



Investment Committee

Item Number 7a – Open Session

Subject: Annual Investment Cost Report

Presenter(s): April Wilcox, Shifat Hasan, Mike Dunigan

Item Type: Information

Date & Time: November 4, 2021 – 15 minutes

Attachment(s): Attachment 1 – Internal / External & Public / Private Portfolio Costs

Attachment 2 – Trends: Comprehensive Costs and Carried Interest

Attachment 3 – Peer Comparison

Attachment 4 – Investment Cost Report Outline and Glossary

PowerPoint(s): Annual Investment Cost Report

POLICY

Investment cost reporting and monitoring requirements are governed by the [CalSTRS Investment Policy and Management Plan](#), IPMP, Teachers' Retirement Board Policy Manual, Section 1000, page A-1. As the overarching policy document for the Investment Branch, the IPMP establishes the framework for meeting CalSTRS' objectives.

HISTORY AND BACKGROUND

The Investment team strives to operate the Total Fund (Total Portfolio) in the most effective, low cost manner. Investment costs have been presented to the Investment Committee (Committee) for well over 15 years, evolving over time to increase its usefulness in measuring the Total Portfolio and underlying strategies. Starting with the 2015 Annual Investment Cost Report, upon the Committee's request, staff began tracking expenses and fees that are capitalized or netted from the investments, i.e. private asset costs. Mercer was hired as the project consultant to obtain these costs and continues to provide their services for obtaining and aggregating expenses, fees and carried interest related to the private assets.

PURPOSE

Staff is pleased to present the Committee with the calendar year 2020 Annual Investment Cost Report. The purpose of this informational report is to provide the Committee:

1. Historical overall costs broken out by Total Portfolio, Asset Class, Internal vs. External Management, and Public vs. Private Investments (Attachments 1 & 2).
2. A capture ratio analysis to show cost effectiveness of the Total Portfolio and asset classes over time. This is a quantitative metric to compare costs (spending) against returns (Attachment 2).
3. A peer comparison of investment cost data prepared by an external cost measurement service provider. Their analysis compares CalSTRS to peers and reports cost effectiveness based on their methodology (Attachment 3).

DISCUSSION

The comprehensive Annual Investment Cost Report is aligned with CalSTRS Investment Belief 3:

Belief 3 – Managing investment costs yields long-term benefits

Investment costs, if not managed appropriately, can have a significant (rather than frictional) impact upon overall portfolio performance. CalSTRS, as a large-scale investor, should focus on measuring, monitoring, and minimizing all relevant investment costs.

Investment costs are an important determinant of fund performance and require close oversight and active monitoring. As public pension plans shift towards greater transparency and fee reporting requirements, there can be misinterpretation related to how all fees and expenses are captured and reported. The Cost Report strives to provide transparency and an in-depth look into all types of expenses incurred in managing CalSTRS investments, including profit sharing (carried interest) and the expenses that have been capitalized (added to the cost basis of the investment). It reflects the fees, expenses and carried interest that were paid in the calendar year 2020.

The investment staff understand that CalSTRS member benefits are paid from net returns and not from gross returns. Therefore, this report takes the cost data a step further and provides a Capture Ratio analysis to better understand the gap between net and gross returns for the total portfolio and major asset classes. Since increased investment costs reduce net returns, fees and expenses are consistently monitored and factored into staff's decision-making process.

Investment Belief 8 states that CalSTRS is best served when there is contractual alignment and transparency of financial interests with its external investment advisors and managers. Asset class staff engage in rigorous negotiations and due diligence to reduce investment costs without compromising the quality of the investments. The overarching criterion is to focus on the highest net payoff including potential tradeoffs associated with fees, risks and returns.

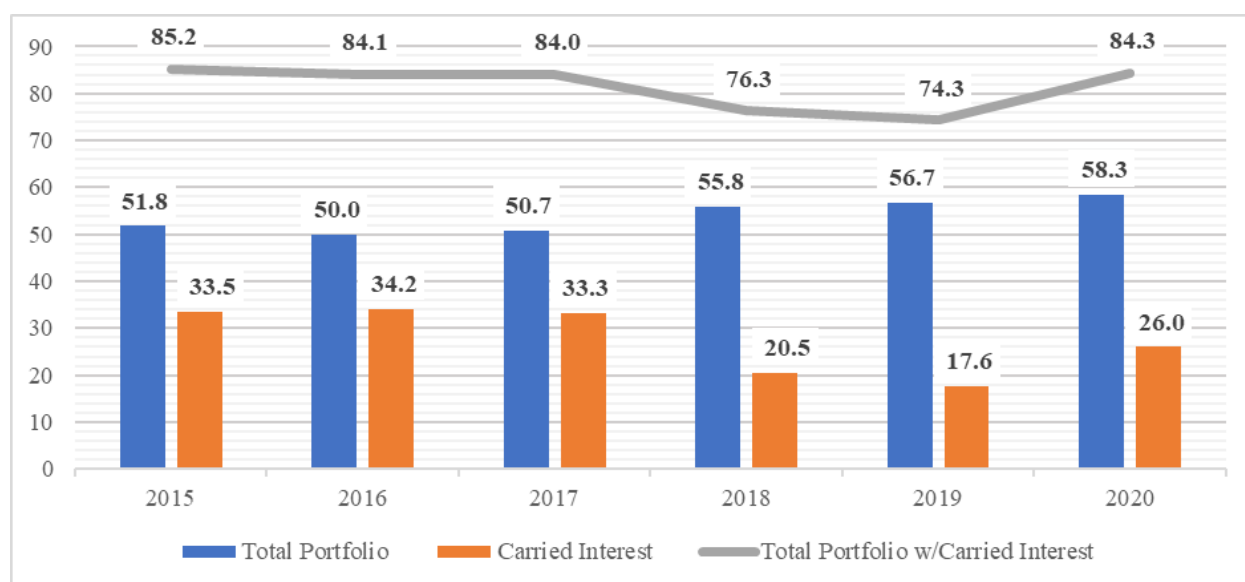
There is no industry standard or format for investment cost reporting. In many cases, comparability is not possible because every pension plan is unique. Differences between plans can include respective mandates, funding objectives and cash flow constraints. Additionally, private assets have characteristics such as non-standard reporting formats and variability in deal structures, making

cost reporting exceptionally complex. Therefore, performance measurement and cost extraction are intricate and not always directly comparable to peers. While most partnerships have an audited annual financial statement, which is closely reviewed by staff, the netted costs and expenses are not uniformly disclosed nor are they delineated by each respective limited partner. As a result, the information must be carefully obtained one investment at a time through direct engagement. The CalSTRS Annual Investment Cost Report sets best practice in cost reporting due to its comprehensiveness and thorough detail in reporting.

The Committee’s direction to staff to delineate the capitalized costs at the November 2015 meeting has proven to be a helpful exercise. Staff continues to improve and enhance this cost reporting to provide transparent information across all asset classes and build best practices.

All costs and carried interest within this report are for calendar year 2020 and on a cash basis. It is important to note that information in this Cost Report is one point in time. Costs can fluctuate significantly each year depending on the life cycle of the underlying investment and/or the investment pace of the strategy. CalSTRS is a long-term investor and as such, return and cost data is more meaningful when compared over long time periods.

Chart / Table 1 – Overall Costs¹ in Basis Points and Absolute Dollar Cost



(\$ in 000's)	2015	2016	2017	2018	2019	2020	2020 Δ
NAV	186,099,586	194,698,312	218,214,795	225,703,278	242,190,270	261,992,425	8%
Total Portfolio Costs	963,184	972,660	1,105,997	1,259,605	1,374,120	1,527,444	11%
Carried Interest Paid	622,767	665,155	727,058	462,966	425,973	681,391	60%
Total w/Carried Interest	1,585,951	1,637,814	1,833,055	1,722,571	1,800,093	2,208,835	23%

¹ Based on total costs for the period over a smoothed NAV to account for new and exited investments during the respective calendar year. Basis point totals may not tie as a result of rounding.

In 2020, overall costs in basis points (Chart 1, grey line) increased by ten basis points. Total Portfolio Costs rose slightly relative to the NAV increase during this time, but the overall increase was primarily attributable to an increase in carried interest paid during the year.

Portfolio costs and carried interest are driven by different factors. Total portfolio costs include management fees and internal operating costs that are highly correlated to the NAV of the Total Portfolio. Carried interest is a profit-sharing agreement between the general partner and the limited partners (i.e. CalSTRS), is positively correlated to investment returns and is paid to the general partner upon the profitable exit from an investment (further defined in Attachment 4 -Glossary).

Trend data above shows a gradual increase in portfolio costs over the last 6 years, with a variable shift in the amount of carried interest paid out over the same period. In 2020, Total Portfolio Costs in dollars increased by 11% (Table 1 above), but when viewed relative to the 8% growth of the Total Portfolio net asset value (NAV), they increased by 1.6 basis points (as shown by the blue bars in Chart 1 above: 56.7 bps in 2019 vs. 58.3 bps in 2020). The amount of carried interest paid out increased in 2020 by 60%, which equates to over 8 basis points when looking at the difference relative to the NAV (as seen by the orange bars in Chart 1). The following sections of this report will outline the drivers of cost in more detail and discuss the trends observed over the 6 years of The Annual Cost Report.

The Drivers of Cost



Asset Growth



Asset Allocation



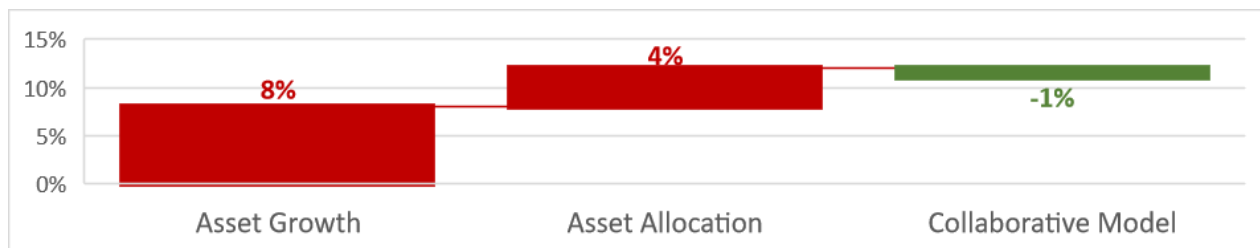
Collaborative Model



Carried Interest

It is important to note that overall costs will increase or decrease based on four primary reasons (shown above). Because there are 4 major levers which drive costs, there will be volatility from year to year. It is most productive to examine longer rolling periods for trends. Total Portfolio Costs and carried interest both increased in 2020 as indicated in Table 1. Carried interest increased by 60% and is discussed separately from portfolio costs (11% increase) given that it is captured on a cash basis and often corresponds to multiple years. Below is a discussion attributing these changes to the four primary drivers of costs.

