

Callan



Chicago Teachers' Pension Fund

Executive Summary

September 30, 2018

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**Public School Teachers' Pension and Retirement Fund of Chicago
Performance Evaluation Executive Summary
Third Quarter 2018**

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Total Fund Commentary

The Fund was valued at \$11.0 billion at the end of the third quarter, representing an increase of \$202.5 million from June 30, 2018. Investment gains of \$258.7 million were offset by negative net cash outflow activity of \$56.2 million during the quarter. Overall, the portfolio's asset allocation was close to its strategic targets at quarter-end, reflecting a slight underweight to private equity, real estate and fixed income, and a slight overweight to domestic equity.

We experienced a technical market correction in February with the S&P 500 Index down 10.1% as well as a drawdown of more than 7% in March, but the memory of those experiences vanished given the S&P 500's smooth, steady climb over 2018 (up 12% in the first three quarters). Economic reports came in mixed for most economies; the U.S. economy has been firing on all cylinders, with the labor market, investments, and output all showing solid gains. U.S. GDP grew 3.5% in the third quarter and 4.2% in the second. The unemployment rate dropped to 3.7% in September, the lowest since 2000. Wages continue to inch up, with average hourly earnings growth rising from 2% toward 3% at the end of the quarter. While potentially inflationary and certainly a cost to business, stronger wage growth kept consumer spending robust, and boosted consumer (and business) confidence. Within the euro zone, investors have been trying to balance the general health of the economy, lower unemployment figures, and stable inflation with headwinds such as ascendant populism (e.g., Italy), declining net export and trade activity, and continued negotiations with regards to Brexit. As much as there is a great deal of positive news to go around as the current economic expansion grinds on, nearly all global economies face headwinds of some kind in the near term.

The Fund had a net return of 2.35% over the quarter (2.41% gross of fees), underperforming the Policy Target by 48 basis points. The Fund ranked in the third quartile among peers over the third quarter, but finished in the top 50% over the trailing three-, five-, seven-, and ten-year periods. Performance relative to the Total Fund Benchmark was competitive over the long-term.

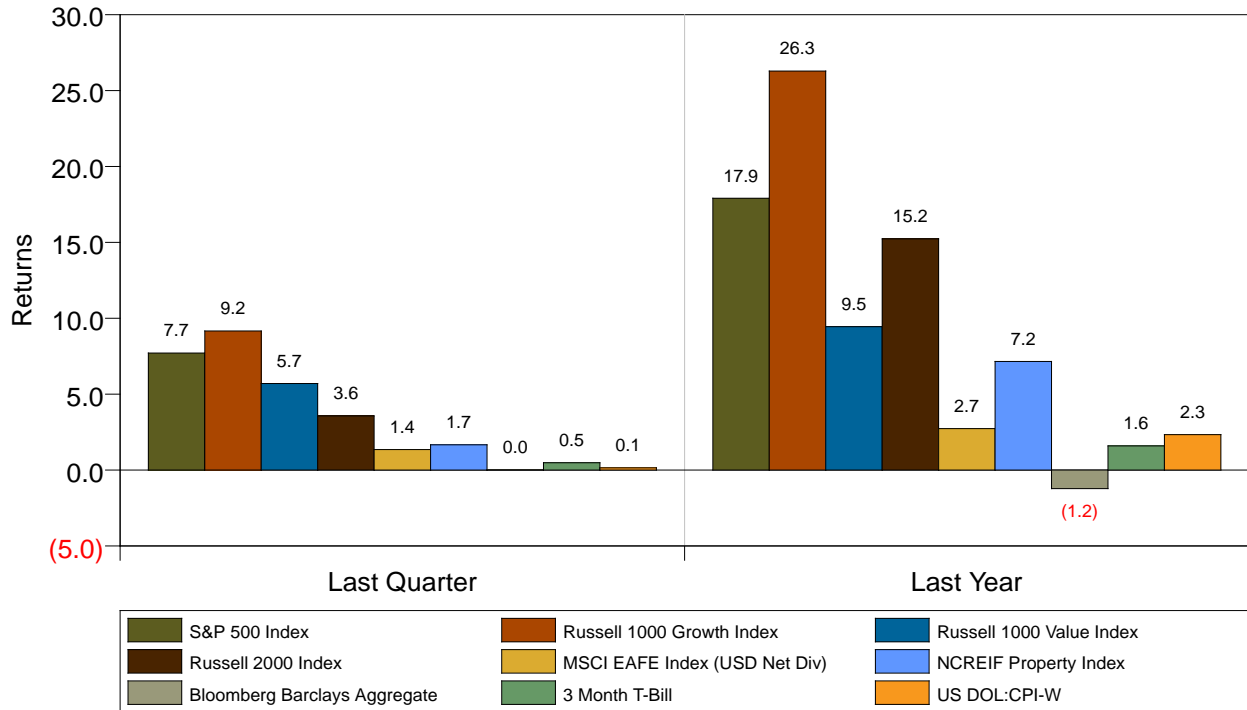
Over the third quarter, domestic stocks outperformed international stocks and developed markets outpaced emerging markets. Large cap stocks outperformed their small cap counterparts due partly to accelerated corporate earnings growth and strong performance from the FAANG's. Growth continued to outperform value across the capitalization spectrum. The divergence between growth and value stocks currently represents the widest margin in 15 years. In this environment, manager-specific performance was mixed relative to benchmarks. The fixed income portfolio was the largest contributor to relative third quarter Total Fund returns while the public equity portfolio posted less attractive results.

