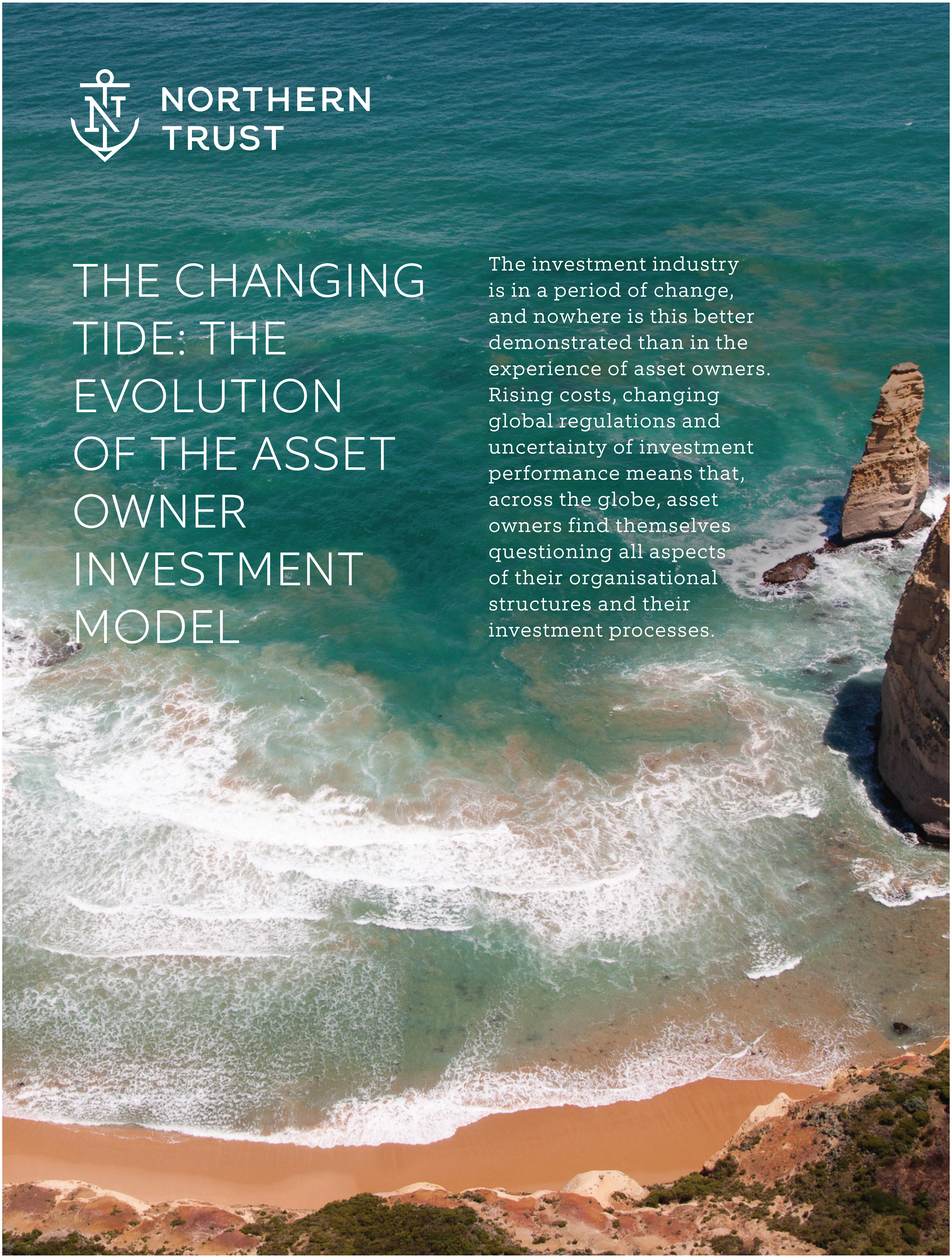

NORTHERN TRUST

THE CHANGING TIDE: THE EVOLUTION OF THE ASSET OWNER INVESTMENT MODEL

The investment industry is in a period of change, and nowhere is this better demonstrated than in the experience of asset owners. Rising costs, changing global regulations and uncertainty of investment performance means that, across the globe, asset owners find themselves questioning all aspects of their organisational structures and their investment processes.

THE CHANGING TIDE: THE EVOLUTION OF THE ASSET OWNER INVESTMENT MODEL

EXECUTIVE SUMMARY

1. The investment industry is in flux. The rise in costs, new technology, global regulatory change and a drive toward fund consolidation have led many asset owners to look more closely at their organisational structures and to rethink their investment processes. Across the globe, investors are bringing their asset management in-house in order to reduce fees, enhance control, gain efficiencies and drive overall investment performance.

2. For asset owners that manage their assets internally, or want to do so in the future, there are several considerations to take into account. These range from setting up and implementing governance structures, to finding and recruiting the right talent, to managing technology needs, and getting to grips with new operational models.