Chart 2 – Total Portfolio Cost Attribution for 2020



Asset Growth (Total Portfolio Costs)

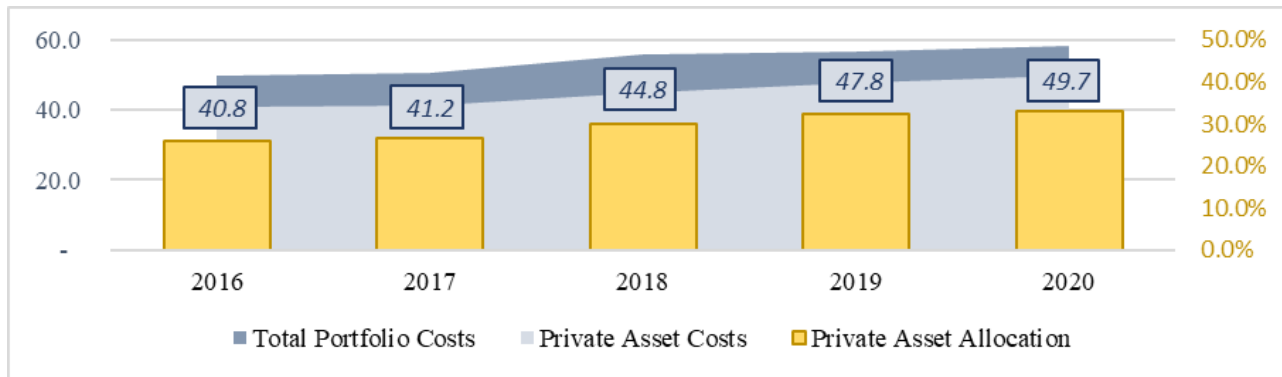
A greater amount of assets under management will increase total costs in absolute terms. As the Total Portfolio NAV has increased over time, so have the dollar amounts of Total Portfolio Costs. Much of this can be attributed to Management Fees that are often based on Net Asset Value. The

Total Portfolio increased assets by 8% over 2020, which in turn explains a roughly similar impact to the Total Portfolio Costs.

Asset Allocation (Total Portfolio Costs)

Private markets and active strategies have higher costs relative to public markets and passive strategies. A higher private asset allocation will often correlate to greater portfolio costs. Chart 3 below shows CalSTRS’ asset allocation to private market investments has increased over the last 6 years. In similar scale, portfolio costs and private asset costs have increased. By viewing costs in basis points relative to the Total Portfolio to eliminate the NAV impact, we see private assets increased by 1.9 bps in 2020 which equals a 4% increase in Total Portfolio Costs.

Chart 3 –Private Asset Allocation % vs. Total Portfolio & Private Asset Costs (bps)



Collaborative Model (Total Portfolio Costs)

The execution of the CalSTRS Collaborative Model is crucial to the long-term return objectives of the Total Portfolio. It is an investment strategy to manage more assets internally in order to reduce costs, control risks and increase expected returns. This includes leveraging our external partnerships to achieve similar benefits and analyzing each asset classes overall strategy to find the best balance of risk and return. Details specific to each asset class are outlined in Attachment 2, but the net savings effect of asset class shifts toward internal strategies equated to a little over half a basis point. Without considering savings related to carried interest, this reduced the Total Portfolio Costs by 1%. Savings related to carried interest and the Collaborative Model is detailed in the November 2021 Board Item 6b: Collaborative Model Savings.

Carried Interest

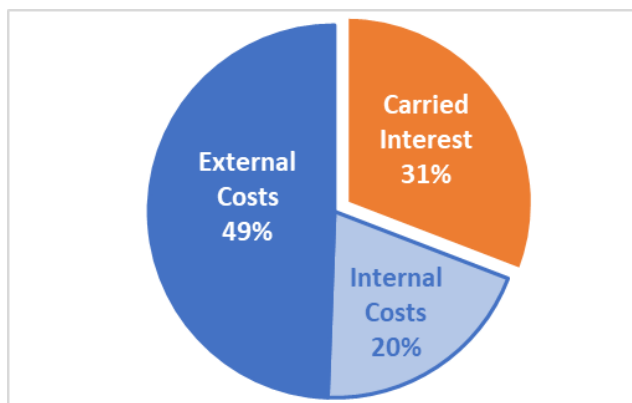
A higher annual return in an asset class where profit sharing agreements exist will increase total costs. The agreements are tied to profits realized over a period of years rather than a single year. Multiple factors influence how much carried interest is earned, which often fluctuates until it is ultimately paid. These range from the strategy of the investment, negotiated agreement, the economic environment over its life and the timing of when dry powder is put to use. To report realized costs with certainty, the Cost Report tracks carried interest as it is paid rather than accrued, making it intricate to attribute drivers in a single year.

[The 2019 Annual Cost Report](#) discussed a correlation between the carried interest paid, vintage years, and the amount of committed capital, that when combined with favorable economic cycles, help explain cyclical increases in the amount of carried interest paid out in a given year. For 2020, carried interest paid increased by 60%, which indicates significant realized gains earned by private assets over the last few years.

Internal vs. External Costs

The following sections provide a further review of costs from the perspective of internal vs. external management and public vs. private assets. Beginning in 2018, The Annual Cost Report began classifying collaborative strategies with external partners like co-investments and joint ventures as ‘Hybrid-Private Managed’. These investments will now be referred to as ‘Internally Managed – Private’. Therefore, internal costs below are inclusive of both public and private asset costs. **Internally managed investments represent the Collaborative Model.**

Chart 4 – Total Portfolio Costs and Carried Interest

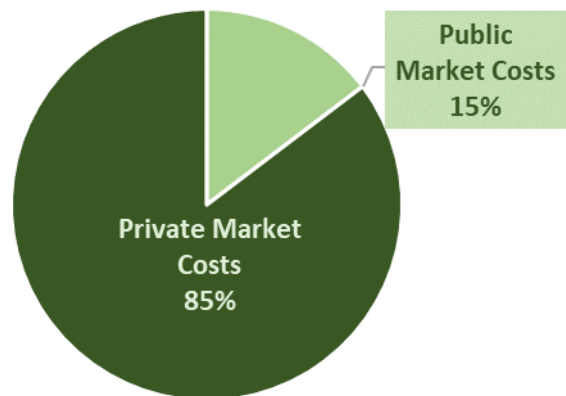


In general, it costs more to manage investments externally than internally. Internal investment management allows staff to focus on specific strategies while leveraging internal knowledge and adding value by generating meaningful cost savings. However, there are strategies that require either significant infrastructure or specialized expertise that economically justify external management. For such strategies, external investment managers and partners are utilized, overseen and monitored by internal

staff and the Investment Committee’s general consultants. For 2020, CalSTRS paid roughly \$2.2 Billion in overall costs: 31% in carried interest, 49% in external management portfolio costs, and 20% in internal management portfolio costs (inclusive of private assets). Table 2 below further outlines the breakdown of public vs. private costs.

Chart 5 – Public and Private Markets (excluding Carried Interest)

Chart 5 shows that private market costs accounted for 85% of the portfolio costs in 2020, yet they make up only 33.1% of the assets in the Total Portfolio (Attachment 1). This is typical and expected as private market investments (private assets) are complex and require a higher degree of expertise, resulting in higher costs. Studies have shown that a private equity program can add significant value to a portfolio in terms of diversified risk and higher expected return specifically over a 10-20-year investment horizon.



There were approximately 786 private assets in 2020. The costs associated with 98% of the private assets, based on their NAV, have been obtained and reported within this report. General partners/managers of the remaining 2% of private assets were non-responsive. They are primarily composed of investments that are winding down and at the end of their life, and therefore have low costs. Staff believes that 98% coverage provides a directionally accurate cost figure, particularly given these costs must be obtained for hundreds of investments across various vintage years going back to 1992.

To obtain the cost information of the private assets, Mercer utilized the reporting template (Fee Template) developed by the Institutional Limited Partners Association (ILPA) for private assets. Mercer will be available to discuss their process and answer any questions.

Table 2 – Total Portfolio Costs as a Percentage of Net Asset Value

\$ in Millions	NAV		Cost		Cost per \$ of NAV	
	\$	%	\$	%		
Externally Managed	94,426	36%	1,089	71%	Private	
<i>Private</i>	52,845	20%	915	60%	External	Internal
<i>Public</i>	41,173	16%	174	11%	\$0.0173	\$0.0115
Internally Managed	167,566	64%	439	29%	Public	
<i>Private</i>	33,752	13%	388	25%	External	Internal
<i>Public</i>	134,222	51%	51	3%	\$0.0042	\$0.0004
Total	261,992	100%	1,527	100%		

In 2020, external management costs were approximately \$1.1 billion compared to \$436 million in internal management costs. Table 2 shows internally managed investments account for 64% of the Total Portfolio NAV, yet they represent only 29% of the Total Portfolio Costs. The difference in cost is even more evident when carving out public and private assets. Externally managed private assets cost \$915 million in 2020. On a per dollar basis, this equates to 173 basis points vs 115 basis points per dollar for internally managed private assets. Internally managed private assets have a lower negotiated cost structure and include co-investments and joint ventures (please see the Glossary for a description of all included investments). External Public assets cost 42 basis points per dollar while internal public assets cost around 4 basis points. This difference includes unequal balances of active and passive strategies between external and internal management, but when strategies are directly compared, internal management is significantly less expensive.

Capture Ratio Analysis

The Capture Ratio reflects the percentage of gross profits captured and reflected in the net returns over the 6-year period ending December 31, 2020. The ratio is shown in cumulative since single year figures can swing based on carried interest from multiple years paid out in a single year. Chart 6 below shows that CalSTRS has captured 93.5% of the gross dollars earned over the last 6 years.

Chart 6 – Total Portfolio Capture Ratio (Cumulative)

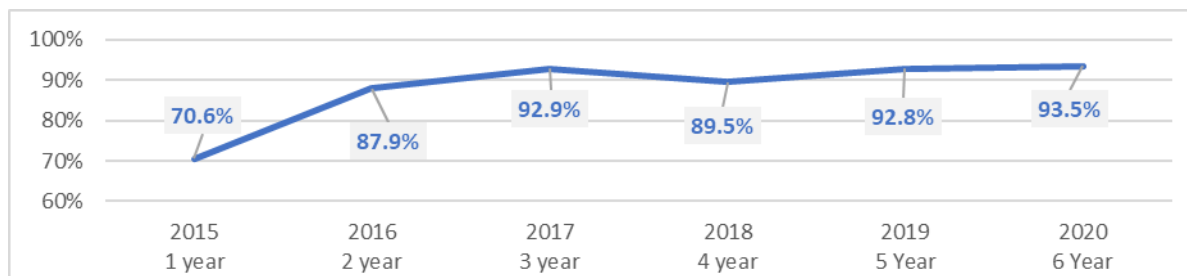


Table 3 below shows that the Total Portfolio has earned almost \$123 billion over the last 6 years, while paying close to \$8 billion in fees and carried interest. The capture ratios for private asset classes will tend to be lower due to the carried interest paid out from these investment types, but this is offset by their long term expected net returns and risk diversification value.

