FCLTGLOBAL

Balancing Act:
Managing Risk across Multiple Time Horizons

FOCUSING CAPITAL
ON THE LONG TERM

ACKNOWLEDGMENTS

This document benefited from the insights and advice of a global working group of senior asset-owner and asset-management staff drawn from FCLTGlobal's Founders and Members. This final document is our own, and the views expressed here do not necessarily represent the views of FCLTGlobal's Founders and Members. We would like to thank and acknowledge the insights of everyone who participated in the working groups that informed our research:

Claude Bergeron, Caisse de dépôt et placement du Québec

Mark Blair, Ontario Teachers' Pension Plan

Steve Boxer, FCLTGlobal

Michael Cantara, MFS Investment Management

Ken deRegt, Neuberger Berman

Anu Gurung, Canada Pension Plan Investment Board

Emily Haisley, BlackRock

Rocky Ieraci, Canada Pension Plan Investment Board

Will Kinlaw, State Street Associates

Robert Koopdonk, Natixis Investment Managers

Richard Lacaille, State Street Global Advisors

Matthew Leatherman, FCLTGlobal

Francis Lienhard, Caisse de dépôt et placement du Québec

Peter Matheos, Wellington Management Company

Kim Millenaar-Haasbroek, PGGM

Jan Parner, ATP

Joel Posters, Future Fund

Gavin Ralston, Schroders

Hans Rademaker, APG Asset Management

Amlan Roy, State Street Global Advisors

Daniel Sandersley, BlackRock

Rishab Sethi, New Zealand Superannuation Fund

Justin Sng, GIC Private Limited

Marc Spalburg, Kempen Capital Management

Rachel Teo, GIC Private Limited

Allyson Tucker, Washington State Investment Board

David Turkington, State Street Associates

Michiel Vetkamp, APG Asset Management

Additionally, FCLTGlobal acknowledges the many important contributions that we received from the following people:

Richard Bookstaber, Office of the President, University of California

Allen He, FCLTGlobal

Lauren Hwang, University of Toronto's Rotman School of Management

Caroline Jiang, University of Toronto's Rotman School of Management

Mark Kritzman, Windham Capital Management

Roland Kupers, NewEconomicMetrics

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Dilip Soman, University of Toronto's Rotman School of Management

Victoria Tellez, FCLTGlobal

Mark Walker, Coal Pension Trustees Investment Ltd.

December 2018

Executive Summary

Boards and executives of long-term funds, such as pension plans, sovereign wealth funds, and endowments, have a challenging problem. They need to manage those portfolios to meet their long-term purpose, which may be decades or more into the future. Yet no fund has the luxury of looking only to that long-term time horizon. Each must also meet expectations in the near term in order to continue in its role and with its investment strategy.[1]

This challenge of meeting both long-term obligations and short-term expectations means that even the longest-term investor must manage across multiple time horizons. This necessity is often at odds with most risk processes, which have been developed to address short-term risks or to target long-term return—but not both.

FCLTGlobal, with input from its members, which include many of the world's leading asset owners and investors, have raised this challenge as central to their ability to take advantage of their long time horizons. Too often, funds carefully set up long-term investment strategies, with a focus on meeting their ultimate purpose, only to shift to a short-term strategy in response to stressful market conditions.

Given our mission of focusing capital on the long term, we see improving risk management across multiple time horizons as one of the key levers for extending investment time frames, and ultimately one of the ways in which fund boards and executives can deliver value to their beneficiaries.

This paper addresses the challenge of managing multiple-horizon portfolios by outlining why such management is important, considering the barriers and hurdles, and then proposing a range of tools that funds could use, as appropriate to their situation.

While investors need long-term investment strategies to meet their long-term obligations, their investments must also perform sufficiently during interim periods to maintain constituents' support. **Balancing long-term objectives with interim performance** is critical.

Current risk behaviors, measurements, and communications typically do not fully **address the challenge of managing portfolios across multiple horizons.**

To tackle this issue, FCLTGlobal, with input from its members, has developed **practical tools** for managing multi-horizon risks, including a **Risk Conversation Guide** for boards and staff to move the issues of managing multiple-horizon portfolios onto the board meeting agenda.

The Importance of Balancing Long-term Objectives with Interim Performance

Investors must manage the tension between long-run objectives and the risks of unacceptable losses over the course of the investment life cycle. Meeting long-term investment objectives can involve the risk of experiencing larger-than-expected losses in the interim. Conversely, taking too little risk can result in getting a good night's sleep but eventually waking to the reality that long-run objectives have been compromised.

One of our Members summarized the goal of long-term investors as generating "excellent performance in the long run with reasonable performance in the short run." Another Member quipped, "You have to make sure you don't get the car keys taken away from you!"

ACHIEVING STRONG LONG-TERM PERFORMANCE AND SUFFICIENT SHORT-TERM PERFORMANCE

- Long-term investors can earn superior returns by capturing a long-term premium.
- Long-term investors are subject to distinct risks and opportunities.
- "Time diversification," or simply holding investments for lengthy periods, may not lead to meeting desired outcomes.

LONG-TERM INVESTORS CAN EARN SUPERIOR RETURNS BY CAPTURING LONG-TERM PREMIUMS

Investors know that having a long-term orientation is an advantage.[2] Those investors with the ability to manage for the long term can ensure that they are not forced to sell in times of stress and, moreover, can purchase assets at favorable prices from those who must sell. They can invest early in promising strategies or managers, and wait patiently for those investments to mature. This long-term advantage is visible in the returns. According to Willis Towers Watson, a significant long-term premium exists that can have a meaningful impact on overall portfolio returns, especially when compounded over extended periods of time.[3] Capturing this long-term premium is critical for long-term investors.

LONG-TERM INVESTORS ARE SUBJECT TO DISTINCT RISKS AND OPPORTUNITIES

The risks to long-term capital are distinct from the risks to short-term capital.[4] From climate change to demographics to cybersecurity, long-horizon investors face forces likely to affect their portfolios significantly over time. These long-term trends present both risks and opportunities, and while it is impossible to forecast the future, anticipating and planning for long-term risks is an integral part of managing a long-term portfolio.[5]

"TIME DIVERSIFICATION"—SIMPLY HOLDING INVESTMENTS FOR LENGTHY PERIODS—MAY NOT LEAD TO THE DESIRED OUTCOMES

Time is not a panacea. A common refrain is "Don't worry; we have time." While it is true that the range of expected returns narrows over time as the inevitable high- and low-return years balance out, that doesn't mean that time cures all ills. Even if, over time, expected returns converge, the fund may not meet its desired outcome. Given the compounding of returns, even small differences can lead to very large differences in the potential outcomes for asset values over time. Longer time periods generate a wider dispersion of potential outcomes for asset values, even if rates of return converge to a narrower range.[6]

"Many people believe that risk diminishes over time. From this view, if you have an investment with a positive growth rate and you reinvest in it over many periods, the fluctuations cancel out and you are left with a reliable gain. Some call this 'time diversification.' This notion is misleading because the size of potential losses increases with time, even though the chance of loss goes down."

—David Turkington, State Street Global Exchange[7]

The Challenge of Managing Across Multiple Horizons

Why is it so difficult to manage risks across multiple time periods, focusing on long-run returns while also ensuring an adequate level of return along the way?

We posed this question to a broad range of investors. Overall, they recognized that most risk processes are built for near-term risks and that risks far out into the future are hard to anticipate and manage. And, of course, while fund time frames may extend for decades, careers and board terms do not. Additional reasons for the difficulty of multi-horizon management fell into three categories: behavioral tendencies, typical measures of risk, and communication issues.

CHALLENGES OF MANAGING ACROSS MULTIPLE HORIZONS

- **Behavioral tendencies:** Common investor behaviors can inhibit long-term value creation.
- **Typical measures of risk:** The usual measures of risk don't incorporate the perspectives of multiple time horizons.
- **Communication:** Long-term investors and their oversight boards often do not communicate effectively about risk.

COMMON INVESTOR BEHAVIORAL TENDENCIES CAN INHIBIT LONG-TERM VALUE CREATION

Investment decision-makers are human, and we have learned a great deal about the impact of human behaviors on decision-making from the work of behaviorists such as Daniel Kahneman, Amos Tversky, and Richard Thaler. Humans naturally need to survive the short term, and many of our behavioral tendencies reflect that. When applied to long-term investing, however, these tendencies can be detrimental to long-run value creation.[8] For example, asset owners often chase performance—buying high and selling low—when selecting asset classes and asset managers. Furthermore, it is difficult to incorporate long-run, uncertain risks into investment policy and strategic asset allocation, leading many investors to ignore those risks altogether.

Humans also have a tendency to make trade-offs over time. We often emphasize the need to meet near-term obligations at the expense of effectively meeting long-term goals. It's easy to kick the can down the road. We also tend to focus, often unduly, on reference points in the recent past. For example, if a portfolio is down 10% year to date, we feel that loss acutely, even if we may be 5% ahead of our long-term target over the last 10 years.

