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Goals-based Investing: Integrating Traditional and Behavioral Finance

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EXECUTIVE SUMMARY

This article examines opportunities to improve wealth management for individual investors by combining traditional investment methodology based on modern portfolio theory with the observations of behavioral finance. Particular areas of focus include new frameworks for risk measurement and risk profiling, and methods for managing behavioral biases. Our key points include:

- In the area of risk measurement, we stress the importance of capturing investor goals and preferences and propose several measures that are consistent with this objective.
- Proposed risk measures differ from traditional measures in that they are based on events and do not require specification of a time interval.
- We critique common risk profiling techniques, advocating separate risk tolerance estimates for separate goals rather than an overall risk tolerance for each investor.
- We note that the "total portfolio" framework of traditional finance is inconsistent with investors' tendencies towards mental accounting and suggest that a better result may be achieved by linking individual strategies to a specific goal or goals.
- The benefits of aligning strategies with goals are also discussed in the context of behavioral theory, with the argument that behavioral biases are more easily managed with this approach.
- Furthermore, we argue that performance measurement for individual investors becomes more meaningful when strategies are evaluated based on progress towards goals rather than using traditional portfolio statistics.

Together, our recommendations comprise a framework for goals-based investing. The implementation of this framework is described through examples, which consider the challenges of investing to meet lifestyle expenses and investing for a fixed planning horizon. We discuss the development of investment strategies for each of these purposes, modifying traditional portfolio construction methods to reflect investor goals, risk tolerances and preferences.

According to our research, our goals-based investing framework delivers better solutions than traditional approaches. Our approach increases the likelihood of achieving specific goals while heeding the lessons of behavioral finance by capturing the ways that investors think and behave. We conclude that goals-based investing is an important step towards narrowing the gap between the investment principles of the practitioner and the perspective of the individual investor.

INTRODUCTION

"We have now begun the important job of trying to document and understand how investors, both amateurs and professionals, make their portfolio choices." –Nicholas Barberis and Richard Thaler [2003]

Since Harry Markowitz wrote his groundbreaking paper, "Portfolio Selection", in 1952, investment professionals have been schooled in a well-known approach to portfolio management. The goal is to build efficient portfolios, those that maximize return for a given level of risk. Efficient portfolios are combined to create an efficient frontier of return opportunities. Investors then select from the frontier, choosing a portfolio that matches their risk tolerance.

The Markowitz approach to portfolio selection led to the development of modern portfolio theory and influences most investment processes used today. It was subjected to a severe test during the recent bear market. As U.S. equity prices fell by 49% from the peak in March 2000 to the trough in October 2002[1], the strengths and weaknesses of traditional investment methods were exposed.

The bear market reinforced the benefits of diversification, which is the key to portfolio efficiency and underpins Markowitz's work. The principle of diversification is as simple as it is powerful. By spreading a portfolio among a variety of investments, investments that are performing poorly are balanced by those that are performing well, resulting in a more consistent pattern of returns. Many investors found that diversification mitigated the effects of falling stock prices. Consider Tiger Woods, better known for his golf game, who gave this confident response to a reporter's questions about volatility in the midst of the bear market: "That's one of the reasons why you diversify yourself." Other investors failed to diversify and fared poorly as a result, such as those who were concentrated in technology stocks.

In most cases, however, even well-diversified investors were unprepared for the full extent of the bear market. Many had implemented strategies in rising markets with neither clear objectives nor a clear understanding of the risks. As they were forced to rethink their strategies, investment practices have come under greater scrutiny. Areas where traditional methods have been disappointing, including goal setting and risk assessment, have received particular attention. More broadly, the investment community is seeking new approaches that are less reliant on traditional investment theory.

THE ROLE OF BEHAVIORAL FINANCE

The search for new ideas gained support in October 2002, when the Nobel Prize for Economics was awarded to Professor Daniel Kahneman of Princeton University. Kahneman's work is often at odds with traditional investment theory. He is among a group of behavioral finance theorists who have challenged the investment community to better reflect the way that investors think and behave. Although most investment processes used today are effective by the standards of Harry Markowitz's theory of portfolio selection, they are less impressive when evaluated in the context of behavioral finance.

Behavioral theorists have disproved many of the assumptions underlying modern portfolio theory, or standard finance as it is now sometimes called. These assumptions have been shown to be inconsistent with individual investor behavior. For example, the rational investor assumption — that investors have

[1] According to the S&P 500 Index.

perfect information about economic and market events and utilize that information to make rational decisions — is a stretch at best. Among the implications is that investors choose portfolios with either too much or too little risk. In the 1990s investors seemed to have forgotten that markets can fall and they implemented aggressive portfolios with disastrous consequences. Today, many of the same investors have been frightened by market events and selected portfolios that are overly conservative.

Behavioral theorists Nicholas Barberis and Richard Thaler [2003] have described the direction of behavioral research as follows:

> We have now begun the important job of trying to document and understand how investors, both amateurs and professionals, make their portfolio choices. Until recently such research was notably absent from the repertoire of financial economists, perhaps because of the mistaken belief that asset pricing can be modeled without knowing anything about the behavior of the agents in the economy.

As the theorists rethink the principles of financial economics, it is incumbent upon the investment community to consider the practical implications of their work. In some respects this has already occurred. For example, savvy traders and money managers have long sought to exploit investors' behavioral tendencies for profit. In other areas progress has been slower, such as helping those same investors to manage wealth and achieve goals.

In this paper, we suggest that behavioral finance should play a critical role in wealth management, one that reinforces the benefits of standard finance. Too often, standard and behavioral finance are seen as competing philosophies with investment professionals expected to choose one side or the other. We believe there is value in both disciplines and recommend an approach to wealth management that blends traditional investment theory with the observations of behavioral theorists.

A GOALS-BASED APPROACH TO WEALTH MANAGEMENT

With our approach, investment principles are redefined from the viewpoint of the investor rather than the practitioner. We define portfolio efficiency in terms of client goals instead of relying on traditional measures of return and standard deviation. Risk management is also based on client goals, using measures to capture the risk of failing to achieve those goals. Based on our custom measures of portfolio efficiency and risk, we then create investment solutions by matching each goal with an appropriate strategy rather than creating a single overall portfolio. The investment solution is reevaluated over time, maintaining consistency with new circumstances and changing goals.

While this approach is certainly more complex than traditional methods of wealth management, it offers valuable benefits. Investors should have more confidence in strategies that are explicitly aligned with their own objectives. They should also have a clearer understanding of their risk exposure, which is expressed in terms that relate more directly to the achievement of goals. Greater confidence and clarity will not prevent disappointment when markets fall; however, the investor should be better prepared for bear markets and more likely to maintain perspective and discipline. In addition, and probably most tangibly, this approach should increase the likelihood of achieving goals.

The main body of our paper is divided into two sections. In the first section, we examine the shortcomings of traditional investment methods, considering the reasons why investors often fail to achieve their goals. We focus on processes for risk measurement, risk profiling, and managing

behavioral biases. Several suggestions are provided for improving upon traditional methods, drawing on the lessons of behavioral finance. In the second section, we outline an approach for implementing our findings. We describe a goals-based investing process that links investment strategy selection to client goals. Investment strategy examples are provided for two common goals: meeting current lifestyle expenses and investing for a fixed planning horizon.

