

The Evolution of Pension Management

Building In-House Capabilities

June 2019

Executive Summary

- Diversification into alternative asset classes can provide attractive returns relative to traditional liquid portfolios, but this comes with higher fees to third-party managers.
 - Pensions are developing new approaches to control fees and capture return; for large, established pensions, insourcing investment teams is an attractive solution.
- Determining which assets to insource requires an institution-specific evaluation of strategies, fee savings and ease of implementation
- Whereas the decision to insource public market portfolios is binary, there are several innovative approaches to insourcing alternative portfolio including coinvesting, joint ventures or club investing, and investing in platforms.
- US pensions seeking to insource compete with asset managers for top investment talent.
 - To attract the right talent, pensions must institute competitive pay structures and change investment mandates to allow for appropriate investment discretion.
 - Elected officials and pension plan leadership can leverage compensation structures to align the fiduciary obligations of the pension with internal investment staff performance.
 - Elements of a best practice investment pay plan include base salary, annual incentive, and long-term incentive bonus.
- To insource successfully, funds must take a gradual approach to build due diligence and support capabilities over the long term.

Insourcing Considerations

Pensions should consider the potential cost savings and availability of investment talent when determining if insourcing is appropriate.

Direct Cost Savings

- Managing funds internally can be cheaper than externally-managed funds.
- Public market investments realize lower fee savings from a basis point perspective but high asset allocation to these instruments may increase the absolute level of fee savings.
- Alternatives have the potential for high fee savings due to external fee structures including asset management and carried interest components.
- Private equity can drive the biggest fee savings for funds with internal fees of 25 basis points versus 150 for external management.
- Pensions may need to insource high fee strategies to capture alpha: a study of 382 investors showed hedge funds generated negative alpha net of fees.¹
- However, ease of implementation must be considered when ultimately determining which strategies to insource.
- Funds can also utilize alternative structures like coinvesting and joint venture / club investing to save on costs without building out a full insourced team.

Key Insourcing Considerations

Talent Considerations

- Funds must reevaluate compensation structures in order to attract top talent from the private sector.
- However, legally mandated public employee disclosures of high investor salaries can cause conflict.²
- Talent must be incentivized to relocate from geographic centers of finance or the pension fund must be willing to create satellite offices.
- Geographic location may prevent funds from attracting talent without high pay which would limit cost savings.
- Asset classes have different headcount requirements, generally more AUM can be managed by an individual within public investment instruments versus alternatives.
- Compensation design must align the interest of staff with those of fund performance.
- Additional hiring consideration must be given to support staff who handle compliance and monitoring for insourced teams.
- Improved reporting software has made it possible to more efficiently manage risk and oversight.

1. CEM Benchmarking, "[CEM Study Reveals In-House Savings](#)" April 20, 2012
2. Deloitte, "[The Asset Owners Conundrum](#)" 2016

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Part I: Direct Cost Savings



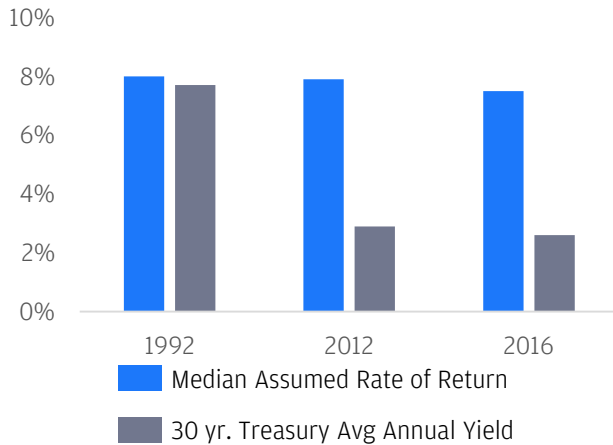
1. Trends in Investment Management Insourcing

Asset Class Diversification and Higher Fees

Pensions can no longer rely on traditional asset classes to fund obligations, leading to increasing allocations to alternative assets and a rise in management fees.

Increasing Reliance on Risk Premium for Returns

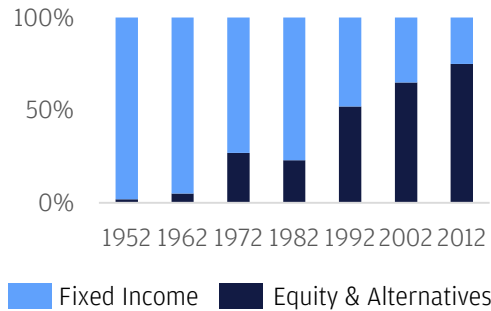
Treasury Yields vs US Pension Target RoR¹



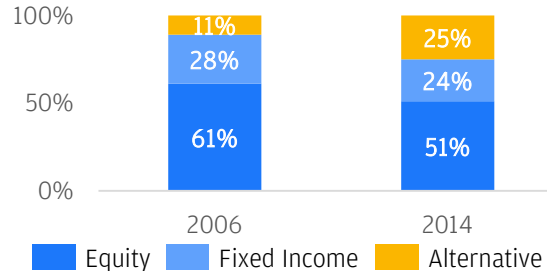
Pensions can no longer rely on fixed income to deliver the returns necessary to meet their obligations.

Diversifying Strategic Allocation

US Public Pension Asset Allocation¹

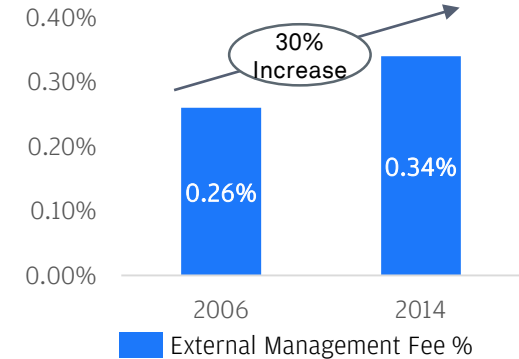


Alternative Asset Allocation 2006 v 2014²



Higher Management Fees

Pensions Ext. Mgmt. Fees; % of Assets²



Investors are experiencing the higher fees of alternatives as they increase their allocation to PE and other alternatives. Smaller pensions may access alternative investment through more expensive methods like funds-of-funds (FoF).

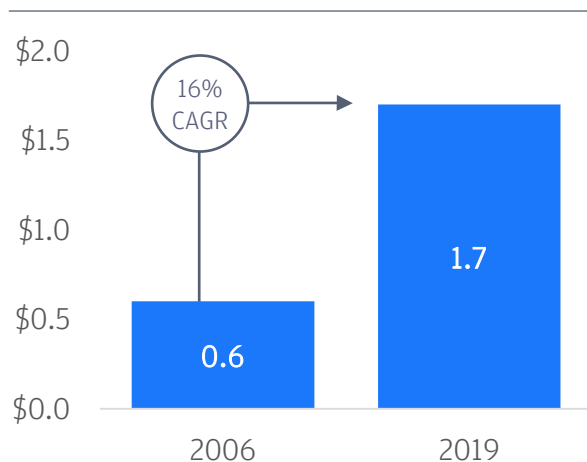
1. Pew Trusts, "State Public Pension Investments Shift Over Past 30 Years" June 2014
 2. Pew Trusts, "State Public Pension Funds Increase Use of Complex Investments" April 12, 2017

Insourcing and Outsourcing Models

As a result, asset owners have looked to either insourcing or Outsourced Chief Investment Officer (OCIO) models to relieve the fee pressures.¹

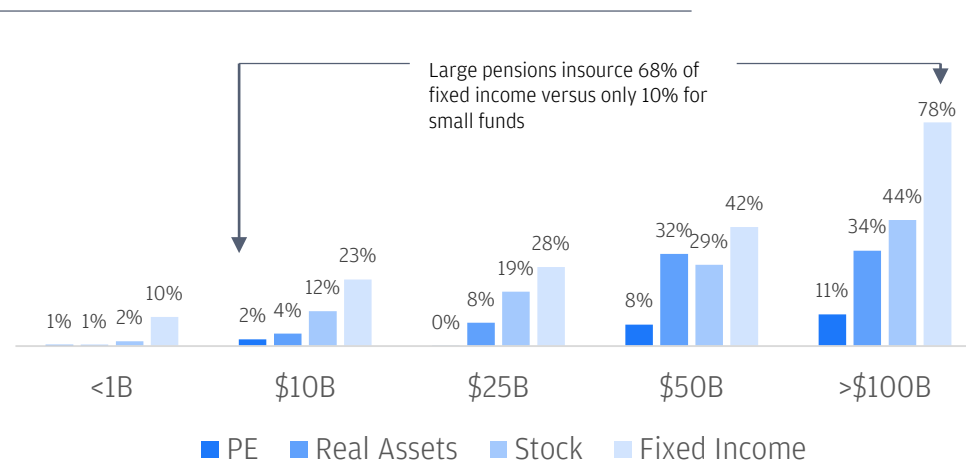
Industry Approaches to Outsourcing / Insourcing

OCIO Assets, Trillion USD²



OCIO model offers a low cost, turnkey solution to smaller pensions seeking a third-party solution to investing.

