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Information, Uncertainty, and Active Investment Management

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KEY FINDINGS

- The traditional case against active management relies on: (1) market efficiency and (2) active portfolios aggregating to the cap-weighted market. But markets are demonstrably inefficient. The aggregation issue is irrelevant if investors have diverse beliefs, preferences, and constraints. Active strategies allow for customization and alignment with investor-specific objectives that passive indexers cannot obtain.
- Knightian uncertainty and information asymmetry are reasons markets cannot be perfectly efficient. Skilled active managers—both quantitative and qualitative—can exploit inefficiencies using unique insights and judgment that are supported by different types of information.
- Investors are best served by considering a variety of investment strategies—index, quantitative active, and fundamental active—each leveraging distinct information sets. Combining these approaches allows investors to capture varied sources of return and to manage risk more effectively.

ABSTRACT

The rise of passive investing has diminished the perceived value of active management. This is driven by the belief that finance theory favors indexing and that expected alpha before costs is always zero. This article challenges that view by tracing the evolution of asset pricing models to include those that do not require all investors to hold the same portfolio of risky assets, highlighting limits to market efficiency, and examining the implications of information costs and investor heterogeneity. It argues that finance theory increasingly supports active investing. Drawing on Frank Knight's and Frederich Hayek's insights, this article distinguishes measurable risk from unmeasurable uncertainty and quantifiable from unquantifiable information. In this context, alpha arises from navigating uncertainty using unique, costly, and judgment-driven insights. This article recommends that investors diversify across information sources, grant flexibility to managers, and avoid overly narrow mandates. The authors conclude that uncertainty is a persistent feature of markets, and that thoughtful, adaptive active management remains essential for aligning portfolios with investors' unique objectives as well as for capitalizing on inefficiencies.

With the massive shift of assets into index funds, many investors wonder whether they should pursue active strategies at all and, if so, to what extent. In this article, we set forth an intellectual and practical framework that supports departing from capitalization-weighted indexing, whether purely in an attempt to beat the market or, alternatively, to match portfolio characteristics to specific investor needs and preferences. We frame this question in a context that goes beyond conventional definitions of risk to address Knightian uncertainty, the challenge

of gathering information that the market does not already have, and the concept of diversifying one's information sources.

SETTING THE STAGE

Active and passive investing differ most fundamentally in the information used for portfolio formation. Passive equity investing uses a limited information set: the market capitalization of each security in the market. This information is easy to obtain, and once it has been procured, everyone has the same information.

Although passive index strategies are sometimes characterized as informationless, they are not; they incorporate the information in the market capitalizations. As such, they do not depend on unique or privileged information but simply provide the returns associated with the general information set available to all investors. Given that market capitalizations, however, are the collective outcome of investors in the economy deciding how much they are willing to pay, or not pay, for each company, index fund investors effectively get a free ride on the backs of other investors involved in price discovery. With their low information and trading costs, passive investing approaches—index funds—have experienced massive inflows of capital from investors over the past 25 years.[1]

Active management, on the other hand, seeks to form portfolios using information that others in the marketplace do not have or choose not to consider. This information is used for both security selection and portfolio construction. Generally, active management seeks to allocate capital to securities with more promising prospects than average, avoid less promising securities, and thoughtfully weight the securities in the portfolio to manage return and risk outcomes, among other things.

Active investing is not exclusively about generating above-average returns. It has always involved evaluating the investment opportunity set across a variety of dimensions, including risk, liquidity, and correlation with one's other assets and liabilities. Benjamin Graham and David Dodd, in their 1934 bible on the topic of fundamental active management, *Security Analysis* (Graham and Dodd 1934), made clear that return was only one consideration in assessing an investment: "An investment operation is one which, upon thorough analysis, promises safety of principal and a satisfactory return. Operations not meeting these requirements are speculative."

Graham and Dodd's notion of safety as it relates to equities has to do with the expectation that a company is worth the price paid, save under highly improbable circumstances. This quote expresses a substantially different perspective on managing risk than the one advanced later, in 1952, by Harry Markowitz, which was focused on variability around an expected rate of return. From either perspective, the idea that investors should be concerned with risk as well as return has been, and continues to be, a central tenet of investing.

Should Investors Pursue Active Management?

In the context of not just trying to beat the market but also tailoring a portfolio to each investor's unique needs and preferences, the question of whether investors should pursue active management is a reasonable one. Although indexing is and should be an investor's default position if he or she knows nothing about the securities in an asset class and has no needs or preferences different from those of the

[1] Cap-weighted funds, unlike other funds, do not need to rebalance due to ordinary stock price changes, only for cash flows in and out of the fund, certain corporate actions, and changes to index holdings. This characteristic saves immensely on trading costs. See Reinganum and Blay (2024) for an analysis of the evolution of active and passive investing from 1989 through 2021.

broad market, that is rarely the case, and active management should be regarded as a viable alternative, if not an important complement to, passive strategies. Furthermore, thinking beyond benchmark-relative returns, active strategies can offer important diversification benefits not offered by passive index funds, particularly with respect to the information used for portfolio formation.

The question of whether to invest actively or passively is especially relevant today given the notable advancements in computing power, the proliferation of new data sources, the ongoing development of novel analytical methods, and the adoption of artificial intelligence that is widely expected to disrupt the economic landscape. These developments present investors with return opportunities beyond those offered by market indexes. In fact, it can be argued that investors have never been in a better position to benefit from information than they are today.

Yet active management, which we define as using unique or special information rather than just the information that is widely available to everyone, has been the target of criticism by both academics and practitioners alike.[2] The essence of such criticism is that it is difficult for any one investor to beat the market and impossible for everyone to do so. In addition, there are costs to employing active management. Therefore, it is argued, indexing is a more efficient use of resources.

Structure of This Article

In this article, we build the case for active management by first objectively summarizing the case against active management. (Philosophers call this *steelmanning*—making the strongest possible case for one's opponent's position, the purpose being to fully understand what one is arguing against.)

We then state the case for active management. We explore the different types of information that can be exploited by investors and describe how they can be accessed through specific types of active investment strategies. We begin by providing insights on active management generally and then discuss expectations for some different types of active investing approaches.

Finally, we provide a framework for capitalizing on and diversifying across the different types of information sources. In that section, we review the characteristics of different types of investment strategies and provide practical guidance on implementation. We also discuss the importance of allowing sufficient degrees of freedom to benefit from active management.

A FOOL'S ERRAND? THE CASE AGAINST ACTIVE MANAGEMENT

The basis for the practical argument against active management can be traced back to an article published in the *Financial Analysts Journal* in 1960, well before passive index funds even existed (Renshaw and Feldstein 1960). The authors proposed what they called an "unmanaged investment company" that tracked a market index.[3] The argument they put forth then is one that persists to this day—the performance of professionally managed funds, relative to market indexes, does not justify the cost.

Renshaw and Feldstein struggled, however, with the practical implications of tracking one of the price-weighted market indexes, such as the Dow Jones Industrial Average,

[2] The demarcation line between active and passive strategies is not universally agreed upon. In this article, we draw it very conservatively, labelling as active any strategy that uses information other than market capitalizations. If the active strategy is primarily rules based, we call it quantitative. If the strategy is primarily judgment based, we call it fundamental.

