WORLD ECONOMIC FORUM

COMMITTED TO IMPROVING THE STATE OF THE WORLD

Measurement, Governance and Long-term Investing

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Preface

The World Economic Forum is proud to release this second report in our Long-term Investing Initiative. Acknowledging an estimated shortfall in pension and infrastructure investments of several trillion dollars globally, for example, long-term investing is a clear priority for societies around the world. The Forum's initiative tries to improve the flow of long-term investments by mitigating obstacles related to measurement and governance, policy drivers and the perceived role of long-term investors.

This report focuses on the first of those obstacles – measurement and governance. It discusses in depth issues related to the estimated US$ 2.4 trillion invested in illiquid assets, which can be subject to substantial distortions and misallocations resulting from inadequate measurement. Traditional metrics for valuing those assets all have significant drawbacks, and more worryingly tend to misstate key risks such as market risk, illiquidity risk and liability risk. The research finds that it is useful to use a limited number of consistent measurements matching a long-term investing horizon. Such metrics should be directionally correct (roughly right rather than precisely wrong) and used to critically evaluate positive or negative investment outliers on a periodic basis. It is found that purported lower volatility and correlations in illiquid assets often result from stale prices rather than fundamentals. Yet a more aggressive mark-to-market approach needs to be tempered to adjust to pro-cyclical pressures.

As no measurements exist that perfectly balance short-term performance management with a long-term outlook, governance becomes extremely important. In fact, the best long-term investors supplement imperfect metrics with sound judgment by tightly linking measurement and governance frameworks. They encourage stable teams that provide familiarity and a track record of experience with difficult decisions. They have professional boards that provide adequate guidance while sheltering the organization from pro-cyclical pressures and enforce incentive systems that encourage appropriate risk-taking by staff. Lastly, they create brands of being desirable investors, thus accessing expert networks that improve their investment due diligence.

This report is the result of a strong partnership between the World Economic Forum and its Global Agenda Council on Long-term Investing (which served as a steering group), industry practitioners and other distinguished experts. The academic research team was led by Josh Lerner, Jacob H. Schiff Professor of Investment Banking, Harvard Business School, and included Ann Leamon, Partner, Bella Research Group, USA, and Vladimir Bosiljevac, Lecturer, Department of Economics, Harvard University. The World Economic Forum project team was led by Anuradha Gurung, Irwin Mendelssohn and Tik Keung.

We hope that the report will specifically be useful to:

- Long-term investors wishing to calibrate against best practice
- Governments and regulators defining appropriate frameworks for long-term investing
- Business and other stakeholders wishing to understand better ways to work with long-term investors
- Researchers seeking to improve investment metrics and governance

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On behalf of the World Economic Forum, we wish to thank the members of the Global Agenda Council on Long-term Investing, chaired by Scott Kalb, Chief Investment Officer of the Korea Investment Corporation, participants at private events, practitioners and researchers who shared their insights during confidential interviews. We appreciate their tremendous contributions to this work.

We hope this research will not only advance the academic understanding of long-term investing, but serve as a catalyst for further public discourse among governments, investors and other stakeholders regarding the role and potential of long-term investing.

Members of the Global Agenda Council on Long-term Investing are:

- Christopher Ailman, Chief Investment Officer, California State Teachers' Retirement System
- Stephen Davis, Executive Director and Lecturer, Millstein Center for Corporate Governance and Performance, Yale School of Management
- Sheila Hooda, Senior Managing Director, Mergers and Acquisitions and Corporate Development, Teachers Insurance and Annuity Association College Retirement Equities Fund
- Tony Hyams, Chairman, Commonwealth Superannuation Corporation
- Reuben Jeffery, Chief Executive Officer, Rockefeller Financial
- Scott E. Kalb (Chair), Chief Investment Officer, Korea Investment Corporation
- Manish Kejriwal, Founding Partner, Kedaara Capital
- Serge Lepine, Chief Investment Officer, Bahrain Mumtalakat Holding Company
- Josh Lerner, Jacob H. Schiff Professor of Investment Banking at Harvard Business School
- Adrian Orr, Chief Executive Officer, New Zealand Superannuation Fund
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- Martin Skancke, Special Adviser, Storebrand Asset Management and Former Director-General, Asset Management Department, Ministry of Finance of Norway
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Executive Summary

In this report, we explore the interlinked impact of measurement and governance on long-term investing. Building on the World Economic Forum's 2011 report, *The Future of Long-term Investing*, we define long-term investing as "investing with the expectation of holding an asset for an indefinite period of time by an investor with the capability to do so."[1] In essence, it is investment carried out over years, and sometimes decades or generations, by such groups as:

- endowments and foundations
- family offices
- insurance companies
- pension funds
- sovereign wealth funds

Measurements guide the choice and assessment of investment strategies, while governance determines what is measured, how it is rewarded and how the strategy will evolve. Misleading or incorrect measurements will result in long-term strategies that are at best suboptimal and at worst actually short-term and misdirected. While the perfect measurement scheme that takes into account risk and valuation over the long term and provides a clear guide to an institution's progress toward its goals has yet to be developed, thoughtful organizations can adapt existing metrics to serve their needs. It is critical, however, for the groups to explain these metrics to their constituencies and to have the support of applicable regulatory agencies. Inappropriate or misunderstood measurement schemes can actually be counterproductive and sway institutions toward a short-term investment orientation.

Long-term investing is more important than ever, yet it seems to face an increasing number of obstacles. Long-term investments can provide above-market returns, due to the ability of companies backed by patient capital to undertake more innovative and ambitious projects. In addition, society often benefits from the types of projects backed by long-term capital, such as infrastructure improvement and energy-efficient technology development.[2] With current estimates of pension and infrastructure investment shortfalls each topping several trillion dollars globally – and the infrastructure funding shortfall in Africa alone estimated as high as US$ 45 billion per year – society needs ever more long-term investment.[3] At the same time, regulations such as mark-to-market requirements and solvency ratios introduce short-term measurements into long-horizon investments. Setting interim values on long-term portfolios can create pressures for rapid change in strategies that have not had a chance to bear fruit.

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1 *The Future of Long-term Investing.* January, 2011. New York: World Economic Forum USA Inc. As a corollary, one could add the viewpoint of McKinsey global managing director Dominic Barton: "For a rough definition of 'long-term', think of the time required to invest in and build a profitable new business … at least five to seven years." Barton, D. "Capitalism for the Long-Term." Harvard Business Review, March 2011.

2 For more on the gap between current and needed clean energy investment, see *Green Investing: Toward a Clean Energy Infrastructure*. January, 2009. New York: World Economic Forum USA Inc., *Green Investing 2010: Policy Mechanisms to Bridge the Financing Gap*. January, 2010. New York: World Economic Forum USA Inc. and *Green Investing 2011: Reducing the Cost of Financing*. April, 2011. New York: World Economic Forum USA Inc.

3 Mthuli Ncube, chief economist for the African Development Bank, cited in "Infrastructure funds gap losing Africa 3 pct of GDP," Reuters.com, July 19, 2011, http://af.reuters.com/article/investingNews/idAFJOE76I0BG20110719, accessed March 5, 2012. For more on the need for infrastructure development in emerging markets, see *Positive Infrastructure: A Framework for Revitalizing the Global Economy*. 2010. Geneva: World Economic Forum.

Measurement Issues

Long-term investment strategies in public and private assets present significant measurement issues. Inaccurate measurement of performance and risk can create substantial distortions. Whether investors believe their positions will bring higher or lower returns than they eventually produce and with more or less risk, the consequences of portfolio misallocation can be enduring.

The measurement tools currently available are not well suited to assessing long-term investments. The traditional metrics for return calculation, such as internal rates of return, cash-on-cash calculations and public market equivalents have drawbacks as discussed below. Methods of valuing portfolios such as mark-to-market and historical accounting approaches can introduce distortions when assessing long-term investments if their limitations are not understood.

Finally, as the 2008 financial crisis highlighted, risks of all types need to be considered more carefully. Examples of the impact of distorted risk measurement include:

- Market risk: The purported lower volatility of private assets often results from stale prices rather than true non-correlation and can lead to underestimation of a portfolio's risk, with negative consequences for asset allocation and performance. Yet marking these assets to market on a frequent basis may highlight volatility and increase pro-cyclical pressures.
- Illiquidity risk: If the full amount of capital committed to a long-term illiquid investment position is not correctly assessed, illiquidity risk can present cash flow pressures.
- Liability risk: For some long-term investors, excessively optimistic statements about future returns relative to their liabilities can introduce significant distortions to investment decisions.

Misassessment of these risks and misapplication of the metrics at hand can lead to results that do not match expectations and impose costs on society at large.

Market, liability and illiquidity risks are classic types of investment risks. In our research for this report, many interviewees mentioned aspects of portfolio valuation/performance measurement and monitoring that play an important role in the ability of an organization to pursue a long-term investment strategy. We therefore add them to Table 1 (right).

Table 1: Types of risk and their impact on a long-term investment programme

Type of Risk	Impact on Long-term Investment Programme
Market risk – Ignored or overemphasized	Asset allocation
Liabilities – Regulatory restrictions	Time horizon Commitment to LTI Strategy (board)
Valuation/Performance – Difficulty of long-term measures – Impact of short-term market fluctuations	Commitment to LTI Strategy (board & staff) – Public pressure Compensation (staff)
Monitoring – Excessively frequent oversight	Commitment to LTI Strategy (board & staff) – Public pressure
Assessment of liquidity needs – Overstated – Understated	Asset allocation – Reluctance to invest in illiquid asset classes – Overcommitment to illiquid asset classes

Misunderstanding these risks affects asset allocation, time horizons and an organization's willingness to commit to a long-term investment strategy. As noted in the World Economic Forum's 2011 report, *The Future of Long-term Investing*, an institution's beliefs regarding the potential benefits of a long-term investment programme can represent a significant constraint. Moreover, the degree to which an organization has committed to a long-term strategy is both determined by and affects the way it treats and manages these risks.

To manage these risks, many institutions employ various types of measurement. Some, such as internal rate of return (IRR), cash-on-cash returns and public market equivalents, measure returns from long-term investments. Others, such as mark-to-market methodologies and the reliance on historic cost, measure valuation. Each metric is definitely useful, but also suffers from undeniable shortcomings, as demonstrated during the crisis of 2008. Some boards remained committed to a long-term strategy and encouraged their staff to take advantage of short-run valuation distortions. Others panicked at the reported losses and abandoned long-term strategies, selling illiquid positions at the worst possible moment. The board overseeing a long-term

investment programme needs to be committed to that strategy. Yet the current measurement tools available make governance, with its understandable need for transparent reporting and short-term performance measurement, extremely challenging.

Governance Issues

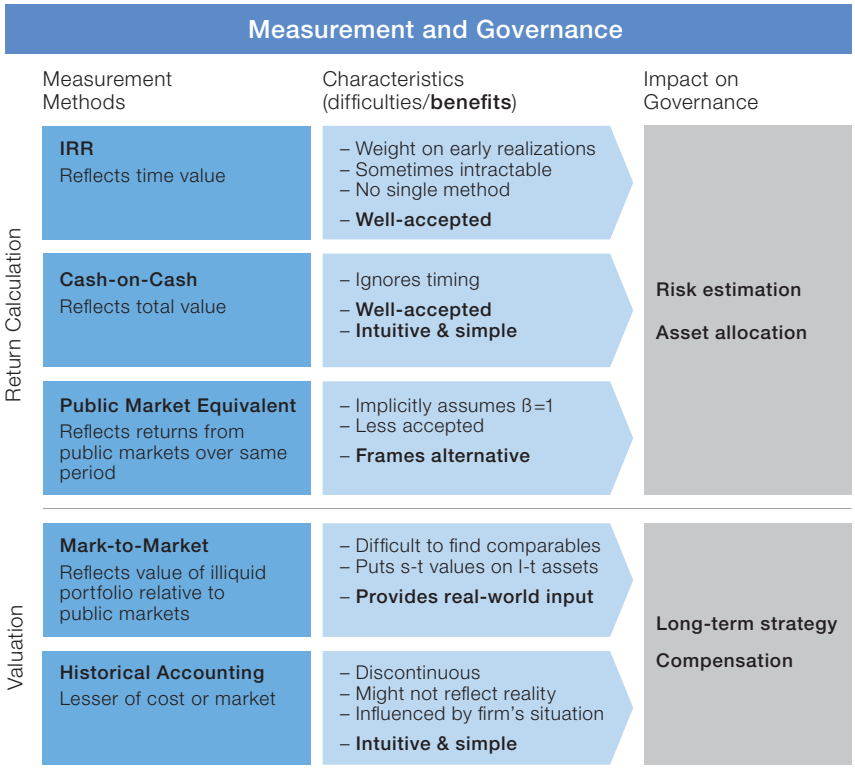
The governance of long-term investors is critically important. Starting with the way these groups[4] are recruited and structured, governing bodies have a wide-ranging impact on the ability of an organization to pursue a long-term investment strategy. Among their responsibilities are:

- Adoption of a strategy: The board approves the group's investment strategy and must defend it during market downturns. Without a strong commitment, an ostensibly long-term strategy can devolve into short-term trend chasing as the group adopts those strategies that are in favour at the moment.
- Choice of metrics and time horizon: The board is involved in the choice of metrics and the time horizon over which they are reported. Quarterly reports may be required but they can be linked to longer-term measurements, such as five- or ten-year forecasts or ranges of performance.
- Risk and selection assessment: Inadequate measurement systems make it difficult for the board to fully understand the risks assumed when entering into long-term contracts with investment managers.
- Establishment or approval of staff compensation systems: Without a clear incentive for a long-term orientation (whether a bonus or simply an understanding of short-term market fluctuations), staff will tend to focus on short-term performance because it is easier to measure and can be expected to pose less career risk.

The Intersection of Measurement and Governance

The success of a long-term investment strategy relies on both measurement and governance: the board's choice and careful application of the best available metrics. Measurement plays an important role in financial modeling and portfolio management. But without understanding the characteristics of the measurement techniques and their advantages and drawbacks, any of these metrics can mislead groups attempting to pursue a long-term investment programme. Figure 1, below, summarizes the most commonly used measurements, their qualities and the most significant effect they have on the governance of a long-term investment programme.

Figure 1: Performance measurement impacts on governance



4 For simplicity, we call these groups "boards"; sometimes they are known as trustees or investment committees.

Measurement and governance have a counterintuitive relationship. In some situations, the best way to correct poor performance is to measure more things more often. Yet too frequent valuation information on long-term investments may be counterproductive. If all investment committees and investors were dispassionate investors, introducing additional data should be beneficial. But excessively frequent measurement – and the consequent focus on near-term liquidity events – seems to introduce a short-term orientation that may distort long-term investments.

If an investor has no intention or need to sell an asset, frequent valuations may lead to decisions that are not in the investors' long-term best interests. A wholesale drop in public markets will undoubtedly reduce the value of a portfolio that is marked-to-market. If the investor plans to hold the assets for decades, the truly long-term investor might wish to buy into the depressed market. But a combination of regulatory pressures and human psychology may lead to pressures on the organization to do the opposite, whether due to lack of commitment to a long-term strategy or to public pressure. Such behaviour ends up defeating the entire purpose of long-term investing.

Recommendations

The central conclusion and recommendation of this study is that governing bodies and other external stakeholders need to act on the understanding that the performance of long-term investments unfolds over time periods longer than the quarter or the year, even when short-term measurements are used. Short-term metrics applied to long-term investments must be understood in a long-term context, for instance, an annual measure in reference to a long-term growth path that expects variation on either side. Governance intersects with measurement in the choice, defense and interpretation of metrics that provide important guidance to a long-term programme without adding a short-term time horizon.

Within that broad context, our research and conversations with many long-term investors helped us reach eight recommendations. While they directly address investors, there is also a role for policy-makers in terms of creating the regulations and structures in which these practices can be adopted. Four address measurements for long-term investment and four concern governance structures to encourage long-term investment. But there is substantial overlap across all of them. Without supportive governance, few long-term investment programmes would be authentically adopted; without thoughtful measurement, assessment and the inevitable interim adjustments would not occur.

1. Commit to a long-term programme and use long-term measurements. Accepting and defining a long-term perspective can set expectations, as when Australia's sovereign wealth fund announced that performance would be measured over a rolling 10-year period although the fund's managers would report results on a quarterly basis.[5] The longer time horizon, along with a strategy to invest across six broadly defined asset classes, provided the fund with greater flexibility. Its results for the year ended June 30, 2011, surpassed its benchmark of 4.5% above Australia's Consumer Price Index by 4.7 percentage points.[6] Paradoxically, commitment to a defined programme provides flexibility to operate within it.

2. Focus on a limited number of metrics. In our interviews, a number of experts mentioned that they focus on a limited number of metrics. All were slightly different. It is therefore difficult to create a definitive list. The critical aspect, however, is that the individual determined the metrics that provide the information deemed necessary to make decisions. Reams of data that cannot be acted upon are not information but inconveniences. As one expert noted, referencing Einstein, "[Risk metrics] should be as simple as possible, but not too simple."[7]

3. Be directionally correct. "We'd rather be precisely wrong than roughly right" is a dangerous waste of energy. Although risk measurement is difficult, risk is ignored at one's peril, as many investors discovered in 2008 and 2009. Being consistent and transparent about an approximate value for risk is preferable to either ignoring it or spending excessive energy on precise but short-lived quantifications.

4. Adopt a critical perspective. Many of the most successful long-term investors have somewhat of an academic orientation, which leads to a process of periodic self-evaluation. Many of these funds will occasionally stop to consider the processes that led them to make investments that proved to be particularly successful or problematic. By moving away from traditional metrics of success (e.g. rate of return), they can get a perspective on their activities that is less likely to be affected by measurement issues.

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5 Adamson, L. "Sovereign Wealth Funds Starting to Embrace Transparency," *Institutional Investor,* September 15, 2011.

6 *Annual Report: 2010-2011*. September, 2011. Melbourne, Australia: The Future Fund. http://www.futurefund.gov.au/__data/assets/pdf_file/0017/4661/16853_FF_2011_AR_WEB_A212093.pdf, accessed January 23, 2012.

7 Confidential interviews.

There are also some more general lessons involving governance and culture that we can highlight for long-term investment success. As we note in the paper, these shape how an organization implements its investment strategy.

5. Encourage stable teams. A key element is to have talented well-staffed teams. If a group does not have a stable team, or lacks the resources to perform hands-on due diligence, it is unlikely to be regarded as a credible investor. A staff with considerable experience and a long tenure appears to offer many benefits to a long-term investment strategy. Their shared experiences provide a common background that helps them undertake complex and subjective investment decisions.

6. Design a system of rewards and protections for staff to encourage appropriate risk-taking. Another critical characteristic of a good team is the ability to make its own decisions and establish a track record in an asset class over a reasonable period of time. This quality is very much linked to the rewards that staff members receive. Compensation does not seem to be a matter of paying more so much as providing the non-pecuniary benefits that come from being a part of a community, as well as a strong sense of mission associated with their work. In the ideal environment, staff will feel comfortable taking responsible risks in support of the institution's long-term future.

7. Create or attract a professional board. An active and professional board or investment committee can make an enormous difference in implementing a long-term investment strategy. The individuals should have a background suited to (although not necessarily expert in) institutional investment management. Many of the most successful institutions in this regard have been endowments, which typically draw from the ranks of alumni. The most effective of these bodies see their role not as micromanaging the decisions of the investment staff, but in setting broad policy directions, setting strategic investment goals and serving as an informed sounding board as the staff grapples with challenges. A board with a solid long-term orientation can ignore the noise of short-term market movements and focus on the predictors of long-term growth and opportunity. They also can help shelter the organization from pro-cyclical investment pressures. Board members need to serve extended terms to accomplish these goals. The governance of the investment effort can contribute to creating an environment that nurtures talent and encourages a long-term perspective.

8. Be a desirable investor. Building a brand as a desirable investor helps an organization access desirable fund managers and attract talented people. Prior to the financial crisis, many fund managers saw endowments and foundations as particularly desirable investors. Since the liquidity pressures that many experienced during the crisis, there has been a greater emphasis on having a variety of desirable investors. The key elements that seem to be associated with desirability include stability of the management team, considerable liquidity and resources and an ongoing organizational commitment to long-term investing.