Finally, observers have commented that many people understood the risks in the economic system before the global financial crisis, but they lacked the imagination to picture how bad it could be. We tend to assume that the future will replicate our experience and therefore look something like the recent past, rather than contemplating very different outcomes.

Recognizing these behaviors in ourselves, our teams, or our oversight boards does not imply any lack of competence or sophistication—it simply means we are human and may need tools to help us manage our own human tendencies. Many of the practical tools discussed at our working groups and outlined below are designed to mitigate these behavioral tendencies.

THE USUAL MEASURES OF RISK DON'T INCORPORATE THE PERSPECTIVES OF MULTIPLE HORIZONS

Investors use measures of risk to help them evaluate their portfolios and understand potential outcomes.[9] Most of these risk measures were developed for use in banking, trading, and other shorter-term endeavors.[10] Furthermore, the investment community has developed its own shorthand uses of these risk measures over time. For all these reasons, existing measures typically do not capture the challenge of both achieving long-term performance and managing short-term risk.[11]

The problem with applying typical risk measures to multiple-horizon portfolios is not only a theoretical

one; it can lead to suboptimal decision-making and unintended consequences.[12] Risk professionals who contributed to this project highlighted ways in which inappropriate risk measures can cost funds real money.[13]

"Investors dramatically underestimate their portfolios' exposure to loss, because they focus on the distribution of returns at the end of the investment horizon and disregard losses that might occur along the way."

—William Kinlaw, Mark P. Kritzman, and David Turkington[14]

Another issue is that investors often set return expectations that are too high for their tolerance for loss, or *drawdown*, in the interim periods. Board members, wanting to have their cake and eat it too through high returns and minimal drawdown risk, may not recognize that there is an explicit trade-off between expected return and interim losses. Failure to appreciate this trade-off means that some funds pursue investment strategies that have little chance of success in meeting their ultimate purpose. A lack of internal consistency between long-run objectives and interim risk tolerances can lead to suboptimal outcomes.

In addition to the points addressed in this paper, working groups raised a number of areas for further research on risk measurement practices across time horizons. Several participants highlighted problems arising from combining results of assets that are marked to market with illiquid assets that are priced infrequently. Another working group member noted the difference in correlations between calm and turbulent market environments. In calm and rising markets, investors want to have positively correlated asset classes. Obviously, in turbulent markets, the diversification benefit from less-correlated assets is highly prized.

Other working group participants mentioned common flaws in the application of portfolio optimization methodologies. For example, it is common practice to scale up short-term volatility for use as a measure of risk for longer-term investment periods, rather than using actual longer-term volatility. As a result, funds could exclude or underweight asset classes that are diversifying over the long term and could thus add real value to the portfolio.[15]

Others noted the impact of non-normal distributions on standard risk measures.[16] Many investment analyses assume normal distributions, and distributions over shorter time frames tend to be more normal. However, once time frames are extended to multiple horizons, the issues of autocorrelation, outliers, and skewed distributions become more serious.

OFTEN, LONG-TERM INVESTORS AND THEIR BOARDS DON'T COMMUNICATE EFFECTIVELY ABOUT RISK

Oversight boards and their investment or risk staff often speak different languages when it comes to risk. The pattern that we see repeatedly is that boards and staff discuss in-depth technical presentations but may not be clear on their long-term implications—they can't see the forest for the trees. Then, inevitably, after some sort of market stress event, board members are surprised by portfolio movements.[17] In the face of this uncertainty and surprise, the board takes on a very short-term focus, often losing confidence in the management team or the strategy and wanting to pull back on risk, perhaps at just the wrong time.

ADDRESSING THESE BEHAVIORAL TENDENCIES, RISK MEASUREMENT CHALLENGES, AND COMMUNICATION ISSUES CAN HELP ASSET OWNERS MEET THE CHALLENGE OF MANAGING MULTIPLE-HORIZON PORTFOLIOS FOR THE BENEFIT OF THEIR ULTIMATE BENEFICIARIES.

Tools for Managing Portfolios Across Multiple Time Horizons

FCLTGlobal, with input from its members, has developed practical tools for managing multi-horizon risks, as well as a **Risk Conversation Guide** for boards and staff to better communicate about these important issues. The following section outlines each of these areas in detail, citing real-world evidence, illustrative examples, and experiences gathered from our colleagues on how to address issues stemming from multi-horizon risk.

OBJECTIVE AND STRATEGY SETTING

- Investment purpose statement
- Investment beliefs
- Strategic advantages and disadvantages
- Investment parameters
- Risk appetite statement
- Strategic asset allocation

RISK ANTICIPATION

- Interactive scenarios
- Clarification of risk preferences
- Purpose-risk analysis

COMMUNICATION CHECKLIST

- Graph information, rather than using data tables, when possible.
- Format graphs probabilistically and in ways that are already familiar to trustees.
- Determine which information trustees need and remove everything else.
- Use clear language on each graph that explains to trustees why they need the information.
- Use captions to annotate any assumptions required to use the data.
- Provide all material in advance.
- Explain material during the board session before analyzing it.

DECISION MANAGEMENT

- Portfolio rebalancing
- Set-asides
- Lock-ups
- Parameters for review
- Decision tracking

RISK AND PERFORMANCE MANAGEMENT

- Long-term performance reporting
- Outcome-focused performance reporting
- Drawdown versus shortfall risk
- Internally consistent targets

RISK CONVERSATION GUIDE

Board members and staff often use different language to communicate about investment risk, leading to a lack of understanding of each of these issues. This guide is a starting point for discussions on risk management for multi-horizon portfolios.

Toolkit 1 Toolkit 2

Using Practical Tools to Manage Multi-horizon Risks

To address the challenges of managing risk across multiple time horizons, FCLTGlobal has worked with its Members to develop a suite of practical tools. These tools, detailed in Toolkit 1, build on the extensive work done by the Focusing Capital on the Long Term initiative, including our *Long-term Portfolio Guide: Reorienting Portfolio Strategies and Investment Management to Focus Capital on the Long Term*, and incorporate thinking from FCLTGlobal's more recent work, *Institutional Investment Mandates: Anchors for Long-term Performance*.[18]

We believe these tools address the cross-cutting issues of behavioral tendencies, risk measurement, and communication by providing practical tools for boards and staff. These tools are grouped into five categories and generally move from the foundational to the more complex. The tools are summarized in Toolkit 1 of this document, and what follows provides an explanation of both the meaning and the rationale for each tool. While not every tool will be appropriate for every fund, the intention is that fund boards and staff can use the tools to help address the challenges of managing multiple-horizon portfolios.

PRACTICAL TOOLS FOR MULTI-HORIZON RISK MANAGEMENT

- Objective and strategy setting tools
- Decision management tools
- Risk anticipation tools
- Risk and performance measurement practices
- Communication checklist

OBJECTIVE AND STRATEGY SETTING TOOLS

Formal agreement on the key objectives of a fund and the strategy to achieve those objectives are together the foundation for managing risks in portfolios across multiple time horizons. Documenting the goals and parameters of a fund may lead to a deeper understanding of the fund's needs and provide greater conviction to maintain a long-term outlook in the face of market stress. Setting objectives and strategies involves six key elements:

- Investment purpose statement
- Investment beliefs
- Strategic advantages and disadvantages
- Investment parameters
- Risk appetite statement
- Strategic asset allocation

An **investment purpose statement** is a clear description of the fund's objective and long-term desired outcome. The Washington State Investment Board's purpose statement provides a succinct example:

The mission of the Washington State Investment Board (WSIB) is to make and manage investments for Washington State pension and other public trust funds with integrity, prudence, and skill to meet or exceed the financial objectives of the beneficiaries of the funds. The Board does so consistent with all applicable statutes, regulations, and Board policies.[19]

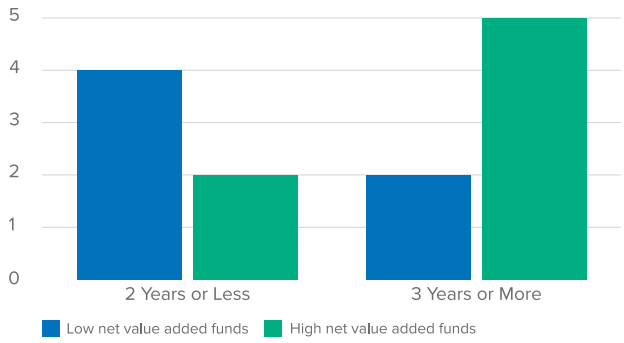
Formally documenting the purpose serves to remind all decision-makers of the fund's long-term goals that are necessary to meet that purpose, building commitment to the overarching objective of the fund.

Investment beliefs are strongly held and clearly articulated views about investing.[20] It is important that these views be disputable—that is, that a reasonable investor could take a different view—in order for them to provide a foundation for a long-term investment strategy. For example, one fund might say that market prices will deviate significantly from fundamental or intrinsic value in the short run, while another might say that markets are efficient, with few opportunities for mispricing. Clearly, those different beliefs could lead to very different investment strategies, such as different views on the role of active versus indexed equities in a portfolio.