[3] An even earlier argument for indexing was John C. (Jack) Bogle's 1951 undergraduate thesis at Princeton, but it is unpublished.

that were the primary market barometers at that time. The justification for capitalization weighting that would address those implications was to come later from advances in finance theory. In fact, we'll find that the basics of modern finance seem to line up in favor of passive indexing. We'll then revert back to practical matters after reviewing the aspects of finance theory that support using passive strategies over active ones.

Indexing and the Basics of Modern Finance

Harry Markowitz's 1952 article, "Portfolio Selection" (Markowitz 1952), which is the foundation of what we now call modern portfolio theory, explains how to optimize a portfolio of securities—that is, how to find the holdings weights that maximize return for a given level of risk. The article dealt primarily with optimization—making the most effective use of an investor's information—but it also helped lay the foundation for passive indexing. It proposed an algorithm for converting the user's beliefs about the future performance of a set of securities, including estimates of expected returns, risks, and correlations, into efficient portfolios. It, however, said nothing about how to form those estimates.[4]

A decade later, William Sharpe provided two critical answers to the question of how to form the estimates. First, he developed, in conjunction with Markowitz, a single-index model of covariance (Sharpe 1963) that greatly simplified the estimation of covariances (risks and correlations) for large sets of securities.[5] Second, he provided a framework for estimating expected returns for securities (Sharpe 1964), proposing that security returns were a function of their sensitivity to market risk—the greater the sensitivity to market risk, the higher the expected return for the security.

Sharpe's second insight (the capital asset pricing model, or CAPM) was revolutionary and was based on understanding what the markets would be like if all investors were rational, Markowitz-type investors. If every investor has the same estimates of return, risk, and correlation for every security—a bold assumption but necessary to simplify the problem—and if all investors optimize, then the capitalization-weighted market portfolio would be (Markowitz) mean–variance efficient.

As a result, an investor can construct a portfolio that maximizes return for his or her level of risk tolerance by combining, in one proportion or another, a market index fund and a risk-free asset.[6] This is a central finding of the CAPM and sums up the original theoretical case against active management.

If the CAPM is correct, the only way to beat the market after adjusting for risk—that is, to add alpha—is to possess and use special insight or skill. A claim of active management ability then, is a claim that one has such skill and can implement it successfully. Later developments in asset pricing added factors other than the market (CAPM) factor, but the general conclusion was the same: active management requires special skill.

Does Alpha Even Exist?

Several decades after Sharpe set forth the CAPM, he wrote a remarkably clever two-page paper, "The Arithmetic of Active Management" (Sharpe 1991b), which has reinforced the case for indexing ever since. It explains that the aggregate of all the

[4] The first few sentences of Markowitz's 1952 paper explains that it was specifically concerned with how you go from beliefs to portfolios. How you arrive at those beliefs, through observation and experience, was another matter altogether, one that Markowitz specifically said he was not addressing (Sexauer and Siegel 2024). Philosophically, Markowitz's portfolio theory was based on the question of how one should act in the face of uncertainty. Determining subjective probabilities was central to that question.

[5] This article was based on Sharpe's PhD dissertation. Harry Markowitz was Sharpe's PhD advisor. See Sharpe (1991a) for more detail regarding this collaboration.

[6] Index funds did not exist when Sharpe, and others, developed the CAPM, but the concept provided a solid theoretical foundation for the capitalization-weighted indexes broadly used by investors today.

actively managed portfolios in an asset class has the same holdings weights as the aggregate of all indexed portfolios in the same asset class and thus has the same return before fees and other costs. Thus, the community of active managers delivers, on average, the index return (again before costs, which are higher for active managers than for index funds).

Following Sharpe's logic, a winning active manager, then, must earn his or her alpha by taking it away from someone else. This makes active management a zero-sum game. In other words, in aggregate, alpha simply does not exist. This does not mean that winners won't emerge—of course some will—but they will be exactly matched by losers.

Adding Sharpe's 1992 article to his 1964 discovery of the CAPM, we have a fairly powerful set of arguments against active management. But that's not all. At around the same time that Sharpe was developing the CAPM, Eugene Fama put forth the efficient market hypothesis, which details various information sets (historical, public, and private) that incrementally drive various forms (weak, semistrong, and strong) of market efficiency—the hypothesis that prices reflect all available information. The implication of this work is that investors can't beat the market without having information that other market participants don't have (Fama 1970).[7]

This argument differs subtly from the CAPM argument—either could be true without the other—but they come out in roughly the same place. You need to have information that others don't have, or special skill at interpreting the information, or you must be superior to the crowd in some other way or combination of ways. There's no way out of that requirement.

Back to Practical Matters

Having summarized the intellectual case for passive indexing, we can return to the question of justifying active management from a practical perspective. We'll begin with the costs of active investing and then move on to the issue of identifying good managers.

The asset-weighted average expense ratio for active equity mutual funds today is 0.64% per year. Compounding this number over a long holding period, that fee structure transfers approximately 16% of the investor's wealth to the manager in 30 years. Moreover, on average, active managers in essentially all equity categories have underperformed properly chosen benchmarks on an after-fee basis.

This is not unexpected. Sharpe's arithmetic of active management says that if the aggregate of all active managers delivers the index return before fees and other costs, they must deliver less than the index return after costs. Of course, statements about the average manager do not reflect the accomplishments of the best managers, who earned superior returns over long periods of time.

If Good Managers Exist, How Do You Find Them?

The final nail in the case against active management is the observation that, even though we know good active managers exist, there's no reliable way to identify them in advance. The sad truth is that winning managers regularly become losing ones as market conditions change or as the early advantages possessed by a given manager fade over time.

[7] Note that, following convention in the field of finance, we've used the word *efficient* to refer to both portfolio efficiency (the property of a portfolio that cannot be improved by reweighting the securities in it) and market efficiency (the idea that markets price securities correctly). These are two entirely separate things. The use of the same word for both concepts confuses many people.

As a result, any formula or process that we use for identifying good managers in advance is unlikely to succeed for very long. It's wiser, the argument against active management goes, not to take one's chances on an active manager, even one who has had a stellar recent track record, because it may have been achieved randomly and is thus unlikely to repeat. Better to index.

THE CASE FOR ACTIVE MANAGEMENT: LAYING THE GROUNDWORK

The intellectual case for active management begins with three ground truths: (1) Investor preferences drive asset prices, (2) the market is not efficient, and (3) most investors are not average—they have unique preferences, objectives, and circumstances that can differ substantially from those of the average investor.

Investor Preferences and Asset Pricing

The original theoretical argument against active management began with the CAPM, which implied that the capitalization-weighted market portfolio was risk efficient and was the only risky portfolio needed by all investors. The model, however, relied on a number of simplifying assumptions, some of which were highly unrealistic. Perhaps the most problematic of these assumptions were that: (1) all investors have the same (homogeneous) beliefs,[8] (2) all investors have access to unlimited borrowing at the risk-free rate, and (3) market risk is the only investor preference that matters.

You don't have to think too long to realize that people don't all think alike. There are clear examples of this in a variety of domains. Consider the differences between socialists and capitalists, Keynesian economists and Austrian economists, Democrats and Republicans, or even flat-earthers and spherical-earthers—despite having access to the same information, different beliefs result in what are most likely irreconcilably different conclusions. The beliefs in the context of the CAPM regarding expected returns, standard deviations, and correlations for market securities are no different—people observing the same information will form widely differing expectations.