Section One: Meeting Investor Goals

Investor goals are best stated in terms of the lifestyle needs, wealth transfers, and charitable gifts to which investment capital will ultimately be applied. Lifestyle needs describe the capital that is required to achieve a desired standard of living. Wealth transfers refer to funds that are transferred to one's children or other family members. Charitable gifts represent support for one's community, defined broadly to include any cause to which the investor wishes to contribute. Wealth management requires planning for each of these three uses of capital.

Despite the efforts of investment professionals to understand their clients' goals for their lifestyle, family, and community, these goals are often unfulfilled. Weak markets commonly receive the blame. However, while it is difficult to build strategies that meet goals in all types of markets, effective investment planning should do exactly that. Lee Munder, founder of the Lee Munder Capital Group, delivered this harsh commentary on the investment industry in February 2003:

> We have to prove our worth. We are not delivering performance. Clients want competitive rates of return. …And we have to be able to produce investment results in all kinds of markets.

In this section of our paper, we critique the effectiveness of traditional investment methods in meeting this challenge. Particular attention is given to the tension between the assumptions of standard finance, which require statistical measures such as expected returns, standard deviations and Sharpe ratios, and the viewpoint of the individual investor, which is based on goals and human psychology. We seek opportunities to improve upon traditional investment practices, raising the likelihood of achieving goals in both strong and weak markets. Opportunities are identified in the areas of measuring risk, risk profiling, and managing behavioral biases.

Risk Measurement

"It is not so much that people hate uncertainty–but rather, they hate losing."
–Amos Tversky [2001]

Risk measurement traditionally relies on portfolio statistics like standard deviation and tracking error, which have convenient properties that make them easy to calculate and manipulate. The development of standard finance would not have been possible without these statistics. However, they have weaknesses related to both their ability to capture market behavior and their relevance from the individual investor's perspective.

While standard deviations fully explain the uncertainty that investors face when we assume that return distributions are normal and unchanged from one period to the next, it is easy to show that markets

exhibit non-normalities and that risk changes through time. In the language of the risk manager, there is ample evidence of skew, kurtosis, and heteroskedasticity. Skew is the degree of asymmetry in the probability distribution and is especially relevant when it is negative, suggesting more downside risk than would be expected using only the standard deviation. Kurtosis describes the degree to which the tail ends of the distribution are more concentrated, or "fatter," than predicted by a normal distribution, implying that extreme results are more likely. Heteroskedasticity indicates that risk changes through time, such that the standard deviation measured over an historical period may not reflect risks going forward. Each of these properties suggests that risks could be overlooked if one were to rely on standard deviation alone, and should be considered within the risk management process.

LINKING RISK MEASUREMENT TO INVESTOR GOALS

In addition to the complex statistical properties that we observe, perhaps more damaging to the challenge of meeting investor goals is inconsistency between traditional risk measures and the way that individual investors experience risk. We argue below that these measures can be hard to interpret, fail to capture the risk of losing money, and relate to time intervals rather than events.

Consider, for example, an investment in the S&P 500 between 2000 and 2002. The standard deviation of the S&P 500 over this period was 19%. The total portfolio loss over the same period was 38%. Few individual investors are able to connect the standard deviation of 19% with the possibility that they could lose over one-third of their wealth. Fewer still can connect the 19% standard deviation with the implications for their capacity to fund their goals. Investors can struggle to find meaning in a measure that doesn't describe risk in terms of clear outcomes. A standard deviation of 19% could coincide with a loss of much more than 19%, a gain of much more than 19%, or anything in between.

Leslie Kiefer [2000] summarizes the challenges of integrating the risk perspectives of the practitioner and the individual investor as follows:

> Investment managers talk about risk as volatility, a tendency that leads them to frame the discussion of risk in terms of the kinds of volatility that can be diversified away. Individual clients, however, are usually much less focused on volatility. Their perceptions of risk are often driven by emotions and, therefore, are easily misunderstood or ignored by managers who take a strictly rational approach to risk. In order to be successful, managers must identify how clients actually perceive risk.

LOSS AVERSION

Among the emotions that determine the individual investor's perceptions of risk is an aversion to losses. The idea that investors are not risk-averse but loss-averse is one of the main tenets of behavioral finance[2]. While the distinction may seem trivial, studies have shown that investors will increase their risk, defined in terms of uncertainty, to avoid even the smallest probability of loss. Thus, the assumption that investors are always risk-averse, which underpins modern portfolio theory, is incorrect. According to behavioral theorist Amos Tversky [2001], "It is not so much that people hate uncertainty – but rather, they hate losing."

[2] Kahneman and Tversky [1979] considered the implications of loss aversion in a landmark paper in which they questioned the validity of the utility function of standard finance. In its place, they introduced a model of investor preferences called a value function. Their value function accommodates the observation that investors are not risk-averse but loss-averse. More broadly, their approach, which they called prospect theory, measures value using reference points rather than total wealth outcomes and, therefore, is more consistent with the behaviors that researchers have observed.

Loss aversion suggests that risk measurement should explicitly consider the risk of loss. Measures of the risk of loss can capture the likelihood that a loss will occur, the severity of loss, or both. Examples include the probability of loss, which considers likelihood but not severity, and the downside deviation, which captures both the likelihood and severity of loss by adjusting the standard deviation formula to isolate return outcomes below a certain threshold (Nawrocki [1999]). In the second section of our paper we describe another measure, the potential portfolio loss, which considers loss severity only. We also provide examples of investment strategies that directly manage the risk of loss. By using measures of the risk of loss to guide strategy development, we can align investment choices more closely with the investor preferences that behavioral theorists have observed.

MEASURING THE RISK OF EVENTS

Another limitation of traditional risk measures is that they are specified in terms of time intervals. Standard deviations tend to be annualized, describing the dispersion of returns over a one-year period. Value-at-risk is also calibrated to a specific time interval, usually considering periods shorter than a year. Because they are calibrated to a single time period, these measures do not capture the risks that investors face when their portfolios fall for several periods in succession. They also do not consider risks that come and go prior to the end of the period.

When risk measures cover periods of a year or shorter, the failure to convey risks extending beyond a single period is the primary concern. In the example used above, investors who know only the annualized standard deviation for the S&P 500 may not have an accurate view of the amount that they could lose over multiple periods. Conversely, when the time period is significantly longer than a year, a particular concern is the failure to consider the path that the portfolio follows between the beginning and end of the period. Annualized risk figures are often extended to 5 or 10 years or longer by projecting forward the distribution of returns. Because this method balances bad years with good years, it can lead investors to lower their view of the risks that they face. Its drawback is that it does not consider the troughs that the portfolio can reach prior to the end date (Kritzman and Rich [2002]). After the recent market cycle, investors do not need to be reminded that these troughs can affect their well-being as much as the end result.