Research suggests that successful investors have a tendency to maintain their investment beliefs. Among the 18 owners controlling $1.6 trillion in assets who responded to a survey fielded in 2018 by FCLTGlobal and the research firm CEM Benchmarking, those that added net value over the course of 10 years tended to stick to their investment beliefs for 3 years or longer (Figure 1).[21]

FIGURE 1- Maintaining investment beliefs

How frequently do you update your fund's investment beliefs?



*Source CEM Benchmarking, Inc.

However, major events can lead to questioning of investment beliefs. The Dutch pension fund Pensioenfonds voor Zorg en Welzijn (PFZW) reformulated its investment beliefs in the aftermath of the global financial crisis. In particular, PFZW staff questioned whether the efficient-markets paradigm remained relevant to the fund's investing strategy. The crisis also prompted questions about the social sustainability of the plan, not just its financial soundness.[22]

Each institution has specific **strategic advantages and disadvantages** that affect its ability to meet investment objectives. Articulating the benefits or drawbacks of one's fund size or location, for example, can contribute to appropriate asset allocation and risk taking that will be consistent across multiple time horizons.[24]

Similarly, some funds have a public profile that renders media attention, or "headline risk," a real danger that could lead, in times of stress, to discontinuing an investment approach that another investor, who is not in the public eye, could maintain. Recognizing these advantages or disadvantages, even if they can't be changed, can lead to better decision-making over time.

AUSTRALIA'S FUTURE FUND BUILDS ITS STRATEGIC ADVANTAGES ON ITS LONG-TERM MISSION

The Future Fund Act 2006 states that the Board must seek to maximise the return earned by the Fund over the long term. There are three main comparative advantages to being a long-term investor:

1. The ability to take on greater levels of market risk, on the assumption that a long-term investor is able to tolerate the shorter-term losses that come with the greater market risk exposure. The greater market risk ought to (albeit in practice, it need not necessarily) be rewarded with higher long-term returns.
2. The ability to accept capital's being locked up in assets or structures that are impossible and/or costly to sell out of within a short period of time. Such investments ought to (albeit in practice, they need not necessarily) attract a premium return to compensate for this loss of liquidity; and
3. The ability to be countercyclical, patient, and opportunistic. The investor can use its long-term nature to reduce risk when prospective returns are unattractive and wait for more compelling opportunities to buy (or sell). At times of market stress when other investors are selling, the long-term investor is able to step in and provide liquidity to the markets in return for outsized forward looking expected returns. This is often referred to as maintaining "dry powder".[25]

Many funds have **investment parameters** that reflect the top-down preferences of the fund sponsor, beneficiaries, or other key constituents.[26] An organization may eliminate positions in land mines, for example, on principle. Others may set investing weights based on non-investment factors such as requiring a certain percentage of the fund to be invested in its home jurisdiction. For example, ABP, the Dutch pension sponsor for civil servants and educators, set new exclusions for APG Asset Management, the organization that manages its pension assets, in January 2018:

ABP takes the next step in its sustainable and responsible investment policy with the decision to exclude the products tobacco and nuclear weapons from its investments. ABP has reached this decision after extensive consultation at the board level, based on the insights shared by participants, employers, and various special interest organizations. The pension fund aims to sell within one year all investments (a total of approximately 3.3 billion euros) in tobacco and nuclear weapons manufacturers.[27]

Clarifying the requirements for, or prohibitions against, certain investments based on long-term principles or values provides clear direction, or a type of "sandbox," for investment decision-making, rather than having the boundaries shift over time. While values-based investment parameters may constrain the opportunity set, specifying any such parameters up front allows the staff and managers to exercise investment discretion within those parameters over the near term while also being aligned with the organization's long-term goals.

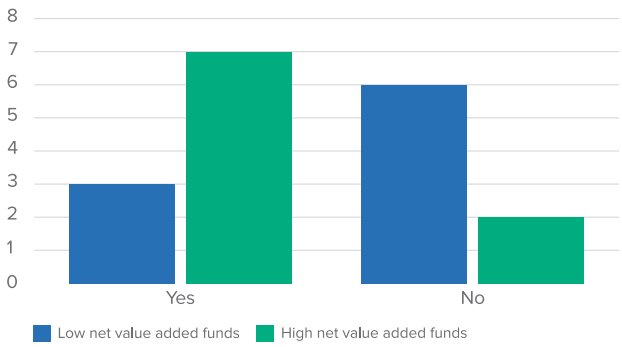
Risk appetite statements are useful in documenting both the amount of risk necessary to achieve the long-term desired outcome and the amount of loss that is acceptable in interim measurement periods. Discussing and agreeing on a risk appetite statement allows asset owners to articulate and analyze risk preferences in a calm environment, rather than simply reacting in challenging environments. Some risk appetite statements tend toward the quantitative, such as "We expect active risk to be 4 percent on average and no more than 8 percent," while others are more qualitative, such as "Our conservative posture means that we will underperform in strong markets and outperform in weak markets." The Long-term Portfolio Guide provides further background on risk appetite statements.

SINGAPORE'S TEMASEK STATES ITS APPETITE FOR RISK SUCCINCTLY AND AT THE LEVEL OF PRINCIPLES

1. We have no tolerance for risks that could damage Temasek's reputation and credibility.
2. We focus on performance over the long term.
3. We have flexibility to maintain concentrated positions.
4. We maintain a resilient balance sheet.
5. We evaluate the potential for sustained loss of overall portfolio value over prolonged periods and use different scenarios to test our resilience.[28]

The 2018 survey of 18 global asset owners, mentioned earlier, also shows an overlap between respondents who use a risk appetite statement and those that have successfully added net value over a decade (Figure 2).

FIGURE 2- Establishing formal risk appetite statements



**Source CEM Benchmarking, Inc.*

Asset owners set long-term asset class targets, or **strategic asset allocations**, that the board and management believe to be sufficient for meeting the fund's long-term goals. Ranges around the long-term target asset-class mix can be used for shorter-term deviations from the target as the portfolio is managed across multiple time horizons. Strategic asset allocations are often made up of absolute asset class weights but can also be based on contributions to risk or other measures.

Oversight boards review these targets and adjust them periodically as new asset classes are introduced or as market conditions change, but the role of the strategic asset allocation is to provide a long-term anchor for the overall fund.

TABLE 1- Illustration of a strategic asset allocation

Asset Class	Target	Range
Developed Market Equity	30%	25%–35%
Emerging Market Equity	10%	5%–15%
Private Equity	20%	15%–25%
Real Estate and Infrastructure	10%	5%–15%
Nominal Bonds & Cash	25%	20%–30%
Inflation-linked Bonds	5%	0%–10%

DECISION MANAGEMENT TOOLS

Decision management tools can mitigate the downside of common behavioral tendencies. Such tools generated vigorous debate during our working group sessions, with some practitioners reporting that they add significant value to their decision-making process and others finding them to be a mismatch for their funds. FCLTGlobal believes these tools can play a role in improving multi-horizon decision-making in some, but certainly not all, funds, depending on their particular decision-making processes. Our working groups focused on the following five tools:

- Portfolio rebalancing
- Set-asides
- Lock-ups
- Parameters for review
- Decision tracking

Portfolio rebalancing policies continually adjust a fund's actual asset allocation toward its long-term targets. This rebalancing may be done over time by adding cash flows to underweight asset classes and taking cash outflows from overweight asset classes. Boards can decide to rebalance the portfolio to targets on a periodic basis so that deviations from the targets are time limited. Alternatively, boards can implement a policy to automatically rebalance to targets after large market movements to prevent the portfolio from falling outside preset boundaries.[29] Automatic rebalancing, in particular, can mitigate the inertia of boards as markets move, often resulting in an overweight to equities after they have risen or an underweight after they have declined. Furthermore, rebalancing policies can mitigate the problem of investors' compounding short-term market movements by buying high and selling low.[30] Committing to countercyclical behavior ahead of stressful events can relieve the pressure from boards to make decisions quickly and during difficult market conditions.

Rebalancing policies are important for boards to consider in conjunction with the objective and strategy tools outlined above. For example, automatic rebalancing requires a belief in mean reversion over time. Any rebalancing policy also needs to incorporate a fund's cash flow patterns.

The following is an example of a published rebalancing policy from Norges Bank Investment Management:

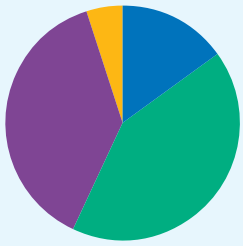
The Ministry of Finance set a rule in place in October 2012 for when and how the benchmark index is to be rebalanced. The rule is straightforward and part of the public regulatory framework. It governs decisions that must often be made in periods of great uncertainty. A clear and public rule ensures that the rebalancing strategy is implemented regardless of market conditions.