3. Asset owners are tackling these challenges in different ways. Each asset owner is in a unique situation, but the trend toward in-house management is truly a global one.

4. Concerns about future-proofing operating models can be a barrier to in-house management. As the investment insourcing trend develops, asset owners are increasingly outsourcing non-core functions to focus on the activities that add the most value. Accordingly, they are reconsidering their operational, technological, risk, governance, and compliance responsibilities.

The investment industry is in a period of change, and nowhere is this better demonstrated than in the experience of asset owners. Rising costs, changing global regulations and uncertainty of investment performance means that, across the globe, asset owners find themselves questioning all aspects of their organisational structures and their investment processes. Many are repositioning themselves for the future. For some, this has meant re-thinking operating models through consolidation or fiduciary management. Others have transformed their investment approaches or asset allocation strategies.

In this challenging landscape, one solution that is becoming increasingly popular is to bring asset management in-house in order to reduce investment management fees, and improve control and transparency. Asset owners are building internal resources in different ways across the globe, but the trend does bring its own challenges and considerations. Internalizing investment management capabilities forces asset owners to rethink people, process and technology - and all three may require transformation in order to bring true operational efficiency to the investment process. Investors who want to manage their assets in-house are, in many cases, navigating new, unchartered territory. Any solution will require optimizing each component of their value chain, and perhaps changing the mix of what is kept in-house and what might be suitable for outsourcing. Risk, costs, capabilities and the ability to adapt to a changing environment – these considerations become top of mind.[i]

ENTERING THE MAINSTREAM

Insourcing – the management of assets or other functions internally – is not a new concept. There have always been asset owners, particularly larger funds and superfunds, which have managed some, if not all of their assets in-house. But bringing the capabilities of direct investing and internal trading together has become more mainstream.[ii] There are several drivers for this.

For many asset owners, it is the realisation that internal investment management may not only reduce costs and improve margins, but can also drive best practice through enhanced risk management and more tightly aligned asset allocation.[vi] “We fundamentally see in-house management as risk management,” said Andrew McKinnon, Chief Financial Officer of the Pension Protection Fund, UK. “If you go back to the Financial Crisis, there was a lot going on in the market. People needed to react quickly and make decisions. But if all of your assets are tied up with third party managers, and you are one of a list of clients, someone might do their best for you, but they have to treat all their clients equally.”

Some asset owners who have historically outsourced investment management are now concerned about the lack of tracking error in their selected funds when looked at in aggregate. For example, if one manager is underweight a stock or sector, and another manager is overweight, it effectively neutralises any alpha generation. The result ends in a passive weighting across the fund’s overall portfolio. Given that the fund is paying active investment fees, this is not a welcome situation,[vii] especially when passive funds are considerably cheaper.

40%

OF GLOBAL ASSET OWNERS INCREASED THE NUMBER OF THEIR IN-HOUSE INVESTMENT STAFF IN THE THREE YEARS TO MID-2018.[iii]

19%

OF GLOBAL INVESTORS HAVE INCREASED THE PROPORTION OF ASSETS THAT ARE MANAGED IN-HOUSE.[iv]

44%

OF INVESTORS WITH ASSETS ABOVE $25 BILLION ARE MANAGING A HIGHER PROPORTION OF ASSETS IN-HOUSE.[v]

It is understandable then, that many asset owners are changing their exposures. Instead of allocating to a range of active providers, they are reapportioning a heavy weighting to lower cost passive strategies, and bringing some portion of the active component in-house.[viii] Historically, some asset owners have utilized consultants and investment managers to drive the majority of their alternative asset allocations, but this is also changing.[ix x]

SCRUTINIZING FEES

Asset owners and their stakeholders find themselves questioning whether their active managers are truly creating alpha in the portfolio. This scrutiny of investment fees (in the context of net returns) is driving the trend towards more insourcing.[xi] The average cost of internal management is eight bps, compared with 46 bps for external management, according to CEM Benchmarking,[xii] which explains why so many high profile pension schemes have been undergoing cost assessment exercises in recent years.

According to a director of alternatives at a multi-billion dollar U.S. foundation, "Fees are a big topic, and a bigger topic in my area of hedge funds than in any other asset group. Fees at the long only level have come down, but hedge fund fees are in many cases very expensive, and we do worry about that."

REGULATION BITES

Regulation has also been a critical factor in the decision to insource asset management. Each country has its own requirements, but asset owners have to be mindful of global regulations and how they impact the markets in which they operate. While many of these regulations relate to the work of underlying managers, asset owners, particularly those who insource, need to understand what obligations they must address directly. Asset managers are already getting to grips with this – Invesco and Wellington Management have been in talks with the Securities and Exchange Commission (SEC) to apply MiFID II cost transparency rules in the US, for example.[xiii] The globalisation of key regulations is an evolving trend.