% Assets Managed Internally by Fund Size, 2016³

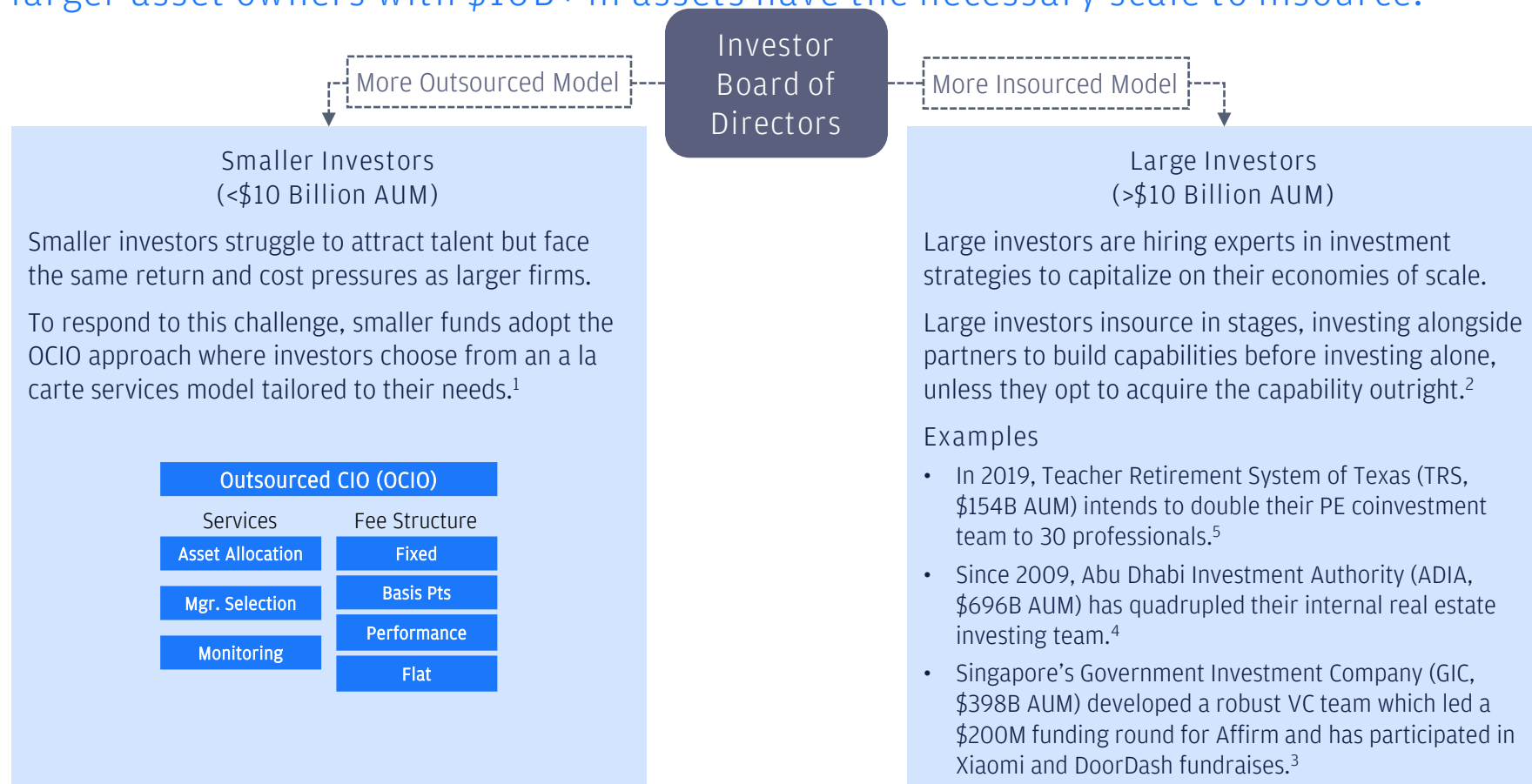


- Large investors leverage their scale to insource assets but few firms manage traditional private equity strategies internally.
- Smaller funds lack the scale to insource and must consider alternative approaches.

1. Pension & Investments, "[More Pension Funds Ponder Going In-House](#)" June 29, 2015
 2. Pensions and Investments, "[OCIO Assets Leap 23%](#)" June 25, 2018
 3. McKinsey, "[The Limits of Pension Consolidation](#)" September 2018

Divergent Strategies

Asset owners with <\$10B in assets tend to favor outsourcing through OCIOs whereas larger asset owners with \$10B+ in assets have the necessary scale to insource.



1. The Institutional Investor, "[The Outsourced CIO Earthquake](#)" January 31, 2019
2. The World Bank, "[Global Evolution of Canadian Pensions](#)" 2017
3. Business Times, "[A Peek into the Workings of GIC's Tech Investment Group](#)" March 23, 2018
4. The Real Deal, "[The World's Biggest Private RE Investor Has a New Boss](#)" May 9, 2018
5. Private Equity International "[How Texas TRS Aims to Go Big...](#)" April 2019

Profiles of Success in Insourcing

Two Canadian pensions, OTPP and OMERS, regarded as industry leaders in insourcing, manage internal portfolios at half the cost of their external portfolios.

Examples of Successful Partial Asset Management Insourcing¹

Ontario Teachers' Pension Plan (OTPP)

Net Assets: \$141 Billion

Internally-Managed		Externally-Managed	
\$112.8 Bn (80% of AUM)		\$28.2 Bn (20% of AUM)	
Salary & Benefit Cost:	\$262 m	Total External Fees:	\$257 m
Implied Fee Rate:	23 BPs	Implied Fee Rate:	91 BPs

Since 1992, OTPP shifted from 100% external fixed income to a well-diversified internally-managed portfolio.²

Ontario Municipal Employees Retirement System (OMERS)

Net Assets: \$65 Billion

Internally-Managed		Externally-Managed	
\$57.2 Bn (88% of AUM)		\$7.8 Bn (12% of AUM)	
Salary & Benefit Cost:	\$171 m	Total External Fees:	\$38 m
Implied Fee Rate:	29 BPs	Implied Fee Rate:	49 BPs

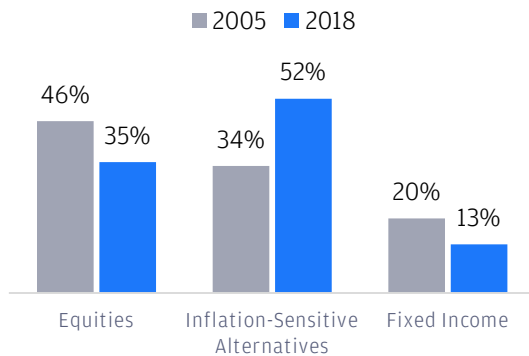
In a span of 30 years, OMERS shifted from conservative externally-managed assets to near total insourcing.²

1. Pension and Investing "[More Pension Funds Ponder Going In-House](#)" June 29, 2015
 2. The World Bank, "[Global Evolution of Canadian Pensions](#)" 2017

OTPP Investing Success

For OTPP, a greater allocation to alternative asset classes and an emphasis on insourcing have not challenged their ability to outperform their benchmark.

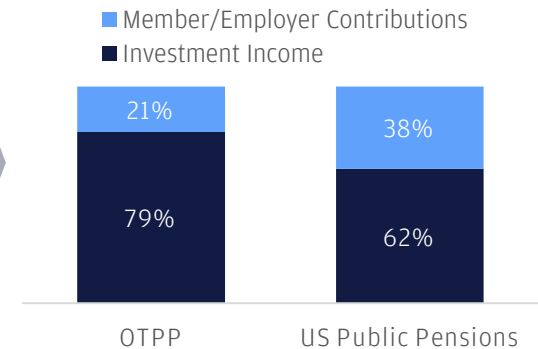
OTPP Asset Allocation



OTPP Returns versus Benchmark

	2018	5-Year	10-Year
Total-Fund Net Return	2.5%	8.0%	10.1%
Benchmark Return	0.7%	6.5%	8.1%
Over/(Under) Performance	1.8%	1.5%	2.0%

Pension Sources of Funding



- As interest rates have remained below historical averages, pensions have started to seek returns in less-traditional asset classes such as venture capital, private equity and credit, and in emerging markets.
- OTPP embraced investments in alternatives relatively early and now maintains an equity allocation - including private equity - of only 35%, below that of most peer funds.

- OTPP's returns have not suffered despite its relatively higher allocation to private and alternative assets as the plan has outperformed its composite benchmark over both the past five- and 10-year periods.
- In addition to asset allocation, manager and security selection have allowed the plan to perform better than its statutory benchmark - emphasizing the need for talented, motivated in-house teams.

- OTPP's unique asset allocation decisions have allowed the plan to fund nearly 80% of its pension obligations with investment income, compared to only 62% for its US public pension peers.
- OTPP has achieved a 100% funding ratio versus a US market average of 78%.
- This is partially explained by OTPP's internal management of 80% of its AUM, which results in millions of dollars in saved management fees.

- [OTPP Benchmarks](#) accessed May 31, 2019
- Pennsylvania State Employees' Retirement System, "[Compensation Study](#)" January 1, 2017
- Pensions and Investments, "[Pensions Must Pay Up](#)" August 8, 2015,
- [OTPP Mid-Year Report](#) 2018

2. Suitability for Insourcing by Asset Class

Potential Fee Savings by Asset Class

Insourcing alternative investments offer more savings on management fees than more liquid investments.

Median Management Fee Internal versus External (basis points)¹

Asset Type	Internal	External	Fee Savings
Equities	10	40	30
Fixed Income	3	18	15
Private Equity	25	150	125
Real Estate	21	75	54

- 19 pensions with investment headcount ranging from 20-647 investment full-time equivalents (FTEs) were assessed to evaluate the fee savings impact of insourcing.¹
- Private equity affords the greatest fee savings opportunity versus external management but is one of the most difficult to implement because of complicated due diligence processes and deal structures.
- Pensions can still realize large dollar volume fee savings in equities and fixed income due to a greater asset allocation to those asset classes.
- Different asset classes require different staffing levels to manage investments, resulting in different break-even points to insource assets.
- A CEM Benchmarking study found the breakeven point for public equities was \$600M USD and fixed income was \$1.2B¹.
 - For Public Equities, the study assumed funds with internal management employ one FTE per \$0.6B AUM.
 - Typical ratio for investment-focused to support-focused FTEs is 3:2.
 - At an average external management fee of 50bps, a \$600M equities allocation can breakeven on insourcing management.
- Degree of investment complexity drives private equity and real estate breakeven points as full-time employees required can vary greatly.
- Each firm should evaluate the complexity of its own strategies to determine the necessary breakeven point of AUM to insource.

1. CEM Benchmarking, "[CEM Study Reveals In-House Savings](#)" April 20, 2012

Private Equity Investing Fees

In fact, all-in fees are around 3% for externally-managed private equity funds and components like carried interest could be eliminated through insourcing.

The Cost of Private Market LP Investing¹

Private Market Investment Costs of a US Public Pension (USD millions)

2016	Mgt Fees	Other Exp	Total Exp	Gross Earnings	Carried Interest	Net Earnings	Carry as % of Gross
Private Markets	122	38	160	1,154	294	860	25.5%
Private Credit	50	24	74	490	73	417	14.9%
Real Estate	55	17	72	647	118	529	18.2%
Total	227	79	306	2,291	485	1,806	21.2%

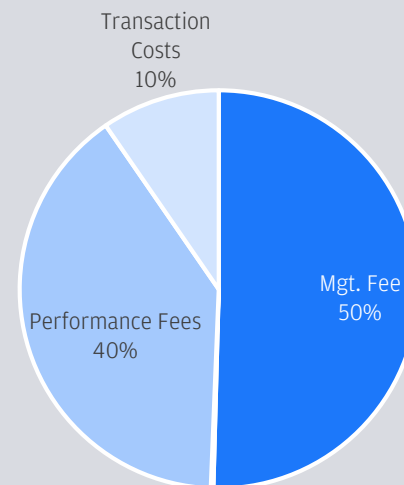
2017	Mgt Fees	Other Exp	Total Exp	Gross Earnings	Carried Interest	Net Earnings	Carry as % of Gross
Private Markets	112	47	159	1,724	378	1,346	21.9%
Private Credit	58	23	81	523	89	434	17.0%
Real Estate	54	16	70	853	202	651	23.7%
Total	224	86	310	3,100	669	2,431	21.6%

Carried interest amounts to a significant portion of total earnings, which can be mostly eliminated with an insourced investment management team.

1. Pennsylvania, "[Final Report and Recommendations](#)" December 19, 2018
2. CEM Benchmarking, "[Implementation Style](#)" Spring 2014 Volume 7

Underreporting of Expenses

The true cost of alternative portfolios include headline management and performance fees along with transaction costs (typically 9.6% of invested) and internal monitoring fees (0.2%).



Returns from Managing Real Estate Internally

For example, fee savings from insourced management of core real estate portfolios has been shown to provide superior risk-adjusted returns.