Table 3 – Capture Ratio

6-Year Period Ending December 31, 2020						
(\$ in millions)	Mngmt. Fees & Carried Interest*	Net Dollar Returns**	Gross Dollar Returns**	Capture Ratio	6-Year Net Annualized Returns (TWR)	12/31/2020 Allocation
Total Portfolio	\$7,967	\$115,000	\$122,967	93.5	8.8	N/A
Global Equity	700	67,761	68,460	99.0	10.3	47%
Fixed Income	60	7,729	7,789	99.2	4.4	12%
Private Equity	3,975	13,449	17,424	77.2	11.7	10%
Real Estate	2,061	13,995	16,056	87.2	8.8	13%

* Management fees and carried interest are considered the industry standard for measuring costs
 ** Cumulative dollar gain or loss over the period

Dollar Returns (gains and losses), as well as Management Fees & Carried Interest, are reflected as cumulative over the 6-year period. The yearly averages for each asset class are available in Attachment 2 – Trends: Comprehensive Costs and Carried Interest.

Peer Comparison

Data for peer comparison was compiled and prepared by a third-party cost measurement service provider utilizing various customized methodologies different from this report. Information in this section is strictly for benchmarking purposes and differs from CalSTRS reported costs primarily due to the exclusion of broker commissions, partnership expenses and carried interest within the peer comparison.

- Based on a comparison of 14 global peers from \$95.6 billion to \$681.9 billion in AUM, CalSTRS investments was a low-cost fund.²

² Data collected and compiled by CEM Benchmarking, Inc. for calendar year 2020.

- CalSTRS investment cost of 46.7 bps was below its expected cost of 58.3 bps, demonstrating the fund was low cost compared to peers, given an identical asset mix.²
- CalSTRS Investment Branch saved 11.6 bps over the expected investment costs of 58.3 bps, which equates to approximately \$300 million saved compared to its peers.²

For further details on peer comparison, please refer to Attachment 3.

CONCLUSION

CalSTRS staff has been reporting investment fees and expenses for many years. As reflected on the investment beliefs statements, staff acknowledges the long-term benefits of managing investment costs. Reducing costs is an integral part of CalSTRS investment decision making process and staff understands the importance of monitoring and measuring costs to meet the policy objectives.

This report is comprehensive, and through this process, costs across all asset classes and strategies are scrutinized and reported. The thoroughness and dedication to transparency, even prior to legislation requiring detailed cost reporting for California pension plans, continues to make CalSTRS the front-runners amongst peers in reporting investment costs.

The Peer Comparison (Attachment 3) provides insight into how CalSTRS is performing compared to global peers. There are challenges to the comparability of costs with peers - which includes the lack of standard practices across the industry for reporting these costs. Therefore, the peer comparison report excludes private asset performance fees and transactions costs except as a footnote.

Staff will continue to work with third party cost measurement service providers to monitor CalSTRS effectiveness in managing investment costs compared to peers. Staff has partnered together with other institutional investors and organizations (e.g. ILPA, P2F2) to advocate best practices across all the asset classes to enhance transparency and improve benchmarking. These efforts and the continued enhancements of the Annual Investment Cost Report will strive to provide the Committee the most meaningful and advanced investment cost information.

Internal / External Management Costs & Private / Public Market Costs (\$ in millions)

External Management Costs ³								
Asset Class/ Investment Strategy	Net Asset Value	Ending Market Allocation	Management Fee	Operating Expense	Other Expenses	Total Expense	2020 Basis Points	2019 Basis Points
Public Market Costs								
Global Equity	36,142	14%	123	14	16	153	42.3	37.6
Fixed Income	4,357	2%	10	2	0	12	26.9	21.0
Inflation Sensitive	672	0%	3	0	0	3	49.0	41.5
Strategic Overlay ¹	3	0%	4	1	0	6	14.5	22.0
Total	\$ 41,173	16%	\$ 140	\$ 17	\$ 17	\$ 174	48.0	36.2
Private Market Costs								
Private Equity	20,861	8%	341	16	143	500	239.8	247.6
Risk Mitigating Strategies	13,609	5%	98	6	53	158	116.1	93.7
Real Estate	9,582	4%	94	7	52	153	159.4	133.9
SISS ²	4,715	2%	38	2	6	46	98.3	106.4
Inflation Sensitive	2,884	1%	30	2	10	42	145.8	175.9
Innovative Strategies	1,195	0%	10	2	4	16	133.9	153.6
Total	\$ 52,845	20%	\$ 612	\$ 35	\$ 268	\$ 915	173.2	164.7
Total External Mgt.	\$ 94,018	36%	\$ 752	\$ 53	\$ 284	\$ 1,089	115.8	

¹ Net Asset Value reflects gains / (losses) on notional values and uses notional values for calculating basis points for currency management

² Includes approximately \$2.3 billion in Sustainability Managers

³ Zero "0" indicates a number rounded to less than 1 million. "--" indicates no value.

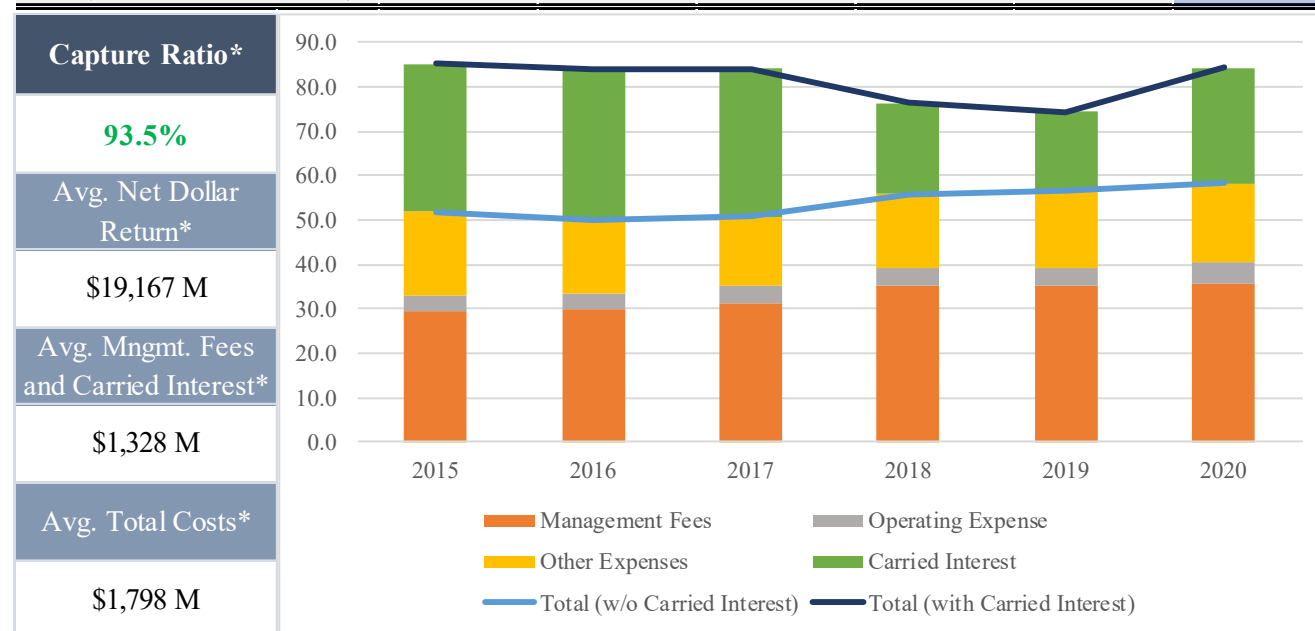
Internal Management Costs ³								
Asset Class/ Investment Strategy	Net Asset Value	Ending Market Allocation	Manager Fee	Operating Expense	Other Expenses	Total Expense	2020 Basis Points	2019 Basis Points
Public Market Costs								
Global Equity	80,462	31%	-	26	2	28	3.5	2.9
Fixed Income	27,221	10%	-	12	0	12	4.4	4.0
Risk Mitigating Strategies	8,244	3%	-	3	-	3	3.6	2.9
Cash / Liquidity	7,959	3%	-	3	-	3	3.6	3.2
SISS	2,896	1%	-	1	0	1	4.4	3.8
Inflation Sensitive	1,672	1%	-	1	-	1	5.1	6.1
Strategic Overlay ¹	5,768	2%	-	1	1	3	0.8	0.5
Total	\$ 134,222	51%	\$ -	\$ 47	\$ 3	\$ 51	3.8	3.4
Private Market Costs								
Real Estate	25,568	10%	169	19	166	354	138.3	131.0
Private Equity	4,664	2%	2	4	10	15	32.8	15.9
Inflation Sensitive	3,273	1%	10	2	6	19	56.6	76.7
SISS	138	0%	-	0	0	0	13.1	90.0
Fixed Income	100	0%	-	0	-	0	4.4	
Innovative Strategies	10	0%	-	0	0	0	236.1	
Total	\$ 33,752	13%	\$ 180	\$ 25	\$ 183	\$ 388	114.9	115.6
Total Internal Mgt.	\$ 167,974	64%	\$ 180	\$ 72	\$ 186	\$ 438	26.1	
Total Public Market	\$ 175,396	67%	\$ 140	\$ 65	\$ 20	\$ 224	12.8	
Total Private Market	\$ 86,597	33%	\$ 792	\$ 60	\$ 450	\$ 1,303	150.5	
Grand Total	\$ 261,992	100%	\$ 932	\$125	\$ 470	\$ 1,527	58.3	

³ Zero ‘0’ indicates a number rounded to less than 1 million. “-“ indicates no value.