The rule specifies a limit for how far the equity allocation in the benchmark index may deviate from the strategic allocation before rebalancing must be performed. The limit is set at 4 percentage points, which means that if the equity allocation in the benchmark index is less than 56 percent or more than 64 percent at the end of a calendar month, it will be returned to 60 percent at the end of the following month.[31]

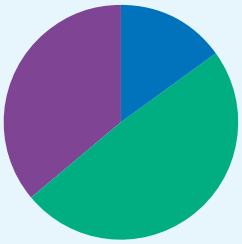
Many multi-horizon funds need to meet short-term cash outflows to pay benefits or support operations, but at the same time, must stay focused on achieving

their long-term goals. One way to create clarity around meeting the needs of different time horizons is to use **set-asides** in the portfolio (Figure 3). Setting aside a portion of the portfolio in short-term funds earmarkedfor upcoming outflows provides confidence that the fund can meet those near-term obligations even in difficult market conditions. At the same time, the practice allows the board to focus the remainder of the fund on investments with a long-term time horizon. Of course, a fund could achieve the same risk/return position within one pool of assets, but in some cases, using a set-aside allows the board to take advantage of the behavior of mental accounting,[32] which may make it easier to achieve the appropriate level of risk and return.

FIGURE 3- The role of set-asides—illustrative portfolio



Portfolio Allocation With Set-Aside



Portfolio Allocation Without Set-Aside

For example, ATP uses a mechanism similar to set-asides that involves dividing its total assets into two portfolios: one that hedges obligations and another that reaches for return so that benefits can become more generous. All of the assets are still under the investor's control and are targeted at the same expected return necessary to fulfill the investor's purpose. This strategy may make the risk easier to bear and, in turn, the long-term commitment easier to maintain.

Here is how ATP describes its approach:

ATP has two value creation sources at its disposal: a hedging portfolio and an investment portfolio. The hedging portfolio is to safeguard the guaranteed return and thus ensure ATP's ability, at all times, to deliver on the guarantees issued. In other words, hedging ensures that ATP's promise to its members is fulfilled.

The principal objective of the investment portfolio is to generate a return that will allow ATP, in part, to raise the guaranteed pensions, thereby preserving the long-term purchasing power of the benefits, and, in part, to build reserves for unforeseen events such as financing increased life expectancy.[33]

Just as Odysseus had his crew tie him to mast as he passed the Sirens, investors can benefit from being unable to react to temptation.[34] **Lock-ups** are the investors' version of being tied to the mast; these contractual terms commit to a capital allocation for a minimum time period with a penalty for early termination. Amid the temptation of changing investment strategies, having a lock-up makes it impossible or at least very costly to do so. Often a by-product of investing in less liquid asset classes, a lock-up also tends to mitigate behavioral tendencies. As seen above, the Future Fund in Australia views its ability to commit to locked-up assets as a strategic advantage.

Making a locked-up commitment effectively changes a multi-horizon investment into a single-horizon investment because the owner has no interim decision-making points. By taking away the ability to sell, lock-ups can be effective at ensuring that owners stay the course during short-term market movements. While lock-ups are common in illiquid asset classes such as private equity or infrastructure, and exit fees often exist in less liquid areas

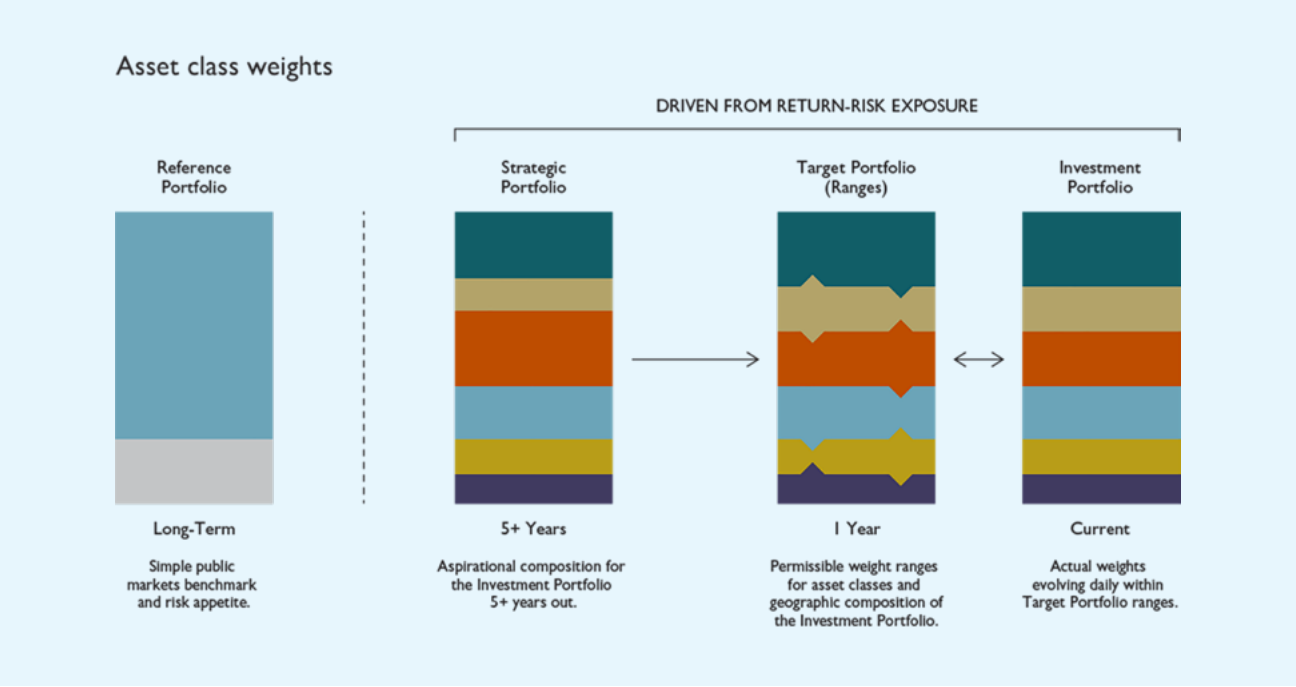
such as emerging market equity, locking up public equity is less common. Hedge funds, however, often have lock-ups at the limited partnership level despite investing in liquid assets; the stated reason for those lock-ups is virtually always to ensure that investors do not exit during periods of short-term stress.

Decision-makers often feel pressure to "do something" when confronted with losses. Conversely, they often ignore overconcentration of risk if performance is strong. One way to mitigate this tendency is to select interim performance or risk **parameters for review** in advance, which will lead to revisiting the investment approach. For example, an investor might put in place a policy to review a portfolio allocation if realized returns have deviated from expectations by more or less than 5%. Inside these parameters, decision-makers expect to maintain their position, but once these parameters are breached—either positively or negatively—the investment strategy will be reevaluated or put on a watch list.

Investment decision-makers improve their performance over time by tracking their decisions and understanding where their strengths lie. Portfolio managers typically understand the impact of both the securities they own and the securities they have chosen not to own. However, fund oversight boards and executives usually track the positions they actually own, rather than also considering what they have chosen to exit or avoid. **Decision tracking**, such as monitoring and reporting on the performance of the current strategic asset allocation relative to prior ones, may shed light on investors' effectiveness at changing their asset allocations. Similarly, tracking the performance of the actual asset allocation relative to the strategic asset allocation highlights how effective decision-makers are when they make tactical choices to deviate from their targets. Of course, any such tracking mechanism works best when it is used to encourage continuous improvement and understand strategic advantages, rather than to lionize or vilify past decisions or decision-makers.

Tracking the effect of strategic asset allocation decisions also can help a board learn from experience and improve its risk management skills. Figure 4 illustrates how the Canada Pension Plan Investment Board relates its actual investment portfolio to its strategic and reference portfolios.

FIGURE 4- Investment framework– Canada Pension Plan Investment Board[35]
Asset class weights



RISK ANTICIPATION TOOLS

While we cannot predict the future, we can anticipate various types of risk and plan for the unexpected. We can also develop a deeper understanding of the other key decision-makers in an organization through these processes, laying the foundation for strong working relationships in a time of stress. This topic generated broad interest during our working groups and analysis, with three tools rising to the top:

- Interactive scenarios
- Clarification of risk preferences
- Purpose-risk analysis

Across all of these ideas, there is a common approach of trying to think, ex ante, about how investment decision-makers might react in different risk scenarios over time, and a belief that doing this type of work up front will serve the long-run performance of investors.

Interactive scenarios are designed to help decision-makers consider how they will respond to possible future states of the world. Questions might include "What would we do if US long-term interest rates rose dramatically?" or "How is our portfolio positioned for the pricing of carbon five years out?"[36] This interactive process identifies plausible, but less expected, future scenarios and their potential impact on the fund. Tabletop simulations of potential risks and responses can challenge investment beliefs and help us consider changes to our asset allocation in such scenarios. These simulations also familiarize us with our own emotions and behaviors in extreme circumstances, helping us to anticipate and "experience" those emotions and behaviors before real risk materializes.[37]

Anticipation of various outcomes and interaction among the decision-makers can also be effective in surfacing different perspectives in the room. Exercises that facilitate **clarification of risk preferences** can be used to evaluate the individual risk preferences of key decision-makers, such as board members and executives, in order to identify differences within the group and anticipate the implications for risk taking.[38] Polling decision-makers individually on key assumptions that are incorporated into investment beliefs and discussing them during a board meeting may highlight differing views. Even raising the issue of managing multi-horizon risk and understanding decision-makers' comfort with this challenge can be a good test for potential board members or executives.