The need for clear, consistent metrics for long-term investors has never been greater. Further work by researchers and practitioners toward developing such measurement techniques would provide returns not just to investors, but also to society as a whole by offering a clearer understanding of how a strategy is performing and whether and how it should be adjusted.

Introduction

This report discusses two important and interlinked issues around long-term investing: measurement and governance. We argue that, without effective governance, measurement schemes can distort decision-making around which investments are chosen and the time frame over which they are held. Yet the lack of meaningful, intuitive measurements for performance and risk over long-time horizons adds more complexity to long-term investing and to the governance of such efforts. Because no perfect measure for the short-term assessment of long-term investments exists, governance entities must choose their metrics carefully and place them in context, while clearly articulating their commitment to – and the importance of – a long-term strategy.

Long-term investing is "investing with the expectation of holding an asset for an indefinite period of time by an investor with the capability to do so."[8] Long-term investors include family offices, sovereign wealth funds, private and public pension funds, endowments and foundations and insurance companies[9]. The assets in which they invest can be public equities or other assets that do not provide the interim chance to sell into an efficient market (most commonly, such assets include investment directly or via funds into buyouts, venture capital, real estate, infrastructure and other real assets).

Because their outcomes are only known in the future, long-term investments are accompanied by substantial uncertainty. The usual approach to managing uncertainty is to encourage more measurements taken more often. If all investment committees and investors were dispassionate investors, introducing additional data should be beneficial. But excessively frequent measurement focuses attention on near-term liquidity events and seems to introduce a short-term orientation that may distort a long-term investment strategy, swaying it toward short-termism. As a result, investment returns may be lower than desired to achieve the goals of the investor and of society at large.

The World Economic Forum's report *The Future of Long-term Investing* noted that a major challenge facing would-be long-term investors is developing "performance measurement systems that balance fostering a long-term perspective with short-term accountability."[10] Risk measurement in a long-term context is another difficulty. Combined, these create an increasing tendency among investors toward a short-term orientation that, while understandable, poses significant challenges in terms of achieving the important goals of long-term investing for both business and public policy.

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8 World Economic Forum USA Inc., *The Future of Long-term Investing*, 9. As a corollary, one could add the viewpoint of McKinsey global managing director Dominic Barton: : "For a rough definition of 'long-term', think of the time required to invest in and build a profitable new business … at least five to seven years," as long as or beyond one business cycle. Barton, D. "Capitalism for the Long-Term." *Harvard Business Review*, March 2011.

9 We focus on the potential long-term investors themselves as opposed to retail investors or organizations or vehicles that may serve as intermediaries (e.g., mutual funds, index funds, and the general partners that manage private equity funds).

10 World Economic Forum USA Inc., *The Future of Long-term Investing*, 74.

The societal importance of long-term investing can be substantial. As noted in the prior report, long-term investors can help to stabilize financial markets by investing countercyclically. They can promote sustainable global economic growth and address social needs by creating companies or funding projects that fill holes in the market.[11] These can range from infrastructure development to innovative responses to resource degradation and clean energy. The time horizons of long-term investors more closely match the period over which such projects may reach fruition and deliver financial gains, while providing positive spillovers (externalities) to society as a whole. Moreover, studies have shown that long-term investors tend to back companies that are more innovative than typical firms.[12] That is, not only do long-term investors supply patient capital, but research shows that they tend to do so to companies that achieve better results.[13]

Despite the benefits to society of long-term investment, its supply has been decreasing. For instance, the amount of short-term trading appears to be growing. The average holding period for US equities has dropped from seven years in the 1970s to seven months, and one estimate suggests that hyper-speed traders, which sometimes hold their securities for seconds, now account for 70% of all US equities trading.[14] Chief executive officers and their teams work hard to meet quarterly guidelines lest investors call for their removal, an emphasis on the short term that can lead to serious suboptimization behaviour, as seen in situations where research and development spending might be cut to "make the numbers" while harming the company's long-term innovation strategies.[15] Long-term investors can act as a counterweight and encourage CEOs to focus on longer term initiatives.[16]

In an ideal world, an efficient market would accurately price the risks that investors face when confronted with an opportunity. Unfortunately, the conditions for an efficient market are often muddied by external shocks, investment fads and other dynamics that distort the accurate assessment of risk and performance, whether annual review cycles, stock market gyrations or quarterly reporting. Lacking appropriate measurements of the interim performance of long-term investments, short-term feedback can mislead the best intentioned long-term investment plan.

This report explores the specific challenges associated with the measurement of the value and performance of long-term investments and how those difficulties compound governance challenges. Numerous examples can be offered:

- Mark-to-market rules require long-term illiquid portfolios to be evaluated relative to a public market benchmark. While the goal of increased transparency is laudable, short-term variations in the value of assets held for the long-term can lead to shifts in investment policy or execution that hinder success in long-term investing.
- Poor risk measurements or inadequate understanding of risk can lead institutions to hold riskier (or less risky) assets than they should otherwise. Market risk and illiquidity risk are both difficult to measure but experience has shown that they need to be considered in some fashion.
- Pricing differences can affect a portfolio that adheres to asset allocation rules. When price changes occur in those assets with more continuous pricing, stale pricing might therefore lead the institution to make mistimed buy and sell decisions based on an inaccurate asset allocation picture. Selling illiquid assets into a depressed market can have repercussions not just on investment performance but also on the reputation of the investor.
- Misguided valuations of the portfolio can lead institutions to distribute too much or too little in a given year. This might occur for an endowment with a rule that requires it to spend a certain percentage of its value each year, or a pension that has differential payouts to different cohorts of retirees.
- Staff evaluation and compensation schemes may create a framework that rewards staff for acting against the stated long-term interests of the institution. Without a long-term portion of the incentive programme, staff may not have financial motivation to pursue long-term investment strategies that would show returns only after they have left the organization. In addition to compensation-related incentives, investment staff must be properly protected from career risk issues that may arise due to negative short-term performance metrics on long-term investment assets.

11 World Economic Forum USA Inc., *The Future of Long-term Investing*, 35-45.
12 Aghion, P., Van Reenen, J. and Zingales, L. "Innovation and Institutional Ownership," *Fondazione Eni Enrico Mattei Working Papers*, paper 488, 2010, http://www.bepress.com/cgi/viewcontent.cgi?article=1500&context=feem accessed December 22, 2011.
13 Kortum, S. and Lerner, J. "Assessing the contribution of venture capital to innovation." In *RAND Journal of Economics*, Vol. 31, No. 4, Winter 2000, 674–692.
14 According to estimates by McKinsey's Dominic Barton, "Capitalism for the Long-Term." Harvard Business Review, March 2011.
15 IBM CEO Sam Palmisano, cited in *Ibid*.
16 One approach to this has been the development of a "loyalty share" scheme whereby long-term investors purchase shares during a particular period and also receive a warrant for additional shares that can be purchased at a later time. For more, see Bolton, P., and Samama, F., "L-Shares: Rewarding Long-term Investors," Working papers of Columbia University, August 2010, http://cgt.columbia.edu/files/papers/Bolton_Samama_L-Shares--Rewarding_Long-Term_Investors.pdf.

– A strong belief system can help governance bodies that have adopted long-term strategies resist pressure from constituencies in the face of poor short-term results. The 2008 downturn provided opportunities for well-priced investments to be made in 2009 but only if the institution had a strong belief in its long-term strategy and the liquidity to allow it to weather the difficult environment.

– Measuring the risk of capital committed to private market assets, rather than capital called down, is essential for a full understanding of future obligations and exposure. In many cases, the regular flow of distributions ameliorates such imbalances, but investors can find themselves unexpectedly illiquid if the usual distribution cycle falters.

Measuring the value and performance of long-term investments is difficult for a number of reasons. There is no clear, comprehensive metric that reflects long-term performance, risk and short-term valuation. But some of the difficulty around measurement involves governance. Some recent regulations may work against successful long-term measurement by placing unwarranted emphasis on short-term performance without acknowledging long-term goals or trends. The increased concern around transparency focuses on short-term performance, potentially to the detriment of long-term strategies. The many different entities that pursue long-term strategies and their different time horizons (years, decades or even centuries), constituencies and reporting requirements further complicate the method and choice of measurement and the application of metrics in governance. Additionally, measuring more things more often with an incomplete metric is unlikely to solve the problem.

These issues are especially urgent today. Many of the most successful investors have had long-term investments at the heart of their portfolio, and long-term investment, as noted, can provide important financial and social returns. In addition, understanding long-term investments is important in shaping regulation. Policy-makers and regulators have been trying to prevent a repeat of the 2008 crash, stabilize the financial system and fund important programmes without raising taxes. But these goals can pressure governing bodies to adopt metrics and policies that act to the detriment of a long-term investment policy. For instance, a state pension fund might be urged to assume a high return on investment to avoid triggering unpopular tax increases. Without informed dialogue among the stakeholders and intuitive performance measurements, arguing for a lower but more realistic number is difficult.[17] Furthermore, without useful, intuitive metrics, fund administrators or chief investment officers may under-allocate to the illiquid assets that have the potential for greater long-run returns and fail to provide badly needed returns, or engage in trend chasing and invest in popular strategies at the top of the cycle.[18] In addition to clear measurements, a way to talk about and reward long-term investment performance must be developed.

This report is structured as follows. For background, we first provide an overview of the types of long-term investors and the case for long-term investing. Next, we explore the measurement challenges that affect the governance of investment groups and the resulting impact on the investors' strategic and tactical choices. The feedback from these measurements informs the later implementation, assessment and evolution of the strategies. In addition, the measurements become part of the incentive system that rewards the staff implementing the programme. The final discussion considers the impact of metrics and reporting on governance and the opportunities for better information to improve governance, strategies and results. We conclude with recommendations to address measurement and governance issues for long-term investments.

To inform our discussion on governance and its relationship to measurement, we draw on case studies of some noteworthy long-term investors and review the published literature, with special attention to articles on institutional investor governance and mark-to-market accounting. We are particularly grateful to the practitioners who graciously shared their insights and experiences during interviews and reviewed the report.

17 Raimondo, G. Rhode Island General Treasurer, *Truth in Numbers: The Security and Sustainability of Rhode Island's Retirement System*, June 2011.

18 For more on such instances, see Ang, A. and Kjaer, K. "Investing for the Long Run." November 11, 2011. Available at SSRN: http://ssrn.com/abstract=1958258, accessed December 23, 2011.

I.

The Importance and Difficulty of Long-term Investing

Long-term investing, whether in public or private assets, can provide important benefits to companies and societies. It can fund the types of projects that require large up-front expenditures, and often entail substantial risk and encounter market scepticism. One of the hallmarks of long-term investment is that it is patient and, often, active. One example of such a project is Apple's debut of the iPod. At its 2001 release, the iPod undersold estimates as the company's share price fell by 25%. Rather than reversing course, the board supported Steve Jobs and by late 2009 Apple had sold 220 million iPods.[19] The Boeing 747 and IBM 370 are similar examples of products that ultimately proved to be wildly successful despite delays and cost overruns.

19 Barton, D. "Capitalism for the Long-Term." *Harvard Business Review*, March 2011.

Short-term investing involves liquid assets that can be readily bought and sold. It provides important liquidity to the capital markets. Many of the classic risk management theories and tools have been developed with the public equity markets in mind and generally under assumptions of full information, fair pricing and a rational investor, although an increasing body of work explores the impact of deviations from these assumptions.[20] Yet some long-term investors have substantial positions in the public markets, as seen with Norway's sovereign wealth fund which has more than US$ 550 billion under management.[21] Except for a maximum 5% allocation to real estate, its assets are in public equities (60%) and fixed income (35%-40%).

While both short- and long-term investors participate in the public markets, long-term investors also tend to be particularly active in the private markets.[22] Here the assets – such as venture capital, buyouts, infrastructure, real estate and real assets (timber, farmland, minerals and oil and gas properties)[23] – tend to be illiquid and marked by substantial uncertainty around their "true" or "fair" value, which often develops over time. The difficulty of determining long-term value is demonstrated in the context of Bessemer Venture Partners, a top-tier venture capital firm. The organization declined the opportunity to invest in eBay when it was first founded because the investors could not see the value in a platform for trading comic books and Pez dispensers.[24] Private assets take a long time to reach their full value – hence the need for patience and, sometimes, active guidance – and that value itself can be difficult to discern, as it is subject to any number of risks. Among them would be execution risk (is the management team effective?), technology risk, timing risk (how long will the project really take?) and financing risk (how much money will be required?). Such risks complicate the decision about whether or not to invest and the excess returns that an investor requires as compensation for these uncertainties.

In theory, the willingness to take on these illiquidity risks should be compensated for through an illiquidity premium, an additional premium received in exchange for locking up capital for an extended period because these assets cannot be rebalanced according to basic principles of portfolio construction and asset allocation. Research comparing the long-term performance of companies that are otherwise identical but more or less liquid in the market has estimated that annual returns increase by 7.5% as one moves from the most liquid decile to the least liquid decile.[25] Private assets can be expected to be less liquid than even the least liquid decile of stocks. Long-term investors want to receive compensation for this reduced liquidity, but with the market's distortions and cyclicality, it is by no means clear that such compensation – for the median investor, at least – will be forthcoming.

Active involvement in managing the investment is commonly associated with long-term investing, in both public and private assets. Some investors such as the California Public Employees Retirement System (CalPERS) and TIAA-CREF are known for their active stances regarding the governance of particular public companies. Others, such as Carl Icahn, try to encourage change by acquiring large positions in a public company. These activities can have positive externalities: all investors benefit from the increase in value when they improve the operations of the firm.[26] The outperformance of private assets comes in part from the active involvement of the investor, whether it is an institution choosing a fund manager or the fund manager managing an investment. It is important to note the dual dimensions of long-term investment. Investing for the long-term can provide important benefits to markets, the economy and the given beneficiary groups. The governance that long-term investors provide can also benefit the companies in which they invest.

Private market investments are also characterized by less frequent information about pricing, due to long gestation periods or lack of comparables. This has three potential impacts:

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20 See, for example, Barberis, N. and Thaler, R. "A Survey of Behavioral Finance." Available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=327880, accessed December 16, 2011.

21 US$ 556 billion as per data from Norges Bank Investment Management, http://www.nbim.no/en/Investments/Active-Management/, accessed December 19, 2011. See also Balding, C. "A Portfolio Analysis of Sovereign Wealth Funds." SSRN, http://ssrn.com/abstract=1141531, 2008.

22 Of course, there are some investments that fall in between short-term and long-term and straddle classifications such as liquid and illiquid. Hedge funds have a hybrid position because some may hold private assets for a few years before exiting. They often allow investors to withdraw their funds under certain circumstances, but can also be considered illiquid because their valuations are often opaque and the investor cannot count on being able to exit the position quickly. Even some very large long-term investors find that their ostensibly liquid public market positions are essentially illiquid over the short-term, simply because selling them moves the market.

23 Note that not all investors in alternative assets invest in all types.

24 Bessemer Venture Partners, Anti-portfolio, http://www.bvp.com/Portfolio/Anti-Portfolio.aspx, accessed December 16, 2011.

25 Pastor, L. and Stambaugh, R. "Liquidity Risk and Expected Stock Returns." In *Journal of Political Economy*, 2003, 111: 642-685. This issue has stimulated additional research, such as that undertaken by Ang, A. and Sorensen, M. "Risks, Returns, and Optimal Holdings of Private Equity." December 2011, *Working paper.* http://www2.gsb.columbia.edu/faculty/aang/papers/PrivateEquity.121511.pdf and Ilmanen, A. *Expected Return.* New York: J. Wiley & Sons, 2011.

26 For a discussion of this point, see Grossman, S. J. and Hart, O. D. "Takeover Bids, the Free-Rider Problem, and the Theory of the Corporation." In *The Bell Journal of Economics*, Vol. 11, No. 1, Spring, 1980. One can also argue that index-linked mutual funds represent long-term investors when they purchase publicly traded stock and hold it until the company is dropped from the index. Index funds, however, are less likely to engage in this kind of shareholder activism.

– Mismeasurement of risk: Just because there is less pricing volatility or less frequent performance measurement, one should not assume that there is less risk. Yet frequently, this is exactly what happens. The low reported correlations between the stated prices of illiquid assets and the much more frequently reported prices of public market assets can be taken to mean that an asset is safer than it really is.
– Mismeasurement of liquidity needs: A second real risk for a long-term investor is a failure to match liability streams with cash flow needs. With infrequent information on pricing and performance of these asset classes, investors can misunderstand their associated liquidity requirements.
– Ambiguity concerning valuation: It is extremely difficult for those implementing a long-term investment programme to determine its eventual performance, especially if it is frequently measured relative to the short-term public markets. Paradoxically, less information may allow highly scrutinized investors to continue with an investment programme that would otherwise generate controversy. This can be seen from the experience of groups in recent years that have marked their illiquid portfolios to market more often, a strategy usually adopted to increase transparency. Such steps have sometimes undermined the goals of long-term investing by increasing the likelihood that the owners, sponsors or the public will pressure the fund managers to behave in a short-term manner during periods of market volatility.

The observations above highlight a fundamental tension between long-term investments and the short-term environment in which decisions are made and performance is assessed. The long-term investment world provides returns many years hence. Even the success or failure of the programme often cannot be assessed for years or decades. But a university, for instance, needs to know that the endowment can pay for today's library books, next year's financial aid and the buildings planned for the next five years. A pension fund must meet its obligations to retirees each month, both now and 75 years in the future.

Without accurate measurement of the risk, interim valuation, and expected returns of the investment portfolio, long-term investors face a dilemma. Optimism regarding future returns and volatility (that the first will be high and the second low) may inspire over-commitment in the near term and, should the optimism be misguided, episodes of belt-tightening in the longer term. Pessimism can create a situation where current contributors, whether tax payers, students or citizens, receive lower benefits and make higher contributions.

At the same time, long-term investors must make important choices about the allocation of their funds. Liquid markets may not function as rationally as assumed; illiquid markets may underperform expectations or meet expectations over a time frame much longer than hoped. Many types of illiquid investments can be difficult or expensive to access. Even liquid public markets can be difficult to exit at the proper time and long time horizons can be difficult to defend in the face of short-term market gyrations.

The impacts of such misallocations can be significant. The University of Rochester, for instance, saw its endowment fall from third in the nation in the early 1970s to 25th in 1995, after making substantial, long-term investments in local companies that performed poorly.[27] As with other challenged endowments, such difficulties usually result in reduced support for faculty and decreased financial aid to students.[28]

The long-term investors and long-term assets

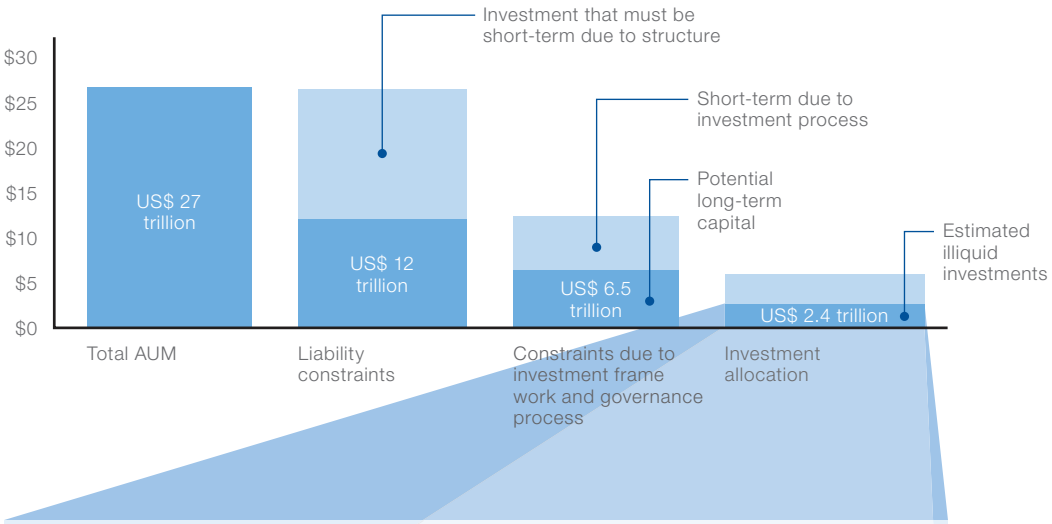
Large institutions have become a majority of the investors in capital markets, both private and public. Institutions that primarily do long-term investing include: private and public pension funds; family offices; endowments and foundations that support the activities of universities, charities, hospitals and other non-profits; insurance companies and the sovereign wealth funds that invest money on behalf of the people of their respective nations. We focus on the potential long-term investors themselves as opposed to retail investors or organizations or vehicles that may serve as intermediaries (e.g. mutual funds, index funds and the general partners that manage private equity funds). These long-term positions are almost always illiquid, whether due to size (in the case of public market investments) or the inability to buy or sell them on a readily accessible market.

