

INVESTMENTS & WEALTH MONITOR

A reprinted article from July/August 2021

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By Karyn Williams, PhD, and Harvey D. Shapiro



INVESTMENTS & WEALTH INSTITUTE®

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Effective investment management requires clear communications to ensure that everyone involved understands the returns they are seeking and the risks they are shouldering. But the amorphous quality of some crucial investment concepts, particularly investment risk, makes this communication problematic.

In this article, we discuss the need for clear communications at the initial stage of the investment process. We start with purpose and objectives as the bedrock for basic decisions about investment strategy. We point out the communication challenges that accompany traditional investment decision frameworks and risk concepts, such as standard deviation.

We present a holistic approach that directly connects objectives and risks to new decision metrics, namely Portfolio Pi and Portfolio Eta (see sidebar).¹ These metrics enable decision-makers to make direct trade-offs among competing objectives. We show that using shared language that is meaningful for investors can help assure that the chosen investment strategy best serves its purpose.

THE SETTING

The investment process at any sizable institution is a collaborative undertaking. The ideas and opinions of participants, from executives and board members to external investment managers and consultants, must be heard and evaluated even if not necessarily implemented. This process requires extensive and intensive communication. But in the

PORTFOLIO PI & PORTFOLIO ETA	
<p>Portfolio Pi is a weighted average of the probabilities of attaining desired investment objectives, which includes avoiding specific losses, over an investment horizon. Applied in context, the Pi Score® summarizes an investment portfolio's potential to achieve objectives and avoid losses.</p>	<p>Portfolio Eta is the economic value that an investor potentially stands to gain or lose between portfolios with different Pi Scores. Portfolio Eta fully summarizes, in dollar or percentage terms, the differences between portfolios' returns, risks, and costs.</p>

investment world, communication is complicated by the language of investments. Some concepts can be expressed simply and precisely, out to the third decimal place, but others are harder to define and to grasp. As a result, deliberations take place in what may seem like a foreign language to some participants, while other participants may believe they have communicated when they have not.

The success or failure of communication shapes significant decisions at every stage of the investment process, from determining the purpose and objectives of an investment program to stipulating the strategy for fulfillment.

FROM PURPOSE TO INVESTMENT OBJECTIVES

The core of an investment program is purpose. But unless decision-makers have a clear and shared understanding about that purpose, developing the investment strategy can be confusing and contentious.

For most sizable investment pools, the general purpose seems clear

enough—and it is not just to make money. The purpose of a philanthropic foundation's investments, for example, is to generate funds to support charitable activities. The purpose of a pension plan's investments is to provide secure retirement incomes. The purpose of an insurance company's investments is to provide the wherewithal for paying future claims. The purpose of investments for households and family offices is to produce current or future income to support family members and their goals.

A distinct purpose can and should spur an emotional connection. Those who shepherd a pool of investment assets should care about the good works advanced by a foundation's grants, the secure retirements facilitated by a pension plan, the protection that insurance provides against crises, and the families supported by family offices. This is Management 101: If people identify with the purpose and goals of the institutions they work for, they are likely to be more engaged and more effective in carrying out their duties.

Table
1

EXAMPLE FIVE-YEAR INVESTMENT RETURN OBJECTIVES

	\$50-million Public Foundation	\$100-million Private Foundation	\$1-billion Defined Benefit Pension Plan
Annual expected funding needs/payments	3.00%	5.00%	3.50%
Expected inflation	2.50%	2.54%	2.75%
Investment management fees	0.75%	0.50%	0.55%
Portfolio growth	0.50%	0.00%	0.20%
Target investment-return objective	6.75%	8.04%	7.00%

But only if purpose is clear can an investor begin to make some basic choices regarding investment objectives. The objectives are the specific returns that investors want their investments to achieve in order to fulfill the purpose; henceforth we refer to these objectives as target returns or target-return objectives. As baseball legend Yogi Berra supposedly said, “If you don’t know where you are going, you might wind up someplace else,” which points to an important truth: It’s critical to clearly articulate and agree on a purpose; otherwise you might pursue an objective that will undermine your purpose.