GLOBAL APPROACHES

Each asset owner is in a unique situation, and faces different challenges and decision-making around internalizing investment management capabilities, and every country and region has its own market requirements and characteristics. But the trend for asset owners to insource investment management is a global one.

> *Much of our decision to bring assets in-house was cost driven. It provided transparency in the portfolio, and it made rebalancing much easier to handle.*
>
> **OLA ERIKSSON**
> CFO, AP2, Sweden

8 BPS

THE AVERAGE COST OF **INTERNAL** MANAGEMENT

46 BPS

THE AVERAGE COST OF **EXTERNAL** MANAGEMENT

INSOURCING TAKES COMMITMENT

"Insourcing takes commitment. One challenge with all of this is that you have to have sponsors who are very much on board. While it is cheaper to manage money in-house, the cost of managing in-house is much more transparent. You need to prepare to justify costs of managing internally, because it is visible and more transparent to your stakeholders."
—**Howard Brindle**, Deputy CEO, USS Investment Management

KEY REGULATIONS AROUND THE GLOBE

Each country has its own requirements, but asset owners have to be mindful of global regulations and how they impact the markets in which they operate. The globalisation of key regulations is an evolving trend.

AUSTRALIA:

The Australian market is dominated by the AUD 2.8 trillion superannuation sector, which is undergoing a rapid transformation. Because of changes recommended by the Royal Commission, trustees and executives will be subject to the same oversight as bank chiefs. Millions of dollars of fees will be abolished.[xiv] Many of Australia's superannuation funds have always been comfortable managing assets in-house, and are now recruiting talent, particularly for the alternatives sector. For example, recently, Australia's First State Super announced plans to increase its investment team in the next three years as it continues to build out its internal expertise.[xv] The focus across multiple funds is to understand how the assets are actually managed, and on transparency and performance analysis, as well as the management of data and of costs.

The country's larger superfunds are already globally significant – Australia has approximately 40 funds with assets of more than AUD 10 billion and 15 with more than AUD 30 billion AUM. The top five have assets over AUD 70 billion.[xvi] The increasing trend to manage assets in-house will only continue for those who have begun the process, particularly because high fees are considered to be the single biggest drain on the super system. Australians pay more than AUD 30 billion each year in super fees according to findings from the Productivity Commission. Many of those costs were paid to underperforming funds.[xvii]

Another driver is consolidation. Smaller funds are merging into superfunds, who are trying to improve their operating models and attract consolidation in an effort to remain competitive.

+30AUD

AUSTRALIANS PAY MORE THAN AUD 30 BILLION EACH YEAR IN SUPER FEES

ASIA PACIFIC (APAC):

Insourcing trends across the APAC region are primarily the purview of large sovereign wealth funds and are driven by some of the considerations already mentioned, with the additional requirement for confidentiality, which is easier to maintain internally. Some of the barriers to insourcing are size, lack of expertise, and lack of technological capability.

CANADA:

Like Australia, Canadian asset owners have long been comfortable managing their assets in house. The $191.1 billion Ontario Teachers' Pension Plan manages approximately 80% of its assets in-house, for example,[xviii] while the $309.5 billion Caisse de dépôt et placement du Québec (The Caisse, or CDPQ), manages 90% of its assets internally.[xix] On average, Canadian pension funds have fared better in performance terms than their US counterparts, with Canada's nine largest pension schemes earning an average annual return of 5.5% in the decade to April 2017, compared with the eight top US pension plans, which returned 3.2% over the same period.[xx] Canadian plan sponsors compensate in-house teams more than US institutions, whose leaner staff make it harder to avoid relying on third party managers.[xxi]

THE UK:

In the UK, insourcing is picking up speed, particularly after concerns about underfunding and deficit of defined benefit pension funds. The DB Taskforce, set up by the Pensions and Lifetime Savings Association (PLSA), identified that members of DB schemes with the weakest employers (those which hold 42% of liabilities of schemes in deficit) have just a 50:50 chance of seeing those benefits paid in full.[xxii]

Pension funds have responded to underfunding and cost concerns in a variety of ways. In 2015, the £28 billion Railways Pensions Scheme Railpen (RPMI) completed its Investment Transformation Programme, in a bid to boost returns. It completely overhauled its investment structure, and, as part of the process, looked at how external managers were being utilised and paid. Railpen found that additional fees charged by its managers were around 300%-400% of the £70 million it paid up front.[xxiii] As a result, it has brought approximately £11 billion in assets in-house.[xxiv]

The government has also been addressing the challenges. Last year, more than 5.3 million members of the Local Government Pension Scheme (LGPS), comprised of 89 local authority pension funds of England and Wales with more than £260 billion AUM, merged into eight separate pools.[xxv] The idea was to share responsibilities, governance, and oversight, build efficiencies across asset allocation – particularly in alternatives – and have more negotiating power with providers. The new pools will bring cost savings as well, and will focus more on ESG related issues. It is early days however. Many of the schemes are still setting up their propositions, and working out how to manage the different components of their business.