Real Estate Net Returns by implementation Style, U.S. Defined-Benefit Pensions¹ (%)









Year	Internal (core)	External direct (core)	External LP (opportunistic)	External FoF (opportunistic)	Total (core & opportunistic)	Listed equity REITs (primarily core)
2016	16.13	11.76	11.4	8.36	10.62	4.88
2015	1.46	0.82	0.42	-0.11	1.56	1.74
2014	27.05	26.29	26.89	23.09	26.28	20.19
2013	1.14	-0.55	-1.55	-1.75	-0.91	3.99
2012	16.73	15.53	15.99	9.38	15.18	20.55
2011	-8.38	-4.5	-5.68	-8.72	-4.08	2.05
2010	14.66	8.13	11.79	10.72	5.97	23.51
2009	34.48	32.13	31.59	39.53	32.71	29.89
2008	-31.61	-28.19	-36.62	-32.5	-29.51	-38.2
2007	-8.58	-10.78	-7.95	-8.83	-11.03	-10.75
2006	33.26	27.99	33.69	20.79	29.04	34.75
2005	12.16	10.96	22.6	6.06	10.74	14.16
2004	22.22	15.34	13.12	13.76	15.74	32.43
2003	30.93	25.55	26.29	29.5	26.55	33.09
2002	-2.74	-0.32	-11.93	-2.18	-1.3	5.17
2001	9.1	3.71	4.79	-0.01	3.47	10.94
2000	33.89	31.53	34.53	29.81	31.55	26.58
1999	5.29	7.38	15.44	10.44	8.73	1.23
1998	-18.42	-11.34	-14.23	-14.5	-12.81	-6.39
Net arithmetic average	9.94	8.5	8.98	6.99	8.34	11.04
Net geometric average	8.31	7.29	7.24	5.59	7.05	9.4
Sharpe Ratio	0.37	0.33	0.33	0.24	0.33	0.43

- A 2018 study by CEM benchmarking showed **internal investment teams routinely outperformed** other implementation styles in real estate investing since 1998.
- Fee savings from insourcing drove the outperformance within core real estate.
- For other strategies, the drag from management fees did not result in lower volatility.
- Fee savings from internal teams can drive greater returns for real estate strategies.

1. CEM Benchmarking, "Real Estate Performance by Investment Implementation Style" December 2018

Which Assets to Insource?

Though the potential cost savings from insourcing alternative asset classes may be higher, the ease of implementation favors traditional asset classes.

Asset Class	Potential Cost Savings	Ease of Implementation	Discussion
Equities			<ul style="list-style-type: none"> Passive equity strategies which track indexes are simpler to manage and typically are the first insourced.¹ Highly liquid nature provides flexibility when building insourcing capabilities.
Fixed Income			<ul style="list-style-type: none"> Investors should evaluate the merits of insourcing fixed income based on factors such as duration, investment grade, country of origin, and type of instrument (e.g., treasuries, private debt, etc.). Short duration, fixed income instruments like treasuries are simpler to insource because of their high liquidity and stability.¹ Private debt, high yield credit, and other esoteric fixed income instruments are more difficult to bring in-house.
Real Estate / Infrastructure			<ul style="list-style-type: none"> Real Estate assets range from low volatility core assets in established geographies to opportunistic ventures in the developing world. Several studies have shown internally-managed, core assets have superior risk-adjusted returns versus riskier externally-managed classes.² Long-term infrastructure assets make sense to insource due to their duration, but their complexity can pose significant risk. Focusing on “brownfield” investments can simplify the valuation and diligence process.
PE/VC			<ul style="list-style-type: none"> Insourcing VC/PE requires significant investment to build deal flow and the asset class requires greater diligence and monitoring.³ VC/PE is highly illiquid so underwriting and ongoing management is crucial. Firms may consider virtual insourcing as an option where investors fund a GP stake in managers to improve fee economics, governance, and learn diligence best practices.

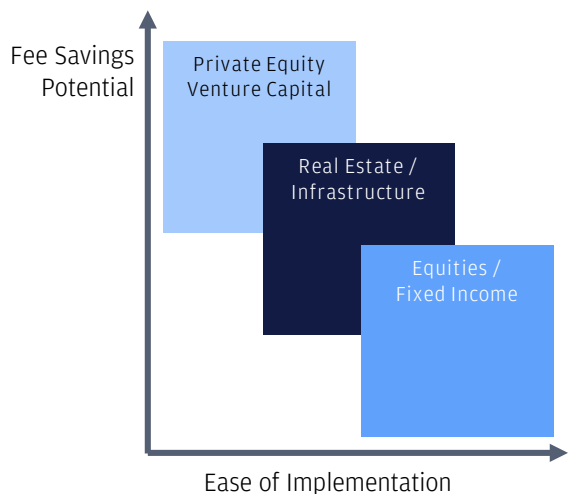
1. Pensions & Investment, “[Low Returns, Fee Scrutiny Drive Rise of Pension Fund Insourcing](#)” June 13, 2016
 2. CEM Benchmarking, “[Real Estate Performance by Investment Implementation Style](#)” December 2018
 3. [GIC Annual Report](#) 2018

Prioritization of Insourcing Assets

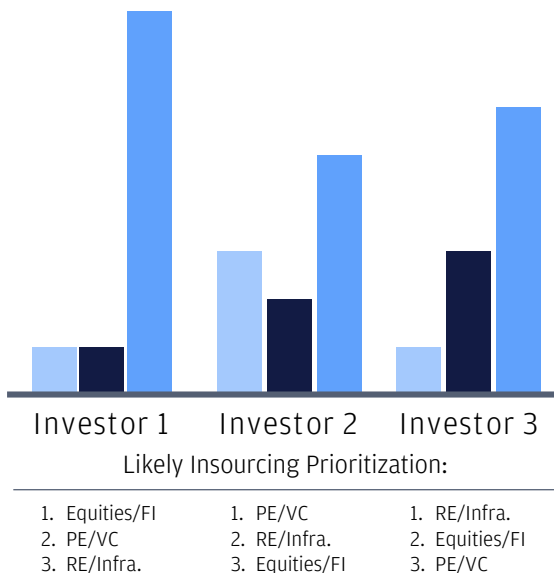
Therefore, the decision to insource should be informed by the institution's specific asset allocation and capabilities.

Assets to Insource: Ease of Implementation vs Savings Potential

General Case




Illustrated Effect of Asset Allocation on Savings Potential



Discussion

- Prioritization of insourcing depends upon a fund's asset allocation, management fees, internal skillset, and specific strategies.
- Funds may find insourcing equities and fixed income is a fast way to begin building investment teams.
- Real estate offers the optimal blend between savings potential and implementation ability.
- Funds can evaluate their own strategies based on estimated fee savings and ease of implementations to arrive at a prioritization framework.

Total savings potential from a specific asset class may change from investor to investor depending on an individual fund's asset allocation.



3. Innovative Approaches to Insourcing

Investor Approaches to Capital Deployment

Whereas insourcing public market portfolios is a binary decision, private markets have a range of insourcing models.

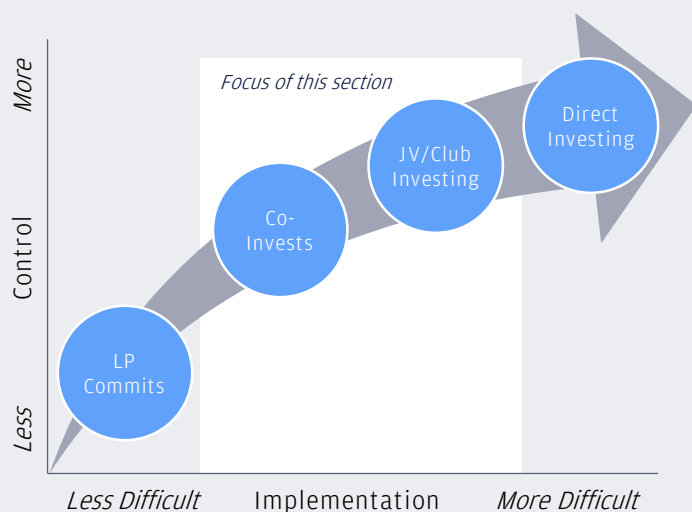
Public Markets

Insourcing for Public Equities and Fixed Income is driven by selecting which aspects of the portfolio to insource rather than the method to insource.

- Equities: US Large Cap, US Small Cap, International and emerging markets
- Fixed Income: US government debt, agency debt, inflation-linked bonds, sovereign credit, investment grade, high yield credit, emerging market debt, private debt

Private Markets

Illustrative Spectrum of Investment Discretion



LP Commitments

Limited partner (LP) commitments wherein the investor commits capital to a general partner (GP) who manages the investment in accordance with the GP's investment strategy. Limited investor control beyond initial subscription documents.

Coinvestments

Direct investment opportunities presented by the GPs to their LP investors. Typically, coinvestments are in opportunities that the GP-managed fund is investing in, allowing the LP investor to invest additional capital alongside the GP for increased exposure.

Joint Venture/Club investing

Partnership investing between institutional investors or between an institutional investor and a private asset manager. Such relationships are highly customizable and may exist for a number of investment or operational purposes.

Direct Investing

Fully insourced investment activities wherein the institutional investor assumes all investment decision-making.

Build Competency Through Secondaries

As a first step, traditional LP investors can build diligence capabilities by setting up a private equity secondaries program.

Overview of Secondaries

- Secondaries offer LPs liquidity options through the ability to sell their stake in a fund early.
- Secondaries generally fall into the categories of single fund interests, portfolio purchases or complex restructurings.¹
- Secondaries present an opportunity to smooth the J-curve by entering into mature vintages and at a discount to net asset value.²
- Regulatory rules such as the Volcker Rule mandating divestment from illiquid assets can incentivize funds to sell positions as well.³

Benefits

- Removes blind pool risk
- Enables investors to refine due diligence process

Risks

- Heated secondaries market has kept pricing at elevated levels for a sustained period of time.⁴
- Investors must be wary of adverse selection where funds only sell positions that are negatively impacting returns.

Trends

- Tail-end funds have NAV of \$570B, 12% of the \$4.9T in the PE space.⁴
- In 1H2018, transactions were up 18% YoY to \$32B and discount to NAV was 5%, its second lowest discount ever.⁴
- Canada Pension Plan Investment Board (CPPIB) has expanded its secondaries team to 20 professionals with \$9.4B in AUM.⁵
- CPPIB began building expertise by acquiring only LP positions but has since expanded to entire funds, carried interest streams, and more complicated structures.⁵
- APG has announced plans to build its own internal secondaries team.⁶

1. IPE, "[Secondaries Come to the Fore](#)" February 2018

2. Preqin, "[Secondary Market Update](#)" 2018

3. Blackstone, "[Secondaries Primer](#)" 2017

4. Pensions & Investments, "[Secondary Market becomes hotbed of activity](#)" November 12, 2018

5. Private Equity International, "[CPPIB The Smartest Nicest Guys...](#)" February 2019

6. Private Equity International, "[APG Build In-House Secondaries Team](#)" June 18, 2018

A Middle Ground: Coinvestment

Next, coinvestment programs offer an attractive compromise between external management and building fully insourced teams.