Once the purpose is clear, there must be a granular discussion of objectives to determine how financial resources should be invested to support that purpose. In the case of a philanthropic foundation, for example, it is widely understood that the foundation should establish specific program goals, because it can’t do everything for everybody. If the foundation’s founder or donor has not designated program goals, then the board and staff must develop them.

Once a foundation has committed to a programmatic goal, such as supporting the arts, its next decision involves its longevity. Should it give away all its money as fast as possible to meet critical needs in the arts and then go out of business (a perfectly reasonable goal)? Or should it commit to existing in perpetuity to help support ongoing needs in the arts (also a reasonable goal)? If so, it needs to create a grant-making program supported by an investment program

that will ensure the foundation lives within its means.

But perhaps this foundation should be guided by some sort of intermediate goal, e.g., exist for the long term but occasionally spend extra resources in moments of crisis. This model became evident during the coronavirus pandemic when some foundations made ad hoc grants to shore up distressed museums and theater organizations that incurred considerable expenses due to closures.

Decisions about which objectives to pursue involve difficult, sometimes painful discussions that often are masked in rhetoric that either conceals objectives or obscures the options.

And decisions about purposes and investment objectives are never one-and-done. Mid-course corrections are possible and often necessary responses to changes in investment results or changes in circumstances. For example, the numerous foundations created a century ago to support orphanages have modified their purposes and investment objectives as the number of orphans and the way they are cared for has changed dramatically over the decades. So periodically confirming purpose and regularly setting investment objectives are essential parts of the investment process.

A practical approach is to set investment objectives over continuous (i.e., rolling) “investment planning horizons.” These periods can be as short as one year or as long as 10; regardless, they usually are updated annually. For example, table 1

shows typical components of target-return objectives over a five-year investment-planning horizon for a \$50-million public foundation, a \$100-million private foundation, and a \$1-billion defined benefit pension plan.

Each of these investment organizations has varying degrees of discretion and precision for setting its target-return objectives. A private foundation must pay out at least 5 percent annually to retain its tax-exempt status, but a defined benefit pension fund requires only an estimated payout, and a public foundation may have substantial discretion in its spending. Nevertheless, each organization has a target-return objective for the five-year horizon, even if it expects to fulfill its purpose indefinitely.

FROM INVESTMENT OBJECTIVES TO RISK

Once investment-return objectives are estimated, investors develop an investment strategy. Maximizing returns may seem like a reasonable strategy, but it’s one that’s easier articulated than accomplished. Seeking high returns means embracing more risk, which creates the potential for setbacks that could constrain an organization’s ability to fulfill its goals.

Risk comes in many different forms. The classic form is the risk of substantial losses that impair capital and hinder the achievement of goals. But consider the risk of an investment opportunity that generates substantial near-term income because it offers very limited long-term growth potential. Conversely, a portfolio focused on long-term gains may not provide enough cash flow to pay for current needs, such as giving scholarships to students.

In a defined benefit pension plan, investments can be matched to the expected stream of payouts, or the plan may seek to maximize returns to reduce the plan sponsor’s contribution. These are reasonable goals, but each requires a different investment strategy.

Choosing the right amount of investment risk to achieve target returns is complicated by a lack of symmetry in the language of investing. Risk and return are the yin and yang of investing. Return measures are concrete and allow meaningful comparisons across time and an array of portfolios. But risk is nebulous and not easily measured. Is it volatility? Tracking error? Any decline in value? A cataclysmic drawdown? The prospect of doing something that others will regard as stupid?

Holton (2004) defines risk as an exposure to any uncertain proposition that has material consequences. That definition leaves plenty of room for a variety of definitions, measures, and applications, which leads to a huge gulf between concepts and understanding, especially for non-investment professionals. Choices about risk also require us to consider our preferences for one outcome or another, which opens the decisions to emotions and perceptions. Thus, in a discussion about risk, it's easy to see how a person might end up feeling a bit like Alice in Wonderland (Carroll 1871):

"When I use a word," Humpty Dumpty said in rather a scornful tone, "it means just what I choose it to mean—neither more nor less."

We ascribe meaning to words based on our own experiences. We likely do not know others' interpretations.