CONTINENTAL EUROPE:

In continental Europe, the size and scope of insourcing has depended on the size and level of sophistication of the asset owner. In the €1.2 trillion Dutch market, consolidation has been a key trend over the last two decades, with the number of pension schemes decreasing by 75% over the period.[xxvi] The number of pension funds dropped from 1,042 in 1998 to 240 last year.[xxvii] As a result, the largest pension funds are gaining assets and are currently managing the majority of their assets in-house. Dutch funds withdrew nearly €30 billion from third-party managers over the four-year period to 2015. And investors in Europe and the Middle East combined pulled more than €45 billion from segregated mandates during 2015 alone.[xxviii]

75%

REDUCTION IN NUMBER OF DUTCH PENSION SCHEMES IN THE LAST TWO DECADES

BRINGING ASSETS IN-HOUSE

"Bringing assets in-house was a lot of learning by doing, particularly on the administrative side. We hired a lot of people, and it was very important to have them learning in the organisation. It was like building a new organisation from start. We had our pillars, but the rest was new." —**Ola Eriksson**, CFO, AP2, Sweden

UNITED STATES:

The U.S. continues to see several high profile asset owners bringing assets in-house. The $230 billion California State Teachers' Retirement Systems (CalSTRS) has a long term plan to increase the internal management of assets, in a bid to save hundreds of millions of dollars in fees.[xxix] In 2017, the pension's costs to manage its internal assets was $30 million, while it cost $1.8 billion (including incentive fees), to pay external managers. 56% of the fund's assets are managed externally, and 44% internally.[xxx] The plan was only 65.5% funded as of June 30, 2018.[xxxi]

Other pension plans are posting substantial savings due to insourcing, according to 2016 news reports:

- The State of Wisconsin Investment Board, Madison, which manages the Wisconsin Retirement System, has increased the proportion of its insourced assets to 59% in 2015, compared to 51% in 2011,[xxxii] and saved $63 million in external fees in 2015.
- The Michigan Department of Treasury, Bureau of Investments, which manages the Michigan Retirement Systems, saves a net $20 million to $30 million a year through managing 35% of its total portfolio internally.[xxxiii]
- The Employees Retirement System of Texas pays fewer than 10bps for investment management and administration, with the cost of internally managed assets four times less than the external manager fees. About 60% of its assets are managed internally.[xxxiv]
- Michigan MERS runs its entire investment division at a cost of 1.5bps per year, including 20% of assets that are managed internally. External manager costs averaged 35bps in 2014.[xxxv]
- The Alaska Retirement Management Board terminated the mandates of nearly 20 external managers because of underperformance and fee structure concerns, and is looking to boost its internal operations instead.[xxxvi]
- UPS has created an in-house managed-account platform for alternatives, and is implementing secondary and co-investment programs within private markets for its $30 billion defined benefit trust.[xxxvii]

> *To build our current infrastructure, we had to reach out to our order management, portfolio accounting, data warehouse, and matching service providers to build out the necessary changes to continue to have straight through processing.*
>
> **THOMAS LIDDY**
> Director of Investment Operations
> Colorado PERA

BARRIERS TO INTERNALIZING TRADING AND INVESTMENT MANAGEMENT

Bringing assets in-house is not always easy. For one thing, asset owners must rethink their governance approach. Investors are more focused on governance issues than ever before. Nearly a third of pension and retirement providers think their investment governance frameworks are lagging behind the increased pools they manage.[xxxviii] As a result, getting to grips with governance obligations is of paramount importance, particularly given shifting regulatory requirements around the globe.

1/3RD

NEARLY 1/3 OF PENSION AND RETIREMENT PROVIDERS THINK THEIR INVESTMENT GOVERNANCE FRAMEWORKS LAG BEHIND THE POOLS THEY MANAGE.

GOVERNANCE

Good governance is critical for anyone managing money, and means having the right structures and processes in place for timely decision-making, including a disciplined and objective review process and appropriate risk management and oversight. It also means providing clear objectives.

"You have to have the right governance and culture. It all stems from our Board, and from there to our internal audit groups to really define risk and identify risk areas. There is also a structure in place to review separations of duty – having the right amount of people to handle the right amount of work load. Governance is really about ensuring that things are being reviewed and being signed off, and that every T is crossed and I is dotted, and people are accountable for their jobs.

THOMAS LIDDY
Director of Investment Operations
Colorado PERA

"You definitely have to have the right governance structure every step of the way. In terms of trading strategies, we have certain investment committees that approve all new strategies and products. You have to have the right support structures in place, so that you have appropriate segregation of duties. We have internal audit functions and external audit functions, and we have different people performing the different functions.

