

Callan



Executive Summary

December 31, 2022

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**Chicago Teachers' Pension Fund
Performance Evaluation Executive Summary
Fourth Quarter 2022**

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Total Fund Commentary

The Fund was valued at \$11,129 million at the end of the fourth quarter, representing an increase of approximately \$457 million from September 30, 2022. The change in the Fund's market value was attributable to capital appreciation, offsetting net negative cash flows by a comfortable margin over the quarter. Investment performance resulted in an increase in the Fund's valuation of \$656 million, and outflows totalled \$199 million over the period. The Fund's asset allocation was close to the permissible Investment Policy ranges, however, the real estate and private equity components of the portfolio exceeded the upper bounds of the range by approximately 1%, respectively, due to the market dynamics experienced during calendar-year 2022 and the relatively strong performance of these private market investments. Conversely, the fixed income portfolio was below the lower bounds of the range by approximately 0.2% during a period of sharply higher inflation and rising yields, both of which negatively impact fixed income investments over the short-term. The year 2022 was characterized as a period of significant volatility, impacting public market investments around the world; however, private market investments fared better in this environment due to the relatively strong performance of these instruments and the valuation process employed for these private market assets, which helps smooth out outcomes over the short-term. In this environment, public market assets (both equity and fixed income) depreciated, but private market investments registered relatively strong results. This dynamic contributes to what is known as the "denominator effect" in the industry. Underweights to Domestic Equity (3.4%), International Equity (3.5%), and Fixed Income (3.2%) were offset by overweights to Real Estate (3.8%), Private Equity (3.4%) and Cash (2.9%). We continue to evaluate opportunities to rebalance the portfolio, consistent with the Fund's long-term objectives and best practices.

Markets depreciated in 2022 as the Fed embarked on an aggressive path of rate hikes to combat unexpectedly high and persistent inflation. Global stock and bond markets posted double-digit losses for the year, with U.S. bonds posting record-breaking calendar year losses and several U.S. stock indices falling the most since 2008. Commodities were a lone bright spot, buoyed by soaring energy prices in the first half of the year and metals later in the year.

In this environment, the Fund had a net return of 6.12% over the quarter (6.21% gross of fees), underperforming the Policy Target by 103 basis points, but ranking in the 29th percentile of peers. Longer-term performance (trailing three-, five-, seven-, and ten-year periods) is ahead of the Policy Target and ranks near the peer group median. Over the quarter, fixed income and real estate contributed most to results. The rest of the asset classes in the portfolio produced slightly negative attribution results over the quarter. It is important to note that private market investments, such as private equity, infrastructure, and real estate are valued on a lagged basis and therefore should be evaluated in more detail separately, using appropriate metrics to capture the magnitude and timing of the cash flows associated with these investments. Callan prepares separate reports on behalf of CTPF to evaluate the performance of these investments in more detail.

Closing Thoughts

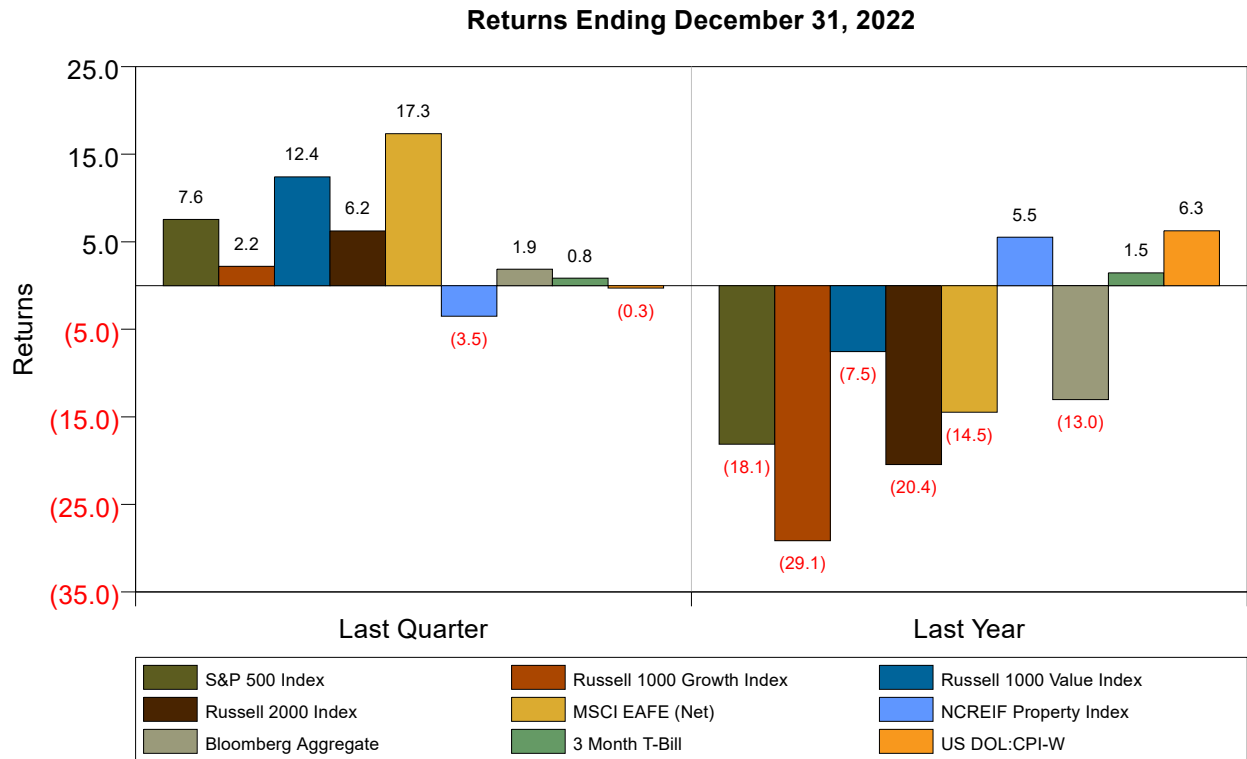
Stock and bond markets depreciated in 2022 as inflation and interest rates rose sharply. The ability of central banks to raise rates sufficiently to harness inflation without causing a recession remains a key question for investors. The on-going war in Ukraine and its toll on human life and global

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economies continues to weigh heavily in the minds of institutional investors. While COVID worries have faded (outside of China), they have not disappeared. That said, as we enter 2023, there are reasons for optimism alongside acknowledgement that risks and uncertainty persist. The reprising of public market instruments and the changing dynamics in the capital markets represent an opportunity for value creation in the future (e.g., fixed income instruments now provide a much better yield for investors). Callan continues to recommend a disciplined investment process that includes a well-defined long-term asset-allocation policy.

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Select Market Returns



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QUARTERLY REVIEW

- **Fourth Quarter, 2022 Investment Performance Update:**
 - Performance: For the fourth quarter, the Fund underperformed the market benchmark by 94 basis points, gross of investment management fees (103 basis points net of fees), and ranked in the 29th percentile of its peers. Longer term performance (trailing three-years and longer) continues to be competitive relative to benchmarks.
- **Watch Status Report:** The following managers are on the Watch List:
 - DFA: Included on the Watch List due to underperformance. Performance has improved in the recent rotation into value opportunities and Watch List scores have consequently improved meaningfully.
 - Ariel: Included on the Watch List due to personnel changes and underperformance.
 - Lazard: Included on the Watch List due to underperformance.
 - Update: Lazard announced a reduction in personnel across the asset management business, representing about 4% of the business. Specific to Lazard's international equity and emerging markets equity platform, Kevin Matthews, former Managing Director and Portfolio Manager/Analyst, left the firm effective January 17, 2023. The international equity and emerging markets platforms continue to be supported by a bench of qualified professionals. We will continue to monitor this manager closely going forward.
 - Strategic Global Advisors: Included on the Watch List due to underperformance.
 - Update: Strategic Global Advisors (SGA) announced that Senior Portfolio Manager Mark Wimer will be retiring on December 31st, 2022. There are no intentions to hire a replacement for Wimer. His responsibilities working on the quantitative models and client servicing will be absorbed by the other senior portfolio management team members. Wimer has been with SGA for 14 years since 2008 and has a total of 27 years' experience. This development is notable, but not actionable.
 - State Street Global Advisors: Included on the watch list due to missing MWDBE brokerage goals.
 - Leading Edge: Included on the Watch List due to underperformance.
 - Attucks: Attucks announced several initiatives impacting their technology platform and investment team during the fourth quarter of 2022. The firm made enhancements to its back office operations, which will allow them to improve data flow in the areas of accounting, performance, compliance, billing and content distribution. With respect to the investment team, Attucks added two individuals, Dhruvi Shah, who joined as a Senior Investment

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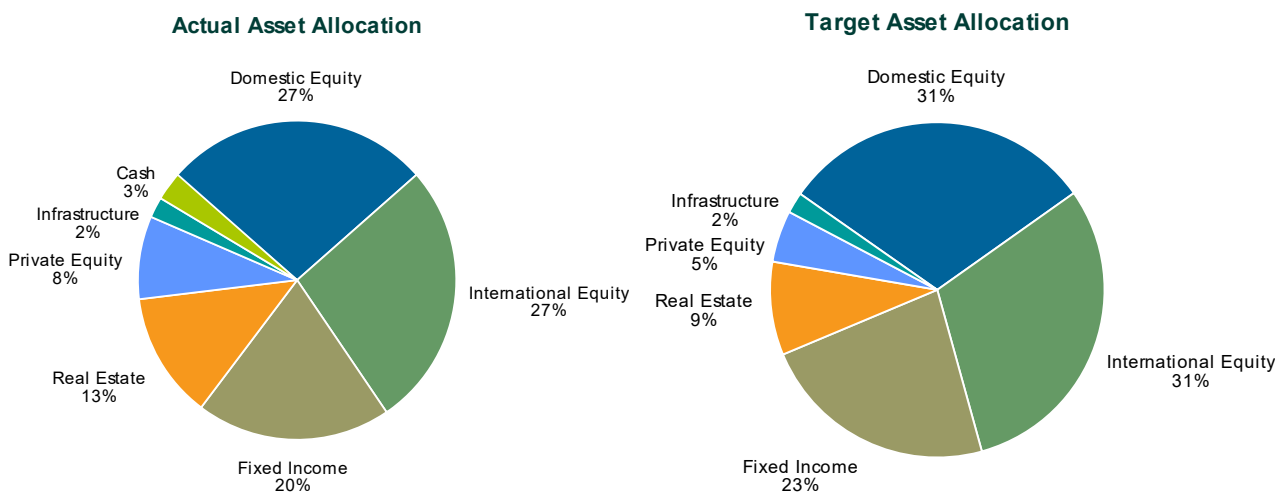
Analyst, and Sinclair Nagy, who joined as a Vice President. Shah will focus on fixed income, while Nagy will provide support in the areas of portfolio management, manager research and private markets coverage. In addition, Attucks announced that former CIO, Patrick Silvestri, decided to leave the firm effective January 1, 2023. The role of Chief Investment Officer is being eliminated, as part of Attuck's strategic plan. Given the magnitude of these changes, we recommend placing Attucks on watch and monitoring the firm closely.

- William Blair International Small Cap: Included on the Watch List due to underperformance.

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Asset Allocation

The Fund was valued at \$11,129 million at the end of the fourth quarter, representing an increase of approximately \$457 million from September 30, 2022. The change in the Fund's market value was attributable to investment performance and net negative cash flows. Investment performance resulted in an increase in the Fund's valuation of \$656 million, and outflows totalled \$199 million over the period. The Fund's asset allocation was close to the Investment Policy permissible parameters, with the exception of Real Estate, Private Equity and Fixed Income. The "denominator effect" experienced in 2022 contributed to the divergence we experienced in the Fund's asset allocation, with Private Equity and Real Estate exceeding the upper bounds of the Investment Policy range, and Fixed Income ending the quarter slightly below the lower range limit. Underweights to Domestic Equity (3.4%), International Equity (3.5%), and Fixed Income (3.2%) were offset by overweights to Real Estate (3.8%), Private Equity (3.4%) and Cash (2.9%). We continue to evaluate opportunities to rebalance the portfolio, consistent with the Fund's long-term objectives and best practices.



Asset Class	\$Millions Actual	Weight Actual	Target	Percent Difference	\$Millions Difference
Domestic Equity	3,015	27.1%	30.5%	(3.4%)	(380)
International Equity	3,000	27.0%	30.5%	(3.5%)	(394)
Fixed Income	2,201	19.8%	23.0%	(3.2%)	(358)
Real Estate	1,426	12.8%	9.0%	3.8%	424
Private Equity	933	8.4%	5.0%	3.4%	377
Infrastructure	228	2.1%	2.0%	0.1%	6
Cash	325	2.9%	0.0%	2.9%	325
Total	11,129	100.0%	100.0%		

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INVESTMENT MANAGER ASSET ALLOCATIONS

Investment Manager Asset Allocation

The table below contrasts the distribution of assets across the Fund's investment managers as of December 31, 2022, with the distribution as of September 30, 2022. The change in asset distribution is broken down into the dollar change due to Net New Investment and the dollar change due to Investment Return.