Lintner (1969) was the first to address asset pricing in the more realistic case where investors hold differing (heterogeneous) beliefs. He showed that a single set of asset prices was still possible because the market aggregates the diverse expectations of heterogeneous investors. The idea that the market portfolio is the right portfolio for all investors, however, no longer held. When investors have different beliefs, they hold different efficient portfolios.

The unlimited borrowing assumption is problematic on at least two fronts. First, in the real world, no investor has access to unlimited borrowing, much less at the risk-free rate. Second, Fama (1976) and Markowitz (2005) both showed that, without the assumption of unlimited borrowing (or shorting), the market portfolio is no longer an efficient portfolio. This insight only confirms that the market is not the most appropriate portfolio for all investors and that investors should optimize their portfolios based on their own beliefs, preferences, and needs—not those of the average investor—if each is to hold the efficient portfolio that is most appropriate for them.

Our criticisms of the first two assumptions arise from flaws in the conclusions from the CAPM. Our disagreement with the third assumption, that market risk is the only investor preference that matters, points to an area of financial theory where researchers have made notable progress in the understanding of asset pricing and markets. Ross (1976), who advanced arbitrage pricing theory (APT), introduced a linear model

[8] Although the assumption that everyone holds the same beliefs is certainly unrealistic, what is seemingly more implausible is that those beliefs are all correct.

of expected returns that considered multiple risk factors. APT, however, approached the world from a supply perspective. That is, investor demand was not the driver of asset prices, rather, it related returns to factors supplied by the economy. Although it did prove useful for derivative pricing, it found limited use elsewhere.

Ibbotson, Diermeier, and Siegel (1984) proposed a new equilibrium theory (NET) that relates asset prices to the demand for an asset across both risk and nonrisk characteristics including taxes, liquidity, and information costs. NET proposes that "investors regard each asset as a bundle of characteristics for which they have various preferences and aversions," and that asset prices reflect aggregate investor preferences around those. Fama and French (2007) also weighed in on the need for a better asset pricing model, explaining that the assumption of all investors agreeing on expected payoffs (homogeneous beliefs) and the expected payoff being the sole basis for holding a security were unrealistic. They explained that asset pricing models needed to consider both disagreements (heterogeneous beliefs) and differences in tastes so that investor preferences beyond market risk impact asset prices.[9]

Building on the earlier work, Ibbotson and Idzorek (2014), and Ibbotson et al. (2018) introduced the popularity asset pricing model (PAPM) assuming homogeneous expectations but differing tastes or circumstances. It says that investors may overpay for a security if it has popular or well-liked characteristics, causing investors who don't prefer those characteristics to get better returns elsewhere.

More recently, Idzorek, Kaplan, and Ibbotson (2024) expanded the PAPM to include heterogeneous expectations, making it one of the most comprehensive and intuitive models to date. The PAPM formalizes the NET framework into an asset pricing model that considers the popularity of assets. Popularity, however, is not a single factor but, rather, the combination of investor preferences for or against an asset's characteristics (e.g., market risk, liquidity, brand, reputation, competitive advantage, etc.). The PAPM says that these characteristics are priced (incorporated in the asset's market price). It is not important if the characteristics are related to risk or not, rational or irrational, classical or behavioral—what is important is that they are liked or disliked by investors or, rather, whether they are popular or unpopular.

Exhibit 1 provides a simple overview of asset pricing considering popularity. The agreement column describes the impact of popularity on an asset's expected return assuming homogeneous beliefs. If an asset has characteristics that are broadly desired by investors (popular) it will trade at a premium and, consequently, its expected return will be lower (–P). Alternatively, undesirable (unpopular), stocks will trade at a discount, increasing their expected returns (+P).[10]

The disagreement column in Exhibit 1 describes the impact of popularity and disagreement (heterogeneous beliefs) on expected returns. We also distinguish between two types of investors, those who are correctly informed about the future prospects of an asset and those who are misinformed. Here we see that the lowest expected returns are for assets that are popular (–P) and where the investor is misinformed (–D) about the future of the asset. It follows that the

EXHIBIT 1

An Overview of Popularity and Asset Pricing

	Agreement	Disagreement (D)	
Popular (P)	–P	Misinformed	–P/–D
		Informed	–P/+D
Unpopular	+P	Misinformed	+P/–D
		Informed	+P/+D

NOTE: The authors are grateful for the discussion and guidance provided by Professor Roger Ibbotson in the production of the chart.

SOURCE: Invesco.

[9] Fama and French (1992) presents a three-factor asset pricing model that provides evidence supporting the idea that investor preferences drive asset prices. It also presents an additional argument against market efficiency in that factors (other than the market) and other pricing anomalies should not exist if markets were indeed efficient.

[10] Ibbotson et al. (2018) provide empirical evidence that stocks with the weakest brands, worst reputations, or with the least competitive advantage tend to offer higher returns.

highest expected returns are for assets that are unpopular (+P) but where the investor is correctly informed (+D) about future prospects.

This last point, in terms of active management, is the most important. The highest returns will be achieved by those investors who can correctly identify unpopular stocks that will one day become popular.[11] Doing this requires an investor with information, skill, and fortitude. It is also useful to note that passive index funds will have larger weights in popular stocks and smaller weights in unpopular stocks than might be merited by their expected returns.

Although the CAPM provided a simple and elegant answer to the question of how to invest and supports contemporary beliefs about passive investing, today we find that many of the practical implications of the model do not hold in the real world. In particular, we now know that:

1. The market portfolio is not the right portfolio for all investors.
2. The market portfolio is not a mean-variance efficient portfolio.
3. Asset prices are not a function of market risk alone; they are driven by a broad range of investor preferences.

Aspects of finance theory, then, have evolved to a point where theory now indicates that most investors must actually be active investors if they are to hold portfolios that are most appropriate for their needs. Interestingly, this is not a contentious statement in some aspects of contemporary asset management. Most academics and practitioners are perfectly fine with actively varying the weights of asset classes (while using passive index strategies within each asset class). The contention lies in using active strategies within an asset class. This brings us to the question of why active management is acceptable at the asset class level but not at the security level. A better understanding of market efficiency can shed some light on why investors should consider implementing with active strategies.

Are Markets Efficient?

Let's begin with the observation, which almost every investor has made on his or her own, that the market is not completely efficient. Just how inefficient is a matter of debate, but it doesn't take much effort to show that some inefficiencies exist. Behavioral finance advocates have accumulated a long list of examples supporting that contention. Our favorites include:

- The S&P 500 closed at 282.70 on October 16, 1987. One business day later, on October 19, it closed at 224.84, a more than 20% loss on a day when, other than the market crash itself, nothing newsworthy happened.
- In March 2000, shares of a company called 3Com could, at least theoretically, be bought for a negative price. The company spun off one of its subsidiaries, Palm Computing, in an initial public offering that rose so high that the subsidiary's market cap was $53.4 billion—while 3Com, which still owned 94% of Palm Computing, had a market cap of only $28 billion. This cannot happen in an efficient market.[12]

[11] Here we focus on expected returns in the context of asset pricing. We should note that active managers can add value in many ways. Being an informed contrarian investor is just one of them.

