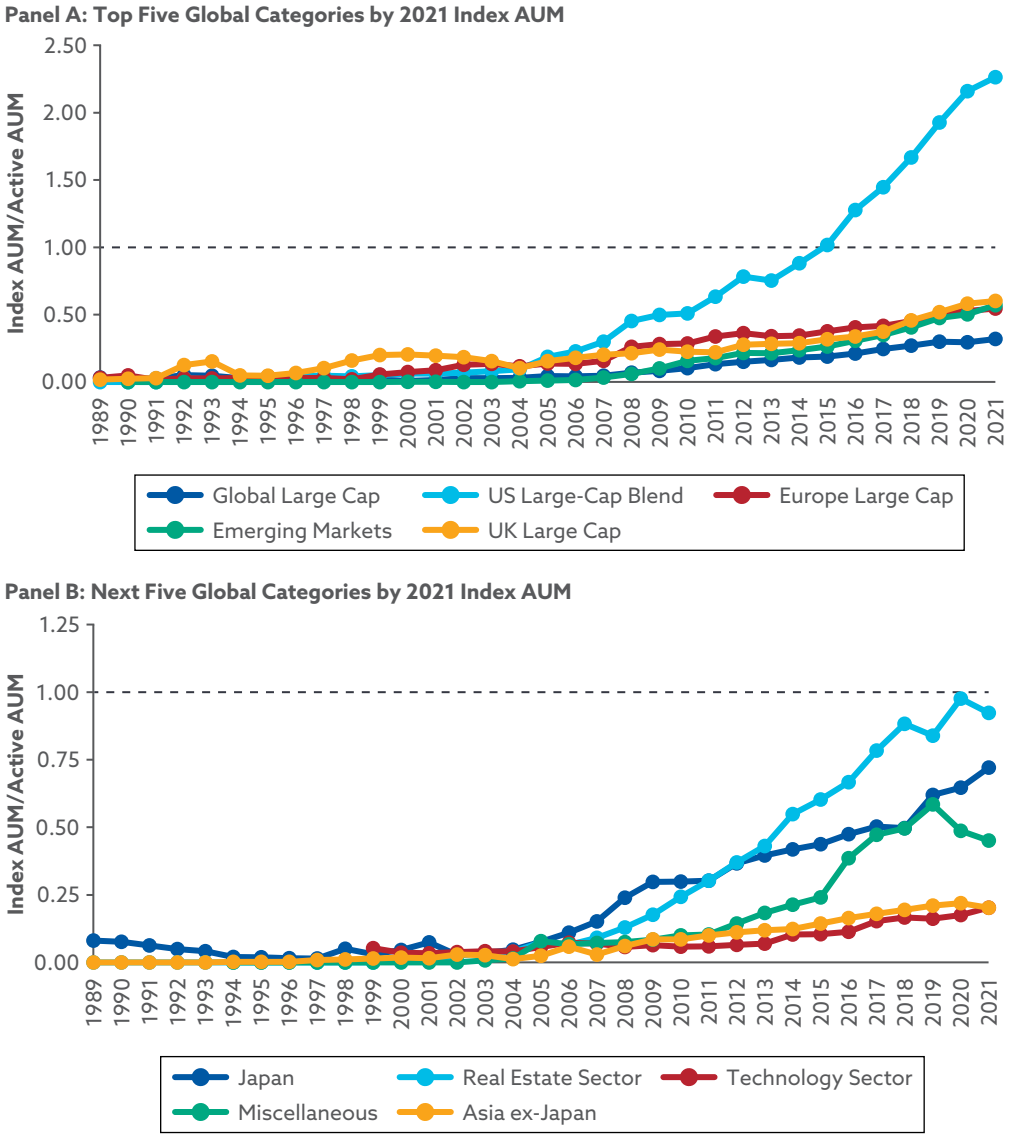
In the Real Estate category, equity index funds have also overtaken active equity funds in terms of AUM for equity funds domiciled in the United States. By the end of 2021, the aggregate AUM of equity index Real Estate funds stood at about $163 billion versus $131 billion for active equity. In 2021, the AUM-weighted expense ratio for Real Estate equity index funds was about 24 basis points compared with about 100 basis points for active Real Estate equity funds.

In the Health Care sector, the market share for equity index funds has grown but has not outpaced active equity funds at the end of 2021. We note that, in 2021, the AUM-weighted expense ratio for Health Care active equity funds was about 64 basis points, substantially less than in Technology and Real Estate active equity funds. The expense ratios for Health Care equity index funds, on an AUM-weighted basis, was about 22 basis points—a level similar to fees among the equity index funds in the Technology and Real Estate sectors.

4.5.2. Index versus Active Equity AUM by Global Category: European-Domiciled Funds

Turning our attention to Europe, the top five categories accounted for about 80% of the AUM of equity index funds in 2021. The two largest categories, Global Equity Large Cap and US Equity Large-Cap Blend, accounted for about 24% and 23% of the total, respectively. The most visually striking feature is the line representing US Equity Large-Cap Blend (**Exhibit 36**, Panel A). At the end

Exhibit 36. Ratio of Index to Active AUM within Categories, European-Domiciled Equity Funds, 1989–2021



Sources: Morningstar Direct; Invesco.

of 2021, equity index funds in the US Equity Large-Cap Blend category held about 2.25 times the AUM of active equity funds in this category. US Large-Cap Blend equity index funds domiciled in Europe contained about $512 billion, contrasted with $226 billion in the active equivalent. In Europe, equity index fund AUM in the US Equity Large-Cap Blend category surpassed the AUM in the active equivalent during 2015. Among the top five European-domiciled categories, only for US Equity Large-Cap Blend has the AUM index equity surpassed the AUM of active equity. Regardless of whether the fund domicile is in the United States or in Europe, investors have been choosing equity index products over active equity products for the US Equity Large-Cap Blend category.

For Global Large Cap, active equity funds domiciled in Europe contained more than three times the AUM of equity index funds ($1.71 trillion versus $0.54 trillion) at the end of 2021. If one delves a bit deeper, among Global Large-Cap equity funds tagged as blend, the AUM for active equity funds is still about 1.75 times that of equity index funds. This result contrasts with the dominance of index funds in the Global Large-Cap category domiciled in the United States and tagged as blend. But equity index funds are slowly gaining market share relative to active equity funds in the European Global Equity Large-Cap space.

In Europe Large Cap, index equity has been gaining market share relative to active equity. Yet, in 2021, active equity AUM exceeded equity index AUM by a substantial margin ($797 billion versus $435 billion). Although the aggregate AUMs are smaller, the categories of Global Emerging Markets and UK Large Cap graphed in Exhibit 36, Panel A, show similar patterns: Index equity has been gaining market share relative to active equity, but active equity still has more AUM than indexed equity in these categories.

The five smaller AUM categories in Exhibit 36, Panel B, made up about 10.6% of the aggregate AUM in all equity funds domiciled in Europe in 2021. In none of these five categories did indexing ever surpass active management in AUM between 1989 and 2021. The AUM of equity index funds in the Real Estate sector came closest to doing so in 2020; in that year, indexed AUM in this sector totaled $45.13 billion and active totaled $46.23 billion. In 2021, this gap widened again in favor of active equity.

The picture painted by European-domiciled equity funds is very clear on the active versus index question: Active equity is the revealed preference over index equity, not only overall but also at the more granular levels. The one important exception to this pattern is found with US Large-Cap Blend funds domiciled in Europe: The AUM of US Large-Cap Blend equity index funds is 2.25 times that of the active equivalent in 2021. In all the other major equity categories—Global Large Cap, Europe Large Cap, UK Large Cap, Global Emerging Markets, Asia Equity (Japan and Asia-ex Japan)—active equity funds dominate equity index funds in terms of AUM for European-domiciled funds.