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Select Market Returns

Returns Ending September 30, 2018



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QUARTERLY REVIEW

- **Third Quarter, 2018 Investment Performance Update:**
 - **Performance:** For the third quarter, the Fund underperformed the Total Fund Benchmark by 48 basis points, net of fees, ranking in the 59th percentile of peers. Longer-term performance continues to be favorable on an absolute and relative basis.

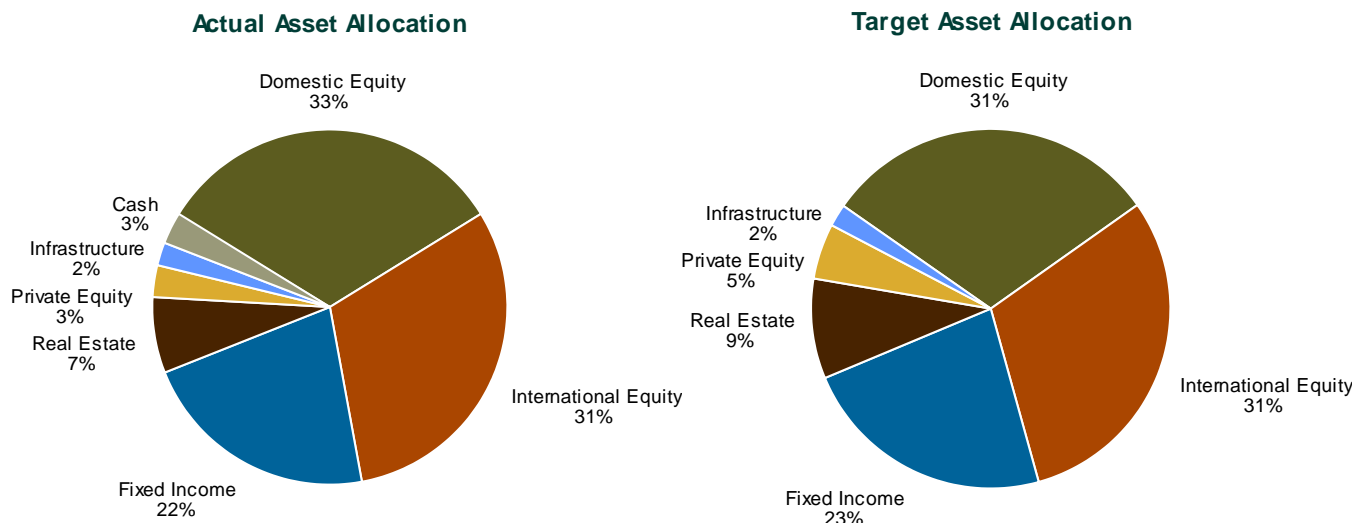
- **Watch Status Report:** The following managers are on the Watch List:
 - Channing Capital: Included on the Watch List due to personnel changes.
 - Ariel: Included on the watch list due to organizational issues.

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Asset Allocation

The Fund was valued at \$11.0 billion at the end of the third quarter, representing an increase of \$202.5 million from June 30, 2018. Investment gains of \$258.7 million were offset by negative net cash outflow activity of \$56.2 million during the quarter. Overall, the portfolio's asset allocation was close to its strategic targets at quarter-end, reflecting a slight underweight to private equity, real estate and fixed income, and a slight overweight to domestic equity.