[12] See Lamont and Thaler (2003). A later article by Cherkes, Jones, and Spatt (2013) shows that this result could be consistent with investor rationality because, at the time, it was difficult to sell Palm short so that 3Com could not be bought for a negative price except by an investor with exceptional access to the securities-lending market. This, however, does not show that the market for the two stocks was efficient; it was not. The price of 3Com (which had a hypothetical upper limit of zero because, in the absence of short selling, you could just buy Palm and get 3Com for free) was unequal to its value

- Momentum strategies work much more often than not. This, too, cannot happen in an efficient market.[13]

These are just anecdotes, not formal proofs that the market is inefficient, but to us the stories are persuasive. It is satisfying, however, to do something more logically rigorous. In a prescient article, Sanford Grossman and Joseph Stiglitz (1980) stated what has been called the *student's proof* of market inefficiency because, in every finance class, there is a smart student in the front row who says something like: If the market were efficient, there would be no payoff for analyzing securities, so no one would analyze securities and the market would be hopelessly inefficient.[14]

In his excellent book, *Adaptive Markets* (Lo 2017), Andrew Lo summarizes our view of market inefficiency and relates it to the availability of information thus: "Prices reflect as much information as dictated by the combination of environmental conditions and the number and nature of 'species' in the economy."

What Lo calls species are the various agents in the market: issuers, market makers, portfolio managers, end-user investors (clients), and many others. His theory also suggests that markets, rather than achieving some static point of efficiency, are dynamic and evolving. It requires investors to adapt to changing conditions if they are to be successful. It's a very different and more realistic description of the markets than the perfect or near-perfect efficiency imagined by efficient-market hardliners. In other words, the market is sufficiently inefficient that investors have opportunities to outperform the market and is continually evolving so that new opportunities continue to become available.

Why Is the Market Inefficient? Beyond the Student's Proof

Although the student's proof states in capsule form why we know the market is inefficient, it's helpful to know more about the mechanism. Herbert Simon, the 1978 Nobel laureate in economics, provided one mechanism, arguing in 1957 that it's rational to be a little irrational (Simon 1957): "Simon … challenged the classical economic assumption that all agents … pursue their self-interest with perfect rationality. He proposed 'bounded rationality' as an alternative assumption," explain Siegel and Scanlan (2014). (This classical assumption has to hold for the market to be fully efficient.) The authors continue:

> Bounded rationality means that there is only so much you can know, so it's rational and necessary to make decisions with incomplete information …. Information is both costly to obtain and difficult to interpret …. Moreover, the acquirer faces diminishing returns to obtaining even more information … [and] it is difficult to know how much of the information you've gathered is already known by others …. Thus, it pays to specialize. It is rational and cost efficient not to try to acquire all information.

This is another reason we would expect the market to be inefficient, why having access to different types of active managers could be beneficial, and why active management may be profitable for the investor.

(clearly positive because it was a functioning company). Price not equalling value is the definition of an inefficient market. (Constraints on short selling are one of many reasons why we should expect the market to be inefficient.)

[13] See Asness, Moskowitz, and Pedersen (2013). Although value strategies could work in an efficient market if a value premium is a reward for risk, this cannot be true of momentum strategies.

[14] The quote is just us imagining what the student would say. See Grossman and Stiglitz (1980). Discussed in nontechnical terms in Ibbotson and Brinson (1987).

Nobody Is Average

According to Sharpe's arithmetic of active management argument, the average active manager performs no better than the market index before costs. Sharpe's argument, however, implicitly assumes that assets not held in index funds are all held in actively managed portfolios for which the market is the benchmark or passive alternative—they are not. There are many kinds of portfolios (including single-stock portfolios) that differ from the market portfolio for reasons other than the owner's attempt to beat the market. Examples including single-stock positions held for corporate control or to defend a tax position; portfolios engineered to hedge a particular risk or prepay a liability; and many others.

For these reasons, the aggregate of all active portfolios professionally managed in the hope of earning alpha (henceforth "active managers") does not sum to the market. Thus, although Sharpe's arithmetic of active management is correct by construction, it applies only to the aggregate of all assets not in index funds—not to the aggregate of active managers as we defined them. So, one cannot generalize from Sharpe's arithmetic to say anything meaningful—good or bad—about active managers as defined here.

In addition, as discussed earlier, each investor has unique preferences and characteristics that cause their optimal portfolio to differ from that of every other investor. For (almost) none of them is the market portfolio the one best portfolio that they should hold.

So, what does Sharpe's observation that the average return of all investors must equal the return of the market say about any given investor? Almost nothing. With differing beliefs, expectations, access to information, skill levels, and preferences for asset characteristics, nobody is average. Each investor rationally should build a portfolio reflecting all these attributes. Only by coincidence will that portfolio be the cap-weighted market portfolio.

Consider the elementary example of an airline pilot trying to hedge his job risk. When oil prices spike upward, oil companies usually make big profits and airlines lose money. The pilot should, therefore, avoid holding airline stocks (especially that of his employer) and overweight oil stocks. An oil company executive should do the opposite.

There are many other reasons for holding a portfolio differing from the cap-weighted market and for those holdings to vary over time. Younger investors might prefer higher risk portfolios while older investors might prefer the opposite. Institutional investors have different objectives and preferences than individual investors and, consequently, hold different portfolios; for example, a tax-exempt institution might load up on high-dividend stocks, which are disfavored by taxpaying individuals. Considering all the different types of investors within the markets, it's easy to understand that almost no investor is represented by the average of all investors.

This is also why active management is not a zero-sum game when all investor and asset characteristics are taken into account; nobody needs to lose for someone else to win. They only need to find someone with different preferences, objectives, or circumstances. In fact, markets exist to provide for the exchange of assets among a wide range of participants with different demand functions. This concept illustrates the idea that active management is potentially helpful for almost everybody and that it is not necessary to be an indexer to be a winning investor.

Do Good Active Managers Exist?

Now let's move on from the matching of investor preferences to asset characteristics to the simpler question of whether active managers can beat the market through skill. One of the strongest arguments for the existence of managers that

can outperform the market comes from Fama and French (2010). What is notable about this study is that one of the authors, Eugene Fama, was the first researcher to find strong support for the efficient market hypothesis, and the study reverses that finding. This study looked at 3,156 mutual funds over the period of 1984 to 2006 and sought to determine if there was evidence for the existence of skillful managers, beyond what might be expected by chance. The challenge was to distinguish between luck and skill in making their determination.

When tests were conducted on fund returns measured net of costs, they found that "few funds have enough skill to cover costs." Damodaran (2012), however, writes about their study, "when they looked at gross returns, they found evidence of manager skill; they estimate that superior managers generate about 1.25% more than the average." This study, by authors who are known opponents of active management, supports similar but more positive findings by Kosowski et al. (2006), who not only found evidence for manager net-of-cost skill but also found that the performance of skillful managers tended to persist. In considering the relevance of these studies one should also consider that the costs for active management have dropped significantly since their publication.

We should note that a 1.25% annual before-cost alpha is actually quite good. A hypothetical manager with an annual alpha of 1.25%, achieved over 1980–2000, would have ranked 47 out of 307 equity managers studied by Siegel, Kroner, and Clifford (2001). Moreover, the managers in that study were limited to those who had survived for 20 years and were therefore almost certainly an upward-biased sample of those that existed at the beginning of the period.[15]

More recently, Guerard et al. (2024) revisited several long-established stock selection models, initially presented in Guerard and Takano (1992), that demonstrated benchmark-relative outperformance. The first model tested was a regression-weighted composite of historical earnings, book value, cash flow, sales, and their related variables. The second model used the same variables except with forecasted earnings in lieu of historical earnings. The third model expanded on the second with the addition of an equally weighted composite of earnings forecasts, revisions, and breadth. A fourth model added momentum as an explanatory variable.