Vice President, Investment Operations
Multi-Billion Dollar Canadian Pension Plan

"Having the appropriate governance, and continually reviewing the decision to insource investment management is vital. Returns aside, from a cost perspective we are fortunate that there are some very strong global pension benchmarking services that give clear indications on the comparison of typical internal vs external costs, and those benchmarking reports underpin our decisions on when to insource investment management, and when to remain insourced.

HOWARD BRINDLE, Deputy CEO
USS Investment Management

Internal managers have unique governance issues. How do asset owners ensure they are doing a better job than an external manager, for example? What performance metrics will they use? How do they monitor, measure, and report on their approach? For some, particularly those which serve the public sector, there are benchmarking methods which can help. Others will need to create their own metrics. And then there is the question of whether an asset owner would ‘fire’ itself as manager if it didn’t think it was delivering investment value. It’s far easier to fire an external asset manager than to fire the team sitting next to you.

Good governance is critical for anyone managing money, and means having the right structures and processes in place for timely decision-making, including a disciplined and objective review process and appropriate risk management and oversight. It also means providing clear objectives.[xxxix] It requires:

- **Clear roles and responsibilities and clear strategic objectives;**
- **A skilled, engaged and diverse board led by an effective chair;**
- **Close relationships with employers, advisers and others involved in running the scheme/plan;**
- **Sound structures and processes focused on outcomes; and**
- **A robust risk management framework focused on key risks**.[xl]

Asset owners who manage assets internally need to ensure they have clear reporting and accountability lines, and that their risk-based internal controls are strong. They must meet their legal requirements, which are constantly evolving, but also ensure that there are no conflicts of interest between roles and functions.

Asset owners who want to bring assets in-house will face other challenges as well, notably the additional costs, the need to ensure and deliver operational efficiency, and future-proofing of operating models. Across the globe, years of asset growth has masked a lot of cost inflation, for example.[xli] According to research from Boston Consulting Group, if markets were to fall, 10% would come off margins.[xlii] Given regulatory requirements, compliance costs are expected to more than double by 2022,[xliii] which makes for a perfect storm.

For asset owners who insource their investment management in 2019 and beyond, getting to grips with cost and ensuring economies of scale is a critical issue. These are considerations that asset managers have been facing for a while now, and some of the solutions will be similar, or overlap. There are six key pillars of costs that funds have to grapple with: [xliv]

Implementation Costs: There are implementation costs to building an investment management infrastructure. These range across the back, middle and front offices. Does the asset owner have the right technology infrastructure, for example? Does it have a sustainable operating model, or is it better off

> *One of the areas we are thinking about is data governance. There is so much data, and that is probably our biggest challenge. It’s important for us to keep having conversations around how we manage that.*
>
> **THOMAS LIDDY**
> Director of Investment Operations
> Colorado PERA

> *There are systems that are available out there now that provide end-to-end solutions. Having a very strong IT infrastructure is not as big a requirement as it used to be, because there are now hosted opportunities by software vendors. These vendors offer solutions beyond their own utility. They may add an outsourcing aspect, but you can then slowly take that over and bring it in-house. There is a lot more versatility.*
>
> **THOMAS LIDDY**
> Director of Investment Operations
> Colorado PERA

outsourcing functions to an integrated, cross-asset class global provider? Can it keep pace with technological change? Is it able to manage the costs of building and running a trading desk, for example, which have greatly increased over the past few years? "The biggest challenge is the stuff that you don't do all the time," said the Director of Investments at a US University endowment plan. "We've got the trading capability, but it's been a while since I've traded commodity futures, for example. When you stop doing that on a regular basis, you lose touch with which counterparties to call, and how all the pieces work. So it's one thing to have the capability, but it's another to be able to turn it on and turn it off. It really works best when it's something you're doing every day."

Reporting requirements and governance rules require greater oversight and monitoring, and business continuity is a key consideration for potential investors. In addition, funds have apportioned fixed costs, systems costs, and disaster recovery costs to consider.

Staffing Costs: Asset owners have to recruit the right talent across the investment spectrum, in an increasingly competitive market. Given that many pension plans and endowments are not in financial centres, attracting and retaining staff is a key consideration. The UK's PPF, for example, had to move its head offices from south London to the City of London financial district, in order to attract good quality investment managers. In addition, asset owners may need to evaluate their compensation structures in order to stay in line with market expectations, as the California State Teachers' Retirement System (CalSTRS) recently announced plans to do.[xlv] And it is not just investment professionals or traders, but the range of front and middle office teams, compliance and risk monitoring and oversight departments, and everyone involved in the logistics of portfolio management, that need to be included in staffing considerations. "Having the right resources is important," said the Vice President of Operations at a multi-billion dollar Canadian pension plan. "It is not just about the front, middle, and back office. It's groups such as operations management, risk and compliance - all of those teams working together."

Opportunity Costs: Over the years, it's not been uncommon to see one person perform a multitude of roles, a portfolio manager executing his or her own trades, for example. The opportunity cost of performing multiple functions is growing, especially for those which don't deliver value. Any function that takes the focus away from delivering alpha is a potential cost to the company.

