

White Paper

Innovations in Long-Term Capital Management The Practitioner's Perspective

April 2016





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**World Economic Forum White Paper
Innovations in Long-Term Capital Management: The Practitioner's Perspective**

April 2016

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Acknowledgements

Foreword

The future of investing lies in the ability to create new sources of wealth rather than simply recycle claims on existing wealth.

This will entail:

1. Recognizing where technology, demographics and inequality enable defensible profits, and where they do not
2. Mitigating the greatest risk to sustainable new wealth creation – namely, the insidious shortening of investment horizons that has been synonymous with rapid informational efficiencies

To increase their probability of success in this future, asset owners are investing in their own capability and resources. From this increasingly self-sufficient and sustainable platform, they are innovating to both increase their operational efficiency and identify the areas in which their comparative advantages enable this wealth creation.

Technology has been both a forcing variable and an enabler in this process. It has commoditized previously costly inputs, increased real-time portfolio risk transparency and enabled greater tailoring of investment outcomes to beneficiary needs.

In this White Paper, the Global Agenda Council on the Future of Investing has documented and compared examples of how asset owners have invested in their own knowledge capital (and some of the resulting changes in their investment programmes), and the implications that flow through the entire industry supply chain. Across the sample surveyed, innovations could be broadly classified into three clusters. While none radically transforms the basic tenets of investing, all leverage them in ways that enable a quiet evolution from passive recipients of returns – generated through trading claims on existing wealth – towards proactive seekers of tailored opportunities to create new wealth with prudence and discipline.

1. The first cluster innovates by leveraging first-mover advantage.

In so doing, these innovations are creating new products and markets by satisfying gaps in:

- a. the availability of long-term financing
- b. non-financial risk measurement and benchmarking
- c. connectivity outside the traditional investment manufacturing ecosystem to become, for example, local partners to companies, start-ups and project developers

2. The second cluster innovates by leveraging the tenet that diversification relates to *risk*, not assets.

In so doing, they are focusing on risk as defined by potentially shifting correlations, common forcing factors or thematic, scenarios in the tails of potential outcomes and idiosyncratic risk, unconstrained by asset class taxonomy.

This is affording more control to asset owners and improving their success probabilities.

3. The third cluster innovates to remarry asset ownership with control.

They make every relationship matter *to their own probability of success*. This could be expected to underwrite the quality and liquidity of private assets by facilitating long-horizon decision-making and, ultimately, to more adequately satisfy beneficiaries' unique requirements.

While the approach taken by each institution was different, five principles of effective investment governance were common to every organization. All the innovators had:

1. *Strong organizational awareness.* The simple but powerful realization that the way the organization is structured will inevitably affect its ability to create, maintain and leverage knowledge adaptively.
2. *Clarity and consistency of purpose.*
3. *Candid self-awareness.* This is reflected in a realistic assessment of areas of comparative advantage (to which they purposefully resource) and areas of weakness (which are either avoided altogether or outsourced).
4. *Transparency.* This supports accountability that, over time, builds credibility with all stakeholders and underpins the appropriate extension of the investment horizon.
5. *A culture of learning and recognizing failure early on.* This enables organizational flexibility and empowerment from the bottom up.

Alison Tarditi

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Australia; Chair (2014-2015) and Member, Global Agenda Council on the Future of Investing

Introduction

In 2014, the total value of professionally managed assets around the world grew to a record \$74 trillion (The Boston Consulting Group, 2015), on par with nearly a year of global gross domestic product. These assets, managed within institutional capital pools on behalf of pensioners, insurance policyholders, foundations, citizens and savers worldwide, contribute directly towards the long-term welfare and self-sufficiency of millions of individuals.

To sustain their capacity to meet the investment objectives of their beneficiaries and other stakeholders, these institutional capital pools – particularly those responsible for public monies, such as pension funds, endowments and sovereign wealth funds – have refined their investment processes, responded to many forces (including the most recent move to a low-rate regime) and developed new ways to generate returns while prudently managing risk. In the decade preceding 2016, institutional investors have pursued various innovations to achieve efficiency gains and improve on their probability of successfully fulfilling their mandates.

In light of the resulting quiet evolution in the industry, the Global Agenda Council on the Future of Investing sought to provide a practitioner's perspective on different ways that the institutional investment community has worked to adapt to myriad forces reshaping financial markets, economic behaviour and institutional design. The goal was to understand both the circumstances that led to these innovations and the ways barriers were addressed during the implementation process. To do so, the council surveyed 21 major asset owners and asset managers from around the globe and identified common themes driving innovation. Many of these reflect parallel developments in, and are applicable to, a variety of other business sectors. The council particularly focused on seven in-depth case studies that showcased situations that are relevant to long-term institutional investors today.