Coinvestment Background	Reasons to Coinvest	Examples
<ul style="list-style-type: none">Coinvesting involves investing alongside a fund manager at lower fees than the traditional LP relationship or no fee at all.<ul style="list-style-type: none">➤ GPs and coinvestors each contribute additional capital to a deal which may be necessary if a prospective deal is too large for fund mandates.Coinvestment is estimated to comprise 20% of overall private equity activity.¹<ul style="list-style-type: none">➤ Preqin found that 66% of coinvestments outperform private equity fund returns.²GPs may leverage coinvestment opportunities as a way to secure commitments to future fundraises and offer LPs an entry into future funds.	<ul style="list-style-type: none">Increased control over portfolio risk exposure.Less blind pool risk than LP commits.Allows pensions to build and strengthen their due diligence capabilities.Facilitates knowledge transfer from private equity managers.Improves fee economics of PE investing.Deepens relationships with existing GPs for deal flow.Partnership model allows funds to develop decision making structures to support eventual independent deal making.	<ul style="list-style-type: none">In 2019, Canada Pension Plan Investment Board changed its organizational structure to double their coinvestments AUM from \$1B to \$2.3B over the past year.³CalSTR's plans to double their \$1.1B in coinvestments over the next five years and believes coinvesting is a tool to build competency that one day will lead to directly-originated deals.⁴The Oregon Public Employees Retirement Fund (\$75B AUM) opted to outsource their coinvestment function, investing \$250M with a long time trusted partner.⁵

1. Cambridge Associates, "[Ready Steady Co-Invest](#)" March 2019

2. Preqin, "[Private Equity Coinvestment Outlook](#)" November 2015

3. Private Equity International, "[CPPIB More Than Doubles Co-Investment Spending](#)" May 2019

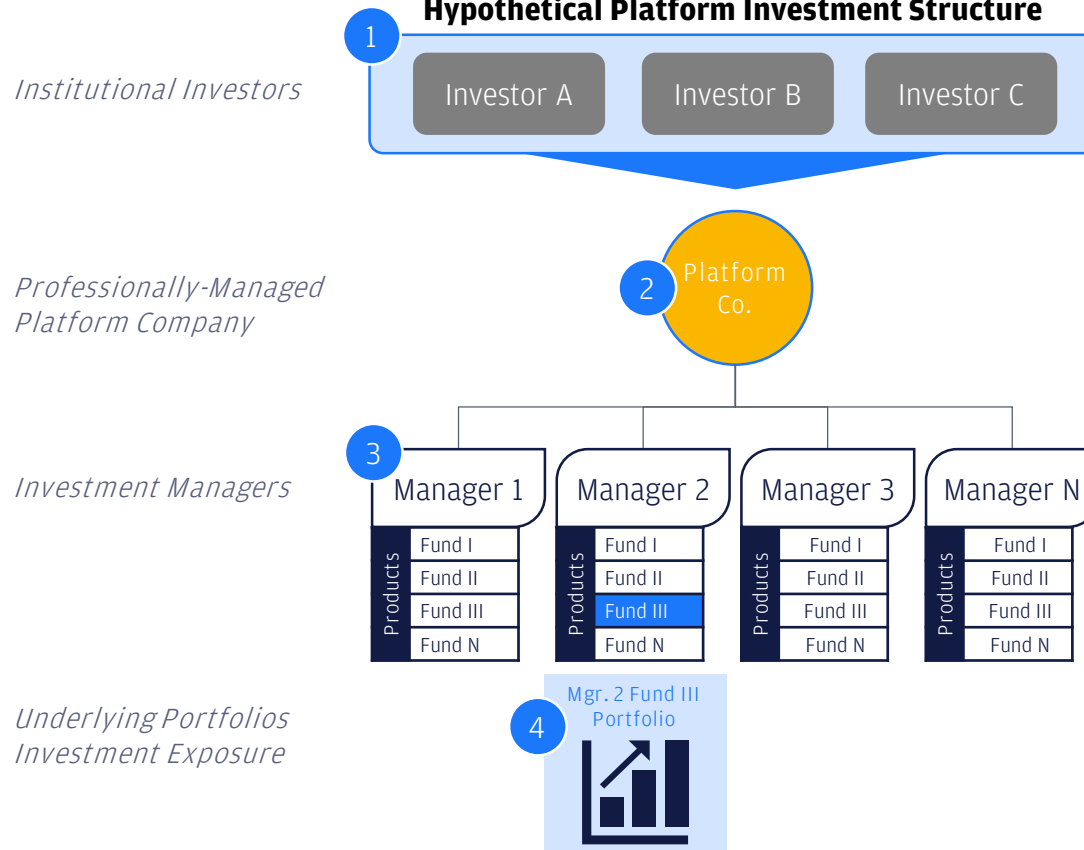
4. Pensions & Investments, "[More Plans Want a Place at the Coinvestment Table](#)" March 2019

5. PE Hub, "[Pathway and OPERF Close \\$250M Co-Investment Fund](#)" February 2019

Platform Investing as a Solution to Insourcing

Finally, joint ventures can allow investors to virtually insource by taking ownership stakes in underlying managers.

Hypothetical Platform Investment Structure



- 1 Institutional investors fund platform company to invest in specialized asset managers.
- 2 The platform company is professionally-managed by a subadvisor to provide seed capital to asset managers in exchange for ownership stakes in their business.
- 3 Managers seeded by the platform company raise additional funds to launch their investment strategies.
- 4 Investors have access and exposure to underlying investments across seeded manager strategies.



Part II: Talent Considerations

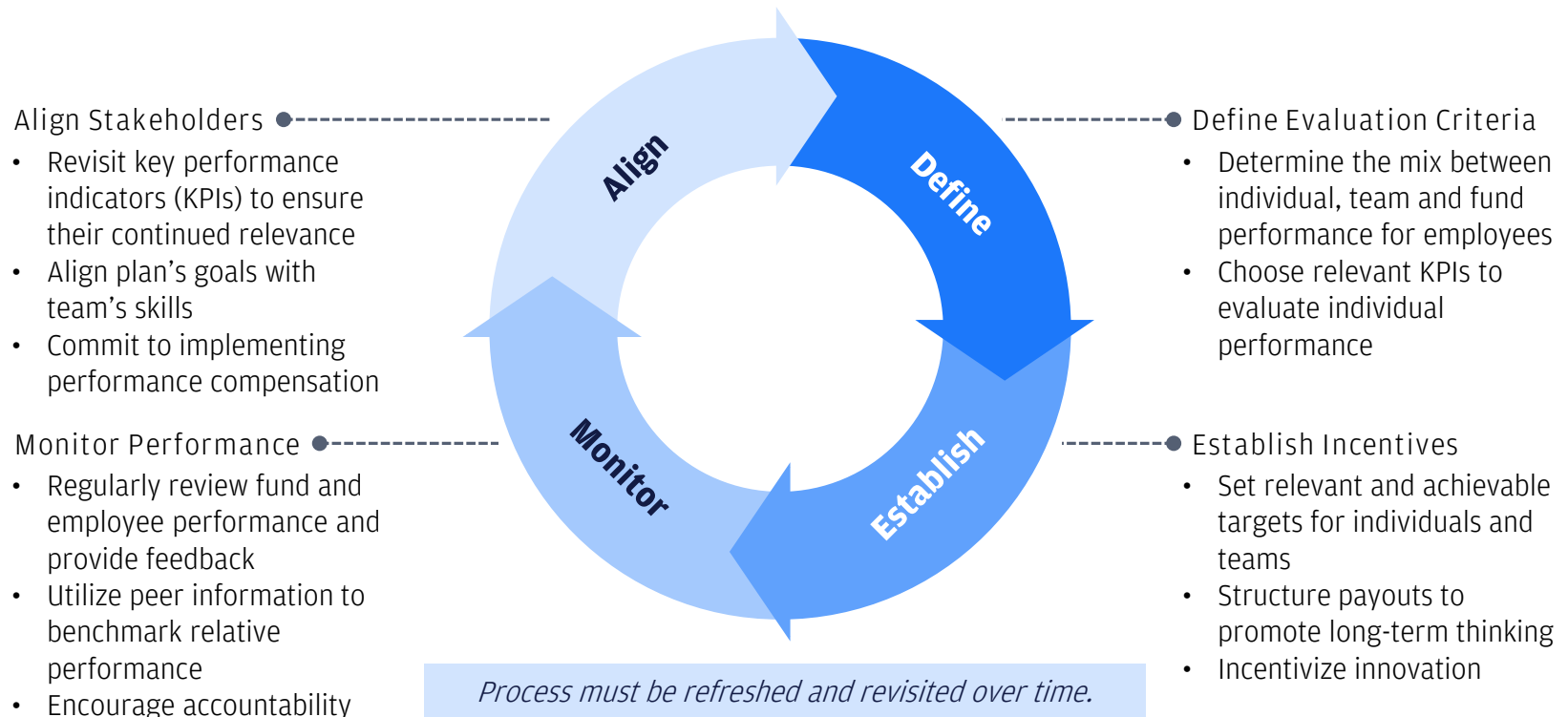


4. Compensation Trends in Pension Management

Guiding Principles for Incentive Pay Schemes

Pension managers should consider several key elements when developing a framework for implementing incentive pay in their overall compensation.

Incentive Pay Scheme Framework



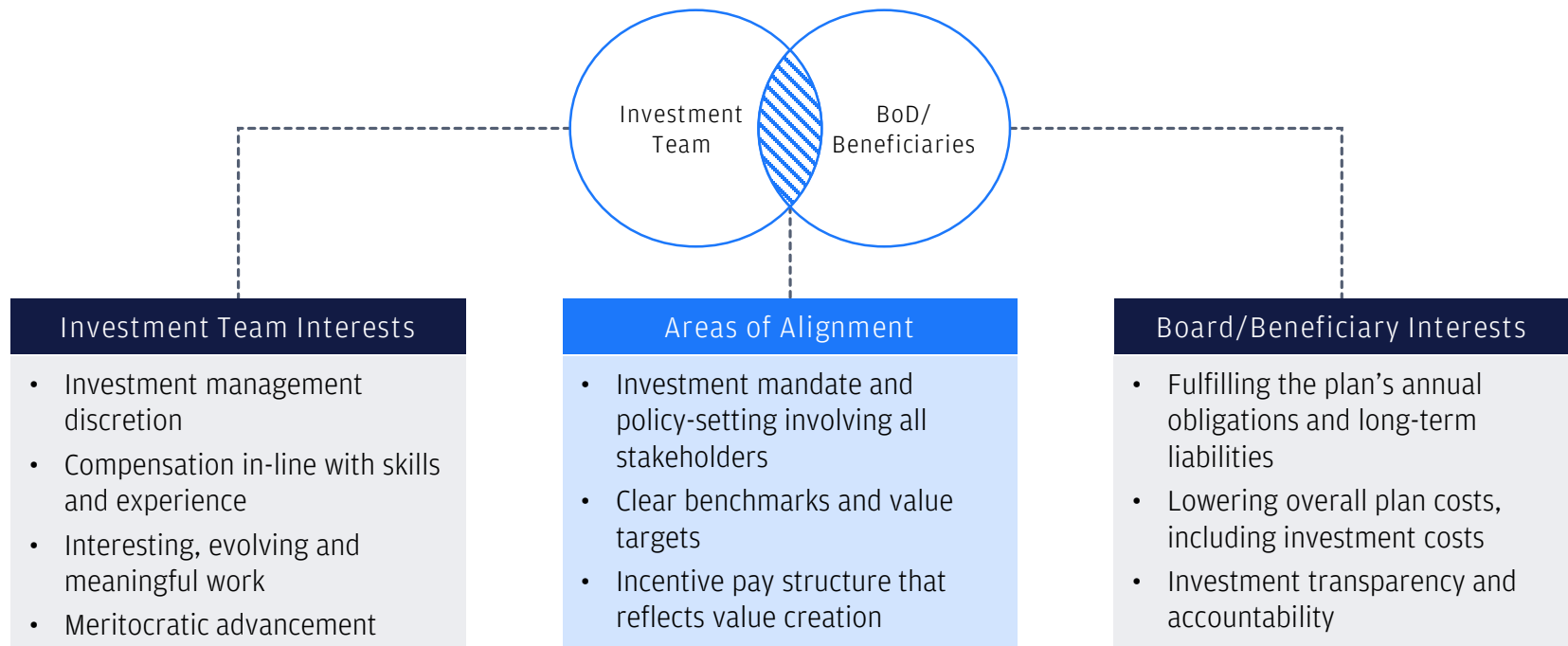
Source: [OTPP Annual Plan 2017](#)

Successful Insourcing Requires Alignment



Successful pensions have built superior in-house teams by offering competitive compensation to top talent while aligning pay with their funds' interests.¹

Alignment of Talent and Management/Beneficiary Interests



Public funds can craft long-term incentive plans to align their interest and concerns with those of their staff while still saving on costs versus external managers.