Market stresses can exacerbate differences in risk preferences and understanding those risk preferences ahead of market stress can lead to better decision-making. The goal of understanding this multiplicity of risk preferences is not to eliminate differences or limit diversity of thought, but to prepare for situations of short-term stress.

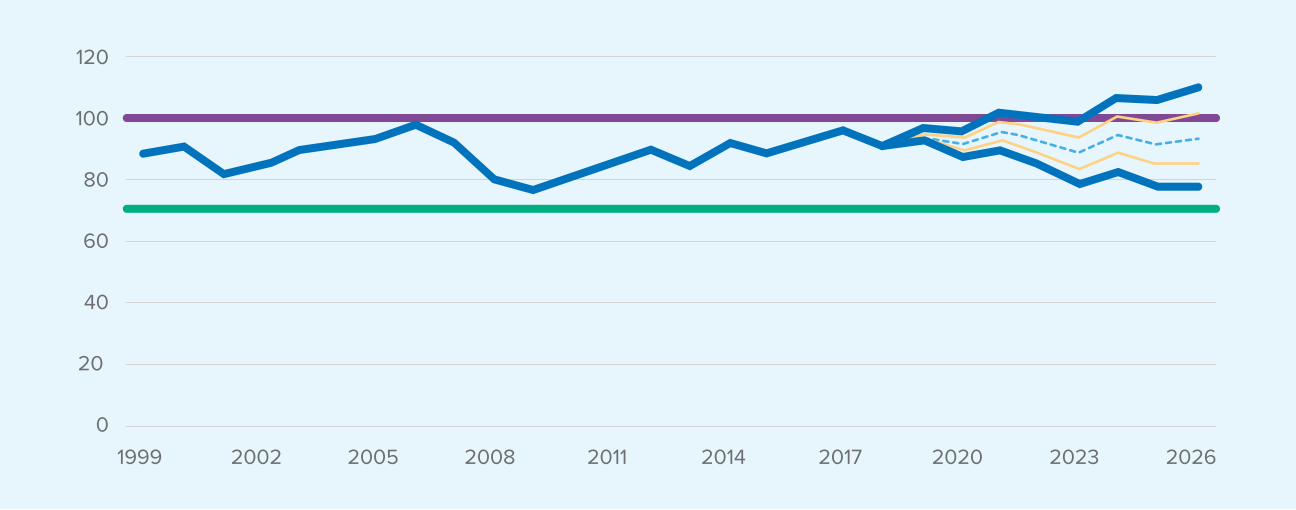
A **purpose-risk analysis** can help investors anticipate risks that could affect a fund's ability to meet its purpose and help a board ensure that it can meet that purpose. The computation of how a fund is tracking to fulfill its purpose provides a probable range of outcomes and can be used to test the board's comfort with that range.[39] Quantifying the level of loss from which a fund could not recover and continue to fulfill its purpose can help decision-makers distinguish between short-term fluctuations and potentially catastrophic losses. Furthermore, by understanding the purpose and the potential risks to meeting that purpose, funds can choose to mitigate that level of loss. For example, if a $1 billion fund would be unable to fund its purpose if it fell to $500 million, it could analyze the potential losses in each of its asset classes and determine its comfort level with its ability to stay above $500 million.

Achieving the fund's purpose is the long-term goal for decision-makers. Emphasizing the performance required to meet a fund's purpose (such as funded status or distribution levels) may allow decision-makers to build portfolios to mitigate the prospect of long-term shortfall and not overreact to short-term drawdowns that do not threaten the purpose (Figure 5).

FIGURE 5- Projecting ranges of outcomes relative to fund purpose—illustrative fund

Our asset allocation risks plan funding between 79-107% over the next business cycle.
Risk to our mission would be a concern at levels below 70%.

Funded ratio range by confidence interval (95th and 99th percentiles)



RISK AND PERFORMANCE MEASUREMENT PRACTICES

Measuring performance and risk is critical to the decision-making processes of institutional investors. The FCLTGlobal working groups had extensive and lively discussions on how to modify typical risk and performance metrics to address the challenges of managing a multiple-horizon portfolio. While there was a range of views among our Members, the following practices emerged as the most important in appropriately measuring risk and performance over multiple time horizons:

- Long-term performance reporting
- Outcome-focused performance reporting
- Drawdown versus shortfall risk
- Internally consistent targets

Long-term performance reporting tables begin with measurements of the relevant time frames, such as 10 years, and then show short-term data, if required, last. Simply flipping the numbers to show long-term performance metrics before quarterly or year-to-date data can serve to anchor attention on the time periods that really matter for long-term value creation.[40] Anchoring to the first numbers on a chart is common, and providing an appropriate time frame as the reference point emphasizes the time periods that are most important to the success of the fund.[41]

Similarly, displaying performance against long-term expected return outcomes, rather than against the benchmarks over interim periods, helps decision-makers stay focused on the longer-term goal rather than short-term fluctuations. This method of **outcome-focused performance reporting** can anchor the discussion of performance back to the desired outcome or purpose, such as fully funding a pension plan. This method of reporting provides key constituents with a longer-term frame for evaluating performance than the common "loss" mind-set often covered in the media or discussed around board tables.

While the portfolio illustrated in Figure 6 sustained large losses in two periods, for example, it is still outperforming its long-term goal.

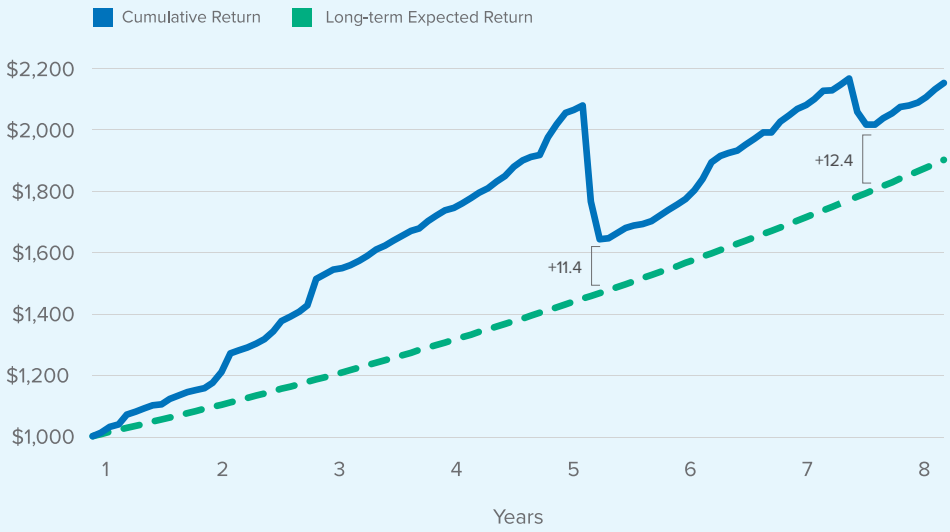
Figure 5 Notes

- Assumes that price changes of individual, underlying securities are independent of one another and tend to have the same scale

FIGURE 6- An example of outcome-focused performance reporting—illustrative fund

Our fund is exceeding the long-term goal even through recent drawdowns.

Actual cumulative return relative to long-term expected return



Recognizing the trade-offs of **drawdown versus shortfall risk** is a key element of managing a multi-horizon portfolio.[42] *Drawdown* can refer to a loss relative to the original investment or peak or interim valuation. *Final shortfall* is the end-of-period gap between the portfolio's value and the expected return outcome. There is a trade-off between the likelihood of experiencing a drawdown along the way and the chance of not having a shortfall relative to the intended outcome.

Organizations can adjust their asset allocation and key risk parameters to reduce interim drawdown risk, but usually not without trading off expected return. Acknowledging this trade-off can help decision-makers withstand periods of short-term stress along the path to achieving an appropriate investment outcome. As an illustration, the green line in Figure 7 shows that with enough time, the chance of a shortfall drops to near zero. However, the dark blue line shows that there is a significant chance of drawdown throughout the time period.

FIGURE 7- Trade-off of shortfall and potential drawdown [43]

The best long-term investors set **internally consistent targets** for expected return, final shortfall, and interim drawdown. We often see investors specify return expectations that are out of line with their comfort level for interim drawdowns, or choose a level of risk that is unlikely to achieve their ultimate expected return goals. Setting internally consistent expectations for expected return, interim drawdown, and final shortfall may help organizations set achievable goals and pursue an appropriate long-term investment strategy. Importantly, these funds can then maintain those strategies during periods of stress rather than changing course in the face of short-term pressure.