One of the greatest challenges is getting everyone to understand and communicate using the appropriate types and levels of risk that must be shouldered to achieve objectives. For institutional investors, "everyone" may include board members, senior management, and outside advisors. For individuals, "everyone" may include investors, their partners, and possibly other family members. On one hand, including the diversity of everyone's perspectives is necessary for good risk decision-making. On the other hand, the amorphous nature of risk makes it hard for all parties to

understand each other and accurately make trade-offs.

Non-investment professionals often are called on to oversee investment pools. For example, teachers, firefighters, or other civil servants sit on boards as trustees of the retirement funds for their occupations. They assuredly contribute ideas about what pension-plan participants want and need, but they likely don't know much about investing a multibillion-dollar portfolio. Conversely, successful investors and investment professionals often sit on boards, often because they have contributed to or raised substantial sums for an institution. These board members often provide valuable expertise, and they may bring strong opinions to the process. For example, a trustee who has made a fortune in real estate may believe an endowment's board should invest heavily in real estate. Real estate worked well for this trustee, so why shouldn't it work well for this endowment? Indeed, real estate is what this trustee knows—but it may be all this trustee knows about investing.

Both professionals and non-professionals need a common and user-friendly language for communicating their ideas and concerns about risk. Otherwise, just because risk has been discussed doesn't mean that ideas and concerns have been communicated successfully. As the Irish playwright George Bernard Shaw put it, "The single biggest problem in communication is the illusion that it has taken place."²

Most sizable institutions hire consultants to help the parties involved communicate and make the trade-off between risk and returns. Most use a mean-variance optimization (MVO) framework to help investors make these choices.³ In an MVO framework, target return is the "mean" or reward of a portfolio and standard deviation is the "variance" or risk. MVO makes the investment strategy decision simple and elegant: Every target return corresponds to an "efficient portfolio" with a risk that is defined by a standard deviation.

But standard deviation fails to characterize risk in a way that matters to most investors. It measures variation in portfolio returns, up and down, but most investors do not regard increases in portfolio values as risk; they care about losing money. They frequently think about returns in absolute terms and they tend to agree with the adage that you can't eat relative returns, i.e., returns relative to a benchmark. And although many investors recognize they may face a decline in portfolio value, particularly in any kind of crisis, the major risk in their eyes is to avoid whatever they may regard as the maximum allowable loss, also known as the risk capacity (discussed below), or the "loss limit."

Only by coincidence would an investor's loss limit ever equal the standard deviation of an MVO portfolio. Figure 1 shows a mean-variance frontier, with the highest expected target returns and corresponding standard deviations for two portfolios. For the public foundation with a 6.75-percent target return (from table 1), the mean-variance efficient portfolio's standard deviation is about 13 percent. In practice, an advisor might translate a 13-percent standard deviation to a loss level that has a 5-percent chance of happening (about 1.65 standard deviations), which in this case is 15 percent. But what if the investor's loss limit is 10 percent? What if it's 25 percent? And, what if 5 percent is too high or low a chance of losing 10 or 25 percent?

If the loss limit is 10 percent and a 5-percent chance of that loss is acceptable, the foundation's mean-variance efficient portfolio has a standard deviation of about 9.7 percent and a lower expected return of 6.0 percent ($-10\% = 6\% - 1.65 \times 9.7\%$). This is a very different portfolio. Without translating for the investor, the probability of hitting 6.75 percent is unknown for this lower-risk portfolio. This makes trade-offs using this framework difficult at best, especially for non-investment professionals.