	December 31, 2022				September 30, 2022	
	Market Value	Weight	Net New Inv.	Inv. Return	Market Value	Weight
DOMESTIC EQUITY	\$3,014,679,760	27.09%	\$(86,124,538)	\$200,974,559	\$2,899,829,738	27.17%
Large Cap	\$2,711,826,172	24.37%	\$(69,813,349)	\$177,236,941	\$2,604,402,580	24.40%
Large Cap Core Index	\$1,972,325,538	17.72%	\$(51,242,496)	\$133,171,542	\$1,890,396,493	17.71%
Rhumbline Rsl 1000 LCC	1,972,325,538	17.72%	(51,242,496)	133,171,542	1,890,396,493	17.71%
Large Cap Growth Equity	\$329,501,483	2.96%	\$(853,248)	\$(2,491,809)	\$332,846,541	3.12%
Rhumbline Rsl 1000 LCG	259,207,951	2.33%	(758,010)	5,202,118	254,763,844	2.39%
Zevenbergen US ACE	70,293,532	0.63%	(95,238)	(7,693,927)	78,082,697	0.73%
Large Cap Value Equity	\$409,999,150	3.68%	\$(17,717,605)	\$46,557,208	\$381,159,546	3.57%
Channing US ACE	129,809,439	1.17%	(905,465)	14,651,370	116,063,534	1.09%
Rhumbline LCV	280,189,711	2.52%	(16,765,430)	31,859,128	265,096,012	2.48%
Small Cap Equity	\$243,460,895	2.19%	\$(16,121,507)	\$19,439,108	\$240,143,295	2.25%
NTGI Structured SCC	74,344,676	0.67%	(15,348,765)	7,413,575	82,279,866	0.77%
Conestoga SCG	88,490,803	0.80%	(222,831)	5,302,418	83,411,217	0.78%
Phocas SCV	80,625,416	0.72%	(549,912)	6,723,115	74,452,212	0.70%
Attucks Domestic Equity (Mgr of Mgrs)	\$59,392,693	0.53%	\$(189,681)	\$4,298,510	\$55,283,863	0.52%
Attucks Heard ACC	26,016,010	0.23%	(83,823)	2,996,560	23,103,274	0.22%
Attucks Lasanti	20,302,297	0.18%	(12,578)	(120,568)	20,435,443	0.19%
Attucks Paradigm LCV	13,061,617	0.12%	(93,541)	1,423,044	11,732,114	0.11%
INTERNATIONAL EQUITY	\$3,000,265,697	26.96%	\$(185,086,909)	\$406,921,772	\$2,778,430,834	26.04%
Ariel EAFE ILCV	69,546,101	0.62%	(532,804)	8,521,356	61,557,549	0.58%
DFA ISCV	158,266,468	1.42%	(2,428,055)	25,568,315	135,126,208	1.27%
Eamest Partners EME	181,841,758	1.63%	(1,737,233)	21,162,110	162,416,881	1.52%
Eamest Partners ILCE	535,385,697	4.81%	(80,465,401)	78,097,980	537,753,118	5.04%
Lazard Asst Mgt ILCE	527,108,976	4.74%	(37,067,145)	69,733,399	494,442,723	4.63%
Leading Edge IE MOM	120,745,586	1.08%	(1,038,060)	15,379,309	106,404,337	1.00%
Morgan Stanley ILCE	509,038,988	4.57%	(57,861,801)	82,623,515	484,277,274	4.54%
Strategic Global Adv. EAFE	69,404,066	0.62%	(590,872)	9,355,845	60,639,092	0.57%
William Blair ILCG	523,671,441	4.71%	(1,825,472)	59,098,197	466,398,715	4.37%
William Blair ISCE	189,656,292	1.70%	(787,122)	23,731,729	166,711,685	1.56%
TOTAL FUND	\$11,128,796,575	100.0%	\$(199,424,489)	\$656,333,439	\$10,671,887,625	100.0%

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INVESTMENT MANAGER ASSET ALLOCATIONS (Continued)

	December 31, 2022			Inv. Return	September 30, 2022	
	Market Value	Weight	Net New Inv.		Market Value	Weight
Attucks Int'l Equity	\$115,600,323	1.04%	\$(752,945)	\$13,650,017	\$102,703,251	0.96%
Attucks ARI	302	0.00%	0	4	298	0.00%
Attucks GlobeFlex Int'l ACC	8,409	0.00%	0	43	8,366	0.00%
Attucks GlobeFlex Global Eq	29,694,620	0.27%	(524,735)	3,639,490	26,579,864	0.25%
Attucks Brown Capital Int'l SCG	22,970,939	0.21%	(33,497)	2,844,623	20,159,813	0.19%
Attucks Ativo Capital EM	43	0.00%	(335)	(7,649)	8,027	0.00%
Attucks Glovista EM	17,690,153	0.16%	(4,347)	1,596,471	16,098,028	0.15%
Attucks Redwood Int'l ACC	22,196,762	0.20%	(64,676)	2,358,329	19,903,109	0.19%
Attucks Paradigm ILCC	23,039,095	0.21%	(125,356)	3,218,704	19,945,747	0.19%
FIXED INCOME	\$2,201,191,418	19.78%	\$(19,943,295)	\$50,144,685	\$2,170,990,028	20.34%
Garcia Hamilton FIC	261,079,166	2.35%	(1,998,396)	5,948,617	257,128,944	2.41%
LM Capital FICP	301,957,568	2.71%	(3,222,918)	7,163,229	298,017,258	2.79%
Pugh FIC	257,168,369	2.31%	(2,403,200)	5,091,316	254,480,253	2.38%
SSgA Agg Bond Index FI	397,988,737	3.58%	(3,144,422)	7,249,778	393,883,380	3.69%
Ramirez FI	108,604,059	0.98%	(1,290,692)	1,810,179	108,084,572	1.01%
WAMCO FICP	562,244,296	5.05%	(5,070,312)	15,390,343	551,924,265	5.17%
Wellington Core Bond	257,254,757	2.31%	(2,318,672)	5,229,843	254,343,586	2.38%
Attucks Fixed Income	\$54,894,466	0.49%	\$(494,812)	\$2,261,379	\$53,127,899	0.50%
Attucks Barksdale	17,192,009	0.15%	(161,758)	295,368	17,058,399	0.16%
Attucks New Century GI TIPS	19,163,089	0.17%	(47,417)	865,842	18,344,663	0.17%
Attucks LM Capital EMD	18,539,368	0.17%	(285,638)	1,100,169	17,724,837	0.17%
INFRASTRUCTURE	\$228,453,112	2.05%	\$(5,213,173)	\$2,079,389	\$231,586,896	2.17%
Brookfield Infra III	43,910,136	0.39%	(3,004,061)	377,790	46,536,408	0.44%
Brookfield Infra IV	21,205,540	0.19%	(1,289,576)	387,051	22,108,065	0.21%
JLC Infrastructure Fund I	4,060,564	0.04%	(304,698)	101,405	4,263,857	0.04%
IFM Global Fund	44,605,966	0.40%	(168,266)	1,970,587	42,803,645	0.40%
JP Morgan Infr-OE	76,186,623	0.68%	(2,152,933)	(1,289,107)	79,628,663	0.75%
Macquarie Fd II Infr	11,342	0.00%	(426,910)	(2,447)	440,698	0.00%
Macquarie European Fund III Infr	348,142	0.00%	802	24,562	322,778	0.00%
Macquarie Infrastructure Fund V	22,066,418	0.20%	2,132,469	569,120	19,364,828	0.18%
Ullico Taxable Fund	16,058,380	0.14%	0	(59,573)	16,117,953	0.15%
TOTAL FUND	\$11,128,796,575	100.0%	\$(199,424,489)	\$656,333,439	\$10,671,887,625	100.0%

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INVESTMENT MANAGER ASSET ALLOCATIONS (Continued)

	December 31, 2022			Inv. Return	September 30, 2022	
	Market Value	Weight	Net New Inv.		Market Value	Weight
REAL ESTATE	\$1,426,026,624	12.81%	\$(12,400,248)	\$3,203,729	\$1,435,223,143	13.45%
BIG RE Fund I	20,751,541	0.19%	(1,947,577)	689,110	22,010,008	0.21%
BIG RE Fund II	13,269,129	0.12%	(1,031,007)	416,264	13,883,872	0.13%
BREDS HG LP	21,081,437	0.19%	(229,894)	332,345	20,978,986	0.20%
City View PRE	319,614	0.00%	0	46,299	273,315	0.00%
Clarion Lion Indus Tr	241,374,617	2.17%	(515,254)	6,272,988	235,616,884	2.21%
Europa Fd III PRE	709,148	0.01%	0	61,608	647,539	0.01%
Fortress Japan PRE	1,128,605	0.01%	(40,667)	198,042	971,231	0.01%
Fortress Japan Fd II PRE	2,122,408	0.02%	(10,538)	57,851	2,075,095	0.02%
Franklin Temp PREMOM	2,197,483	0.02%	0	0	2,197,483	0.02%
GreenOak Fund III	16,934,766	0.15%	(57,377)	99,962	16,892,181	0.16%
Heitman IV LP	26,291,671	0.24%	(254,604)	201,759	26,344,516	0.25%
Heitman V LP	17,026,714	0.15%	3,539,095	284,848	13,202,770	0.12%
JP Morgan Strat PRE-OE	198,439,654	1.78%	(1,533,269)	(10,382,269)	210,355,192	1.97%
LaSalle Property PRE-OE	285,856,696	2.57%	(2,599,748)	2,830,461	285,625,983	2.68%
Longpoint RE Fd I	368,119	0.00%	12,982	(64,910)	420,047	0.00%
Longpoint RE Fd II	22,538,751	0.20%	4,301,552	599,034	17,638,165	0.17%
Long Wharf VI	19,841,207	0.18%	(2,580,773)	(0)	22,421,980	0.21%
MB Asia RE Fd PRE	246,373	0.00%	0	(5,471)	251,844	0.00%
Newport Cap Fund II	20,619,930	0.19%	(88,527)	443,203	20,265,254	0.19%
Newport Cap Fund III	1,297,744	0.01%	(67,750)	352,358	1,013,136	0.01%
Oak Street Fund IV RE	10,942,748	0.10%	(599,962)	225,629	11,317,081	0.11%
PRISA Fd I PRE-OE	206,578,089	1.86%	(1,809,556)	455,684	207,931,960	1.95%
PRISA Fd II PRE-OE	149,932,561	1.35%	(393,304)	1,829,436	148,496,429	1.39%
SASC II	11,207,722	0.10%	(6,283,287)	523,402	16,967,607	0.16%
TA Associates Realty Fund XII	52,472,202	0.47%	370,727	(2,507,962)	54,609,438	0.51%
UBS Realty PRE-OE	69,504,115	0.62%	(559,692)	12,056	70,051,751	0.66%
Walton St Fd III PRE	53,651	0.00%	0	(982)	54,633	0.00%
Walton St Fd V PRE	1,277,927	0.01%	0	(278,645)	1,556,572	0.01%
Walton St Fd VI PRE	10,132,366	0.09%	(14,509)	592,657	9,554,218	0.09%
Walton St Mexico Fd I PRE	1,509,636	0.01%	(7,308)	(81,027)	1,597,971	0.01%
TOTAL FUND	\$11,128,796,575	100.0%	\$(199,424,489)	\$656,333,439	\$10,671,887,625	100.0%

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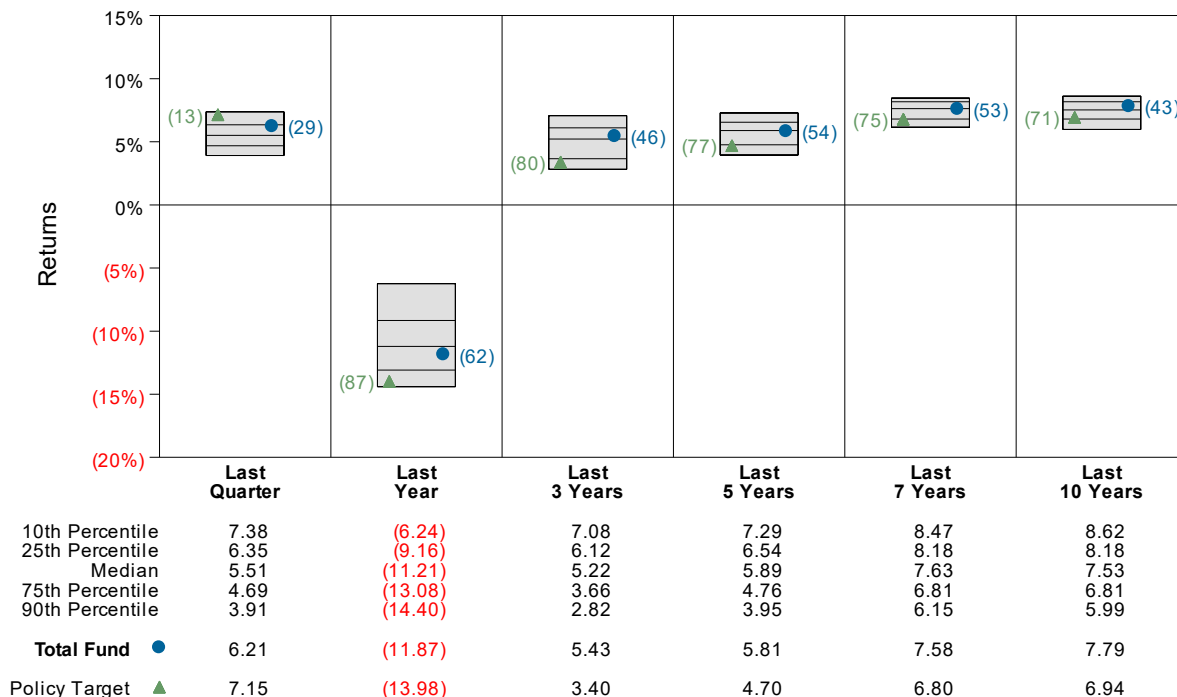
INVESTMENT MANAGER ASSET ALLOCATIONS (Continued)