The Ontario Teachers' Pension Plan uses such a strategy:

"*The Ontario Teachers' Pension Plan develops its overall investment strategy based in part on inputs from the Partners about risks it can or cannot tolerate. Various zones demarcate the Plan's risk appetite, including the levels of interim loss that the plan could handle over its long-term investment horizon. The Partners understand the balance we must achieve between appropriately managing our risk of loss and being able to take enough risk to earn our overall expected return and fulfill our mandate. As such, they are very realistic about setting these parameters, which in turn helps Ontario Teachers' design an overall investment strategy and asset allocation allowing us to earn our expected return without undue risk of loss.*"

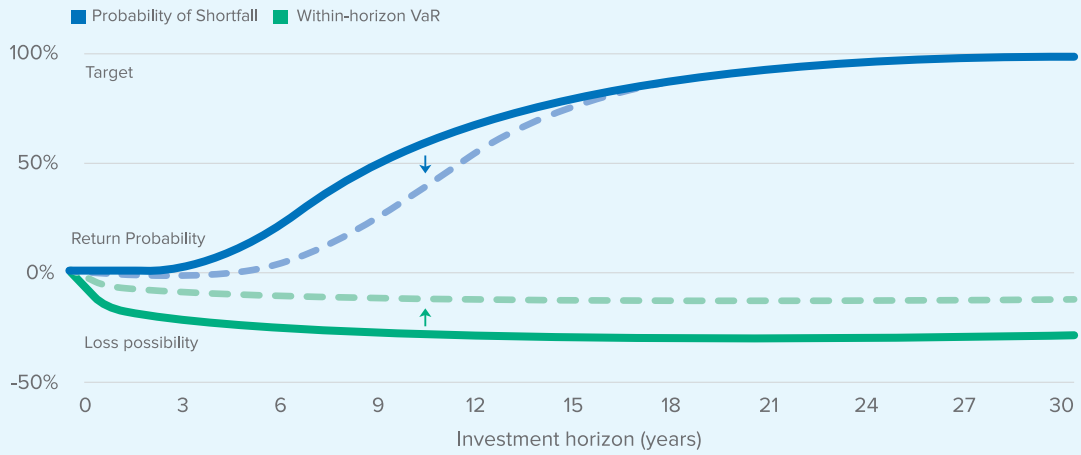
—Mark Blair, Director at Ontario Teachers' Pension Plan[44]

Figure 8 illustrates that an investor has to make internally consistent trade-offs. In this case, the investor sets a parameter to halve the risk of loss during the investment period, as reflected in the dotted green line relative to the solid green line. This more conservative portfolio, depicted in the dotted blue line, will take several more years to close in on the target relative to the less conservative portoflio, depicted with a solid blue line.

FIGURE 8- Internally consistent trade-offs—illustrative portfolio[45]

An investor that needs possibility of loss during an investment will need to wait longer to have confidence about hitting their target.

Effect in terms of End-of-Horizon Value-at-Risk of having Within-Horizon Value-at-Risk (10-year horizon), both at 95th percentiles.



COMMUNICATION CHECKLIST

Strong communication between the board and staff builds an environment in which good investment decisions can be made over multiple time horizons. These internal communications are universally cited as challenging despite the best intentions of the participants on both sides. The Ontario Teachers' Pension Plan has recognized this challenge:

"To support better oversight and decision-making, we have improved the quality of risk materials in packages to our Board of Directors. More crisp and succinct information has cut down on the volume of materials and made our central information more concise and accessible."

—Mark Blair, Director at Ontario Teachers' Pension Plan [46]

FCLTGlobal and Behavioral Economics at Rotman, a program of the University of Toronto's Rotman School of Management, researched ways in which staff can communicate more effectively with board members, helping board members oversee their risk practices and fulfill their long-term responsibilities.[47] This extensive work has been distilled into a **data communication checklist** that staff can use for preparing board materials. The checklist is deceptively simple; it is harder than it looks to transform technical risk data into presentations that meet these criteria.

DATA COMMUNICATION CHECKLIST

- ☑ Graph information, rather than using data tables, when possible.
- ☑ Format graphs probabilistically and in ways that are already familiar to trustees.
- ☑ Determine which information trustees need and remove everything else.
- ☑ Use clear language on each graph that explains to trustees why they need the information.
- ☑ Use captions to annotate any assumptions required to use the data.
- ☑ Provide all material in advance.
- ☑ Explain material during the board session before analyzing it.

Figure 8 Notes

- Data based on a national portfolio analysis developed by State Street Associates for FCLTGlobal.
- Assumes an asset allocation, volatility level, and analyzation of monthly volatility input. Changing any of these assumptions would affect the data points marginally but not the overall tradeoffs.
- Assumes that price charges of individual, underlying securities are independent of one another and tend to have the same scale.

Facilitating Discussions with a Risk Conversation Guide

FCLTGlobal and its Members have developed a Risk Conversation Guide, found in Toolkit 2. Board members and staff often use different language to communicate about investment risk, leading to a lack of understanding of the most important risk issues facing a fund. Often, when difficult market conditions arise, boards shift to short-term decision-making because they are not comfortable with the level or types of risk the fund is taking.

Conversations held in advance of difficult times can build conviction around the agreed-upon investment approach. This guide can serve as a tool to facilitate and structure a productive discussion about multi-horizon risk for the board and staff of a fund in nontechnical language, helping the fund develop a common understanding of critical issues around risk taking.

The intent is for the guide to be a starting point for discussions on risk management for multi-horizon portfolios and to build on topics that our research identified. We would encourage boards, and board chairs in particular, to test this guide and raise questions like the ones it recommends. Making risk oversight sessions more interactive will improve decision-making on all sides, and we hope this conversation guide will help board members make the most of those discussions.

SUMMARY

In summary, boards and executives of long-term funds, such as pension plans, sovereign wealth funds, or endowments, have a challenging problem. They need to manage those portfolios to meet their long-term purpose, which may be decades or more into the future. Yet no fund has the luxury of looking only to that long-term time horizon. Each must also meet expectations in the near term in order to continue in its role and with its investment strategy.[1]

This challenge of meeting both long-term obligations and short-term expectations means that even the longest-term investor is managing across multiple time horizons. At the same time, most risk processes have been developed to address short-term risks or to target long-term return—but not both.

We hope that this paper has addressed the challenge of managing multiple-horizon portfolios. We would appreciate feedback on your experiences of implementing these and other ideas at Research@FCLTGlobal.org.

FCLTGLOBAL

Practical Tools to Address Investment Challenges

TOOLKIT 1

To address the issue of managing portfolios to both meet long-term objectives and weather short-term risks, FCLTGlobal, with input from its members, has developed **practical tools** for managing multi-horizon risks. We have provided illustrative examples to these tools, but they are not intended to be prescriptive or exhaustive.

OBJECTIVE AND STRATEGY SETTING

Investment purpose statements

Succinct and clear description of the reason that the fund exists and the outcome necessary to fulfill that purpose

- Our investments finance a monthly pension benefit, defined nominally but with the discretion for occasional cost-of-living adjustments, on a lifetime basis for all teachers, first responders, and civil servants in our state that have achieved retirement status. In order to fulfill this purpose, we need to generate a return equal to at least our nominal actuarial rate of 7% over rolling 10-year periods.

Investment beliefs

Strongly held and clearly articulated, but disputable, views that provide a foundation for a long-term investment strategy

- Returns over the long term are a product of fundamental economic drivers.
- Market prices deviate significantly from fundamental or intrinsic value in the short run.
- Market returns show short-term momentum but longer-term tendency for reversion to the mean.
- A focus on the long-term risk of loss of principal, rather than on short-term volatility, adds return.

Strategic advantages

Each institution has specific strategic advantages and disadvantages that affect its ability meet investment objectives

- We can benefit from the ability to hold an investment over time and never be a forced seller.
- Our alumni body/ location/ history/ staff composition provides us a particular advantage in this asset class/region.
- Our asset size enables us to invest in small funds/requires us to invest in large opportunities.
- Our public profile limits/enhances our ability to take long-term risk.
- Our tax status is an advantage/disadvantage in certain asset classes.
- Being a growing/mature fund with high net inflows/outflows permits us to/limits us from making significant illiquid allocations.

Investment parameters

Eliminating or weighting investment positions based on the top-down preferences of the fund sponsor, beneficiaries, or other key constituents

- Allocate > 15% of total assets to securities issued by firms headquartered in the local state or province.
- Exclude any securities issued by firms that derive > 20% of revenue from tobacco products.
- Overweight allocations toward firms in the top quartile for carbon efficiency by industry.

Risk appetite statement

Documentation of the amount of risk necessary to achieve the long-term desired outcome and the amount of loss that is acceptable in interim measurement periods

- We have a 1% chance that the reference portfolio return over one year will be less than -25%.
- We expect the active risk to be 4% on average and no more than 8%.

Strategic asset allocation

A target asset-class mix that the board and management believe to be sufficient for meeting the fund's long-term goals. There may be ranges for shorter-term deviations around the long-term target asset-class mix

- Clearly defined, long-term allocation policies together with ranges around the expected long-run allocation.

DECISION MANAGEMENT

Portfolio rebalancing

A policy that adjusts asset allocation toward targets with cash flows, periodically, or after large market movements to prevent the portfolio from falling outside preset boundaries

- Cash inflows will be added to underweight asset classes and cash outflows will be taken from overweight asset classes to continually rebalance the portfolio toward the policy targets. If the actual asset allocation moves +/-10% from the policy targets, the staff will rebalance the policy to the targets within 10 days without requiring a further decision of the board.