It has been estimated that long-term institutional investors own roughly over US$ 27 trillion out of a total of US$ 65 trillion in professionally managed assets worldwide.[29]

It has been further estimated that, due to constraints related to the organizations' liability profiles, investment beliefs, risk

27 Lerner, J., Schoar, A. and Wang, J. "Secrets of the Academy: The Drivers of University Endowment Success." In *Journal of Economic Perspectives*, 2008, 22(3): 207-222.
28 Brown, J., Dimmock, S., Kang J. and Weisbenner, S. "Why I Lost My Secretary: The Effect of Endowment Shocks on University Operations." NBER Working Paper 15861, http://www.nber.org/papers/w15861, May 29, 2010.
29 Data from 2009 in World Economic Forum USA Inc., *The Future of Long-term Investing*.

Figure 2: Estimated allocations to illiquid assets by different types of long-term investors[31]



Institution	Estimated allocation to illiquid investments (USD Trillion)	Estimated assets under management (USD Trillion)	Estimated allocation to illiquid investments (% of total)
Family offices	0.4	1.2	35%
Endowments/Foundations	0.3	1.3	20%
Sovereign Wealth Fund	0.3	3.1	10%
Defined benefit Pension Funds	1.0	11.0	9%
Life insurers	0.4	11.0	4%

appetites and decision-making structures, the sum available for long-term investing is roughly US$ 6.5 trillion.[30] An estimated US$ 2.4 trillion (i.e. 37% of the US$ 6.5 trillion in long-term assets) has been allocated to illiquid private market assets (as shown in Figure 2).

Institutional investors are far from a monolith. The smaller investors such as family offices and endowments/foundations are estimated to allocate a larger proportion of assets to alternatives – measured as a percentage of their total – than do the larger groups, like life insurers and defined benefit pension plans. Moreover, they differ among and even within their designated groups due to many of the same constraints that affect the amount of capital each group devotes to illiquid investments. Among endowments, for instance, varying degrees of comfort with illiquid positions result in differing exposure to such investments, while different regulatory requirements and core beliefs yield substantial differences in portfolio construction among sovereign wealth funds and insurance companies. In fact, the members of each of these groups tend to use different approaches to investing. Some institutions do their own investing; others, such as smaller family offices and pension funds, outsource much of it to funds of funds or advisors.[32]

30 Data from Ibid., 9-10, 17, and Figure 2.

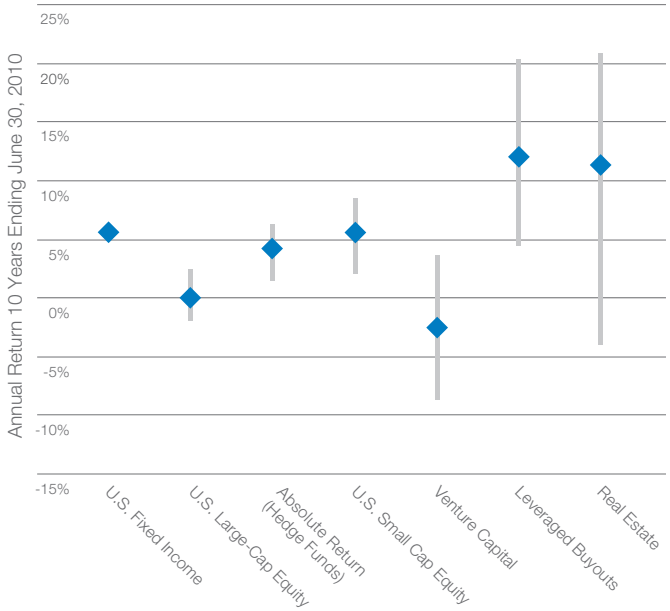
31 Data as of 2009 from *Ibid*., 9-10, 17, and Figure 2.

32 Organizations such as investment advisors/consultants can play an important role for institutions unfamiliar with illiquid investments or unable to hire highly talented investment professionals due to their recruiting and compensation practices. In these cases, the use of a consultant can enable a long-term programme that would otherwise be impossible to execute. But some observers criticize these groups on several grounds. First, they may tend toward risk aversion, recommending brand name firms or those with good past performance even if their prospects – due to changes in the market or within the fund itself – are less compelling. Second, there may be a tendency for consultants to benchmark each other and follow the herd in and out of asset classes. These tendencies may be exacerbated by the career concerns of individual consultants: ascribing performance to individuals within an organization can be difficult, as the long-time horizon over which an appropriate investment programme generates information can mean that many of the original decision-makers have departed. There is often the temptation to make an uncontroversial recommendation, rather than to embrace a contrarian perspective.

The impact of alternative assets

Many long-term investors have positions in alternative assets, such as private equity (venture capital and buyouts), real estate, natural assets (minerals, oil, timber and farmland) and absolute return vehicles.[33] With these, measurement issues are especially significant because manager choice is so important. While US fixed income managers show a difference of 0.75% in returns between the top and bottom quartile, the inter-quartile range for managers of such alternatives as private equity, real estate and natural assets rises to the double digits, as shown below in Figure 3.

Figure 3: Upper and lower quartile and median returns to assets, 10 years to June 30, 2010[34]



Measurement becomes important here because these metrics help the institutions determine which managers are better. The long latency of feedback for managers in private equity and real estate emphasizes the importance of reliable and intuitive metrics for those groups investing in them.

33 Note that not all investors in alternatives invest in all these asset classes.

34 Please note, the US fixed income top and bottom quartile marks are subsumed in the median due to their small deviation. Yale University Investments Office, "The Yale Endowment 2010," http://www.yale.edu/investments/Yale_Endowment_10.pdf, 26, accessed December 23, 2011.

II.

Measurement Issues for Long-term Investments

Judging the performance of long-term investing has long been the subject of academic research. First, will the investment performance over time match expectations? That is, is the initial asset allocation correct or has the investor taken on an excessive amount of any of the many risks that exist?[35] Second, and possibly more difficult to assess, is the question of interim measurement, or the institution's progress toward its goal.

35 For more on the risks involved in long-term investing, see World Economic Forum USA Inc., *The Future of Long-term Investing,* 21-24.

There is a natural fondness for measurement on an annual or more frequent basis. But measuring long-term investment results quarterly or annually exposes the long-term investor to the risk of mismeasurement. It is difficult to discern whether a poor short-term result indicates a bad long-term strategy or a short-term market drop. Without a clear set of protocols around integrating short-term results and relentlessly good communications, interim market movements can create abrupt strategy shifts, or "trend-chasing," reducing the benefits of the long-term orientation.

Some of these protocols could be mathematical – evaluating performance on three- or five-year rolling averages, for instance, or various weighting patterns – while others are philosophical and relationship-based. In many cases, they require the institution to develop a set of beliefs around the importance of long-term investing and a willingness to defend that belief in the face of short-term disruptions – that is, a governance structure that supports long-term investing. Without such governance, a crisis could create misallocations and disruptions in strategy.

In addition, problems around measurement can present real challenges to the design and implementation of a long-term investment programme. Especially in the early days of a new strategy, the governing entity – whether a board, individual or political body – will pay particular attention to its performance. It is at this beginning stage when results are most likely to be at best inconclusive and at worst, misleading. Given the importance of long-term investment and the need for more such programmes, as the markets become more uncertain and regulation more stringent and short-term in nature, the issue of measurement becomes all the more critical.

The particular challenges posed by alternative investments

Large pools of money, whether endowments or pension funds, face a common challenge: How can they outperform the market given their size? A long-term investment programme in alternative assets can generate significant rewards for the investor who approaches it carefully and systematically. Yale University has grown its endowment from US$ 1 billion in 1985 to US$ 19.4 billion in 2011 (a 13.1% average annual return between 1990 and 2010)[36] due to its focus on illiquid assets such as private equity (buyouts and venture capital), hedge funds, real estate, natural resources[37] and careful attention to rebalancing. The Canada Pension Plan Investment Board (CPPIB), which manages the pension investments for 17 million working Canadians, has generated average annual returns of 5.9% between 2001 and 2011 and grown its asset pool to more than C$ 150 billion thanks in part to a creative mix of alternative assets that includes infrastructure, buyout funds and direct investments along with active strategies in the public markets.[38]

Different types of investors in private equity, a classic alternative asset for long-term investors, have been found to enjoy very different results.[39] As shown in Table 2, endowments have substantially outperformed other investors. Yet private equity, with its long time horizons and infrequent reporting, provides particular challenges with respect to interim measurement. Moreover, manager choice is particularly important.

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36 Yale University Investments Office, "The Yale Endowment 2011, and Fabricant, G. "Yale Endowment Posts 22% Gain…," *New York Times*, September 29, 2011, http://www.nytimes.com/2011/09/29/business/yale-endowment-posts-return-of-21-9.html, accessed October 18, 2011.

37 Please note that long-term investors do not always invest in the same types of alternative assets for a host of reasons including access, the amount of capital that they need to allocate and their own comfort with and knowledge of the particular asset.

38 www.cppib.ca, accessed October 14, 2011, and CPPIB, *CPPIB Annual Report 2010*.

39 Lerner, J., Schoar, A. and Wongsunwai, W. "Smart Institutions, Foolish Choices: the Limited Partner Performance Puzzle." National Bureau of Economic Research Working Paper No. 11136, http://www.nber.org/papers/w11136. and data from SBBI/Ibbotson. Another version of this paper with a shorter time series (funds raised between 1991 and 1998) was published under the same title in *Journal of Finance*, 2007, 62 (2): 731-764. Results showed a similar pattern (endowments leading, commercial banks lagging, and all others in the middle) but fewer negative returns as the funds most affected by the 2001-03 downturn were excluded.

Table 2: Data on investors in private equity, funds raised between 1991 and 2001[40]

	Year private equity investment programme started	Total assets under management (US$ millions)	Total private equity commitment (US$ millions)	Fund size (US$ millions)	Fund IRR (%)	Weighted fund IRR (%)	Average annual returns to S&P 500
Corporate pension funds	1986	10,728	635	826	5.10%	3.10%	12.00%
Endowments	1985	1,565	200	588	20.50%	16.90%	12.30%
Insurance companies	1983	36,631	1,171	542	5.50%	2.10%	12.90%
Investment advisors[41]	1988	4,811	3,654	782	-1.80%	-3.00%	12.10%
Other	1989	933	108	429	4.80%	5.90%	10.90%
Public pension funds	1987	24,753	2,212	984	7.60%	2.60%	12.40%

The outperformance of endowments reflects governance and a commitment to a long-term presence in private assets, along with relevant networks and an ability to gather and assess information, fostered by the development of a collegial mission-driven team of investors. It also points to the importance of manager selection because the top-performing endowments have access to the top managers. Perhaps the most significant conclusion from the data is that long-term investing in public markets, despite their occasional roller coaster qualities, is a viable alternative for those institutional investors that cannot access top private funds.

Alternative assets present an especially difficult challenge for measurement. Without continuous pricing, the standard risk calculations break down, as will be discussed below. Within alternative assets, we focus on measurement issues around private equity (both venture capital and buyouts). Not only have the issues of measurement in this context received the most attention from researchers, but the problems themselves are daunting.[42] We focus in particular on two private equity investors: Yale University and the Canada Pension Plan Investment Board, because their strategies and approaches have been well documented.

The typical approach to investing in alternative assets involves committing capital to a fund manager who invests in a broadly described group of assets.[43] The fund's life is usually between 7-12 years. The investors in the fund (limited partners or LPs) have limited liability, but also limited input over the specific companies in which the fund managers (general partners or GPs) invest. Furthermore, the LPs compensate the GPs through fees typically based on committed capital and a share of the profits. There are other ways of investing in alternative assets, such as directly investing in private companies, but unless specifically mentioned, this report refers to investments in funds or funds-of-funds.

Measuring the performance of an alternative investment is difficult until the fund has started yielding results. In the interim, the valuation of long-term illiquid assets is strongly influenced by market cycles. Indeed, as one investor noted, "the ultimate value of your investment can be determined to a large extent by events

40 Adapted from *Ibid.*, 47-49.

41 Investment advisors include funds-of-funds, consultants, and other intermediaries.

42 Other complicating factors aside, infrastructure and real estate investing tend to have more predictable cash flows.

43 Gompers, P. and Lerner, J. *The Money of Invention*. Boston: Harvard Business School Publishing, 2001; and Lerner, J., "Note on Private Equity Partnership Agreements," *Harvard Business School Case No. 294-084I*. Boston: HBS Publishing, 2004.

that are almost impossible to predict, ranging from technological breakthroughs to the impact of an unexpectedly high-quality management team to major changes in market direction."[44] While these situations immediately apply to venture capital and buyout investments, changes in market direction can surprise hedge funds, natural asset funds and real estate funds as well. The experiences of both Yale and CPPIB illustrate these challenges. Yale's endowment lost 24.6% of its value in 2008's crash.[45] For the year ended June 30, 2011, the endowment generated a 21.9% return, rising to US$ 19.4 billion. The CPP fund's value fell by 18.6% between June 30, 2008, and June 30, 2009, before recovering in 2010 and 2011.

Measuring the performance of an alternative asset fund is complicated, not only because the metrics currently in use can give contradictory results but also because timing can be so tricky. Part of the challenge involves disaggregating performance to date. The National Venture Capital Association reported that US venture capital returns for the decade to June 30, 2011 had turned positive (1.3%) but still lagged returns to the S&P 500 (2.7%), and that 1998 was the last vintage year for which distributions from venture capital funds to their limited partners exceeded the capital invested (that is, provided net gains).[46] Yet the founder and managing general partner of one placement group said, "The way I see recent history is as three to four years of bad performance, three to four years of decent performance; and three to four years from now, venture capital may be doing really well. Our venture capital portfolio showed a 40% IRR last year. Every year since 2005, our venture portfolio has outperformed our buyout portfolio. But some of our clients are still trying to get out of venture capital altogether." How is a long-term investor to determine the success of its strategy with such long-cycle variation?

Where do measurement problems appear?

Problems around measurement come in different types and affect long-term investors in a number of different ways: through reporting, asset allocation, manager assessment, alignment of interests and compensation.

– Reporting: Limited partners (LPs) in private markets (most commonly private equity) need to rely on reports from fund managers (general partners or GPs) to assess performance. In their reports and fund prospectuses, GPs must value their illiquid holdings. Historically, the GPs of many alternative asset funds, especially venture funds, valued their investments at cost. Their reasoning was based on the premise that they did not know what a company or project was worth because it was breaking new ground or changing in unexpected directions. But they knew the value at which they were willing to invest in it. That made cost the most reasonable representation of value, and the measurement they were most willing to report to LPs. Over time, the approach shifted to "cost or last financing round".[47] Buyout and real estate investors valued their companies based on comparable firms in the public or private markets, but those too could pose challenges when companies were undergoing substantial restructuring.

  For LPs, this approach delivered positive surprises in robust markets, when firms would exit portfolio companies at values in excess of the holding price. But in falling markets, negative surprises meant that limited partners had to revise budgets and spending plans. In part to address this asymmetry, the European International Accounting Standard (IAS) 39 and then the United States' Federal Accounting Standards (FAS) 157 were enacted. A comparable rule has been promulgated by the International Accounting Standards Board that has, in turn, been adopted by other national accounting associations. Groups that invest in alternative assets, subject to these rules – private equity funds, funds of funds, pension funds, foundations, endowments and real estate funds – must determine the fair market value of their holdings (mark-to-market) on a quarterly basis.[48] In a change from the

44 Confidential interviews.

45 It is important to bear in mind that the S&P index lost 26% in the year ending June 2009, which corresponds to Yale's 24.6% loss. Yale's loss was in line with the markets, which is reasonable, given that recent measurement trends and regulations link the valuations of many alternative assets to public equities through "mark-to-market" exercises. Because alternative assets can rarely be liquidated in a short amount of time at values close to fair market, the measurement issue has been an ongoing challenge for long-term investors.

46 "Venture Capital Returns Continue to Improve in the First Half of 2011", *National Venture Capital Association Press Release*, October 25, 2011, http://www.nvca.org/index.php?option=com_content&view=article&id=78& Itemid=102.

47 As the last financing round usually occurred at a higher value than the original entry price, this choice held some moral hazard, as the higher unrealized value burnished the fund's performance and made it look more appealing to potential investors. See Lerner, J., Hardymon, F., and Leamon, A., "Between a Rock and a Hard Place: Valuation and Distribution," *Harvard Business School Case No. 803-161*. Boston: HBS Publishing, 2003.

48 "Alternative Investments in Employee Benefit Plans," www.aicpa.org, January 2009, http://www.Perkinsaccounting.com/uploads/EBP/Alternative_Investment_Plan.pdf accessed November 8, 2011.

historic emphasis on entry price, these regulations focused on a security's exit price. Marking a privately held company to market is an imprecise effort, and some GPs, in frustration, have marked the entire portfolio to zero to reflect their opinion that at any moment in time the assets were valueless even if they could be sold. Even those investors with positions in public stocks that they planned to hold for the long term were, naturally, marked to market, even though they had no intention of selling the security, especially into a depressed market. Thus, China's sovereign wealth fund, China Investment Corporation (CIC), saw the reported value of its stake in Blackstone Group tumble in 2008 but planned to hold it for "five to seven years . . . because it is a long-term financial investor".[49]

– Asset allocation: Institutional investors need to ensure that assets are allocated appropriately to maximize long-term risk-adjusted returns while providing adequate liquidity to meet ongoing liabilities (for those that have them). An endowment that supplies 5% of its institution's annual operating budget has greater liquidity needs than a family office investing for a future generation. Such differences will naturally lead to different asset allocations. Since the financial crisis, institutional investors have become more aware of liquidity concerns. Before 2008, many institutional investors believed that a diversified portfolio could provide the necessary combination of returns and liquidity because the assets were uncorrelated. In the downturn, however, a wide array of asset classes lost value simultaneously – public and private and foreign and domestic equities in particular, which had long been touted as uncorrelated. With the benefit of hindsight, much of the purported lack of correlation may in fact have been due to mismeasurement of correlations between public and privately held assets.[50] In many cases, investors realized that they had not adequately assessed the illiquidity that they faced.

– Manager assessment: Further complicating the matter, investors must take into account the performance differences across managers in many categories of alternative investments. If asset allocation decisions are made assuming average performance and correlation, and actual performance differs considerably, then the asset allocation decisions may be faulty. To determine the best alternative asset funds, an institution must combine quantitative and qualitative assessments. Past performance has been shown to be a useful (but not complete) predictor of future performance in alternative investments,[51] but it does not represent all the information that investors need. A further challenge is the time lag, as a team rarely can develop a credible reputation until it has closed three funds, or been in business for roughly 10 or 12 years. Even then, changes in fund size or structure shift the reference point. Better methods of assessment can lead to better decisions by the investment team and investment committee. Without reliable measurement, an investment committee and staff may be prone to trend chasing, in which they pursue the strategy that has most recently been in vogue. Rapid changes in strategy prevent the establishment of close ties to fund managers, without which the institution will lack important information for decisions about reinvestment.[52]

  Uncertain measurement affects manager choice and the ways that the managers present themselves. Every alternative asset firm raising money tries to find a framework through which it can present its performance as above average. Given the importance of accessing top performing managers, in-depth information about performance is critical. Without a historical perspective, industry knowledge and networks and an institutional commitment to the asset class, finding this information is very difficult. Many long-time investors have noted the importance of looking through fund-level data to the performance of the individual GPs and even the individual companies in each portfolio. This information helps the institutional investor decide which GPs are critical to the firm's performance, how the GPs react in a crisis, whether they treat their investors as true partners and how (and whether) they pursue the strategy they claim.[53] While there will likely always be some measure of soft information as part of the investment decision, the time savings of a reliable measure of performance would be immense.