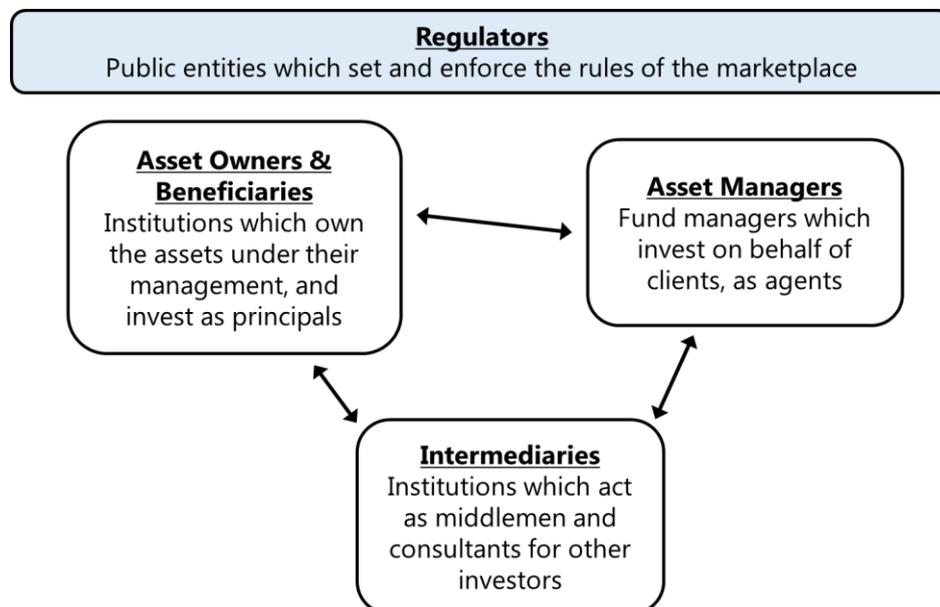
The remainder of this report is structured as follows.

- **Sections I and II** provide the organizing framework of the investment ecosystem and the investment management value chain
- **Section III** describes the major forces currently stimulating investment innovation
- **Sections IV and V** discuss the key trends in investment management and how they are prompting transformation throughout the ecosystem
- **Section VI** lays out the characteristics common to all the investment organizations identified herein as innovative
- **Section VII** presents and classifies the case studies carried out by the Global Agenda Council on the Future of Investing

I. Institutional Investment Ecosystem

Four primary stakeholders make up the institutional investment ecosystem (Figure 1):

Figure 1: Institutional Investment Ecosystem



Source: World Economic Forum

- **Asset owners and beneficiaries** are institutions that are the legal owners of the assets under their management and receive the benefits associated with ownership, as principals. Examples of asset owners include pension plans, insurance companies, foundations, endowments, family offices and sovereign wealth funds. Asset owners typically hold multi-asset portfolios and make asset allocation decisions based on their investment objectives, market outlook and constraints. They are fiduciaries to their beneficiaries. They may choose to manage assets directly using internal investment teams, or outsource investments to external asset managers, or some combination of both.
- **Asset managers** are institutions that manage investments on behalf of clients, as agents, without taking legal ownership of the assets under management. Asset managers invest client funds into securities according to pre-established investment guidelines, typically laid out in investment management agreements or fund constituent documents. Asset managers are required to act as fiduciaries to their clients. A large number of asset management companies – over 20,000 in the United States (Investment Company Institute, 2015) and Europe (European Fund and Asset Management Association, 2014) alone – offer an extensive range of investment services in traditional and alternative markets, spanning broad-based to highly specialized investment mandates.
- **Intermediaries**, such as institutional investment consultants and registered investment advisers, are institutions that provide advisory services to asset owners on asset allocation and manager selection. Intermediaries also conduct due diligence on asset