Figure 1

MEAN-VARIANCE EFFICIENT PORTFOLIOS

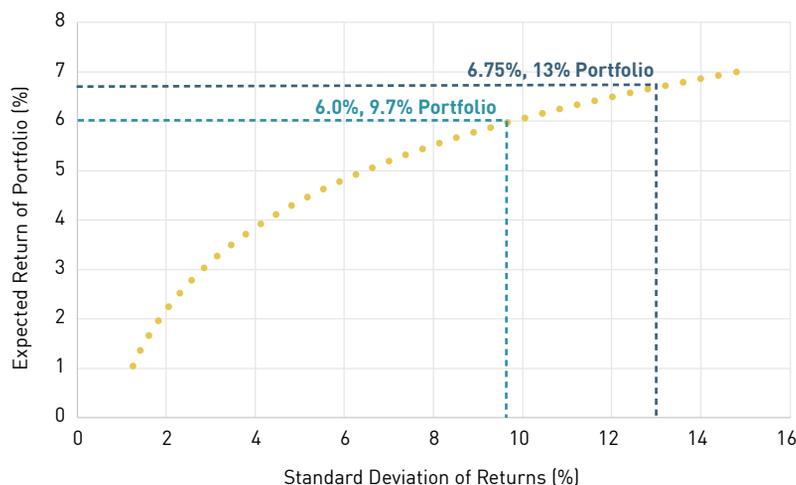


Figure 2

DISTRIBUTIONS OF PORTFOLIO OUTCOMES

Net of outflows and rebalancing

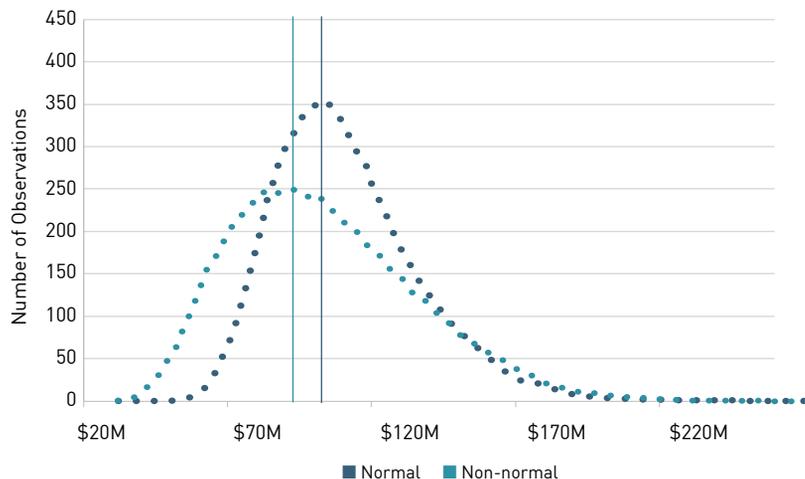


Table 2

STANDARD INVESTMENT RISK METRICS

	Normal	Non-normal
Annualized Standard Deviation	10%	14%
Five-Year Value-at-Risk (95th percentile)	29%	44%
Five-Year Conditional Value-at-Risk (95th percentile)	33%	51%
Average Drawdown	11%	13%
Average Maximum Drawdown	21%	29%

In any case, standard deviation turns out to be less than fully descriptive of realistic potential portfolio outcomes and the potential paths to those outcomes, and so MVO excludes critical decision information. Most notably, it ignores the potential for very large drops in portfolio value (tail risk), smaller sustained declines in portfolio value (sequence risk), and

depletion of the portfolio (depletion risk) over an investment horizon.

Tail risk is particularly important for new institutions, for which survival may become impossible under extreme market conditions. Plans designed around their long-term targeted investment returns that are based on limited

risk information can be undermined by a large drawdown in the first few years. An institution's portfolio and reputation are likely to spend the next few years climbing out of a deep hole. Likewise, sequence and depletion risk may go unnoticed until it is too late, so understanding the potential for these risks is essential.

Tail risks happen more often than MVO assumes.⁴ Figure 2 shows potential portfolio values (outcomes) under normal and realistic non-normal asset return assumptions for the \$100-million private-foundation portfolio with an 8.04-percent target-return objective (from table 1). The portfolio's strategic asset allocation is 30-percent U.S. equities, 30-percent non-U.S. equities, 30-percent U.S. fixed income, and 10-percent broadly diversified hedge funds. The five-year investment-horizon outcomes for both distribution assumptions reflect the foundation's strategic allocation and investment activities during the five-year horizon, including quarterly spending, fees, and asset rebalancing. The averages of the outcomes are indicated by the vertical lines.

The differences in outcomes are notable, particularly regarding potential losses. Any decision that excludes this potential for loss can lead to regret, forced selling, unexpected costs, lower than planned cumulative annual growth rates, and depletion.