– Alignment of interests: Measurement is closely related to alignment of interests, because the managers of private investment funds (the GPs) often have different motivations

49 Shangguan Zhoudong, "CIC May Hold Blackstone Stakes for 5 to 7 Years," *China Daily*, March 6, 2008, http://www.chinadaily.com.cn/bizchina/2008-03/06/content_6514855.htm.

50 In addition, these problems were exacerbated by leverage. In some cases, this leverage was not fully understood by investment committees prior of the crisis, for instance, the extent of as-yet-unfulfilled promises to fund partnerships.

51 Kaplan, S. N. and Schoar, A. "Private Equity Performance: Returns, Persistence and Capital Flows." In *Journal of Finance*, 2005, 60 (4): 1791-1823.

52 See Lerner, J. Schoar, A. and Wongsunwai, W. "Smart Institutions, Foolish Choices," for more on the importance of longevity and informal information gathering.

53 Discerning this has become more difficult in the wake of the buyout industry's "Club" deals, where as many as five firms might collaborate in a mega-buyout. With smaller deal sizes, the incidence of club deals has fallen.

than do the providers of capital (the LPs). For example, when exiting an investment, performance measurement and fee structures can create tensions between the GPs and LPs. After an exit, the LPs receive their cost basis (the amount invested in the company) and a share (usually 80%) of the profits. In most buyout, real estate and venture capital funds, GPs are compensated through fees (usually based on the capital committed to the fund) and carried interest, a share of the profits (usually 20%). In many cases, however, there is no time element to the carry calculation – a GP receives the same share of the profits if a portfolio company becomes liquid in one year or in 10. The fund's overall IRR will suffer in the 10-year scenario, but if the company returns gains in 10 years, carry will usually be paid. For the LP, however, this is a suboptimal scenario. If the company could have been exited after two years for a small loss, the institution could have invested the money in (one would hope) a better opportunity. Instead, the cash was tied up in a struggling company for a decade as the GP tried to reach a profitable exit.

The opposite tension can also arise when the LP would prefer that the GPs hold the company longer and build more value. GPs, on the other hand, may wish to exit a company at a smaller gain to collect performance fees, boost their track record or position the firm to raise another fund.

Another element of interest alignment comes into play with the hurdle rate. Many GPs receive carry only after the limited partners have received their capital and a preferred return. The customary figure for the hurdle (also known as preferred return) is 8% for private equity firms, but in equity bull markets 8% may be rather easy to achieve. For the LP, the question then arises about the extent to which the GPs are adding value. When interest rates are very low due to deflation, some GPs may argue that 8% is too high. Proper performance measurement metrics could help to address this conflict.

– Compensation: Performance measurement can affect compensation with potentially harmful consequences for investment strategy, allocation and execution. For long-term investors, determining a reward system for internal staff is particularly difficult because the structure must encourage short-term accountability for long-term strategies and decisions. An investor compensated on year-over-year increases in portfolio value will likely (and understandably) seek short-term quick hits even if the institution needs performance over the long term. A compensation system that is excessively long term may have difficulty retaining staff because the individuals are not rewarded for their work in the near-term. Another concern is whether the reward system encourages creative strategy exploration. If the board members to whom the staff reports are themselves motivated largely by short-term interests, they will be less willing to encourage employees to risk pursing innovative investment strategies. Yale's CIO David Swensen often invokes John Maynard Keynes' adage that society deems it better to fail conventionally than succeed unconventionally.[54] If the compensation system further encourages a short-term focus, long-term investing will be even more difficult to implement. Finally, it can be demotivating to staff members if they are subjected to criticism or career risk due to short-term price fluctuations on long-term investment strategies. This can make them reluctant to assume – or even eager to avoid – the proper investment risk for the organization's long-term mission.

While we have focused on private assets, many of the same issues around performance over the long term occur for public assets. Frequent pricing information, especially if it is assumed to represent fair value, can obscure the eventual value of the asset, whether private or public. Public assets can be mispriced in the short term to the extent that their price does not reflect the true long-term value. This mispricing, due perhaps to a company operating in an out-of-favour sector or a general misperception of market risk, can endure for a substantial period and create disarray in an investment programme. For instance, Warren Buffet's value-oriented Berkshire Hathaway fund underperformed the S&P 500 Composite Index for a four-year stretch during the 2000s. However, short-term investors that could not tolerate this underperformance and redeemed their holdings missed a strong period of outperformance during 2007 and 2008.

The inability to relate short-term observable data to long-term performance distorts asset allocations in critical ways. Poorly performing funds can raise money, perpetuating their underperformance and failing to produce returns for their investors. Investments may be abandoned too soon, or not abandoned soon enough. Individuals rationally pursue their own interests, which can contradict the best interests of the investment institution. This leads us to the next question we want to address: How significant are these distortions?

54 Lerner, J. and Leamon, A., "Yale University Investments Office: February 2011," *HBS Case No. 812-062*. Boston: HBS Publishing, 2011.

How significant are these distortions?

Basic economic theory teaches us that mispricing induces misallocation. Hence, inaccurate measurement of the risks and rewards of long-term investment means that investors will allocate incorrectly because they are not receiving the proper pricing signals. The liquidity shock of 2008 is a clear example: Many institutions had committed to illiquid assets (particularly buyout funds) on the assumption that historic patterns of distributions would meet future calls for committed capital without understanding the true risk implied by this exposure. When distributions ceased in the wake of the financial crash, some groups found themselves unprepared to fund the commitments undertaken in better times. They had to sell public equities into sinking markets or illiquid positions to secondary purchasers. The double-digit drops that endowments announced in June 2009 required institutions from the University of Toronto to Yale and Harvard to re-examine their approach to asset allocation and manager choice, and to add a relatively new focus on illiquidity risk.

For endowments, negative shocks of this type result in fairly abrupt changes and manifest themselves in sharp cuts to research faculty, support staff and financial aid to incoming students.[55] The larger the endowment is, the greater the shock to the university, given its reliance on contributions from the endowment for general support. Yet because most schools determine their payout ratios (the amount of the endowment that is contributed to the operating budget every year) by using a smoothing formula over a number of previous years, the impact of a positive shock to the endowment is more muted and may not result in substantial changes in spending.

Pension funds are also severely affected by these distortions. The United States, for instance, faces US$ 2.5 trillion in unfunded pension liabilities, and almost all other developed nations face similar challenges.[56] Simply producing investment returns sufficient to avoid increased pension contribution rates could have positive spillover effects, e.g. through increased consumer spending or funding for other programmes. The degree to which issues involving governance and measurement distort the asset allocation decisions of pension fund managers is a serious matter.

Without clear metrics, the benchmark against which a long-term investor's staff is trying to perform is ill-defined, making interim assessment difficult. Many long-term investors, particularly endowments and pension funds, report quarterly or annual performance, which is picked up by the press. Outperformance is welcome but expected; underperformance can create a hostile reaction.[57] In addition, measurement for compensation is difficult, as government salary bands rarely reward a talented investor as generously as does Wall Street. For some organizations, meeting performance goals is less a matter of incentive payments than of keeping a job, leading to an attitude of risk aversion and a short-term focus.

Measurement distortions also are a problem with respect to the board of directors. Members of state pension boards, for instance, often have fairly short tenures due to term limits and other regulations designed to reduce insider dealing. Board members, understandably, want the pension fund to do well under their guidance. Without straightforward measurements, providing sufficient information for the board to become comfortable in choosing an unconventional investment strategy, or a skilled but unknown manager, can be very difficult.

Additional difficulties arise in the decision about whether to continue with a particular investment strategy. Even the behaviour of transparent public stocks with ample research can pose complications for the long-term investor. In early 2009, an investor in Ford had any number of reasons to dump the stock as GM and Chrysler filed for bankruptcy. The investor could wonder whether the decline in auto stocks was a short-term market fluctuation or whether Ford would follow its industry fellows into bankruptcy. Between the week of 15 September 2008 and 4 May 2009, Ford stock traded below US$ 5 per share. In a situation like this, should a long-term investor buy more Ford or sell auto stocks altogether? By early 2012, both Ford and GM had recovered, making the investor who held Ford for the long term appear wise indeed – in hindsight.

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55 Brown, J. et al., "Why I Lost My Secretary: The Effect of Endowment Shocks on University Operations." NBER Working Paper 15861, http://www.nber.org/papers/w15861, May 29, 2010. (Interestingly, negative endowment shocks do not result in cuts to the number of administrators).

56 Bullock, "U.S. public pensions face $2,500 billion shortfall," FT.com, January 17, 2011, http://www.ft.com/intl/cms/s/0/dd3ff74c-2272-11e0-b6a2-00144feab49a.html#axzz1nMT6ycNh, accessed August 11, 2011. OECD data from 2009 recounted in *The Future of Long-term Investing*, New York: World Economic Forum Inc., 2011, (p. 55, reports that corporate pension funds alone are 30% underfunded, while those of Japan are almost 50% underfunded and Canada roughly 10%).

57 This is not surprising. In Barberis, N. and Thaler, R. "A Survey of Behavioral Finance," research has determined that the pain of loss outweighs the happiness of gains. Public pension fund staff may also face the opinion that providing good short-term results is their job.

With private assets, investors must make the difficult decision around reinvestment; whether, having once accessed a fund, they should continue to invest in it. Fund managers usually raise subsequent funds when the current one is approximately four years old and rarely generating significant results. Especially with venture capital funds, an investor must decide whether to reinvest in the subsequent fund or risk losing its position altogether, as the managers of successful funds rarely need additional investors.

U.S. public pension funds are most likely to reinvest in general (60% of the time), while endowments do so roughly 50% of the time.[58] Moreover, both choose funds where the *future* performance is better. The difference is most striking for endowments. The funds in which they have reinvested generated an actual average performance of 31%, compared to 7% for funds in which they did not reinvest. Public pension funds have reinvested in vehicles that produce 6% in future average returns compared to -2% for those where they do not reinvest. Most of the other investors reinvest in funds if the *current* fund's performance is good, only to see the subsequent fund underperform. This skill in forecasting fund performance likely stems from an ability to gather, assess and act upon information to which the institutions are privy as current investors. This ability appears to be greater for the endowments of more exclusive universities, suggesting that the investment staff has access to a well-informed network and can better gather and and use the available information. The "soft" data is used to enhance or fill out the hard but incomplete information on fund performance.

The Impact of Different Allocations

To estimate the financial impact of these different performance records, we calculated the impact of the different returns in private equity investing using data from Lerner, et al.[59] We approximated the returns that corporate and public pension funds received, based on the vintage year performance of various private equity funds and the contributions of these different investors. Assuming an investment horizon of seven years, we computed the additional returns that these pension funds would have earned in various vintage years had they enjoyed the endowments' IRRs (20.5%). To create this model we used the data on committed capital to private equity derived from the 2007-2008 Russell Investments Survey on Alternative Investing.[60] Under these assumptions, the results show that the pension funds that invested in funds raised in 2001 could have earned between US$ 136 billion and US$ 291 billion more than they did, had they performed as the endowments did.

It can be reasonably argued that there are limits to the ability of other institutions to replicate the long-run investing strategies of endowments. They may not be able to identify and access top-performing investors or may have so much capital to allocate that they are restricted to investing in the largest funds. (A substantial academic literature suggests that performance tends to fall as funds get larger.[61]) At the same time, there are various ways in which a large institution can invest in smaller funds by using intermediaries[62] and improve its decision-making, as discussed in this report. There are many good reasons that a pension fund may not be able to emulate an endowment's allocation or asset choice, but that trade-off and the costs of such choices need to be acknowledged.

58 Lerner, J., Schoar, A. and Wongsunwai, W. "Smart Institutions, Foolish Choices".
59 Ibid.

60 The data was compiled from Russell Research's survey of 167 North American limited partner respondents. IRR for public pension funds, corporate pension funds and endowments were taken from Lerner, Schoar and Wongsunwai's paper "Smart Institutions, Foolish Choices: the Limited Partner Performance Puzzle," and the IRRs were calculated for the period from 1992 to 2002.
61 This phenomenon has been documented for venture capital funds in Kaplan, S. N. and Schoar, A. "Private Equity Performance: Returns, Persistence and Capital Flows," in Lopez-de-Silanes, F., Phalippou, L. and Gottschalg, O. "Giants at the Gate." *EDHEC Risk Institute Working Paper*, January 2011, http://www.edhec-risk.com/edhec_publications/all_publications/RISKReview.2011-01-18.2122/attachments/EDHEC_Working_Paper_Giants_at_the_Gate.pdf,accessedDecember 22, 2011 and for hedge funds in Getmansky, M. "The Life Cycles of Hedge Funds." *Market Technicians Association Working Paper*, May 2004, http://docs.mta.org/pdfs/Getmansky.pdf, accessed December 22, 2011. While there are large funds that perform well (although rarely on the scale of top-tier venture capital funds) it is the process of growth that appears to reduce performance, per Lerner, J., Leamon, A. and Hardymon, F., *Private Equity, Venture Capital, and the Financing of Entrepreneurship*. New York: J. Wiley, 2012, 357-359.
62 Lerner, J., Hardymon, F., Angella, F. and Leamon, A. "Grove Street Advisors." *Harvard Business School Case No. 804-050*. Boston: Harvard Business Publishing, 2004.

A typology of measurement issues

Measurement issues fall into three general groups, which appear repeatedly in discussions of asset allocation and compensation.[63] We list the major ones below and then explore their details later at greater length:

1. Valuation and return calculations: There is no single accepted method for determining the value of a long-term investment and the overall results from a portfolio or a fund. Current approaches, whether for public or private securities, have limitations. Inaccurate valuations and performance assessment of a long-term portfolio can have substantial and detrimental consequences.
2. Risk: The question of risk in long-term investments has been a subject of extensive study. Without an adequate, practical method for risk adjusting returns, long-term investors can assume that their portfolios are less (or more) risky than they are. In turn, this assessment can skew future asset allocation decisions.
3. Liabilities: Incorrect assessment of liabilities creates further complications. Mistaken estimations of future liabilities can result in the misallocation of assets.

These three issues appear repeatedly in discussions of asset allocation for investors, investment management for the fund managers and compensation for all parties involved.[64] All of these are also entwined with fund governance. We detail these concerns below.

Valuation and return calculation methodologies

All long-term investors are affected by issues of valuation and return calculation. At some point, any long-term investor will be asked the deceptively simple question: "What's your portfolio worth?" Most long-term investors face substantial pressures around their funds' values, as their constituencies are keenly interested in the matter.

The traditional approaches toward performance assessment of an illiquid asset (usually private) are cash-on-cash and internal rate of return (IRR).[65] More recently, other approaches have been employed, as described below:

- Cash-on-cash: Perhaps the most straightforward approach is the computation of "cash-on-cash" returns, also known as a multiple. This technique compares the money returned and/or currently in the fund to the money invested. More precisely, one common variant – the ratio of distributed to paid-in capital – examines the ratio of the capital returned to the limited partners to the funds that they have provided. For example, a US$ 500 million fund that has returned US$ 1.5 billion would have a cash-on-cash return of 3.0x, assuming that all the capital had been called down. A second frequently used approach computes the ratio of the capital returned to the limited partners and the current value of the fund's holdings to the capital provided. In our example above, if the fund's portfolio still held companies worth US$ 250 million (i.e. if the fund returned US$ 1.75 billion), the multiple would be 3.5x. Based on these measures, funds can be compared to others with a similar level of maturity (i.e. those raised in the same year). A company can also be valued with a cash-on-cash measurement after its exit.
  - While intuitive, cash-on-cash is in many respects a victim of its straightforwardness. It does not take into account the timing of the cash flows that it compares. This violates one of the central tenets of finance that "a dollar today is worth more than a dollar tomorrow". Using cash-on-cash metrics, we cannot tell whether the returns were evenly distributed over time, front-weighted or back-weighted. Clearly, one might be preferable to another, but the cash-on-cash metric makes no judgments.
- IRR: Most private equity investors also use vintage year analyses in which the internal rate of return (IRR, the discount rate that sets the net present value of the fund's cash flows equal to zero) of a specific private equity fund is compared to those of a set of similar funds raised in the same year. This provides a simple comparison, but is prey to many difficulties stemming from peculiarities of the IRR calculation itself. The major drawbacks include what we will call the "tortoise and hare" problem, lack of systematization, the paradox of multiple IRRs and the aggregation problem.
  - Tortoise and hare: An IRR calculation can place too much weight on the rapid return of capital, with near-term returns outweighing later but larger returns. As a result, many investors use cash-on-cash because they are more interested in the largest returns, as opposed to the earliest ones.
  - Lack of systematization: There is no one right way to calculate an IRR. Investment groups differ sharply in their treatment of such elements as the timing and valuation of exited investments, the valuation of companies remaining

63 Confidential interviews.
64 Confidential interviews.
65 Investors may also track other measures, including indicators of operational performance such as sales, profitability or progress in introducing new products.

in their investment portfolios, the impact of taxes and other details, making comparisons surprisingly difficult.

  - Multiple IRRs: The IRR has difficulty handling complex cash flows – in particular, multiple sequences of drawdowns and capital returns. This situation, which is completely normal for private equity funds or a series of investments in public stocks, often has the unfortunate side effect of generating multiple IRRs, which become completely unusable.
  - The aggregation problem: The IRR combines information on multiple cash flows in a very idiosyncratic way. Typically, a private equity fund invests in a number of deals and an institutional investor invests in many funds. Unfortunately, IRRs for multiple funds can be misleading and fail to converge or produce multiple answers.

- Net present value (NPV): Net present value examines the discounted value of the cash flows into and out of an asset or a fund, with a discount rate that should approximate the investor's cost of capital. This approach solves the timing issue of cash-on-cash and the various problems of the IRR, but introduces the issue of finding the appropriate discount rate. A value that reflects the true expected return on the part of the institutions and individuals who provide the capital – perhaps somewhere between 12% and 18% – seems far more appropriate than the so-called "venture capital" approach. (The latter approach uses a very large discount rate – 30%, 50% or even higher – which comingles the cost of capital and an adjustment for excessive entrepreneurial optimism.) In some cases, the total net present value is then normalized by the amount of capital committed to the fund.
- Public market equivalent (PME): This methodology determines whether a private investment outperformed the public markets. The PME compares the proceeds generated by investing in the private equity fund with those from investing the same amount in the S&P 500 (or, if one prefers, another index).[66] If the ratio of the proceeds from the private equity investment to the public investment is greater than one, private equity was the superior investment; if less than one, the public investment is better. Yet this methodology too suffers from computational challenges and from the fact that it has not been widely adopted. Some researchers have suggested that the PME can either fail to produce an answer or produce inappropriate answers.[67] Another concern is its inherent assumption that the private investment's beta is 1, or the same as the public market, and that deviations are due to idiosyncratic performance differences. This methodology also ignores the potential pro-cyclical pressures that can develop from volatility in the public market.
- Mark-to-market (or fair value): This type of accounting has been widely accepted as part of the Generally Accepted Accounting Principles (GAAP) in the United States since the early 1990s and has also been adopted in Europe. Rather than a method for calculating returns, it provides a method for valuing a portfolio or an asset (or a liability) at a moment in time based on its fair value in a market place.[68] If the price of a comparable asset or liability is unobtainable, a fair value price can be based on the output of a model or the investor's best estimate. In general, valuing private illiquid assets is a challenge, as some private companies have yet to bring products to market, some are undergoing organizational transformation and some, such as infrastructure and real estate, have unique issues of project risk. Even for public assets, the assumption that exit price is the same as value does not always hold. While legally required in many cases, mark-to-market also introduces significant biases with long-term investments because it tries to put a price on an asset that an owner may have no intention of selling and where, in many cases, the eventual and current values may differ substantially.
  - While it is inherently difficult to argue with something called "fair", this methodology also presents challenges. Mark-to-market valuations can be too high and therefore prone to panic selling if the valuations drop sharply; or too low, and likely to disrupt or misguide spending or asset allocation plans. Because the second appears to be the lesser concern, managers tend to err on the side of undervaluing portfolios by being very conservative. Deviations from reality in either direction, though, impose real costs. Endowments, for instance, tend to adjust rapidly to downside surprises but not to increase

66 Long, A. M. and Nickles, C. J. *"A Private Investment Benchmark."* Preprint, February 1996.

67 Aizenman, J. and Glick, R. "Sovereign Wealth Funds: Stylized Facts about their Determinants and Governance." NBER Working Paper 14562, http://www.nber.org/papers/w14562, 2008.