An alternative to using period-specific measures is to measure the risk of events without specifying a time interval. Although the term event risk is commonly used to refer to extreme economic and market developments (see, for example, Powers [2003]), for our purposes events are defined as violations of investor preferences or goals. We seek to measure the risk that a strategy will fail rather than defining risk in terms of time periods and regardless of whether or not extreme circumstances are present. For example, to capture loss aversion, risk measures might consider the potential portfolio loss that could occur between any two points in time. The event in this example is a portfolio loss of a certain amount. Alternatively, risk measures might estimate the probability that an investment strategy fails to achieve a particular goal at any time in the future. In this case, the event is the breach of a goal. Event risk measures such as potential portfolio loss and probability of failing to achieve a goal are discussed further in the second section of our paper, where we demonstrate how they can be used for strategy development.

Our premise is that investors should be more concerned about specific events, whenever they may occur, than performance outcomes for a single time period. Therefore, we should aim to define risk

according to events rather than defaulting to traditional measures. Event risks are more difficult to calculate than statistical measures such as standard deviations [3], but better aligned with the way that the individual investor experiences risk.

Risk Profiling

"In the old days, many people kept their money for rent, furniture, groceries, and so on, in separate jars. Today, we have the same mental accounting approach to our various pools of assets." –Meir Statman [2002]

Risk profiling is used to establish the client's risk tolerance, which is often the primary link between the client and the investment recommendation. Like risk measurement, it is an important part of investment planning but one that is sometimes poorly executed. We consider below two of the difficulties involved in building an effective risk profiling process. First, the information that people provide about their attitudes towards risk can be misleading and hard to interpret. Second, it is not easy to integrate risk tolerance estimates with other factors affecting strategy selection, notably client goals.

Proper risk profiling requires some type of questioning, either verbal or in questionnaire form, with most advisors using both. The drawbacks of relying solely on verbal questioning are described by researchers Victor Callan and Malcolm Johnson [2002]:

> It is often difficult for clients to describe in their own words their attitudes about risk. The initial meetings with financial advisers can be quite difficult for some clients because of the lack of understanding that they might have about their 'financial selves', and the investment risks that they might be willing to accept.

Callan and Johnson also note that "most forms of communication between people, even between people who know each other very well, involves a fair degree of miscommunication," and suggest that risk profiling requires a scientifically developed measure of risk tolerance, obtained using a questionnaire.

While many advisors accept the views of Callan and Johnson and other proponents of questionnaires, the effectiveness of questionnaires is open to debate. In a study by Ken Yook and Robert Everett [2003], six different questionnaires were evaluated by administering them to MBA students, with the conclusion that some provide accurate risk tolerance estimates while others do not. The correlations among the six questionnaires were relatively low, indicating that all of them could not be correct. Furthermore, the relationship between the subjects' responses and their investment decisions was found to be weak.

DECISION FRAMING

The challenges involved in risk profiling are perhaps best understood in the context of decision framing, an area of behavioral research that has been led by Kahneman and Tversky. Decision framing research indicates that slight differences in the way that questions are posed lead to very different answers about people's preferences[4]. Roszkowski [2002] provides the following example:

[3] Measures of event risk often require Monte-Carlo simulations.

[4] The study of decision framing is related to prospect theory (Kahneman and Tversky [1979]). See, for example, Thaler [1980], Kahneman and Tversky [1984], and Tversky and Kahneman [1986].

> Consider research in which one group of people is informed that there is a 50 percent chance of success in a particular venture. Another group is told that this same venture has a 50 percent chance of failure. Logically, the same proportion of people in each group should be willing to take this risk. Yet this was not the case. When the risk was described (framed) in terms of the probability of success, more people were willing to take it than when this same risk was described in terms of the chances of failure.

The implication is that questions for risk profiling should be worded carefully to isolate the investor's attitudes without introducing biases. Even accurate risk tolerance estimates, however, can lead to a poor strategy choice. If, for example, the client is by nature a risk taker, a risk tolerance estimate might suggest a risky strategy in situations in which a conservative portfolio is sufficient to meet the stated goals. In other situations, a naturally cautious person might opt for a conservative strategy despite goals that are more likely to be met with an aggressive approach.

MENTAL ACCOUNTING

More fundamentally, the notion of an overall risk tolerance for each investor is flawed. Behavioral theorists have shown that investors have not just one but multiple attitudes about risk. For some goals and investment accounts, risk tolerance may be low, while other goals and accounts may be associated with a high risk tolerance. For instance, most investors are unwilling to risk capital that has been allocated to their children's education costs. However, they may have other accounts, sometimes described as fun money, that are not needed for lifestyle expenses and are invested adventurously, seeking the highest return opportunities.

Investors who manage risk on a goal-by-goal basis exhibit mental accounting, referring to the practice of maintaining separate investment accounts, either mentally or in practice, and making decisions differently depending on the nature of the account[5]. Behavioral finance professor Meir Statman [2002] observes that:

> We tend to compartmentalize the assets we use for downside protection from the assets we use for upside potential. In the old days, many people kept their money for rent, furniture, groceries, and so on, in separate jars. Today, we have the same mental accounting approach to our various pools of assets.

Behavioral theorists have argued that mental accounting, and the multiple goals on which it is based, is incompatible with traditional investment theory. Traditional theory suggests that an allocation should be established for an investor's total portfolio. Risk is also managed at the total portfolio level, using an estimate for the investor's overall risk tolerance. It is difficult to reconcile this single portfolio framework with separate mental accounts linked to multiple goals.

An alternative to the traditional approach is to allow more than one strategy, as discussed by Shefrin and Statman [2000] and Brunel [2003]. Each strategy is linked to a goal and managed according to the risk measures and risk tolerance that are most appropriate for that goal. This approach, which we call goals-based investing, is compatible with mental accounting. Another advantage is that it manages

[5] The study of mental accounting also emerged from prospect theory (Kahneman and Tversky [1979]) and the observation that value functions are defined relative to a reference point rather than in absolute terms. Multiple reference points imply multiple and separate mental accounts. Mental accounting has been used to explain many investor behaviors, including the tendency to manage investment accounts differently depending on the purpose of the account (Thaler [1985]; Shefrin and Thaler [1988]; Thaler [1999]; Shefrin and Statman [2000]).

the risk of not achieving goals rather than relying on traditional risk measures. Further benefits are considered in the next sub-section, where we discuss behavioral biases.

Managing Behavioral Biases

"Follow the pattern of the physician: Ask, listen, diagnose, educate, and treat." –Meir Statman [2002]

Thanks to the work of Kahneman, Tversky, Statman, and others in their field, we are learning more about investor behaviors such as loss aversion and mental accounting. These behaviors are characterized as preferences and should be reflected in the investment process. For example, practitioners should accommodate loss aversion by developing strategies that seek to manage losses. Similarly, they should accommodate mental accounting by developing strategies that can be aligned with investors' separate goals and accounts. Practitioners who fail to accommodate investor preferences are ignoring the criteria by which their performance will be judged.

Other behaviors that theorists have studied are characterized as biases rather than preferences. Biases can lead to failed investment strategies and should be controlled rather than accommodated. Below we consider several examples of potentially damaging biases, including overconfidence, hindsight bias, overreaction, belief perseverance, and regret avoidance. In each case, research indicates that these are common behavioral traits.