Asset Class	\$Millions Actual	Weight Actual	Target	Percent Difference	\$Millions Difference
Domestic Equity	3,576	32.5%	30.5%	2.0%	221
International Equity	3,399	30.9%	30.5%	0.4%	44
Fixed Income	2,409	21.9%	23.0%	(1.1%)	(122)
Real Estate	754	6.9%	9.0%	(2.1%)	(236)
Private Equity	317	2.9%	5.0%	(2.1%)	(233)
Infrastructure	230	2.1%	2.0%	0.1%	10
Cash	317	2.9%	0.0%	2.9%	317
Total	11,001	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 September 30, 2018, with the distribution as of June 30, 2018. 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.

	September 30, 2018		Net New Inv.	Inv. Return	June 30, 2018	
	Market Value	Weight			Market Value	Weight
DOMESTIC EQUITY	\$3,576,320,020	32.51%	\$39,445,213	\$222,514,143	\$3,314,360,665	30.69%
Large Cap	\$3,095,385,554	28.14%	\$(15,454,255)	\$206,641,116	\$2,904,198,694	26.90%
Large Cap Core Index	\$2,074,516,487	18.86%	\$(10,750,993)	\$143,937,835	\$1,941,329,645	17.98%
NTGI 500 Index LCC	277,430,467	2.52%	(1,431,328)	19,918,264	258,943,531	2.40%
Rhumbline Rsl 1000 LCC	1,797,086,020	16.34%	(9,319,666)	124,019,571	1,682,386,114	15.58%
Large Cap Core Equity	\$-0	(0.00%)	\$(618,591)	\$1,118	\$617,474	0.01%
Ivy LCC	-0	(0.00%)	(618,591)	1,118	617,474	0.01%
Large Cap Growth Equity	\$547,651,736	4.98%	\$(1,419,154)	\$40,009,902	\$509,060,989	4.71%
Rhumbline Rsl 1000 LCG	358,265,985	3.26%	(1,211,520)	30,025,428	329,452,078	3.05%
Zevenbergen US ACE	189,385,751	1.72%	(207,634)	9,984,474	179,608,911	1.66%
Large Cap Value Equity	\$473,217,332	4.30%	\$(2,665,517)	\$22,692,261	\$453,190,587	4.20%
Channing US ACE	147,948,653	1.34%	(639,879)	5,549,833	143,038,699	1.32%
BMO Global-Harris LCV	325,268,679	2.96%	(2,025,637)	17,142,428	310,151,888	2.87%
Small Cap Equity	\$407,251,356	3.70%	\$55,289,864	\$12,529,803	\$339,431,689	3.14%
NTGI Structured SCC	186,794,462	1.70%	(715,891)	6,809,429	180,700,923	1.67%
BMO Disciplined SCG	41,605,930	0.38%	39,956,198	1,649,733	-	-
Conestoga SCG	43,172,748	0.39%	39,974,442	3,198,307	-	-
Phocas SCV	135,678,216	1.23%	(23,924,884)	872,335	158,730,765	1.47%
Attucks Domestic Equity (Mgr of Mgrs)	\$73,683,109	0.67%	\$(390,396)	\$3,343,224	\$70,730,282	0.66%
Attucks Matarin SCC	24,076,980	0.22%	(93,575)	398,881	23,771,674	0.22%
Attucks Paradigm LCV	24,111,131	0.22%	(173,576)	1,268,445	23,016,263	0.21%
Attucks Stoneridge LCE	25,451,242	0.23%	(123,225)	1,680,779	23,893,688	0.22%
INTERNATIONAL EQUITY	\$3,398,799,236	30.90%	\$(24,858,869)	\$6,895,293	\$3,416,762,812	31.64%
Ariel EAFE ILCV	77,311,332	0.70%	(704,749)	1,494,161	76,521,919	0.71%
DFA ISCV	185,051,338	1.68%	(31,412)	(1,718,109)	186,800,859	1.73%
Eamest Partners EME	175,986,796	1.60%	(1,583,717)	224,541	177,345,972	1.64%
Eamest Partners ILCE	601,364,104	5.47%	(4,709,754)	3,261,257	602,812,600	5.58%
Lazard Asst Mgt ILCE	594,917,640	5.41%	(4,338,268)	1,970,205	597,285,703	5.53%
Leading Edge IE MOM	132,194,542	1.20%	(1,318,081)	279,741	133,232,882	1.23%
Morgan Stanley ILCE	609,883,604	5.54%	(4,040,403)	2,721,245	611,202,763	5.66%
Strategic Global Adv. EAFE	78,565,828	0.71%	(763,426)	845,517	78,483,736	0.73%
William Blair ILCG	625,367,236	5.68%	(4,440,334)	106,147	629,701,423	5.83%
William Blair ISCE	197,405,354	1.79%	(1,621,284)	(4,642,749)	203,669,388	1.89%
TOTAL FUND	\$11,000,667,369	100.0%	\$(56,155,500)	\$258,675,028	\$10,798,147,841	100.0%