Using the Wharton Research Data Services database for US stocks over 1980–2020, Guerard et al. estimated information coefficients (ICs) for the four models. The IC is a commonly used statistical measure of predictive ability; it is the correlation of forecast returns with subsequent results (realizations). All four models reported positive and statistically significant ICs that, when used as part of an active strategy, would be expected to produce excess returns. The estimated ICs and *t*-statistics (italicized and in parentheses) for the four models were 0.021 (*4.10*), 0.033 (*5.75*), 0.039 (*7.24*), and 0.052 (*7.98*), respectively.[16]

[15] From the database used in the writing of Siegel, Kroner, and Clifford (2001). The database was compiled by the authors thereof, from various sources as described in their article. The comparison of the hypothetical 1.25%-alpha manager to the Siegel, Kroner, and Clifford database is a little unfair because the hypothetical 1.25% alpha is before fees and the Siegel, Kroner, and Clifford database is after fees, but we are trying to determine what is achievable in markets, not what was achieved after fees were subtracted.

[16] Although ICs in the range of 0.02–0.04 don't sound very useful, they are. Anyone who has tried to forecast stock price movements knows that they are mostly random, and that a small edge translates to economically significant profits if modest forecasting ability is applied consistently over a long time period. In MSCI Barra (2010), the authors write, "Generally speaking, many portfolio managers would view a 'good' IC as 0.05 and a 'very good' IC as 0.10." Li et al. (2024), in a paper on using neural networks to forecast stock price changes, come to a similar conclusion: "… IC values exceeding 5% [that is, 0.05] in absolute terms are considered highly favorable in this context."

What is notable about these results is that the use of forecasted earnings in the second model provided a notable improvement in both IC and statistical significance over the first model that relied on contemporary and historical data alone. The further inclusion of additional human insight-generated variables in the third model also resulted in notable improvements over the second. These results not only confirm that stock selection models can be effective for active management—more generally, they also provide evidence of the value of human judgment in active stock selection.

Costs: The Elephant in the Room

Although we have discussed both theoretical and practical arguments in favor of active management, we have failed to address the elephant in the room—the cost of active management. Access to data, expertise, insights, price discovery, and trading infrastructure, among other things, is not free. However, there have been significant cost improvements in recent decades.

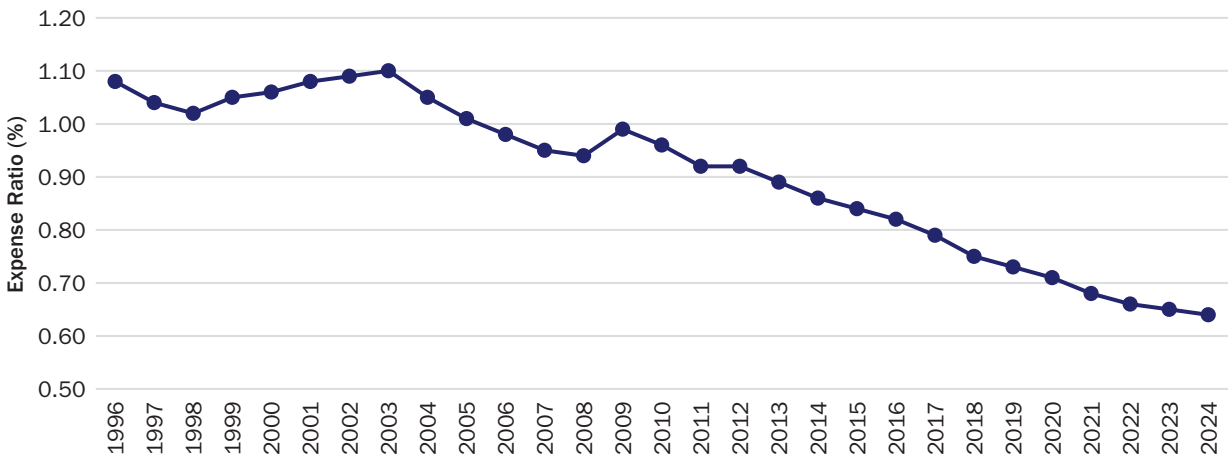
Exhibit 2 shows the asset-weighted average expense ratios for active equity mutual funds. Expense ratios have fallen significantly from a high of 1.10% in 2003 to 0.64% today. Consequently, cost concerns should be notably less important than they once were, especially given that the average expense ratio over the time period used for Fama and French's 2010 study was over 1%.

For comparison, the asset-weighted expense ratio for equity index funds stands at 0.05%. This latter number, however, is highly biased. Reinganum and Blay (2024) examined the evolution of active and passive investing from 1989 through 2021 and found that a substantial portion of passive index assets under management were concentrated in Morningstar's US Large Capitalization Blend category, arguably the most liquid and least costly segment of the markets to trade. In comparison, the average asset-weighted expense ratio for all active blend equity funds is 0.23%, and for further context, money market fund expenses average 0.22%.

The advent of active exchange-traded funds (ETFs) is also a highly promising development. The standard mutual fund vehicle is notably unfriendly to taxable investors because they may be required to pay taxes on profits realized by other investors migrating in and out of funds, even when the investor in question has not realized any profits. Active ETFs provide the same advantages to their holders that index ETFs provide, including those arising from the substantial market infrastructure that has been developed and

EXHIBIT 2

Asset-Weighted Average Expense Ratios for Active Equity Mutual Funds



SOURCES: Li and Atamanchuk (2025), Investment Company Institute, Lipper, and Morningstar.

implemented for the efficient trading of index ETFs. Currently, the asset-weighted average expense ratio for an actively managed equity ETF stands at 0.44%.

Oscar Wilde once described a cynic as someone "who knows the price of everything and the value of nothing."[17] It is our contention that active management, in its many forms, offers investors benefits beyond the hyper-narrow focus on benchmark relative returns. We'll spend more time on this point later, but it is important to recognize there are correlation and risk management benefits that are offered by active strategies that passive index funds simply do not provide. The matching of asset characteristics to investor preferences is just the most obvious of these.

Furthermore, there are an increasing number of studies that point to concerning implications resulting from the increased adoption of passive strategies. For example, Brightman and Harvey (2025) show that stocks with high passive ownership are exhibiting a rising sensitivity to market risk, whereas actively held stocks are showing a decline. Sorensen (2025) also argues that allocating to passive capitalization-weighted indexes exposes investors to underestimated embedded concentration and diversification risks and suggests active strategies as a reasoned alternative. Looking forward, it appears that active strategies will become an increasingly important source of diversification for investors.

DEEPENING THE CASE FOR ACTIVE MANAGEMENT

If we accept that successful active management is possible because: (1) investor preferences drive asset prices, (2) the market is not efficient, and (3) that no investor is average, the logical next question is: What kinds of thinking are likely to generate alpha? What information-gathering and information-interpreting activities offer the possibility of profit?