Sources:

1. [CPPIB Annual Report 2018](#)

2. Pensions & Investments, "[Pubic CIO Pay Getting Renewed Attention](#)" July 2018

3. [OTPP Annual Report](#) 2017

4. New York Times "[Canada Finds Key to Pension Fund Investing](#)" December 2014

Industry Compensation Breakdown



The compensation structures of many US public pensions lack the incentive features commonly found in the private sector or best-in-class international peers.

Pay Component	Market Segments				US Public Pension Funds
	Public Alternative Managers	SWFs & Leading International Pensions	Private Alternative Managers	Traditional Asset Managers	
Base Salary	✓	✓	✓	✓	✓
Annual Bonus	✓	✓	✓	✓	✓
Equity	✓		✓ (For upper management)	✓	
Long-term Incentive Plans		✓ (Relative outperformance vehicle)			
Carried Interest	✓	✓ (Present for some insource funds/deals)	✓		
Co-Investment	✓		✓		

Source: Korn Ferry, ["Insights Around Investment Team Paradigms"](#) May 2019

Benefits of Alignment



Adjusting compensation programs to incorporate bonus incentives can be positive for beneficiaries, leaders, and staff alike.

Why adjust incentive pay structure?

- Historically, public pensions could not compete with the private sector in retaining top talent.
- Boards recognize incentive compensation can generate alpha.
- Modifying pay structure gives management flexibility to prioritize their goals and achieve workforce alignment.
- Incentives can be tailored to pay out only when specific plan component targets are met.
- Savings from decreased spend on external managers offsets the increase in internal payroll.

Win-win of stakeholder alignment

Beneficiaries and Taxpayers

- Save on management fees
- Performance is measured and paid based on multiyear results to protect the interest of beneficiaries.

Pension Fund Leaders

- Incentive pay plans attract and retain high caliber staff.
- Long-term compensation structures drive increased retention and fund stability.

Staff

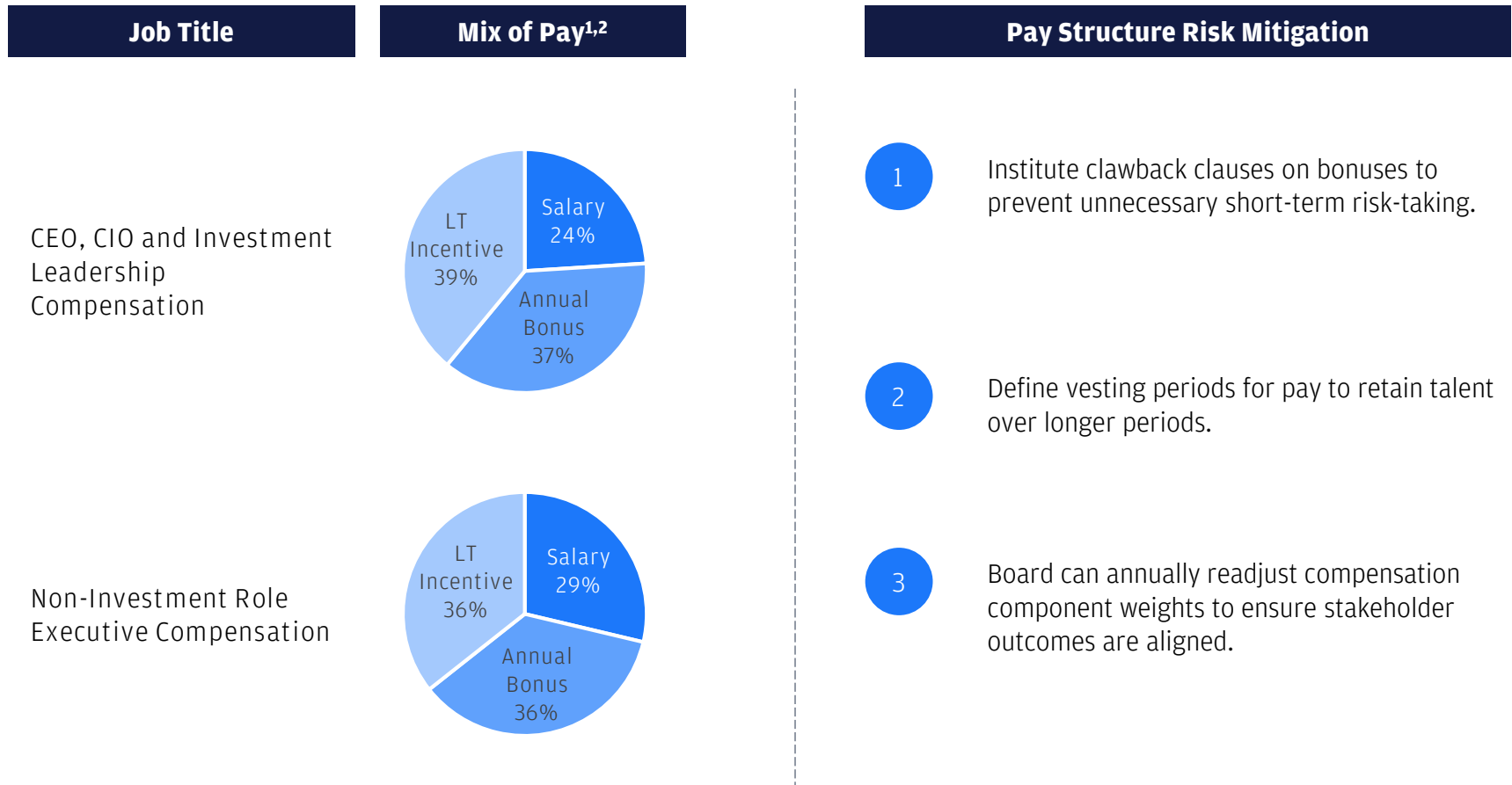
- Incentive pay plans make public sector careers more attractive for top talent.
- Pay mechanics include individual and fund level targets to ensure meritocratic allocation and share of upside.

Source: Korn Ferry, "[Insights Around Investment Team Paradigms](#)" May 2019

Potential Pay Mix



In a well-designed incentive system, base compensation is a smaller component of overall potential earnings for investment staff.



1. [OTPP Annual Plan 2017](#)
2. [CPPIB Annual Report 2018](#)

Pay for Performance Plan Design

To align various interests, incentive plans can be designed to achieve short- and long-term goals.

Base Salary + Incentives = Total Compensation

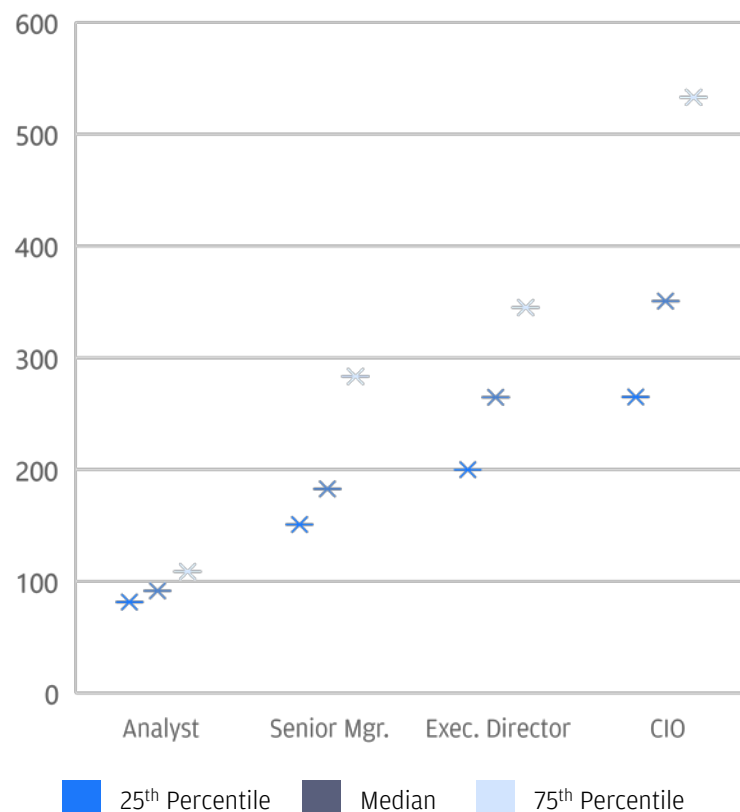
Quantitative Performance Incentive (15 – 25% of base salary)

- Based on relative investment performance over multi-year periods (3 to 5 years)
- Benchmarks should be clear and transparent to determine relative out/under performance.
- Minimum and maximum incentive opportunities are usually assigned per employee or by position. Typically, 10 – 30% of base salary.
- Investment performance/contribution to firm performance constitutes a greater part of total compensation for senior staff.
- Variable compensation may surpass 10 – 30% of base salary for senior management positions, especially for entities implementing management transitions.