68 FASB 157 Paragraph 5, quoted in PEIGG, "2007 Updated Private Equity Valuation Guidelines: Frequently Asked Questions," http://www.peigg.org/images/2007__March_Updated_US_PE_Valuation_Guidelines_FAQ.pdf, 1, accessed February 20, 2008, cited in Lerner, J., Hardymon, F. and Leamon, A. "Between a Rock and a Hard Place: Valuation and Distribution." *Harvard Business School Case No. 803-161*, Boston: HBS Publishing, 2003, 12.

spending commensurately with upside performance.[69] If valuation estimates are unduly optimistic and inspire spending increases that, in retrospect, are unwarranted, the resulting corrections can be painful indeed.

– Cost-or-last round: Prior to the requirement of mark-to-market valuation, most illiquid assets were valued at cost. In the case of private equity (especially venture capital) they might be valued at the most recent financing round on the assumption that such a transaction best reflected changes in value. If these valuations were not revisited regularly, investors could be surprised when the eventual realized values were either higher or lower than expected. Such distortions could lead to portfolio misallocation, difficulty in budgeting and an unwarranted assumption that the assets were uncorrelated to public markets when the issue might be that the private asset prices were reported less frequently than those of public stocks. The benefit of infrequent reporting, though, is that it may help long-term investments reach fruition without second-guessing the strategy.

The lack of a standard measurement poses significant problems for investors in long-term investments. Return estimation is a critical piece of the decision around long-term investment, whether asset allocation, investor choice or employee compensation. Yet return calculation methods for private assets and even public stock held for the long term tend to include an important element of subjectivity, especially in their interim valuation.[70] How is an investor to determine when a drop in value is just a short-term change and when it indicates a fundamental problem in strategy?

Some industry insiders argue that one of the most important things a manager can do in terms of valuation is to be consistent and transparent from one year to the next.[71] The argument runs that as long as managers are consistently biased, they will offset each other and estimations of portfolio performance will be realistic. But even then, comparisons with market benchmarks, measures of correlation and risk, and the computation of relative performance will be distorted.

69 Brown, J., Dimmock, S., Kang J. and Weisbenner, S. "Why I Lost My Secretary: The Effect of Endowment Shocks on University Operations." NBER Working Paper 15861, http://www.nber.org/papers/w15861, May 29, 2010.

70 As a result, investors may also track other measures, including indicators of operational performance, such as sales, profitability, or progress in the introducing new products.

71 Confidential interviews.

Risk measurement methodologies

Risk measurement represents another major issue facing long-term investors. Misunderstanding risk, whether market, liability or illiquidity risk, and responding to it in the wrong way – by, for instance, being excessively risk averse at the expense of needed returns – exposes investors to distortions in their asset allocations and return assumptions. In addition to the classic types of financial risk, long-term investors are exposed to political risk, as governments can nationalize previously privatized industries despite foreign investment protection treaties.

Although there are three classic types of risk (market, liability and illiquidity), we add two more to this discussion because of their interaction with measurement of long-term investments. Valuation/performance risk reflects the possibility that an asset or an investment strategy will not produce the anticipated results in the expected time frame. Monitoring risk refers to the possibility that frequent measurement or reporting may distort the very programme that is being measured. While these can be considered subsets of the classic risk categories, the research and interviews done for this report determined that they were nonetheless important considerations. The various types of risk and how they can affect a long-term investment programme are shown in Table 3.

Table 3: Types of risk and their impact on a long-term investment programme

Type of Risk	Impact on Long-term Investment Programme
Market risk – Ignored or overemphasized	Asset allocation
Liability – Regulatory restrictions	Time horizon Commitment to LTI strategy (board)
Valuation/Performance – Difficulty of long-term measures – Impact of short-term market fluctuations	Commitment to LTI Strategy (board & staff) – Public pressure Compensation (staff)
Monitoring – Excessively frequent oversight	Commitment to LTI strategy (board & staff) – Public pressure
Assessment of liquidity needs – Overstated – Understated	Asset Allocation – Reluctance to invest in illiquid asset classes – Overcommitment to illiquid asset classes

Risk is commonly used to refer to the amount of variation the value of the asset is expected to undergo. In the matrix above, the various types of risk affect a long-term investment strategy in several different ways:

- Asset allocation: Ignoring market risk can lead to investment in assets with greater or lower amounts of risk than the organization can tolerate.
- Time horizon: Regulatory restrictions can create a mismatch between the time horizons of liabilities and the assets that investors are allowed to hold.
- Compensation: Risk around assessing valuation and performance could encourage the adoption of strategies that may not be as long-term as the institution needs.
- Commitment to a long-term strategy: Excessively frequent oversight provides a stream of short-term market information about a long-term strategy that may send confusing signals regarding the long-term holdings and reduce commitment to a long-term strategy.

Market risk

Financial economists and market practitioners tend to focus on systemic risk, or the extent to which the performance of a firm, fund or portfolio is correlated with the returns of relevant public market benchmarks. It is also of concern with alternative assets, where the standard risk measurement approaches used in public markets do not apply in the face of discontinuous pricing. Mismeasurement of risk can make investors think that certain assets are less volatile or more liquid than they thought, inducing institutions to take on more risk of either sort than intended. Misunderstanding risk can distort asset allocations from the optimal level necessary to achieve an institution's desired returns given its constraints.[72]

The standard approach to risk measurement is predicated on the public markets. The public markets differ substantially from the private or illiquid ones, but to understand the shortcomings of the current risk measurement metrics, we must explore those currently in use. Market risk is estimated by running a regression that explains the fund's returns using measures of public market performance, along with a constant. In these regressions, there are two key items of interest. The first is the coefficient on the market returns (the "beta"). A beta of one suggests the fund is as risky as the market, a beta less than one implies it is less risky and a beta greater than one implies it is riskier. The beta – and thus the required return before a fund is pronounced to be an outperformer – grows with the risk that the fund assumes. The constant term shows whether, after controlling for the market's movements, the market-adjusted performance is superior to the appropriate benchmark, inferior to that measure or too close to the measure of market performance to discern.

With this information, analysts can avoid drawing false conclusions about the success of different investment managers. A fund investing in high-tech stocks may have higher absolute returns over a given period but these would be offset by the greater riskiness (higher beta) of its portfolio. Similarly, an investor who makes greater use of debt will have a higher beta and a greater required return before being designated an outperformer.

In recent years, there has been extensive discussion in the finance literature about the measures of market performance that should be used as control variables in these regressions. A consensus has emerged around the view, first articulated by Gene Fama and Ken French,[73] that three crucial measures should be used: i) the performance of the market as a whole; ii) the performance of small-capitalization stocks relative to larger securities and iii) the performance of "growth" stocks relative to "value" stocks (i.e. the differential performance of those securities with higher and lower ratios of market value of their equity to their book equity value).[74] In other words, it is necessary to isolate the performance of the fund from overall market changes ("a rising tide lifts all boats") and particular dynamics that might affect companies of different sizes and characteristics. Once these three aspects are controlled, the coefficient on the constant term should give an appropriate indication of the fund's relative performance.

Moving to alternative investments, hedge funds present the easiest arena for measuring risk in long-term investments. Many of the securities held by hedge funds are traded on a daily basis, so they can (and do) report estimates of their historical risk and risk-adjusted performance quite frequently.[75] Others, such as funds holding distressed debt or loans to private companies, not to mention private equity, have less readily priced portfolios.

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72 For more on the impact of constraints on a long-term investing programme, see World Economic Forum USA Inc., *The Future of Long-term Investing*, 17.

73 Fama, E. F. and French, K. R. "Common Risk Factors in the Returns on Stocks and Bonds." In *Journal of Financial Economics*, 1993, 33 (1): 3–56; and French, K.R. "Presidential Address: The Cost of Active Investing." In *Journal of Finance*, August 2008, 63 (4).

74 More recently, stock momentum has been proposed as a fourth key factor. Vassalou, M. "News related to future GDP growth as a risk factor in equity returns," In *Journal of Finance*, April 2003, 68 (1): 47-73.

75 Of course, even if funds are priced daily, there may still be limitations on their liquidity, as many investors discovered to their dismay when they tried to liquidate positions in 2008 and 2009.

There are challenges with market risk measurement for all alternative asset classes, although hedge funds can be more tractable and thus have been studied more deeply. Researchers have determined three primary reasons that hedge funds pose specific problems for measuring and controlling risks: i) difficulty in developing relevant benchmarks; ii) difficulty in accounting for the dimensions of credit and liquidity risks and iii) difficulty in accounting for the way risk changes in frequently unpredictable ways.[76]

These problems are considerably greater when we move to truly illiquid investments, such as real estate, private equity and infrastructure. These funds differ fundamentally, both from public equities and each other. These dimensions include their investment strategies, use of debt, stages of development, geographical investment patterns, types of investment, time horizon to exit and the risks associated with them. Ideally, the assessment of these fund returns would take account of such differences.

In these asset classes, long-term investors do not typically attempt to adjust returns in the same way that mutual fund investors do. They tend to compare the IRRs and cash-on-cash returns of funds against their peers, rather than against what was happening in markets more generally during the period. In part, this may be due to the investment management industry's conservatism; many investors feel that cash-on-cash returns and IRRs have worked well enough and there is no need for change. But it can be problematic for several reasons. If the funds are different – say, one is considerably riskier than others in its cohort – this can create misleading results. Moreover, at times, funds as a whole may do particularly well or poorly when compared to public markets. But there is another difficulty as well – it is simply very hard to calculate the relationship between private and public markets for two reasons: stale prices and inconsistency.

Stale prices pose a stubborn obstacle to comparisons between funds and between asset classes over time. While the movements of public market indexes can be observed on a daily (or even minute-by-minute) basis, changes in the value of private companies can be observed only after substantial delay when it is determined that a product works or not, or at an IPO or acquisition. Even in these two latter situations, the actual realized value from the investment can differ from the announced closing price due to stock price movements during lock-ups.

In part, illiquid assets have stale prices because the companies accrete value slowly and uncertainly, and these changes are reported only sporadically. Even with mark-to-market reporting, how does one realistically value a company that might be the next Google or might go out of business? Mistaking stale prices for true non-correlation can create problems with portfolio allocation because an asset perceived as uncorrelated may turn out to have greater amounts of market risk than was anticipated.

The comparison of public and private equity returns thus becomes very difficult. As a result, it is hard to know to what extent private equity returns simply reflect public stock movements or true excess value creation. The types of analyses commonplace when assessing mutual and hedge funds are much more difficult to undertake here. If the problem of stale pricing is unrecognized or disregarded, public and private equities can be thought – incorrectly – to be uncorrelated. Instead, studies have shown that with a three-month lag, even the correlation of the S&P 500 Index to itself falls to 34%.[77]

Illiquidity Risk

A second form of risk, which prior to the 2008 crisis was not as fully appreciated by many long-term investors, is illiquidity risk: the possibility that an asset will not be readily converted to cash when necessary. Endowments and foundations in particular were heavily invested in illiquid assets, and even some of their public equity investments were in emerging markets or small-cap investments, which also suffered similar problems. Many were faced with a double blow. Just as realizations from alternative assets dried up and the value of public equities plummeted, their constituencies most needed their help. Many hedge funds were less liquid than anticipated during the crisis, due to the imposition of redemption limits. Even a large fund holding mostly public securities cannot escape illiquidity risk – it may not be able to sell a stock into a liquid market in an extreme situation, such as was seen during the 1987 market crash or in the aftermath of the 9/11 attacks.

As difficult as it is to measure market risk in alternative asset portfolios, illiquidity is no more tractable. In conventional finance, it is assumed away because most investors never thought that liquidity across all asset classes would dry up at the same time.

76 Lo, A. "Risk Management for Hedge Funds: Introduction and Overview," In *Financial Analysts Journal*, November/December 2001, 57 (6). Fung, W. and Hsieh, D.A. "Benchmarks of Hedge Fund Performance: Information Content and Measurement Biases." In *Financial Analysts Journal*, 2002, 58 (1),; Amenc, N. and Martellini, L. "The alpha and omega of hedge fund performance measurement." *EDHEC-MISYS Risk and Asset Management Research Center*, 2003; Amenc, N., Martellini, L. and Vaisse M. "Benefits and risks of alternative investment strategies." In *Journal of Asset Management*, 2003, 4 (2): 96-118.

77 Lerner, J., Leamon, A., and Hardymon, F., *Private Equity, Venture Capital, and the Financing of Entrepreneurship*. NewYork: J. Wiley, 2012, 290.

"[Il]liquidity risk doesn't show up in a mean variance model. You have to think about it very carefully," said David Swensen, CIO of Yale.[78] A number of organizations are trying to consider liquidity explicitly, whether modelling the institution's needs as a series of different time horizons or modeling the impacts of illiquid commitments at the time the commitment is made, to better plan for later capital calls.

Liabilities

A different measurement problem – liability calculations – afflicts some long-term investors, particularly defined benefit pension funds, life insurance companies and endowments. In each case, matching the forecasted liabilities to expected asset values limits the amount of capital available for long-term investment. Calculating these liabilities can be very inexact, which increases the pressure on the investors to adopt a more short-term orientation. Two forces are at play: a tendency toward conservatism in response to that uncertainty in addition to regulatory constraints that may require substantial amounts of liquidity.

For defined benefit schemes, the liability issue reflects the fact that at the end of any given year (or more often), some employees will withdraw their funds due to retirement or job changes. The pension funds must therefore allocate capital every year to each of their clients (beneficiaries) on the chance that it will be withdrawn. In addition, the premium that employers pay for the employees is calculated with reference to guaranteed interest rates that the funds must provide. Thus, while any given individual may be in the retirement system for a considerable period of time, there is a continual need to manage liquidity. As a result, noted one industry insider, "We can't really invest for the long term. We're faced with having to distribute to individual pension accounts on a yearly basis and with providing a guaranteed minimum return each year."[79] Life insurance companies are also subject to liabilities calculation issues, particularly with reference to mandated solvency ratios. These ratios compare an insurer's capital to the premiums written and are imposed by national and/or regional regulators. Overassessment of the liabilities outstanding (the potential claims) can require the insurer to hold more short-term positions both for ready capital and to reduce uncertainty. In the case of endowments, their annual contributions to the institution's operating budget can also lead them to assume suboptimal levels of risk to meet their liabilities. The difference is that their allocation choices are usually freed from regulatory edict.

Assessing liabilities is not easy. Ultimately, it requires making assumptions about future demand for capital, which will be a function of hard-to-foresee factors such as changes in life expectancy, and investment performance, which is even harder to predict, especially given pressures from principal-agent issues and regulation that may enact unpopular responses (increased taxes, reduced benefits) to increased liabilities. But today, significant biases appear to increase many long-term investors' calculations of liabilities, a situation that may be related to the governance issues that we will discuss below.

78 Lerner, J. and Leamon, A., "Yale University Investments Office: February 2011," *HBS Case No. 812-062*, 17.
79 Confidential interviews.

III.

Key Governance Challenges for Long-term Investors

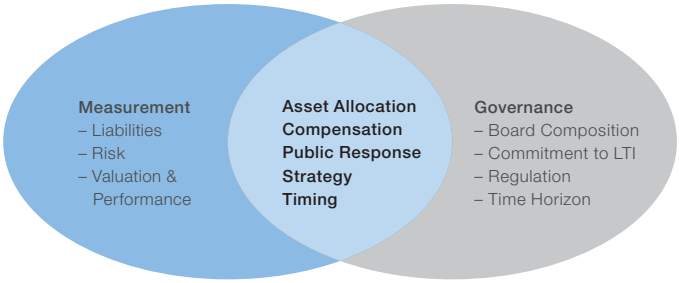
The governance structure of a long-term investment programme deeply affects the types of investment strategies that will be adopted and the ways in which investment performance will be measured. Whether in an external context, such as regulation, or internally through incentive systems, governance bodies, as part of their oversight responsibilities, are deeply involved in the implementation and measurement of long-term investment programmes.

The regulatory context of a long-term investment programme defines the framework within which the effort occurs and often requires certain types of measurement. The internal context of a long-term investment effort involves the culture, compensation and internal support for the programme. The majority of long-term investors have bodies that provide internal governance and that interact with regulators around the external context. These are often called boards of directors, sometimes boards of trustees or investment committees.[80] The actual investment duties are usually performed by a combination of internal staff and external managers, with oversight provided by the board. For some small investors, such as some family offices or endowments, the board does everything – it supplies, invests and manages the capital; approves asset allocations and structures the internal operation.[81] In the case of some corporate and public pension boards, a single individual, usually the sponsor's CFO or the state's treasurer, is the fund's fiduciary. While this structure may streamline decision-making, the exclusion of plan beneficiaries and dispassionate outsiders strikes some as problematic.[82]

The role of the board is multifaceted and ranges from dealing with and helping to inform regulation through creating public support for the effort to helping investment staff develop innovative strategies. The board is deeply involved in measurement issues: thinking through and implementing compensation plans, approving asset allocations and developing a thoughtful opinion about the metrics to be adopted. In the absence of clear, intuitive measurements, a variety of financial, psychological, political and methodological issues can put pressure on a long-term investment strategy.[83]

It is critically important that the boards of institutions doing long-term investing actually believe in it and establish a strong governance structure and an organizational culture with a long-term orientation. To support it, they must develop a compensation system that rewards the right things. It also requires a willingness to be truly contrarian, to support "unconventional success", and to create an environment that allows responsible experimentation – with its invariable companion, occasional failure. The permission to try new things and fail responsibly conveys to the staff that the directors believe in them and their dedication to the organization's goals. That can be a powerful motivational tool. It is not, however, an easy approach to develop. There are many psychological barriers against a true long-term orientation and a willingness to try new things and risk loss. The boards that do this will likely be outperforming boards, operating at the intersection of measurement and governance, as illustrated in Figure 4.

Figure 4: Where measurement and governance intersect



Boards: Composition, responsibilities and performance

A well-chosen board with a strong connection to the institution's mission can provide a number of benefits by linking the external environment to an organization's internal execution. The board can inform strategy discussions and communicate results to external constituents. Directors can provide important market information as well as insights into particular funds and assets to the internal investment staff. The board can also help to create (and support) the internal governance structures around compensation, asset allocation and manager selection that support the long-term investment effort.

Ideally, a long-term investor's board is composed of experts, meets at fairly long intervals and understands, informs and supports the long-term investment strategy.[84] The ideal board governs rather than manages. One notable example is Yale's Investment Committee. In addition to reviewing the Investment Office's portfolio and its asset allocation practices, its members

80 A difficulty can arise when an endowment's Investment Committee recommends a strategy (for instance, retaining gains after a strong year's performance), but the Board of Trustees wants higher payouts to fund various programmes. We use "board" to refer to the group that supervises the investment effort.

81 Amit, R., Liechtenstein, H., Prats, M. J., Millay, T. and Pendleton, L. "Single Family Offices: Private Wealth Management in the Family Context." *Knowledge@Wharton*, 2008, http://knowledge.wharton.upenn.edu/paper.cfm?paperID=1365.

82 See, for instance, International Corporate Governance Network, *ICGN Statement of Principles on Institutional Shareholder Responsibilities*, (London: ICGN, 2007), http://www.icgn.org/files/icgn_main/pdfs/best_practice/inst_share_responsibilities/2007_principles_on_institutional_shareholder_responsibilities.pdf, accessed February 24, 2012.

83 While fund managers, such as private equity and real estate groups, also have governance issues that can affect their management of long-term investments, they are beyond the scope of this paper.