Table 2 shows typical standard metrics used to describe portfolio risks for each resulting portfolio distribution. Decision-makers face a challenge interpreting these metrics. If we assume non-normality, is 14 percent too high a standard deviation? What level of confidence is appropriate for Value-at-Risk? Generally, such standard metrics do not convey sufficient meaning because they lack context—the specific information that decision-makers need to make informed choices about risk.

Amid this disconnect between standard metrics and investor context, institutions

naturally prefer to make vague references, if any, to risk in their investment policies, with statements such as the following: “Achieve 5-percent growth plus inflation and expenses over the investment horizon,” “maximize long-term returns consistent with prudent levels of risk,” “achieve reasonable returns with acceptable levels of risk,” or “outperform the policy benchmark by 2 percent over rolling three-year periods.”

It can take an organization several years to perceive that its policy portfolio, which was chosen based on standard deviation, is not working. But by that time, there may not be enough money to meet grant commitments or write checks to family members or pay insurance claims.

The bottom line is that an MVO approach has serious shortcomings regarding risk and standard metrics are short on meaning. Most importantly, these metrics can lead to poor investment decisions and cause regret.

RISKS THAT MATTER, ATTAINABLE OBJECTIVES

Being precise about what we want our investments to deliver—i.e., target returns—says nothing about whether what we want is attainable. Investment committees must recognize this explicitly. What does attainable mean? It means having a high probability of meeting target-return objectives, given the amount of risk you can spend. And if standard deviation is not a meaningful and useful measure of risk, then we need a measure that is.

Although we can never fully know our risk exposures, we can begin by identifying the exposures that matter. One meaningful exposure is a portfolio loss so substantial that it impairs an organization’s ability to serve its purpose. This is akin to the accounting world’s concept of incurring losses so substantial that a business is at risk of no longer being a “going concern.” This level of loss is an investor’s risk capacity or loss limit.

There are several ways to estimate risk capacity, but any measure is imprecise. One approach is to determine the available financial resources that the investment portfolio can lose without impairing the institution’s purpose. Available financial resources can be defined as the market value of assets less the value of any financial commitments and margin-of-safety assets in a stressed market environment. Even if this estimate reflects only a snapshot in time, it is a good starting point.

For some, a stressed market may lead to a large reduction in revenues and limited ability to reduce costs, thereby reducing available financial resources for an extended period of time. The healthcare sector provides a recent and extreme example of this kind of stress. Revenues at many hospitals declined dramatically due to a reduction in elective procedures while costs increased substantially because of an influx of COVID-19 patients. Meanwhile, the value of investment portfolios plummeted in March 2020 before rebounding strongly with policy support. Any healthcare system that chose to sell investments before the rebound to obtain operating cash risked permanent impairment.

Next, the investor needs to assess the potential impact of pursuing its target investment returns on its available financial resources. Suppose the \$100-million

private foundation has estimated its risk capacity at \$25 million, i.e., the most it can lose without impairing its ability to serve its purpose is 25 percent of its portfolio’s value. At a 25-percent loss, whether due to an unexpected and unfortunate event or continuing depletion, the foundation may have to reduce its payout considerably. And, if it averages historical values of the portfolio to calculate its payouts, it may end up paying out more than the 5 percent it targets.

This information about risk capacity facilitates the evaluation of an investment strategy simply by asking: “What is the average of the probabilities that the portfolio will hit our target-return objective of 8.04 percent annually and not lose 25 percent over the next five years?” Conversations framed this way make risk less nebulous because they are centered on a loss that matters to the foundation and tied to a decision metric that people understand, namely, the probability of success.