	December 31, 2022			September 30, 2022		
	Market Value	Weight	Net New Inv.	Inv. Return	Market Value	Weight
PRIVATE EQUITY	\$933,111,777	8.38%	\$8,790,233	\$(8,270,709)	\$932,592,253	8.74%
Adams St Many Fd PE	407,102,835	3.66%	16,939,620	(10,511,259)	400,674,474	3.75%
African Dev Ptr III	4,927,613	0.04%	(234,421)	(197,284)	5,359,318	0.05%
AFIG Fund II LP	7,688,851	0.07%	(34,027)	(879,746)	8,602,624	0.08%
Aldrich Capital Partners II	387,784	0.00%	504,342	(116,559)	1	0.00%
Astra Partners I	9,572,330	0.09%	(61,332)	2,064,077	7,569,585	0.07%
AUA II	3,271,997	0.03%	(4,867,932)	1,349,510	6,790,419	0.06%
AVP XI LP	37,261,110	0.33%	(76,953)	670,766	36,667,297	0.34%
AVP XII LP	16,495,910	0.15%	1,198,571	(53,529)	15,350,868	0.14%
AVP XIII	1,539,509	0.01%	723,125	(68,662)	885,046	0.01%
Data Focus I	7,476,021	0.07%	(68,741)	493,793	7,050,969	0.07%
EQT Fund VIII	25,704,674	0.23%	(180,168)	1,851,966	24,032,876	0.23%
EQT IX LP	22,450,639	0.20%	23,231	(490,747)	22,918,155	0.21%
Estancia II	10,799,730	0.10%	491,538	311,591	9,996,601	0.09%
Farol Fund II	19,712,684	0.18%	(79,320)	1,857,112	17,934,892	0.17%
HarbourVest Ptrs VI PE	97,958	0.00%	0	(14,016)	111,974	0.00%
HarbourVest Ptrs VII PE	20,203,141	0.18%	(905,778)	(657,568)	21,766,487	0.20%
HarbourVest Ptrs VIII PE	1,855,527	0.02%	(226,664)	(83,809)	2,166,000	0.02%
HVP Buyout X PE	17,039,059	0.15%	(894,249)	214,274	17,719,034	0.17%
HVP Venture X PE	17,565,097	0.16%	(251,431)	(332,553)	18,149,081	0.17%
HVP Brand Fd II	760,484	0.01%	100,000	(83,324)	743,808	0.01%
Hispania Fd II PE	44,198	0.00%	0	(7,781)	51,979	0.00%
ICV Capital Ptrs III PE	8,799,193	0.08%	(87,559)	(143,232)	9,029,984	0.08%
ICV Capital Ptrs IV PE	12,627,862	0.11%	120,528	(789,548)	13,296,882	0.12%
KKR Americas Fd XII	30,710,298	0.28%	(464,969)	(2,540,252)	33,715,519	0.32%
KKR Americas Fd XIII	6,679,065	0.06%	1,365,871	(224,253)	5,537,447	0.05%
Long Arc Capital Fd I	8,329,698	0.07%	0	161,130	8,168,568	0.08%
MB SPO FD II	2,775,278	0.02%	188,379	(109,754)	2,696,654	0.03%
Mesirow Fd IV PE	3,294,769	0.03%	(458,158)	(128,783)	3,881,710	0.04%
Mesirow Fd V PE	11,883,674	0.11%	(435,374)	(450,563)	12,769,611	0.12%
Mesirow Fd VII A PE	19,240,258	0.17%	369,688	(191,838)	19,062,408	0.18%
Mesirow Fd VII B PE	17,054,141	0.15%	(161,875)	1,403,803	15,812,213	0.15%
Mesirow Fund VIII	13,376,475	0.12%	(590,000)	(234,549)	14,201,024	0.13%
Mesirow Fd IX PE	196,594	0.00%	0	1,497	195,097	0.00%
Mesirow Fd X PE	5,331,020	0.05%	(240,228)	99,987	5,471,261	0.05%
Muller M2 MPEFF PE	3,256	0.00%	0	0	3,256	0.00%
NMS Capital Fund III	18,722,254	0.17%	(244,546)	0	18,966,800	0.18%
NMS Capital Fund IV	7,632,491	0.07%	(48,071)	680,538	7,000,025	0.07%
P4G I	4,496,008	0.04%	1,546,751	(84,518)	3,033,775	0.03%
Palladium Ptrs III PE	17,149	0.00%	0	0	17,149	0.00%
Palladium Ptrs IV PE	8,121,896	0.07%	(437,808)	182,221	8,377,483	0.08%
Palladium Ptrs V PE	11,839,438	0.11%	(692,809)	(1,133,421)	13,665,667	0.13%
Pantheon Asia Fd V PE	435,407	0.00%	(43,081)	(13,558)	492,046	0.00%
Pantheon Europe Fd II PE	14,658	0.00%	0	1,203	13,454	0.00%
Pantheon Europe Fd VI PE	1,888,012	0.02%	(63,837)	205,131	1,746,719	0.02%
Pantheon GI Fd 2014	33,034,130	0.30%	(826,448)	(158,829)	34,019,407	0.32%
Pantheon Select Fd	19,204,256	0.17%	602,841	(563,559)	19,164,974	0.18%
Pantheon USA Fd III PE	219,688	0.00%	0	(5,828)	225,516	0.00%
Pantheon USA Fd IV PE	422,364	0.00%	0	0	422,364	0.00%
Pharos Fd II PE	3,290,741	0.03%	0	(605,686)	3,896,427	0.04%
Pharos Fd III PE	12,414,873	0.11%	0	810,497	11,604,376	0.11%
Red Arts Capital Opp Fd I	6,913,590	0.06%	0	182,284	6,731,306	0.06%
RLJ Equity Fund II	10,455,983	0.09%	427,491	(366,701)	10,395,193	0.10%
Turning Rock Fd I	5,056,216	0.05%	(1,246,101)	167,062	6,135,255	0.06%
Turning Rock Fd II	6,893,576	0.06%	(56,294)	180,515	6,769,355	0.06%
WM Partners II	9,780,316	0.09%	(1,833,566)	82,042	11,531,840	0.11%
CASH	\$325,019,903	2.92%	\$100,518,252	\$1,279,809	\$223,221,842	2.09%
TOTAL FUND	\$11,128,796,575	100.0%	\$(199,424,489)	\$656,333,439	\$10,671,887,625	100.0%

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Total Fund Performance vs. Target

Callan Public Fund Spons - Large (>1B)



Note: Performance is shown gross-of-fees.

Current quarter Policy Target = 30.5% Russell 3000 Index, 30.5% MSCI ACWI ex US Index, 23% Bloomberg Aggregate Bond Index, 9% NFI ODCE Value Weight Index, 5% Russell 3000 Index+3.0% and 2% FTSE Developed Core Infrastructure 50/50 Net.

For the fourth quarter, the Fund underperformed the market benchmark by 94 basis points, gross of investment management fees (103 basis points net of fees), and ranked in the 29th percentile of its peers. Longer term performance (trailing three-years and longer) continues to be competitive relative to benchmarks.

The manager attribution effect was negative over the quarter, with private equity detracting the most from relative results. The manager attribution for domestic equity and infrastructure also detracted from results. However, total attribution for fixed income and real estate had a positive impact on relative results.

The following is a brief summary of the performance of each of the major asset classes represented in the Fund (performance commentary relative to benchmarks is net of fees, while results relative to peers is gross of fees):

- Domestic Equity:** The domestic equity composite outperformed the Russell 3000 Index by 31 basis points over the fourth quarter, ranking in the 79th percentile of its peers. Small cap managers outperformed their large cap counterparts with Northern Trust exceeding its benchmark by 243 basis points.
- International Equity:** The international equity composite outperformed the MSCI ACWI Ex-US IMI Index by 42 basis points for the quarter, and ranked in the 72nd percentile of its peer group. Relative performance was mixed for the international equity managers this quarter. Ariel, Lazard, Morgan Stanley, Strategic Global, and William Blair International Large Cap Growth all detracted from

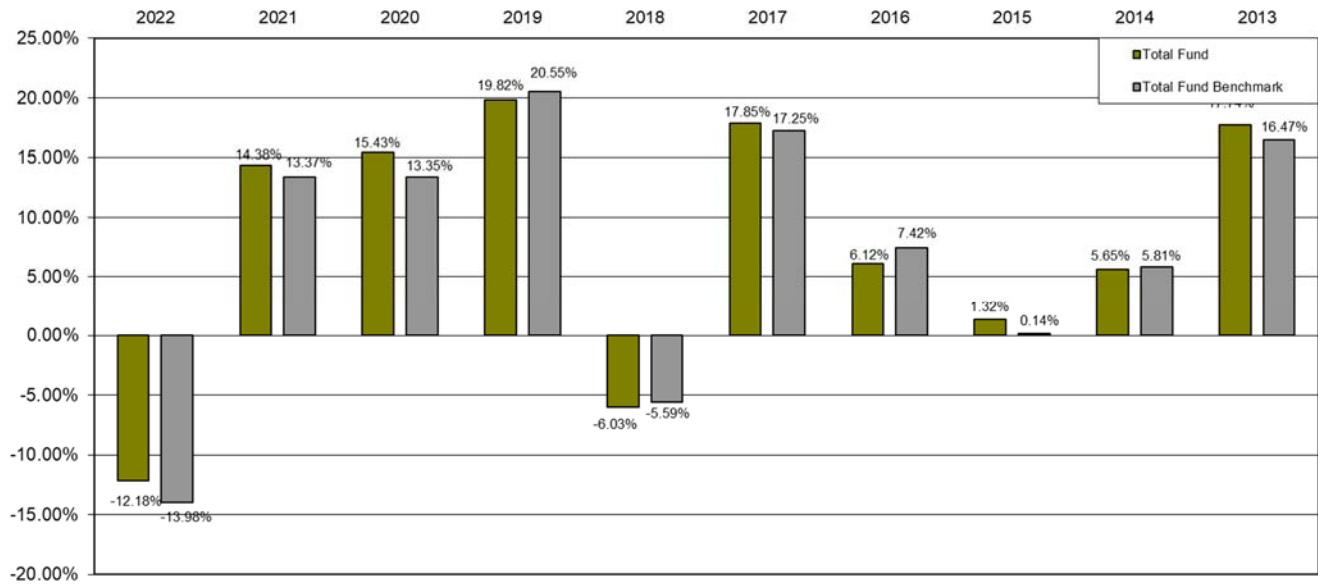
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performance. Earnest Partners Emerging Markets posted a strong quarter, outperforming its benchmark by 329 basis points. Earnest Partners, William Blair International

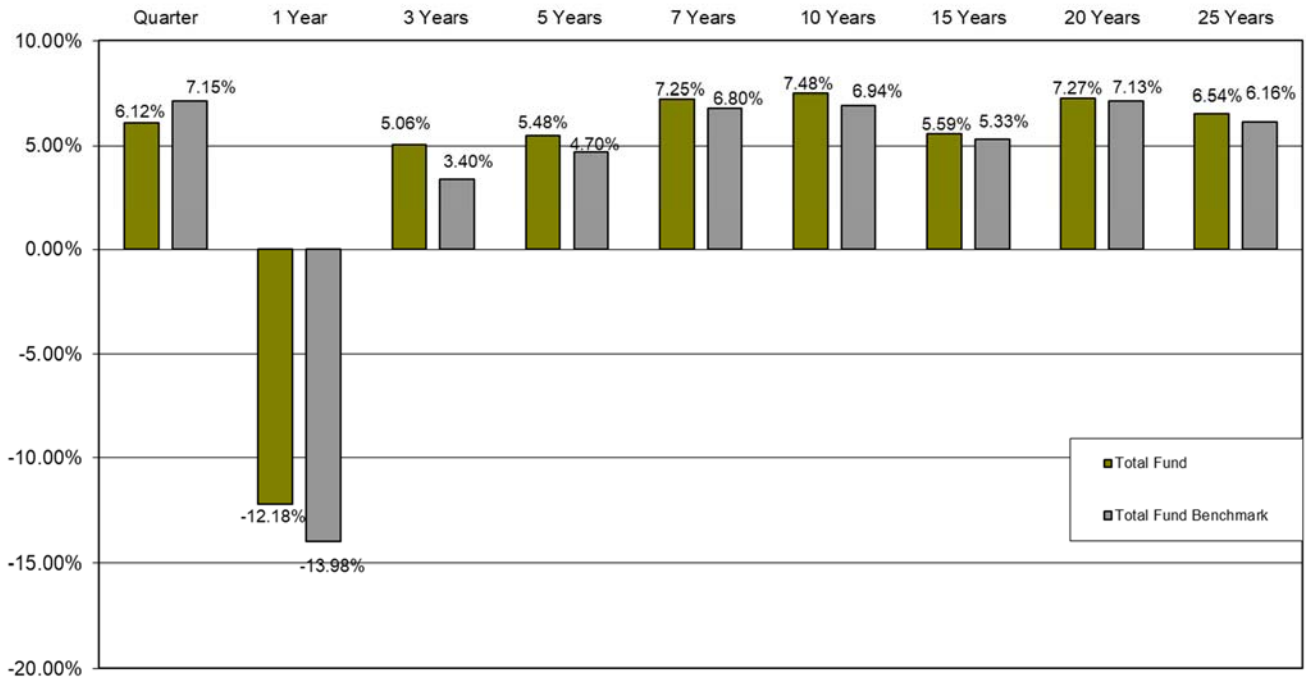
- Small Cap, DFA and Leading Edge all managed to outperform their respective benchmarks.
- **Fixed Income:** The fixed income composite outperformed the Bloomberg Aggregate Index by 42 basis points for the quarter and ranked in the 31st percentile of its peers. Wellington, Garcia Hamilton, LM, Pugh and Western all outperformed their respective benchmarks and contributed to the portfolio's success.
- **Alternative Investments:** The infrastructure and private equity portfolios underperformed their respective benchmarks while the real estate portfolio outperformed on a time-weighted return basis. It is important to note that performance evaluation for these instruments should encompass several metrics that go beyond time-weighted return calculations. These metrics take into account the timing and magnitude of distributions and contributions over the life of these investments. This cash flow activity is imperative in evaluating the success of these instruments. Hence, these portfolios are evaluated separately and more rigorously under separate cover.

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Total Fund Calendar Year Performance, Net of Fees



Total Fund Performance over Various Trailing Periods, Net of Fees



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MANAGER PERFORMANCE

Table 1 presents returns for the public market domestic and international equity and fixed income managers and composites in the Chicago Teacher Pension Fund relative to appropriate benchmarks on a net of fee basis. Managers highlighted in red are currently on the Watch List.

Table 1 (Net-of-Fees):

CTPF Investment Strategies	Net Investment Returns as of 12/31/2022						Inception Date	Qtr-End MV
	FUND	Qtr	1 Yr	3 Yr	5 Yr	7 Yr		
Fixed Income								
SSgA Aggregate Bond Index	1.84	-13.01	-2.75	-	-	-2.61	Aug-19	\$398m
Bloomberg Barclays Aggregate Index	1.87	-13.01	-2.71	-	-	-2.55		
Variance	-0.03	0.00	-0.04	-	-	-0.06		
Wellington Core Bond	2.02	-14.35	-2.67	-	-	-2.47	Aug-19	\$257m
Bloomberg Barclays Aggregate Index	1.87	-13.01	-2.71	-	-	-2.55		
Variance	0.15	-1.34	0.04	-	-	0.08		
Garcia Hamilton	2.29	-10.84	-1.86	0.45	1.25	2.52	Oct-10	\$261m
Bloomberg Barclays Aggregate Index	1.87	-13.01	-2.71	0.02	0.89	1.72		
Variance	0.42	2.17	0.85	0.43	0.36	0.80		
LM Capital*	2.38	-11.94	-2.00	0.36	1.36	3.19	Nov-04	\$302m
Bloomberg Barclays Aggregate Index	1.87	-13.01	-2.71	0.02	0.89	2.95		
Variance	0.51	1.07	0.71	0.34	0.47	0.24		
Pugh Capital Management	1.98	-13.01	-2.40	0.18	1.06	1.93	Oct-10	\$257m
Bloomberg Barclays Aggregate Index	1.87	-13.01	-2.71	0.02	0.89	1.72		
Variance	0.11	0.00	0.31	0.16	0.17	0.21		
Ramirez Fixed Income	1.64	-13.06	-	-	-	-12.36	Dec-21	\$109m
Bloomberg Barclays Aggregate Index	1.87	-13.01	-	-	-	-12.28		
Variance	-0.23	-0.05	-	-	-	-0.08		
Western Asset Management	2.76	-16.89	-3.44	-0.08	1.58	3.95	Feb-03	\$562m
Bloomberg Barclays Aggregate Index	1.87	-13.01	-2.71	0.02	0.89	3.11		
Variance	0.89	-3.88	-0.73	-0.10	0.69	0.84		

*LM mandate changed from Core Bond to Core Plus Bond as of 7/1/13. Peer group rankings are not applicable to the full track record given the change in mandates.