Transaction Costs: These are often tangible and intangible. Tangible benefits come via lower commissions and are immediate and obvious. Intangible benefits will accrue over time with the right analytical and execution tools.

"

We don't really have any cost concerns, because we're able to negotiate competitive spread levels – in the case of trading treasuries – or commission levels. But it's difficult to have a full time staff dedicated to that function. Fortunately, we do not have a great deal of activity, so that this can be part of some peoples' other jobs.

But it's not always easy when they are out of the office, or on vacation. It's difficult to have a full trading capability in-house without building up the human resources.

Director, Investments at a Multi-Billion Dollar US University Endowment

Compliance Costs: Compliance costs are varied and widespread. They include the costs of operational compliance, and of meeting regulatory requirements – for example, by holding assets directly, tax returns become more complicated, filings are required in several countries, and more manpower is needed to navigate through the complexities.

Technology/Cyber Security Costs:

All of these costs, and others, need to account for the relentless march of technology, and the money it requires to stay on top of artificial intelligence, automation, and data analytics, or to build scaleable platforms. New to the asset owner would be a requirement to have pre- and post-trade compliance tools, an order management and execution management system, as well as ensure they have a functioning IBOR to facilitate accurate decision making by the portfolio management teams.

Asset owners cite cyber risk and data management as key concerns, and have been positioning themselves for the future. "We are very dependent on our systems, and we are becoming more and more an IT company," said Ola Eriksson, CFO of AP2 in Sweden. "It means embracing different systems is important. We are more focused on issues like cyber security than ever before."

There is increasing emphasis on data warehousing as well as data aggregation. Whether they are insourcing or not, asset owners want access to aggregated and consolidated data models, and data analytics.

IN-HOUSE MANAGEMENT FOR THE FUTURE

So where does all this leave asset owners that elect to manage assets in-house? For many, it is about focusing on their core investment propositions, and perhaps outsourcing ancillary components of the value chain. These include functions such as collateral management and foreign exchange, back and middle office operations (portfolio accounting and analytics, compliance, client reporting), as well as trading activity. "We outsource anything that makes sense, and that is typically not for cost reasons, but more about complexity, and specialisms," said Howard Brindle, Deputy CEO at USS Investment Management. "We would outsource OTC valuations, for example, because that's a skill-set that outsourced providers can do with specialist software. It's the same with collateral management. You have to be close to the market at all times, and there is complexity and risk involved in doing this internally. The scale of investment just doesn't warrant it."

Outsourced trading, which was once considered a solution for small funds only, has now developed to a scale where it's a viable solution for even large institutions. It can deliver immediate cost savings and efficiencies to an in-house manager, while also lowering operational risk, enhancing transparency, and improving governance.

> *Data management is just paramount, and we have a dedicated group that manages data. We make sure it is accurate, complete, and that we know our sources of data.*
>
> Vice President, Investment Operations Multi-Billion Dollar Canadian Pension Plan

For asset owners that manage assets in-house or are considering doing so, outsourcing some or all of these functions means they don't have to navigate changing regulatory regimes on their own, nor do they have to deal with the high costs of building back, middle, and even front office functionality, or recruiting the right talent for those components. "We outsourced our back and middle offices processes because we worked out that the cost of doing it ourselves would be broadly comparable, and that it is a scaleable business," said Mr. McKinnon. "We'd be taking on a lot of operational risk and there was no strategic benefit from doing it ourselves. It is not a core business activity."

Key Considerations for Internal Investment Management

1	Would asset allocation be more holistic if certain assets are brought in-house?
2	Will insourcing provide cost savings?
3	Will it help address regulatory compliance?
4	Are there opportunity costs of *not* doing it?
5	What assets would it make sense to bring in-house?
6	What new systems will be required?
7	How does an asset owner address the technical and operational complexity of managing money internally?
8	Does timing matter?
9	Can the asset owner find the staff and expertise needed to run an investment portfolio from front to back?
10	Does it make sense to outsource some of the operational functions, and, if so, which ones?
11	Will the asset owner be able to address technology and other costs required?
12	Can in-house managers measure their own performance in the same way as external managers are measured?
13	How can and should they govern themselves?
14	Will the asset owner be prepared to "fire itself" as investment manager, if necessary?

LOOKING AHEAD

Whether they are insourcing asset management, or outsourcing functions, asset owners must always think about what value they are gaining. It is important to remember that no one size fits all, and each investor is unique. Asset owners must decide what their tipping points are, and at what point it makes sense to bring assets in-house. They must consider how they will deal with the operational, technological, risk, governance, and compliance complexities around that decision-making.

Asset owners that have chosen to manage their assets in-house should be aware of the regulatory landscape, their long term investment goals and business strategy, as well as the increasing cost of operating in the investment industry, today and in the future. Each will have a unique set of circumstances to factor into consideration. Internalizing investment management can bring great benefits for both the risk and returns of a portfolio, but must be managed with great care. Partnering with providers who specialize in back, middle and front office services for in-house managed asset owners can make the transition seamless in their drive for operational efficiency and investment results.