Figure 3 shows the probabilities that the target return of 8.04 percent and the horizon loss limit of 25 percent will be achieved under each distribution assumption for three investment portfolios the foundation is evaluating. These include the current portfolio, a lower-equity portfolio, and a higher-equity portfolio.⁵ Under normal distribution assumptions, the probabilities of success are generally higher. If the loss limit is

Figure 3 PROBABILITIES OF SUCCESS
Investment objectives and risks that matter

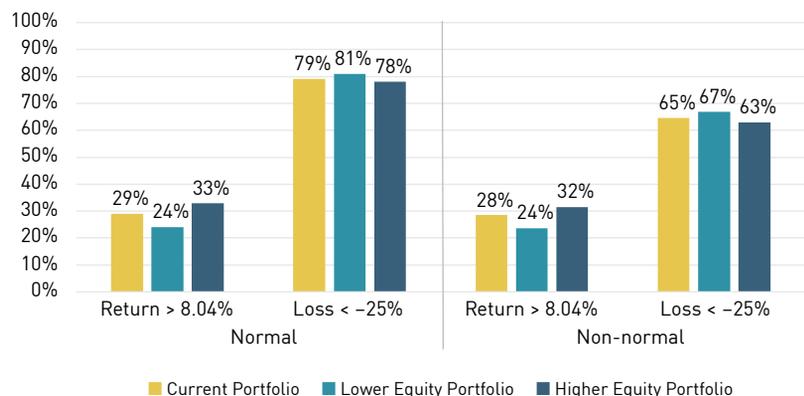
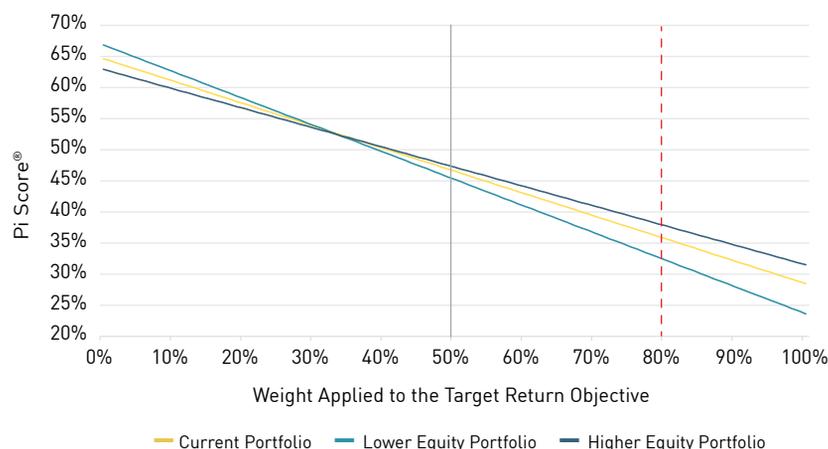


Figure 4

AVERAGE PROBABILITY OF SUCCESS, VARIED BY RELATIVE IMPORTANCE OF THE TARGET RETURN AND LOSS LIMIT

Assuming a non-normal distribution of outcomes



an important consideration, the results based on a non-normal distribution of outcomes provide critical information for the decision-makers about risks that matter.

Regardless of the distribution assumption, all the portfolios shown in figure 3 have low probabilities of achieving the target-return objective. This is because the private foundation must spend 5 percent annually, real yields are expected to be negative, and asset premia are insufficient to cover the gap. This is an essential piece of information: The foundation may not get what it wants, even if it raises its equity allocation all the way to 100 percent.

The results shown in figure 3 are easily communicated and they highlight necessary trade-offs. In this case, an increased probability of achieving one target corresponds to a reduced probability of achieving the other. How can the foundation choose among these three portfolios?

If the foundation weighs the relative importance of its target-return objective versus its loss limit, it can measure its potential for success as an average of the probabilities. This average—its Pi Score®—helps the foundation to determine whether the objectives are

attainable and which investment strategy is best.

Figure 4 shows Pi Scores for each portfolio, where weights have been applied to the target return and the loss limit probabilities, representing the relative importance of each to the decision-makers. If the investor equally weights the importance of achieving the target return and the loss limit, corresponding to the vertical line in the middle of figure 4, the higher-equity portfolio

... with metrics described here, the dialogue moves beyond vague generalities about “a lot” or “a little” or “somewhat” to more precise statements of probabilities relative to targets, especially risks, that matter to the institution.

has the highest Pi Score at 48 percent, slightly higher than the current portfolio’s, which is 47 percent.⁶

Alternatively, the foundation might choose to weigh its target return and loss limit other than equally. In fact,

decision-makers might want to evaluate a broad array of weightings and results. This will prompt a discussion about which matters more: achieving the target return or ensuring the loss limit is not violated. Figure 4 shows that if the target return is more important, then the higher-equity portfolio generally is preferred, and if the loss limit is more important, then the lower-equity portfolio may be preferred.