Set-asides

Dividing the portfolio into two, based on time frames: short-term funds earmarked (set aside) for upcoming outflows and held in liquid assets, and the remaining funds invested with a long-term time horizon

- Funds equivalent to the next 12 months' projected outflows will be invested in cash equivalents. The balance of the portfolio will not hold cash equivalents and will be invested with an expected time frame of 10 years.

Lock-ups

A contractual term committing to a capital allocation for a minimum period of time with a penalty for early termination

- The fund will make multi-year commitments to private equity and infrastructure, and it recognizes that, once made, those allocations will not be changed based on market conditions.

Parameters for review

Preselected interim performance or risk parameters, positive and negative, inside which decision-makers expect to maintain their position, and outside which they expect to reevaluate their position

- The board and management expect to maintain asset allocation targets as set in the Investment Policy Statement for the coming five years unless a particular asset class outperforms or underperforms its expected return by 5%.

Decision tracking

The practice of monitoring and reporting on the performance of the current strategic asset allocation relative to prior strategic asset allocations, and the actual asset allocation relative to the strategic asset allocation

- Staff will monitor and report on the performance of actual asset allocation relative to strategic asset allocation on a rolling 10-year basis and will monitor the added value of changes from the prior strategic asset allocations.

RISK ANTICIPATION

Interactive scenarios

An interactive process of identifying plausible but less-expected future scenarios and simulating responses to understand any potential impact on investment beliefs and asset allocation

- Persistently low interest rates
- Three-degree temperature change and corresponding rise of sea levels
- Significant increases in longevity

Purpose-risk analysis

A computation of the probable range of how a fund is tracking to fulfill its purpose, the level of loss from which it could not recover to continue fulfilling its purpose, and ways to mitigate that level of loss

- Our fund could withstand a drawdown of 50% before compromising our mission.
- The expected worst-case scenario from our asset allocation is a loss of 30%.

Clarification of risk preferences

An exercise to evaluate the individual risk preferences of key decision-makers, such as board members and executives, to identify differences within the group and anticipate the implications for risk taking

- Poll decision-makers individually on key assumptions incorporated into investment beliefs, and then discuss during a board meeting
- Conduct interactive scenario planning and note different perspectives
- Use behavioral tests to measure individual differences and compare
- Identify comfort with multi-horizon risk as an objective for board composition/executive hiring

Long-term performance reporting

Organizing performance reporting tables to begin with measurements of long-term periods, and if short-term data is required, putting it last

- For performance reporting, show the since-inception and longest-period performance results on the left-hand side of the page, giving lower priority to recent short-term results, such as the most recent quarter's performance.

Outcome-focused performance reporting

Displaying performance against long-term desired expected return outcomes rather than simply against benchmarks over interim periods

- Our long-term goal is to achieve returns of the consumer price index (CPI) + 5%. Over the past 10 years we have outperformed this target by 75 basis points.

Drawdown versus shortfall risk

Drawdown refers to a loss relative to the original investment or peak or interim valuation. Final shortfall is the end-of-period gap between value and the expected return outcome. There is a trade-off between experiencing a drawdown and having a shortfall, or not achieving the intended outcome.

- Recognize that trade-offs exist between the likelihoods of achieving expected return, having a final shortfall, and experiencing interim drawdown.

Internally consistent targets

An internally consistent set of targets for expected return, final shortfall, and interim drawdown

- Our expected return is 8%; this asset allocation has a 5% chance of a drawdown of 25% or more of the portfolio's current value.

FCLTGLOBAL

Risk Conversation Guide for Boards and Staff

TOOLKIT 2

To facilitate discussions about managing portfolios to both meet long-term objectives and weather short-term risks, FCLTGlobal, with input from its members, has developed this **Risk Conversation Guide** for boards and staff. We have provided illustrative answers to these questions, but these are not intended to be exhaustive or comprehensive.

OBJECTIVE AND STRATEGY SETTING

What is the purpose of the fund?

- Meet liabilities with minimal cash contributions
- Maximize resources for stabilization or development
- Contribute to an operating budget

What are our desired outcomes and key metrics of success?

- Absolute return
- Real absolute return
- Return relative to benchmark
- Return relative to peers

What is the ultimate time frame of the fund?

- Perpetual
- Time frame of liabilities
- Generational

What interim time periods are important for measuring success?

- Ten years
- Three years
- Annual

What are our most important investment beliefs?

- Returns over the long term are a product of fundamental economic drivers.
- Market prices deviate significantly from fundamental or intrinsic value in the short run.
- Market returns show short-term momentum but longer-term tendency for reversion to the mean.

Under what circumstances would we reconsider these investment beliefs?

- Prolonged market downturn
- Fundamental change in global trade environment
- Significant regulatory change

What are our unique characteristics as an investor? What are our strategic advantages and disadvantages?

- Ability to hold an investment over time and not be a forced seller
- Alumni body/location/history/staff composition
- Asset size that enables investments in small funds/requires investments in large opportunities
- Public profile that limits/enhances our ability to take long-term risk
- Tax status
- Fund maturity or net inflow/outflow status
- Investment skill in a particular area

What top-down preferences of the fund sponsor or beneficiaries do we need to accommodate?

- Home country requirements
- Incorporation of ESG factors

Do we have a clearly agreed-upon risk appetite statement?

- If yes, share and discuss
- If not, give rationale

Are we comfortable with the allocation targets in our policy or reference portfolio, and the ranges around or deviations from those targets?

- Policy portfolio targets, ranges, and rationale
- Current allocation and rationale

DECISION MANAGEMENT

Should we have a portfolio rebalancing policy?

- Yes, a rebalancing policy could mitigate the problem of investors "buying high and selling low" by committing to countercyclical behavior ahead of stressful events.
- No, we are using a different approach.

Should we use set-asides to earmark funds for upcoming outflow needs?

- Yes, investing money equivalent to upcoming outflows in short-term instruments provides confidence that the fund can meet those obligations in any market condition.
- No, there is no need, as the same result can be achieved without separating the portfolio.

Do we have lock-ups in our portfolio? If so, at what size and terms?

- Yes, lock-ups are common in certain asset classes and ensure continuity.
- No, we are not invested in locked-up portfolios.

How do we track the effectiveness of our strategic decision-making?

- Understanding which strategic decisions have added or subtracted value can provide discipline and assist investors in understanding their strategic advantages.

Do we present data effectively to frame our decision-making?

- The presentation of information affects the risk tolerance and long-term focus of institutional investment leaders.

What is our tolerance for outperformance or underperformance?

- Preselected interim performance or risk boundaries, positive and negative, inside which decision-makers expect to maintain their position, and outside which they expect to reevaluate their position

RISK ANTICIPATION

What are our top three to five long-term investment risks and opportunities?

- Market risk (e.g., rates, inflation, FX)
- Potential shocks (e.g., financial crisis, cyberattack)
- Long-term trends (e.g., climate change, demographics)
- Lower returns for longer periods

What short-term risks could derail us?

- Credit tightening
- Lack of liquidity

How do we envision and consider potential longer-term risks?

- Interactive simulation of risk scenarios

What risks do we choose to mitigate? What is the cost of mitigating these risks?

- Risk-dampening positions
- Costs of hedging

Are we being compensated for assuming these risks? Are there opportunities to benefit from these risks?

- Expected return for risk-taking investments
- Opportunities for additional risk taking

Under what circumstances do we expect our key investment strategies to underperform?

- Rising interest rates
- Extended market valuations

How do we anticipate that we will respond to significant risks?

- Recommit to current asset allocation
- Revisit investment beliefs and asset allocation

Do we understand the risk preferences of individual decision-makers within our organization or among our key constituents?

- Poll members on key investment assumptions and preferences
- Disclose risk expectations to key constituents

What level of loss would threaten our purpose?

- Level of risk taking necessary to fulfill our purpose or meet expected return targets
- Level of loss that would threaten our ability to fulfill our purpose

Are our non-investment sources of inflows or outflows correlated to any of these risks?

- Tax receipts
- Charitable contributions
- Stabilization fund requirement

RISK AND PERFORMANCE MEASUREMENT

What measures of risk are most important to us? Why?

- Volatility
- Peak-to-trough drawdown
- Shortfall relative to desired expected return outcome

How are we emphasizing performance over long-term time periods?

- Framing performance from long- term to short-term time periods
- Highlighting rolling multi-year performance

How are we measuring performance against desired expected return outcomes?

- Showing performance relative to long-term outcome
- Emphasizing progress toward goal rather than short-term fluctuations

Are we making a clear distinction and trade-off between drawdown risk and shortfall risk?

- *Drawdown* is a loss relative to the original investment or peak or interim valuation; *shortfall* is the end-of-period gap between value and the intended outcome.
- There is a trade-off between the likelihood of experiencing a drawdown and the chance of not having a shortfall.