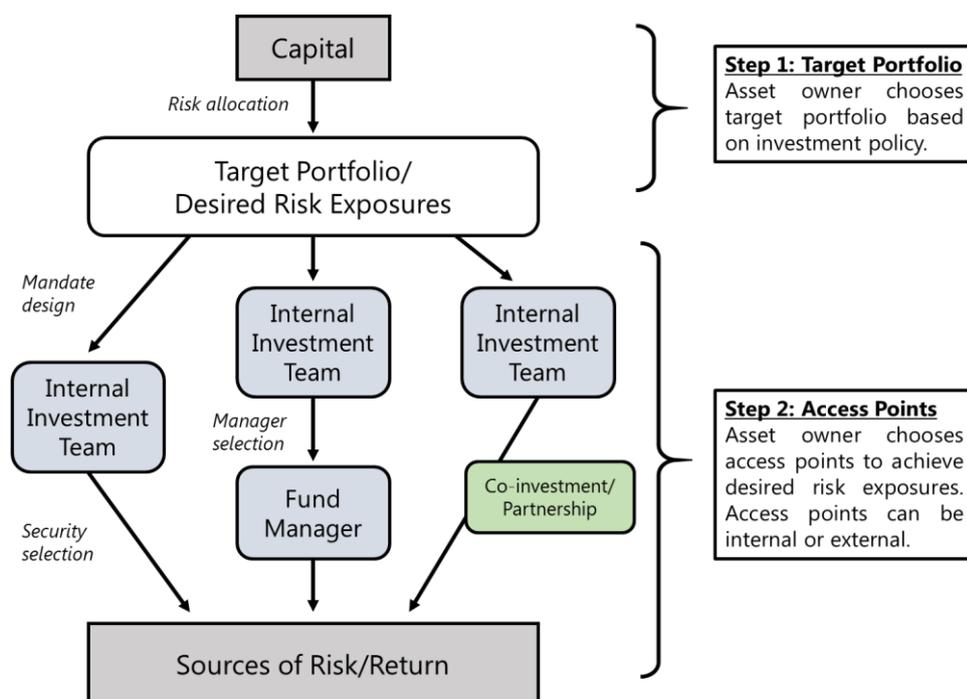
managers and financial products, offering independent advice that can either represent or augment asset owners' internal resources and expertise.

- **Regulators** are public authorities and government agencies responsible for setting, monitoring and enforcing the requirements, restrictions and guidelines governing financial institutions. Typically, regulatory agencies aim to set rules that maintain market confidence, ensure financial stability, protect customers and reduce financial crime. Notable financial regulatory agencies include the Securities and Exchange Commission and the Financial Industry Regulatory Authority in the United States, the Financial Conduct Authority in the United Kingdom, the Bank for International Settlements and the European Insurance and Occupational Pensions Authority.

II. Investment Management Value Chain

The core investment purpose of every asset owner is to preserve the real value of its aggregated pools of capital and grow them sustainably to meet its end objectives. This involves generating an appropriate return for each unit of risk purchased with that capital. This can be achieved through various organizational structures, involving both internal and external resources. Figure 2 visualizes this process, in a series of decisions referred to here as the investment management value chain.

Figure 2: Investment Management Value Chain



Source: World Economic Forum

The value chain is a two-step process

To implement its investment policy, the asset owner must first establish its target portfolio(s). A portfolio is informed by the organization's investment policy, which is a statement that reflects the organization's risk tolerance, return objectives and constraints. The investment policy is then translated into a target portfolio. This is done by choosing a target mix of diversified investment risks (accessed via investing in asset classes such as bonds and equity) through a process of risk allocation.

Second, the asset owner chooses access routes by which to implement its targeted risk allocation. Access and implementation can be via internal (in-house investment professionals and operations resources) and/or external (intermediaries) teams, as long as they have an adequate probability of generating the intended risk exposures and net returns, after accounting for costs and fees. Asset owners must decide on how best to implement different risk exposures. Some sources of return can be accessed using simple instruments such as index futures; others require the build-up of internal competencies, and others still rely on working with asset managers.

The fundamental challenge for the asset owner is to make a priori assessments of the relative value propositions offered by alternative access routes to the same types of

underlying investment risks. For example, an asset owner has to choose between the equity risk contained within a passive index exposure and the equity risk within a private-market opportunity.

Developments within the industry (as it matures) and external to it (via technological innovation) have resulted in greater transparency of the risks and costs within the investment ecosystem, particularly by highlighting common underlying risk factors in the large variety of investment products available. They have also increased the asset owner's ability to address these risks and costs, through the design and more direct management of its access channels. To increase the probability of investment success (defined as achievement of the asset owner's investment objectives), activities are being aimed at reducing inefficiencies along the investment management value chain.

III. The New Investment Landscape

Four key forces have led investors to become significantly more conscious of the investment management value chain and the need for innovation.

1. Macro environment

The culmination of a very long credit expansion cycle in the global financial crisis of 2008 reset the trajectory of global economic policy and growth. Persistently low interest rates, persistently high debt burdens and greater policy intervention are widely expected to describe the investment context of the next decade.