For example, applying an 80-percent weight to the target return and a 20-percent weight to the loss limit results in a Pi Score of 36 percent for the current portfolio, 32 percent for the lower-equity portfolio, and 38 percent for the higher-equity portfolio (dotted vertical line). Given its needs and preferences, the higher-equity portfolio appears to best serve the foundation.

There is no one right answer. But, with metrics described here, the dialogue moves beyond vague generalities about “a lot” or “a little” or “somewhat” to more precise statements of probabilities relative to targets, especially risks, that matter to the institution. To be sure, the discussion still revolves around uncertainties, but decisions are informed by a common language and agreed-upon preferences of those involved.

The foundation’s decision-makers may feel uncomfortable choosing a portfolio based on avoiding a loss limit at the horizon date, so intra-period loss levels could and should be examined. Viewing a range of potential outcomes and their probabilities of occurring can be very informative. Figure 5 shows the average drawdown and maximum expected drawdown over three- and five-year horizons assuming a non-normal distribution of outcomes.

The private foundation’s decision-makers can decide: Is the potential for a maximum drawdown event that is beyond its risk capacity (29 percent versus the loss limit of 25 percent) worth a 32-percent chance of hitting its target

return, as shown in figure 3? Perhaps. There is a very small chance that a -29-percent return will happen within five years and the average drawdown of 13 percent does not violate the foundation's loss limit.

A complementary way to help judge whether one portfolio is preferable to another is to translate differences in potential outcomes into dollar terms. This summarizes all the potential outcomes, not just one. The foundation board can ask, "How much money would we have to add to our current portfolio in order to achieve the higher Pi Score of the higher-equity portfolio?"

Most people can understand and relate to dollar-value differences among competing investment strategies. Choosing a portfolio with higher economic value is like generating free money—one portfolio can be worth substantially more than another if it better serves objectives and better manages risk.

Figure 6 shows the dollar-value (and percentage return) differences—i.e., Portfolio Eta—between the current portfolio and the lower- and higher-equity portfolios when the foundation board puts an 80-percent weight on the target return and a 20-percent weight on the loss limit.

Figure 6 shows that, given the foundation's target-return objective, loss limit, and weightings, the higher-equity portfolio is "worth" about \$2.2 million more than the current portfolio over the five-year investment horizon. This is equivalent to 0.44 percent in additional return per year—return that is left on the table with the current portfolio. This is no small sum for the foundation, and a value that is hard to attain through manager alpha. Likewise, the current portfolio is worth about \$1.9 million more or 0.38 percent per year compared to the lower-equity portfolio, and the higher-equity portfolio is worth about \$3.8 million or 0.75 percent per year compared to the lower-equity portfolio.