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INVESTMENT MANAGER ASSET ALLOCATIONS (Continued)

	September 30, 2018			Inv. Return	June 30, 2018	
	Market Value	Weight	Net New Inv.		Market Value	Weight
Attucks Int'l Equity	\$120,751,462	1.10%	\$(1,307,442)	\$2,353,336	\$119,705,568	1.11%
Attucks APEX Int'l ACC	12,843	0.00%	(4,194)	4,194	12,843	0.00%
Attucks GlobeFlex Int'l ACC	9,828	0.00%	0	(8)	9,835	0.00%
Attucks GlobeFlex Global Eq	25,000,218	0.23%	(303,600)	317,346	24,986,473	0.23%
Attucks Brown Capital Int'l SCG	31,827,952	0.29%	(468,995)	1,333,918	30,963,029	0.29%
Attucks Ativo Capital EM	19,212,344	0.17%	(292,971)	(159,480)	19,664,795	0.18%
Attucks Glovista EM	19,314,469	0.18%	(114,031)	(322,108)	19,750,608	0.18%
Attucks Redwood Int'l ACC	25,373,809	0.23%	(123,650)	1,179,473	24,317,985	0.23%
FIXED INCOME	\$2,408,572,173	21.89%	\$(18,749,226)	\$4,249,454	\$2,423,071,945	22.44%
NTGI Gov/Credit Index FI	909,256,853	8.27%	(6,362,695)	819,686	914,799,862	8.47%
Garcia Hamilton FIC	224,785,469	2.04%	(1,420,758)	(313,619)	226,519,846	2.10%
LM Capital FICP	199,774,092	1.82%	(2,075,283)	974,759	200,874,615	1.86%
Pugh FIC	218,348,361	1.98%	(1,775,206)	130,909	219,992,658	2.04%
Taplin Canida FI	220,516,857	2.00%	(1,569,357)	936,812	221,149,402	2.05%
WAMCO FICP	584,218,186	5.31%	(5,089,050)	1,619,568	587,687,668	5.44%
Attucks Fixed Income	\$51,672,355	0.47%	\$(456,877)	\$81,338	\$52,047,894	0.48%
Attucks New Century GI TIPS	19,922,049	0.18%	(59,164)	(175,319)	20,156,532	0.19%
Attucks LM Capital EMD	13,750,074	0.12%	(199,119)	200,812	13,748,380	0.13%
Attucks Ramirez Fixed Income	18,000,233	0.16%	(198,594)	55,845	18,142,982	0.17%
INFRASTRUCTURE	\$229,845,268	2.09%	\$1,976,914	\$504,313	\$227,364,041	2.11%
Brookfield Infra III	25,367,899	0.23%	5,316,686	261,718	19,789,496	0.18%
JP Morgan Infr-OE	93,948,773	0.85%	(3,339,942)	(1,240,543)	98,529,258	0.91%
Macquarie Fd II Infr	81,339,643	0.74%	0	956,925	80,382,718	0.74%
Macquarie European Fund III Infr	29,188,954	0.27%	171	526,213	28,662,570	0.27%
TOTAL FUND	\$11,000,667,369	100.0%	\$(56,155,500)	\$258,675,028	\$10,798,147,841	100.0%

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INVESTMENT MANAGER ASSET ALLOCATIONS (Continued)