84 Clark, G. and Urwin, R. "Best-Practice Pension Fund Governance." In *Journal of Asset Management*, 2008, 9. See also, Kochard, L.E., and Rittereiser, C.M. *Foundation and Endowment Investing: Philosophies and Strategies of Top Investors and Institutions*. New York: Wiley Finance, 2008.

often serve as sounding boards to help the staff explore new ideas. The trust built up between the board and the office staff has supported the adoption of unconventional strategies. Board members have a fairly long tenure, close ties to the school and relevant backgrounds. The board meets quarterly, which allows it to give high-level direction without micromanaging.[85]

Such boards are difficult to create. In part, this reflects the fact that long-term investing is hard. Whether making an investment into a private or public security, many long-term decisions are difficult to justify in the short run. Consider, for instance, saying "buy Ford" in late 2008 or "fund the venture capital firm that's backing Google" when it was just two college students in a garage. Such a view may seem to conflict with the responsibilities of a typical investment committee to hold people accountable and ask them to justify their approaches, but such an approach can generate substantial returns. The Canada Pension Plan Investment Board, for instance, invested in high-rated distressed corporate debt during the financial crisis, a strategy that seemed risky in the panicked atmosphere of the time. This strategy was vindicated when these positions had all been exited at substantial gains less than two years later.[86] Likewise, the Yale Endowment's staff purchased high quality secondary fund positions during the liquidity shortages of the downturn, and regretted that it had not bought more.[87]

Moreover, good board governance practices may increase investee company returns. Sovereign wealth funds with better Truman index scores (an index that measures groups across a number of aspects of governance) appear to have some positive impact on an investee company's stock price performance.[88] For example, research has shown a 2.4% per annum performance premium between 2000 and 2003 for better-governed public pension funds.[89] These results, however, must be interpreted with caution along several dimensions. First, the quality of governance measures are self-reported. Second, the performance measures do not adjust for differing risk profiles of the portfolios. Third, a four-year observation period is fairly short for assessing long-term investments. Fourth, the causality could run either way – good governance could create good performance or good performance could mean that boards are given the flexibility to adopt good governance approaches.

Practitioners seek similar qualities: "Board members should be collegial, helpful, humble and open-minded individuals with relevant experience and a deep dedication to the organization's mission."[90] Yet studies have found that many board members may not be particularly well prepared for their responsibilities. One 2001 study on United Kingdom pension boards found that "many trustees are not especially expert in investment" and did not avail themselves of opportunities that the institution provided to increase their knowledge. Nor, it appeared, did many prepare for meetings.[91]

Observing that board members were supposed to represent the beneficiaries of the fund, a later study had a gentler appraisal, saying, "It is not a question of whether board members should become experts in this area [investment], as that is not a realistic expectation. That said, board members must be capable of strategic thinking [on relevant topics]… they should insist on clear linkages between the pension contract; how the organization defines, measures and manages risk; and how outcomes are measured and rewarded."[92] In November 2009, the United Kingdom's Pensions Act established a code of "Trustee Knowledge and Understanding" to help ensure that trustees had "appropriate knowledge and understanding of the law relating to pensions and trusts . . . and the investment of the assets of such schemes."[93]

Assembling an expert board can be particularly difficult for public pension funds because they serve a number of constituencies.[94] In many cases, the governor appoints a few members to the board, which must also represent the contributors, and also include certain office-holders, *ex-officio*. For example, the

85 Lerner, J. and Leamon, A. Yale University Investments Office: February 2011. *Harvard Business School Case No. 812-062*. Boston: HBS Publishing, 2011.

86 Such a strategy, of course, complicates the definition of "long-term" investing. CPPIB invests with a 75-year horizon. These positions could have been held as long as necessary to yield a gain.

87 Lerner, J. and Leamon, A., Yale University Investment Office, February 2011.

88 Dewenter, K. L., Han, X. and Malatesta, P. H. "Firm Values and Sovereign Wealth Fund Investments," In *Journal of Financial Economics*, November 2010, 98(2): 256-27.

89 Ambachtsheer, K., Capelle, R. and Lum, H. "The Pension Governance Deficit: Still With Us." In *Rotman International Journal of Pension Management*, Fall 2008, 1(1): 14-21.

90 Confidential interviews.

91 Myners, P. "Institutional Investment in the United Kingdom: A Review." 2001, available at http://www.hm-treasury.gov.uk/media/2F9/02/31.pdf (last visited Oct. 14, 2005), cited in Clark, G., Caerlewy-Smith, E. and Marshall, J. "Pension Fund Trustee Competence: Decision-Making in Problems Relevant to Investment Practice." In *Journal of Pension Economics and Finance*, 2006, 5: 93.

92 Ambachtsheer, K., Capelle, R. and Lum, H. "The Pension Governance Deficit: Still With Us." In *Rotman International Journal of Pension Management*, Fall 2008, 1(1): 14-21.

93 The Pensions Regulator of the U.K., *Code of Practice No. 7:Trustee Knowledge and Understanding*, 2009, 6., http://www.thepensionsregulator.gov.uk/docs/code-07-trustee-knowledge-understanding.pdf, accessed February 24, 2012.

94 Mitchell, O.S., Piggott, J. and Kumru, C. "Managing Public Investment Funds: Best Practices and New Challenges." *NBER Working Paper No. 14078*, http://www.nber.org/papers/w14078 August 2008.

California Public Employees Retirement System (CalPERS) has a 13-member board that includes six directors elected by the membership for four-year (renewable) terms, three political appointees (two by the governor and one by the Senate), and four members who serve *ex-officio*, such as the state treasurer. The board meets monthly and its presidency is decided annually.[95] There is, therefore, a significant potential for shifting membership, which can hamper the creation of an effective team dynamic.

High-performing public pension boards, based on the research, should include a mixture of political appointees, usually chosen for their financial acumen, and members elected by the beneficiaries.[96] Too few or too many beneficiaries on a board can reduce performance, but including a sufficient number can have a beneficial effect in that they take their responsibilities seriously and serve as an important conduit of information to the broader group of contributors. There appears to be a limit to the benefit conveyed by having stakeholders on the board, though. Excessive representation, especially of retirees, has been found to create short-termism, risk aversion and herding behaviour.[97] To address underperformance among funds' boards, research has noted the need for training of board directors and controls to mitigate potential conflicts of interest.[98]

It is interesting to note the impact of two aspects of board life – meeting frequency and tenure – on the performance of boards overseeing long-term investment programmes. Frequent meetings can be difficult to integrate with a long-term strategy.[99] As noted in the psychological literature, humans are prone to emphasize the information most recently acquired and the pain of losses generally outweighs the joy of gains. Frequent meetings provide the opportunity for frequent feedback, conveying overly precise information on short-term changes in the portfolio's value. This can lead to more frequent assessments of the portfolio's performance. Such information, and the sense that one needs to do something, can lead to micromanagement of the investment strategy, which at its worst can lead to rapid changes in strategy rather than long-term commitments. Even without going to that extreme, if the staff knows it must defend its strategy to the board on a monthly basis, it may tend toward more conventional approaches that are likely to perform well over the short term rather than a long-term strategy that might deviate from short-term benchmarks and require extensive explanation. This can create "closet indexers", the phenomenon of ostensibly long-term investors pursuing a strategy that closely follows shorter term indices.[100]

Finally, tenure appears to play a role in board performance. While the boards of many university endowments are known for their long tenure, other boards, particularly those of public pension funds, have shorter appointments, sometimes legally mandated terms of two to four years. A tension immediately arises: Individuals with a two- or four-year tenure are overseeing an investment programme that ought to have a time horizon many times that. This difference can set up a tension between the director's desire to appear effective over the course of his/her tenure and the timeline over which a long-term strategy shows results, especially if a new strategy might incur losses in the short term. Such institutional risk aversion could increase, with an inevitable increase in focus on short-term results, if the pension plan's chief investment officer or other staff have a short time horizon as well. A CEO/CIO seeking to position himself/herself for the next move and a board member with a short legally mandated tenure may both be inspired to focus on good performance in the short term, rather than the long term, given the time lag between implementation and fruition.[101]

95 http://www.calpers.ca.gov/index.jsp?bc=/about/organization/board/home.xml, accessed November 7, 2011. In response to a comprehensive review of its governance practices, CalPERS has reduced the number of board committees and adopted 10 governance reforms. "CalPERS Board Adopts Governance Reforms," *Press Release*, September 14, 2011, http://www.calpers.ca.gov/index.jsp?bc=/about/press/pr-2011/sept/calpers-board-adopts.xml, and "CalPERS Changes Board Committee Line-Up," Press Release, February 10, 2012, http://www.calpers.ca.gov/index.jsp?bc=/about/press/pr-2012/feb/board-line-up.xml, accessed February 24, 2012.

96 Hess, D. "Protecting and Politicizing Public Pension Fund Assets." In *U. Cal-Davis Law Review*, 2005, 39: 187-227, and Stewart, F. and Yermo, J. "Pension Fund Governance: Challenges and Potential Solutions." *OECD Working Papers on Insurance and Private Pensions*, No. 18, OECD Publishing, 2008, http://dx.doi.org/10.1787/241402256531.

97 Clark, G., et al, J. "Pension Fund Trustee Competence: Decision-Making in Problems Relevant to Investment Practice." In *Journal of Pension Economics and Finance*. 2006, 5: 93.

98 Stewart, F. and Yermo, J. "Pension Fund Governance: Challenges and Potential Solutions." *OECD Working Papers on Insurance and Private Pensions*, No. 18, OECD Publishing, 2008, 10.1787/241402256531, http://dx.doi.org/10.1787/241402256531.

99 Clark, G. and Urwin, R. "Best-Practice Pension Fund Governance." In *Journal of Asset Management*, 2008, 9.

100 For more, see Cremers , K. and Petajisto, A., "How Active is Your Fund Manager?" In *Review of Financial Studies*, 2009, 22 (9): 3329-3365.

101 See World Economic Forum USA Inc., *The Future of Long-term Investing*, 25. Of course, part of the turnover may be caused by compensation and other internal governance matters.

Regulation and regulatory issues

Another factor affecting institutional investors, especially pension funds and life insurers, is regulation. These organizations face an assortment of regulations, including marking the portfolio to market,[102] reporting annual or quarterly returns and obeying rules regarding the allocation of capital in particular ways. Because these rules have the strength of law, they are difficult to change even if they prove to create distortions.

Regulation often creates unintended consequences, many of which stem from difficulties with measurement. Much of regulation involves measurement, and when measurement is imprecise or open to interpretation, behaviour can change in unpredictable and often unfortunate ways. Frequent reporting on long-term assets without an appropriate context can also introduce distortions. Short-term changes in the value of long-term assets raise questions about asset allocation and portfolio management that should be viewed in the context of expectations for the asset and for the entire portfolio but often are not.

Mark-to-market valuation reflects efforts to improve the regulation of long-term investments. These regulations stem from a genuine desire to improve the transparency of long-term investors, by providing what is hoped will be measurements more closely aligned to the true value of the asset or liability. The difficulty, though, is that the value has not been locked in because the owner has not sold (or tried to sell) the asset.

Finally, regulatory requirements on the allocation of capital can further distort long-term investment strategies. Many pension plans face pressure to invest within their constituency's borders. Some national pension plans have been urged or required to lend or invest for domestic projects that do not provide competitive financial returns.[103] Such stipulations may be good social policy, but they threaten the financial returns upon which the contributors depend.

New solvency requirements currently under discussion would require pension funds and life insurance companies to hold risk capital against changes in the net asset values on their balance sheet. With a reduced ability to take on risk and long-term investments, these institutions may end up pursuing pro-cyclical strategies, rather than buying when the market falls and potentially having a market-stabilizing effect. When stock markets fall, their equity would fall as well, reducing their risk capital. This would lead funds to de-risk by decreasing their equity holdings or reducing the risk of their equity portfolio. In either case, they would have to act pro-cyclically, selling into a falling market or buying the lower risk securities toward which most other investors are fleeing. On the other hand, "unconstrained" long-term investors can use exactly the opposite strategy, rebalancing their portfolios and taking more risk when markets are falling by buying equities.

Another example of the unintended consequences of regulations appears in the Polish Pension Fund scheme. Established by law in 1997 and fully operational in 2000, the programme had, by 2003, only managed to accumulate a balance equal to the contributions. The primary problems appeared to have involved, in addition to excessive up-front costs that encouraged asset gathering rather than investment results, government-imposed asset allocations that tended to funnel funds into the local stock and government bond market. Peer-based performance measurements led to herding behaviour as funds invested in the same types of assets rather than trying innovative strategies that, while offering a chance at above-market returns, also threatened losses.[104] Moreover, funds were required to report valuations on a *daily* basis.

Efforts to improve transparency and increase liquidity reflect situations where laudable goals may be impeded by difficulties in measurement. It is natural, as in the Polish example, to want to see how a new programme is doing or to want to keep a close eye on a system that has been in peril. But as noted before, frequent short-term assessment of long-term investment without putting it in a long-term context can introduce unintended short-term pressures.

At the same time, regulation and legislation can support long-term investment efforts. One group that benefited from regulation in support of such a programme is the Canada Pension Plan Investment Board (CPPIB). The CPPIB, by law, must invest "to maximize gains without undue risk of loss"[105] – that is, its mandate is solely financial. Established by legislation in 1997 as part of a fundamental overhaul of the national pension system, CPPIB is a Crown Corporation (owned by the federal

102 Pension funds are not alone in marking their portfolios to market, as will be discussed.

103 See for instance, Little, B., *Fixing the Future*. Toronto: U. of Toronto Press, 2008, for a description of the former version of the CPP and its provision of low-interest funds to the provinces.

104 Stanko, D. "Polish Pension funds, Does the System Work?" *Pensions Institute: Discussion Paper PI-0302*, January 2003, www.pension-institute.org, accessed November 7, 2011.

105 Canada Pension Plan, www.cppib.ca, accessed March 7, 2012.

government) but specifically insulated from political interference. In fact, changing the CPPIB's charter is harder than changing Canada's constitution; the board of directors is recruited directly from the business community, the CEO is hired by the board and staff is exempt from government pay bands.[106] Yet despite this insulation, the effects of the market downturn still aroused fierce criticism of the programme and the compensation levels and long-term incentive scheme of the executives, as we discuss below.

Explaining a long-term strategy to the wider constituencies

For a long-term investor to be most effective, the board of directors must be committed to a long-term strategy and willing to explain and defend it to constituents. The challenge may confront public pension fund managers most directly, but the chief investment officers of endowments and even sovereign wealth funds can also be exposed to popular concerns about drops in fund value. The nature of political reality often works against a long-term perspective even for multigenerational investors: it is difficult to be in charge when a fund loses money. The board must be comfortable with short-term volatility and able and willing to articulate the strategy's importance to the community. In the words of David Denison, CEO of CPPIB, announcing that the Canada Pension Plan's value had fallen by 7.5% in first half of 2008, "… the CPP Investment Board invests not for the quarter, but for the quarter century and beyond."[107] That said, CPPIB intentionally publishes quarterly results and gives media interviews in an effort to strike a balance between transparency and a focus on the long-term investment strategy, while carefully distinguishing the one from the other.[108]

Market downturns affect the reported performance of the entire portfolio, whether public or private (the latter due to mark-to-market requirements). Understandably, a constituency – whether it is pension contributors, alumni, family members or the population in general – becomes concerned when the value of the fund falls. These fluctuations can create a huge public and political pressure, forcing managers to devote a lot of time to explaining the results and, sometimes, trying to save their jobs. A common outcome is so-called "panic selling" and the rapid changing of strategies. Panic selling refers to situations when managers and boards aggressively sell off their portfolios, usually in response to market downturns. This was especially evident during the global financial crisis and, regrettably, such actions merely locked in losses. A group with a set of long-term investment beliefs would respond, "It was worth X; it's priced at half of X." A truly long-term investor follows this with, "Let's buy more." But it takes a strong stomach and a supportive board to implement this strategy when newspapers and politicians are focusing on losses. True governance on the part of the board and the fund's upper management is critical at this time.

In addition, a large long-term investment portfolio has a number of moving pieces. According to one senior executive of a leading endowment, it can be difficult for inexperienced board members to see the big picture of an entire investment portfolio and strategy. Rather than assess the level of risk in the portfolio overall, for instance, it can be easier, especially for individuals new to investing, to focus on a particular fund or deal. Such micromanagement distorts the goals of long-term investment and distracts the investment staff from exploring strategies, evaluating managers and developing long-term relationships with the best funds and trust with the market.

During the financial crisis, even some boards with a long history of long-term investments abandoned that strategy and instructed the staff to sell private assets on the secondary market. These actions may have hurt their prospects for returning to a long-term approach, as they appeared to be uncommitted and prone to change strategy when the teams in which they were invested most needed them.[109]

An extensive literature in social psychology and behavioural economics suggests that humans have evolved to go with the herd and to overvalue short-term information.[110] Both of these characteristics, it has been suggested, may exacerbate financial bubbles and crashes, making it difficult to convince a nervous board that the 2008 downturn, for example, is exactly the right time to buy secondary positions from distressed long-term investors.

106 See www.cppib.ca; Hardymon, F., Lerner, J. and Leamon, A. "Canada Pension Plan Investment Board," *Harvard Business School Case No. 9-809-073*. Boston: HBS Publishing, 2008; and Ambachtsheer, K. "How Should Pension Funds Pay Their Own People?" In *Rotman International Journal of Pension Management*, Spring 2011, 4 (1).

107 CPPIB, "CPP Fund ends second quarter at $117.4 billion," News Release, November 12, 2008, http://www.cppib.ca/News_Room/News_Releases/nr_11120801.html accessed October 14, 2011.

108 Confidential interviews.

109 Confidential interviews.

110 Shiller, R.J. *Irrational Exuberance*. New York: Random House, Inc., 2005; and De Bondt, W. F. M. and Thaler, R. "Does the stock market overreact?" In *Journal of Finance*, 1985, 40: 793-808; De Bondt, W. F. M. and Thaler, R. "Further evidence on investor overreaction and stock market seasonality," In *Journal of Finance*, 1987, 42: 557-581.

Managing the fund

Boards are also deeply involved in the internal governance of the fund. Sometimes, in fact, they are excessively involved in internal matters. An ideal board sets broad direction and helps to articulate and refine the investment strategy to the managers who implement it. The board designs or approves the compensation system. It helps to create the right culture for the organization, which can play an extremely important role in retaining and rewarding individuals. Finally, the board also evaluates management and can set the stage to reward not just short-term performance but also the correct implementation and execution of the long-term strategies of the organization.

If committees and staff are to work well together in an environment marked by long-cycle feedback and uncertain metrics, they must establish a significant level of trust. That requires good internal governance. A key concern is longevity among the staff because a large amount of intellectual capital accumulates over time. Fund staff and their investment managers develop relationships and understanding and can generate ideas and share information. Good governance that ensures accountability, transparency, an interesting working environment and fair compensation, and helps to create a sense of a shared mission, goes a long way toward generating outperformance.

Setting direction

The board can play a critical role by articulating its belief in long-term investment. Yet investment beliefs and risk issues were among the top three areas of tension for both boards and executives and executives and their staff, according to a study of 81 senior pension executives managing a total of US$ 1.4 trillion at the end of 2004.[111] As shown in Table 4, issues around context, governance and investment beliefs were areas of great concern between boards and executives ("oversight"), and strategic planning, context and investment beliefs were significant issues for executives with their staff ("management").

Table 4: Pension fund oversight and management[112]

The more important oversight issues	% of senior pension executives mentioning this as important
- Agency/context issues	44%
- Governance effectiveness issues	36%
- Investment beliefs/risk management issues	20%
The more important management issues	
- Strategic planning/management effectiveness	73%
- Agency/context issues	15%
- Investment beliefs/risk management issues	12%

Compensation

One of the most direct ways in which a board can create a high-performing long-term investment organization is through structuring compensation schemes. Much about compensation has to do with what is measured and how those metrics are employed.

The challenge for any long-term investor is tailoring an evaluation scheme that balances short-term rewards, measurement and accountability with the organization's long-term goals. But convincing investors to make long-term investments can be difficult. It is human nature to want to see the results of our strategies. In addition, people tend to discount long-term gain but are highly averse to short-term loss.[113]

Long-term investment goes against this pattern and requires an innovative approach to compensation that balances short-term and long-term incentives. Complicating things further, there is often a separation between the owners (for instance, sovereign entities or pension fund contributors) and individual managers. This sets up situations where the individual managers (whether internal staff or hired experts) are agents and work within a

111 Ambachtsheer, K., Capelle, R. and Lum, H. "The Pension Governance Deficit: Still With Us." In *Rotman International Journal of Pension Management*, Fall 2008, 1(1): 14-21.