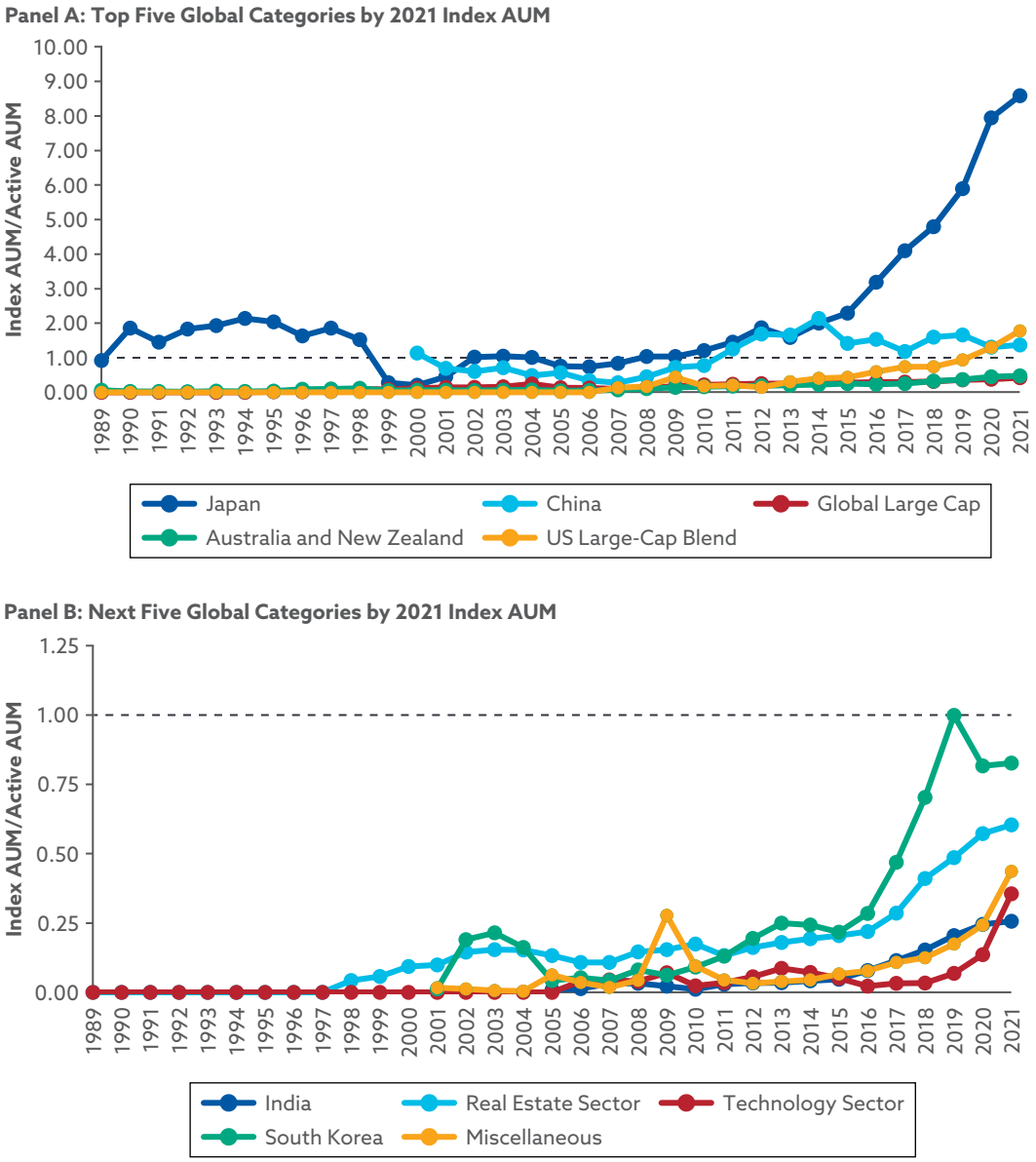
4.5.3. Index versus Active Equity AUM by Global Category: ROW-Domiciled Funds

Index equity and active equity data from funds domiciled in the ROW may challenge popular beliefs about the evolution and adoption of the passive or indexed approach. From 1989 through 1994, equity index funds domiciled in Japan had more AUM than equity index funds domiciled in the United States.

In 2021, ROW-domiciled Japan Equity index funds constituted approximately 42% of the AUM of all ROW equity index funds. The preference for index funds in that sector also prevailed for most

of the 1990s. Indeed, as **Exhibit 37**, Panel A, presents, in 12 of the 19 years between 1989 and 2007 in the ROW, the AUM of Japan Equity index funds exceeded the AUM of Japan active equity funds. Since 2008, index funds have gained tremendously in relative AUM among ROW-domiciled Japan Equity funds. As of 2021, the AUM of Japan Equity index funds domiciled in the ROW was about 8.5 times that of active equity funds ($560 billion versus $63 billion). Focusing on equity

Exhibit 37. Ratio of Index to Active AUM within Categories, ROW-Domiciled Equity Funds, 1989–2021



Sources: Morningstar Direct; Invesco.

funds domiciled in Japan, the AUM of Japan Equity index funds is almost 10 times as large as the AUM of Japan active equity funds as of 2021 ($538 billion versus $55 billion).

In the Japanese market, it appears that indexing almost completely dominates the Japanese equity investing landscape. Indexing has nearly squeezed out active management in that sector. The Japanese data confirm that caution should be exercised when trying to generalize results from one sector to inform the active versus passive debate, because the results can be very different in different regions of the world.

Greater China Equity index funds domiciled in the ROW constituted about 24% of the AUM of all ROW equity index funds, the largest category other than Japan Equity. For the first decade of the 2000s, the AUM of equity index funds in the Greater China category was less than the AUM of active equity funds in that category. Active equity funds increased their market share of Greater China Equity until 2007, at which point the trend reversed. By 2011, ROW-domiciled equity index fund AUM surpassed the active equity AUM for this category and has remained slightly ahead ever since. Interestingly, the market share for Greater China Equity index funds relative to active equity funds was about the same in 2021 as it was in 2011.

In 2021, the AUM of Greater China Equity index funds domiciled in the ROW totaled $301 billion compared with $220 billion in active equity funds in the same category. The number of equity index products in the Greater China Equity category grew to almost 1,100 by 2021. Most of these products are domiciled in mainland China, invest in mainland Chinese equities, and accounted for $250 billion of the $301 billion. Isolating Greater China Equity funds in the Large-Cap Blend group, index funds contained more than four times the AUM of active funds ($63 billion versus $14 billion). In contrast, the Large-Cap Growth grouping was strongly tilted toward active equity funds ($58 billion versus $21 billion for index).

Some equity funds domiciled in the ROW are in the US Large-Cap Blend category. Since 2020, the AUM of ROW-domiciled US Large-Cap Blend index funds has exceeded the AUM of active funds in the category. At the end of 2021, the AUM of index and active equity funds in this category stood at $48 billion and $27 billion, respectively. Thus, the US Large-Cap Blend category was the only one in which index fund AUM exceeded active fund AUM in each of the three broad regional domiciles analyzed in this study (United States, Europe, the ROW) as of 2021.

Exhibit 37, Panel B, plots the ratio of equity index AUM to active equity AUM for the next five largest categories of Global Equity funds domiciled in the ROW. (Note that the y-axis scaling used in Panel B is different from the one used in Panel A.) For equity index funds domiciled in the ROW, these five categories together account for about 13% of the total ROW equity index AUM and sum to $165 billion in 2021. Although equity index AUM has been gaining market share compared with active equity, active equity still dominates indexing in this group. In 2021, none of these global categories had more AUM in index equity than in active equity.

For equity funds domiciled in the ROW, the equity index versus active equity evidence suggests a mixed bag. Within the Japan Equity and Greater China Equity categories, equity index funds have dominated active equity funds in terms of AUM for a decade. This domination has become extreme in the case of Japan Equity. By 2021, US Large-Cap Blend funds domiciled in the ROW also joined Japan Equity and Greater China Equity in having more AUM in index than in active funds. But in the 7 other categories of the top 10 analyzed here, active equity far outpaces index equity in terms of 2021 AUM, although equity indexing has been gaining some market share.

5. UNDERSTANDING THE FUTURE OF ACTIVE AND PASSIVE INVESTING

In Chapters 3 and 4, we documented both a high level and detailed view of the current state of active and passive investing. This state did not occur randomly. Rather, it reflects a profound change in asset management theories and technology between 1952 and the present, as well as changes in the supply of and demand for active and passive management skills. But the current state of active and passive investing is also built on economic innovations that predated 1952 by about 180 years. We believe that inescapable economic forces will continue to profoundly shape the active versus passive debate and, more generally, the evolution of the asset management industry.

Although today's active and passive funds differ in many dimensions, they have at least one thing in common: They are both funds (i.e., pooled investment vehicles). A pooled investment vehicle combines the financial resources of multiple investors into one investment entity. Pooled investment vehicles have existed for nearly 250 years. One of the earliest records of a pooled investment fund comes from an enterprising Dutch merchant and broker in Amsterdam named Abraham van Ketwich, who perceived an opportunity to offer small investors the chance to gain exposure to a diversified pool of investments in Austria, Denmark, Germany, Spain, Sweden, and Russia as well as in colonial plantations in Central and South America.[5]

In 1774, van Ketwich solicited subscriptions (certificates of partial ownership) to a trust labeled "Eendragt Maakt Magt," which translates in English to "Unity Creates Strength," a motto used by the Dutch Republic. Van Ketwich's innovative trust came at an opportune time, on the heels of a financial crisis—the financial credit panic of 1772–1773. The crisis involved the failures of interconnected Dutch merchant bankers, such as Clifford's, which suffered substantial losses because of outsize (and directionally wrong) exposure to the British East India Company. The appeal of diversified exposures struck a chord; prudent investing necessitated spreading monies across a variety of different securities, and van Ketwich appealed to this sentiment. The pooling of the monies of individual asset owners into one investment vehicle allowed the trust to scale in size and achieve its diversification objective. Furthermore, the trust provided access to investment opportunities that otherwise would have been inaccessible to many. This early trust also separated the investment management function from the brokerage function; van Ketwich benefited by facilitating the trades.