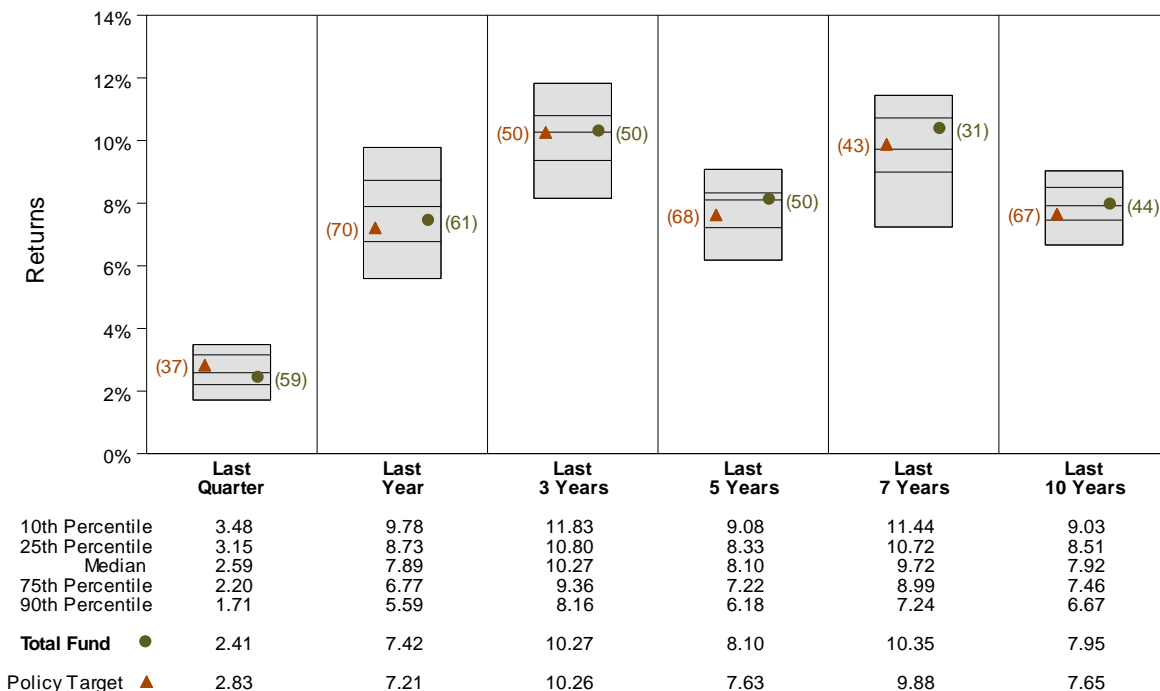
	September 30, 2018				June 30, 2018	
	Market Value	Weight	Net New Inv.	Inv. Return	Market Value	Weight
REAL ESTATE	\$753,775,168	6.85%	\$(6,487,755)	\$11,243,699	\$749,019,224	6.94%
BIG RE Fund I	13,413,365	0.12%	13,413,365	(0)	-	-
BREDS HG LP	13,029,094	0.12%	(2,237,867)	244,253	15,022,708	0.14%
Capri Select Fd II PRE	51,101	0.00%	0	0	51,101	0.00%
City View PRE	11,885,577	0.11%	162	303,724	11,581,691	0.11%
Clarion Lion Indus Tr	53,275,785	0.48%	(398,541)	2,491,250	51,183,076	0.47%
Europa Fd III PRE	1,800,677	0.02%	(3,046,028)	(30,734)	4,877,439	0.05%
Fortress Japan PRE	4,134,011	0.04%	0	1,207,394	2,926,617	0.03%
Fortress Japan Fd II PRE	4,316,550	0.04%	(278,898)	639,669	3,955,779	0.04%
Franklin Temp PREMOM	12,004,604	0.11%	(2,365,973)	504,524	13,866,053	0.13%
Fremont Realty PRE	1,502,612	0.01%	0	(7,006)	1,509,618	0.01%
GreenOak Fund III	2,606,128	0.02%	266,052	(28,722)	2,368,798	0.02%
Hudson Realty Fd V PRE	230,390	0.00%	0	1,999	228,391	0.00%
IC Berkeley Partners III	1,192,067	0.01%	(1,829,355)	(158,728)	3,180,149	0.03%
JP Morgan Strat PRE-OE	157,686,729	1.43%	(1,476,947)	2,832,142	156,331,533	1.45%
LaSalle Property PRE-OE	106,761,332	0.97%	(4,700,794)	(4,956)	111,467,082	1.03%
MB Asia RE Fd PRE	426,947	0.00%	(55,809)	(31,498)	514,254	0.00%
Newport Cap Fund II	15,342,539	0.14%	(2,310,860)	624,894	17,028,505	0.16%
Newport/DV Urban PRE	1,391,332	0.01%	0	(36,733)	1,428,065	0.01%
Oak Street Fund IV RE	6,156,301	0.06%	1,573,187	230,529	4,352,585	0.04%
PRISA Fd I PRE-OE	144,526,035	1.31%	(1,240,930)	2,310,520	143,456,445	1.33%
PRISA Fd II PRE-OE	22,719,262	0.21%	(197,152)	442,822	22,473,592	0.21%
UBS Realty PRE-OE	154,835,157	1.41%	(1,601,368)	0	156,436,525	1.45%
Walton St Fd III PRE	141,014	0.00%	0	(758)	141,772	0.00%
Walton St Fd IV PRE	513,371	0.00%	0	(108,980)	622,351	0.01%
Walton St Fd V PRE	8,398,189	0.08%	0	(126,828)	8,525,017	0.08%
Walton St Fd VI PRE	10,269,258	0.09%	0	223,807	10,045,451	0.09%
Walton St Mexico Fd I PRE	5,165,741	0.05%	0	(278,885)	5,444,626	0.05%
PRIVATE EQUITY	\$316,749,192	2.88%	\$4,598,399	\$11,756,278	\$300,394,514	2.78%
Adams St Many Fd PE	159,004,279	1.45%	(822,000)	6,166,309	153,659,970	1.42%
EQT Fund VII	212,252	0.00%	209,506	2,746	-	-
HarbourVest Ptrs VI PE	911,853	0.01%	(111,907)	40,465	983,295	0.01%
HarbourVest Ptrs VII PE	12,838,137	0.12%	532,744	539,520	11,765,873	0.11%
HarbourVest Ptrs VIII PE	6,979,033	0.06%	(695,552)	610,707	7,063,878	0.07%