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Table 1 (Net-of-Fees, Continued):

CTPF Investment Strategies		Net Investment Returns as of 12/31/2022					Inception Date	Qtr-End MV
FUND	Qtr	1 Yr	3 Yr	5 Yr	7 Yr	Since Inception		
Large Cap Equity								
Rhumbline Russell 1000 Index Fund	7.03	-18.86	7.44	9.14	11.25	8.26		
Russell 1000 Index	7.24	-19.13	7.35	9.13	11.26	8.21	Jun-07 \$1,972m	
Variance	-0.21	0.27	0.09	0.01	-0.01	0.05		
Rhumbline Russell 1000 Growth Index Fund	2.03	-28.60	8.02	-	-	12.11		
Russell 1000 Growth Index	2.20	-29.14	7.79	-	-	12.02	Oct-17 \$259m	
Variance	-0.17	0.54	0.23	-	-	0.09		
Zevenbergen Capital Management	-9.96	-54.41	-2.66	5.38	7.94	9.79		
Russell 3000 Growth Index	2.31	-28.97	7.32	10.45	12.55	9.38	Oct-92 \$70m	
Variance	-12.27	-25.44	-9.98	-5.07	-4.61	0.41		
Channing*	12.52	-1.88	9.44	8.40	10.08	13.10		
Channing Benchmark	12.18	-7.98	5.88	6.50	9.07	11.80	Jul-09 \$130m	
Variance	0.34	6.10	3.56	1.90	1.01	1.30		
Rhumbline LCV	12.16	-7.70	-	-	-	-7.70		
Russell 1000 Value Index	12.42	-7.54	-	-	-	-7.54	May-96 \$280m	
Variance	-0.26	-0.16	-	-	-	-0.16		
Small Cap Equity								
Northern Trust Small Cap	8.66	-15.89	5.43	5.67	8.99	11.36		
Russell 2000 Index	6.23	-20.44	3.10	4.13	7.90	9.93	Jan-91 \$74m	
Variance	2.43	4.55	2.33	1.54	1.09	1.43		
Conestoga Small Cap Growth	6.18	-27.70	3.74	-	-	2.71		
Russell 2000 Growth Index	4.13	-26.40	0.65	-	-	0.05	Jul-18 \$88m	
Variance	2.05	-1.30	3.09	-	-	2.66		
Phocas Small Cap Value	8.79	-15.13	6.06	4.12	-	7.30		
Russell 2000 Value Index	8.42	-14.48	4.70	4.13	-	7.90	Jul-16 \$81m	
Variance	0.37	-0.65	1.36	-0.01	-	-0.60		
Manager of Managers								
Attucks**	9.43	-20.71	0.38	1.89	5.14	4.63		
Custom Benchmark	9.64	-14.12	2.69	3.61	6.84	5.42	Dec-13 \$230m	
Variance	-0.21	-6.59	-2.31	-1.72	-1.70	-0.79		

*Channing mandate changed from Mid Cap Value to All Cap Value as of 10/1/11. Channing Benchmark reflects Russell MC Value Index through 9/30/11 and Russell 3000 Value thereafter. Peer group rankings are not applicable to the full track record given the change in mandates.

**In 4Q13, Attucks was transitioned from a domestic equity portfolio to a Best in Class portfolio.

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Table 1 (Net-of-Fees, Continued):

CTPF Investment Strategies		Net Investment Returns as of 12/31/2022					Inception Date	Qtr-End MV
FUND	Qtr	1 Yr	3 Yr	5 Yr	7 Yr	Since Inception		
International Equity								
Ariel Investments	13.71	-11.76	-0.20	0.55	-	2.97	Jul-16	\$70m
MSCI EAFE Index	17.34	-14.45	0.87	1.54	-	5.61		
Variance	-3.63	2.69	-1.07	-0.99	-	-2.64		
EARNEST Partners	14.37	-12.36	2.83	2.56	6.69	5.02	Apr-07	\$535m
MSCI ACWI ex-US Index	14.28	-16.00	0.07	0.88	4.80	2.20		
Variance	0.09	3.64	2.76	1.68	1.89	2.82		
Lazard	14.08	-14.86	-0.86	0.28	3.49	4.80	Jan-01	\$527m
MSCI ACWI ex-US Index	14.28	-16.00	0.07	0.88	4.80	4.14		
Variance	-0.20	1.14	-0.93	-0.60	-1.31	0.66		
Morgan Stanley	17.00	-13.75	0.52	1.37	4.08	7.48	Apr-95	\$509m
MSCI EAFE Index	17.34	-14.45	0.87	1.54	4.53	4.66		
Variance	-0.34	0.70	-0.35	-0.17	-0.45	2.82		
Strategic Global Advisors	15.37	-16.37	-0.92	-0.54	-	3.84	Jul-16	\$69m
MSCI EAFE Index	17.34	-14.45	0.87	1.54	-	5.61		
Variance	-1.97	-1.92	-1.79	-2.08	-	-1.77		
William Blair Growth	12.58	-28.12	1.58	2.85	5.67	6.89	Feb-10	\$524m
MSCI ACWI ex-US IMI Growth Index	12.73	-23.49	-0.26	1.39	5.11	5.22		
Variance	-0.15	-4.63	1.84	1.46	0.56	1.67		
William Blair International Small Cap	14.02	-35.43	-2.26	-0.93	2.92	3.28	Apr-07	\$190m
William Blair ISCE Benchmark*	11.73	-26.09	0.65	0.76	4.75	2.77		
Variance	2.29	-9.34	-2.91	-1.69	-1.83	0.51		
Dimensional Fund Advisors	19.15	-9.65	1.75	-0.33	4.48	7.27	Jun-12	\$158m
MSCI World Small Cap ex-US Value	16.80	-14.00	-0.02	0.04	4.74	6.52		
Variance	2.35	4.35	1.77	-0.37	-0.26	0.75		
EARNEST Partners Emerging Markets	12.99	-10.45	-0.12	1.37	6.94	2.77	Mar-13	\$182m
MSCI Emerging Markets Index	9.70	-20.09	-2.69	-1.39	5.17	1.45		
Variance	3.29	9.64	2.57	2.76	1.77	1.32		
International Manager of Managers								
Leading Edge	14.31	-18.18	-1.14	-0.26	3.93	3.83	Apr-10	\$121m
MSCI ACWI ex-US Index	14.28	-16.00	0.07	0.88	4.80	3.76		
Variance	0.03	-2.18	-1.21	-1.14	-0.87	0.07		

* The William Blair ISCE benchmark is comprised of the MSCI ACWI ex US Small Cap Index through 5/31/12 and the MSCI ACWI ex US Small Cap Growth Index thereafter.

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Table 1 (Net-of-Fees, Continued):

CTPF Investment Strategies	Net Investment Returns as of 12/31/2022						Inception Date	Qtr-End MV
	Qtr	1 Yr	3 Yr	5 Yr	7 Yr	Since Inception		
FUND								
Infrastructure								
Infrastructure Composite	0.61	8.24	12.65	12.47	11.94	8.34	Nov-08	\$229m
Infrastructure Benchmark*	9.25	-5.79	1.43	4.47	5.47	6.74		
Variance	-8.64	14.03	11.22	8.00	6.47	1.60		
Real Estate								
Real Estate Composite	0.02	21.48	14.07	10.99	10.16	8.13	Jan-02	\$1,426m
NFI-ODCE Value Weight	-5.17	6.55	8.97	7.72	7.57	7.26		
Variance	5.19	14.93	5.10	3.27	2.59	0.87		
Private Equity								
Private Equity Composite	-1.07	-0.22	22.54	17.77	16.05	10.93	Jan-02	\$933m
Private Equity Benchmark**	7.97	-15.36	11.05	12.57	13.87	9.05		
Variance	-9.04	15.14	11.49	5.20	2.18	1.88		

*The Infrastructure Benchmark is 8% Annualized Return through 9/30/17 and FTSE Developed Core Infrastructure 50/50 (Net) thereafter.

**The Private Equity Benchmark is Russell 3000 through 9/30/17, thereafter Russell 3000+3%.

Note: Private market investments shown above are typically reported on a one quarter lag. Private Equity returns are, at times, reported on a longer lag. Comments on Infrastructure, REITS and Real Estate are covered in the quarterly Real Estate Report. Private Equity is discussed in the quarterly Private Equity Report.

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MANAGER PERFORMANCE

Table 1 presents returns for the public market domestic and international equity and fixed income managers and composites in the Chicago Teacher Pension Fund relative to appropriate benchmarks on a gross of fee basis. Managers highlighted in red are currently on the Watch List.

Table 2 (Gross-of-Fees):

CTPF Investment Strategies	Gross Investment Returns as of 12/31/2022						Inception Date	Qtr-End MV
	Qtr	1 Yr	3 Yr	5 Yr	7 Yr	Since Inception		
FUND								
Fixed Income								
SSgA Aggregate Bond Index	1.85	-12.97	-2.71	-	-	-2.58	Aug-19	\$398m
Bloomberg Barclays Aggregate Index	1.87	-13.01	-2.71	-	-	-2.55		
Variance	-0.02	0.04	0.00	-	-	-0.03		
Peer Ranking – CAI Core Bond	56	58	96	-	-			
Wellington Core Bond	2.07	-14.20	-2.49	-	-	-2.31	Aug-19	\$257m
Bloomberg Barclays Aggregate Index	1.87	-13.01	-2.71	-	-	-2.55		
Variance	0.20	-1.19	0.22	-	-	0.24		
Peer Ranking – CAI Core Bond	28	96	79	-	-			
Garcia Hamilton	2.32	-10.73	-1.73	0.58	1.40	2.68	Oct-10	\$261m
Bloomberg Barclays Aggregate Index	1.87	-13.01	-2.71	0.02	0.89	1.72		
Variance	0.45	2.28	0.98	0.56	0.51	0.96		
Peer Ranking – CAI Core Bond	7	2	17	33	51			
LM Capital*	2.42	-11.81	-1.85	0.51	1.51	3.36	Nov-04	\$302m
Bloomberg Barclays Aggregate Index	1.87	-13.01	-2.71	0.02	0.89	2.95		
Variance	0.55	1.20	0.86	0.49	0.62	0.41		
Peer Ranking - CAI Core Plus Bond	28	16	47	73	80			
Pugh Capital Management	2.01	-12.89	-2.26	0.32	1.20	2.09	Oct-10	\$257m
Bloomberg Barclays Aggregate Index	1.87	-13.01	-2.71	0.02	0.89	1.72		
Variance	0.14	0.12	0.45	0.30	0.31	0.37		
Peer Ranking - CAI Core Bond	33	50	63	75	82			
Ramirez Fixed Income	1.69	-12.92	-	-	-	-12.23	Dec-21	\$109m
Bloomberg Barclays Aggregate Index	1.87	-13.01	-	-	-	-12.28		
Variance	-0.18	0.09	-	-	-	0.05		
Peer Ranking - CAI Core Bond	69	54	-	-	-			
Western Asset Management	2.80	-16.74	-3.28	0.08	1.75	4.13	Feb-03	\$562m
Bloomberg Barclays Aggregate Index	1.87	-13.01	-2.71	0.02	0.89	3.11		
Variance	0.93	-3.73	-0.57	0.06	0.86	1.02		
Peer Ranking - CAI Core Plus Bond	13	97	97	95	59			

*LM mandate changed from Core Bond to Core Plus Bond as of 7/1/13. Peer group rankings are not applicable to the full track record given the change in mandates.

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Table 2 (Gross-of-Fees, Continued):

CTPF Investment Strategies	Gross Investment Returns as of 12/31/2022						Inception Date	Qtr-End MV
	Qtr	1 Yr	3 Yr	5 Yr	7 Yr	Since Inception		
FUND								
Large Cap Equity								
Rhumbline Russell 1000 Index Fund	7.03	-18.85	7.45	9.15	11.25	8.27	Jun-07	\$1,972m
Russell 1000 Index	7.24	-19.13	7.35	9.13	11.26	8.21		
Variance	-0.21	0.28	0.10	0.02	-0.01	0.06		
Peer Ranking – CAI Large Cap	59	54	47	45	41			
Rhumbline Russell 1000 Growth Index Fund	2.03	-28.59	8.03	-	-	12.12	Oct-17	\$259m
Russell 1000 Growth Index	2.20	-29.14	21.67	-	-	12.02		
Variance	-0.17	0.55	-13.64	-	-	0.10		
Peer Ranking - CAI Large Cap Growth	68	37	27	-	-			
Zevenbergen Capital Management	-9.87	-54.19	-2.25	5.82	8.38	10.23	Oct-92	\$70m
Russell 3000 Growth Index	2.31	-28.97	7.32	10.45	12.55	9.38		
Variance	-12.18	-25.22	-9.57	-4.63	-4.17	0.85		
Peer Ranking - CAI All Cap Growth	100	100	98	92	85			
Channing*	12.64	-1.36	9.97	8.91	10.61	13.64	Jul-09	\$130m
Channing Benchmark	12.18	-7.98	5.88	6.50	9.07	11.80		
Variance	0.46	6.62	4.09	2.41	1.54	1.84		
Peer Ranking – CAI All Cap Value	34	34	40	35	50			
Rhumbline LCV	12.17	-7.69	-	-	-	-7.69	May-96	\$280m
Russell 1000 Value Index	12.42	-7.54	-	-	-	-7.54		
Variance	-0.25	-0.15	-	-	-	-0.15		
Peer Ranking – CAI Large Cap Value	40	56	-	-	-			
Small Cap Equity								
Northern Trust Small Cap	8.69	-15.81	5.52	5.77	9.09	11.45	Jan-91	\$74m
Russell 2000 Index	6.23	-20.44	3.10	4.13	7.90	9.93		
Variance	2.46	4.63	2.42	1.64	1.19	1.52		
Peer Ranking - CAI Small Cap	60	48	59	55	61			
Conestoga Small Cap Growth	6.35	-27.20	4.45	-	-	3.42	Jul-18	\$88m
Russell 2000 Growth Index	4.13	-26.40	0.65	-	-	0.05		
Variance	2.22	-0.80	3.80	-	-	3.37		
Peer Ranking - CAI Small Cap Growth	21	51	54	-	-			
Phocas Small Cap Value	9.01	-14.38	6.95	4.99	-	8.16	Jul-16	\$81m
Russell 2000 Value Index	8.42	-14.48	4.70	4.13	-	7.90		
Variance	0.59	0.10	2.25	0.86	-	0.26		
Peer Ranking - CAI Small Cap Value	89	83	56	59	-			
Manager of Managers								
Attucks**	9.59	-20.23	0.96	2.49	5.76	5.23	Dec-13	\$230m
Custom Benchmark	9.64	-14.12	2.69	3.61	6.84	5.42		
Variance	-0.05	-6.11	-1.73	-1.12	-1.08	-0.19		

*Channing mandate changed from Mid Cap Value to All Cap Value as of 10/1/11. Channing Benchmark reflects Russell MC Value Index through 9/30/11 and Russell 3000 Value thereafter. Peer group rankings are not applicable to the full track record given the change in mandates.