112 *Ibid.,* 16.

113 Barberis, N. and Thaler, R. "A Survey of Behavioral Finance." available at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=327880.

measurement system that might reward them for activity that runs contrary to the best interests of the principal or owner. This could occur, for instance, when an endowment's staff is compensated based on year-over-year performance, encouraging the adoption of short-term high-growth strategies although the owner (the university) wants long-term out-performance. The metrics in a long-term investment strategy must be carefully chosen and thoughtfully applied because they can correct or exacerbate some of these principal-agent problems.

A number of talented investment managers at long-term investment groups are compensated at less than market rates even as they espouse the importance of alignment of interests. In part, it appears that some of their rewards are non-pecuniary. Linking compensation to the organization's mission can be a powerful motivating factor.[114] "To be interested in this job [working for Yale's Investments Office], it helps a lot if you feel a real connection to Yale and want to do something good for the university," according to a Senior Associate at the Yale Investments Office and a 2006 Yale graduate.[115] CPPIB attracts members of the Canadian Diaspora, from firms such as Bank of America Merrill Lynch and Goldman Sachs by offering the chance to live in Toronto, pursue a global career and make a difference in the lives and retirements of 17 million Canadians, along with a competitive salary.[116]

It might be thought that a natural solution for retaining staff at long-term investors would be to offer higher compensation levels. But a number of long-term investors that have offered or discussed offering substantial incentive-based compensation to their staff, such as Harvard[117] and Stanford[118], have been among those hit by large-scale defections of investment personnel, sometimes after intense public criticism. Moreover, the compensation of internal investment staff at academic institutions and public bodies has been intensely controversial.[119] In part, offering generous pay packages to employees of non-profit organizations is often met with great resistance by alumni or other groups. Furthermore, few non-profit groups can match the pay of hedge funds or other private groups.

In addition to the level of compensation, the structure of rewards – usually salary and a bonus – has proven problematic. Most experts agree that there needs to be some sort of scheme to reward individuals who implement successful long-term strategies, but a bonus based on one year's performance is counterproductive. Unfortunately, what one measures is often what is produced.

Across all investor types, there is a general consensus that the compensation scheme of private equity groups (a salary and some type of carried interest or ability to invest alongside the fund) best links immediate decisions to long-run performance. One institutional investor in private equity argues for a system where 50% of compensation is ultimately driven by the quality of decision-making. Not only does that reward long-term decisions and good strategies, but it also "has the credibility to connect people better with the group,"[120] potentially increasing longevity with the institution and the type of knowledge acquisition that can help improve decision-making and performance.

As another public pension fund manager observed, "If we want to make long-term decisions, then the performance compensation needs to be about something that is long term. However, pushing somebody to make 30-year decisions is not realistic."[121] He recommends that compensation should be based on a rolling three- to five-year time horizon additionally secured with clawbacks on the incentive segment of the package. With clawbacks, the individual receives the full amount of the incentive payment but can be required to refund a portion of the incentive payment. Harvard Management Company has developed a programme in which incentive compensation is paid out over three years and can be clawed back if subsequent performance falls. Compensation for the entire senior management team is related to the performance of the endowment overall, and will fall in any year that the endowment suffers a negative return.[122] An alternative approach is holdbacks, through which the full amount is paid out over a period of time subject to the achievement of certain goals.[123] For either of these systems to be effective in

114 World Economic Forum USA Inc., *The Future of Long-term Investing*, 9.
115 Hetherington, R. A. cited in Griswold, A. "Investments Office Hires Yalies." *Yale Daily Sun*, October 2010, http://www.yaledailynews.com/news/2010/oct/22/investments-office-hires-yalies/.
116 Hardymon, F., Lerner, J. and Leamon, A. "Canada Pension Plan Investment Board," *Harvard Business School Case No. 9-809-073*. Boston: HBS Publishing, 2008, 12.
117 *Ibid*.
118 Grant, P. and Buckman, R. "Fatter Pay Lures University Endowment Chiefs: Stanford Loses Fund Manager; McCaffery Leaves for Start-Up with Paul Allen." *Wall Street Journal*, June 27, 2006, C1ff.
119 Seward, Z.M. "Harvard's Billion-Dollar Man Departs." *Forbes.com*, June 29, 2005,http://www.forbes.com/2005/06/29/harvard-management-meyer-cxzs_0629harvard1.html.
120 Confidential interviews.
121 *Ibid*.
122 Wee, G. "Fixing Harvard's Failures will Take Five Years." *Bloomberg Market News*, September 28, 2010, http://www.bloomberg.com/news/2010-09-28/failures-of-harvard-endowment-will-take-five-years-to-fix-in-mendillo-plan.html and www.hmc.harvard.edu, accessed August 8, 2011.
123 Applebaum, G. "Clawbacks and Hold-backs: How Do They Impact Incentive Plans?" *Western Independent Bankers: HR & Training Digest*, February 2011, http://www.wib.org/publications__resources/hr__training_digest/feb11/appelbaum.html, accessed December 22, 2011.

encouraging a long-term orientation, the benchmarks would have to be carefully designed to avoid penalizing an employee for movements in the broader market.

For public investment organizations, compensation offers additional challenges. Due to political dynamics and public pressure, these groups generally cannot offer lucrative compensation schemes. Furthermore, many of the resources considered critical for executing a long-term investment strategy (travel to meet teams or money for research tools and training) are the first to be cut when budgets are squeezed. The staff may be blamed if performance falls. In turn, they may be more risk averse than otherwise to avoid embarrassment and keep their jobs.

Here again, measurement intrudes on governance. Unless the compensation system and the system of investment beliefs guard against it, bad results for a quarter can discourage the staff and create resistance to implementing a long-term investment model. Instead, a system where quarterly results are placed in context can support a long-term programme. One expert comments: "Too much focus on short-term performance and the resulting criticism, particularly during a market downturn, can cause many investment professionals, including senior professionals, to question the model and mission of the organization, leading them to veer off course. They think, 'If the focus is short term and that is how I am going to be evaluated, and the short term is unpredictable, then why should I take any investment risk?'"[124]

Long-term institutions need to develop a method that links compensation with results three, five and ten years distant. The closest analogy may be high-technology firms, which rely heavily on options to reward employees. These options are only valuable if the firm succeeds in the future. While such a scheme is unlikely to be exactly duplicable by a long-run investor, it provides an interesting model.

Firm culture

By defining what an organization values and rewards, compensation helps define the greater firm culture. If committees and staff are to work well together in an environment marked by long-cycle feedback and uncertain metrics, they must establish a significant level of trust. A key concern in turn is longevity among the staff because a large amount of intellectual capital accumulates over time. Fund staff and their investment managers develop relationships and understanding and can generate ideas and share information.

A culture that encourages learning and a team ethos can provide emotional rewards that can encourage loyalty and commitment. A shared sense of purpose, whether the mission is education or the provision of retirement security, can encourage pride in and commitment to an organization's work. Opportunities for additional education can provide employees with the sense that the institution believes in them and their future. A widely accepted benchmark for performance can also play a focusing role. The CPPIB, for instance, has a benchmark of 4.0% growth after inflation each year to meet its commitments 75 years in the future. This provides employees and the public a clear short-term goal with a defined long-term impact.

124 Confidential interview.

IV.

The Intersection of Measurement and Governance

As the preceding section has shown, governance and measurement are closely related. Not only do governance choices determine the metrics that are adopted and the ways they are reported, but they also inform the culture and compensation system within which investing activities and strategies are implemented. With strong support from the board or investment committee, a long-term investment programme can survive periods of short-term underperformance, and good governance has been associated with better performance.[125] In the section below, we explore the areas where measurement and governance intersect: in timing, regulation and compensation. We explore the concerns raised about mark-to-market valuation and conclude with recommendations.

125 This may in part result from the board's willingness to defend the long-term programme, which might dissuade the investors from rapid shifts in strategy.

Timing

A substantial measurement challenge for long-term investment is the time horizon. When short-term volatility creates sudden changes in the value of illiquid assets, pressure from politicians, the press, other stakeholders or even one's own reward system can be intense and encourage revisions to long-term strategies. Without measurements that can reflect long-term potential (perhaps within a range), this pressure is hard to withstand. CPPIB CEO Davis Denison's comment: "We invest for the quarter century, not the quarter," requires a supportive board and an audience that is willing to trust the message. In effect, he is saying, "Trust me, this will work out." That is a difficult message to convey.

The desire for measurement can lead to unproductive decision-making. Noted one interviewee, "In private equity, people want to pull out their cards to see if they were right in making a given investment. The most objective measure of performance is an exit. So the investors encourage the fund managers – or sometimes it's the managers themselves – to create realization events to validate their strategies." In many cases, a later exit would allow the company to accrete more value but fund management requires an earlier exit. Noted another: "We invest in assets that should be held for more than five to seven years. Yet the GPs want to realize carry for the end of a seven- to ten-year fund, so we end up with short-term exits on a long-term asset."[126] FAS 157 and its European counterpart, the fair market rules, and marking a position to market were all supposed to address these issues from a regulatory perspective. Instead, as briefly discussed earlier, one could argue that in the near term, they have complicated the situation for long-term investors because fair market value is so difficult to determine in a long-term context. In addition, one could contend that marking illiquid assets to market when one has no intention of selling them introduces new biases, and may create pressures for action when patience would be the better course.

Regulation

Governance and measurement also intersect in regulation. Since the 2008 liquidity crisis, regulators (especially in Europe) have focused on increasing the liquidity in the system.[127] This has taken the form of measuring the solvency of each individual entity on a stand-alone basis. Some practitioners have expressed concern that the focus on individual actors might affect the performance of the system as a whole. The manager of a life insurance fund described the situation using an example: "A traveler comes to the train station late at night and there is only one taxi standing there. When the traveler tries to get in, the driver says, 'Sorry, the regulation says that a taxi must always be at the taxi stand, so I cannot take you anywhere.'"[128] Likewise, he argued, a minimum requirement for the liquidity in the system may tie up a lot of capital, preventing its use when required. By measuring the wrong thing (e.g. liquidity being used as a proxy for lack of risk) on a granular basis, the efficiency of the system itself is reduced.

Regulatory constraints can also prevent many pension fund managers from being as long term as they would want to be. When pension funds, for instance, are required to mark their assets to market on a continuous basis, this introduces a strong bias toward short-term strategies. In a situation with falling long-term interest rates and liabilities increasing quickly, such restrictions can reduce the investment options available to these funds.

Ideally, the time horizons for life insurance companies and pension plans would match those of their liabilities, for instance, 30 to 40 years. However, new regulations have established risk capital requirements for alternative assets that could make it difficult for the alternatives to provide a return sufficient to offset the additional reserves. Some fund managers noted that such regulations appeared to create a tension: the investors would be incentivized to hold more short-term assets despite their long-term liabilities.

Compensation

One of the most difficult areas in which governance and measurement are linked is compensation. Linking compensation, which occurs over the short term, with decisions that bear fruit over the long term is a challenge. At one big pension fund, the staff received a bonus if the IRR of the alternative assets portfolio rose in a given year. That performance, however, had little correlation with the decisions made in the year the bonuses were awarded. Rather, it reflected decisions made five or six years before. Noted the interviewee, "In a typical institutional investor, the people who made those decisions in 2005 are long gone."[129]

126 Some infrastructure funds, it should be noted, are structured with a longer life to match the asset length.
127 Primarily through 2009's Solvency II directive.
128 Confidential interviews.
129 *Ibid*.

Compensation: An Example

The CPPIB has made a concerted effort to balance short-term and long-term compensation. In his recent article, Keith Ambachtsheer[130] examined the relationship between internal pension fund compensation practices and fund performance over time at CPPIB. Compensation at CPPIB, he explains, has three elements: a base salary and both short- and long-term incentive plans. Base salaries are competitive, but not as high as independent alternative investment firms.

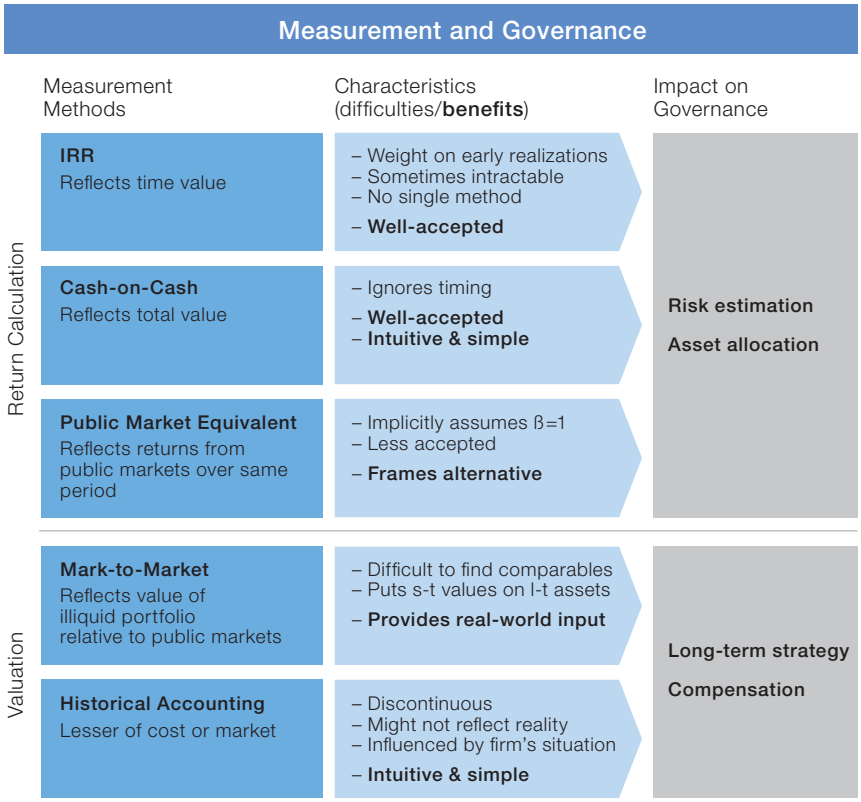
The next component is the Short-Term Incentive Plan (STIP). Target STIP awards are a percentage of salary to which a multiplier is applied. The multiplier is composed of two elements: the performance of the CPP Fund and that of the asset class in which the individual invests (calculated over the past four years), along with the individual's personal performance in terms of meeting individual goals. STIP payouts can be deferred and invested in either the CPP Fund as a whole, or else 50% in the overall CPP Fund and 50% in CPPIB's alternative assets portfolio, further aligning incentives.

The Long-Term Incentive Plan (LTIP) further links individual interests to long-term performance. LTIP awards are a percentage of salary at the start of each year, paid out at the end of four years. Like the STIP, a multiplier is applied based on the performance of the CPP Fund and the employee's asset class compared to a benchmark. The final payout increases or decreases with the CPP Fund's four-year compounded rate of return. Ambachtsheer applauds this scheme but notes that the CEO's compensation package appears excessively weighted toward investment performance rather than strategy setting or internal management efforts.

Choice of metrics

Another difficulty can be that in an effort to find some way of measuring returns or performance, a group chooses an inadequate metric. As described in Figure 5, the common methods of calculating both return and valuation have benefits but also possess drawbacks. They can affect governance in four significant ways: the methods of return calculation affect it through risk estimation and asset allocation; and the valuation methods in a less direct manner: through the calculation of compensation and how the organization articulates its performance in terms of its commitment to a long-term strategy. It is important, then, that an organization takes these biases into account and thinks carefully about how to place each of the measurements into a long-term context.

Figure 5: Performance measurement impacts on governance



130 Ambachtsheer, K. "How Should Pension Funds Pay Their Own People?" In *Rotman International Journal of Pension Management*, Spring 2011, 4 (1); and World Economic Forum USA Inc., *The Future of Long-term Investing*, 11.

Marking-to-market

Marking-to-market as applied to long-term investing is still a matter of development and debate. While part of the discussion hinges on choosing the right comparable, much of it involves issues around timing. Some experts hold that more frequent pricing works against long-term investment by explicitly reporting interim variations that have little if any impact on the investment's eventual realized value. They argue that *less* frequent pricing, as long as it is not mistaken for lower volatility, should be encouraged. The information provided may otherwise reflect short-term volatility that the investors should be prepared to withstand and frequent valuations increase pressure for short-term behaviour. The benefit of marking-to-market, however, is that investors can better understand the amount of risk in the asset class because they receive more frequent information on price changes.

Some believe that with time, mark-to-market rules may create a degree of transparency that will address some of the more troublesome aspects of fund valuation. The valuations of private companies may start converging as there becomes an agreed upon external standard for pricing. This might start to resolve the issue where a private equity fund with a strong portfolio may mark down a company that is slightly underperforming, while a fund with weaker investments might value that same company at the top of the range. Moreover, the mark-to-market exercise is likely to focus GPs more intently on exits. While there may be fewer surprises as a company valued at cost suddenly soars on IPO or acquisition, the valuation will more closely approximate reality and make it easier for the institutional investors to plan their budgets, make allocations and assess their future liquidity needs.

Many practitioners comment that more frequent marking-to-market works against long-term investing by increasing reported volatility. Especially for a high-profile fund, such as a public pension fund, an announcement of quarterly portfolio losses is usually followed by intense media and political criticism. This can occur even when the fund has performed better than the market as a whole, or when the longer term record still places it safely within its target return range. As one institutional investor said, "I prefer the stale pricing methodology because I want smoother pricing trends. They are less volatile and will not affect my asset allocation model. The problem for asset allocators is to make sure they do not confuse less frequent real time mark-to-market with lower risk."[131]

Based on the conversations and research done for this paper, we came to the conclusion that frequent valuation information about long-term investments may be counterproductive and that excessively frequent measurement – and the consequent focus on near-term liquidity events – seems to introduce a short-term orientation that may distort long-term investments. A wholesale drop in the public markets will undoubtedly reduce the value of a portfolio that is marked-to-market. But the point is moot if the investor plans to hold the assets for decades. In fact, the investor might wish to buy into the depressed market. But a combination of public and regulatory pressures and human psychology may lead an organization to do the opposite. Such short-termism can reduce the important benefits that long-term investment can provide.

In addition, marking-to-market has not corrected the inconsistency with which groups value investments. While established groups, especially among venture capital funds, generally use conservative assumptions when valuing their portfolios, less established organizations are often more aggressive. These differences can distort performance data, creating the appearance of superior performance when interim returns are compared, even if long-run performance may be no different from (or even lower than) that of other organizations. These distorted measurements increase the possibility of asset misallocation on the part of investors.

Some investors use mark-to-market values as a directional indicator. The CEO of a European private equity group describes how his firm uses a type of mark-to-market in just that way: "On the day we do the deal, we determine five companies to use as comparables. That will be the model you use for your multiple. That list doesn't change for the time we own the company. We look at the general direction. That way, you know you're comparing apples to what you thought were apples at the start. Otherwise, you might think it's an apple but it's really a banana."[132] This approach of determining a few key comparisons for directional guidance requires careful consideration, communication across the firm and commitment to an unconventional approach.

Another interviewee believed that marking-to-market could demonstrate the impact of active investing and support the argument for long-term investing. "When the stock market went down, so did the private equity valuations. But most private equity groups manage their companies better than the average public company over a similar time frame. So the values came

131 Confidential interviews.

132 Confidential interviews.

back like a yo-yo due in part to the underlying companies' ability to outperform the market."[133]

Recommendations

The discussion above may discourage the reader: the measurement issues may appear to be intractable. But such a conclusion would be incorrect. There are some best practices that can be derived. The most central is a caution against excessive reporting. In many cases, more frequent reporting on more variables provides more information and better decision-making. With long-term investing, however, the effect is counterintuitive. More frequent reporting on more variables without a long-term context can provide misleadingly granular information that can skew a long-term investment strategy towards a short-term orientation.

Other important best practices we have observed are listed below. Most of them apply directly to the investment community, however, public policy-makers can play an important role by taking into account the potential impact, however unintentional, of regulations which may inadvertently work against long-term strategies.