Over the past seven years, low interest rates have cut asset owners' incomes and, by lowering discount factors, inflated the present value of their (explicit or implicit) long-term liabilities. Moreover, for many defined benefit plans, low returns have been compounded by the failure to receive promised inflows, in the case of numerous pensions in the United States and elsewhere, or increased outflows to meet social demands.

In this environment, asset owners have been, and likely will continue to be, compelled to be more conscious of leakages along the value chain, such as costs and fees, as these consume a greater proportion of a relatively lower total return.

2. Regulatory risk

The aftermath of the global financial crisis saw the introduction of myriad new rules governing the provision of investment services by asset managers and other investment firms, particularly in terms of market structure and investor protection. Notable examples include:

- The Markets in Financial Instruments Directive (MiFID) in the European Union (EU), which lays out extensive reforms for market activities, the use of derivatives and capital requirements
- The Undertakings for Collective Investments in Transferable Securities (UCITS) directive, which provides a host of rules over UCITS-compliant investment vehicles that can be offered in the EU
- The Basel III Accord, the Dodd-Frank Act and Solvency II, which substantially increase capital requirements at banks and alter their market-making and trading capabilities
- A host of national policy initiatives

The move to a more risk-based solvency approach internationally strengthens the long-term stability of the financial system. It also reverberates along the investment supply chain, with knock-on effects either directly or indirectly to investors and their beneficiaries. The regulatory interventions are altering the size of the investible universe for some players, changing cost structures for all and redefining the nature of the relationship between counterparties. As the rules change, investors are obliged to innovate to stay current and effective.

3. Industry life stage

Independent of these macro forces, the investment management industry itself has been maturing in its development of people, market intelligence and governance. Over the last two decades, these tendencies have been accelerated by a growing awareness of the scale and importance of asset owners' aggregated savings pools to their ultimate stakeholders – namely, governments, pensioners and plan beneficiaries.

To this end, many of the larger and/or progressive endowments, sovereign wealth and pension funds have invested heavily in their own capability and resources. They have implemented governance frameworks and risk-management systems that now enable greater autonomy to implement professional standards of investment management. In the case of public-sector-defined benefit funds, this has led to less direct political influence to invest in politically favoured projects. These changes have been reflected within organizational structures and, in many of the cases examined in this White Paper, have resulted in increased real-time investment decision-making by internalized professional investment teams.

The survey for this study suggests that as asset owners invest more in their own knowledge management and organizational design, they become both more conscious of the inefficiencies that might hinder them from achieving their investment objectives, and more enabled to address them. For example, as stewards of public funds, many of the asset owners surveyed recognize the structural limitations placed on their organizations' compensation and incentive structures. In order to compete effectively for investment talent, they have generally responded by capitalizing on non-monetary benefits, such as long-term and broad opportunities for training, development and advancement, greater professional responsibility earlier in career life cycles, and work-life flexibility.

The asset owners surveyed have also given much consideration to designing long-term incentive systems that align performance-based rewards with the long-term investment horizon of their beneficiaries and stakeholders (see, for example, the Rotman International Journal of Pension Management's case study on the Canada Pension Plan Investment Board [Ambachtsheer, 2011]).

4. Technological innovation

The widespread adoption of transformative and generally disinflationary new technologies in the financial sector has exponentially increased the scale and speed of analytical capability.

Modern, networked computers provide asset owners with a range of data and analytical tools, such as portfolio construction models and risk management tools, which were previously obtainable only from highly specialized outsourced firms. Brought in-house through on-demand bespoke programmes, web-based interfaces, mobile applications and software plug-ins, these systems deliver efficiency gains, cost reductions, more flexible access and customization benefits directly to asset owners.

Technology has enabled the asset owners surveyed to analyse their own portfolios in real time, better understand the risks they face under different investment strategies, respond accordingly, and identify and reduce value chain inefficiencies.

IV. Trends in Asset Owner Innovation

Many asset owners recognize that in order to sustainably reduce inefficiencies along their investment management value chain, they must first improve their own processes and capacity for innovation.

Governance first

Reducing inefficiencies begins with establishing robust governance structures at the top of the house. This reflects the simple but powerful realization that how an organization is structured will inevitably affect its ability to create, maintain and leverage knowledge adaptively.