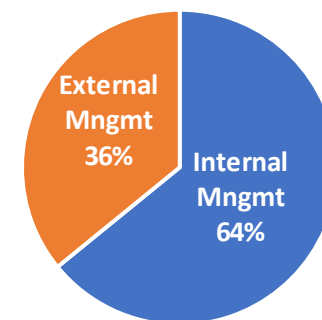
Trends: Comprehensive Costs and Carried Interest

Total Portfolio

Net Asset Value ⁺ (\$ Billions)	2015	2016	2017	2018	2019	2020
100% Allocation as of	186.10	194.70	218.21	225.70	242.19	261.99
BPS	2015	2016	2017	2018	2019	2020
Management Fees	29.4	29.7	31.0	35.2	35.2	35.6
Operating Expense	3.5	3.9	4.0	4.2	4.1	4.8
Other Expenses	18.9	16.3	15.7	16.5	17.4	18.0
Total (w/o Carried Interest)	51.8	50.0	50.7	55.8	56.7	58.3
Carried Interest	33.5	34.2	33.3	20.5	17.6	26.0
Total (with Carried Interest)	85.2	84.1	84.0	76.3	74.3	84.3



Market Value Allocation

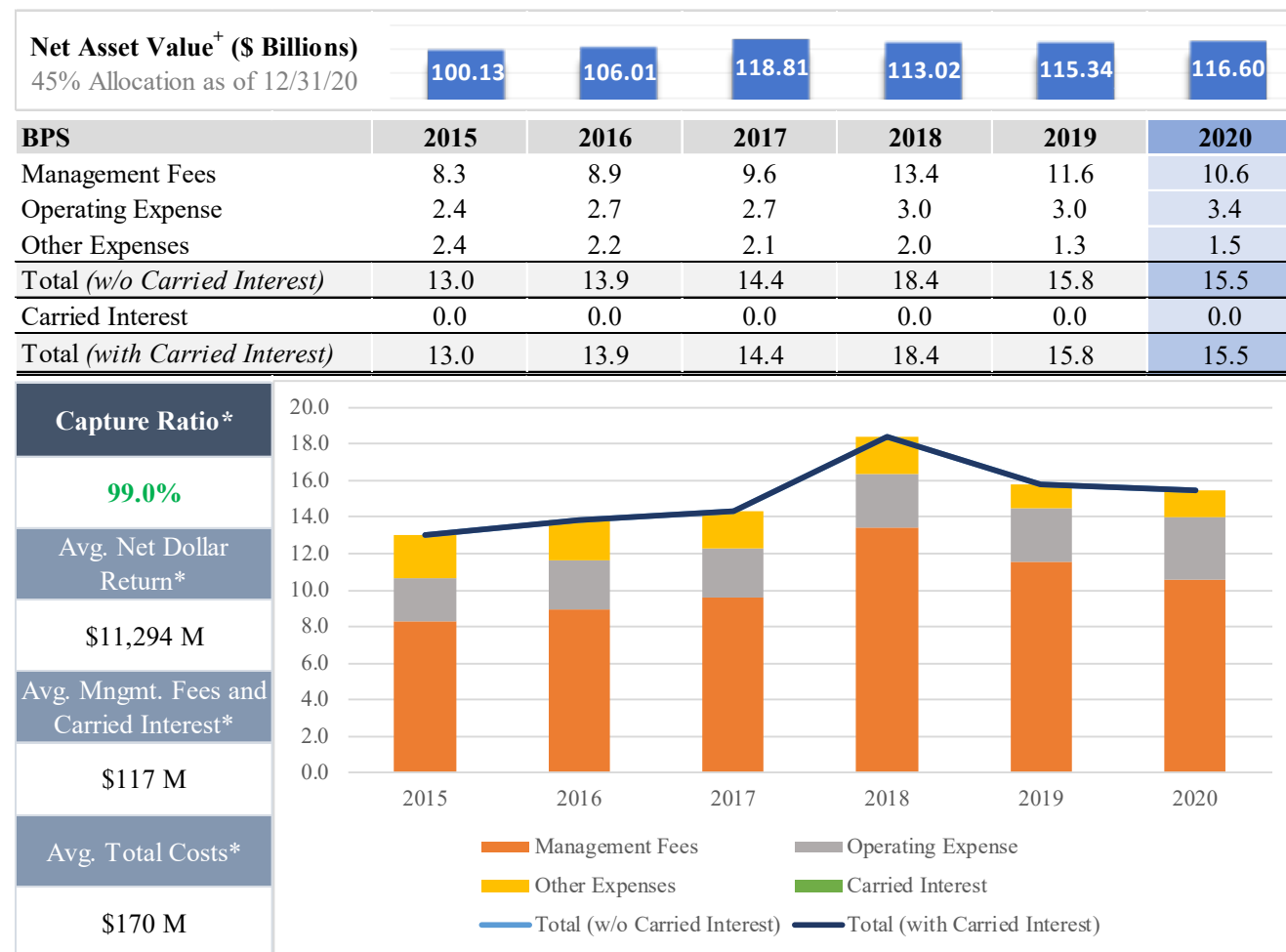


- ▶ **11% increase in total portfolio costs** (excluding Carried Interest) attributable to NAV growth and asset allocation shifts toward private assets.
- ▶ **Carried Interest increased significantly (60%)** indicating realized profits being taken after 5 years of double digit returns from the private asset classes.
- ▶ The **Capture Ratio increased** in a year where significant carried interest was paid out – showing the expenses were offset by significant gains across the Total Fund.

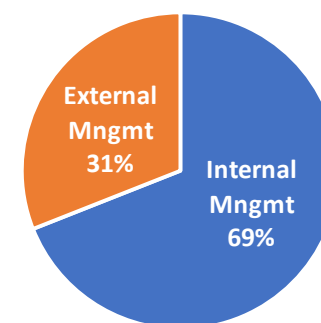
* Calculated using a 6-year average. The Capture Ratio uses the industry standard for measuring costs; which is management fees and carried interest. Partnership expenses and internal administrative costs are captured in Total Costs.

+ Net Asset Value is a monthly average over the year.

Global Equity



Market Value Allocation



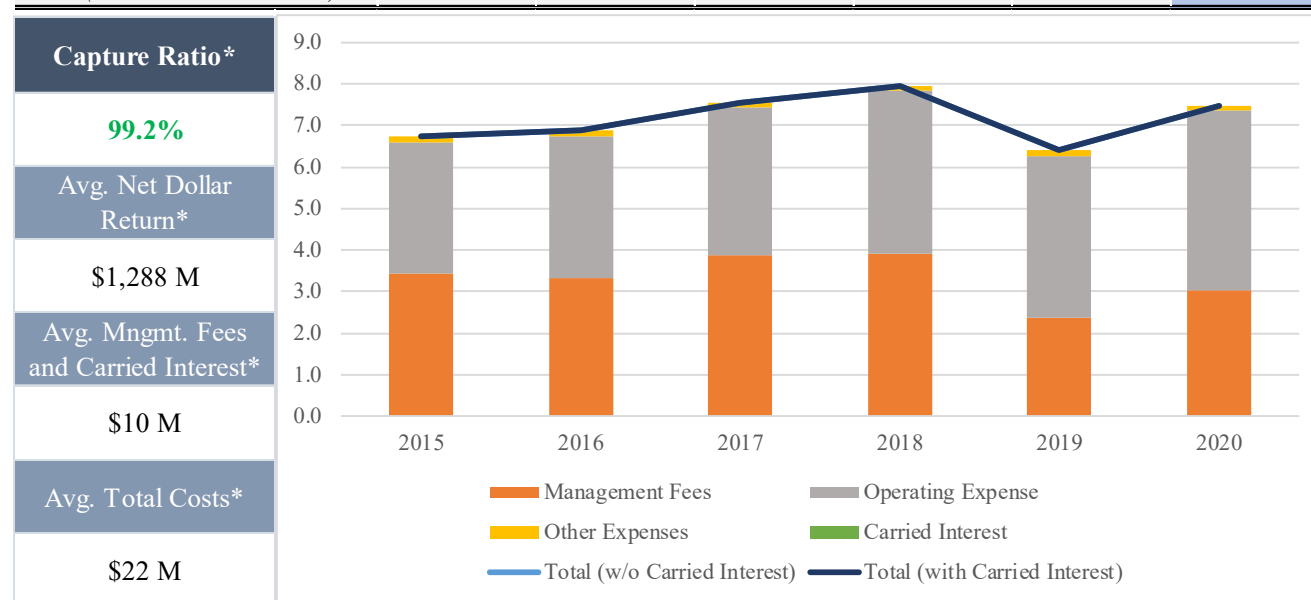
- ▶ **Management fees decreased 1 bps** relative to the NAV
- ▶ **Internal management costs remained significantly low** relative to external management; 3 bps per dollar compared to 42 bps.
- ▶ **GE reduced actively managed assets** in market segments where it is difficult to beat the index or from lower conviction managers, and **reallocated** the assets **to internally managed** index portfolios – leading to cost savings.
- ▶ **Negotiated reduced fees** with some active emerging market managers

* Calculated using a 6-year average. The Capture Ratio uses the industry standard for measuring costs; which is management fees and carried interest. Partnership expenses and internal administrative costs are captured in Total Costs.

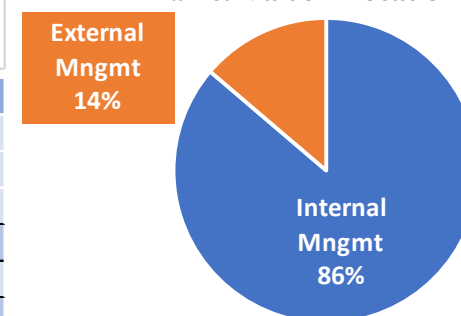
⁺ Net Asset Value is a monthly average over the year.

Fixed Income

Net Asset Value ⁺ (\$ Billions)	30.31	31.21	29.95	27.74	29.57	31.68
12% Allocation as of 12/31/20						
BPS	2015	2016	2017	2018	2019	2020
Management Fees	3.4	3.3	3.9	3.9	2.4	3.0
Operating Expense	3.1	3.4	3.5	3.9	3.9	4.3
Other Expenses	0.1	0.1	0.1	0.1	0.1	0.1
Total (w/o Carried Interest)	6.7	6.9	7.6	8.0	6.4	7.5
Carried Interest	0.0	0.0	0.0	0.0	0.0	0.0
Total (with Carried Interest)	6.7	6.9	7.6	8.0	6.4	7.5



Market Value Allocation



- **Management fees increased** from 2019 after staying flat in previous years. This was the result of a **performance kicker** for one of the external managers **not being paid out** in 2019 due to 2018 performance but being earned for all other years.

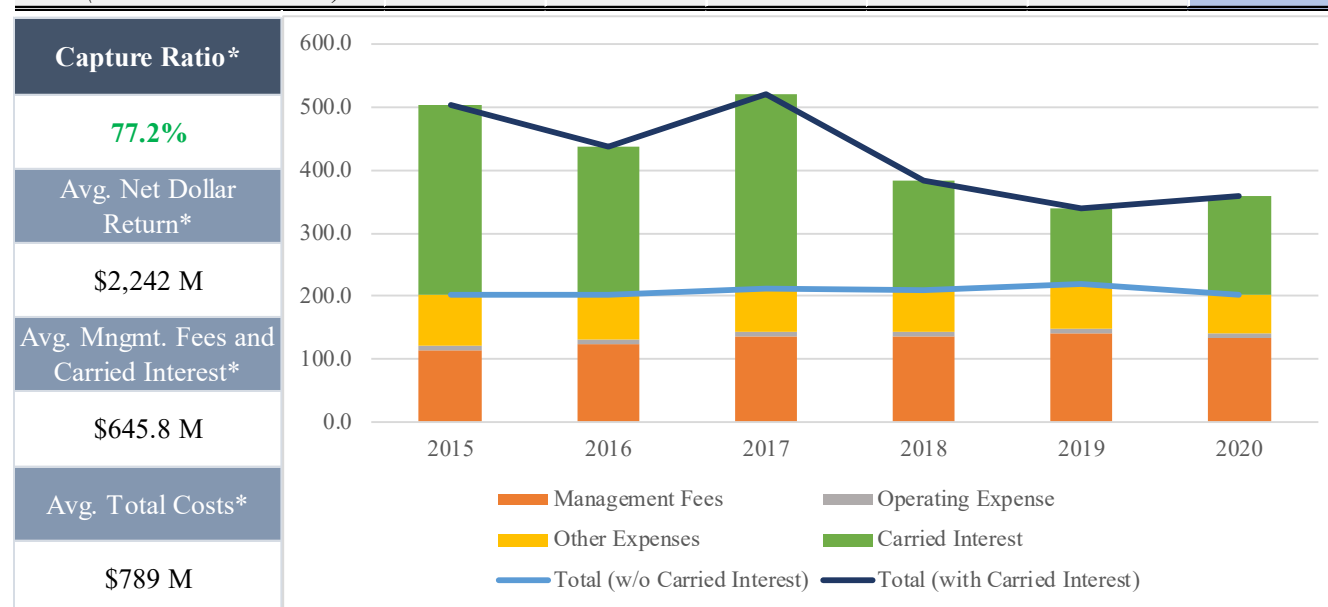
 - Eliminating the impact of the performance kicker, management fees have reduced the past two years.
- **Internal management increased** slightly from last year.