Qualitative Performance Incentive (5 – 15% of base salary)

- Non-investment related contributions (e.g., leadership, personal development, teamwork, etc.)
- Formal review process by various superiors to evaluate subjective criteria
- Reduces as a proportion of incentive compensation for more senior positions

2017 Pension Total Cash Compensation, Investment Teams¹



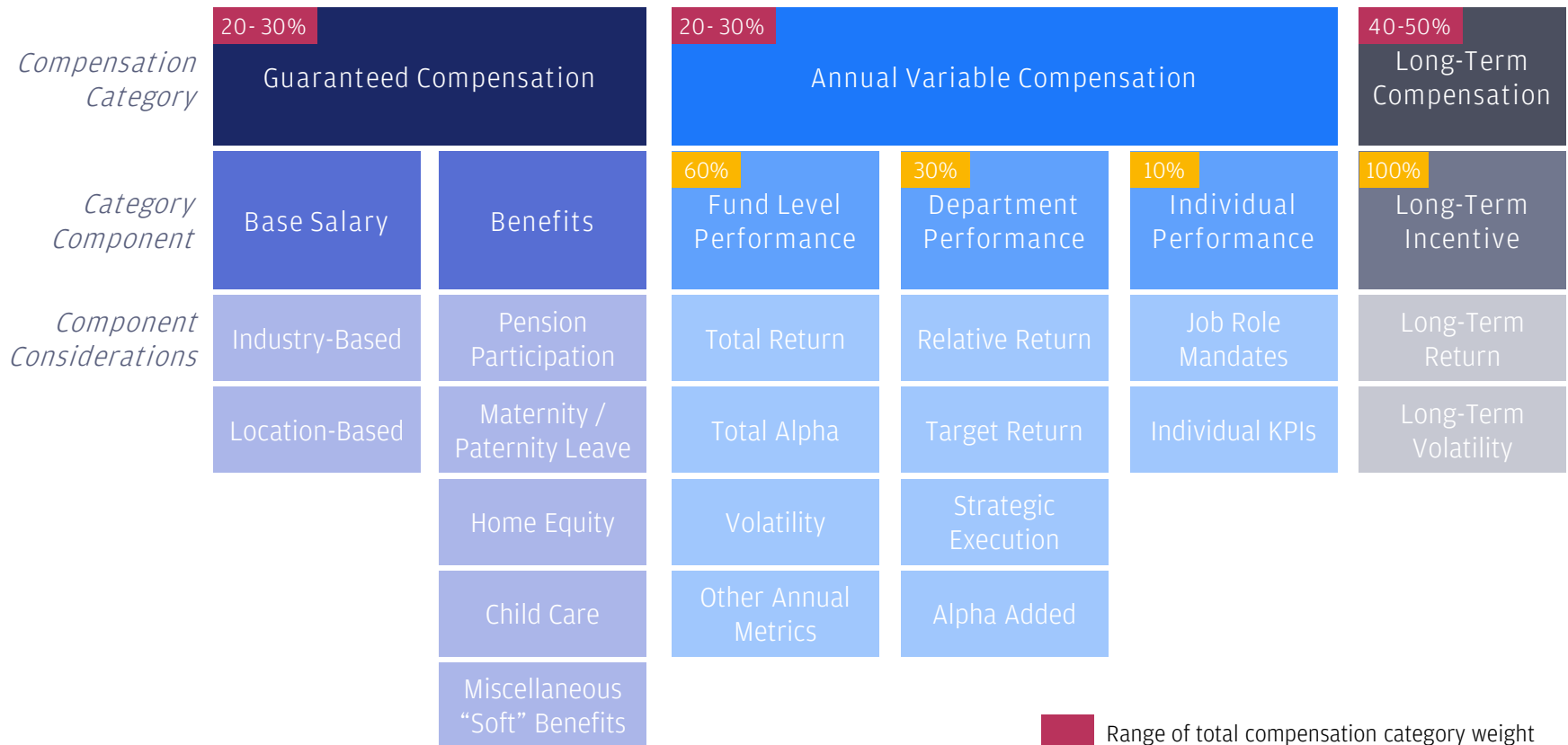
1. McLagan, "2018 Pension Funds Compensation Survey" October 9, 2018 Figure used for illustrative purposes only.
 2. Pennsylvania State Employees' Retirement System, "Compensation Study" January 1, 2017



Potential Pay Structure



Incentive pay targets can be established based on fund performance across returns, volatility, and other KPIs defined in the prior step.

Illustrative Pay Structure of Full Incentive Plan^{1,2,3}



 Range of total compensation category weight
 Weight within compensation category

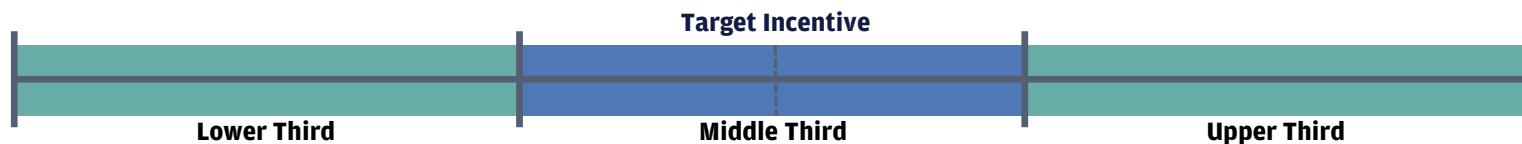
1. [OTPP Annual Report 2017](#)
2. [CPPIB Annual Report 2018](#)
3. [PSP Annual Report 2018](#)

Pension Variable Compensation Structures



Boards can control total compensation by setting target rate ranges to control cost and establish an equitable compensation scheme.

Generally Proposed Incentive Plans for US Public Pensions, (Incentives as % of Salary)				
Tier	Title	Minimum	Target	Maximum
1	Executive Director & CIO	17.5%	35.0%	52.5%
2	Deputy Executive Director Senior Investment Officers Chief Operating/Financial Officer Chief Operating Officer Chief Risk and Compliance Officer General Counsel	12.5%	25.0%	37.5%
3	Investment Directors Senior Portfolio Managers Portfolio Managers Other Investment Managers	7.5%	15.0%	22.5%
4	Senior Analysts Analysts Senior Traders Traders	5.0%	10.0%	15.0%



- Employees who are not meeting the established performance criteria for the position, or
- Employees who have minimum qualifications to fulfill the job responsibilities, or
- Employees with minimum amount of relevant work experience

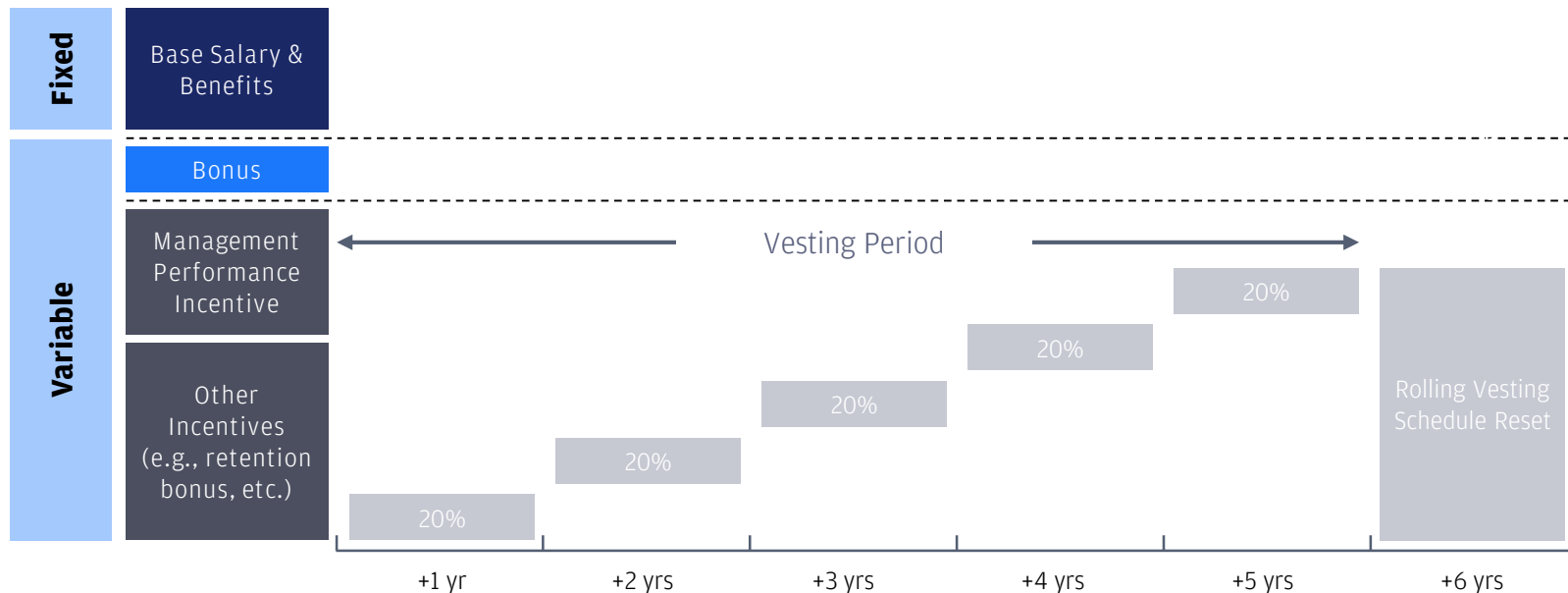
- Employees who fully meet the established performance criteria, or
- Employees who are fully qualified for the position, or
- Employees with critical skills, yet no shortage of talent for the role in the market

- Employees who exceed established performance criteria, or
- Employees with a higher degree of qualifications of the position requirements, or
- Employees who occupy key jobs with hard to recruit talent

Pay Schemes at Leading Public Pensions



Boards can leverage vesting period structures to encourage employee retention and align the long-term view of the pension with compensation of investment staff.



Examples of Shifts to Variable Compensation from Leading Public Pensions

- 1 CalPERS raises annual incentive limits from 45% to 75% of annual base, from 30% to 50% for investment managers.¹
- 2 CalPERS raises CIO base salary from \$424,500 to \$707,500, and up to 150% of base in additional incentives.²
- 3 Ontario Teachers' compensation mix for senior level staff: base salary (25%), annual incentive (37.5%), long-term incentive (37.5%).³

McLagan AON, Investment Practices and Performance 2016, 1) Pensions & Investments, "[CalPERS Board Adopts new Compensation Package](#)" February 21, 2019 2. Pensions & Investments, "[Public CIO Pay getting Renewed Attention](#)" July 23, 2018 3. Top 1000 Funds, "[OTPP Maxes Paying Well Pay Off](#)" March 16, 2018

Maintaining Your Compensation Scheme



For incentive structures to remain effective, reviewing and updating is necessary to keep pace with the market to ensure continued alignment with plan performance.

1. Collect Data Annually

- Gather data from public peers for various positions
- Gather data from private asset managers with whom there is competition for talent
- Pick a weighting scheme to arrive at a blended pay per position (e.g., 75% Public/25% Private)

2. Benchmark Against Market

- Set your firm's median pay for a given position against the blended median found in the previous step
- Calculate percent deviation from market median

3. Review Results

- Prioritize positions with the greatest deviation from the market median
- Recognize trends that may arise that are unique to your organization (e.g., lower-level positions may be closer or above market to attract younger people to non-major cities)

4. Make Appropriate Adjustments

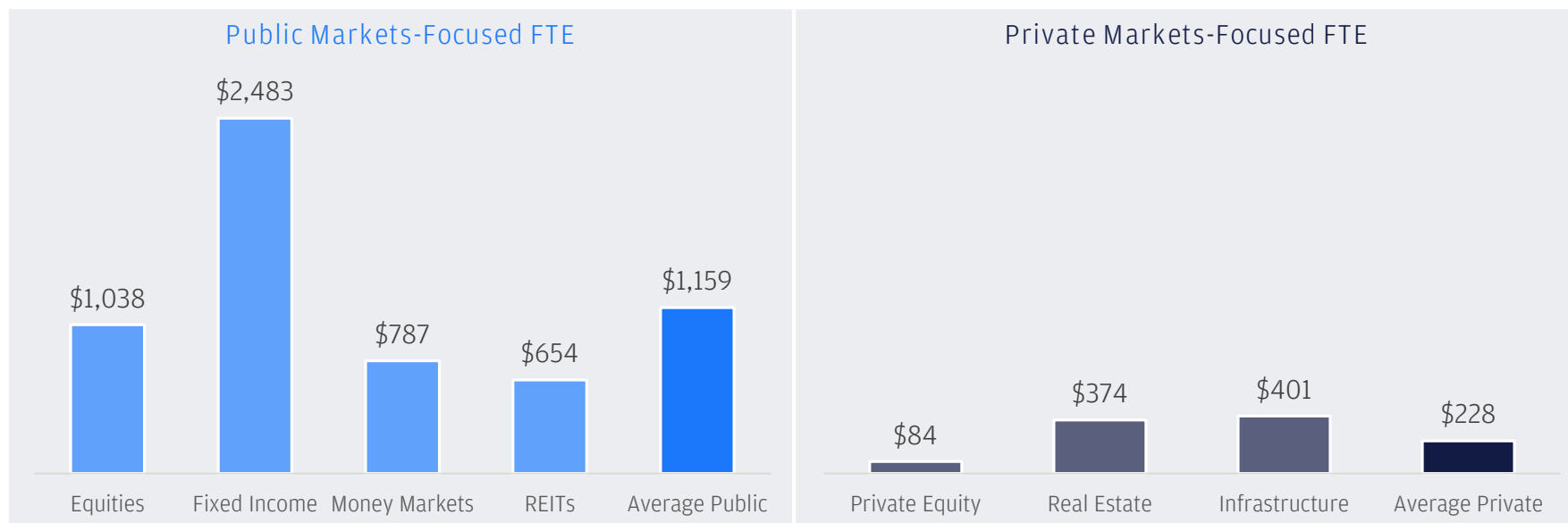
- Set a plan to bring pay in-line with market, including:
 - Delaying raises for positions that are above market median
 - Accelerating raises for existing employees
 - Adjusting pay only for entrants into a new title (e.g., outside hire or internal promotion)

5. Building Investment Support and Capabilities

Investment FTE Requirements by Asset Type

AUM/FTE efficiency is greater for public markets versus private markets.