"Unity Creates Strength" is ultimately a play on an investment theme that provides investors access to diversification and to the benefits of economies of scale. Today, funds that we label "active" and "passive" have both relied on access and economy of scale arguments. That is, regardless of a fund's investment objective, funds have been constructed and sold on the premise that investors can access better risk-and-return opportunities at lower costs if they pool their assets rather than by building custom portfolios separately and individually. The gains from pooling might be driven by advantages in trading, research, operations, custody, oversight, regulations, distribution, or access. The gains and cost advantages from pooling have presumably exceeded the potential benefits of customization. Indeed, pooled investment funds are implicitly predicated on the view that low-cost customization is not economically feasible or practicable.

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[5]Rouwenhorst (2004) provides a detailed and intriguing history of mutual funds and how their evolution influenced capital markets.

Note that the creation of pooled investment vehicles that diversify risk came before—in fact, centuries before—the notions of "active" and "passive" investing. Indeed, the economy of scale rationale for pooled funds is so fundamental that it can be easily overlooked and its foundational role ignored.

The Eendragt Maakt Magt trust of 1774 combined key elements of a successfully launched, innovative financial product:

1. The ability of asset managers to create an economically viable, trustworthy investment vehicle that provided investors with access to securities with well-specified investment objectives; and
2. The desire of asset owners to actually own this vehicle in their portfolios.

Yet widespread adoption of innovative financial products is neither guaranteed nor instantaneous. Indeed, it was not until the second half of the 19th century that closed-end investment trusts like Eendragt Maakt Magt spread beyond the Netherlands to London and the United States. In this era, pooled investment vehicles typically had a closed-end structure in which a fixed number of shares were issued. The repurchase of such shares, if permitted, was not necessarily completed at a price equivalent to the value of the underlying securities in the fund. This structure remains common in private equity and private debt funds.

Van Ketwich's trust created a pooled vehicle that made diversification accessible and affordable to a broader group of investors. Some 150 years later, in 1924, the newly formed Massachusetts Financial Services company created another vehicle that appealed to asset owners—the open-end mutual fund. The Massachusetts Investors Trust added a feature to pooled vehicles that investors found desirable, namely liquidity. In the open-end structure, the investment company can issue and redeem shares in the fund at a price that closely reflects the underlying value of the investment portfolio, the so-called net asset value (NAV). This was different from the method by which closed-end funds could be converted to cash, in which case investors would have to find a buyer for their shares in the open market and would often have to sell at a notable discount to NAV.

With the advent of the open-end mutual fund, asset owners now had the ability to buy or sell shares in the fund easily and at fair market value. This new structure provided both diversification and liquidity. Again, investor adoption of this innovation did not happen overnight. In 1929, there were only 19 open-end mutual funds as opposed to approximately 700 closed-end funds. In the mid-1940s, the assets under management (AUM) in open-end funds first exceeded those in closed-end funds. The number of open-end funds did not exceed the number of closed-end funds until the 1950s. The success of open-end funds was ultimately driven by economy of scale arguments, supported by such considerations as trading, research, and administrative costs. For most investors, the liquidity provisions of open-end funds proved to be a compelling reason to use them.

5.1. The Beginning of the Active versus Passive Debate

Diversification and liquidity, although desirable, do not translate directly to investment performance. Before 1960, for funds domiciled in the United States, the Dow Jones Industrial

Average (DJIA) was a commonly accepted yardstick against which investment performance was often compared. The rationale for investment company management of funds was succinctly put by Arthur Wiesenberger: "A group of professional investors, working full-time and with extensive research facilities, should be able to handle a fund of money better than most individual investors" (1943, p. 5).

Then, in 1960, Edward Renshaw and Paul Feldstein published an article titled "The Case for an Unmanaged Investment Company" in the *Financial Analysts Journal*. This article challenged the view that professional advice and management by investment companies are worth the price investors pay for such services. They pointed out that, over the 1947–1956 period, only 11 out of 89 diversified stock and balanced funds in Wiesenberger's data had percentage gains greater than the DJIA (and the DJIA calculations did not include dividends). In the spirit of this finding, other studies by the US Securities and Exchange Commission (SEC) and the American Institute for Economic Research over different time periods also noted that investment company fund performance was not typically superior to that of a representative average or common stock index.

Renshaw and Feldstein threw down a gauntlet that reverberates to this day: Would investors be better served by an unmanaged investment company? What Renshaw and Feldstein meant by an unmanaged investment company was a fund that tracked some type of representative market average or index, or what we now know as an index fund. Such a fund would, they argued, provide investing outcomes that most investors would consider acceptable. Renshaw and Feldstein concluded their 1960 article perplexed by the question of why an unmanaged investment company did not yet exist. Although they didn't have the answer to their question at that time, their question was prescient and foreshadowed another powerful pivot in the evolution of pooled funds.

The Renshaw and Feldstein assertion that an unmanaged investment company might be at least as good as an investment company that managed assets did not go unchallenged. John B. Armstrong, the pen name of none other than John C. Bogle, authored "The Case for Mutual Fund Management," also published in the *Financial Analysts Journal* in 1960. Armstrong strongly argued that fund performance comparisons with market averages, such as the DJIA, were not apples-to-apples comparisons. The hypothetical performance of market averages was not adjusted to reflect costs that would be associated with brokerage expenses paid by the fund that are caused by turnover in the constituent members of the average—such expenses are unavoidable—or by the drag in performance caused by the need for a fund to hold cash or other annual operating expenses. Stated differently, according to Armstrong (1960), the DJIA was not a fund; it was a hypothetical "paper portfolio" with none of the previously mentioned costs and frictions.

In addition, Armstrong noted that three of the "four pioneer mutual funds" with 30-year track records from January 1930 through December 1959 reported total percentage increases greater than those of the DJIA. Armstrong also argued that one should compare funds with volatilities similar to or greater than the volatility of the DJIA—a subtle point that many authors may not have considered in 1960.[6] Based on this subset of funds over the 1950–1959 period, Armstrong concluded that fund performance "has been outstanding" (1960, p. 34).

[6]The way Armstrong (i.e., Bogle) describes volatility is more akin to the notion of beta than standard deviation.

We contend that the active versus passive debate effectively began in 1960 with this exchange by Renshaw and Feldstein, on the one hand, and Armstrong (i.e., Bogle) on the other. Of course, the debate was originally framed as the case for managed versus unmanaged investment companies. Note that none of these authors argued that the DJIA was the best reflection of "the market," but all agreed that a better and more representative market index was needed. It is one of the great ironies in the history of asset management that Bogle, who would go on to found the world's largest index fund firm, initially advocated for managed investment companies or, in today's terms, active management.

5.2. Finance Theory and Investment Practice Converge

Challenges to managed investment companies continued in the 1960s following the 1964 publication of the capital asset pricing model (CAPM) by William Sharpe and others. For example, in a study of 115 mutual funds, Jensen (1968) reported that managed funds did not, on average, achieve superior beta risk-adjusted returns (i.e., alpha). Moreover, the 115 funds, on average, did not outperform a buy-the-market-and-hold strategy. Jensen's analysis suggested that the outperformance of any one individual mutual fund could not be distinguished from random chance. Fama's (1970) review of efficient capital markets only added to the skepticism about funds achieving superior returns because, according to Fama, security prices fully reflected all available information. Academic evidence, both theoretical and empirical, seemed to be piling up against the view that an appropriately risk-adjusted representative average or common stock index could be reliably outperformed.

From a practitioner's point of view, one of the innovations of the CAPM was that it specified, in theory, what the optimal definition of "the market" should be. In the CAPM, the market was a market-capitalization-weighted average of all risky assets. This definition aligned more closely with the S&P 500 Index methodology than it did with the DJIA approach, which began as a simple price-weighted average of securities. From an investment company's perspective, a capitalization-weighted index is the easiest and lowest cost type of stock market index to track in an index fund. Once index holdings are identified and investment proportions are initially set, constituent weights automatically adjust both to ordinary price changes and to corporate actions, such as stock splits. This is not true of any other weighting scheme, for which constant rebalancing because of price changes is required. Other than to issue new shares of the fund, redeem existing shares, or make changes in the index constituents, turnover and trading costs should also be minimal for a cap-weighted index.

The advances in 1960s computer technology (IBM mainframes), the availability of stock market data in computer-friendly formats, and the acceptance of a capitalization-weighted index like the S&P 500 as a "good" market index breathed life into the Renshaw and Feldstein vision for an unmanaged investment company. The investment offering of such a firm would eventually be known as an index fund. The world's first engineered index fund was developed at Wells Fargo Bank in the early 1970s under a team supervised by John "Mac" McQuown; however, the fund was designed only for institutional investors. Because it was not an SEC-registered pooled vehicle, it was not available to the general retail public.

As a result, the honor of having developed the first index fund went to John Bogle, the founder of Vanguard, who persuaded the board to let him run an unmanaged fund. That fund,

the Vanguard First Index Investment Trust launched in August 1976, aimed to track the S&P 500 Index while minimizing investor fees. At launch, the fund had gathered only $11.3 million in assets. Undoubtedly, Bogle's quest to minimize investor fees was aided in May 1975 by the abolition of fixed-rate stock commissions in favor of competitive brokerage rates. Between its launch and 1989, the starting point of our empirical analyses presented in Chapters 3 and 4, the fund experienced an annualized growth rate of about 50%, but this translated into only about $1.8 billion in AUM, hardly an overwhelming commercial success.