The institutions surveyed have worked closely with their stakeholders (e.g. boards, members and constituents) to set clear, actionable investment policy statements that accurately reflect the investment beliefs, long-term objectives, risk tolerance, time horizon and benchmarking process of the organization. An extensive body of research precedes this White Paper (e.g. *Long-Term Portfolio Guide* [Focusing Capital on the Long Term, 2015]), speaking to the importance of investing within the context of institutional endowments and limitations. Innovative asset owners know this, and have dedicated significant resources towards improving internal governance standards, crafting precise investment policy statements and obtaining the consistent and focused buy-in of all stakeholders. Some, like the Commonwealth Superannuation Corporation in Australia, have developed a detailed investment delegation framework that directly empowers their internal investment teams to take real-time investment decisions. Such decisions are taken within well-defined and transparent boundaries that reflect the organizations' risk appetite and objectives. Others have instituted investment committees, to which their main boards delegate decision-making capacity.

Diversification relates to risk, not assets

Investment policy is implemented through risk allocation, portfolio construction and ongoing management. To this end, and recognizing that no single best measure of risk exists, the asset owners surveyed are increasingly using a larger and more diversified suite of quantitative and qualitative tools, as well as measures to assess the adequacy of their portfolio.

These include quantitative models, which derive market-implied returns and allow for confidence-adjusted view overlays; scenario-based calibrations that envision a large range of potential investment conditions and their likely impact on portfolio outcomes; and tail-risk analysis (e.g. customized conditional value-at-risk models). A growing number of asset owners are adopting a “total portfolio” approach that emphasizes assessing individual investments and asset classes in the context of their marginal risk contributions at the total fund level, as opposed to sub-sector or asset-class benchmark levels.

Additionally, most of the asset owners surveyed now describe their risk assessment processes as “holistic”. Non-financial as well as traditional financial risk factors are explicitly considered in any assessment of individual investment opportunities or of their portfolios as a whole. Non-financial risks are described as those that affect an asset's social licence to operate (i.e. environmental, social and governance risks) or pose reputational risk to the asset owner; they also include idiosyncratic factors that tend to rise with an opportunity's complexity (e.g. private-asset structuring arrangements). The pension funds ATP (case study: Rethinking Asset Allocation) and APG (case study: Responsible Investing in Real Estate) provide examples of how some asset owners, having become more conscious of non-

traditional risks, now integrate them into their portfolio construction and manager or asset selection processes.

Implementation remarries ownership and control

Asset owners have grown more conscious of the importance of effectively executing their investment strategies. *How* assets are accessed and ideas are implemented can be as important as – or even more important than – *which* assets or ideas are accessed.

Transparency, control and cost management matter, particularly in a potentially low-return environment. To this end, a number of the larger organizations surveyed have substantially strengthened and increased their internal investment resources to enable direct execution. Setting up internal teams carries significant fixed costs and operational risks, so even the larger investors surveyed have learned to be judicious when expanding internal operations into new markets. Once they decide to invest in a new strategy, however, having an internal investment team is one way to enable customization and management flexibility over the asset's lifetime. The Canada Pension Plan Investment Board (CPPIB) (case study: Thematic Investing) and the University of California Endowment (case study: Investing in Innovation) are examples of strategies being implemented by internal teams; they are specifically tailored to the needs and traits of their organizations and deliver the ability to manage and control assets throughout the investment's life cycle.

Not many of the asset owners surveyed have internalized all of their investment implementation. Economies of scale exist in implementing investment strategies, and in many cases external managers provide more cost-effective solutions. However, where execution is through external third parties, they have all still sought to increase transparency, customization and control over their investments and contracted services.

At the very least, asset owners are imposing stricter reporting standards on external investment managers. For example, public-plan sponsors, such as the New York City Retirement Systems, now demand "full transparency" on the fees charged by their fund managers (Martin, 2015a). Some of the asset owners surveyed in this White Paper, such as the Future Fund in Australia, require asset-level look-through transparency as a precondition for investing with an external manager. Many also defer to the collective bargaining power offered by industry organizations, such as the Alignment of Interests Association, an organization for investors in hedge funds, and the Institutional Limited Partners Association in private equity. They do so to set minimum acceptable standards and best practices for managers' economic and liquidity terms, documentation and governance, and transparency and disclosure policies.

A similar desire for greater transparency and control is also occurring in public equity holdings. Many investors surveyed were looking to take a more active and engaged ownership role with public companies, whether collectively or individually. Previously, the highly dispersed shareholder base saw little shareholder influence over boards and management as to what mattered to those shareholders; now, many large asset owners implement policies of responsible and active ownership by engaging with company management and shareholder voting.