OVERCONFIDENCE

Overconfidence suggests that investors overestimate their ability to predict market events. Because of overconfidence, investors often take risks without receiving commensurate returns. Another effect of overconfidence is overtrading, which can lead to poor investment decisions and excessive transactions costs. Behavioral theorists Brad Barber and Terrance Odean have reinforced the dangers of overconfidence with a series of studies showing that portfolio performance is inversely related to the amount of trading in the portfolio. In one study [2000], they divided 78,000 investors with a large brokerage firm into five groups according to the frequency of trading, and showed that the annual return for the group that traded most frequently was about 6% less, after transactions costs, than the return for the group that traded the least. While there could be a variety of behavioral traits that help to explain the 6% difference, those investors who trade most often while performing poorly would appear to be overconfident of their investment skills.

HINDSIGHT BIAS

Hindsight bias refers to evidence that people often believe they had predicted an event when in fact they had not. Kahneman and Mark Riepe [1998] write that most people "are honestly deceived when they exaggerate their earlier estimate of the probability that the event would occur." Hindsight is a trait that reinforces tendencies towards overconfidence. As advisors are well aware, it can also lead to difficult customers who demand explanations for why their advisors did not anticipate events that were obvious in hindsight.

OVERREACTION

Overreaction suggests that people are overly influenced by random occurrences. Kahneman and Riepe [1998] note that "the human mind is a pattern-seeking device, and it is strongly biased to adopt the hypothesis that a causal factor is at work behind any notable sequence of events." As a result, investors tend to over-interpret patterns that are coincidental and unlikely to persist. They react to recent history and their own experiences, without paying enough attention to events that were not directly experienced or retained in memory. When we see investors squandering their wealth by buying high and selling low, overreaction is frequently the cause.

BELIEF PERSEVERANCE

Belief perseverance indicates that people are unlikely to change their opinions even when new information becomes available (Lord, Ross and Lepper [1979]). According to Barberis and Thaler [2002]:

> At least two effects appear to be at work. First, people are reluctant to search for evidence that contradicts their beliefs. Second, even if they find such evidence, they treat it with excessive skepticism.

Belief perseverance can cause investors to stick with the wrong approach for longer than they otherwise would if they were taking a more balanced view.

REGRET AVOIDANCE

Regret avoidance is the tendency to avoid actions that could create discomfort over prior decisions, even though those actions may be in the individual's best interest. Among other effects, it can help to explain why investors commonly retain their losing investments longer than they hold on to winning investments, a behavioral characteristic that Shefrin and Statman [1985] have termed the disposition effect. Researchers have argued that one of the reasons that investors are reluctant to sell losing positions is because to do so is to admit a bad decision. This reluctance can be linked to both regret avoidance and belief perseverance. To avoid the stress associated with admitting a mistake, the investor holds onto the losing position and hopes for a recovery. Odean [1998] demonstrated the pitfalls of the disposition effect in a study showing that investors would achieve higher returns if they sold winners and losers with equal regularity.

Biases such as those described above were certainly understood before the emergence of behavioral finance, if not proven through behavioral research. In fact, practitioners typically find that the assertions of behavioral theorists are not unlike their own observations. Despite this, the investment community's track record for managing investor behavior is open to question. Traditional processes are simply not well matched to the psychology of the individual investor.

Statman [2002] argues that financial advisors should think of themselves as financial physicians. He urges them to:

> Follow the pattern of the physician: Ask, listen, diagnose, educate, and treat. Financial advisors who act as financial physicians combine the science of finance and securities with the ability to empathize with and guide clients — thinking not about risk and return but about investors' fears, aspirations, and the errors they are likely to make. Financial advisors promote wealth and well-being just as physicians promote health and well-being.

While Statman's advice may have been considered unconventional 10 years ago, today the ideas of behavioral theorists are entering the mainstream. Practitioners recognize that investor biases are difficult to manage without considering the behavioral side of investing. It is our contention that a goals-based investing process can capture the lessons of both standard and behavioral finance, avoiding many of the pitfalls that behavioral researchers have identified. As discussed earlier, client goals should determine the way that risk is defined, the method for estimating risk tolerance, and the choice of investment strategy.

A goals-based approach works by reducing the friction between the practitioner's perspective, which is based on traditional investment principles, and the investor's perspective, which is determined by goals and psychological makeup. When these perspectives are not well integrated, strategy selection becomes arbitrary. Investors have greater flexibility to use their portfolio as a testing ground, trying different approaches and changing strategies based on their outlook and emotions. They are then exposed to many of the biases that behavioral researchers have identified. If, however, strategy selection is closely linked to the investor's goals, then it becomes more difficult for damaging behaviors to take hold.

We recommend a disciplined process that is customized to each investor. Goals and preferences should be defined as clearly as possible and supported through risk management, using measures such as the probability of breaching a goal and potential loss. Progress towards goals should be monitored, with performance evaluated in this context. Strategy adjustments should be based on changes in circumstances or goals rather than behavioral factors. This approach heeds the lessons of behavioral finance by seeking consistency with the investor's aspirations and preferences while suppressing the biases that can lead to failed strategies.

Section Two: Implementing a Goals-Based Approach

The goals-based investing process is illustrated in Exhibit 1. As the Exhibit shows, the process links client goals to risk management objectives and investment strategies. Client goals are based on the investment portfolio's eventual use, such as current or future lifestyle needs. Risk management objectives are stated in terms of risk measures that are best matched to the particular goal. Investment strategies are designed to be efficient in the context of their corresponding goals and risk management objectives. Each combination of goal, risk management objective and investment strategy may comprise a separate sub-portfolio, which we call an asset pool. Asset pools are combined to create a full investment solution.

EXHIBIT 1: GOALS-BASED INVESTING PROCESS

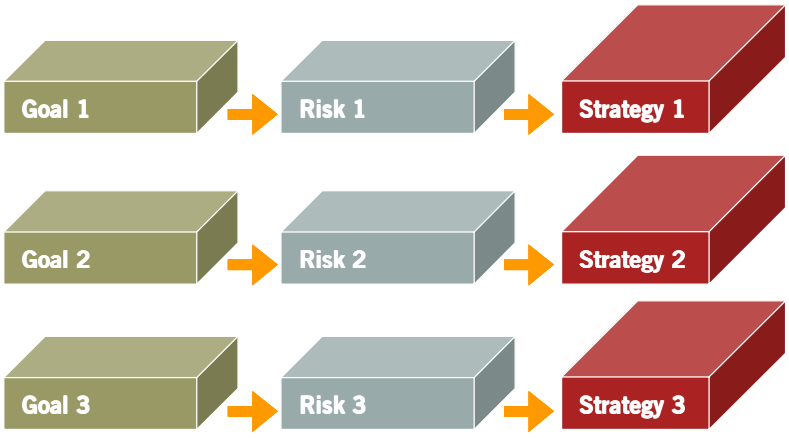
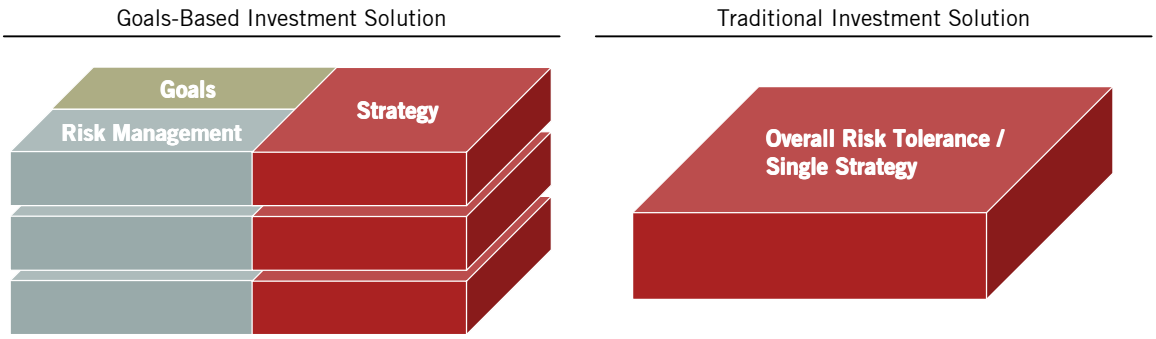