* Calculated using a 6-year average. The Capture Ratio uses the industry standard for measuring costs; which is management fees and carried interest. Partnership expenses and internal administrative costs are captured in Total Costs.

* Net Asset Value is a monthly average over the year.

Private Equity

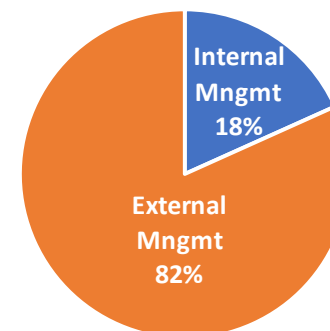
Net Asset Value ⁺ (\$ Billions)	17.18	16.54	17.11	19.06	21.59	25.52
8% Allocation as of 12/31/20						
BPS	2015	2016	2017	2018	2019	2020
Management Fees	113.9	124.4	136.6	136.2	142.1	134.2
Operating Expense	7.1	7.5	7.9	7.4	6.4	7.8
Other Expenses	81.0	70.1	68.1	66.6	70.1	59.9
Total (w/o Carried Interest)	202.0	202.0	212.6	210.3	218.6	202.0
Carried Interest	300.6	235.5	308.4	173.7	121.7	158.0
Total (with Carried Interest)	502.6	437.5	521.0	384.0	340.2	360.0



* Calculated using a 6-year average. The Capture Ratio uses the industry standard for measuring costs; which is management fees and carried interest. Partnership expenses and internal administrative costs are captured in Total Costs.

+ Net Asset Value is a monthly average over the year.

Market Value Allocation

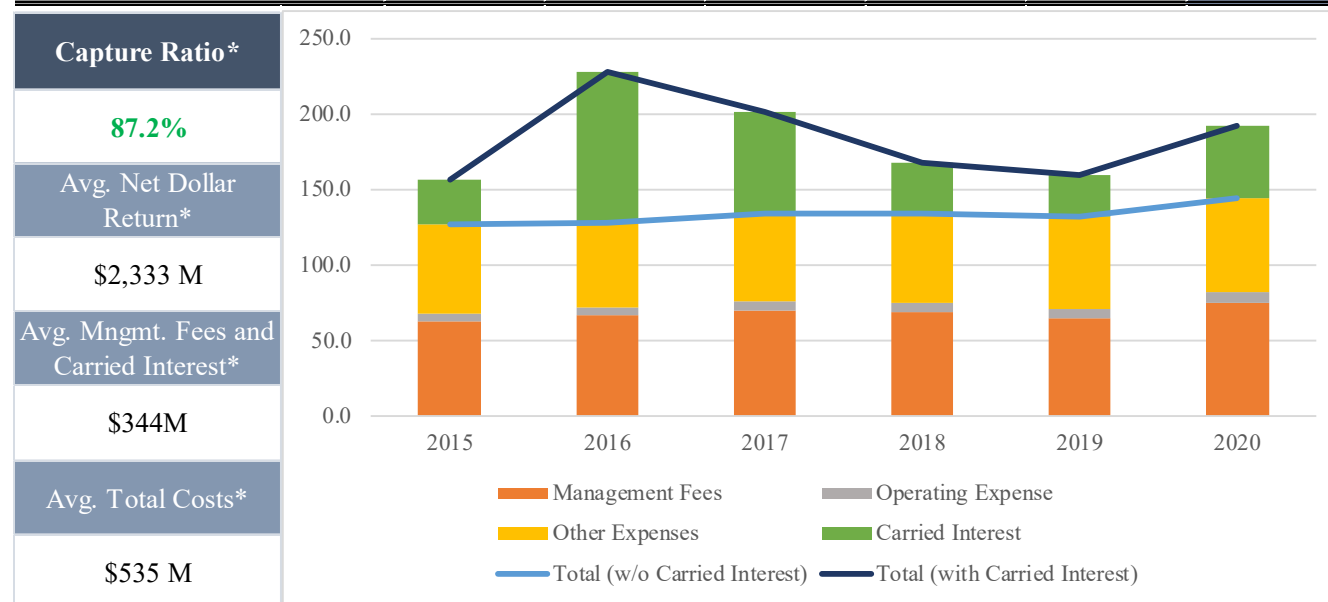


Cost per NAV □ 240 bps □ 33 bps

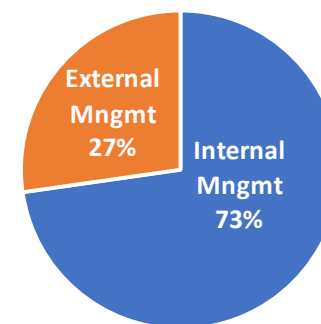
- ▶ A 6-year period is a limited view for private equity investments, which are generally 10 to 15-year investments.
- ▶ The Private Equity portfolio **increased the commitment pace** over the last five years, which generally leads to higher relative costs due to the **J-curve effect**.
- ▶ **Management fees decreased** as investment in co-investments has increased over the last five years.
- ▶ **Carried Interest increased by 55%**, on a dollar basis, indicating realized profits being taken after 5 years of double digit returns from the Private Equity.

Real Estate

Net Asset Value ⁺ (\$ Billions)	25.79	25.80	25.99	29.37	32.77	35.15
13% Allocation as of 12/31/20						
BPS	2015	2016	2017	2018	2019	2020
Management Fees	63.0	66.7	69.9	69.4	65.2	74.7
Operating Expense	4.6	5.3	5.9	6.2	6.1	7.5
Other Expenses	59.7	56.6	58.2	59.1	60.6	61.9
Total (w/o Carried Interest)	127.4	128.6	134.0	134.6	131.8	144.0
Carried Interest	29.1	99.7	67.5	33.0	27.5	48.3
Total (with Carried Interest)	156.5	228.3	201.5	167.6	159.3	192.4



Market Value Allocation



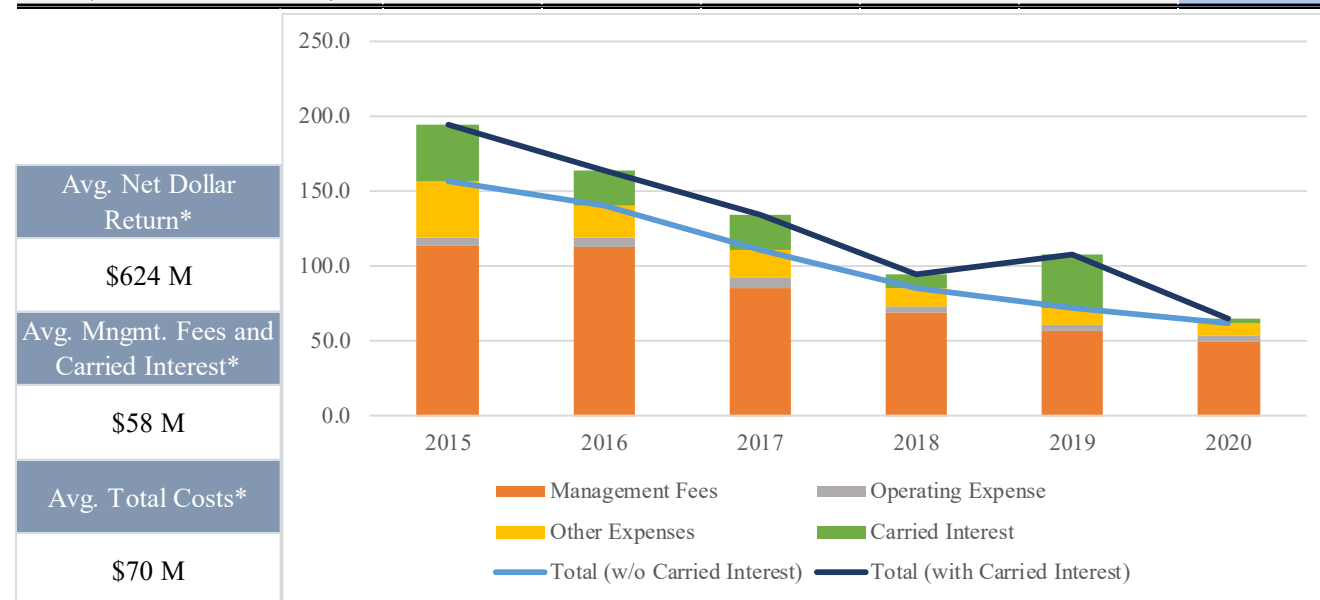
- ▶ A 6-year period is a limited view for real estate investments, which are generally extend beyond this timeframe.
- ▶ **Management fees increased** from 2019 due predominately to increased allocation to joint ventures. These will tend to show higher relative costs in the onset due to initial investment into setup and infrastructure.
- ▶ **Carried Interest increased by 80%**, on a dollar basis, indicating realized profits being taken after 5 years of close to double digit returns from Real Estate.

* Calculated using a 6-year average. The Capture Ratio uses the industry standard for measuring costs; which is management fees and carried interest. Partnership expenses and internal administrative costs are captured in Total Costs.

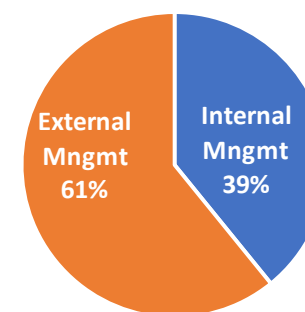
+ Net Asset Value is a monthly average over the year.