The launch of S&P 500 stock index funds supercharged diversification in liquid, pooled vehicles available to investors, both large and small. Although the S&P 500 led the way, broader index funds were developed that provided asset owners with access to more securities as well as to securities traded in different regions of the world, as reflected in indexes such as the MSCI World (launched in 1986) and MSCI All Country World Index (ACWI; launched in 2001). Investors increasingly embraced unmanaged index funds, which came to be referred to as passive funds. Like van Ketwich's Eendragt Maakt Magt trust of 1774, these funds offered asset owners exceptional diversification in a pooled vehicle. Unlike the trust of 1774, the modern-day funds offered asset owners much better liquidity and at a very low cost. Low cost has been a pillar of the most successful broadly diversified stock index funds. Indeed, as of 2023, a review of Morningstar and prospectus data shows that the expense ratio (management fees plus other expenses) associated with holding a share of an S&P 500 index fund was at least 80% lower than it was in 1989 and is now approaching zero.

The development of exchange-traded funds (ETFs) in the 1990s offered an alternative pooled format to open-end mutual funds. In the United States, the first ETF was the SPDR S&P 500 Trust ETF (SPY), launched in 1993 by State Street Global Advisors.[7] Unlike open-end mutual funds, ETFs offered intraday liquidity so investors could buy and sell the fund just like an ordinary stock at any time during market hours, as opposed to once per day with open-end mutual funds. Also, ETFs offer significant tax efficiency advantages that result from the creation or redemption process. Furthermore, index ETFs can be used for hedging purposes (you can sell them short). ETFs have been popular with investors for a variety of reasons. Nonetheless, index ETFs and index open-end mutual funds share critical common features. Namely, they both provide investors with broad diversification in liquid pooled vehicles that are relatively easy to buy and sell. Furthermore, the performance of unmanaged index funds of either kind—ETFs or open-end funds—often compares favorably with actively managed funds.[8]

5.3. Technology Enables Customization

Labeling broadly diversified index funds as "unmanaged" minimizes the operational challenges associated with implementing a fund that closely matches the performance of an index. In fact, managing an index fund is very much an active endeavor. The asset manager of an index fund may not need to invest resources in determining the security weights of an index and may license them from an index provider. However, the asset manager of an index fund does need to buy and sell securities in a market, and that is where trading technology and savvy matter a lot.

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[7]SPDR stands for Standard & Poor's Depositary Receipt. The SPY is a passive ETF that tracks the performance of the S&P 500 Index.

[8]For example, S&P reported that 93% of large-cap US funds underperformed the S&P 500 Index over the 15-year period ending in 2022.

Clearly, tracking a capitalization-weighted index helps in limiting transactions, since day-to-day fluctuations in prices will not typically trigger trades. Furthermore, the proportion of an index fund's AUM traded in a given day will usually be small. But such events as purchases or redemptions of index fund shares, or additions and deletions to the index, may very well trigger transactions in the underlying securities of the fund.

The term "tracking error," meaning deviation of the fund's returns from the index returns, emanated from the world of index funds. Apart from considerations of diversification, liquidity, and low cost, investors tend to gravitate toward index funds that have virtually zero tracking error relative to the underlying index—that is, index funds that meet their investment objective. In certain asset classes and geographic locations, near-zero tracking error is not always possible, but it is an ideal toward which the fund manager strives.

Technology and competition have relentlessly driven down the costs that investors have to pay for index (and active) funds, and we believe these forces will continue to upend the asset management industry. We believe that we are near the beginning of a sea change in the asset management industry. The active versus passive debate has raged for more than six decades, but our view is that the distinction between "passive" and "active" management will begin to fade, if not become irrelevant. With the benefit of hindsight, we are tempted to characterize the past five decades (starting in 1976) as the era of "low-cost, widely available, broad, pooled diversification." This diversification was delivered in the form of pooled index funds, either ETFs or open-end mutual funds. Pooling gave many investors access to a broad array of securities, allowed economies of scale in operations, drove down the final cost of investing, and increased the returns ultimately received by the end investor.

Our thinking is that the next phase in the evolution of asset management, which will be driven by advances in technology and concomitant decreasing costs, will see investment companies evolve from providing asset management as a product to offering asset management as a service. The winning asset management firms from this point forward will be those that can successfully market to and engage with investors in developing low-cost customized solutions.

Investors will continue to desire diversification, liquidity, and competitively low fees. But they will increasingly be able to invest through customized, separately managed accounts that will better cater to their individual needs and requirements. These types of accounts are not new, per se—they've existed for large institutional investors and ultra-high-net-worth individuals. But with continuing advances in technology, investment modeling, and portfolio construction algorithms, we believe that customization will become increasingly prevalent across very large swaths of retail and institutional investors.

Investors will continue to embrace the well-diversified portfolios that Markowitz and other academics have long advocated. This may mean, however, that investors will hold fewer funds and significantly more (hundreds or even thousands) individual securities in their own portfolios. Such a structure will better allow investors to achieve outcomes tailored to their specific needs and preferences. This will not happen overnight or, perhaps, not even within the intermediate term. But we do see the march along this path beginning. Asset managers and advisers who do not develop the capabilities, tools, and skills to help investors reap the benefits of customization will be disrupted and disappear.

Customization will allow asset owners to attain more desirable outcomes measured both in terms of wealth and in terms of personal preferences and beliefs. For taxable investors, the current low-hanging fruit on the wealth side of the customization equation is optimizing after-tax returns by managing and offsetting gains and losses. Current tax codes could change, however. Our view is that customization is much more than a way to utilize current tax codes to minimize investor tax liabilities. Taxable as well as nontaxable accounts will benefit from the flexibility to surgically alter exposures to different securities, industries, sectors, characteristics, investment horizons, liquidity features, and varying risk metrics. Currently, the desire for customization has been partially met as firms have created more narrowly focused passive funds and ETFs. The next level of customization will continue this trajectory as more investors are able to access customized investment solutions.

It may seem ironic that the next evolutionary step in investment management following passive indexing is active customization. After all, indexing captured substantial business from investment companies that claimed expertise in stock picking. And isn't stock picking just one type of customization? Obviously, yes, but the previous shift to indexing was due to questioning the value of active security selection. Investors today are much more open to the application of financial engineering techniques to allow for the consideration of their specific needs and preferences.

That said, the next generation of customization must deliver better outcomes and better value to the investors. In other words, customization must be smart. By "smart," we mean total portfolio solutions that are economically efficient, theoretically sensible, and accurately reflective of the distinct needs and preferences of individual investors. Smart customization will take many different forms. In our view, full implementation of smart customization will be reached when highly diversified, separately managed accounts (SMAs) are ubiquitous among all investors, when investor accounts are exclusively populated with individual securities (and select active funds), and when asset management firms can offer such services at a profit. Such an idealized state may never be fully attained. However, the march toward such a state has already begun and will likely accelerate as technology continues to drive down costs and enhance customization capabilities.

5.4. Customization Is Active Management

By definition, smart customization is a move away from the one-size-fits-all solution of the CAPM model developed in the 1960s. That solution was one in which the risky portion of all investors' portfolios was the capitalization-weighted market portfolio of all risky assets. Some index instruments that have begun to deliver on smart customization have already been developed and embraced. Customization necessitates slicing and dicing the universe of all securities by different criteria and then weighing those securities such that the constituent weights of an investor's portfolio ultimately differ from those of the overall market.

A simple way to slice and dice the universe of securities is to classify them based on transparent and easy-to-observe security characteristics. Perhaps no characteristic is more easily observed and transparent than the country in which a security is listed. Not surprisingly, classifying securities into country groupings was a very early slice. Similarly, identifying securities for country-based index funds was a relatively undemanding endeavor for asset management companies. Developing the implementation and trading infrastructure to offer these funds is a heavier lift, but it highlights the distinct expertise offered by asset managers. Single-country

index funds were created for countries around the world, such as the United States, Canada, the United Kingdom, Japan, Australia, Brazil, Singapore, Mexico, and India, among many others. Country index funds, like the "market portfolio," tend to be market capitalization-weighted. These are not considered active because the asset manager is not expressing any over- or underweights relative to the capitalization weights.

Yet, the mere existence of country index funds illustrates how the distinction between active and passive investing can be obscured. The raison d'être for a single-country index fund must be that some investors, for any number of reasons, want to overweight or underweight a country relative to the global market index. This is effectively an active decision. Ironically, active views are often implemented, at least in part, by using these passive country index funds.

At a somewhat higher level of aggregation, some investors may prefer to express views on a region rather than an individual country; for example, rather than articulating preferences among countries, such as the United Kingdom, Germany, France, Italy, and the Netherlands, one could hold a nonmarket weight (above or below the market weight) in a European index fund. Country and regional index funds are simple tools that illustrate the desire to customize and actively manage portfolios. Of course, even these simple country and regional tools, in their current pooled-vehicle formats, may not offer the diversification and customization that investors ultimately desire. Investors tend to focus on large-capitalization companies because of concerns about the scale of the pooled-vehicle product and liquidity concerns around product size.