**In 4Q13, Attucks was transitioned from a domestic equity portfolio to a Best in Class portfolio.

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Table 2 (Gross-of-Fees, Continued):

CTPF Investment Strategies	Gross Investment Returns as of 12/31/2022						Inception Date	Qtr-End MV
	Qtr	1 Yr	3 Yr	5 Yr	7 Yr	Since Inception		
FUND								
International Equity								
Ariel Investments	13.91	-11.15	0.48	1.24	-	3.64	Jul-16	\$70m
MSCI EAFE Index	17.34	-14.45	0.87	1.54	-	5.61		
Variance	-3.43	3.30	-0.39	-0.30	-	-1.97		
Peer Ranking - CAI Non-US Equity	81	20	67	70	-			
EARNEST Partners	14.49	-12.00	3.25	2.98	7.13	5.50	Apr-07	\$535m
MSCI ACWI ex-US Index	14.28	-16.00	0.07	0.88	4.80	2.20		
Variance	0.21	4.00	3.18	2.10	2.33	3.30		
Peer Ranking - CAI Non-US Equity	74	24	13	26	14			
Lazard	14.13	-14.72	-0.69	0.45	3.66	5.12	Jan-01	\$527m
MSCI ACWI ex-US Index	14.28	-16.00	0.07	0.88	4.80	4.14		
Variance	-0.15	1.28	-0.76	-0.43	-1.14	0.98		
Peer Ranking - CAI Non-US Equity	78	45	85	84	87			
Morgan Stanley	17.12	-13.39	0.92	1.78	4.50	7.94	Apr-95	\$509m
MSCI EAFE Index	17.34	-14.45	0.87	1.54	4.53	4.66		
Variance	-0.22	1.06	0.05	0.24	-0.03	3.28		
Peer Ranking - CAI Non-US Equity	33	33	58	56	74			
Strategic Global Advisors	15.51	-15.94	-0.42	-0.04	-	4.33	Jul-16	\$69m
MSCI EAFE Index	17.34	-14.45	0.87	1.54	-	5.61		
Variance	-1.83	-1.49	-1.29	-1.58	-	-1.28		
Peer Ranking - CAI Non-US Equity	58	53	83	90	-			
William Blair Growth	12.68	-27.85	1.93	3.21	6.04	7.27	Feb-10	\$524m
MSCI ACWI ex-US IMI Growth Index	12.73	-23.49	-0.26	1.39	5.11	5.22		
Variance	-0.05	-4.36	2.19	1.82	0.93	2.05		
Peer Ranking - CAI Core Growth Int'l Equity	65	79	31	27	45			
William Blair International Small Cap	14.26	-34.84	-1.45	-0.10	3.78	4.24	Apr-07	\$190m
William Blair ISCE Benchmark*	11.73	-26.09	0.65	0.76	4.75	2.77		
Variance	2.53	-8.75	-2.10	-0.86	-0.97	1.47		
Peer Ranking - CAI Int'l Small Cap Equity	69	95	76	52	80			
Dimensional Fund Advisors	19.15	-9.65	1.75	-0.33	4.48	7.29	Jun-12	\$158m
MSCI World Small Cap ex-US Value	16.80	-14.00	-0.02	0.04	4.74	6.52		
Variance	2.35	4.35	1.77	-0.37	-0.26	0.77		
Peer Ranking - CAI Int'l Small Cap Equity	11	5	22	58	49			
EARNEST Partners Emerging Markets	13.15	-9.96	0.41	1.91	7.50	3.30	Mar-13	\$182m
MSCI Emerging Markets Index	9.70	-20.09	-2.69	-1.39	5.17	1.45		
Variance	3.45	10.13	3.10	3.30	2.33	1.85		
Peer Ranking - CAI EM Equity	18	11	36	25	24			
International Manager of Managers								
Leading Edge	14.54	-17.48	-0.34	0.55	4.77	4.65	Apr-10	\$121m
MSCI ACWI ex-US Index	14.28	-16.00	0.07	0.88	4.80	3.76		
Variance	0.26	-1.48	-0.41	-0.33	-0.03	0.89		
Peer Ranking - CAI Non-US Equity	73	63	82	81	68			

* The William Blair ISCE benchmark is comprised of the MSCI ACWI ex US Small Cap Index through 5/31/12 and the MSCI ACWI ex US Small Cap Growth Index thereafter.

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Table 2 (Gross-of-Fees, Continued):

CTPF Investment Strategies	Gross Investment Returns as of 12/31/2022						Inception Date	Qtr-End MV
	Qtr	1 Yr	3 Yr	5 Yr	7 Yr	Since Inception		
FUND								
Infrastructure								
Infrastructure Composite	0.90	9.40	14.21	13.58	12.93	9.07	Nov-08	\$229m
Infrastructure Benchmark*	9.25	-5.79	1.43	4.47	5.47	6.74		
Variance	-8.35	15.19	12.78	9.11	7.46	2.33		
Real Estate								
Real Estate Composite	0.22	22.46	15.04	11.85	11.00	8.68	Jan-02	\$1,426m
NFI-ODCE Value Weight	-5.17	6.55	8.97	7.72	7.57	7.26		
Variance	5.39	15.91	6.07	4.13	3.43	1.42		
Private Equity								
Private Equity Composite	-0.88	0.52	23.87	18.77	16.85	11.22	Jan-02	\$933m
Private Equity Benchmark**	7.97	-15.36	11.05	12.57	13.87	9.05		
Variance	-8.85	15.88	12.82	6.20	2.98	2.17		

*The Infrastructure Benchmark is 8% Annualized Return through 9/30/17 and FTSE Developed Core Infrastructure 50/50 (Net) thereafter.

**The Private Equity Benchmark is Russell 3000 through 9/30/17, thereafter Russell 3000+3%.

Note: Private market investments shown above are typically reported on a one quarter lag. Private Equity returns are, at times, reported on a longer lag. Comments on Infrastructure, REITS and Real Estate are covered in the quarterly Real Estate Report. Private Equity is discussed in the quarterly Private Equity Report.

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Manager Watch List

MANAGER/STRATEGY	REASON	DATE PLACED ON WATCH LIST	LAST DUE DILIGENCE MEETING	ACTIONS TAKEN	POLICY/RECOMMENDED ACTIONS	AUM as of 12/31/2022	Current Quarter Watch List Score	Previous Quarter Watch List Score
DFA - International Small Cap	Performance Reasons	August 2019	March 2023	Monitor	Monitor	\$158 mil.	0.5	0.7
Ariel - International Equity	Personnel Turnover/Performance Reasons	July 2020/August 2020	February 2023	Monitor	Monitor	\$70 mil.	0.8	0.8
Lazard - International Equity	Performance Reasons/Personnel Turnover	March 2021	February 2023	Monitor	Monitor	\$527 mil.	0.8	0.8
State Street Global Advisors - Passive Bond	Brokerage	April 2022	March 2023	Monitor	Monitor	\$398 mil.	N/A	N/A
Leading Edge - International Equity	Performance Reasons	September 2022	February 2023	Monitor	Monitor	\$121 mil.	0.7	0.7
Strategic Global Advisors - International Equity	Performance Reasons	March 2021	February 2023	Monitor	Monitor	\$69 mil.	0.8	0.8
Attucks	Personnel Turnover	March 2023	February 2023	Monitor	Monitor	\$230 mil.	N/A	N/A
William Blair - International Small Cap	Performance Reasons	March 2023	January 2023	Monitor	Monitor	\$190 mil.	0.7	0.7

Policy/Recommended Actions Legend

Remove = Policy action taken due to IPS guidelines. Remove manager from the watch list as performance improves.

Termination = Recommended action for the Board

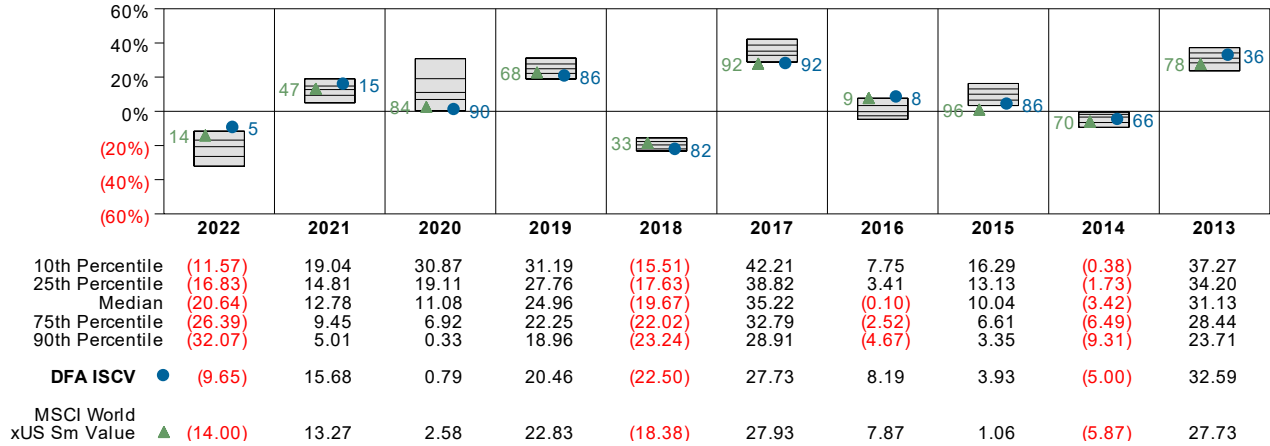
Monitor = Recommended action for the Board

Search = Board authorized a manager search

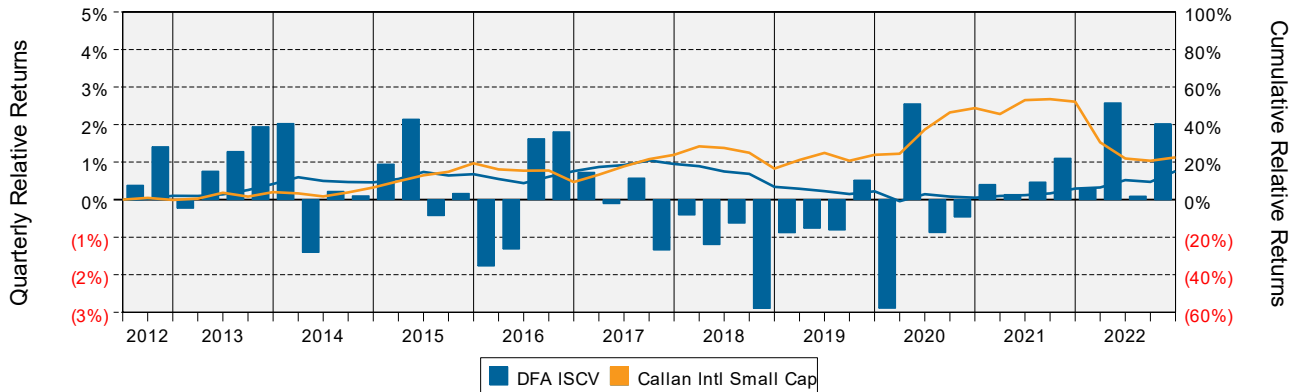
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Manager Watch List: DFA

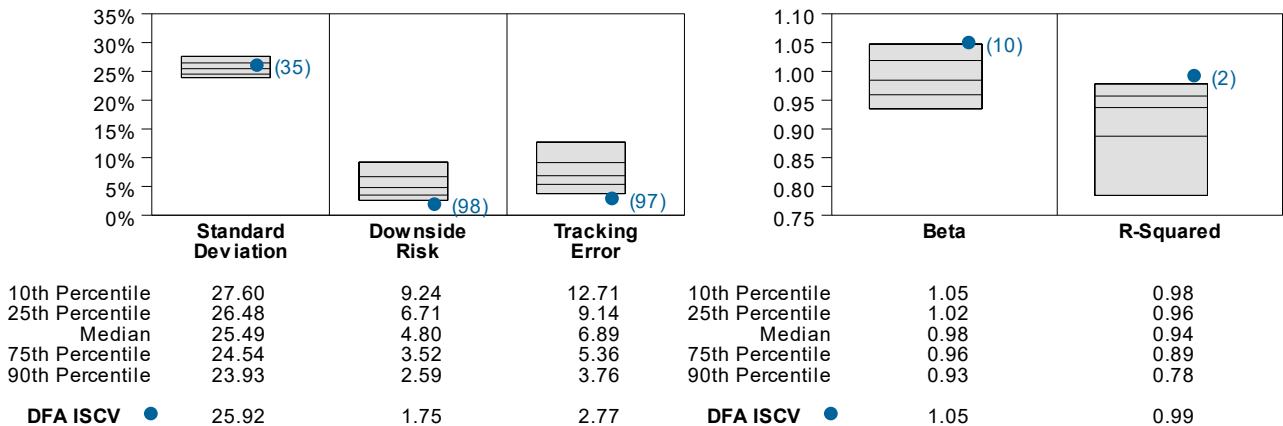
Performance vs Callan International Small Cap (Gross)



Cumulative and Quarterly Relative Returns vs MSCI World xUS Sm Value



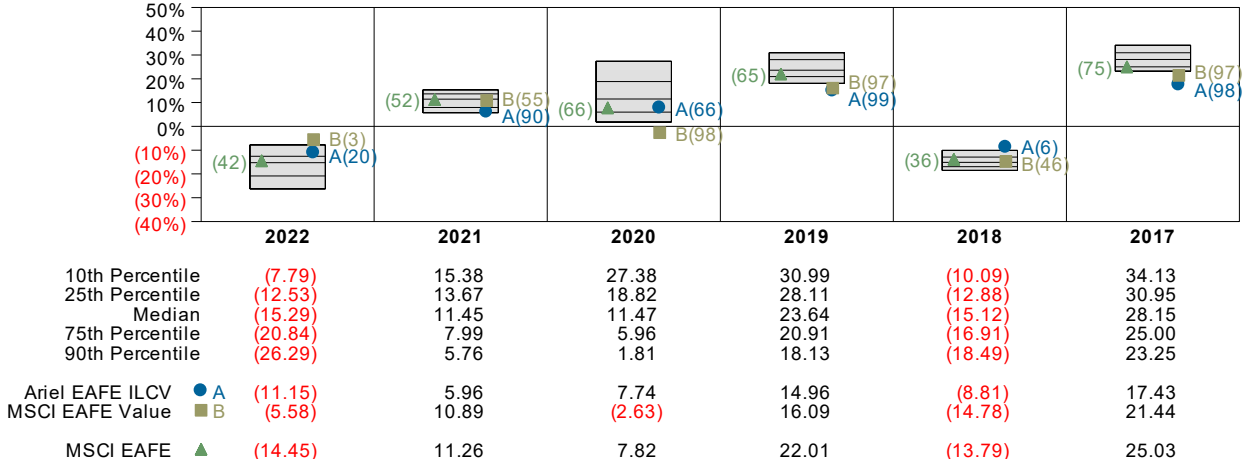
**Risk Statistics Rankings vs MSCI World xUS Small Value (Net)
Rankings Against Callan International Small Cap (Gross)
Five Years Ended December 31, 2022**