Sustainable Investment & Stewardship Strategies (SISS)

Net Asset Value ⁺ (\$ Billions)	4.34	4.07	5.70	6.07	8.01	7.75
3% Allocation as of 12/31/20						
BPS	2015	2016	2017	2018	2019	2020
Management Fees	113.7	112.4	85.6	68.6	56.6	49.2
Operating Expense	5.5	6.9	6.6	4.7	4.2	4.6
Other Expenses	37.2	21.3	18.4	12.2	11.2	7.8
Total (w/o Carried Interest)	156.3	140.7	110.6	85.4	71.9	61.7
Carried Interest	38.0	23.0	23.6	9.0	35.7	3.3
Total (with Carried Interest)	194.3	163.6	134.2	94.4	107.6	65.0



Market Value Allocation



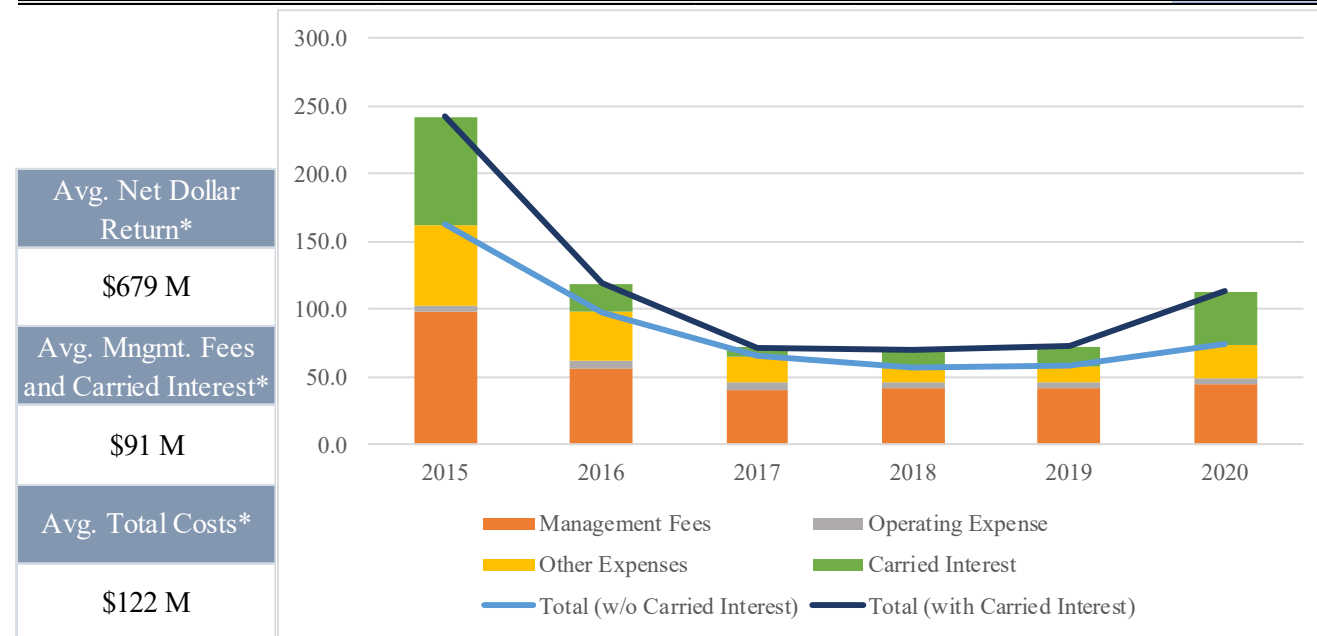
- ▶ SISS currently invests in public market securities across **activist managers** and **sustainability-focused managers**. The activist portfolios are held in limited partnership vehicles, much like private assets.
- ▶ Management fees and **costs decreased significantly for the 5th straight year**; partly due to an increased allocation to sustainability managers, which have lower fees than activist managers.
- ▶ A 6-year period is a limited view for SISS investments; most managers have investment time horizons and holding periods that extend beyond this timeframe.

* Calculated using a 6-year average. Management fees and carried interest are the industry standard for measuring costs. Partnership expenses and internal administrative costs are captured in Total Costs.

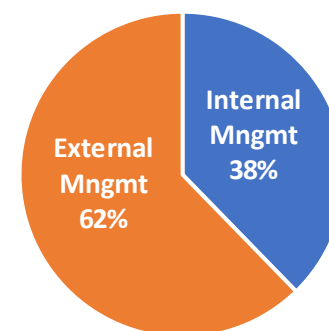
+ Net Asset Value is a monthly average over the year.

Risk Mitigating Strategies

Net Asset Value ⁺ (\$ Billions)	1.85	3.77	12.32	20.64	22.75	21.85
8% Allocation as of 12/31/20						
BPS	2015	2016	2017	2018	2019	2020
Management Fees	97.5	56.8	41.1	41.3	42.1	45.0
Operating Expense	4.7	5.6	4.7	4.2	3.5	4.2
Other Expenses	60.4	35.3	19.3	11.4	12.6	24.4
Total (w/o Carried Interest)	162.6	97.7	65.1	56.8	58.2	73.7
Carried Interest	79.7	21.3	6.6	12.7	14.4	39.4
Total (with Carried Interest)	242.3	118.9	71.7	69.6	72.6	113.1



Market Value Allocation

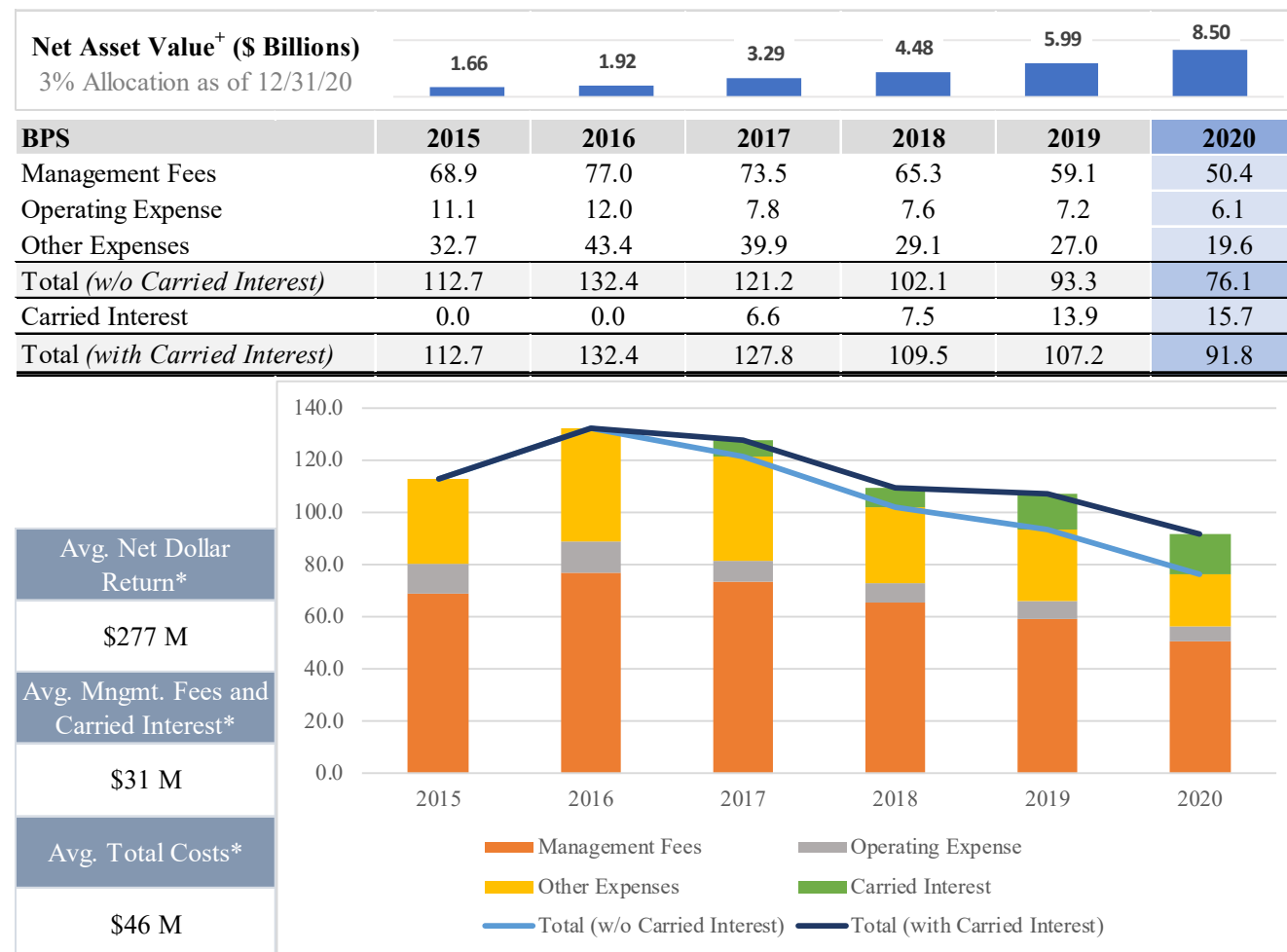


- ▶ RMS' objective is to construct a portfolio that **provides protection to the total plan** during deep and extended equity market downturns.
- ▶ **Portfolio costs increased** by almost **15 bps in 2020**. This is due to a *methodology change* in how brokerage costs were reported. New regulation at the end of 2018 has increased transparency around fees embedded in an assets price. When this methodology is applied to 2019, **RMS costs actually decreased slightly**.
- ▶ RMS' effectiveness and cost-efficiency are best evaluated over a **full market cycle, which typically extends well beyond the 6-year** timeframe depicted here.

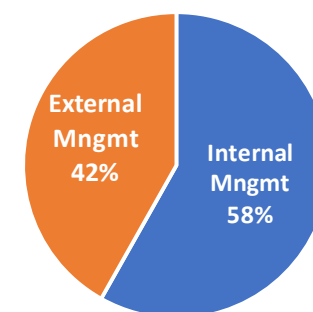
* Calculated using a 6-year average. Management fees and carried interest are the industry standard for measuring costs. Partnership expenses and internal administrative costs are captured in Total Costs.

⁺ Net Asset Value is a monthly average over the year.