Other pooled-vehicle customization tools have been designed based on the level of development (both economic development and capital market sophistication) of the country in which a security is domiciled. A security's country domicile, per se, is easily identified. Commercial firms, such as MSCI and S&P, currently classify countries into four market types: developed, emerging, frontier, and standalone. (Standalone markets, a relatively new category, are markets that do not fit well into the other categories because of newness or recent deterioration of market conditions.)

These classifications are not as straightforward or transparent as country domicile. Market-type classifications depend on a host of conditions that include the legal, institutional, and political environments; market size; infrastructure; accessibility; and liquidity. The assessments of these conditions are more subjective than country domicile, as shown by the fact that MSCI and S&P do not always fully agree on the placement of countries into these four groups. Nonetheless, the development of these classifications led to the creation of other index products that allowed investors to slice and dice and reassemble their portfolios in customizable ways. One might view index products based on region or market type as tools that enhance the ability of investors to shape, at least in a rough way, the risk–return profile of their portfolios. Of course, weighting these index funds in a portfolio is active portfolio management because the underlying security weights will differ from the weights of a global market cap-weighted index. Index products defined by region and market type are relatively simple ways to allow investors to partition and actively tilt their portfolios.

Other partitions have allowed investors to shape portfolios along different dimensions. Partitions based on the economic activity of companies are also offered by asset management firms. For example, broad-based sector index funds, often constructed using the Global Industry Classification Standard (GICS), can be used to customize an investor's portfolio. Some narrower industry index funds have also been created. Region, market type, and economic sectors were among the first dimensions that index products have targeted since the turn of this century.

Of course, active managers also offer funds partitioned along these dimensions, but active managers, by definition, offer tailored portfolio funds, not a cap-weighted (passive) exposure to the dimension.

The point is that index asset managers have been trying to satisfy the demand for low-cost customization by offering narrower, niche index funds. Although these funds are nowhere near as large in terms of AUM as US Large-Cap Blend funds, they clearly illustrate that even investors who focus on minimizing fund fees often seek to form active portfolios—that is, portfolios that differ from the world market index.

Within pooled-vehicle formats, complexity also plays a role in the acceptance and adoption of funds. The country domicile of a security is not a complex concept. Regions composed of individual countries are easily understood.[9] Market type as defined earlier (developed, emerging, frontier, and standalone countries) requires further analysis and is more complex, but different analysts often reach the same conclusions. The classification of firms based on their products and services into economic sectors and industries involves more complexity and analysis; even the categories into which companies are classified change over time with changes in production technology and consumer demand.

Investors have embraced investment products that are index-like (the stock weights are market-cap weights) but are based on more complex, albeit intuitive, stock classification methods. One of the most broadly accepted of all the "complex but intuitive ideas" in asset management (at least in equities) is the notion of a growth stock versus a value stock. At the end of 2021, growth and value index products contained more than $1 trillion in AUM. Yet the precise method of assigning a firm to a growth or value grouping varies with the index provider and is a topic of controversy even though the "growth" and "value" classifications seem straightforward and intuitive.[10] Value- and growth-tilted index funds are now arrows in the quivers of investors, as are tilts toward large- or small-capitalization stocks. Once again, specialized index products such as these are now part of the toolkit for active portfolio management.

5.5. Information, Complexity, and Adoption

The shift from simplicity to complexity within the pooled-vehicle fund space has allowed for even greater customization options—and more abstraction. The more abstract customization tools are often based on factor models. These abstractions usually employ quantitative techniques for both security selection and portfolio construction. Common factors in stock returns (hereafter just "factors") represent either risk premia or anomalies in asset pricing.

Factor index funds offer investors the opportunity to exploit these premia or anomalies. As discussed in Chapter 4, these index funds are often labeled "smart beta," or "strategic beta" in Morningstar's nomenclature. Yet, factor index funds have not been widely embraced. For example, at the end of 2021, index funds classified as quality (which is a recognized equity factor) by Morningstar had accumulated only $107 billion in AUM across all domiciles. Momentum factor index funds had gathered only $37 billion by the end of 2021.

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[9]Of course, simplicity alone does not guarantee widespread adoption. In Chapter 3, we documented the decline in popularity of country and regional index funds over time.

[10]For example, see the MSCI Global Investable Market Value and Growth Index Methodology (May 2023). www.msci.com/index/methodology/latest/GVG.

Portfolio construction algorithms have also been used to create strategic beta index funds. Low-volatility funds, such as the iShares MSCI USA Min Vol Factor ETF and the Invesco S&P 500 Low Volatility ETF, are popular. Yet, on a worldwide basis, risk-oriented strategic beta equity index funds accounted for only $86 billion at the end of 2021.[11] These advanced customization tools are not nearly as widely understood or accepted as those based on more intuitive concepts, such as growth, value, and dividend yield. Complex ideas, even if elegant and well-grounded in scholarly research, have only had limited appeal within pooled-vehicle index funds.

In our view, the biggest challenge and threat to pooled-vehicle index funds comes from the rise of direct or personalized indexing in conjunction with SMAs enabled by advances in technology that have continued to lower the costs of customization.[12] Direct indexing, however, appears unlikely to fully supplant all pooled-vehicle index funds. After all, a direct or personalized index might consist of some combination of existing index funds or individual securities that are rebalanced periodically. Indeed, this is an approach that many registered investment advisers and institutional asset owner consultants take with their clients. But the rise of direct indexing clearly reflects the desire of investors to customize solutions.

Ultimately, we believe that investors' desires for customization and flexibility will diminish the demand for pooled funds. Just as investors' preferences for liquidity eventually ended up dominating the fund landscape, so too do we envision investors' preferences for individualized flexibility overtaking the constraints imposed by pooled-vehicle structures. We first saw this evolution in preferences when open-end funds squeezed out most closed-end funds. We are now seeing this again as the even more liquid ETF format seems to be strangling the open-end fund format. Going forward, the desire for flexibility and customization is likely to see SMAs and direct indexing becoming a much larger portion of the investing landscape.

This flexibility does not mean that investors will abandon the insight of modern portfolio theory, but it does mean that the practice of portfolio management will change meaningfully. For example, suppose a taxable investor chooses to use the S&P 500 Index as their benchmark target portfolio. Rather than buying one security, an S&P 500 ETF, an investor works with an asset manager to purchase positions in most, if not all, of the 500 underlying equities that make up the index in proportion to their index weight. (This step is called direct indexing.) With the advent of fractional share trading and custody as well as low trading costs, one does not need mega wealth to replicate index exposures with individual securities in an SMA. With the passage of time, some of the underlying securities will have gains and others will have losses, at least on paper. A taxable investor, with the aid of asset managers informed by analytics, computing algorithms, and other intellectual property, will be able to judiciously realize gains and losses to maximize after-tax returns while still closely matching the performance of the S&P 500. These strategies are not new but will be extended to a much broader range of investors.

[11]This number includes several funds that deliberately seek high beta rather than low volatility.

[12]Coates (2023) points out that the concentration of ownership for the largest index funds in the United States might violate current anti-trust regulations regarding ownership and control. Ackerman (2024) reports similar concerns regarding ownership of US banks by the largest index funds.

Even without taxes to consider, investors will have a much greater ability to express their investment tastes and preferences at a granular level. For example, we observe that different investors have different attitudes about environmental, social, and governance (ESG) concerns and may wish to express their concerns in ways that cannot be accomplished in a pooled ESG fund. Investors, if they so desire, will be able to express their individual views on ESG—or proxy or other issues—in SMAs rather than in the standardized, one-size-fits-all way that a fund format offers.

Offering highly customized SMAs with a multitude of holdings to most investors would currently be a heavy lift for the asset management industry and many of the custodial banks upon which the industry relies. In our view, however, the question is not if, but when, this evolution will transpire. Technology and economics will play a determining role. It will not only require addressing issues like trading fractional shares but also require recordkeeping abilities to expand greatly. The "when" will be different for different investors. For investors with limited wealth, this idealized state may not be feasible (or desired) in the foreseeable future.

Ironically, the very desirable features of current index funds—their transparency and simplicity—may make them vulnerable to unbundling. The target investment weights of index funds are virtually in the public domain. The proprietary intellectual property of index providers may not be sufficient to protect funds from being disintermediated when the technology for fractional ownership of securities and custody is widely available to many individual asset owners. After all, approximate capitalization weights can be obtained from a variety of sources: from MSCI to S&P to the University of Chicago's Center for Research in Security Prices (CRSP). Asset owners will be able to implement index-like solutions with the benefits of customization.

Active management via funds should, in principle, prove more resistant to the movement to customized SMAs because security weights are necessarily proprietary, reflect unique intellectual property, and thus are intentionally not easy to replicate. Many actively managed funds, however, will need to change. The current critiques of benchmark-hugging active management will not disappear. Active funds that offer little differentiation from their stated benchmark will continue to have a big red target on them and likely will not be able to justify their franchises for much longer. In a world of customized SMAs, the active funds that survive and thrive will be those that clearly demonstrate their investment edge and insight through the consistent production of alpha.