HVP Buyout X PE	5,843,492	0.05%	768,955	315,497	4,759,040	0.04%
HVP Venture X PE	4,664,525	0.04%	480,024	167,873	4,016,628	0.04%
Hispania Fd II PE	2,720,372	0.02%	0	(19,015)	2,739,387	0.03%
ICV Capital Ptrs PE	1,368,239	0.01%	(29,649)	(1,653)	1,399,541	0.01%
ICV Capital Ptrs III PE	10,736,246	0.10%	0	(448,559)	11,184,805	0.10%
ICV Capital Ptrs IV PE	1,937,009	0.02%	(166,960)	460,782	1,643,187	0.02%
KKR Americas Fd XII	3,690,660	0.03%	0	230,686	3,459,974	0.03%
Mesirow Fd I PE	2,193,016	0.02%	0	54,467	2,138,549	0.02%
Mesirow Fd II PE	7,001,109	0.06%	(900,000)	259,163	7,641,946	0.07%
Mesirow Fd IV PE	10,553,589	0.10%	(400,000)	505,491	10,448,098	0.10%
Mesirow Fd V PE	17,266,357	0.16%	(700,000)	929,150	17,037,207	0.16%
Mesirow Fd VII A PE	1,621,674	0.01%	893,750	(32,558)	760,482	0.01%
Mesirow Fd VII B PE	2,439,244	0.02%	1,006,250	116,816	1,316,178	0.01%
Mesirow Fd VIII PE	662,905	0.01%	0	(122,452)	785,357	0.01%
Mesirow Fd X PE	9,603,970	0.09%	0	165,936	9,438,034	0.09%
Muller M2 MPEFF PE	2,469,984	0.02%	0	47,971	2,422,013	0.02%
NMS Capital Fund III	1,332,162	0.01%	(155,157)	(220,766)	1,708,085	0.02%
Palladium Ptrs III PE	1,071,933	0.01%	(85,455)	(22,407)	1,179,795	0.01%
Palladium Ptrs IV PE	7,311,930	0.07%	(42,138)	261,860	7,092,208	0.07%
Palladium Ptrs V PE	2,539,705	0.02%	2,539,705	0	-	-
Pantheon Asia Fd V PE	2,459,544	0.02%	(175,000)	207,202	2,427,342	0.02%
Pantheon Europe Fd II PE	78,510	0.00%	0	(15)	78,526	0.00%
Pantheon Europe Fd VI PE	4,360,975	0.04%	(373,995)	476,646	4,258,324	0.04%
Pantheon GI Fd 2014	10,094,311	0.09%	1,320,268	0	8,774,043	0.08%
Pantheon Select Fd	1,225,000	0.01%	800,000	0	425,000	0.00%
Pantheon USA Fd III PE	326,821	0.00%	0	0	326,821	0.00%
Pantheon USA Fd IV PE	622,571	0.01%	0	40,000	582,571	0.01%
Pharos Fd II PE	4,878,421	0.04%	0	445,957	4,432,464	0.04%
Pharos Fd III PE	12,659,958	0.12%	705,010	640,798	11,314,150	0.10%
RLJ Equity Fund II	1,103,546	0.01%	0	(62,339)	1,165,885	0.01%
Syncom Venture PE	1,965,859	0.02%	0	0	1,965,859	0.02%
CASH	\$316,606,311	2.88%	\$(52,080,176)	\$1,511,847	\$367,174,640	3.40%
Cash Appropriation Acct	68,331,859	0.62%	0	360,108	67,971,752	0.63%
Cash Equivalent CTFP	246,800,346	2.24%	(52,075,771)	1,143,902	297,732,216	2.76%
Global Transition	1,464,962	0.01%	0	7,593	1,457,369	0.01%
STEP Holding	9,144	0.00%	(4,404)	245	13,304	0.00%
TOTAL FUND	\$11,000,667,369	100.0%	\$(56,155,500)	\$258,675,028	\$10,798,147,841	100.0%