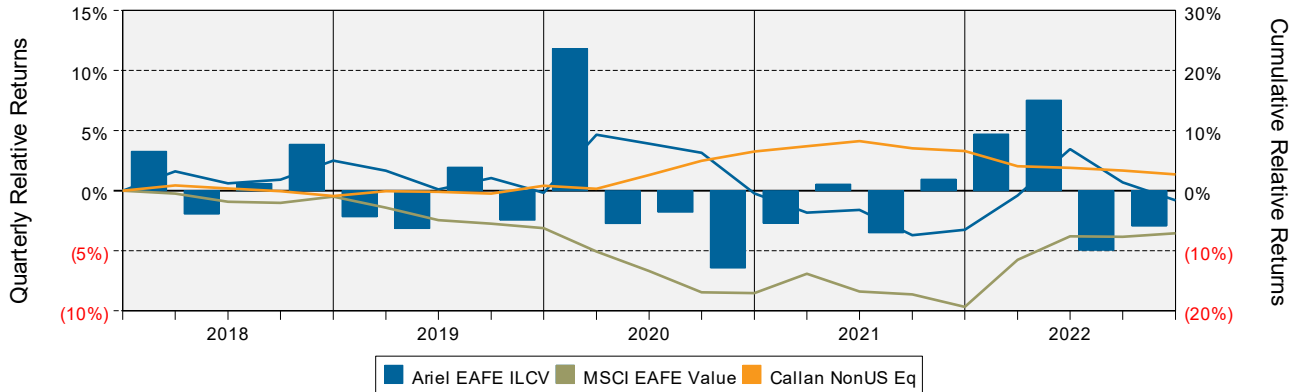
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Manager Watch List: Ariel

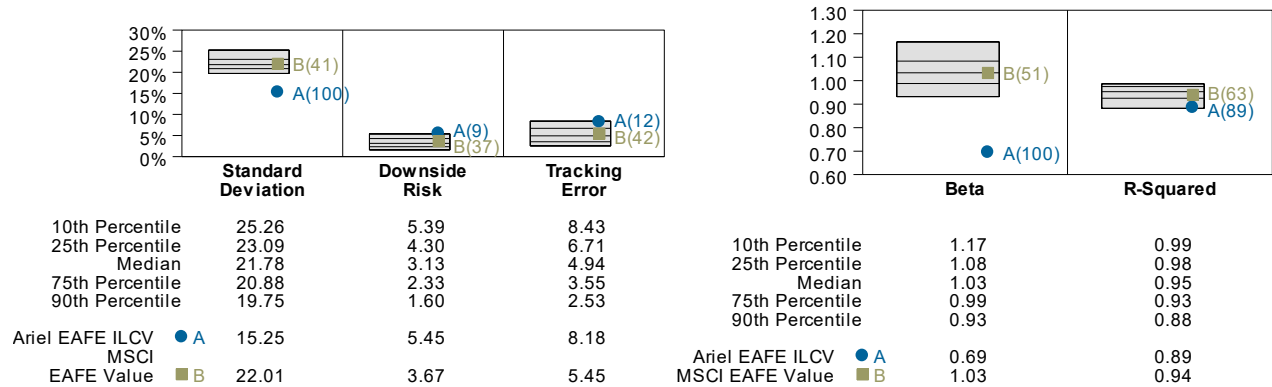
Performance vs Callan Non-US Equity (Gross)



Cumulative and Quarterly Relative Returns vs MSCI EAFE



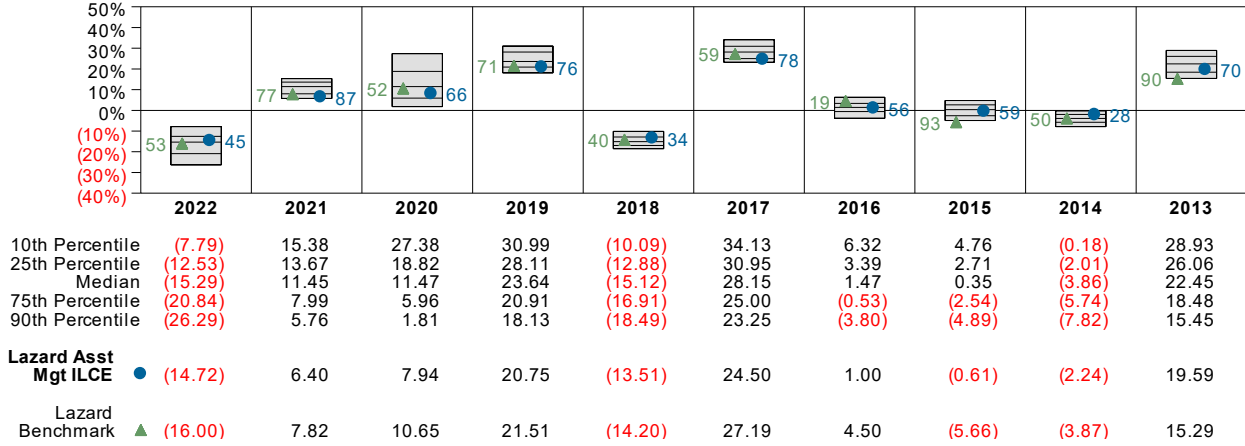
**Risk Statistics Rankings vs MSCI EAFE (Net)
Rankings Against Callan Non-US Equity (Gross)
Five Years Ended December 31, 2022**



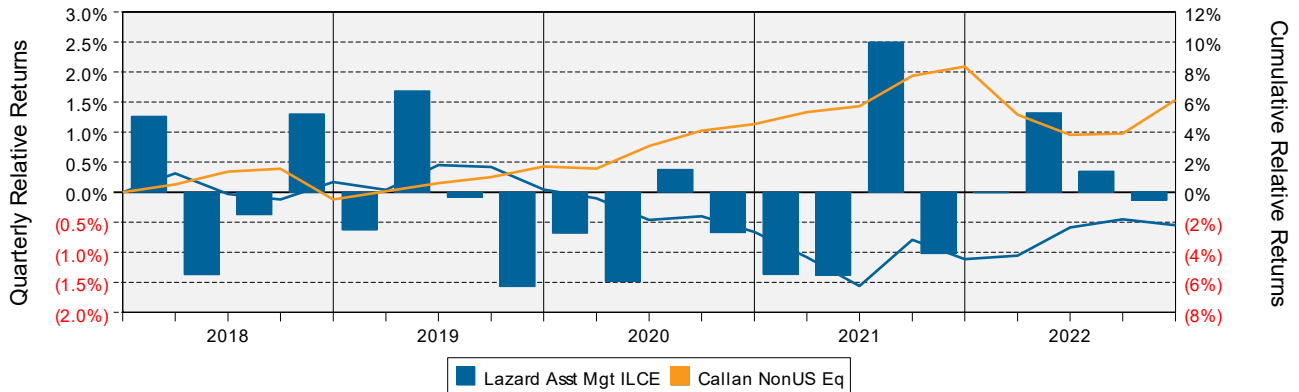
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Manager Watch List: Lazard

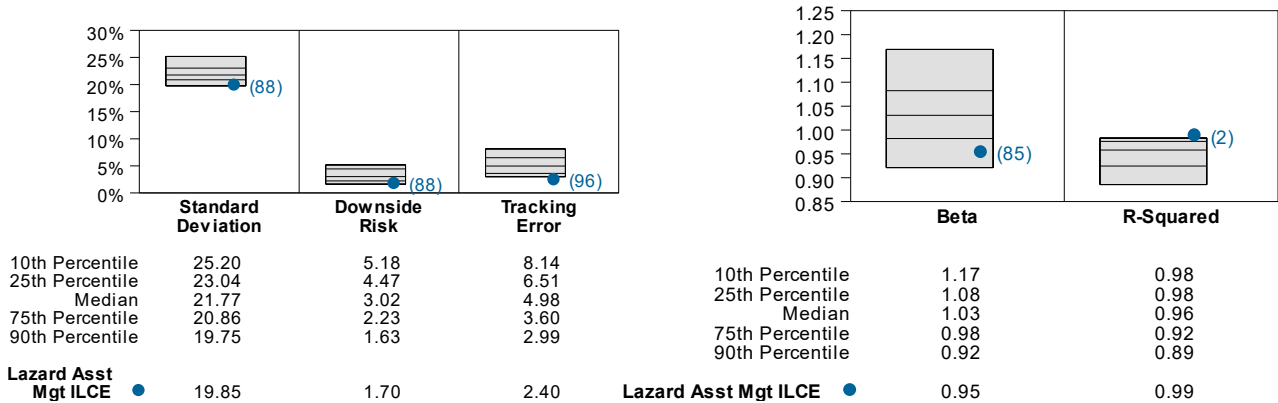
Performance vs Callan Non-US Equity (Gross)



Cumulative and Quarterly Relative Returns vs Lazard Benchmark



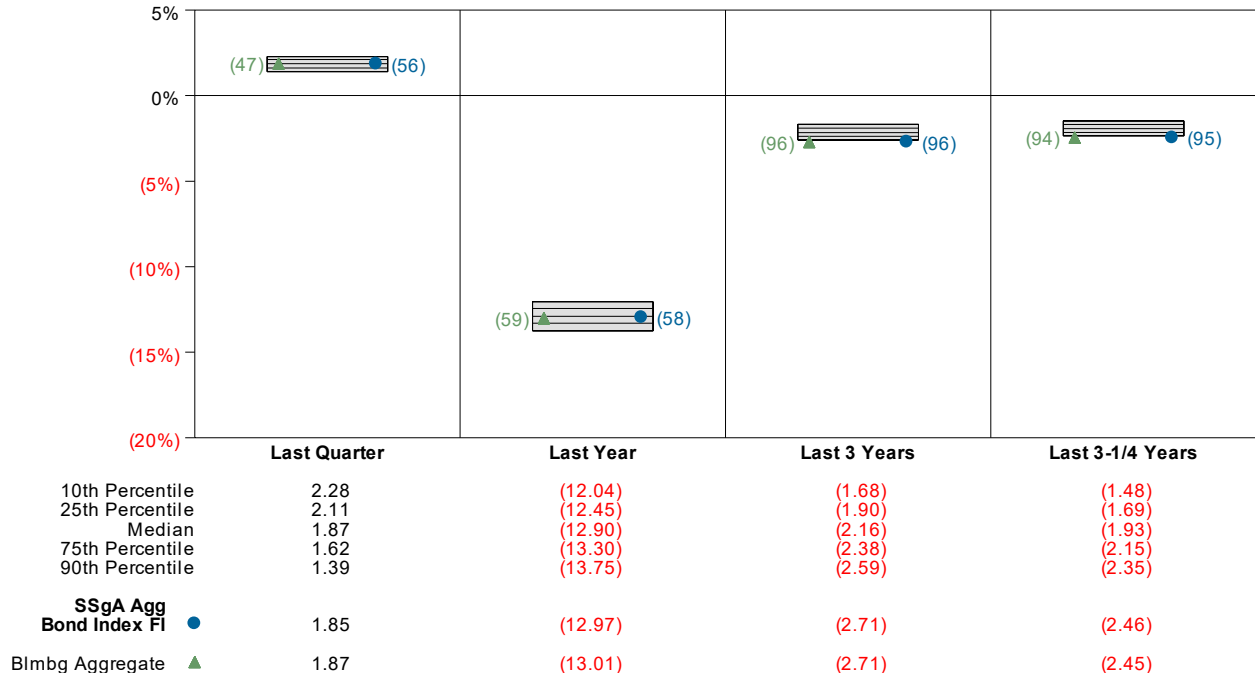
Risk Statistics Rankings vs Lazard Benchmark Rankings Against Callan Non-US Equity (Gross) Five Years Ended December 31, 2022



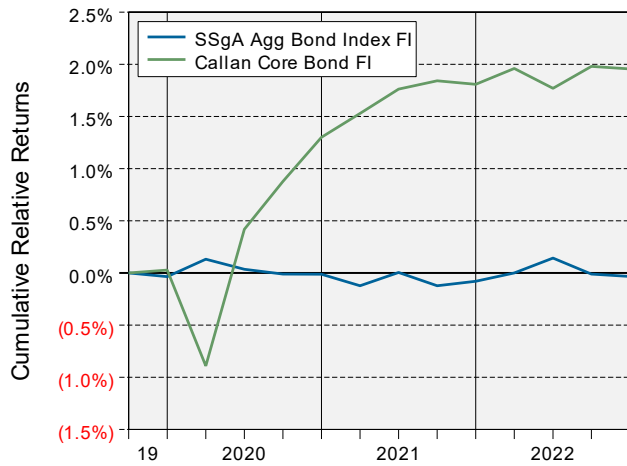
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Manager Watch List: State Street Global Advisors

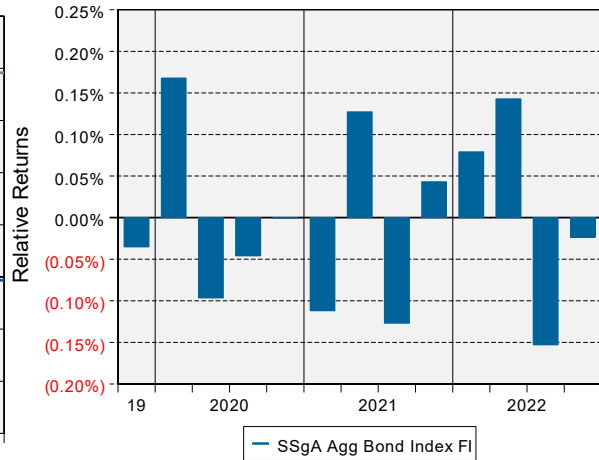
Performance vs Callan Core Bond Fixed Income (Gross)