The nature of these proprietary insights can be highly varied, ranging from the idiosyncratic to the systematic. For example, one potential expertise might be at the macro level of tactical asset allocation, in which case a manager's skill is expressed in shifting allocations between different asset classes as dictated by their models and views. Another potential expertise might be expressed in dynamic factor timing, that is, altering exposures to factors (e.g., size, value, growth, momentum, quality) as economic conditions change. Other active managers may have specialized insights into supply chains and the derived demand for certain goods and services, or perhaps managerial and operational skills. The proliferation of new and alternative data sources and advances in artificial intelligence (AI), machine learning, natural language processing, and large language models that allow for the processing of those data are promising for informing active strategies.

Regardless of the source of the expertise or insights, the intellectual property of these active funds will be proprietary and not reflected in index-like weights. The performance of these active funds is likely to be scrutinized frequently. Although the proprietary nature of active funds may help to preserve the pooled-fund format for active management, the AUM of active

funds may become highly volatile if investors are less willing to give them the benefit of a long time horizon. Cathie Wood's active ETF, ARK Innovation, may become a more common structure for active funds in the future.

5.6. Toward Hyper-Managed Portfolios

Index funds grew out of a simple question posed in 1960: Would investors be better served by an unmanaged investment company? In the subsequent decades, unmanaged investment company products have served investors well. It is with some irony, then, that we foresee the next step in fund evolution to be toward a hyper-managed investment company. We use the term hyper-managed deliberately to reflect the complexity required to implement highly customized investment solutions.

Hyper-managed separate accounts will require more than technological advances in operations (e.g., fractional shares, custody, bookkeeping). They will also require technology to assist with investment decision making. Low-cost customization at scale will necessitate the development of decision support systems. These systems will be required to accurately elicit the preferences and requirements of asset owners and to formulate optimal investment solutions.

In general terms, a decision support system (DSS) describes a computerized system that assists individuals in making well-informed decisions. As asset managers engage with clients to develop strategies, they need to address specified financial objectives while considering a given a set of client preferences. DSSs will be critical in evaluating potential solutions and the various risk–return–preference trade-offs presented by those solutions. Asset managers will need to be able to iterate through alternate solutions quickly and provide intuitive analytics to inform and guide clients in understanding relevant investing characteristics as well as to determine which solutions are most likely to achieve specified objectives. Ultimately, the client selects the solution to implement, but they would do so only after being well-informed in making that decision.[13]

The expertise of asset managers and investment researchers will be put to work developing algorithmically sensible and appropriate solutions. Without the development of these systems to guide decision making, customized SMAs will struggle to capture market share. Winning asset managers in the future will be those who can develop systems that can meaningfully facilitate client engagement in developing custom solutions. Innovations in AI may very well play a key role in making these systems increasingly intuitive and efficient in developing solutions. Even as customized solutions proliferate in hyper-managed separate accounts, we expect that costs to implement these solutions will decline as will management fees, on average.

One challenge resulting from the move to hyper-managed separate accounts may be investors' current ability to hedge risk at low cost and with ample liquidity using ETF index funds, such as SPY, iShares Core S&P 500 ETF (IVV), Vanguard S&P 500 ETF (VOO), and iShares Russell 2000 ETF (IWM). The hedging demand for these funds relies on the fact that, once an ETF unit is created, it can be shorted like any other security. Yet, to the degree that the demand for these

[13]Harry Markowitz was a staunch advocate of DSS to address client asset management needs in the future. He believed that these systems needed to include optimization, analytics, and simulation capabilities, among other things. Much of his later work was dedicated to providing guidance on the development of DSS for the future of portfolio management (see Markowitz 2016).

pooled-vehicle ETFs diminishes for long-term investors with long-run horizons, the supply of ETF units available for shorting will also shrink. At some point, a lack of demand from stable, long-only investors could limit the ability to use these instruments to short indexes, such as the S&P 500 or the Russell 2000. Demand for long positions in these instruments from short-term traders could fill the gap, but we are not sure. Thus, a shift toward hyper-managed separate accounts, while beneficial for most investors, could pose a problem for investors who like the current ease and low cost of risk hedging using index ETFs; quickly shorting 500 individual stocks in index proportions would be operationally challenging. Even though hyper-managed separate accounts will grow over time, unanticipated consequences may be associated with this growth.

Fixed income investing and private investments may evolve along somewhat different paths. Currently, most fixed income instruments are not traded in the same way as equities for a variety of reasons. Historically, bonds were viewed as heterogeneous legal contracts, difficult to standardize and often held until maturity. As a result, the secondary market for bonds did not develop in the same way as it did for equities. Bond trading is usually done between counterparties without an exchange acting as the clearing mechanism between buyers and sellers. For structural reasons, then, bond pricing is less transparent than stock pricing. Bond trading is also less liquid. Perhaps surprisingly, even US government bonds are not exchange traded. Due to the lack of pricing transparency and lack of liquidity in bond trading, bonds are a good natural fit for pooled vehicles that offer liquidity to the end investor.

The distinction between index and active funds in fixed income is not as clear-cut or relevant as it is in equities. As we saw in Chapters 3 and 4, the US Large-Cap Blend category dominates index equities. Even though the Bloomberg US Aggregate Bond Index might be viewed as the fixed income equivalent of US Large-Cap Blend, in practice it is nowhere near as prevalent as a product. For example, at the end of 2021, the iShares Core US Aggregate Bond ETF (AGG) had amassed only $92 billion in AUM. Because investors have strong preferences regarding the principal dimensions of bond pricing (e.g., duration, credit rating, tax status, government issued), both bond mutual funds and bond ETFs are offered along these dimensions.

Are these funds index products or active products? Indeed, one might argue that currently all bond funds are actually active funds, notwithstanding the index label used for marketing. In attempting to replicate an underlying bond index, a portfolio manager may not be able to buy or sell all of the bonds in the index and thus needs to find acceptable alternatives that can be bought or sold. Although the end investors of bond funds enjoy liquidity, the asset manager that manufactures the fund cannot avoid the illiquidity issues inherent in the structure of the bond market.

Because of the market structure constraints of bond trading, pooled-vehicle index funds in fixed income are more difficult to transition to a hyper-managed account structure than their equity index fund counterparts. Indeed, there may be modest growth in the fixed income index pooled-vehicle fund market over the next few years, as a result of growth in factor and ESG-driven bond funds. Such pooled-vehicle bond funds are based on more complex concepts, such as quality, momentum, minimum volatility, and value. We believe fixed income factor strategies do offer a pathway to broader adoption of fixed income indexing because they are less constrained than traditional broad market fixed income index funds in how they access desired exposures. Compared with traditional bond funds based on interest rate and credit risk, they also offer an expanded set of exposures for portfolio management. However, growth in these

strategies depends largely on investors being more willing to embrace such approaches in the fixed income space than they have been in equites.

Creating a hyper-managed separate account of individual bonds is probably not feasible until the market structure of fixed income trading improves. For this reason, fixed income "index" funds are probably less susceptible to unbundling than equity index funds over the intermediate term. The challenges are not just back-office or operational but also center around better access to individual bond offerings. The bond market is predominantly a fragmented one, often labeled as over the counter (OTC). What is lacking is a centralized place for buyers and sellers of bonds to easily find the natural counterparty.

To historians of equity markets, this predicament should sound familiar. Nearly 50 years ago, the NASDAQ marketplace was created to serve unlisted stock shares that faced comparable disadvantages. Electronic, automated systems developed that created a centralized place (not a physical location) for unlisted equities. We believe economic forces combined with technology will move bond trading in similar directions; the "white-shoe" ways of current bond trading will eventually yield to more transparent, centralized trading mechanisms.

Although centralized trading may disrupt some business models of current bond dealers and traders, it will likely lower the cost of issuing debt in aggregate and give bondholders much more flexibility, making bond markets much more like stock markets. It will open the way for bonds to be hyper-managed in separate accounts just like equities. And it will ensure that the proprietary, intellectual property of active bond funds is based on investment insight, not merely on access to bonds. This process will take longer in the fixed income space because of complexity and entrenchment, but asset owners and asset managers should start thinking about the ramifications of this shift as they map out their strategies.

Where will private equity funds and private debt funds fit in a world of hyper-managed separate accounts? By the nature of private instruments, we do not believe that their role will be affected by the general movement to hyper-management. Private equity and private debt funds will be, by definition, actively managed, proprietary funds and thus not subject to unbundling like equity index funds. In fact, private assets have been a key drag on the listed fund AUM we analyzed in Chapters 3 and 4 as they have drawn (likely a large amount of) assets away from listed active fund AUM.

These funds will persist as the asset management industry evolves. Like all actively managed funds, however, private equity and private debt funds will need to clearly articulate their investment edge and differentiate their performance from investments that can be accessed through public markets. The stampede into private funds over the past couple of decades was driven, in part, by performance attributable to their high leverage in a low-interest-rate environment. In the absence of historically low interest rates, one cannot but wonder whether private firms will once again turn to listing in public markets in greater numbers, even given the costs of that process.

More generally, the threat to private markets may come from public markets, making private transactions less appealing. Even if this is the case, we do not see private equity funds and private debt funds disappearing; however, they may become more highly specialized and focused. Liquidity and transparency are highly desired by many investors, and private funds typically do not rank high on these attributes.