Exhibit 2 compares a goals-based investment solution to a traditional investment solution. With a traditional investment process, efficient portfolios are created using standard investment theory. The investor's overall risk tolerance is established through risk profiling. The risk tolerance estimate is then mapped to one of the efficient portfolios. Goals-based investing seeks to improve upon traditional methods by aligning investment strategies with the goals of the individual investor. This approach may not be appropriate for all investors, particularly those without precise goals, but when goals are clearly identified it has valuable benefits. As noted in the previous section, it improves upon traditional methods in risk measurement, risk profiling, and managing behavioral biases.

EXHIBIT 2: GOALS-BASED INVESTING VERSUS TRADITIONAL INVESTING



The idea that investors may require multiple strategies for multiple goals is not new, but has gained legitimacy as practitioners have explored the implications of behavioral theory and questioned the single portfolio framework of traditional finance. Recent articles proposing multi-strategy approaches include Shefrin and Statman [2000] and Brunel [2003]. Shefrin and Statman [2000] consider separate investor goals within their specification of behavioral portfolio theory, describing multi-strategy portfolios as "layered pyramids where investors divide their current wealth between a bottom layer, designed to avoid poverty, and a top layer, designed for a shot at riches." Brunel [2003] further develops the recommendations of Shefrin and Statman, conducting a complete asset allocation analysis derived from investor goals. He suggests a framework in which investment strategies are matched to

"buckets" assigned to four fundamental goals: liquidity, income, capital preservation, and growth. He compares the "bucket analysis" based on goals to a traditional approach, stating that:

> ..as individuals go through the asset allocation process looking at the same "buckets" through which they do look at their wealth in their every-day circumstances, the allocations they eventually choose will feel both more comfortable and more reasonable, and thus should be more easily sustainable over time. They will not feel they are "boxed into" a fixed long-term allocation, with which they find it difficult to associate.

Brunel also notes that the approach still relies on sophisticated analytical tools and, therefore, can be applied to investors seeking detailed analyses.

The principal drawback to a goals-based investing process is its complexity, which makes it challenging to implement. Among the issues to be resolved for successful implementation are the appropriate level of customization and the process for investment strategy development. While goals-based investing in its purest form implies customized strategies for each investor, when costs are considered full customization is rarely feasible. A more sensible and equally effective approach is to build a suite of investment products that can be matched to common investor goals. We then create customized solutions by selecting from the suite of products on a goal-by-goal basis.

With this approach, products are developed according to performance or risk management objectives. For example, consider a strategy managed to limit the risk of a decline in portfolio value of 10% or more. This strategy is characterized by its risk management objective. It might be matched to an asset pool for short-term lifestyle expenses, which needs a high degree of principal stability. A second strategy, with very different objectives, could be managed to limit risk at a particular time in the future without regard to principal stability. In other words, the second strategy allows volatility as long as it does not affect the outcome at the horizon date. It might be used for an asset pool with a clearly defined investment horizon, perhaps coinciding with a retirement date. For both strategies, the risk management objective is aligned with investor goals for the particular asset pool.

Many strategies widely used today work well with a goals-based approach. For instance, laddered bond portfolios can be matched to asset pools for current lifestyle expenses. Other strategies are less compatible with goals-based investing but still have a role to play. Consider model portfolios that are characterized by an asset allocation mix, or asset allocation models. Asset allocation models appeal to investors without precise goals who are seeking well-diversified portfolios.

More importantly, additional strategies that are not commonly used today can provide investors with both closer matches for common goals and more choices. In the remainder of this section of our paper, we discuss two common goals that warrant further strategy development: investing to meet current lifestyle needs and investing for a fixed planning horizon. We also propose investment strategies that can be applied to these goals.

Investing to Meet Current Lifestyle Needs

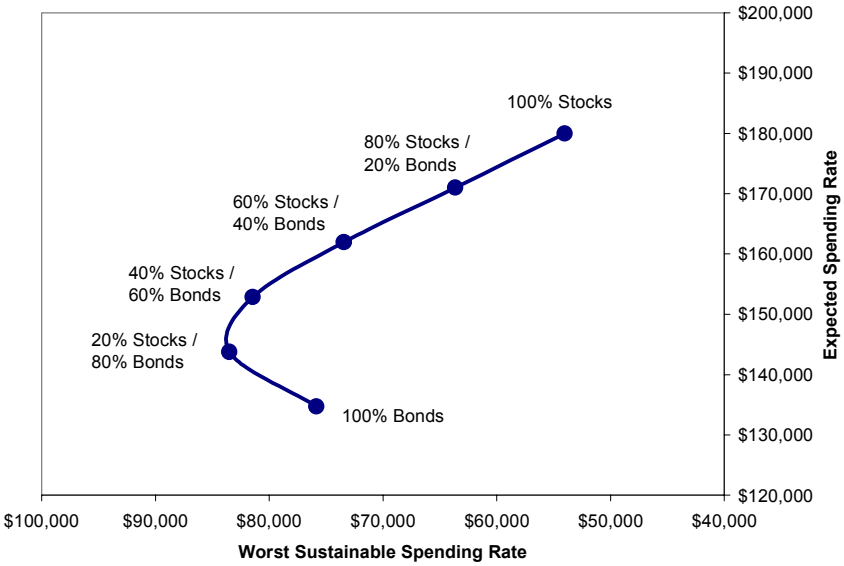
There are a variety of strategies that can be applied towards current lifestyle needs, including absolute return strategies, cash flow matching, and income strategies. Strategy selection depends on the way that the decision is framed. For instance, does the investor set precise cash flow targets for each

period, suggesting that a cash flow match might be appropriate? Is the investor encouraged to meet lifestyle needs through coupons and dividends without drawing down principal? In this sub-section, we modify the Markowitz or traditional investment framework to frame the decision in a way that investors can easily see the connection to their goals. Investor goals are then translated into performance criteria that can be used to construct a portfolio.