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Total Fund Performance vs. Target

Callan Public Fund Sponsor - 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% BB BC 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 third quarter, the Fund underperformed the market benchmark by 42 basis points, gross of fees (48 basis points net of fees), and ranked in the 59th percentile of its peers. For the trailing one-year period, the Fund outperformed the Total Fund Benchmark by 21 basis points, gross of investment management fees (underperformed by 6 basis points net of investment management fees) and ranked in the 61st percentile of its peer group.

Manager attribution effect was mixed across asset classes this quarter. Fixed income and infrastructure outperformed their broad benchmarks over the quarter while domestic equity, private equity, international equity and real estate underperformed their respective benchmarks. The following is a brief synopsis of the performance of each major asset class over the period (performance commentary relative to benchmarks is net of fees and performance commentary relative to peers is gross of fees):

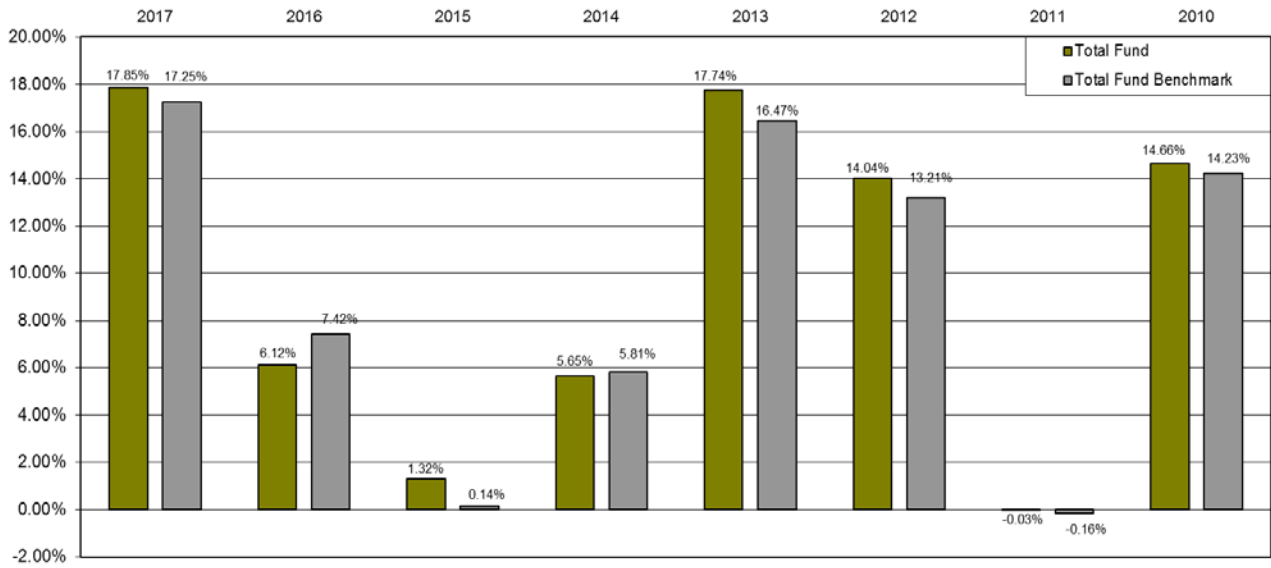
- Domestic Equity:** The domestic equity composite underperformed the Russell 3000 Index by 53 basis points for the quarter, ranking in the 56th percentile of the peer group. Performance was mixed for the active domestic equity managers over the quarter. Zevenbergen, Channing, BMO SCG, Phocas, and BMO LCV underperformed their respective benchmarks over the quarter. Conestoga and Northern Trust outperformed their respective benchmarks over the period. Zevenbergen posted particularly weak returns this quarter, underperforming the Russell 3000 Growth Index by 342 basis points, net of fees. This is characteristic of the high tracking error investment strategy employed by this manager.