Before concluding this chapter, it might be instructive to highlight some differences between our vision of hyper-managed accounts and current traditional advisory accounts. We present a brief overview of some of these differences in **Exhibit 38**. In thinking about the comparisons,

Exhibit 38. Comparison of Salient Characteristics of Traditional Advisory and Hyper-Managed Accounts

Characteristic	Traditional Advisory Accounts	Hyper-Managed Accounts
Role of asset manager	Primarily provider of standardized, scalable, pooled investment products. Plus, model portfolios using pooled products.	Provider of investment services to help create and implement a customized total portfolio solution using primarily individual securities and select funds.
Objective	Generally risk–return based.	Multidimensional. Risk–return plus other objectives, which may include nonpecuniary preferences and multiperiod approaches.
Implementation	Mostly pooled funds. Trading typically involves buying and selling just small subsets of funds, not transacting in hundreds of individual securities.	Mostly individual securities. Requires asset management skill and expertise to efficiently execute individual security trades to meet customized objectives.
Diversification	Generally limited to asset class or fund exposures.	Greater control over risk exposures that can be tailored to needs of investor and preferences.
Access to opportunities	Primarily through pooled funds. Generally limited to opportunities available through funds. Scale of funds can limit investment opportunities in smaller, less liquid securities.	Primarily through individual securities plus some pooled active funds. Unconstrained by fund considerations. Limitations are those imposed only by the individual investor.
Exposure management (e.g., factors or ESG)	Limited flexibility. Managed through fund selection.	High flexibility. Managed through individual security selection.
Active risk budgeting	Difficult to fine-tune through fund exposures.	Greater control given that exposures are managed through many individual securities.

(continued)

Exhibit 38. Comparison of Salient Characteristics of Traditional Advisory and Hyper-Managed Accounts *(continued)*

Characteristic	Traditional Advisory Accounts	Hyper-Managed Accounts
Tax management	Manual process often directed by third-party tax professionals.	Customized, systematic tax management. Hundreds of individual holdings provide greater opportunity for tax efficiency.
ESG	Expression of views can be implemented only through available funds. Not tailored to individual investor values.	Specific individual preferences can be targeted as a part of the portfolio construction process.
Performance evaluation/ monitoring	Prespecified, third-party benchmarks. Focused on maintaining risk–return objective.	Multidimensional custom benchmark. Focused on maintaining multidimensional objectives.
Proxy voting	Analysis and decisions made by fund manager or asset management firm. Votes cast by fund manager are on behalf of the entire fund.	Individual investors can dictate or direct the votes of their shares. May rely on advice from asset manager or third parties.
Fee structure	Fund costs plus advisory fees. Compensation for allocation advice and account monitoring.	Primarily advisory fees (disintermediation mitigates pooled fund expenses). Compensation for added value created through customization. Flexibility in portfolio construction allows for better value from services provided.

it is important to distinguish between funds (managed by asset managers), brokerage accounts (self-directed by individual investors), advisory accounts (managed by advisers), and hyper-managed accounts (managed collaboratively by investors, advisers, and asset managers). This comparison focuses on a few salient characteristics and their manifestations in advisory accounts and hyper-managed accounts as this is the most relevant area in which we expect transitions to occur initially. Over time, we believe assets will also migrate from self-directed brokerage accounts to hyper-managed accounts as the benefits of unbundling securities held in pooled funds are recognized and appreciated by investors.

Our hope is that this comparison provides a better understanding of what we envision as hyper-managed accounts and highlights some of the tangible benefits of customization. One aspect not directly addressed in the previous paragraphs, but worth pointing out, is proxy voting. With hyper-managed accounts holding numerous individual securities, proxy voting

would be decentralized as individual investors once again become the voters. Concentration of proxy votes in the hands of a small number of mega-asset managers is coming to be questioned on grounds of perhaps running afoul of financial regulations and monopoly laws. Although hyper-management is an outgrowth of technological change and preferences for customization, a societal benefit of its adoption could alleviate concerns about ownership concentration.

5.7. The Future for Asset Managers

The successful asset manager of the future will need to carefully make the transition from portfolio management as a product to portfolio management as a service. Doing so will close a circle wherein asset managers of the distant past (i.e., before the mutual fund and index fund revolutions) also provided portfolio management as a service—albeit with much higher costs, little attention to diversification, and no scientific performance measurement.[14]

The productization of the asset management business has provided access to opportunities that previously had high barriers to entry. For decades, pooling provided this access. For many types of securities, however, access may no longer require pooling. The rise of hyper-managed separate accounts does not mean that all portfolio products will disappear. Indeed, well-defined and differentiated products and funds will certainly find allocations. Successful asset managers, however, will need to provide and develop services that asset owners and the intermediaries who work on their behalf find valuable.

As discussed previously, managing individual holdings in hyper-managed accounts will provide investors with more flexibility and economic benefit. However, the greater the granularity of individual holdings, the greater the challenges of allocation. Asset owners will be seeking providers that not only can handle traditional challenges of asset class allocation but also can simultaneously manage the portfolio construction issues associated with a widely expanding number of unbundled securities within each asset class.

As Markowitz (1952, 1959) argued decades ago, asset owners will continue to be concerned with their overall portfolio composition. Unlike the solutions of the 1960s through the recent past, however, one size (the "market portfolio") will not be optimal for all. Each investor will need to construct an overall portfolio that meets his or her requirements in terms of risk, returns, taxes, preferences, liquidity, ESG characteristics, and future cash flows.

Historically, asset managers have strived to be trusted partners of financial advisers, consultants, wealth managers, and, in the case of do-it-yourself investors, the end client or asset owner. The asset manager was not expected to assemble the entire portfolio but rather to provide easy-to-understand and easy-to-service building blocks (products). The asset manager needed to provide the data and analytics needed to persuade their partners that the product met its risk-and-return expectations and belonged in the client's overall portfolio. The unbundling of pooled funds, with the concomitant need to construct investor portfolios based not only on risk and return considerations but also on client-specific preferences and tax situations, means that investors of all sizes will demand institutional-caliber portfolio construction services without having institutional-size wealth.

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[14]The authors thank Larry Siegel for this keen observation.

Organizations that can provide and implement total portfolio solutions in hyper-managed separate accounts for asset owners will command a premium in pricing, reflecting the added value that comprehensive solutions provide. Given all the levers and parameters needed to develop a total solution, the final portfolio construction function should be deliberately centralized into one node. But where is that node located? A natural suggestion would be the financial adviser, who deals directly with the end client.

But how many financial advisers will have the expertise, tools, and resources to develop proprietary total solutions that incorporate risk, return, taxes, and preferences over the now thousands of unbundled index securities plus active funds on a highly customized and individual basis? Perhaps a handful of large, well-resourced firms will achieve this end, and their clients will be effectively tied to their investment ecosystem. But where will the small and midsize financial consultants turn to acquire the tools and analytics required to construct this total solution with superior outcomes and keep clients in their investment ecosystem? One possibility is that a new cadre of firms will arise to develop and distribute tools and analytics to small and midsize financial advisers who might repackage and offer, or "white label," highly customized solutions as their own. The ability to implement solutions on behalf of, or in conjunction with, advisers will also be a key factor. These new firms would face a potential barrier to entry—namely, trust and reputation. Financial advisers are fiduciaries, and new firms would need to establish trust.

Another possibility would be for small and midsize financial advisers to turn to asset management firms to provide the tools and analytics needed to create highly customized portfolio solutions for end clients that would already include a path to implementation. The financial adviser would still own the relationship with the end client and the end client would remain in the financial adviser's ecosystem, but the systems and software of the financial adviser would incorporate the tools from the asset manager. Asset managers have a big competitive head start over new firms. In particular, asset managers have an established brand and presumably a preexisting relationship of trust with the adviser. Unlike products, in which a financial adviser could select some from different asset managers, this service—the highly customized total portfolio solution—will likely be awarded to just one provider. We cannot help but think of the early days of personal computers when different computer manufacturers had a label that indicated that their computers were powered by Intel inside. One asset manager may not be as dominant as Intel was in the early PC days, but it might be.

The asset management industry might evolve into two basic types of firms. Like today, one type would be the asset manager that creates proprietary active products. These products will provide access to proprietary return streams that are differentiated and incorporate unique intellectual property with respect to the behavior of security prices.

The other type of asset manager might be thought of as a hybrid firm. A hybrid firm will develop and offer active products for a variety of clients. In addition, such a firm will also develop, curate, deliver, and service the tools and analytics to support small and midsize financial advisers who can implement highly customized total portfolios for the adviser's client—what we've previously called a hyper-managed separate account.

Given that some asset managers will have the technical capability and expertise to create customized total portfolios, wouldn't they be tempted to bypass the financial adviser and offer these services directly to the end client, the asset owner? In the case of retail clients, most asset managers will probably not take this path because the regulatory and customer service requirements for retail clients entail substantially different skills and risks than those required

for asset management. Some current asset managers, however, who primarily operate using a direct-to-consumer model, may have no alternative but to embark on this path.