According to traditional investment theory, investors should manage the trade-off between expected portfolio return and portfolio risk. A higher expected return is the reward for bearing more risk. Risk is measured in traditional theory as the standard deviation of return. When a portfolio is being used to fund lifestyle expenses, we can create a different framework that is more meaningful to the investor by redefining reward and risk. With new measures of reward and risk, portfolio efficiency takes on a different meaning. We can create an efficient frontier that is comparable to the traditional Markowitz frontier but more consistent with the investor's goals.

In Exhibit 3, we show a frontier of reward and risk opportunities using measures that are based on lifestyle goals. We constructed portfolios of two asset classes, U.S. stocks and U.S. bonds, and used data from 1926 to 2002 to calculate the return distribution for each portfolio. Return distributions are then rolled forward using Monte-Carlo simulations to project wealth and spending for a hypothetical investor. The investor is assumed to be drawing from an asset pool of $1 million, which is fully exhausted after covering lifestyle expenses for the next 10 years.

EXHIBIT 3: FRONTIER OF REWARD AND RISK OPPORTUNITIES FOR CURRENT LIFESTYLE EXPENSES



Source: Ibbotson Associates, SEI Investments

Reward is defined in Exhibit 3 as maximizing the amount of spending that the portfolio is expected to fund. The measure that we use is an expected value, or average of all potential outcomes. The risk to the goal of maximizing spending is that spending falls below the expected level. Different methods for measuring this risk can lead to very different conclusions. For this reason, the approach to risk measurement merits particular attention.

MEASURING THE RISK TO CURRENT LIFESTYLE GOALS

Practitioners who use cash flow modeling often define risk according to the end result after an investment period of 10 or 20 years or more. They may focus on the worst possible result for the amount of spending that the portfolio can accommodate, on average over the investment horizon. Strategies may be chosen to ensure that the average spending rate exceeds a certain threshold. This approach has the benefit of linking the risk measure to the investor's lifestyle goals. Its drawback is that it does not consider risks that come and go prior to the horizon date. For average cash flow or other results measured at the end of a long horizon, there are always scenarios in which a desired outcome is achieved only after appearing unlikely at some point along the way. At the point at which the outcome is uncertain, the investor is forced to reconsider his or her situation. Lifestyle goals may be pared back and plans changed. The original investment strategy may be altered, either decreasing aggressiveness to avoid further damage or increasing aggressiveness in an attempt to reverse past losses. The implication is that the individual's well-being depends on performance throughout the investment period, not just on the average or final outcome. When people lose confidence that they will reach their goals, even if that confidence is eventually restored, that is rarely a satisfactory result.

In Exhibit 3, we use a risk measure that considers the path that the investor experiences between the present and the horizon date. We estimate the worst sustainable spending rate that could occur prior to the horizon. The sustainable spending rate is defined as the amount of spending that the investor can be confident of maintaining without running out of capital[6]. The worst sustainable spending rate considers the lowest level that the sustainable spending rate might reach at any time prior to the horizon. It is defined using a 99% confidence interval, allowing a 1% probability that the sustainable spending rate will fall as far as or below the worst level[7]. This is an event-specific rather than period-specific measure. It considers the risk that sustainable spending could fall to a certain level, which is the event, **regardless of the time at which the event might occur**. Although they are more difficult to calculate than period-specific measures, event-specific measures are better correlated with the individual investor's perceptions about the success or failure of their investment strategy.

Ideally, communications between advisors and investors should be based on reward and risk measures such as those in Exhibit 3. Investors are better equipped to select investments when decisions are framed in terms of their goals. Institutional investors have long recognized the importance of translating performance measures into terms that are more meaningful to them. For example, pension plan sponsors use asset-liability models to understand the implications of their investment decisions for pension expense and plan contributions, the financial measures most critical to policy success or failure. Endowments use similar models to assess the effects of different investment strategies on their spending policies. Compared to institutions, individual investors are often less familiar with investment theory and with the statistics traditionally used to measure performance and risk. Therefore, they have perhaps an even greater need to restate portfolio characteristics in non-investment terms.

[6] For Exhibit 3, investors are considered to be confident when there is a 95% probability that the spending rate can be maintained without running out of capital, based on estimates for the distribution of portfolio returns.

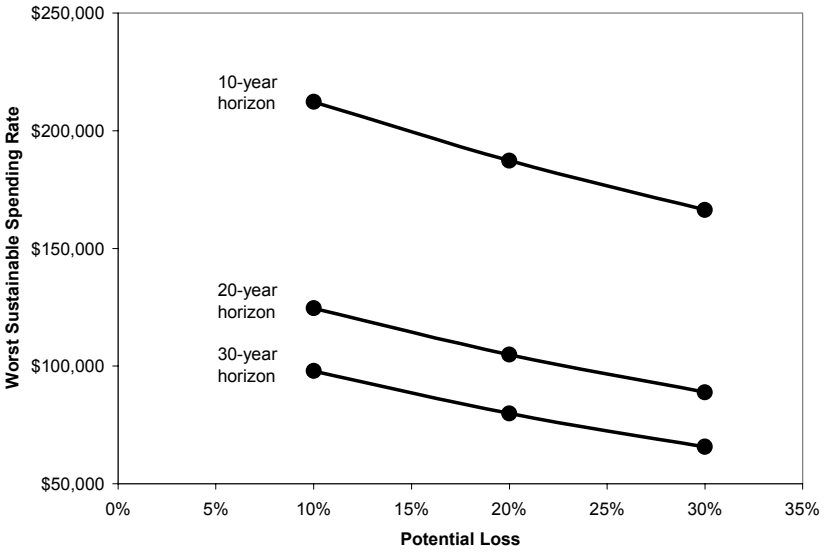
[7] According to our assumptions for the distribution of portfolio returns.

IMPLEMENTING THE NEW MEASURES OF REWARD AND RISK

The practitioner, however, cannot rely entirely on the reward and risk measures that are most meaningful to the client. From the practitioner's perspective, it can be difficult to build portfolios based on characteristics such as those measured in Exhibit 3. Two observations can help to resolve this conflict. The first observation is that the expected spending rate is determined largely by the expected portfolio return. The higher the expected portfolio return, the more the investor can expect to spend in each period without running out of capital. The second observation is that the worst sustainable spending rate is closely related to the portfolio's downside risk, measured as the potential loss. The greater the potential loss, the more severe is the potential drop in sustainable spending[8]. Like the worst sustainable spending rate, the potential loss is an event-specific risk measure that is estimated using Monte-Carlo simulations and confidence intervals. It considers the amount that the investor could lose between any two points in time, from peak to trough.

In Exhibit 4, we demonstrate the relationship between potential loss and the worst sustainable spending rate. We consider portfolios with potential losses of 10%, 20% and 30%. In each case, we assume an expected portfolio return of 6%. We then measure the worst sustainable spending rate over horizons of 10, 20 and 30 years for an asset pool of $2 million. The worst sustainable spending rate falls as the horizon lengthens because the spending rate has to be maintained for a longer period. As discussed above, it also falls as the potential loss increases.