In our back to basics quest for inspiration, we harken back to the timeless works of Frank H. Knight (1885–1972), the founder of the Chicago School of economic thought, and Friedrich Hayek (1899–1992), the best-known economist of the Austrian school. These men sought to understand the links between information, risk, uncertainty, and profit in the context of not just finance but economics more broadly.

Updating the list of inspirational sources, we also draw on two living financial economists and investment managers, Richard Grinold and Ronald Kahn. Building on the base established by Markowitz and Sharpe, they created the modern quantitative framework for understanding investment risk and the sources of alpha.

Frank H. Knight's Distinction between Risk and Uncertainty

Frank Knight's contributions to economics were very broad, but he is best known for drawing a distinction between risk and uncertainty. He also set forth a theory of entrepreneurship, which turns out to have a surprising application in the pursuit of investment alpha. Addressing the first issue, Knight (1921) wrote:

> Uncertainty … [is] radically distinct from the familiar notion of Risk, from which it has never been properly separated …. "Risk" means in some cases a quantity susceptible of measurement, while at other times it is something distinctly not of this character; and there are far-reaching and crucial differences … depending on which of the two is really present and operating …. It will appear that a *measurable* uncertainty, or "risk" proper, as we shall use the term, is so far different from an *unmeasurable* one that it is not in effect an uncertainty at all.

[17] In "Lady Windermere's Fan" (1893).

Others later defined measurable uncertainty, or risk proper, as a situation in which you know all the possible outcomes and you can estimate the probability of each one occurring; you just don't know which outcome will happen. Let's just call this risk and leave the word "uncertainty" for its opposite.[18]

Knightian uncertainty, then, exists when you don't know all (or any) of the possible outcomes, much less their associated probabilities. Herein, wrote the philosopher-investor Peter L. Bernstein, lies the wildness (Bernstein 1995). Uncertainty is what causes markets to be imperfect and explains the existence of economic profits and their investment counterpart, alpha.[19]

True profit (alpha in the investment world), then, is more likely to be the result of accepting Knightian uncertainty than of taking Knightian risk. Extending this metaphor, taking Knightian risk is taking beta risk, where you get paid the same (per unit of risk) as everyone else. Accepting Knightian uncertainty, in contrast, means taking idiosyncratic, nonmarket, unsystematic, diversifiable risk—the kind for which you're rewarded with alpha if you're right.

The Knightian concept of risk might be expanded to include the kinds of bets that are taken by quantitative managers. Uncertainty, however, can only be managed by fundamental managers. When the wildness happens, the only people who will have anticipated it are those who look at fundamental company, industry, and economic information—or who have gone even further, studying social, demographic, psychological, and cultural trends and exploring the limits of the possible.

Friedrich Hayek: Knowledge Is Decentralized and May Be Quantifiable or Unquantifiable

The great Austrian–British economist Friedrich Hayek pointed out that, as summarized by David Henderson (2016), "the information that is most valuable in an economy is decentralized; it exists in little pieces in the minds of … billions of people." This was one of the reasons Hayek favored a free-market economy where decisions are made by those people, not by a central planner.

Hayek (1945) made a clear distinction between quantifiable and unquantifiable information. The information that Hayek described as most valuable is generally unquantifiable and not available to everyone. Because efficient markets rely on information being perfect, costless, and universally known, Hayek identified yet another reason why the market cannot be efficient.

In an efficient market, all of the information relevant to the pricing of securities, quantifiable or unquantifiable, is eventually impounded in the security's price. But if some types of information are costlier to obtain or require more skill to interpret than others, they are less likely to be reflected in market prices and present the greater opportunity for active managers. The costlier and more difficult-to-interpret information is, naturally, the unquantifiable part.

Quantifiable information can be scrutinized by teams of analysts working with large databases, conventional computing tools, and AI. The output of this kind of analysis is, typically, but not always, a set of over- and underweights of securities relative to a benchmark.

[18] Knight's risk versus uncertainty distinction is also the original source of Donald Rumsfeld's famous (or infamous) quote about known knowns, known unknowns, and unknown unknowns—a phrasing we find to be even clearer than Knight's. Unknown unknowns represent Knightian uncertainty.

[19] Economic profits, that is, profits in excess of the cost of capital, are zero under conditions of perfect competition and perfect and costless information. Obviously, such conditions do not exist and economic profits do exist.

A portfolio constructed using this kind of thinking will be diversified and close to the benchmark, reflecting a modest view of the analyst's special information relative to the wise crowd information inherent in market prices.

But reliance on quantifiable information alone will only take advantage of part of the opportunity for alpha generation because the unquantifiable part of the information set typically contains the big deviations from consensus wisdom. It contains the wildness.

Economics, Art or Science?

A second point, taken from Hayek's Nobel lecture, which he called "The Pretence of Knowledge," is that economics is not physics or any other hard science, even though many wish to treat it that way. Hayek (1974) said:

> [The] failure of the economists to guide policy more successfully [comes from] their propensity to imitate as closely as possible the procedures of the brilliantly successful physical sciences—an attempt which in our field may lead to outright error… [This] "scientistic" attitude… is decidedly unscientific in the true sense of the word, since it involves a mechanical and uncritical application of habits of thought to fields different from those in which they have been formed.

Tough words, but correct ones. In investment management we are not trying to formulate policy, but we are doing something very similar: trying to optimize outcomes based on very limited knowledge of the future, what Hayek called the pretense of knowledge.

We describe this limitation thus: There are variables, or packets of information, that are not measurable; they cannot be summarized or averaged; but knowledge of them is required for proper decision making. To interpret this information requires critical thinking and judgment, which are humanistic, not mechanistic, qualities. The interpretation of qualitative information is the one place in the investment process where information asymmetry is most likely. Thus, its natural home is fundamental analysis.

The Fundamentals of Information and Active Investing

In their classic reference book *Active Portfolio Management*, Grinold and Kahn (1994) propounded a set of engineering principles for alpha production that, while couched in scientific language, allows generously for qualitative input. They set forth what they called the fundamental law of active management, which is elegantly summarized as follows:

$$\text{IR} = \text{IC} \times \sqrt{\text{Breadth}}$$

where

- IR, the information ratio, is the alpha of a portfolio, scaled (divided) by the active risk of the portfolio, where active risk is the annualized standard deviation of period-to-period alphas (excess returns).
- IC is the correlation of the manager's forecasts with subsequent results (realizations).

- Breadth is the number of independent active decisions the manager makes in each period and can be regarded as the number of different places in the global asset marketplace that the manager applies the information in the IR.[20]

This equation can be interpreted as saying there are two ways to be an active manager. You either know a little about a lot of stocks, which means you emphasize breadth, or you know a lot about a few stocks, meaning that you have a high IC (you can't know a lot about a large number of stocks). Understanding how a manager uses information is crucial because it provides insight into the characteristics of the excess returns and risks that are to be expected from a manager.

Portfolio Construction and Uncertainty

Any investment strategy can be defined by two elements: (1) a set of securities and (2) a set of weights.[21] So far, we've focused on security selection, the choice of which securities to hold. Portfolio construction, assigning weights to each of those assets, is an equally critical aspect of active management.

To understand how an investment manager might approach portfolio construction, we revisit Harry Markowitz's 1952 portfolio theory, which uses principles from game theory and Bayesian probability to guide decisions under uncertainty. It uses an investor's beliefs about the expected returns, risks, and correlations of a selected set of securities and translates them into a portfolio that maximizes return for a given level of risk. In other words, it seeks to make the most effective use of an investor's stock selection skill (IC) by managing the uncertainty around expected outcomes.