Inflation Sensitive



Market Value Allocation



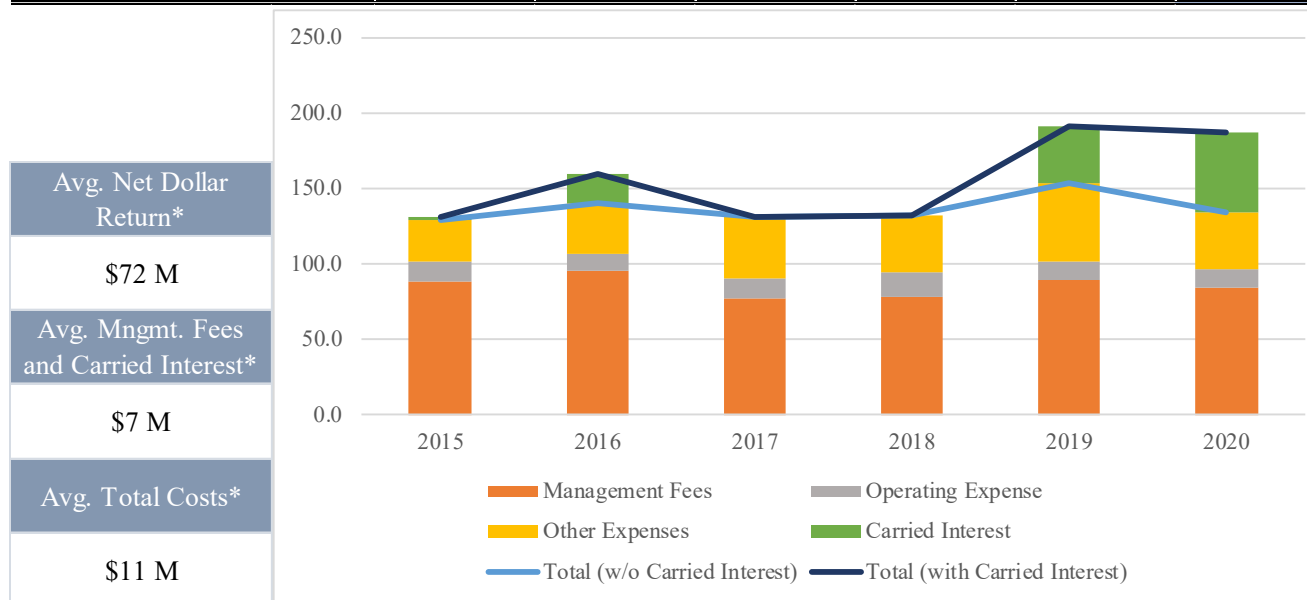
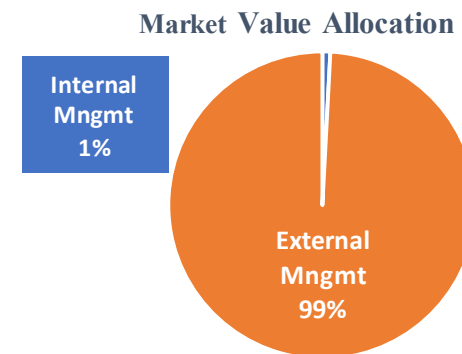
- ▶ **Carried interest increased** from 2019 as managers continued to earn performance incentives.
- ▶ The **allocation increased** again from 2019 to 2020, continuing to bring down the cost basis points per NAV

* Calculated using a 6-year average. Management fees and carried interest are the industry standard for measuring costs. Partnership expenses and internal administrative costs are captured in Total Costs.

⁺ Net Asset Value is a monthly average over the year.

Innovative Strategies

Net Asset Value ⁺ (\$ Billions)	0.45	0.50	0.44	0.51	0.93	1.20
0% Allocation as of 12/31/20						
BPS	2015	2016	2017	2018	2019	2020
Management Fees	88.5	95.1	76.8	77.8	89.9	84.0
Operating Expense	12.8	11.2	13.9	16.4	11.4	12.9
Other Expenses	28.1	33.9	40.8	38.0	52.3	37.9
Total (w/o Carried Interest)	129.4	140.2	131.5	132.2	153.6	134.7
Carried Interest	2.2	19.9	0.0	0.0	37.9	52.1
Total (with Carried Interest)	131.6	160.1	131.5	132.2	191.5	186.8



► Costs can fluctuate over time relative to the types of strategies that make up the portfolio

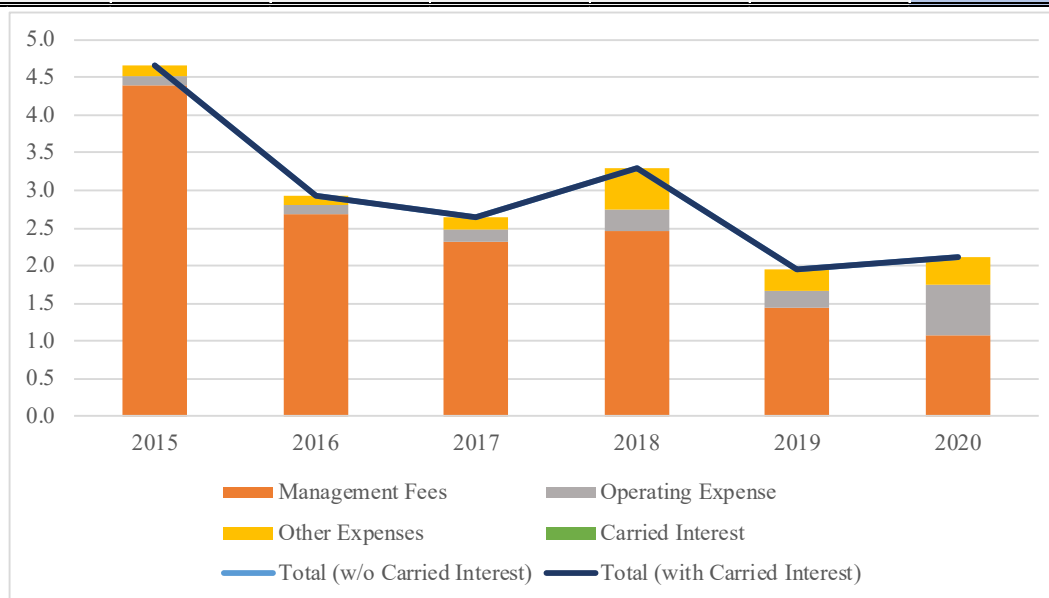
* Calculated using a 6-year average. Management fees and carried interest are the industry standard for measuring costs. Partnership expenses and internal administrative costs are captured in Total Costs.

+ Net Asset Value is a monthly average over the year.

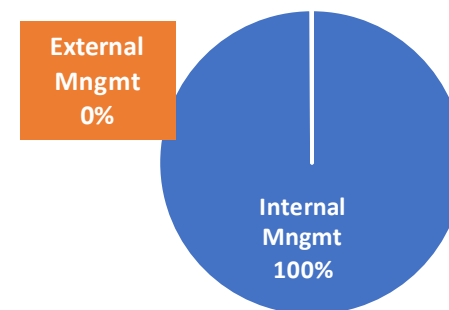
Avg. Net Dollar Return*	\$72 M
Avg. Mngmt. Fees and Carried Interest*	\$7 M
Avg. Total Costs*	\$11 M

Strategic Overlay

Net Asset Value ⁺ (\$ Billions)							5.77
0% Allocation as of 12/31/20		0.16	0.09	0.44	0.99	0.16	
BPS	2015	2016	2017	2018	2019	2020	
Management Fees	4.4	2.7	2.3	2.5	1.4	1.1	
Operating Expense	0.1	0.1	0.2	0.3	0.2	0.7	
Other Expenses	0.1	0.1	0.2	0.6	0.3	0.4	
Total (w/o Carried Interest)	4.7	2.9	2.6	3.3	1.9	2.1	
Carried Interest	0.0	0.0	0.0	0.0	0.0	0.0	
Total (with Carried Interest)	4.7	2.9	2.6	3.3	1.9	2.1	



Market Value Allocation



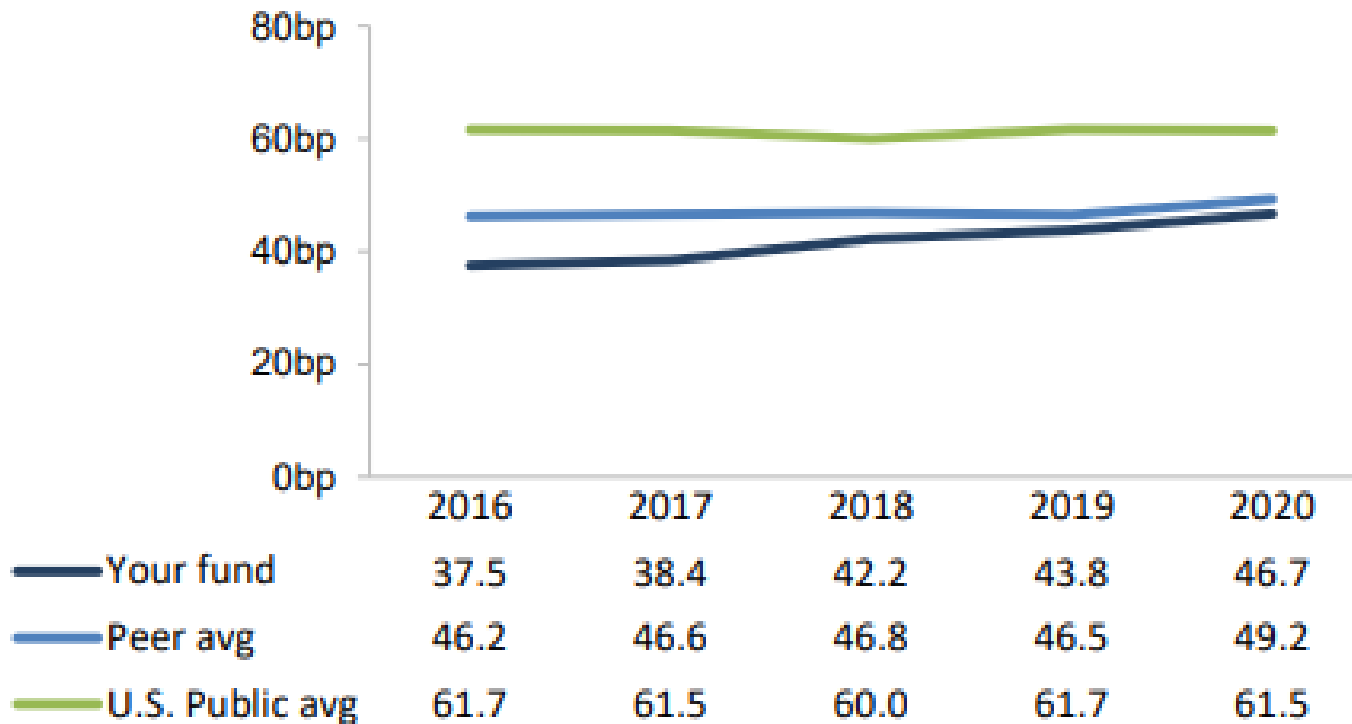
- ▶ There are 3 external currency managers with a notional value of \$4 billion. External Management reflects zero due to rounding of Net Asset Value.

⁺ Net Asset Value is a monthly average over the year.

Peer Comparison (Developed by third party cost measurement service provider¹)

Trend in Total Investment Cost

Investment costs, excluding transaction costs and carried interest, increased relative to the previous two years due to public market strategy changes and increasing allocations toward private assets. Trend analysis includes 43 U.S. Public Funds and 14 global peer funds with 5 or more consecutive years of data.



¹ Data collected and compiled by CEM Benchmarking, Inc. for calendar year 2020.