Cumulative Returns vs Blmbg Aggregate



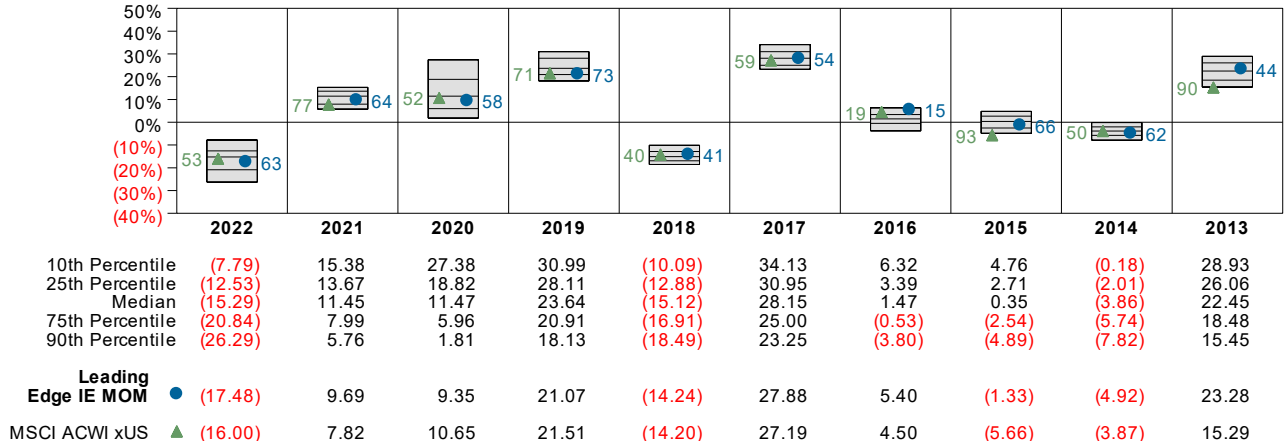
Relative Return vs Blmbg Aggregate



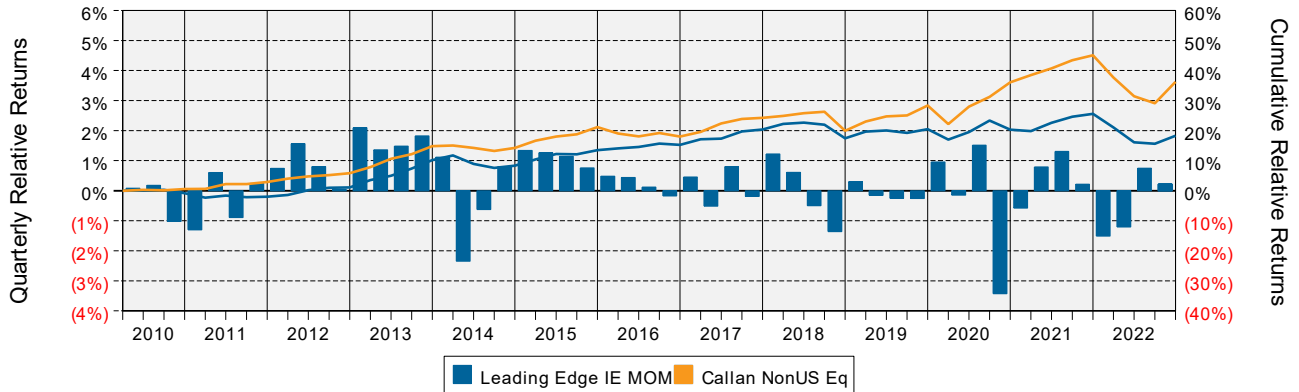
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Manager Watch List: Leading Edge

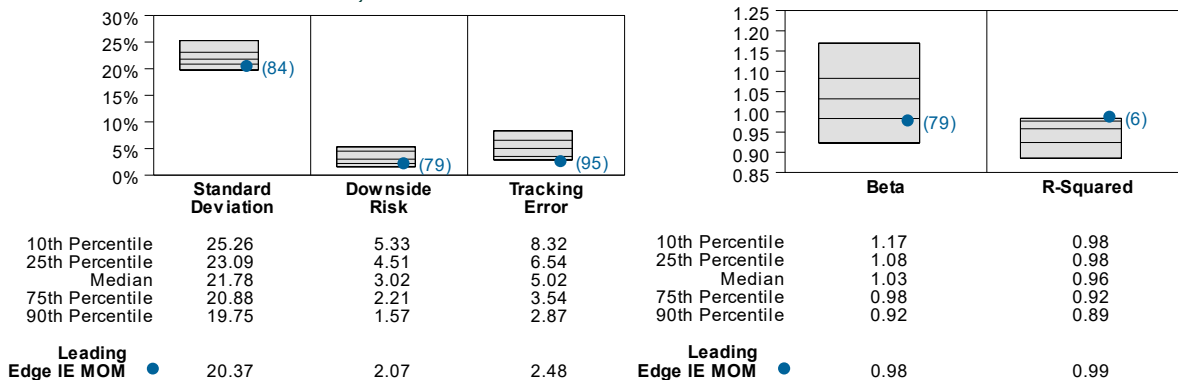
Performance vs Callan Non-US Equity (Gross)



Cumulative and Quarterly Relative Returns vs MSCI ACWI xUS



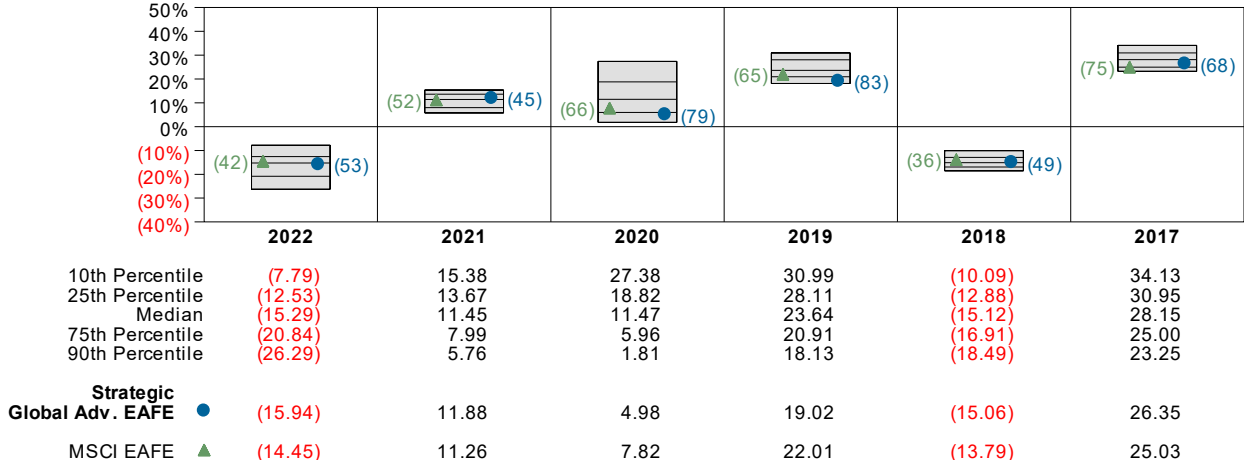
**Risk Statistics Rankings vs MSCI ACWI xUS (Net)
Rankings Against Callan Non-US Equity (Gross)
Five Years Ended December 31, 2022**



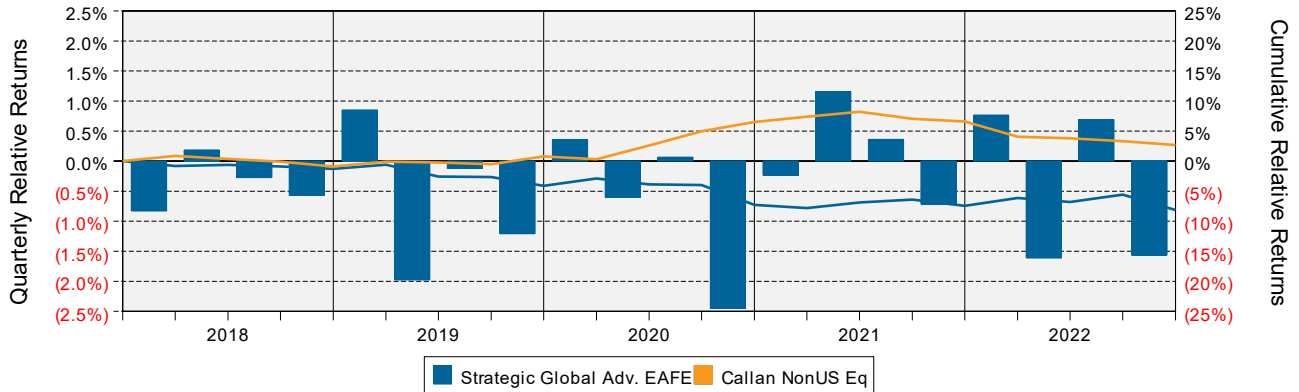
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Manager Watch List: Strategic Global Advisors

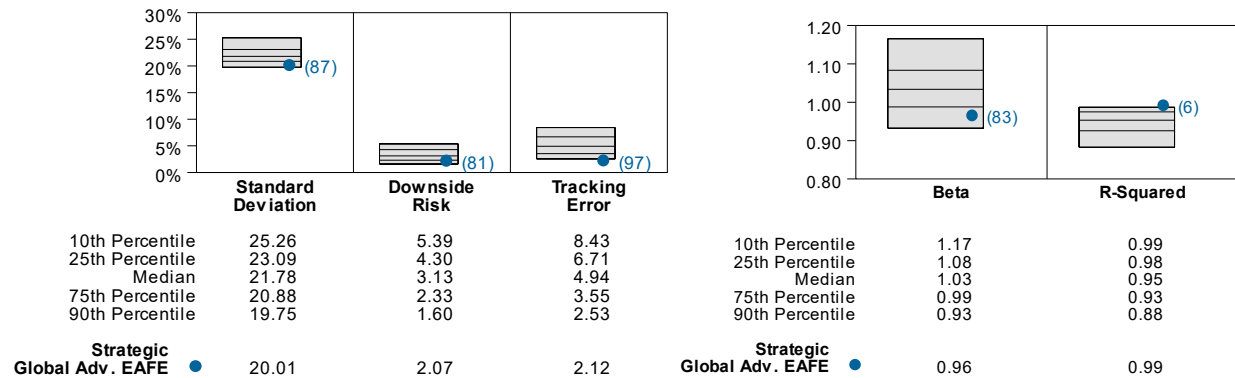
Performance vs Callan Non-US Equity (Gross)



Cumulative and Quarterly Relative Returns vs MSCI EAFE



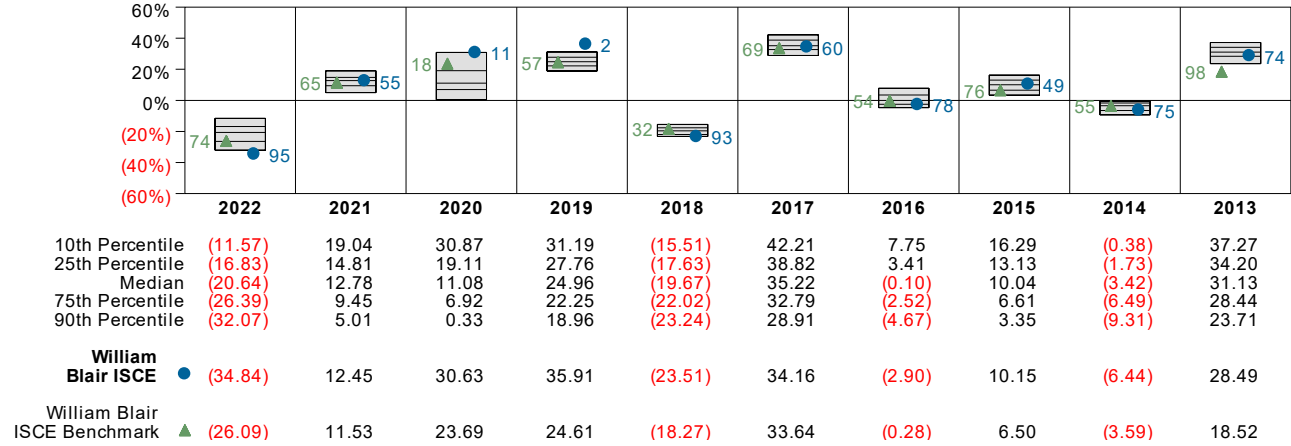
**Risk Statistics Rankings vs MSCI EAFE (Net)
Rankings Against Callan Non-US Equity (Gross)
Five Years Ended December 31, 2022**



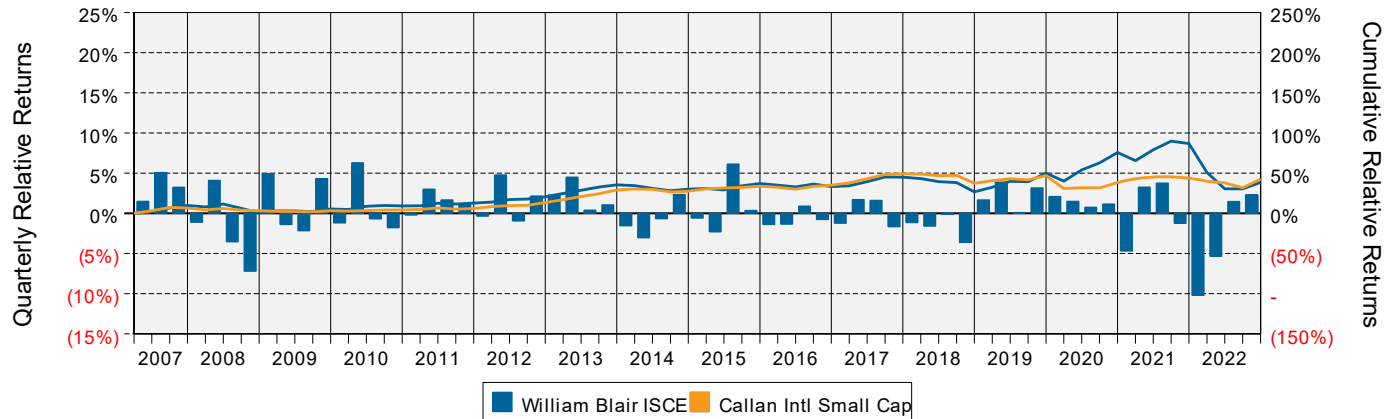
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Manager Watch List: William Blair

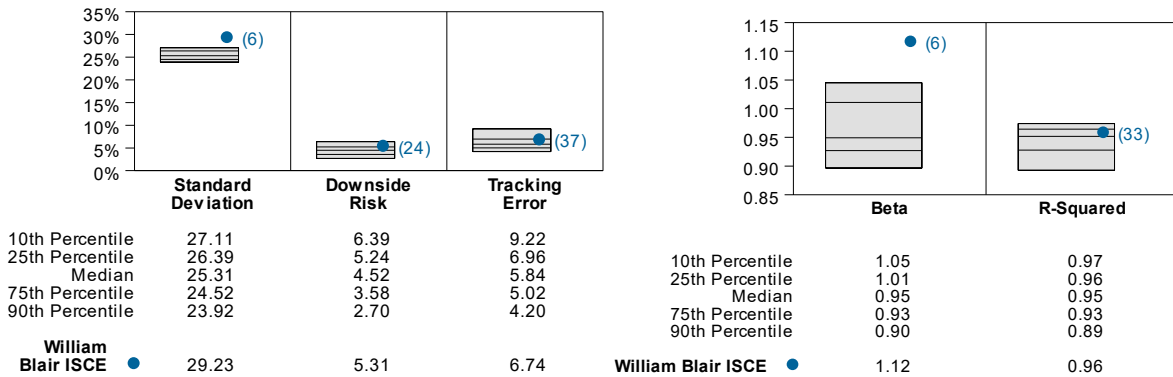
Performance vs Callan International Small Cap (Gross)



Cumulative and Quarterly Relative Returns vs William Blair ISCE Benchmark



**Risk Statistics Rankings vs William Blair ISCE Benchmark
Rankings Against Callan International Small Cap (Gross)
Five Years Ended December 31, 2022**



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General Market and Economic Conditions

The fourth quarter provided a welcome rebound across many markets, spurred by signs that inflation was moderating. The MSCI ACWI Index rose nearly 10% for the quarter, with gains broad-based across countries. Global bond markets were mixed; the Bloomberg Global Aggregate Bond Index gained 4.6% (unhedged), largely due to U.S. dollar depreciation, with the hedged version up only 1.0%. The U.S. dollar lost some of its gusto in 4Q, retreating from its 20-year high and bolstering returns for unhedged investments overseas. The greenback lost nearly 8% vs. a basket of developed market currencies (DXY).