"The biggest and starkest change in the industry is the custodian banks. They are really becoming technology companies. I think that's going to change the entire dynamic of what is offered to firms who want to change from outsourced to insourced. They can do that through their custodian banks." —**Thomas Liddy**, Director of Investment Operations, Colorado PERA

ABOUT NORTHERN TRUST

Northern Trust is a leading provider of asset servicing, asset management, wealth management, and banking to institutions, corporations, affluent families and individuals. Founded in Chicago in 1889, Northern Trust has offices in the United States in 19 states and Washington, D.C., and 23 international locations in Canada, Europe, the Middle East and the Asia-Pacific region. For more than 130 years, Northern Trust has earned distinction as an industry leader for exceptional service, financial expertise, integrity and innovation.

Northern Trust Asset Servicing provides a comprehensive range of financial services for institutional investors and asset managers around the world. We offer front, middle and back office capabilities to help clients meet the demands of a changing and complex investment landscape. Innovative technology, deep expertise and personalized service provide integrated solutions that help clients make more insightful business decisions.

FOOTNOTES

[i] Thinking Ahead Institute, Willis Towers Watson "The Asset Owner of Tomorrow: Business Model Changes for the Great Acceleration" 2017 https://www.thinkingaheadinstitute.org/en/Library/Public/Research-and-Ideas/2017/11/The-asset-owners-of-tomorrow

[ii] bfinance "Asset Owner Survey: Innovations in Implementation" September 2018 https://www.bfinance.co.uk/insights/asset-owner-survey-2018/asset-owner-survey-2018-download/

[iii] Ibid.

[iv] bid.

[v] Ibid.

[vi] Northern Trust "Catching the Wave – Global Outsourcing Trends Heading Down Under" 2019 https://cdn.northerntrust.com/pws/nt/documents/asset-servicing/global-outsourcing-trends-heading-down-under.pdf

[vii] Ibid.

[viii] Ibid.

[ix] *Financial News* "University Pension Fund Recruits For In-House Private Equity Deal Push" Last Updated: 16 October 2017 https://www.fnlondon.com/articles/university-pension-fund-recruits-for-in-house-private-equity-deal-push-20171016

[x] PWC and AMAFORE "Global Pension Funds: Best Practices in the Pension Fund Investment Process" 2016 https://www.pwc.lu/en/asset-management/docs/pwc-awm-global-pension-funds.pdf

[xi] EY "Technology, Governance, and Risk: Can New Thinking On These Three Issues Bring Retirement Security for Millions?" 2018 https://www.ey.com/Publication/vwLUAssets/ey-global-pension-report/$File/ey-global-pension-report.pdf

[xii] *Pensions and Investments Online* "Low Returns, Fee Scrutiny Drive Rise of Pension Fund Insourcing" Last Update June 13 2016 https://www.pionline.com/article/20160613/PRINT/306139984/low-returns-fee-scrutiny-drive-rise-of-pension-fund-insourcing

[xiii] *Financial Times* "Invesco and Wellington Eye Global Adoption of MiFID II" Last Updated 4 March 2019 https://www.ft.com/content/075382ef-6c58-3b21-9010-63aa8e013d70

[xiv] Northern Trust "Catching the Wave – Global Outsourcing Trends Heading Down Under" 2019 https://cdn.northerntrust.com/pws/nt/documents/asset-servicing/global-outsourcing-trends-heading-down-under.pdf

[xv] IgnitesAsia "Australia's First State Super to boost in-house expertise" 16 August 2019 https://www.ignitesasia.com/c/2482823/294253/australia_first_state_super_boost_house_expertise?referrer_module=emailMorningNews&module_order=13&_sso_code=f551f1618049e4e475f2b6174415284f5220121c&code=YTJGbVFHNTBjbk11WTI5dExDQXhNREE0TXpRMExDQXhOek0xTkRJMU1qQXg

[xvi] SuperGuide "Kingpins of super: 20 largest superfunds" 19 June 2018 https://www.superguide.com.au/boost-your-superannnuation/top-20-largest-super-funds

[xvii] Northern Trust "Catching the Wave – Global Outsourcing Trends Heading Down Under" 2019 https://cdn.northerntrust.com/pws/nt/documents/asset-servicing/global-outsourcing-trends-heading-down-under.pdf

[xviii] Ontario Teachers' Pension Plan Press Release "Ontario Teachers' Net Assets At $191.1 BN At Year End 2018" 2 April 2019 https://www.otpp.com/news/article/-/article/802306

[xix] Caisse de dépôt et placement du Québec https://www.cdpq.com/en/investments/overall-portfolio