These best practices can help investors focus on and execute against critical measures for a long-term strategy:

1. Commit to a long-term programme and use long-term measurements. Accepting and defining a long-term perspective can set expectations, as when Australia's sovereign wealth fund announced that performance would be measured over a rolling 10-year period although the fund's managers would report results on a quarterly basis.[134] The longer time horizon, along with a strategy to invest across six broadly defined asset classes, provided the fund with greater flexibility. Its results for the year ended June 30, 2011, surpassed its benchmark of 4.5% above Australia's Consumer Price Index by 4.7 percentage points.[135] Paradoxically, commitment to a defined programme provides flexibility to operate within it.
2. Focus on a limited number of metrics. In our interviews, a number of experts mentioned that they focused on a limited number of metrics. All were slightly different. It is therefore difficult to create a definitive list of performance metrics. The critical aspect, however, is that the individual determined the metrics that provide the information deemed necessary to make decisions. Reams of data that cannot be acted upon are not information but inconveniences. As one expert noted, referencing Einstein, "[Risk metrics] should be as simple as possible, but not too simple."[136]
3. Be directionally correct. Being "precisely wrong" rather than "roughly right" is a dangerous waste of energy. Although risk measurement is difficult, risk is ignored at our peril, as many investors discovered in 2008 and 2009. Being consistent and transparent about an approximate value for risk is preferable to either ignoring it or spending excessive energy on precise but short-lived quantifications.
4. Adopt a critical perspective. Many of the most successful long-run investors have something of an academic orientation, which leads to a process of periodic self-evaluation. Many of these funds will occasionally stop to consider the processes that led them to make investments that proved to be particularly successful or problematic. By moving away from traditional metrics of success (e.g. rate of return), they can get a perspective on their activities that is less likely to be affected by measurement issues.

There are also some more general lessons involving governance and culture that we can highlight for long-term investment success. As we note in the paper, these shape how an organization implements its investment strategy:

5. Encourage stable teams. A key element is to have talented well-staffed teams. If a group does not have a stable team, or lacks the resources to perform hands-on due diligence, it is unlikely to be regarded as a credible investor. A staff with considerable experience and a long tenure appears to have many benefits for long-term investing. Perhaps most significantly, their shared experiences provide a common background that helps them undertake complex and subjective investment decisions.
6. Design a system of rewards and protections for staff to encourage appropriate risk taking. Another critical characteristic of a good team is the ability to make its own decisions and establish a track record in an asset class over a reasonable period of time. This quality is very much linked to the rewards that staff members receive. Compensation does not seem to be a matter of paying more so much as providing the non-pecuniary benefits that come from being a

133 Confidential interviews.

134 Adamson, L. "Sovereign Wealth Funds Starting to Embrace Transparency," *Institutional Investor*, September 15, 2011.

135 *Annual Report: 2010-2011*, September 27, 2011. Melbourne: The Future Fund. http://www.futurefund. gov.au/data/assets/pdf_file/0017/4661/16853_FF_2011_AR_WEB_A212093.pdf, accessed January 23, 2012.

136 Confidential interviews.

part of a community, as well as a strong sense of mission associated with their work. In the ideal environment, staff will feel comfortable taking responsible risks in support of the institution's long-term future.

7. Create or attract a professional board. An active and professional board or investment committee can make an enormous difference in implementing a long-term investment strategy. The individuals should have a background suited to (although not necessarily expert in) institutional investment management. Many of the most successful institutions in this regard have been endowments, who typically draw from the ranks of alumni. The most effective of these bodies see their role not as micromanaging the decisions of the investment staff, but in setting broad policy directions, setting strategic investment goals and serving as an informed sounding board as the staff grapples with challenges. A board with a solid long-term orientation can ignore the noise of short-term market movements and focus on the predictors of long-term growth and opportunity. They also can help shelter the organization from pro-cyclical investment pressures. Board members need to serve extended terms to accomplish these goals. The governance of the investment effort can contribute to creating an environment that nurtures talent and encourages a long-term perspective.
8. Be a desirable investor. Building a brand as a desirable investor helps an organization access desirable fund managers and attract talented people. Prior to the financial crisis, many fund managers saw endowments and foundations as particularly desirable investors. Since the liquidity pressures that many experienced during the crisis, there has been a greater emphasis on having a variety of desirable investors. The key elements that seem to be associated with desirability include stability of the management team, considerable liquidity and resources and an ongoing organizational commitment to long-term investing.

Finally, the need for clear, consistent metrics for long-term investors has never been greater. Further work by researchers and practitioners toward such measurement techniques would provide returns not just to investors, but also to society as a whole by offering a clearer understanding of how a strategy is performing and whether and how it should be adjusted.

Appendix

Forty-five Elements of Fund Governance

We have reproduced the table from Ambachtsheer et al. referenced in Section III. The table can be used to help assess the effectiveness of a fund's governance processes and structure. The ranking reflects the executives' level of agreement with each statement in reference to their own organization.

2005 Rank	1997 Rank	Statements to be Scored by Pension Fund Executives
1	1	I can describe our mission (why we exist).
2	4	I can ensure the setting of clear, appropriate, understandable and well-communicated performance standards for our external investment managers.
3	10	I can describe our values (how we work together).
4	13	I can describe our fund's strategic positioning (how we provide better value to stakeholders than alternatives).
5	12	There is a high level of trust between my governing fiduciaries and the pension investment team.
6	11	Developing our asset mix required considerable effort on the part of myself and the governing fiduciaries and it reflects our best thinking.
7	25	I can describe our operational plan (what we are going to accomplish in terms of quality, quantity, timeliness and resource requirements).
8	22	Employee turnover within the pension fund organization is low.
9	3	My governing fiduciaries do a good job of representing the interests of plan stakeholders.
10	16	I can describe our vision of where we should be in the future.
11	14	There is a clean allocation of responsibilities and accountabilities for fund decisions between the governing fiduciaries and the pension investment team.
12	6	I ensure the setting of a clear, appropriate, understandable and well-communicated framework of values and ethics for our employees.
13	18`	We examine and improve our internal processes on a continuous basis.
14	19	Those reporting directly to me understand and share our vision, mission, values, strategic positioning, operation plan and resource plan.
15	7	People in our organization do what they say they will do.
16	9	People in our organization collaborate well on teams and projects.
17	24	My governing fiduciaries approve the necessary resources for us to do our work.
18	17	I ensure the setting of clear, appropriate, understandable and well-communicated performance standards for our employees.

2005 Rank	1997 Rank	Statements to be Scored by Pension Fund Executives
19	2	My superior investment performance reduces the future contributions of the underwriters of the pension promise (usually company shareholders or taxpayers for DB plans).
20	15	My governing fiduciaries set a clear, appropriate, understandable and well-communicated framework for values and ethics.
21	31	My governing fiduciaries hold me accountable for our performance and do not accept sub par performance.
22	29	I can describe our resource plan (obtaining and optimally utilizing the required human, financial and information technology resources).
23	5	I ensure that our organization does not accept sub par performance from our employees.
24	21	My organization uses its time efficiently (well focused and does not waste time).
25	8	My superior investment performance enhances benefit security and the potential for higher pensions for plan participants.
26	32	My governing fiduciaries understand and share our vision, mission, values, strategic positioning, operation plan and resource plan.
27	23	My organization uses its time effectively (deals with the right issues).
28	35	My governing fiduciaries have good mechanisms to understand and communicate with plan stakeholders.
29	39	I have clearly written documents describing our vision, mission, values, strategic positioning, operational plan and resource plan.
30	30	My governing fiduciaries do a good job of balancing over-control and under-control.
31	33	My governing fiduciaries set clear, appropriate, understandable and well-communicated standards for our organizational performance.
32	20	My governing fiduciaries and related committees use their time efficiently (focused and do not waste time).
33	26	I ensure that the organization has a good process for selecting, developing and terminating employees.
34	27	Managing the pension fund is perceived to be an important part of our sponsoring organization(s).
35	28	My governing fiduciaries and related committees use their time effectively (deal with the right issues).
36	38	I have the necessary people and budget to do the work.
37	34	I have the necessary managerial authority to implement long term asset mix policy within reasonable limits.
38	36	My governing fiduciaries have appropriate turnover (neither too high nor too low).
39	37	My governing fiduciaries have superior capabilities (relevant knowledge, experience, intelligence, skills) necessary to do their work.
40	40	Compensation levels in our organization are competitive.
41	41	My governing fiduciaries do not spend time assessing individual portfolio manager effectiveness or individual investments.
42	42	My governing fiduciaries examine and improve their own effectiveness on a regular basis.
43	44	I have the authority to retain and terminate investment managers.
44	43	Our fund has an effective process for selecting, developing and terminating its governing fiduciaries.
45	45	Performance based compensation is an important component of our organizational design.

Source: Ambachtsheer, K., Capelle, R. and Lum, H. "The Pension Governance Deficit: Still With Us." In *Rotman International Journal of Pension Management*, Fall 2008, 1(1): 14-21.

Selected Bibliography

Adamson, L. "Sovereign Wealth Funds Starting to Embrace Transparency." In *Institutional Investor*, September 15, 2011.

Aghion, P., Van Reenen, J. and Zingales, L. "Innovation and Institutional Ownership." *Fondazione Eni Enrico Mattei Working Papers, paper 488, 2010,* http://www.bepress.com/cgi/viewcontent.cgi?article=1500&context=feem, 2011.

Aizenman, J. and Glick, R. "Sovereign Wealth Funds: Stylized Facts about their Determinants and Governance." NBER Working Paper 14562, http://www.nber.org/papers/w14562, 2008.

Ambachtsheer, K. "How Should Pension Funds Pay Their Own People?" In *Rotman International Journal of Pension Management*, Spring 2011, Vol. 4, Issue 1.

Ambachtsheer, K., Capelle, R. and Lum, H. "The Pension Governance Deficit: Still With Us." In *Rotman International Journal of Pension Management,* Fall 2008, 1 (1): 14-21.

Amenc, N. and Martellini, L. "The alpha and omega of hedge fund performance measurement," EDHEC-MISYS Risk and Asset Management Research Center, 2003.

Amenc, N., Martellini, L. and Vaisse M. "Benefits and risks of alternative investment strategies." In *Journal of Asset Management*, 2003, 4(2): 96-118.

Amit, R., Liechtenstein, H., Prats, M. J., Millay, T. and Pendleton, L. "Single Family Offices: Private Wealth Management in the Family Context." *Knowledge@Wharton,* http://knowledge.wharton.upenn.edu/paper.cfm?paperID=1365, 2008.

Ang, A. and Kjaer, K. "Investing for the Long Run." SSRN, http://ssrn.com/abstract=1958258, 2011.

Ang, A. and Sorensen, M. "Risks Returns and Optimal Holdings of Private Equity." December 2011, *Working paper,* http://www2.gsb.columbia.edu/faculty/aang/papers/PrivateEquity.121511.pdf.

Balding, C. "A Portfolio Analysis of Sovereign Wealth Funds." SSRN, http://ssrn.com/abstract=1141531, 2008.

Barberis, N. and Thaler, R. "A Survey of Behavioral Finance." SSRN, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=327880, 2002.

Barton, D. "Capitalism for the Long-Term." *Harvard Business Review,* March 2011.

Bergstresser, D. and Philippon, T. "CEO Incentives and Earnings Management: Evidence from the 1990s." In *Journal of Financial Economics*, June 2006, 80(3): 511-529.

Bergstresser, D., Rauh, J. and Desai, M. "Earnings Manipulation, Pension Assumptions and Managerial Investment Decisions." In *Quarterly Journal of Economics*, February 2006, 121(1): 157-195.

Bolton, P., and Samama, F. "L-Shares: Rewarding Long-term Investors." Working papers of Columbia University. http://cgt.columbia.edu/files/papers/Bolton_Samama_L-Shares--Rewarding_Long-Term_Investors.pdf, August 2010.

Bortolotti, B., Fotak, V. and Megginson, W. "The Financial Impact of Sovereign Wealth Funds Investments in Listed Companies." SSRN, http://ssrn.com/abstract=1108585, 2008.

Bortolotti, B., Fotak, V., Megginson, W. and Miracky, W. "Sovereign Wealth Fund Investment Patterns and Performance." Fondazione Eni Enrico Mattei Working Paper 22, 2009.

Brown, J., Dimmock, S., Kang J. and Weisbenner, S. "Why I Lost My Secretary: The Effect of Endowment Shocks on University Operations." NBER Working Paper 15861, http://www.nber.org/papers/w15861, May 29, 2010.

Canada Pension Plan Investment Board Annual Report. June 30, 2010 and June 30, 2011. Toronto: Canada Pension Plan Investment Board, http://www.cppib.ca/files/PDF/ CPPIB_AR_2010_EN_Online.pdf and http://www.cppib.ca/files /PDF /CPPIB_AR_2011_EN_ Print.pdf.

Clark, G., Caerlewy-Smith, E. and Marshall, J. "Pension Fund Trustee Competence: Decision-Making in Problems Relevant to Investment Practice." In *Journal of Pension Economics and Finance*, 2006, 5: 91-110.

Clark, G. and Urwin, R. "Best-Practice Pension Fund Governance." In *Journal of Asset Management*, 2008, Vol. 9.

Cremers, K and Petajisto, A. "How Active is Your Fund Manager? A New Measure That Predicts Performance." In *Review of Financial Studies,* 2009, 22 (9): 3329-3365.

De Bondt, W.F.M. and Thaler, R. "Does the stock market overreact?" In *Journal of Finance,* 1985, 40: 793-808.

De Bondt, W. F. M. and Thaler, R. "Further evidence on investor overreaction and stock market seasonality," In *Journal of Finance,* 1987, 42: 557-581.

Dewenter, K. L., Han, X. and Malatesta, P. H. "Firm Values and Sovereign Wealth Fund Investments," In *Journal of Financial Economics*, November 2010, 98 (2): 256-278.

Fama, E. F. and French, K. R. “Common Risk Factors in the Returns on Stocks and Bonds.” In *Journal of Financial Economics,* 1993, 33 (1): 3–56.

French, K.R. “Presidential Address: The Cost of Active Investing.” In *Journal of Finance*, August 2008, 63 (4).

Fung, W. and Hsieh, D. A. “Benchmarks of Hedge Fund Performance: Information Content and Measurement Biases.” In *Financial Analysts Journal*, 2002, 58 (1).

Fung, W. and Hsieh, D. A. “A Primer on Hedge Funds.” In *Journal of Empirical Finance,* 1999, 6: 309-331.

Annual Report: 2010-2011, September 27, 2011. Melbourne: Future Fund. http://www.futurefund. gov. au/ data/assets/pdf_ file/0017/4661/16853_ FF_2011_AR_WEB_ A212093.pdf.

Getmansky, M. “The Life Cycles of Hedge Funds.” *Market Technicians Association Working Paper,* May 2004, http://docs.mta. org/pdfs/ Getmansky.pdf.

Global Pension Statistics, OECD, www.oecd.org/daf/pensions/gps, 2010.

Gompers, P. and Lerner, J. *The Money of Invention.* Boston: Harvard Business School Publishing, 2001.

Grossman, S. J. and Hart, O. D. “Takeover Bids, the Free-Rider Problem, and the Theory of the Corporation.” In *The Bell Journal of Economics*, Spring 1980, 11 (1).

Hardymon, F., Lerner, J. and Leamon, A. “Canada Pension Plan Investment Board,” *Harvard Business School Case No. 9-809-073*. Boston: HBS Publishing, 2008.

Hess, D. “Protecting and Politicizing Public Pension Fund Assets,” In *U. Cal-Davis Law Review,* 2005, 39: 187-227.

Ilmanen, A. *Expected Return.* New York: J. Wiley & Sons, 2011.

Kaplan, S. N. and Schoar, A. “Private Equity Performance: Returns, Persistence and Capital Flows.” In *Journal of Finance*, 2005, 60 (4): 1791-1823.

Kochard, L. E. and Rittereiser, C. M. *Foundation and Endowment Investing: Philosophies and Strategies of Top Investors and Institutions.* New York: Wiley Finance, 2008.

Korajczyk, R. and Sadka, R. “Pricing the commonality across alternative measures of liquidity.” In *Journal of Financial* Economics, 2008, 87: 45-72.

Kortum, S. and Lerner, J. “Assessing the contribution of venture capital to innovation.” In *RAND Journal of Economics*, Winter 2000, 31 (4): 674–692.

Lerner, J. and Leamon, A. “Yale University Investments Office: February 2011.” *Harvard Business School Case No. 812-062.* Boston: HBS Publishing, 2011.

Lerner, J. “A Note on Private Equity Partnership Agreements.” *Harvard Business School Case No. 294-084.* Boston: HBS Publishing, 1994.

Lerner, J., Hardymon, F. and Leamon, A. “Between a Rock and a Hard Place: Valuation and Distribution.” *Harvard Business School Case No. 803-161.* Boston: HBS Publishing, 2003.

Lerner, J., Hardymon, F., Angella, F. and Leamon, A. “Grove Street Advisors.” *Harvard Business School Case No. 804-050.* Boston: HBS Publishing, 2004.

Lerner, J., Leamon, A. and Hardymon, F. *Private Equity, Venture Capital, and the Financing of Entrepreneurship.* New York: J. Wiley & Sons, 2012.

Lerner, J., Schoar, A. and Wongsunwai, W. “Smart Institutions, Foolish Choices? The Limited Partner Performance Puzzle.” In *Journal of Finance*, 2007, 62 (2): 731-764.

Lerner, J., Schoar, A. and Wang, J. “Secrets of the Academy: The Drivers of University Endowment Success.” In *Journal of Economic Perspectives*, 2008, 22 (3): 207-222.

Lo, A. “Risk Management for Hedge Funds: Introduction and Overview.” In *Financial Analysts Journal*, November/December 2001, 57 (6).

Long, A. M. and Nickels, C. J. *“A Private Investment Benchmark.”* Paper given at AIMR Conference on Venture Capital Investing, February 13, 1996, http://alignmentcapital.com/ pdfs/ research/ icm_aimr_ benchmark_1996.pdf.

Lopez-de-Silanes, F., Phalippou, L. and Gottschalg, O. “Giants at the Gate.” *EDHEC Risk Institute Working Paper*, January 2011, http:// www.edhec-risk.com/edhec_publications/all_publications/ RISKReview.2011-01-18.2122/attachments/ EDHEC_Working_ Paper_ Giants_at_the_Gate.pdf.

Mitchell, O. S., Piggott, J. and Kumru, C. “Managing Public Investment Funds: Best Practices and New Challenges.” *NBER Working Paper No. 14078*, http://www.nber.org/papers/w14078 August 2008.

Myners, P. “Institutional Investment in the United Kingdom: A Review.” http://www.hm-treasury.gov.uk/media/2F9/02/31.pdf, 2001.

Pastor, L. and Stambaugh, R. “Liquidity Risk and Expected Stock Returns.” In *Journal of Political Economy*, 2003, 111: 642-685.

Raimondo, G. “Truth in Numbers: The Security and Sustainability of Rhode Island’s Retirement System.” Rhode Island General Treasurer, June 2011.

Shiller, R. J. *Irrational Exuberance*. New York: Random House, Inc., 2005.

Stanko, D. “Polish Pension Funds, Does the System Work?” *Pensions Institute: Discussion Paper PI-0302,* January 2003, www.pension-institute.org.

Stewart, F. and Yermo, J. “Pension Fund Governance: Challenges and Potential Solutions.” *OECD Working Papers on Insurance and Private Pensions*, No. 18, OECD publishing, 2008, 10.1787/241402256531. http://dx.doi.org/10.1787/241402256531.

Thaler, R. and Sunstein, C. *Nudge: Improving Decisions about Health, Wealth, and Happiness.* New York: Penguin, 2009.

Vassalou, M. “News related to future GDP growth as a risk factor in equity returns.” In *Journal of Finance,* April 2003, 68 (1): 47-73.

Yale Endowment Annual Report, 2010. New Haven: Yale University Investments Office.

The Future of Long-term Investing, January, 2011. New York: World Economic Forum USA Inc.

Green Investing: Toward a Clean Energy Infrastructure, January, 2009. New York: World Economic Forum USA Inc.

Green Investing 2010: *Policy Mechanisms to Bridge the Financing Gap*, January, 2010. New York: World Economic Forum USA Inc.

Green Investing 2011: Reducing the Cost of Financing, April, 2011. New York: World Economic Forum USA Inc.

Positive Infrastructure: A Framework for Revitalizing the Global Economy, 2010. Geneva: World Economic Forum.

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