AUM per Internal Asset-Management FTE (millions of USD)



- CEM Benchmarking analysis shows public investments can be managed with more efficiency than private investments.
- While an alternatives FTE manages less AUM, efficiency is dependent upon deal size, experience of staff, and velocity of transactions.
 - Funds can improve on industry metrics and use AUM per FTE as a KPI for leaders to manage.
 - Velocity of transactions could be constrained by fund size or management direction.

Source: CEM Benchmarking, "[How Large Pensions Organize Themselves](#)" Spring 2012

Investment Staff

However, OMERS' \$14.2B PE portfolio is managed by 39 investment professionals; this improved efficiency is likely driven by deal size and velocity.

Sample Organizational Structure: OMERS' Private Equity Team

Corporate Title	Executive VP	Senior Managing Director	Managing Director	Director	Associate Director	Associate
Number of FTEs	1	3	8	6	8	13
Responsibilities	Global Leader of PE Practice	Lead 3 principal geographic regions and large deals	Lead deal sourcing, execution and portfolio mgmt.	Assist with asset management and deal execution	Support asset management and deal execution	Conduct deal modeling and support portfolio company teams
Board Involvement	Serve on Boards of Portfolio Companies				Board Observers	
Focus Area	Practice leadership	Functional or Sector (e.g., healthcare, auto parts, etc.)	Functional or Sector (e.g., healthcare / business development)	Sectors (e.g., software, business services)	Generalist	Generalist

Source: [OMERS Organizational Chart](#) accessed May 31, 2019

Support Staff

Insourcing investment teams also requires hiring additional back office personnel based on volume of assets managed, type of assets, and investment complexity.¹

Discussion

- A survey of 26 leading pension funds showed pension funds hire 1.7-2.5 back office FTEs for every investment FTE.²
- Passive strategies exhibit greater FTE hiring economies of scale than labor intensive strategies like private equity and real estate, but higher fees associated with externally managing these assets can still make insourcing worthwhile.
- A study of 19 pensions from \$12B to \$340B in AUM found support FTE by AUM varied from 1.0-1.3 FTE per \$1B in AUM.³
- The two studies suggest that funds may be able to achieve economies of scale in FTE hiring once a prerequisite level of support functions are hired.

Public Pension Survey Respondents' Staffing, by Role³

Functional Role	FTE Count
Executive Investment Operations, Support and Custody	36
Asset Allocation	5
Risk Management	8
Corporate Governance	3
Compliance, Internal Audit and Reporting	16
Public Relations	3
Client Account Management	5
Valuation and Performance Analytics	8
IT Applications and Databases	23
IT Hardware and Security	9
Legal	6
Human Resources	5
Office support and Other	7

1. PWC, "[Best Practices in the pension funds investment process](#)" 2016

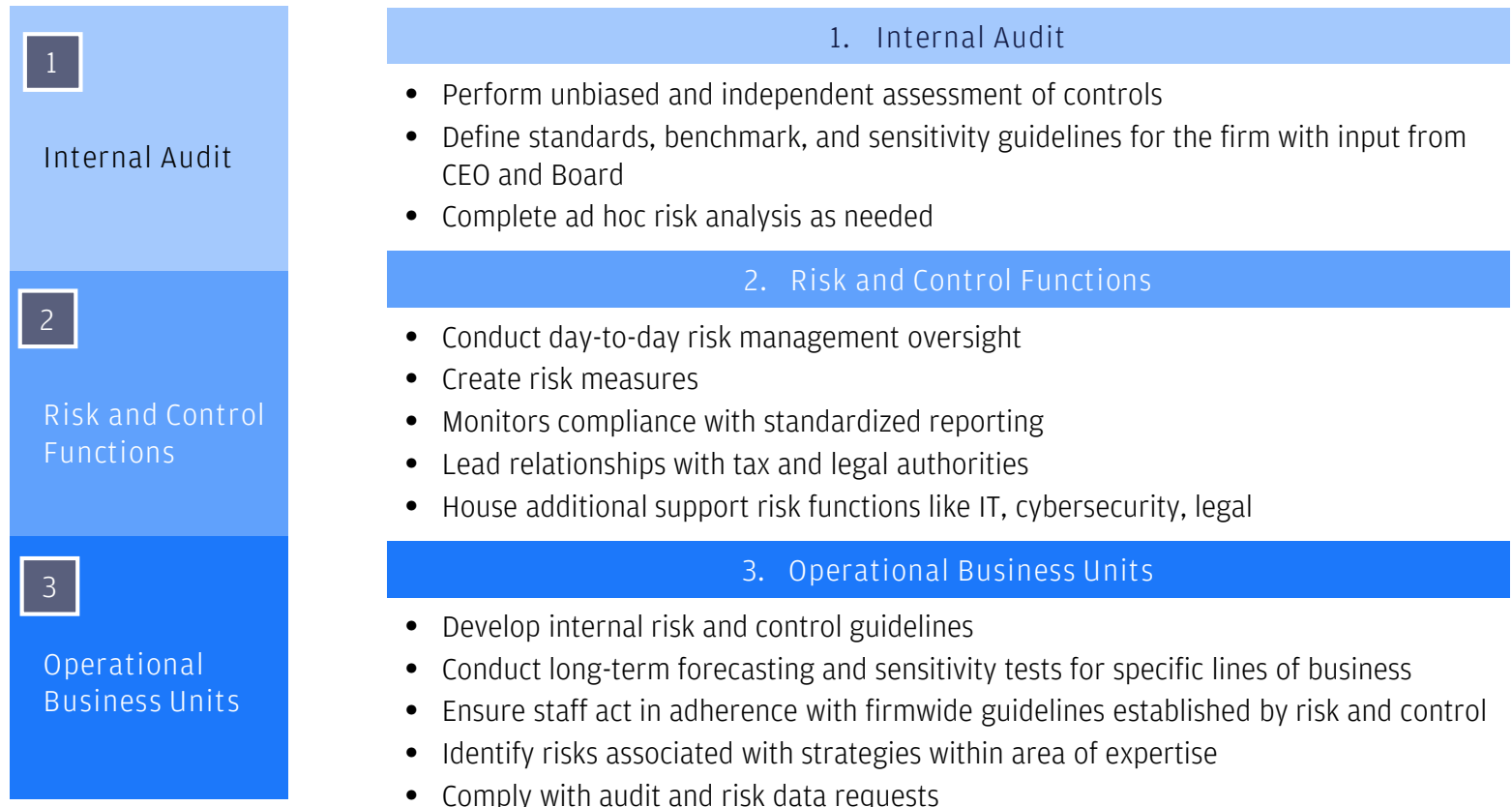
2. Top 1000 Funds, "[Your Guide to Internal Staffing Levels](#)" June 26, 2016

3. CEM Benchmarking, "[How Large Pensions Organize Themselves](#)" Spring 2012

Key Support Staff – Risk Management

Risk management and audit functions are key to the success of insourced teams but the function is often overlooked.

Levels of Risk Management



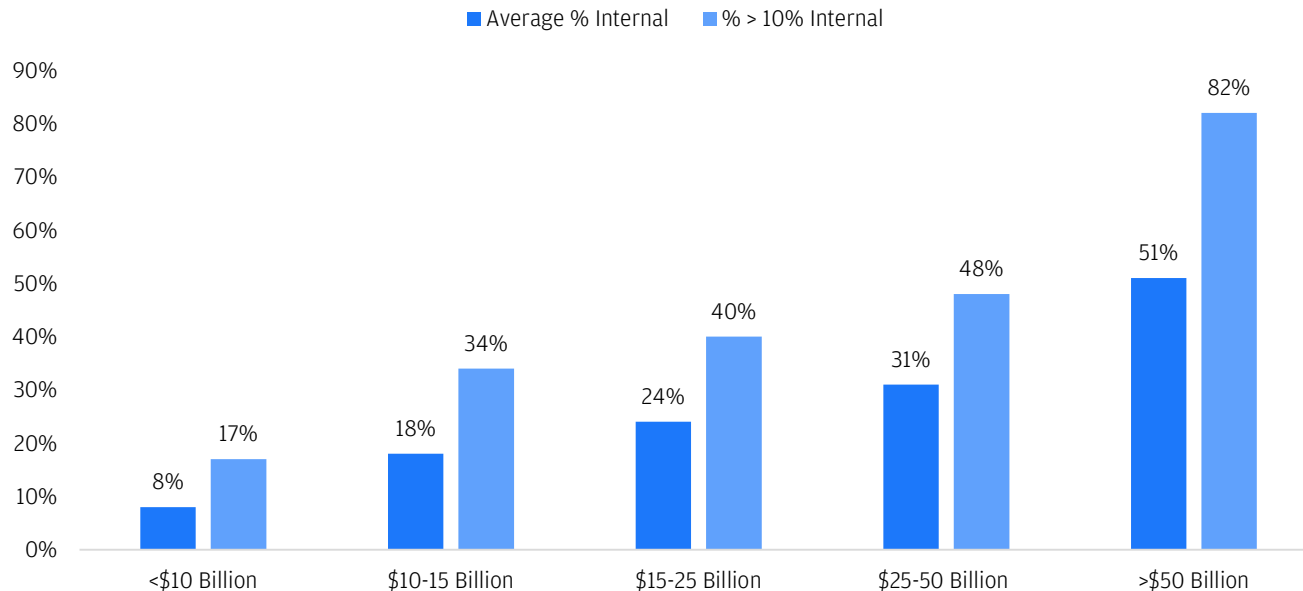
Source: [GIC Annual Report](#) 2018



Supplemental Information

Internal Asset Management Data

Internal AUM Metrics by Manager Size and Asset Class



Percentage Managed Internally, by Asset Class

	<\$10 Billion	\$10-15 Billion	\$15-25 Billion	\$25-50 Billion	>\$50 Billion
Stock	26%	39%	50%	70%	62%
Fixed	64%	76%	85%	75%	59%
Real Assets	37%	58%	37%	59%	52%
Private Equity	0%	3%	0%	16%	11%

Source: McLagan, "[2018 Pension Funds Compensation Survey](#)" October 9, 2018

Compensation Data for US Public Pensions

Benchmarking against direct peers adds transparency and confidence in management's pursuit to set compensation structures and set targets.