Thus, evaluating a manager requires understanding not just how they select securities but also how they assign weights to those securities—a process that should aim to maximize the benefits of information use while avoiding unnecessary risk.

AI, Active Management, and the Future

Perhaps the most concise but practically accurate description of risk was put forth by Cambridge University professor Elroy Dimson, who explained that "risk means more things can happen than will happen" (Dimson and Marsh 1982). This description extends the concept of risk beyond volatility and into the realm of uncertainty. It also relates directly to the world investors are facing today and to the way that the practice of active management might evolve in the future.

From one perspective, we see the increasing adoption of capitalization-weighted passive index funds by investors—a direction that positively rejects the use of information (other than the general information set available to all investors) for investment decision making. From another perspective, we are seeing the proliferation of computing

[20] IC measures the manager's skill, the frequency with which he makes forecasts that turn out to be accurate. This is fairly simple. In contrast, Ron Kahn writes, breadth is "the hardest part of the Fundamental Law to understand." He expands on this:

> Breadth…measures the number of independent bets the manager takes per year… [It] is a rate, not a number. It's not the number of assets in the portfolio. We expect twice as many bets over two years than [over] one year, so the number of holdings isn't the right concept… [B]readth relates to both the number of assets under consideration and the information turnover rate [that is, the frequency with which each asset is subjected to a decision involving information]. (Kahn 2018, p. 51)

(Our italics and parentheticals.)

[21] The definition of an active strategy can be further reduced to the act of selecting a set of weights—given that weights for some securities can be set to zero. For our purposes it is useful to separate the practice into two components: security selection and portfolio construction.

power, new datasets, novel analytical methods, and emerging technologies such as AI and quantum computing, which are already reshaping the asset management industry.

The two poles of costly active management and cheap passive indexing should move closer together. We showed earlier that active management costs are already declining. Meanwhile, we expect that passive managers (broadly defined as those claiming no special insight into stocks or stock groupings) will begin to function more as intermediaries for matching investor preferences to asset characteristics, as the PAPM suggests. Thus, there will be different passive funds for tax-exempt and taxable investors, those with or without views on environmental, social, and governance (ESG) investing, those with a home-country bias or home-country aversion, and many other clienteles. Fees for such funds will rise above rock-bottom index fund levels. This evolution has already started.[22]

As AI is increasingly adopted across the investment management industry, costs should decline further, not just from better and cheaper information gathering and interpretation but also from increased efficiencies in operations, regulatory compliance, and reporting. Chin (2025), discussing the impact of AI on active investing, goes further and describes how both fundamental and quantitative strategies will benefit. Fundamental managers will gain scale in their ability to apply their insights across a wider range of securities. Quantitative managers will also benefit from new data sources and the ability to quantify information now regarded as purely qualitative. Overall, both types of managers, working symbiotically with AI technologies, should be able to gather more information and interpret it more quickly. The good news, for investment management professionals and (we believe) for investors, is that human judgment will retain its central role.

Despite the promise of AI, there is a limit to what it can conceivably offer to investment management. As Peter Bernstein once noted, risk exists because we do not know the future. Unless the world changes in such a way that we (or AI) can accurately predict the future, there will be risk, there will be uncertainty, and there will be value in human judgment and active management.

INFORMATION, UNCERTAINTY, AND ACTIVE INVESTMENT MANAGEMENT: PRACTICAL APPLICATION

Up to this point, we have revisited both practical and theoretical aspects of active management. We now turn to application. We'll first briefly review the different types of investment strategies and provide a description of each in the context of our broader argument about different types of information, risk, and uncertainty.[23] We will then provide practical guidance on the implementation of active strategies in a portfolio to make the most of active management.

All investment decisions implement some sort of information, which is really the only commodity of any value in the investment business. Let's look at index funds, quantitative active funds, and fundamental active funds.

Passive Index Funds

Index funds offer exposure to the information set broadly available to all investors, reflected in market capitalization weights that represent what the New Yorker columnist James Surowiecki called the wisdom of crowds. Although markets often

[22] See Reinganum and Blay (2024).

[23] This article focuses on long-only investing but can be adapted to long–short investing by changing a few words (short instead of underweight and so forth). Information has intrinsic value independent of the specific application to which you put it; the specifics of the application merely reflect constraints, mandates, laws, and so on.

aggregate information effectively, history—like the market crashes of 1929, 2000, and 2008—shows that crowds can also be irrational, as Charles Mackay illustrated in his eye-opening 1852 book, *Extraordinary Popular Delusions and the Madness of Crowds*.

Relying solely on market cap-weighted indexes means accepting both the wisdom and the folly of crowds. Although index funds are a widely used default for implementation, they are not a one-size-fits-all solution—especially when individual investor preferences, objectives, and circumstances call for more tailored approaches.

Quantitative Active Funds

Quantitative strategies rely on quantifiable information and statistical models to identify securities with characteristics historically linked to higher returns—such as valuation ratios, sector exposures, factor sensitivities, or sentiment indicators. These models are typically rules based and data driven, focusing on systematic patterns rather than deep analysis of individual companies. As a result, they aim to know a little about a lot of securities, making broad, diversified bets across many securities, rather than knowing a lot about a few securities, as fundamental managers try to do.

These strategies tend to perform well in stable market environments, where historical relationships hold. During periods of market stress, however, when correlations shift and patterns break down, the statistical models upon which many quantitative strategies rely may be less effective.

Quant managers emphasize breadth—making many small, low-conviction bets that are updated frequently, often monthly or quarterly. This leads to short-term payoff horizons and more consistent, though typically smaller, excess returns. The strength of this approach lies in its scalability and ability to systematically capture small inefficiencies across a wide universe of securities.

Fundamental Active Funds

Fundamental strategies combine quantifiable data, unquantifiable insights, and human judgment to evaluate individual companies. Managers assess factors like company leadership, strategy, supply chains, and industry dynamics to forecast earnings and estimate returns. Fundamental managers face a formidable task as they must often act on insights extracted from incomplete or imperfect information. These discretionary approaches rely on deep, company-specific analysis which amounts to knowing a lot about a few securities.

Because of the deep knowledge of the securities held, fundamental managers are well positioned to be opportunistic, especially during market shifts or inflection points. They emphasize insight (IC) over breadth, making fewer, high-conviction bets with longer and less predictable payoff horizons. As a result, excess returns tend to be larger but more variable over time. Panel A of Exhibit 3 provides an overview of the three different types of investment strategies we've discussed, relating them to sources of return and types of information exploited. Panel B provides a comparison of the practical characteristics of the different strategies.