EXHIBIT 4: RELATIONSHIP BETWEEN POTENTIAL LOSS AND WORST SUSTAINABLE SPENDING RATE



Source: SEI Investments

[8] Consider that the sustainable spending rate at any point in time is a function of the size of the portfolio. Risk to the size of the portfolio is determined primarily by the potential portfolio loss.

LIFESTYLE PROTECTION STRATEGIES

Investors and their advisors can use the relationship between sustainable spending and potential loss to choose an investment portfolio. The investor determines the minimum sustainable spending rate based on lifestyle needs. The minimum sustainable spending rate is translated into a target for potential loss according to the relationship shown in Exhibit 4. The investor and advisor can then consider alternative portfolios with a potential loss equal to or below the target and choose the portfolio with the highest expected return.

This process implies different portfolio construction methods than those most commonly used today. Portfolios would be built to manage the trade-off between expected returns and potential loss rather than managing risk versus an index. Put differently, performance objectives are stated in absolute rather than relative terms. Strategies for managing absolute performance are prevalent in the hedge fund arena, where they are often called absolute return strategies. Absolute performance objectives can be extended to other asset classes as well by eliminating the tracking error constraint that often guides security selection. Asset classes can then be combined to create a diversified strategy with desired characteristics for expected return and potential loss. For the purposes of our paper, we will call these lifestyle protection strategies.

Lifestyle protection strategies have the benefit of aligning the investment process with spending goals. Another benefit is that investors can choose a lifestyle protection strategy according to its performance characteristics. Strategies are described by reward and risk measures, and investors make a selection based on their preferred balance between these two characteristics. For example, the expected spending rate can be increased if the investor is willing to accept a lower sustainable spending rate in a worst-case scenario. This differs from a traditional approach of differentiating portfolios by the mix of asset classes. When characteristics are provided for a traditional strategy, they are usually stated in investment terms using single period measures, without a clear relationship to the investor's goals.

The principal disadvantage to lifestyle protection strategies is their performance in bull markets. To manage potential losses, these strategies are constructed with a beta of less than one to the broad market. Therefore, they are likely to lag broad market indices in bull markets while outperforming those indices in bear markets. This performance profile is appealing for many investors, particularly those with the spending goals that we have discussed. Investors with different goals should consider whether another type of strategy is more appropriate.

CASH FLOW MATCHING

Thus far, our analysis has considered the goal of maximizing expected spending while managing worst-case results for sustainable spending. In some instances, current lifestyle goals can be stated more precisely, using targets for the amount of cash required in each period. When goals are expressed using precise cash flow targets, cash flow matching may be the best investment approach. Laddered bond portfolios can be built to match an investor's expenses with the cash flows generated by the portfolio. The risk management objective in this case is to ensure a high degree of certainty that cash flow targets are met.

A number of questions can be asked to test whether cash flow matching is the best fit in a particular situation. First, are the spending targets likely to change? With changes to the objectives of the cash

flow match, a bond ladder may need to be unwound prior to maturity at unfavorable market prices. Therefore, if required cash flows for the bond ladder cannot be forecast accurately, then cash flow matching is probably not the best approach. Second, is the investor satisfied with the yield available on the cash flow matched portfolio? Investors seeking high returns may find a better fit with strategies that are invested more aggressively than a bond ladder. Third, is the investor comfortable focusing on cash flows without worrying about the market value of the portfolio? While their cash flows are fixed when held to maturity, bonds included in a ladder can exhibit significant price volatility. For investors who are uncomfortable with volatility, a better approach may be to manage volatility directly rather than managing cash flows as the principal objective.

If the answers to any of these questions suggest that cash flow matching is not the best approach, then lifestyle protection strategies may be a better fit. However, if the right conditions are present then cash flow matching has notable benefits. A cash flow match provides a high degree of comfort that the investor's stated goals will be met. The investor may also be in a better position to pursue other goals once the cash flow match is established. After allocating capital to current lifestyle needs, the investor knows precisely how much capital is available for other goals and can identify strategies to meet those goals.

Investing for a Fixed Planning Horizon

For portfolios used for growth rather than current expenses, there are once again a variety of strategies that could be suitable with strategy selection depending on the way the decision is framed. In this sub-section, we consider a decision framework characterized by a fixed planning horizon. The planning horizon could coincide with a life event such as a retirement date or college enrollment date. Or, it could simply represent a time period used for planning purposes. For example, an investor who has created an asset pool to cover the next 10 years of living expenses may have a second asset pool with a 10-year planning horizon to be applied to future expenses once the first pool is exhausted. Whether it is based on a life event or a planning period, the investor's goals and risk management objectives are determined by the fixed horizon.

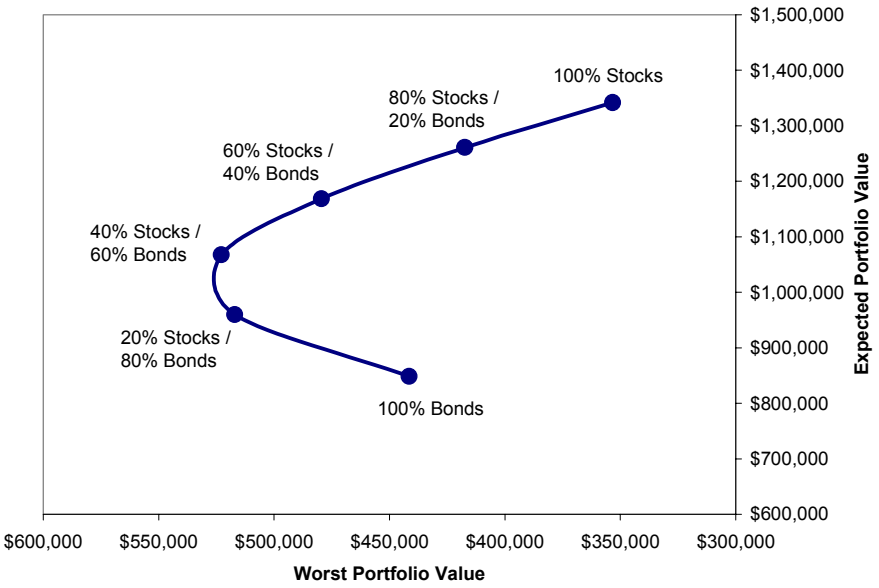
Like the process that we applied to current expense asset pools, we redefine portfolio efficiency to be consistent with investor goals by identifying appropriate measures of reward and risk. Reward can be measured as the expected portfolio value at the horizon date or, equivalently, expected asset growth. Growth is the reason we invest — to have a larger portfolio in the future than we have today. While growth is universal, risk can be measured differently depending on the psychology of the investor. Below we consider two risk measurement approaches and the implications for strategy selection.

One approach is to consider the amount of capital that could be lost, recognizing that losses are the opposite of growth. Defining risk in this way is consistent with the observations of behavioral theorists (and practitioners) that investors are loss-averse, and suggests a role for the lifestyle protection strategies described in the previous sub-section. However, a drawback to this approach is that the investment process for managing the trade-off between growth and loss is unlikely to be the best process for managing the portfolio value at the horizon date. Rather than constraining the risk of loss, it may be more consistent with investor goals to use measures that are directly linked to the planning horizon.