	2017 Total Cash USD (000's)		
	25th Percentile	Median	75th Percentile
Overall Management			
CIO	265.0	350.5	532.8
COO/CAO	140.2	195.2	258.6
Executive Director	199.9	264.6	344.8
Investment Team			
Team Leader - General Inv.	193.8	257.5	357.6
Team Leader - Alternate Inv.	219.4	257.5	372.6
Team Leader - Traditional Inv.	172.6	274.1	326.9
Sr Manager	150.7	182.5	283.3
Sr Analyst	103.7	122.9	176.4
Analyst	81.5	91.6	108.7
Finance & Accounting			
CFO/Head of Finance	124.5	161.6	199.3
Legal			
Chief Legal Officer	132.9	192.9	274.9

Average bonus paid by peer group funds

Role	Bonus Range
Head of Asset Class	40-50%
Senior Portfolio Manager I	40-45%
Senior Portfolio Manager II	30-35%
Intermediate Portfolio Manager	20-25%
Research Analysts	10-15%

*McLagan data

Source: McLagan, "2018 Pension Funds Compensation Survey" October 9, 2018

Labor Market Competitors' Data

Public pensions should also consider private market pay if they hope to lure talent from areas other than current pension employees.

Position	Private Sector Firms					
	Salary (\$000s)			Total Cash (\$000s)		
	25th	Median	75th	25th	Median	75th
Management						
CIO	356	420	567	725	1055	1873
Executive Director	400	455	654	922	1399	3014
CLO	263	325	371	412	676	833
CFO	230	296	353	371	565	902
Investments						
Head of Fixed Income	225	278	350	473	619	965
Senior PM I - Fixed Income	200	217	250	341	416	535
Senior PM II - Fixed Income	141	169	199	216	271	358
Head of Real Estate	225	260	290	566	651	800
Senior PM I - Real Estate	193	200	211	331	415	477
Head of Equities	248	312	375	360	424	573
Senior PM - Equities	170	205	250	227	379	600
Head of Private Equity	260	327	386	480	652	781
Senior PM I - Real Estate	193	200	211	331	415	477
Senior Manager	166	188	219	258	301	405
Senior Risk	140	171	205	179	258	345
Senior Portfolio Analyst	80	100	140	109	151	200
Portfolio Analyst	72	86	110	88	115	150
Analyst	63	70	80	63	77	88

Source: McLagan, "2018 Pension Funds Compensation Survey" October 9, 2018

Investment Positions Pay Structure at Comparable US Public Pension

		Pay Range for Investment Positions			
Grade	Jobs	Min	Median	Max	% Spread
1	Investment Support Analyst	\$59,067	\$76,787	\$94,507	60%
2	Investment Analyst	\$62,869	\$81,729	\$100,590	60%
	Operations Analyst				
	Data Analyst				
	Quantitative Analyst				
3	Investment Analyst II	\$80,465	\$104,605	\$128,744	60%
	Operations Analyst II				
	Data Analyst II				
	Quantitative Analyst II				
4	Investment Analyst III	\$89,455	\$116,291	\$143,128	60%
	Quantitative Analyst III				
	Performance Analyst				
	Compliance Officer				
5	Senior Investment Analyst	\$107,346	\$139,549	\$171,753	60%
	Investment Ops Manager				
	Compliance Officer II				
6	Open Grade	\$115,090	\$149,617	\$184,144	60%
7	Investment Manager	\$122,834	\$159,685	\$196,535	60%
8	Senior Investment Manager	\$147,401	\$191,622	\$235,842	60%
9	Inv Dir. (Traditional Asset Class & Risk)	\$192,923	\$250,800	\$308,667	60%
10	Inv Dir. (Alt. Asset Classes)	\$212,215	\$275,880	\$339,545	60%
11	Open Grade	\$218,292	\$283,780	\$349,268	60%
12	Deputy CIO	\$224,370	\$291,680	\$358,991	60%
13	Open Grade	\$246,806	\$320,848	\$394,890	60%
14	Open Grade	\$271,487	\$352,933	\$434,379	60%
15	CIO	\$297,873	\$387,235	\$476,597	60%

- This pay structure was proposed for a \$20B US Public Pension, benchmarked against 16 competitor organizations with an average AUM of \$16.7B and an average of 176 FTEs.
- A similar pay structure can be adjusted for geographical factors and degree of active versus passively managed AUM.

Source: Gallagher, "[Benefit Services Survey](#)" May 2018

Non-Investment Pay Structure (1/3)

Range of Pay for Non-Investment Positions					
Grade	Jobs	Min	Mid	Max	% Spread
1	Record Specialist	\$33,460	\$40,152	\$46,844	40%
2	Administrative Aide Facilities Technician Member Services Analyst	\$37,690	\$45,229	\$52,767	40%
3	Records Analyst	\$40,010	\$48,012	\$56,014	40%
4	Facilities Technician II	\$42,316	\$50,780	\$59,243	40%
5	Accounting Specialist Member Services Analyst II	\$45,230	\$54,276	\$63,322	40%
6	Administrative Assistant Member Services Analyst Lead Accounting Specialist II Computer Support Specialist	\$49,167	\$58,997	\$68,829	40%
7	Legal Assistant City Support Analyst Senior Computer Support Specialist Technology Design Specialist Support Services Analyst Communications Analyst	\$54,334	\$65,201	\$76,067	40%
8	Executive Assistant Accountant IT Business Process Analyst M.S. Business Process Analyst Regional Manager I Human Resources Generalist	\$56,697	\$70,871	\$85,045	50%

Source: Gallagher, "[Benefit Services Survey](#)" May 2018

Non-Investment Pay Structure (2/3)

		Range of Pay for Non-Investment Positions			
Grade	Jobs	Min	Mid	Max	% Spread
9	Actuarial Analyst	\$60,601	\$75,751	\$90,901	50%
	Change Management Coordinator				
	Senior Technology Design Specialist				
	Systems Analyst				
	Records Supervisor				
	Accountant II				
	Investment Accountant				
	Network System Administrator				
Regional Manager II					
10	Process & Content Mgmt Specialist	\$69,632	\$87,040	\$104,447	50%
	Investment Accountant II				
	Network Security Analyst				
	Senior Internal Auditor				
	Senior Regional Manager				
QA/QC Analyst					
11	Accounting Operations Supervisor	\$73,928	\$92,410	\$110,891	50%
	Senior Systems Analyst				
	Database Admin/Dev				
	Senior Software Developer				
12	Open Grade	\$83,647	\$104,559	\$125,470	50%

Source: Gallagher, "[Benefit Services Survey](#)" May 2018

Non-Investment Pay Structure (3/3)

Grade	Jobs	Range of Pay for Non-Investment Positions			
		Min	Mid	Max	% Spread
13	Member Services Manager	\$84,451	\$109,786	\$135,122	60%
14	Asst General Counsel I Network Operations Manager Senior Software Architect	\$92,911	\$120,784	\$148,657	60%
15	Asst General Counsel II Investment Attorney I Controller	\$100,991	\$131,288	\$161,586	60%
16	Asst General Counsel III Investment Attorney II Information Systems Manager	\$111,611	\$145,095	\$178,578	60%
17	Director of Internal Audit Director of Human Resources Senior Project Manager Asst Dir of Info Resources	\$116,824	\$157,713	\$198,602	70%
18	Director of Actuarial Services Investment Attorney III Director of Govt Relations Director of Communications	\$127,990	\$172,787	\$217,583	70%
19	Director of Finance Director of Member Services Director of Info Resources	\$134,390	\$181,426	\$228,462	70%
20	Lead Investment Attorney	\$145,075	\$195,851	\$246,627	70%
21	Deputy Executive Director General Counsel	\$160,331	\$216,447	\$272,563	70%
22	Open Grade	\$168,347	\$227,269	\$286,191	70%

Source: Gallagher, "[Benefit Services Survey](#)" May 2018



Biographies and Disclosures

Wafra Consulting Services Team Biographies

Richard Safranek
Senior Managing Director

Richard Safranek is a Senior Managing Director and serves on Wafra's Management Advisory Committee. Mr. Safranek leads all consulting services and research, and manages a broad range of special purpose investment vehicles.

Previously, Mr. Safranek also served as a Portfolio Manager at Wafra, covering equity markets in the Asia-Pacific and Emerging Markets regions. He joined Wafra in 1995. Prior to that, Mr. Safranek served as an Investment Analyst at World-Wide Investment Co., a Hong Kong-based family office, where he conducted economic, political and market research on Hong Kong and China.

Mr. Safranek earned a BA in International Relations from Johns Hopkins University and an MBA from Columbia University. He completed a Chinese language program at Beijing Foreign Language Institute.

Martin Lujan
Vice President

Martin Lujan is a Vice President at Wafra, focusing on research, investment opportunities across functional areas, and providing strategic business and financial consulting services to institutional investors. Previously, Mr. Lujan worked at Barclays PLC in Equities Trading, and in the investment management divisions of Goldman Sachs and GMO.

Mr. Lujan earned a BA, magna cum laude, in Finance and Economics from the University of New Mexico and an MBA from MIT Sloan School of Management with a concentration in finance.

James Saliba
Vice President

James Saliba is a Vice President at Wafra, focusing on market analysis, research, and providing strategic consulting services across industries. Previously, Mr. Saliba was a Manager with Strategy& (formerly Booz & Company) in New York and the Middle East, where he advised clients on large-scale transformations, supported capabilities-driven growth and performed strategic due diligence for joint ventures and public-private partnership across industries.

Mr. Saliba earned a BS in Mechanical Engineering, cum laude, from Villanova University and both an MBA and an MFin from MIT Sloan School of Management.

Stephen Burt
Senior Associate

Steve Burt is a Senior Associate at Wafra, focusing on strategic consulting projects and financial analysis and performance. Previously, Mr. Burt was a Senior Financial Analyst specializing in strategy and financial planning and analysis for publicly-traded companies where he assessed the strategic and financial impact of potential capital investments. Mr. Burt was also an Associate in the financial services and strategy practice at Booz Allen Hamilton (Middle East) where he advised clients on capital structure design and conducted market research for new strategic initiatives.

Mr. Burt earned a BS, summa cum laude, in Political Science from Texas A&M and an MBA from MIT Sloan School of Management.

Mohammed Almuraikhi
Associate

Mohammed Almuraikhi is an Associate at Wafra focusing on research and consulting services. Previously, Mr. Almuraikhi was a part of Wafra's Junior Analyst Rotation Program.

Mr. Almuraikhi earned a BS with honors in Finance from Gulf University (Kuwait) and an MS in Finance from George Washington University. Mr. Almuraikhi was recently accepted into the Ph.D program in Finance at the London School of Economics (LSE) where he will begin his research in Fall 2019.

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