Making the Most of Active Investments

Having reviewed the most common investment strategies available to investors, we can now turn our focus to how investors can best make use of active investment management. To this end, we offer three key suggestions:

1. *If you are going to be active, be serious about it*: A common and frustrating situation arises when asset owners demand that their active managers

EXHIBIT 3

An Overview of Investment Strategy Characteristics

Panel A: Investment Strategies by Sources of Return and Information Type

		Information Type			
		Quantifiable			Unquantifiable
Sources of Return	Market	Index Strategies	Quantitative Strategies	Fundamental Strategies	
	Inefficiencies and Anomalies				
	Uncertainty				

Panel B: Comparison of Investment Approaches

Feature	Passive Index	Quantitative Active	Fundamental Active
Information Type	Information accessible to all	Quantifiable; Observed patterns in data	Quantifiable/unquantifiable; Human experience and judgment
Basis for Active Returns	None	The future resembles the past	The future may differ from the past
Opportunity Set	Universal	Broad	Narrow
Depth of Insight	None	Shallow	Deep
Timing of Active Bets	None	Periodic; Short-term	Discretionary; longer-term
Consistency of Active Returns	None	Consistent	Variable
Scalability	Indefinitely large	High	Low
Key Strengths	Simplicity, low cost	Power of averages	Power of exceptions; Opportunistic
Key Weaknesses	Ignores market inefficiencies	Turning points; Depth of insights	Empirical support for intuition; hard to scale

SOURCES: Invesco. Adapted from Chin (2025).

produce returns similar to those of their cap-weighted benchmark (that is, control tracking error closely) and are then surprised to find that the manager doesn't earn much alpha. What is worse, the more closely we ask managers to track a given benchmark, the higher the costs incurred—tighter tracking with fewer holdings requires more turnover and imposes higher trading costs. There is simply no way around that. Furthermore, imposing tighter tracking also implies biasing security selection toward securities that are most like the index being tracked—further thwarting the benefits of active security selection.

If an investor is going to pay the costs of price discovery that an active manager provides, they should let the manager be active. Looser tracking to a benchmark, *ceteris paribus*, requires less trading, reducing trading costs, and increasing the likelihood of benefitting from the manager's skill. If a manager has information, they should use it.

This does not obviate the need to manage the overall active risk of the asset owner's portfolio. But an investor can manage their active risk by blending active funds with a corresponding index fund, assigning to each fund a weight reflecting the investor's tolerance for active risk. Paying for a slightly active manager instead is akin to buying a computer because you want the box it comes in and then complaining that the box was expensive. If you want a box, buy a box. If you want to track an index, invest in an index fund. If you want active management, invest in an active manager with the freedom needed to maximize the benefits of their active decisions.

2. *Diversify information sources, but establish realistic expectations*: Although almost everyone understands that well-managed investment portfolios use the principle of diversification, what is it that investors should diversify? We conclude that investors are best served when they diversify their information sources because information is the only source of investment value. There is information in the wisdom of crowds, the patterns of return that emerge from trading, and the unique contributions of thinking individuals.

   Thus, to be properly diversified in terms of information sources, investors should combine:
   - index funds, the composition of which reflects the information set available to everyone
   - quantitative active funds, which make use of information hidden in return patterns and other numerical data
   - fundamental active funds, which exploit information (both quantifiable and unquantifiable) and judgment

   Of course, investors should align expectations with a manager's approach. Quantitative managers focused on breadth tend to deliver more consistent alpha through frequent, smaller bets. In contrast, fundamental managers emphasizing insight (IC) may produce larger but less consistent gains or losses. Time and diverse market conditions are often required for such managers to show successful results.

   When diversifying, investors should consider the characteristics of active strategies across different market conditions. Quantitative managers may be challenged during periods of market turbulence where statistical relationships break down. Alternatively, fundamental managers are uniquely positioned to be opportunistic during market dislocations. The payoffs, however, may take time to materialize.

   Passive index funds, in addition to their basic role as a beta source, give investors a way to adjust active risk. Allocating more to active strategies increases active risk; allocating more to passive reduces it. Combining both offers flexibility to adjust portfolios across different market environments.

3. *Implement broadly*: A common impediment to the effective implementation of active strategies is the oversegmentation of investment policy. For example, policy portfolio equity allocations are often divided across a number of market segments, including US large-cap, US midcap, US small-cap, developed market ex-US, and emerging market stocks—with each segment tied to a corresponding benchmark for performance evaluation.

   Then, when implementing the policy, this practice ties manager selection and behavior too closely to cap-weighted benchmarks. It significantly limits an investor's ability to benefit from other aspects of active management, such as diversification or specialization. For example, allocations to factor strategies can offer substantial diversification benefits. Cavaglia et al. (2022a, 2022b) examined the benefits of factor overlays to multiasset portfolios and showed how even naïvely constructed overlays notably improved long-term investor outcomes. In short, there is more to implementation using active managers than benchmark-relative returns.

   Investors are better served by setting portfolio policy using broad asset groups, such as a single global equity allocation, and then implementing with a broad range of active and passive strategies. This approach simplifies implementation and provides investors with significantly greater freedom and flexibility to pursue excess returns and manage risk through:
   - overweights/underweights to subasset classes,
   - the use of specialist managers focused on specific types of investments,

- the use of strategies not tied to cap-weighted indexes (such as factor strategies)
- the use of managers with tactical approaches or other unconventional strategies such as hedging and leverage

The performance of such a combination of strategies can then be measured against the broader policy allocation while also assessing manager-specific performance with their corresponding benchmarks.

Some of the world's largest and most respected pension funds are already doing something like this. New Zealand's NZSuperFund measures the performance and risk of their portfolio relative to a simple three-asset reference portfolio: global equities, New Zealand equities, and fixed income (NZSuperFund 2023). CPP Investments of Canada measures the performance of its portfolio relative to a two-asset portfolio consisting of global equities and Canadian government bonds (CPP Investments 2025). We are simply suggesting that this implementation framework can be adapted to broad asset-class policy allocations within multi-asset portfolios.

CONCLUSION: WHY ACTIVE MANAGEMENT CAN BENEFIT INVESTORS

In a world where both Knightian risk and uncertainty shape investment outcomes, investors can benefit from returns that exist across the full spectrum—from measurable risks to the more ambiguous terrain of uncertainty. Although risk can be quantified and priced, uncertainty—driven by change in economics, demographics, policy, technology, and geopolitics—remains persistent and unquantifiable. Yet, it is precisely this uncertainty that creates the conditions for excess returns. As PAPM suggests, investment returns are positively related to the unpopularity of an asset's characteristics—including but not limited to risk and uncertainty—with the highest returns going to the informed investor.

This leads to two foundational reasons why active management remains valuable. First, markets are not perfectly efficient. Information is costly to acquire and interpret, and not all investors are equally skilled or motivated to do so. Those who are—whether through superior insight or luck—can earn alpha. The challenge for asset owners is to identify these managers in advance, a task that demands rigorous due diligence and ongoing evaluation.

Second, even if the market is efficient and cannot be beaten through conventional alpha-seeking efforts, investor preferences differ. These differences—across time horizons, risk tolerances, tax situations, other asset positions, and ESG priorities—mean that the market portfolio is rarely optimal for any individual. Active managers play a crucial role in constructing clientele-specific portfolios, enabling investors to trade with others who have different needs. This creates value without necessarily requiring market-beating insight.

Moreover, the use of diverse information types—both quantifiable and unquantifiable, to use Hayek's distinction—enables active managers to navigate uncertainty more effectively. By interpreting signals that fall outside traditional models, they can manage risk, uncover inefficiencies, and align portfolios with evolving investor goals. This, however, is no easy task. Active management is difficult because predicting the future is difficult. Investors must set realistic expectations: Success lies not in eliminating uncertainty but in managing it wisely.

Ultimately, uncertainty is a salient and persistent feature of the financial markets. It is where opportunity comes from. And as long as change persists, so too will the need for thoughtful, adaptive, and skillful active management.

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