Extending connectivity outside the traditional investment ecosystem

Many of the asset owners surveyed have developed novel ways to mitigate agency risk, broaden their investment opportunity set and manage costs. Programmes for co-investing, seed capital and connectivity outside the traditional investment manufacturing ecosystem are all examples of these innovations. These non-traditional relationships exist where internal and external investment implementation intersect.

The past decade has seen significant growth in private equity co-investments. Asset owners make large direct investments in private deals in conjunction with third parties, and thereby reduce their total cost of access. These third parties have traditionally been asset management firms (Black & Lee, 2015). But many of the asset owners surveyed are now forming local partnerships with operational entities outside the traditional investment manufacturing ecosystem. New partners include listed companies, start-ups and project developers. Such relationships offer asset owners improved economics, competitive access and a broader opportunity set for transferring knowledge.

Some asset owners are seeking to exploit the intersection of first-mover advantage and cost management through seed-capital programmes. Nascent funds receive seed capital from asset owners in exchange for lower fees, better terms, more transparency and greater access, or by making large commitments in exchange for a “quantity discount”.

Such programmes are presently being applied at funds such as the Public Sector Pension Investment Board of Canada (Daniel Garant, personal interview, 2015) and PensionDanmark (case study: Direct Infrastructure Investing). But these programmes can have unintended consequences through reduced investment flexibility, increased risk concentration and diluted focus of internal resources.

Regardless of whether the asset owners surveyed are deploying capital to traditional third-party asset managers or via some more innovative partnerships, the consistent trend is to fewer and more sizeable relationships. This reflects an increased awareness that in order to be effective and sustainable, the number of external relationships has to match an asset owners’ internal capacity to review and manage the resulting investments. As a result, all of the asset owners reported having culled their external relationships and increased the size of their mandates to a smaller collection of investment partners. For example, the California Public Employees’ Retirement System has reduced its external relationships by over 100 managers (Martin, 2015b). Similarly, the New Zealand Superannuation Fund seeks to build relationships only with fund managers that offer flexible, longer-horizon investment mandates (case study: Manager Flexibility).

This trend is corroborated by asset managers (e.g. Carlyle), who describe the growing number of investors requiring bespoke mandates and separately managed accounts as part of an overall strategy to extract more tailored value from a smaller number of relationships (Mike Asprey, personal interview, 2015). Once again, these relationships involve customized investment agreements, larger capital allocations and longer time horizon – and with these features come attendant risks.

V. Relationships in the Investment Ecosystem

These trends have led to changes in the relationships between asset owners, advisory intermediaries and asset managers. Most notably, larger-scale asset owners are becoming increasingly self-sufficient in what they can do in-house and more precise about measuring the value proposition offered by external agents. They are also becoming more cognizant of the benefits of controlling assets they intend to hold over very long time horizons. All these changes have been enabled by asset owners' investment in their own capability to innovate – through improved governance, fit-for-purpose resourcing and clarity of purpose.

This has generally resulted in fewer, more customized external manager relationships rather than complete disintermediation of asset management. Most of the larger global asset owners now implement some variant of the “Canadian model”, whereby they build up substantial internal expertise in targeted areas of comparative advantage and insource that portion of their investment management value chain. But complete internalization of the entire investment manufacturing chain is still considered counter to the dominant trend of identifying and exploiting comparative advantage.

What has changed is asset owners' ability to identify, price and react to inefficiencies within their supply chain. This should support innovation across the investment ecosystem, enable capital to be efficiently allocated to previously unexploited opportunities and deliver lower-risk outcomes to the ultimate beneficiaries.

VI. Prerequisites for Innovation

While the approaches taken by the asset owners surveyed are all different, they have two common characteristics.

First, they all seek to deliver more customized net-return outcomes to their beneficiaries and stakeholders (with greater risk mitigation). The activity is focused and leverages institutional comparative advantage by controlling the life cycle of their investments and eliminating inefficiencies in supply-chain costs.

Secondly, four principles of effective investment governance were common to each of the organization studies:

1. Clarity of purpose

Any organization requires a clear understanding of its objective, how that objective relates to its stakeholders and beneficiaries, and how success and failure will be recognized. This clarity takes on specific forms among effective and innovative asset owners. In the innovative asset owner organizations surveyed, risk appetite, constituent demographics, investment horizon, investment universe and constraints were some of the key inputs for determining their net-return objectives. Such objectives and their implications for shorter-term performance were consistently understood and accepted across the organization and its governing bodies, and were prerequisites for a culture of innovation and appropriate risk-taking. All the organizations studied also exhibited an acute awareness of organizational maturity, scale and liquidity profile, with specific respect to how different investment programmes are effective in different settings.