[xx] Simcorp Blog "4 Reasons Why Public Pension Plans Are Insourcing" 19 April 2017 https://www.simcorp.com/en/insights/journal/2017/insourcing-asset-management

[xxi] *Institutional Investor* "US Pensions Aim To Be More Like Canadian Funds" Last Updated 4 April 2017 https://www.institutionalinvestor.com/article/b1505py0f5mpb1/us-pensions-aim-to-be-more-like-canadian-funds

[xxii] Pensions and Lifetime Savings Association Press Release: "Bold Thinking on Consolidation Needed, Says PLSA DB Taskforce" 7 March 2017 https://www.plsa.co.uk/Press-centre/Press-Releases/Article/Bold-Thinking-On-Consolidation-Needed--Says-PLSA-DB-Taskforce

[xxiii] *Professional Pensions* "All Change: How the RPS Transformed its Approach to Investment" Last Updated 26 February 2015 https://www.rpmi.co.uk/docs/default-source/rpmi-in-the-news/professional-pensions-on-rpmi-railpen.pdf?sfvrsn=2

[xxiv] *Professional Pensions* "Railpen Cuts Costs Further and Brings More Investment In-House" Last Updated: 18 March 2019 https://www.professionalpensions.com/professional-pensions/analysis/3072721/railpen-cuts-costs-further-and-brings-more-investment-in-house

[xxv] Northern Trust "The Local Government Pension Scheme: Beyond Asset Pooling" May 2018 https://www.northerntrust.com/documents/white-papers/asset-servicing/lgps-beyond-asset-pooling.pdf

[xxvi] Investments & Pensions Europe "Pension Consolidation: Is It All Good News?" April 2018 https://www.ipe.com/reports/special-reports/thought-leadership/pension-consolidation-is-it-all-good-news/10023898.article

[xxvii] Investments & Pensions Europe "Dutch Scheme Consolidation: APFs Attract €8 Billion in Two Years" Last Updated 20 December 2018 https://www.ipe.com/countries/netherlands/dutch-scheme-consolidation-apfs-attract-8bn-in-two-years/10028752.fullarticle

[xxviii] *Deloitte Performance Magazine* Issue 21 "The Asset Owners Conundrum: Insourcing of Asset Management"

[xxix] *Chief Investment Officer* "CalSTRS Wants To Increase Internal Management" Last Updated: 28 May 2019 https://www.ai-cio.com/news/calstrs-wants-increase-internal-management/

[xxx] Ibid.

[xxxi] Ibid.

[xxxii] *Pensions And Investments Online* "Low Returns, Fee Scrutiny Drive Rise of Pension Fund Insourcing" Last Updated 13 June 2016 https://www.pionline.com/article/20160613/PRINT/306139984/low-returns-fee-scrutiny-drive-rise-of-pension-fund-insourcing

[xxxiii] Ibid.

[xxxiv] Ibid.

[xxxv] Ibid.

[xxxvi] *Financial Times* "CalSTRS To Pull $20 BN From External Managers" Last Updated: 16 October 2016 https://www.ft.com/content/1f1e396c-9162-11e6-a72e-b428cb934b78

[xxxvii] *CNBC* "Brian Pellegrino" 2 May 2016 https://www.cnbc.com/2016/05/02/brian-pellegrino.html

[xxxviii] EY "Technology, Governance, and Risk: Can New Thinking On These Three Issues Bring Retirement Security for Millions?" 2018 https://www.ey.com/Publication/vwLUAssets/ey-global-pension-report/$File/ey-global-pension-report.pdf

[xxxix] The Pensions Regulator "21st Century Trusteeship" https://www.thepensionsregulator.gov.uk/en/trustees/21st-century-trusteeship

[xl] Ibid.

[xli] Northern Trust "Catching the Wave – Global Outsourcing Trends Heading Down Under" 2019 https://cdn.northerntrust.com/pws/nt/documents/asset-servicing/global-outsourcing-trends-heading-down-under.pdf

[xlii] The Boston Consulting Group "The Hidden Pressures on Asset Managers" 4 May 2018 http://image-src.bcg.com/Images/BCG-The-Hidden-Pressures-On-Asset-Managers-May-2018-r2_tcm38-191615.pdf

[xliii] *Financial News* "Compliance Costs to More Than Double by 2020" Last Updated 27 April 2019 https://www.fnlondon.com/articles/compliance-costs-to-more-than-double-by-2022-survey-finds-20170427

[xliv] Northern Trust "Catching the Wave – Global Outsourcing Trends Heading Down Under" 2019 https://cdn.northerntrust.com/pws/nt/documents/asset-servicing/global-outsourcing-trends-heading-down-under.pdf

[xlv] Fundfire "CALSTRS Reviews Pay Policy in Bid to Bring Investments In-house", July 2019 https://www.fundfire.com/c/2430923/289033/calstrs_reviews_policy_bring_investments_house?referrer_module=issueHeadline&module_order=2

NORTHERN
TRUST