The second approach is to measure the worst portfolio value at the horizon date. It is defined using a 99% confidence interval, indicating a 1% probability that the portfolio value will be equal to or less than the worst outcome. This is a period-specific risk measure; it does not consider the path that the portfolio takes between the present and the horizon. For this reason, it may be inappropriate for investors who are uncomfortable with a long-term view. However, unlike many period-specific measures, the worst portfolio value is tailored to the investor's planning horizon. Investors may value an approach that manages the distribution of portfolio values at their horizon date. Strategies can be designed to provide a high degree of certainty that the portfolio value will exceed a minimum level.

In Exhibit 5, we show a frontier of reward and risk opportunities for a hypothetical investor, constructed using data from 1926 to 2002. The reward measure is the expected portfolio value, or average of all possible outcomes. The risk measure is the worst portfolio value as described above. The investor is assumed to be investing $500,000 for a retirement date 10 years in the future and choosing from portfolios of U.S. stocks and bonds. The chart provides a framework that the investor can use to select a portfolio for a fixed planning horizon.

EXHIBIT 5: FRONTIER OF REWARD AND RISK OPPORTUNITIES FOR FIXED INVESTMENT HORIZON



Source: Ibbotson Associates, SEI Investments

FIXED HORIZON STRATEGIES

In practice, efficient portfolios would be diversified among more asset classes than shown in Exhibit 5. To construct diversified portfolios that are efficient in the context of a fixed planning horizon, practitioners should identify the risk-free investment. This is different from the risk-free investment for either relative return or absolute return strategies. For relative return strategies, the risk-free investment is one that replicates the index against which returns are compared. For absolute return strategies, the risk-free investment is cash. For strategies linked to a fixed planning horizon, the risk-free investment is a high-quality zero coupon bond that matures near the horizon date. A zero coupon bond delivers only

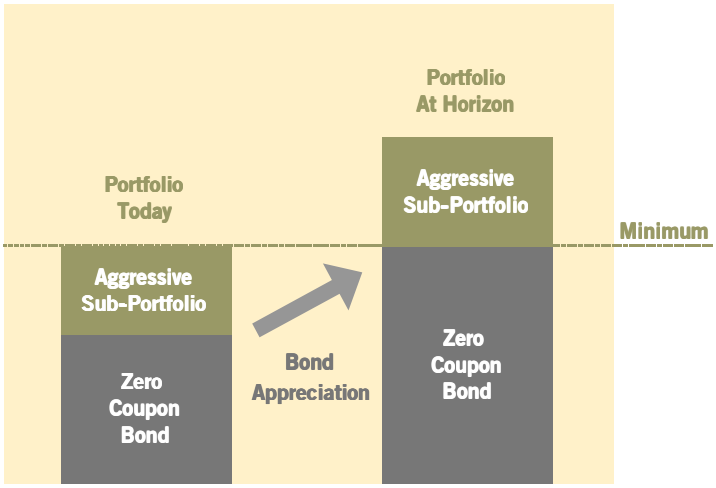
one cash flow, the principal payment. Both the amount and the timing of the principal payment are known with certainty.

With a zero coupon bond identified as the risk-free investment, portfolio construction depends on finding the right balance between the zero and other more aggressive assets. The other assets can be combined in a separate sub-portfolio. Because the zero is used to control risk, the separate sub-portfolio can be managed aggressively to maximize return. We refer to the combination of the zero and the aggressive sub-portfolio as a fixed horizon strategy.

Relative allocations between the zero and the aggressive sub-portfolio are set according to the investor's risk tolerance, which can be captured using confidence intervals for the worst portfolio value as in Exhibit 5. This is similar to the process for selecting a lifestyle protection strategy. The investor sets a target for the worst portfolio value. The investor and advisor then consider portfolios with a worst portfolio value equal to or above the target, and choose the portfolio with the highest expected return.

Alternatively, the investor's risk tolerance can be established without using confidence intervals. It can be based on a minimum portfolio value that is certain to hold, barring a government debt default. This process is illustrated in Exhibit 6. As shown in the exhibit, if the desired minimum portfolio value at the horizon date is equal to the portfolio value today, then the investor purchases a zero coupon treasury bond with a principal amount equal to the portfolio value today. Because the price of the bond is lower than the principal amount, the investor does not need to apply the full value of the current portfolio to purchase it. The difference between the current portfolio and the amount needed to purchase the zero can be invested in the aggressive sub-portfolio to increase the expected growth rate.

EXHIBIT 6: ACHIEVING A MINIMUM PORTFOLIO VALUE



The strategy demonstrated in Exhibit 6 is highly conservative, ensuring that the portfolio at the horizon is larger than the portfolio today. The zero coupon bond delivers a known principal payment, returning the full amount of the investor's initial capital, while the aggressive sub-portfolio provides additional asset growth. Even if the aggressive sub-portfolio declines in value, the total strategy will have a positive return. In practice, investors may not need to lock in a positive return. If the desired minimum portfolio

value at the horizon date can be set below the portfolio value today, then the allocation to the zero can be reduced, implying a lower level of protection while allowing a higher allocation to aggressive assets. As above, the appropriate level for the minimum portfolio value and, therefore, the allocation to zero coupon bonds, depends on the investor's risk tolerance.

To test the suitability of a fixed horizon strategy, we consider again the approach used for cash flow matching. There are three questions that are especially relevant and these are similar to the questions posed in the previous sub-section. First, is the investment horizon likely to change? If the horizon changes, then zero coupon bonds may need to be sold at unfavorable prices and the minimum portfolio value no longer holds. Second, is the investor satisfied with the return on the zero coupon bond? If not, he or she might consider a larger allocation to the aggressive sub-portfolio or explore other strategies. Third, can the investor tolerate the volatility of the zero coupon bond, knowing that the principal payment does not change even as market prices fluctuate? If volatility is a particular concern, then alternative approaches such as the lifestyle protection strategies discussed earlier may be a better fit.

CONCLUSIONS

"We have met the enemy and he is us." –Pogo

Despite the efforts of investment professionals to understand their clients' goals, actual results commonly fall short of those goals. Friction between the practitioner's approach and the individual investor's perspective is often to blame. In particular, traditional investment methods favored by practitioners do not always capture the way that investors think and behave.

In this paper, we suggest an approach to wealth management that draws from both traditional investment theory and behavioral theory, closing the gap between the practitioner and the investor. We propose that portfolio construction and risk management should be closely aligned with client goals, and provide several examples, comparing strategies for meeting current lifestyle expenses with strategies for a fixed investment horizon. Unlike the single portfolio framework of traditional finance, with our approach investment solutions might consist of multiple strategies linked to multiple goals.

Goals-based investing improves upon traditional approaches in the areas of measuring risk, risk profiling, and managing behavioral biases. Furthermore, it should help to restore investor confidence after the events of the last market cycle. At a time when failed strategies have forced investors to rethink plans for their lifestyle, family, and community, the investment industry needs to create better solutions. By combining the older ideas of traditional finance with the newer thinking of behavioral finance, we believe we can meet this challenge.

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