For example, asset owners with smaller asset bases recognized that they are at a natural disadvantage bidding against very large pension or sovereign wealth funds for very small (non-governance) stakes in very large private deals. As a result, the organizations studied have refocused their efforts on their own areas of comparative advantage (e.g. small-cap local equities or smaller-scale, social infrastructure opportunities). Liquidity profiles are explicitly considered as a determinant of investment universes and ongoing portfolio-management constraints. Multigenerational sovereign wealth funds with no explicit liabilities (such as GIC) can take on substantially more market and illiquidity risk than mature pension funds that pay out a proportion of assets each year (such as ATP). These characteristics are explicitly reflected in the organizations' objectives, resourcing and investment opportunity sets.

2. Strong organizational self-awareness

At the core of innovative institutions is the simple yet powerful realization that how an organization is structured will inevitably determine its ability to create, maintain and leverage knowledge adaptively. This is reflected in a realistic assessment of the organization's areas of comparative advantage, to which it purposefully devotes resources, and its areas of weakness, which are either outsourced or excluded from its investable universe. It is easy for investors to attempt to do too much against a backdrop of financial markets saturated with instruments and opportunities. Successful organizations take stock of their endowments, enumerate their competitive edges and admit their weaknesses, then focus their efforts on their biggest comparative advantages.

The organizations surveyed in this White Paper provide examples of how such self-awareness is attained. Many, such as PensionDanmark, were forced to search for new

investment opportunities after the global financial crisis. APG and Caisse de Dépôt et Placement du Québec (CDPQ) were encouraged by their beneficiaries to consider new investment programmes that could affect their welfare. The University of California held its pre-existing venture capital programme highly accountable and realized that its competitive advantage in venture capital investing lay elsewhere.

3. Transparency and purposeful resourcing

In supporting accountability, transparency builds credibility over time with all stakeholders and supports appropriate extension of the investment horizon. The organizations surveyed typically referenced transparent processes and outcomes, together with adequate internal resources, as prerequisites for effective real-time decision-making.

Transparency allows stakeholders to have confidence in the decision-making processes underlying long-term decisions, particularly when an investment programme comes under question in the face of short-term volatility. This is particularly important for long-horizon investors. Having an investment strategy suspended when sponsor, board or management becomes uncomfortable with short-term volatility completely negates the investor's key advantage: not being forced to sell at a bad time. Best practices associated with transparency include predetermined risk parameters, thorough documentation of major investment decisions, real-time updates to stakeholders of failures and successes, and proactively mitigating failure. Purposeful resourcing across these organizations also means saying "no" to opportunities that fall outside the skill base or the organization's comparative advantages.

4. A culture of learning and recognizing failure early on

Innovation *and* investing entail uncertainty and sometimes end in failure. Organizations that attempt innovative investment programmes must be prepared for a number of new efforts that will fail. The organizations surveyed focus on robust operational processes that allow for rapid impact assessment, iterative learning and the conscious culling or tweaking of innovations that don't succeed. In an effort to build this culture, many institutional investors have implemented incentive structures that reward innovative efforts and collaborative processes rather than focusing on avoiding failure.

Building up these capabilities has associated costs and does not take place overnight. All the organizations studied recognize the importance of setting realistic expectations and preparing stakeholders for potential risks when embarking on new initiatives. To maintain their probability of success in delivering to their investment objectives over the long term, they are all investing in their own capabilities via robust governance, efficient resource management (technology and skilled, fit-for-purpose human capital) and transparent measurement of both success and failure.

VII. The Consequences of Asset Owner Innovation

Asset owners are transforming from being passive recipients of returns generated through trading claims on existing wealth to proactive seekers of tailored opportunities to create new wealth with prudence and discipline. In so doing, they are (1) creating fit-for-purpose investments and addressing market failure, (2) diversifying ecosystem risk and (3) making relationships matter and extending their reach beyond the traditional investment manufacturing ecosystem.

1. Creating fit-for-purpose investments and addressing market failure

In response to what Nouriel Roubini, Professor of Economics and International Business, Leonard N. Stern School of Business, New York University (USA), has called the "paradox of liquidity" and intensified regulation, traditional financial intermediaries are providing fewer services (e.g. reduced market-making activities, fewer bank loans to small enterprises), and less market-making activity, than they did in the past (Roubini, 2015). Asset owners are stepping into some of these gaps to provide sources of longer-term financing to areas of the economy that previously were only well serviced by short- to medium-term capital. This provision is to improve the measurement of non-financial risks and to establish investable benchmarks that better align to sustainable, long-term investment horizons.