As we enter 2023, uncertainty remains around the degree to which the Fed can navigate a “soft landing” while combatting inflation. Outside of the U.S., a war that shows no signs of ending and China’s path forward as it moves away from its “zero-COVID” policies pose challenges. However, there are a few notable silver linings and reasons for optimism that we choose to highlight to start the new year. Most importantly, valuations in both stock and bond markets have improved. Inflation, while still high, has shown signs of moderating. The labor market remains resilient despite aggressive rate hikes. And China’s reopening, albeit rocky, may lead to an economic rebound and contribute to global growth in 2023.

Given the sharp sell-off in stocks, valuations are more reasonable. The forward P/E ratio for the S&P 500 Index was 16.65x as of year-end vs. a 16.82x average over the past 25 years, according to data from JP Morgan. For fixed income investors and savers, the sharp rise in interest rates provides immediate benefits in the form of higher income and much-improved forward-looking returns. Callan’s 10-year projection for core U.S. fixed income returns more than doubled from the end of 2021, from 1.75% to 4.25%.

Headline CPI was 7.1% (ex food and energy: +6.0%) in November, off its June peak of 9.1%; the Personal Consumption Expenditures (PCE) Index rose 5.5% (Core PCE: +4.7%). These year-over-year (YOY) figures remain well above the Federal Reserve’s long-run inflation rate objective of 2%, but most components of the CPI registered smaller gains or even price declines in the most recent reading. Energy and core goods (especially used car prices) fell in November while food prices (at and away from home) and shelter costs continued to rise. The average price of unleaded gas declined from a June high of \$5.00/gallon to about \$3.20/gallon at year-end, according to AAA. The lagged impact of higher rates, a moderation in supply chain-related price increases, and falling home prices suggest that inflation has peaked. On the flip side, higher wages and a tight labor market, uncertainty around energy prices, and increased demand from China (especially for commodities) pose a threat to inflation’s downward trajectory.

The Federal Reserve raised its target range for the Fed Funds rate by 50 bps to 4.25% - 4.50% at its December meeting, the highest since 2007. The 2022 cumulative rate hike totaled 425 bps. The Fed has been explicit in its intent to aggressively fight inflation and is willing to see the economy slow and unemployment rise to bring it down. The median Fed Funds rate projection from the Fed for year-end 2023 is now 5.1%, up 50 bps from the September projections. The median expectation for 2023 unemployment also rose a bit to 4.6% (from 4.4%) while the projection for real GDP growth fell sharply to 0.5% from 1.2%. A mid-December Bloomberg survey of 38 economists revealed that 70% think that there will be a recession next year with growth averaging only 0.3% for the year. Notably, markets and the Fed both expect inflation to fall over longer periods; the “longer-run” median projection from the Fed for the Core PCE Index is 2.0% and the five-year breakeven inflation rate (the difference between nominal and real five-year Treasury yields) was 2.3% as of year-end. Real GDP in 3Q22 was +3.2% (annualized), up from the -0.6% rate in 2Q. The Conference Board forecast calls for 0% real growth in 2023, recovering

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to 1.7% in 2024.

The labor market remained strong despite well-publicized layoffs across the tech industry. Unemployment held steady at 3.7% and payroll growth, while moderating in 4Q, remained robust. Just over 260,000 jobs (non-farm payrolls) were added in November, above expectations, and while down from higher figures earlier in the year it is well above the pre-pandemic average of 150,000–200,000. Further, the ratio of job openings to job seekers remained elevated. The Job Openings and Labor Turnover Survey (JOLTS) for November showed that open positions outnumbered available workers by a ratio of 1.7 to 1, down only slightly from October, and higher than expected. Continued labor shortages, however, do pose a risk as higher wages filter through to inflation. Average hourly earnings for nonfarm payrolls were up 5.1% in November YOY.

While rents continued to rise, rising mortgage rates impacted home sales. Data from Freddie Mac show that 30-year mortgage rates dipped slightly from 7.1% in November to 6.4% at year-end, but they are markedly higher than one year ago (3.1%). According to the National Association of Realtors, existing home sales dropped nearly 8% in November (35% YOY), with all regions reporting both monthly and yearly declines. Affordability remains low, due both to relatively high home prices and higher mortgage rates. The median house price, which hit a record high of \$413,800 in June, fell to \$370,700 in November but remained above the \$358,200 price tag one year ago.

The battle to bring inflation down is not limited to the United States. Shortly after the Federal Reserve's 50 bp rate hike in mid-December, the European Central Bank (ECB), the Bank of England, and the Swiss National Bank followed suit with 50 bp rate increases of their own. As in the U.S., policymakers recognize that slower economic growth will likely be an outcome; the ECB lowered its forecast for growth for 2023 to 0.5%, down from a previous forecast of 0.9%. Economists in the U.K. expect the country to face one of the worst recessions among the G7 countries, and Kristalina Georgieva, International Monetary Fund director, recently warned that half of the European Union may experience a recession next year.

Japan surprised markets in December with an unexpected change to its monetary policy around yield curve management. The Bank of Japan (BOJ) raised the band for the 10-year bond yield to fluctuate 50 bps around 0%, more than the previous 25 bps band. Following the announcement, the bond yield rose sharply, briefly touching 0.46%, and the yen strengthened 3% vs. the U.S. dollar. While not specifically a tightening move, it was unexpected and perceived by the markets to be a first step. Core (ex-food) inflation in November exceeded the Bank's 2% policy target and hit a 40-year high of 3.7%. The yen lost almost 13% vs. the U.S. dollar in 2022 and has been a contributor to inflation.

While many countries are facing the prospects of a recession in 2023, China could be poised for a recovery. The country is opening its borders to foreigners on Jan. 8, 2023, after being closed for more than 1,000 days. Though China is currently facing a surge in COVID cases, the lifting of its zero-COVID policy has important economic ramifications for the rest of the world. While GDP growth was likely well below the official target (+5.5%) in 2022, this policy shift is expected to boost consumer spending and economic growth, which in turn should help global growth as demand for commodities, global goods, and services rises. China uses a large portion of the world's oil and various metals, and the downside to China's recovery is that escalating demand from the country could further inflationary pressures around the globe.

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Fourth Quarter 2022 Market Performance

U.S. stock indices posted positive returns in 4Q as investor sentiment improved, but the YTD results remained dismal with most indices posting double-digit declines. The S&P 500 Index rose 7.6% for the quarter, lowering its YTD loss to 18.1%. Returns were quite mixed across sectors with Energy (+22.8%) being the best and Consumer Discretionary (-10.2%) faring the worst. Value stocks trounced growth for the quarter (Russell 1000 Value: +12.4%; Russell 1000 Growth: +2.2%) and the year (Russell 1000 Value: -7.5%; Russell 1000 Growth: -29.1%). In 4Q, the Growth Index was hurt by relative underweights in Health Care, Financials, and Energy as well as significant underperformance from Tesla (-54%) and Amazon (-26%). Looking back three years, growth is only modestly ahead of value (Russell 1000 Value: +6.0%; Russell 1000 Growth: +7.8%). Small cap stocks exhibited the same pattern in 4Q (Russell 2000 Value: +8.4%; Russell 2000 Growth: +4.1%) but value's full year margin is smaller in the small cap space (Russell 2000 Value: -14.5%; Russell 2000 Growth: -26.4%).

Global ex-U.S. markets also participated in the 4Q rally, and currency appreciation vs. the U.S. dollar further bolstered returns. The MSCI ACWI ex USA Index gained 14.3% (Local: +7.8%), reducing its YTD loss to 16.0% (Local: -9.6%). Across developed market countries, gains were broad-based and value outpaced growth, but by a smaller margin than in the U.S. (MSCI ACWI ex USA Value: +15.7%; MSCI ACWI ex USA Growth: +12.9%). Unlike in the U.S., all sectors of the ACWI ex USA Index delivered a positive return in 4Q of 10% or more.

Emerging markets (MSCI Emerging Markets: +9.7%; Local: +6.6%) also rebounded in 4Q, but returns were mixed across countries. While many countries were up double-digits, India (+2.0%) and Brazil (+2.4%) weighed on broad market returns. China (MSCI China: +13.5%) outperformed. Quarterly returns were also mixed across regions: Latin America (+5.7%), Emerging Europe (+43.1%), and Emerging Asia (+10.8%). The 2022 return for the MSCI EM Index was -20.1%.

U.S. fixed income experienced its worst year—ever—in 2022, by a wide margin. The Bloomberg US Aggregate Bond Index sank 13.0%; the next worst calendar year was 1994 when the Aggregate fell 2.9%. The silver lining lies in the 4.68% yield-to-worst for the Index, up from 1.75% at the beginning of the year. The yield curve remained inverted at year-end; the 10-year Treasury yield was 3.88% and the 2-year yield was 4.41%. The inversion reflects investor expectations for the economy to slow and an eventual need for the Fed to lower rates. The fourth quarter brought some relief to bond investors as longer rates fell modestly and most “spread” sectors outperformed Treasuries. The Aggregate gained 1.9%. High yield corporates (Bloomberg High Yield Index: +4.2%) were star performers, but this Index was down 11.2% for the year.

While rates across developed markets rose broadly in 2022, changes were mixed in 4Q. Rates fell in the U.K. but rose across most of Europe and in Japan. The Bloomberg Global Aggregate ex USD soared 6.8% (hedged: +0.2%) due largely to weakness in the U.S. dollar. Still, the YTD differential for hedged and unhedged investors is nearly 9% (unhedged: -18.7%; hedged: -9.8%). Emerging markets also had a good quarter with the JPM EMBI Global Diversified up 8.1% and the local currency JPM GBI-EM Global Diversified up 8.5%. For the year, the indices were down 17.8% and 11.7%, respectively.

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Appendix

Appendix - 12/31/22

	Watch List Criteria: Rolling three year returns rank below median (Gross of Fees). If the above statement is true, then column reads "Yes". If not, then "No".		Watch List Criteria: Rolling three year returns are more than: 1. 200 basis points below the market index (Net of Fees) for equity managers. 2. 50 basis points below the market index (Net of Fees) for core fixed income managers. 3. 100 basis points below the market index (Net of Fees) for core plus fixed income managers. If the above statements are true, then column reads "Yes". If not, then "No".		Watch List Criteria: Rolling seven year returns rank below median (Gross of Fees). If the above statement is true, then column reads "Yes". If not, then "No".		Watch List Criteria: Rolling seven year returns are below the return of the index (Net of Fees). If the above statement is true, then column reads "Yes". If not, then "No".		Watch List Criteria: Five year information ratio is negative and ranks below median. If the above statement is true, then column reads "Yes". If not, then "No".		Watch List Criteria: Five year up market capture is below 90% and ranks below median. If the above statement is true, then column reads "Yes". If not, then "No".		Watch List Criteria: Five year down market capture is above 90% and ranks below median. If the above statement is true, then column reads "Yes". If not, then "No".		Weighted Averages	
	09/30/2022	12/31/2022	09/30/2022	12/31/2022	09/30/2022	12/31/2022	09/30/2022	12/31/2022	09/30/2022	12/31/2022	09/30/2022	12/31/2022	09/30/2022	12/31/2022	09/30/2022	12/31/2022
Manager																
<i>Small Cap Growth Equity</i>																
Conestoga**	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	0.10	0.10
<i>Small Cap Value Equity</i>																
Phocas*	No	Yes	No	No	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes	0.50	0.60
<i>Small Cap Equity</i>																
NTGI Structured Small Cap	Yes	Yes	No	No	Yes	Yes	No	No	No	No	No	No	No	No	0.30	0.30
<i>All Cap Growth Equity</i>																
Zevenbergen	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes	0.60	0.70
<i>All Cap Value Equity</i>																
Channing	No	No	No	No	Yes	No	No	No	No	No	No	No	Yes	Yes	0.30	0.10
<i>International Equity</i>																
EARNEST Partners	No	No	No	No	No	No	No	No	No	No	No	No	No	No	0.00	0.00
Lazard	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	0.80	0.80
Morgan Stanley	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	No	No	No	No	No	0.50	0.50
Leading Edge	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	0.70	0.70
William Blair	No	No	No	No	Yes	No	No	No	No	No	No	No	Yes	Yes	0.30	0.10
Ariel*	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	0.80	0.80
Strategic Global*	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	0.80	0.80
<i>International Small Cap</i>																
William Blair	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	Yes	Yes	0.70	0.70
DFA	No	No	No	No	Yes	No	Yes	Yes	Yes	Yes	No	No	Yes	Yes	0.70	0.50
<i>Emerging Market Equity</i>																
EARNEST Partners	No	No	No	No	No	No	No	No	No	No	No	No	No	No	0.00	0.00
<i>Active Core Fixed Income</i>																
Ramirez***	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	0.10	0.10
Pugh	Yes	Yes	No	No	Yes	Yes	No	No	No	No	No	No	Yes	Yes	0.40	0.40
Garcia Hamilton	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No	0.20	0.20
Wellington**	Yes	Yes	No	No	Yes	Yes	No	No	No	No	No	No	Yes	Yes	0.00	0.00
<i>Active Core Plus Fixed Income</i>																
LM Capital	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No	0.20	0.20
<i>Active Opportunistic Fixed Income</i>																
WAMCO	Yes	Yes	No	Yes	Yes	Yes	No	No	No	No	No	No	Yes	Yes	0.40	0.50

*Manager does not yet have 7 years of portfolio data. CTPF portfolio data has been linked with a representative historical manager composite to populate columns requiring at least 7 years of data in the analysis above.

**Manager does not yet have 5 years of portfolio data. CTPF portfolio data has been linked with a representative historical manager composite to populate all columns requiring at least 5 years of data in the analysis above.

***Manager does not yet have 3 years of portfolio data. CTPF portfolio data has been linked with a representative historical manager composite to populate all columns in the analysis above.