Are we prepared to take the short-term losses required to meet our expected return targets?

- Are our expectations for long-run returns internally consistent with our expectations for losses during the investment horizon?

ORGANIZATION

How do we organize ourselves as a long-term investor to manage risk and opportunity over multiple time horizons?

- Governance
- Staff recruiting and development
- Incentives and rewards

How do we create and maintain a long-term risk-taking culture?

- Expectation setting
- Communications
- Diversity
- Compensation

How do we ensure that our purpose statement, investment beliefs, and perspective on our strategic advantages guide our behavior?

- Incorporation into investment decision process
- Inclusion in performance evaluation

What decisions regarding risk are made by the board, the staff, and external managers?

- Board level
- Staff level
- Manager level
- Others

How do we measure success to reward staff?

- Fund level
- Asset class level
- Portfolio/manager level
- Security/deal level

If the organization increased your budget significantly, how would you use those additional resources, and what shortcomings would you address?

- Additional or different staff
- Upgraded or new systems
- External expertise or consulting

BLIND SPOTS

What keeps you up at night?

- Operational or uncompensated risk
- Other unanticipated risk

What topics did we miss in this discussion?

Note on Methodology

Risk for investors is often framed in terms of the probability of losing a particular amount of money, or the amount of money lost at a specified level of probability. An investor may face a 90 percent chance of losing no more than $100 million, for instance, or may learn that a fifth-percentile loss would correspond to $120 million.

These figures pertain only to a single investment horizon, namely the end point of the investment period rather than the risk along the way. Long-term investors must consider multiple time horizons, both the end point and interim checks, and they will benefit from risk estimates that provide information about both. Whereas short-term investors need to concern themselves only with more immediate results, long-term investors will want to gauge their possibility of losses during an investment period and their probability of earning their target return. An investor who needs a lower possibility of loss during an investment period will need to wait longer to have confidence about hitting the target.

We have produced several charts to illustrate these concepts using analysis of a notional owner's asset allocation created for us by State Street Corporation, an FCLTGlobal Member. These illustrations assume an initial investment of $1 billion with a target of ending up with $2 billion. The hypothetical asset allocation has an expected return of 8 percent and a volatility of 12 percent.

We illustrate these concepts in two graphs. The blue line in Figure 9 represents the probability of achieving the $2 billion target in a given year. That probability is nearly zero at inception and grows to nearly 100% after 20-plus years. The odds of getting to the $2 billion target in 10 years are 52 percent. The green line graphs how much money this investment could lose over time. Both of these probabilities are at the 5th percentile of returns. That is, this notional investment produces final returns above the blue line in 95 percent of simulations, and it passes below the green line at any point during the investment period in only 5 percent of simulations. After 20 years, 5 percent of simulations have lost more than 28 percent of their original value at some time within the horizon.

FIGURE 9- Components of risk trade-off

Investors face a risk of loss during an investment as also a risk of failing to achieve the end goal. They must make tradeoffs between these risks and also the expected return that they want to earn. .

End of Horizon and Within- Horizon Value-at-Risk at 95th percentiles relative to an annual expected return of 8 percent..

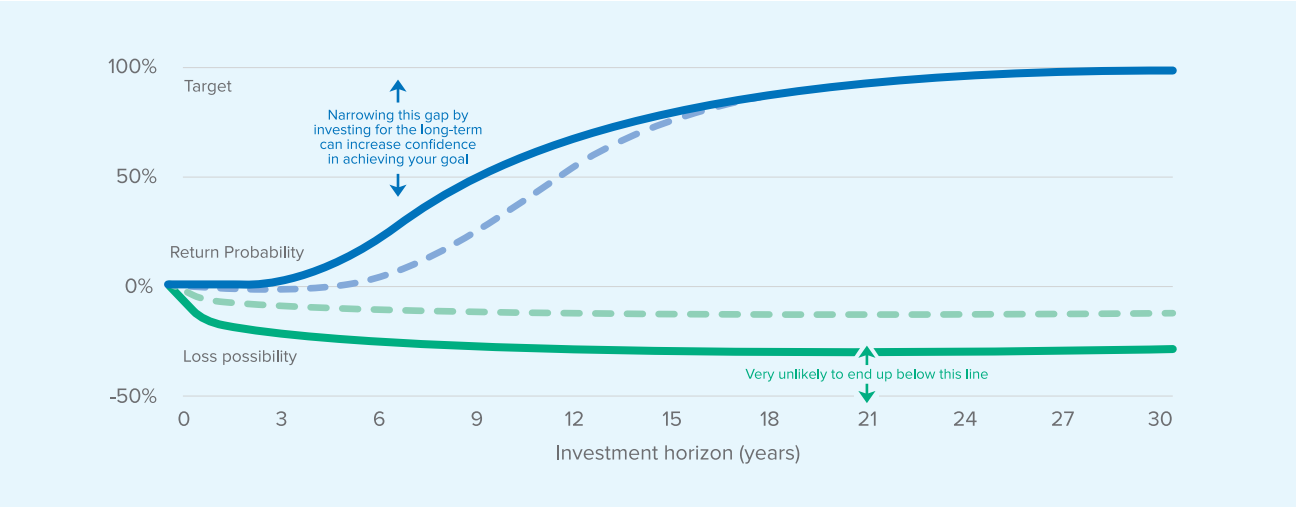


Figure 9 Notes

- Data based on a national portfolio analysis developed by State Street Associates for FCLTGlobal.
- Assumes an asset allocation, volatility level, and analyzation of monthly volatility input. Changing any of these assumptions would affect the data points marginally but not the overall tradeoffs.
- Assumes that price charges of individual, underlying securities are independent of one another and tend to have the same scale.

An investor would have to make trade-offs to change these parameters within this asset allocation. Figure 10 superimposes two new lines to illustrate these trade-offs. In this case, the investor sets a parameter to halve the risk of loss during the investment period, represented by the dotted green line. This new, more conservative portfolio will have a lower set of forecast returns, depicted in the dotted blue line. The dotted blue line now lies below the original blue line and takes several more years to close in on the target line. After 10 years, we have only a 34 percent chance of hitting our $2 billion target. A risk manager or board that wanted to reduce nearer-term risks would thus be better able to understand the likely long-run cost of the mitigation, in terms of either a lower likelihood of reaching a long-term investment obective, or the need to defer meeting that goal.

FIGURE 10- Internally consistent trade-offs—illustrative portfolio

Conversely, an investor who wants to earn the expected return more rapidly must significantly raise the amount of loss that can be experienced during the investment period. An investor who needs to earn the target goal more rapidly will incur a greater possibility of interim loss.

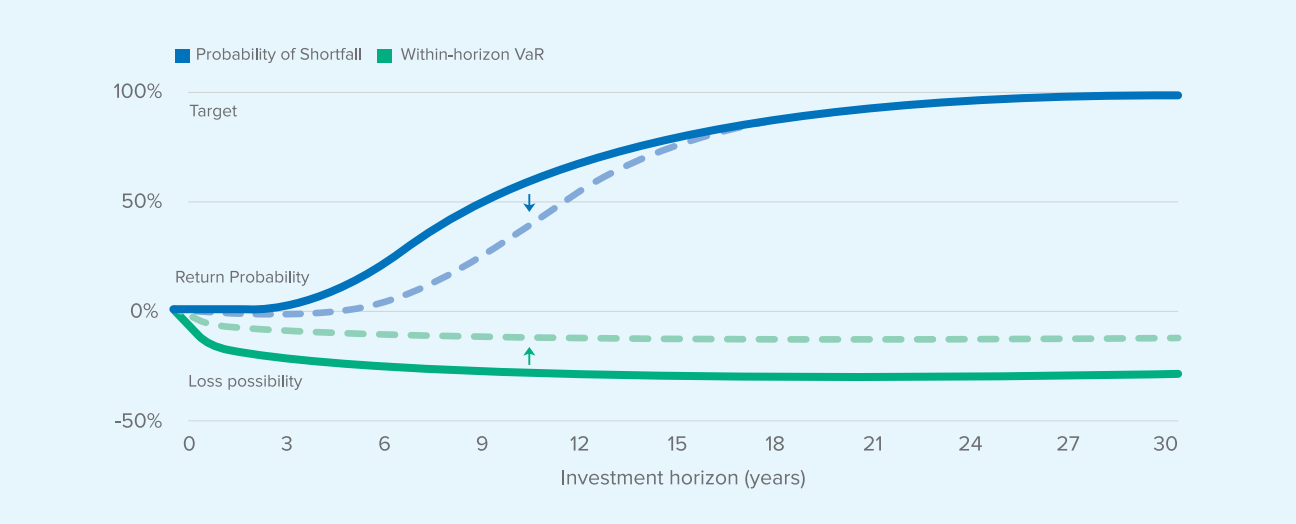


Figure 10 Notes

- Data based on a national portfolio analysis developed by State Street Associates for FCLTGlobal.
- Assumes an asset allocation, volatility level, and analyzation of monthly volatility input. Changing any of these assumptions would affect the data points marginally but not the overall tradeoffs.
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