Examples of these developments are found in the case studies of APG, CDPQ and the University of California Endowment.

Organization	Case Study
APG	<p>Responsible Investing in Real Estate</p> <ul style="list-style-type: none"> • How APG created GRESB (Global Real Estate Sustainability Benchmark), a new benchmark for environmental, social and governance factors in real estate • Engagement with other investors and sectors to promote the benchmark • The process of establishing a culture of responsible investing in an organization like APG • Potential benefits arising from responsible investing
CDPQ	<p>A New Model for Infrastructure</p> <ul style="list-style-type: none"> • How CDPQ conceived of and established CDPQ Infra, a highly integrated partnership model for carrying out public infrastructure projects • Complementarities between CDPQ Infra and the current suite of public-private partnerships in infrastructure • How CDPQ Infra harnesses CDPQ's competitive advantages • The potential for new investment models to help fill the infrastructure gap
The University of California Endowment	<p>Investing in Innovation</p> <ul style="list-style-type: none"> • The university's plans for UC Ventures, a new venture capital investment programme that harnesses the university's innovation landscape • The challenges inherent for investors in venture capital and how UC Ventures hopes to mitigate them • The organizational endowments that enable the university to create a unique investment programme

2. Diversifying risk

Rather than deploying capital in set ratios across long-standing asset classes, asset owners are increasingly focused on within-asset-class and within-individual-asset, constituent financial and non-financial risk exposures. In so doing, they are focusing on risk as defined by potentially shifting correlations, common forcing factors or thematics, scenarios in the tails of potential outcomes, and idiosyncratic risk, and concentrating less on risk as defined singularly by volatility and siloed by asset class taxonomy.

Examples are found in the ATP and CPPIB case studies. These practices, widely adopted, can be expected to afford greater stability to financial markets.

Organization	Case Study
ATP	<p data-bbox="416 640 815 674">Rethinking Asset Allocation</p> <ul data-bbox="416 674 1283 920" style="list-style-type: none"> <li data-bbox="416 674 1283 741">• The latest iteration of ATP’s risk-based asset allocation model, which incorporates portfolio-wide risk-factor investing <li data-bbox="416 741 1283 808">• How ATP manages the risks most relevant to its objectives, specifically interest rate, liquidity and tail risks <li data-bbox="416 808 1283 875">• Expanding ATP’s risk framework to cover residual, non-quantifiable risks embedded in private investments <li data-bbox="416 875 1283 920">• Including alternative risk premia strategies in the total portfolio
CPPIB	<p data-bbox="416 965 687 999">Thematic Investing</p> <ul data-bbox="416 999 1331 1312" style="list-style-type: none"> <li data-bbox="416 999 1331 1099">• The process of implementing CPPIB’s thematic investing strategy, which invests in underappreciated long-term structural growth drivers <li data-bbox="416 1099 1331 1167">• CPPIB’s approach to searching for investable themes and structural drivers <li data-bbox="416 1167 1331 1234">• How CPPIB’s institutional endowments enable it to invest successfully in long-term trends <li data-bbox="416 1234 1331 1312">• The importance of strong governance for long-horizon investment strategies

3. Making relationships matter and extending the investment ecosystem

As institutional asset owners become more aware of their competitive edge and distinctive attributes, they engage more effectively with external service providers and asset managers to ensure that every relationship matters to their own probability of success. They are also connecting beyond the traditional investment manufacturing ecosystem to become local partners to companies, start-ups and project developers.

Examples are found in the New Zealand Superannuation Fund and PensionDanmark case studies.

Organization	Case Study
New Zealand Superannuation Fund (NZSF)	Manager Flexibility <ul style="list-style-type: none"> • “Flexibility”, or the ability to dynamically increase, decrease or reallocate risk within a mandate as investment opportunities change – a characteristic that NZSF looks for in closely aligned external managers • The precise characteristics which NZSF values in external managers • The features of NZSF’s closest relationships with aligned intermediaries
PensionDanmark	Direct Infrastructure Investing <ul style="list-style-type: none"> • PensionDanmark’s motivations for and experiences in establishing a direct infrastructure investing strategy • The challenges facing a medium-sized fund in infrastructure investing • How PensionDanmark leveraged the capabilities of an external fund manager to act as an aligned intermediary • How the fund attempted to stay ahead of the curve in infrastructure markets

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