5.7.1. Will Institutional Consultants Compete with Asset Managers?

Highly customized total portfolio solutions will require significant implementation capabilities. Apart from modeling and strategies, the solution will necessitate managing and implementing many moving parts. The implementation requirements associated with hyper-managed accounts may put some institutional consultants at a competitive disadvantage. Although recommendations and evaluations of active managers and proposals on broad asset allocations may still be desired, the number of individual security holdings (possibly including funds) to manage, trade, and track is likely to explode relative to levels seen today.

Even if consultants had the modeling abilities to generate microlevel recommendations on security weights, many asset owners do not have the ability to implement so many microlevel recommendations. Thus, to fully benefit from highly customized total portfolio solutions recommended by consultants, asset owners will need to either develop or outsource such implementation capabilities.

Consultant recommendations will have value only if they can be acted on, which is why the consultant business model may be challenged. Consultants may need to develop operational expertise to implement the microlevel recommendations. Alternatively, they may more closely embed themselves into their institutional clients and develop the clients' ability to implement these recommendations. Large institutional clients with existing operational infrastructure in trading and implementation may find this evolution quite natural. Smaller institutions without this implementation expertise, however, may very well look elsewhere.

The need to look elsewhere could open an opportunity for hybrid asset managers to gain additional mandates from institutional asset owners. In particular, asset managers could implement the asset owner's highly customized total portfolio solution using either the microlevel recommendations from the consultant or the microlevel recommendations based on the asset manager's proprietary hyper-managed modeling systems. The consultant faces the risk that the asset manager's independent systems might squeeze the consultant out of the business relationships unless the consultant credibly develops large-scale implementation skills.

5.7.2. Will Custodial Banks Compete with Asset Managers?

In principle, one might think that custodial banks, with trading capabilities and preexisting relationships with institutional asset owners, might try to work their way into the highly customized total portfolio solution business. After all, custodial banks are developing, and will continue to develop, some of the technical software and hardware infrastructure that will make hyper-managed separate accounts feasible for many. Furthermore, these custodians offer detailed accounting and reporting systems.

Nonetheless, we would be surprised if custodial banks opt to compete with asset managers to develop proprietary customized total portfolio business solutions for asset owners for at least two reasons. First, we do not think custodial banks have the brands necessary to effectively compete against sophisticated proprietary investment solutions. Security, safety, reliability, accounting, reporting, and operational soundness are the hallmarks of successful

custodial banks. High-value proprietary investment insights are not a core attribute of a custodial bank brand. Second, given the regulation and government oversight of custodial banks, we think that these banks would be reluctant to enter lines of business that are not directly linked to the plumbing of the financial system because of the associated risks.

Such potential new business efforts by custodial banks would probably receive careful regulatory scrutiny and likely result in large capital charges, if the new business lines were allowed at all. Thus, we foresee the symbiotic relationship between asset managers and custodial banks persisting. Asset managers will provide the microlevel modeling, investment insight, and trading to drive highly customized portfolio solutions, whereas custodial banks will develop and maintain the financial infrastructure to seamlessly implement these solutions in a secure, safe, and reliable way.

We clearly envision asset managers extending their reach beyond products into high-value services. Indeed, we foresee asset managers' revenues shifting from asset management products to advisory fees over time as assets transition from pooled vehicles into hyper-managed accounts. The speed at which they do so will depend on the speed of technological development and the tangible net economic benefits of unbundled, highly customized total portfolio solutions.

The growth area for asset managers will be in high-value services. The transition from portfolio management as a product to portfolio management as a service is more than just a slogan. We view this transition as profound and as impactful as other financial events, such as the creation of the open-end fund, the creation of the ETF, or the end of fixed-rate brokerage commissions in 1975. Over decades, these changes led to the creation of mega-financial firms (such as Schwab and Vanguard) and the collapse of others. Asset management firms, existing and nascent, have the opportunity to meaningfully shape the investment management landscape over the near term as well as over the next several decades. The winning asset management firms will create smart, prudent, sensible, and proprietary investment processes that facilitate client engagement and support the construction of highly customized portfolios in hyper-managed separate accounts.

Marketing, selling, and distributing hyper-managed investment services will likely require skill sets that differ from those needed to market, sell, and distribute investment products. Hyper-managed separate accounts will sometimes greatly outperform simple, economically meaningful benchmarks. Benchmark-relative performance may not resonate, and promoting 1-, 3-, 5-, and 10-year track records may lose relevance. In other words, asset managers will need to be able to distinguish themselves from their competitors without relying on a performance track record or star rating. Highly customized, client-specific investment solutions will not have a live track record.

Clearly, asset managers will need to develop metrics that demonstrate the net economic benefit of their customized investment processes for the end investor. That is, their superior proprietary outcomes, relative to strategies that are simple to implement and understand, need to be demonstrated for each client. Persuasion will matter, and an integral part of persuasion will be their brand. Developing and maintaining a reputation of trust, investing expertise, integrity, confidence, and service will be increasingly important. In addition, asset management firms will need to clearly communicate the advantages of their intellectual property with respect to both investment modeling and implementation tactics. The training for and methods used by sales and distribution teams will clearly need to be updated to focus on investment services. The human resources departments of asset management firms will surely need to reassess the optimal mix of employee skills and backgrounds.

6. CONCLUSION

Passive investing, as manifested in the assets under management (AUM) of index funds, exploded from 1989 through 2021. In aggregate, on a worldwide basis investors flocked to index funds, particularly in the US Equity Large-Cap Blend category—a category that in 2021 had substantially more global AUM than any other category. By 2021, investors preferred index funds over active funds in the US Equity Large-Cap Blend category by margins of more than three to one ($5.4 trillion versus $1.8 trillion). Even for US Equity Large-Cap Blend funds domiciled in Europe and the rest of the world (ROW), index funds contained more AUM than active funds. Japanese equities domiciled in Japan might be the poster child for index investing, where the AUM of index funds outstripped those of active funds by margins approaching nine to one in 2021. One might characterize this shift as a triumph achieved by giving investors access to liquid, low-cost, broadly diversified portfolios.

Yet, the meteoric rise of passive investing relative to active investing has been neither uniform nor consistent across the different geographies of the world or across the different asset categories. Active investing is very much present. The overwhelming ascendancy of index funds associated within the US Equity Large-Cap Blend category is the exception rather than the rule. One cannot assert that this dominance is merely a reflection of US Large-Cap stocks in general. For example, in the US Large-Cap Growth Equity category, active funds attracted more than three times the AUM of index funds by the end of 2021 ($2.33 trillion versus $0.76 trillion). By 2021, investors still seemed to prefer active funds over index funds in the Global Large-Cap Equity category as well ($3.9 trillion versus $1.9 trillion). Within categories, the relative preference for active funds also varies by region. Active selection coexists alongside strategies that promote broad diversification, and many investors remain comfortable with active management.

The economics of customizable portfolios, enabled by technology facilitating hyper-managed separate accounts, will yield better outcomes for investors in terms of after-tax returns and alignment with investor attitudes and preferences. The pivot to hyper-managed separate accounts will roll out over time as asset managers and custodial institutions address the significant operational, administrative, reporting, and regulatory hurdles to implementing this new investment management ecosystem. The spread of hyper-managed separate accounts beyond just the wealthiest asset owners will require the development of decision support systems that can probe and accurately capture the tastes, preferences, and requirements of individual investors and institutions.

The proprietary intellectual property of active asset managers will continue to be expressed in funds or models, including multi-asset portfolio models. The challenge for active funds in the future will be similar to the challenges today—namely, demonstrating the economic edge that their insights generate over low-cost, simple-to-implement, and transparent outcomes constructed with index-like solutions. So-called closet index funds, masquerading as active funds, will continue to whither in the future.

From an investor's perspective, the allocation to active funds or models will boil down to a simple question: How much of my capital am I comfortable devoting to "price discovery" activities? Active investing is inherently a price discovery endeavor, based on a belief that some type of mispricing can be exploited. In contrast, passive investing tends to be rooted

in a "price-taking" viewpoint that assumes market prices are good enough indicators on which to base investment decisions. In the future, active and passive investing will coexist but will increasingly take place within hyper-managed separate accounts, where the passive component will be implemented in an unbundled way rather than in a fund to maximize net economic benefits and other objectives. The ratio of the mix will undoubtedly differ from investor to investor.

In 1960, Renshaw and Feldstein posed a question so profound that it resonates loudly today: Would investors be better served by an "unmanaged investment company" that just tracks some type of representative market average return? With the benefit of hindsight, we see that many investors have clearly answered in the affirmative.

For even the largest asset owners, the technology to implement such a solution took more than a decade to develop. For smaller investors, first the mutual fund and then the ETF offered the only feasible access to broad market returns. We believe that with the advances in technology, the future path is that more investors and most wealth will be hyper-managed within separate accounts that better cater to investor needs and preferences. Perhaps ironically, we view this shift being better described as hyper-managed rather than unmanaged as the preferences and economic positions of individuals will result in highly customized solutions. So, what is beyond active and passive investing? We anticipate customized, hyper-managed investment solutions that will include aspects from both active and passive investing perspectives.

The next frontier for asset managers and their service providers will be the era of low-cost customization. Firms that successfully evolve and hone their expertise, capabilities, and distribution skills to offer hyper-managed solutions will thrive. The future of investment management is both daunting and full of opportunity.

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