Figure 5

WITHIN HORIZON LOSS EXPERIENCE

Assuming a non-normal distribution of outcomes

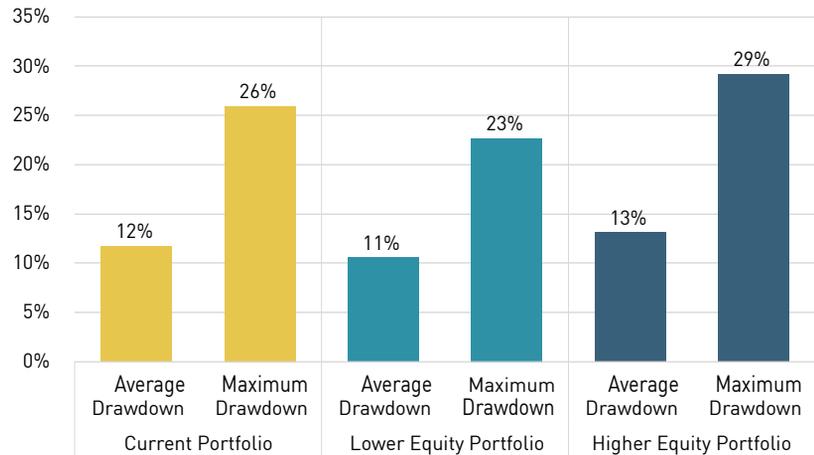
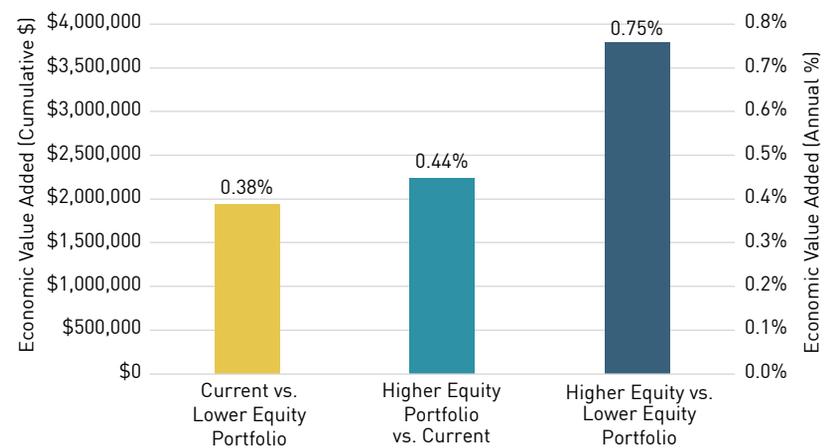


Figure 6

ECONOMIC VALUE DIFFERENCES BETWEEN PORTFOLIOS

80% Target Return Objective, 20% Risk Limit Weighting



Still, the foundation board may not feel satisfied with a low probability of hitting its return target or it may not feel safe enough with the drawdown risks. Using these metrics to help trade off what it wants with risks that matter, the foundation might revisit its target-return objective and consider changes to its portfolio's construction, active versus passive managers, risk management activities, and other investment lifecycle attributes.

Alas, these metrics do not provide absolute, definitive, unassailable answers. Rather, they contextualize investment concepts, particularly the concept of investment risk, so that everyone involved is speaking the same language

and understands the potential impact of their choices.

CONCLUSION

Every fiduciary, regardless of their role or experience, can communicate clearly about investment objectives and risks that matter. Direct measures of the probabilities that fundamental targets and limits can be achieved, weighted by agreed-upon preferences and coupled with comprehensive comparisons of portfolio strategies in dollar terms, provide a more accessible and disciplined decision framework for everyone involved. Even newcomers to the investment world can

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COMMUNICATING CLEARLY ABOUT INVESTMENT OBJECTIVES . . .

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feel more confident that they understand their choices and are doing their best to protect and sustain the purpose of the investment assets. ●

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ENDNOTES

1. For the theoretical framework underlying Portfolio Pi, see Cvitanic et al. (2020). Portfolio Eta is a related concept developed by Cvitanic and Williams. Cvitanic is a scientific advisor to Hightree Advisors, LLC.
2. Although this quote often is attributed to George Bernard Shaw, the original quote is found in Whyte (1950).
3. The MVO framework finds the maximum expected return corresponding to a given portfolio risk level. Typically, risk is defined as the volatility of a portfolio of assets. The framework is based on the foundational paper by Markowitz (1952).
4. Financial market data exhibit non-normal behavior, including volatility clustering, autoregression, fat tails, skewness, and asymmetric dependencies. For a summary of the stylized facts describing price changes and their impact on securities, asset classes, and portfolios, see Homescu (2014).
5. The lower-equity portfolio is 25-percent U.S. equities, 25-percent non-U.S. equities, 40-percent fixed income, and 10-percent broadly diversified hedge funds. The higher-equity portfolio is 35-percent U.S. equities, 35-percent non-U.S. equities, 20-percent fixed income, and 10-percent broadly diversified hedge funds. For simplicity, all analyses use indexes. All figures and results assume a non-normal distribution of portfolio returns.

6. Determined by equally weighting the target return and loss limit objectives: Pi Score of 48% = 50% weight × 32% chance of success in achieving return target + 50% weight × 63% chance of success in not violating loss limit.

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