Investment Cost Report Outline³

Asset Class/ Investment Strategy	Management Fees		Operating Expense ¹			Other Expenses ²		Carried Interest
	Base Management Fees	Performance Fees	CalSTRS Internal Salary	CalSTRS Operating Expense	CalSTRS Other Expenses	Partnership/ Fund Expenses	Brokerage Commission/ Transaction Fee	
Global Equity	✓	✓	✓	✓	✓	--	✓	--
SISS	✓	✓	✓	✓	✓	✓	✓	✓
Fixed Income	✓	✓	✓	✓	✓	--	✓	--
Cash	--	--	✓	✓	✓	--	✓	--
Real Estate	✓	--	✓	✓	✓	✓	✓	✓
Private Equity	✓	--	✓	✓	✓	✓	✓	✓
Inflation Sensitive	✓	--	✓	✓	✓	✓	✓	✓
Risk Mitigating Strategies	✓	--	✓	✓	✓	✓	✓	✓
Innovative Strategies	✓	--	✓	✓	✓	✓	✓	✓
Strategic Overlay	✓	✓	✓	✓	✓	--	✓	--

✓ included in reports -- not applicable

¹“Operating Expense” throughout this report includes staff salaries, travel, supplies, training and other Investment Branch support, research services and administrative expenses.

²“Other Expenses” throughout this report include portfolio company fees that the General Partner/Manager or its related parties receive from the portfolio companies for consultancy services, broken deal fees, transaction and deal fees, board of director fees, ongoing monitoring fees and capital markets fees, as well as property management fees, construction management fees, project marketing fees, and other fees for real estate partnerships; also includes fund of fund fees. It includes private asset related partnership expenses inclusive of accounting, IT, administration, audit & tax, bank fees, custody fees, due diligence, legal, organizational, travel and entertainment, insurance, partnership level taxes and other expenses charged to the partnership. Includes brokerage commissions charged to CalSTRS for trades in the public markets. Excludes trading spread for fixed income and currency instruments.

³ Soft Dollars are no longer part of the program as of 2017.

Glossary

Asset Class/Investment Strategy	As outlined in the Investment Policy and Management Plan (IPMP); a group of securities that have similar financial characteristics, behave similarly in the market place, and are subject to the same laws and regulations. CalSTRS asset classes and investment strategies include Global Equity, SISS, Fixed Income, Private Equity, Real Estate, Inflation Sensitive, Innovative Strategies, Risk Mitigating Strategies, Strategic Overlay and Cash.
Basis Point (Bps)	A unit of measure used in finance to describe the percentage change in value or rate of a financial instrument. One hundredth of the one percent or .0001 in decimal form.
Brokerage Commissions/Fees	An agent or agent’s company charges to conduct transactions between buyers and sellers. Fees are charged for services such as purchases, sales, and advice on the transaction, negotiations or delivery. Included as “Other Expenses” within the report.
Capitalized Costs	An accounting method used to delay the recognition of expenses by recording the expense as a long-term asset.
Capture Ratio	Percentage of gross profits retained after paying management fees and carried interest.
Carried Interest (Profit Sharing)	Applicable to private assets only. A profit-sharing mechanism by which general partners are compensated for their performance, usually after meeting a certain performance threshold and returning all previously paid management fees to limited partners. Carried interest is distributed to the general partner as part of the profit before profits are paid to the limited partners (CalSTRS).
Collaborative Model	One of the objectives established for the 2017/18 Investment Committee Work Plan is to review and evaluate how CalSTRS approaches the implementation decision regarding internal versus external asset management across the portfolio. The proposed new model that is being studied is referred as the “Collaborative Model”. It focuses on developing innovative platforms and strategies by enhancing the social capital of investment organizations to improve their effectiveness and investment efficiency.
Corporate Governance	See Sustainable Investment and Stewardship Strategies (SISS).
Currency Management Program (CMP)	A program within the Strategic Overlay which manages CalSTRS total exposure to foreign currencies. Generally uses notional values, not market value, when calculating basis points.

External Asset Management	The outsourcing to external companies of asset management of various securities and other assets in order to meet specified investments goals.
External Management Costs	Costs that are associated with external management of investments. Generally, these are management fees of private and public markets, partnership expenses and related salaries, support and oversight.
Fixed Income	An asset class comprised of investment grade and non-investment grade securities in both the U.S. and non-U.S. dollar base. Examples of Fixed Income securities include debt securities and derivatives (futures, options, swap agreements or forward agreements).
General Partner	A general partner is an owner of a partnership who has unlimited liability. A general partner can be an entity or individual who is also usually a managing partner and active in the day-to-day operations of the business or investment fund.
Global Equity	An asset class comprised of U.S.; non-U.S. developed countries, and emerging markets securities. Examples of Global Equity securities include Exchange Traded Funds (ETF), stocks domiciled in the U.S., international securities traded on the exchanges of all countries contained in the MSCI All Country World Index ex U.S. and the MSCI Frontier Markets Index, units of participation in commingled index funds or trusts and derivatives (futures, options, swap agreements, structured notes, warrants, asset trusts or forward agreements).
Global Master Custodian	A bank servicing the Investment Branch that takes responsibility for reconciling its records with those of each investment manager, processing and recording trades, relieving CalSTRS of this administrative burden.
Hybrid Asset Management (2018-2019)	<p>Investment category that represents collaborative strategies with external partners. These were previously combined under external management but have been carved out for Co-Investments and where CalSTRS has significant ownership and control (full or primary) over investment decisions such as purchases, sales, or financing. The investment type is specific to each asset class or investment strategy as follows:</p> <ul style="list-style-type: none">• Co-Investments: Private Equity, Real Estate, Inflation Sensitive and SISS• Separate Accounts and Joint Ventures: Real Estate• Managed Accounts: Inflation Sensitive. <p>As of 2020, these are classified as Internal Management Private.</p>

Inflation Sensitive	An asset class currently comprised of Infrastructure and Treasury Inflation-Protected Securities (TIPS), this asset class should produce a relatively stable return stream, with a return level between equities and fixed income, and an overall higher correlation to inflation than equity or fixed income.
Infrastructure	A strategy within Inflation Sensitive asset class comprised of limited partnerships, co-investments, commingled funds and publicly listed investments; spanning various industries such as energy resources and utilities, transportation assets, ports, water and waste and communications.
Innovative Strategies	A program where the primary objective is to invest in strategies that do not fit any of CalSTRS existing asset classes and explore new concepts that are expected to improve diversification of the overall investment portfolio when fully implemented.
Internal Asset Management	Asset management of various securities and other assets in order to meet specified investment goals performed ‘in-house’ by CalSTRS staff.
Internal Management Costs	Costs that are incurred for internal management of the investments and relevant operational support and administration.
Internal Salary	An Operating Expense that comprises of salary and benefits paid to CalSTRS staff within the Investment Branch.
Management Fee	A periodic payment made by an investment fund to the fund’s investment advisor for investment and portfolio management services which is calculated as a percentage of assets under management. Performance-based fees are paid when the advisor generates positive returns above an agreed upon performance rate. As displayed in the cost tables, manager fees include both asset base and performance base manager fees for public markets and manager fees excluding performance for private markets. Management Fee excludes internal staff salaries.
Net Asset Value (NAV)	The dollar value of the fund based on the total value of all the securities in its portfolio, any liabilities the fund has and the number of fund shares outstanding.
Notional Amount	The U.S. Dollar amount of the underlying assets.
Operating Expense	Includes staff salaries, travel, supplies, training and other Investment Branch support and administrative expenses. Includes advisor, consultant, risk and trade management system expenses. Includes investment expenses not allocated to an asset class such as custodian, audit and other organizational support budget expenses.

Other Expenses	Includes portfolio company fees that the General Partner/Manager or its related parties receive from the portfolio companies for consultancy services, broken deal fees, transaction and deal fees, board of director fees, ongoing monitoring fees and capital markets fees, as well as property management fees, construction management fees, project marketing fees, and other fees for real estate partnerships; also includes fund of fund fees. It includes private asset related partnership expenses inclusive of accounting, IT, administration, audit & tax, bank fees, custody fees, due diligence, legal, organizational, travel and entertainment, insurance, partnership level taxes and other expenses charged to the partnership. Includes brokerage commissions charged to CalSTRS for trades in the public markets. Excludes trading spread for fixed income and currency instruments.
Partnership Expenses	Applicable to private assets. Reflected under "Other Expenses" and includes private asset related partnership expenses inclusive of accounting, IT, administration, audit & tax, bank fees, custody fees, due diligence, legal, organizational, travel and entertainment; may also include insurance, partnership level taxes and other expenses charged to the partnership.
Portfolio Company Fees	Applicable to private assets. Reflected under "Other Expenses" and includes fees the General Partner/Manager or its related parties receive from the portfolio companies for consultancy services, broken deal fees, transaction and deal fees, board of director fees, ongoing monitoring fees and capital markets fees, as well as property management fees, construction management fees, project marketing fees, and other fees for real estate partnerships; includes fund of fund fees.
Private Equity Asset Class	An asset class comprised of limited partnerships, direct investments, co-investments and secondary interests in leverage buyout, venture capital, distressed debt, mezzanine financing, natural resources and proactive private equity. The objective of private equity assets is to provide an enhanced investment return over those available in the public market.
Private Markets	Refers to the market of mostly illiquid investments that do not trade on an exchange. Investment structures can range from limited partnerships, limited liability companies and joint ventures.
Private Market Costs	The expenses associated with private assets including the costs that have been capitalized and deducted from the gross value of the investment, such as management fees for limited partnerships, portfolio company fees and other types of expenses paid to the general partner and/or its affiliates. Within our report, private market costs also include relevant staff salaries and administration costs to manage the private assets.
Public Markets	Refers to the market of securities that trade on an exchange and can be bought or sold by anyone in the general population. These securities typically trade in a systemized secondary market.

Public Market Costs	Expenses associated with the management of the publicly traded investments and fixed income securities. These include external management costs such as management fees, broker commissions and applicable internal costs.
Real Estate Asset Class	An asset class comprised of direct real estate investments, joint venture and value-added investments, and commingled funds in Office, Retail, Multifamily and Industrial subcategories.
Risk Mitigating Strategies	An asset class that invests in several investment strategies including long duration U.S. Treasuries, trend following, global macro, systematic risk premia, and other types of strategies.
Soft Dollars	Soft dollars are the benefits provided to an asset manager by a broker-dealer as a result of commissions generated from financial transaction executed by the broker-dealer for client accounts or funds managed by the asset manager. Soft dollars, in turn might be used to pay for future commission expenses, research, advice etc.
Spread	A spread is the difference between the bid and the ask price of a security or asset.
Sustainable Investment & Stewardship Strategies (SISS)	Formerly known as Corporate Governance. A program within the Global Equity asset class. Some investments are structured as limited partnerships or co-investments, focused on active management where managers take large individual positions and engage boards and management to undertake value driving change. Others are structured like traditional external asset management and integrates robust environmental, social, and governance criteria into the portfolio company selection process.