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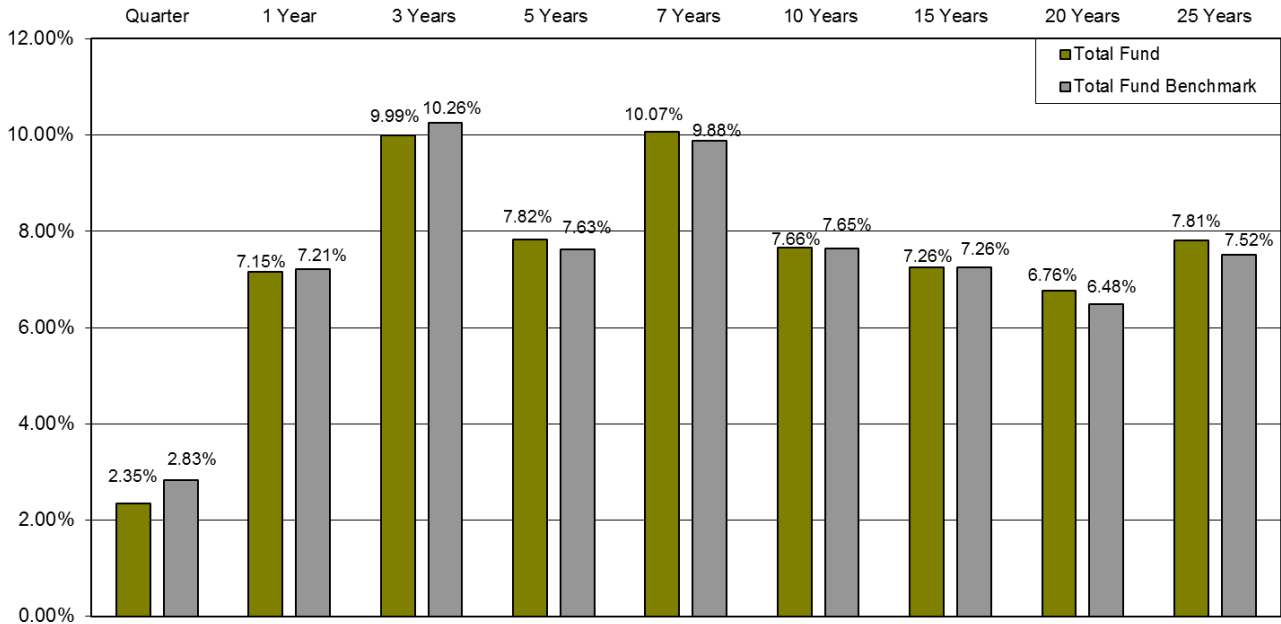
- **International Equity:** The international equity composite underperformed the MSCI ACWI Ex-US IMI benchmark by 19 bps over the third quarter, ranking in the 76th percentile of its peer group. Performance was mixed for the international equity managers over the quarter.
- **Fixed Income:** The fixed income composite outperformed The Bloomberg Aggregate Index by 10 basis points for the quarter, ranking in the 79th percentile of its peers. Performance was generally favorable for these managers over the quarter.
- **Alternative Investments:** The private equity and real estate portfolios underperformed their respective market benchmarks for the quarter while the infrastructure portfolio posted favorable results.

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Total Fund Calendar Year Performance, Net of Fees



Total Fund Trailing Year Performance, Net of Fees



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**Public School Teachers' Pension and Retirement Fund of Chicago
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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 9/30/2018						Inception Date	Qtr-End MV
	FUND	Qtr	1 Yr	3 Yr	5 Yr	7 Yr		
Fixed Income								
Northern Trust Gov/ Credit Index Fund	0.08	-1.33	1.44	2.20	2.08	5.10	Jan-94	\$909m
Bloomberg Barclays Gov/Credit Index	0.06	-1.37	1.45	2.23	2.10	5.08		
Variance	0.02	0.04	-0.01	-0.03	-0.02	0.02		
Garcia Hamilton	-0.17	0.59	2.01	3.15	3.71	3.56	Oct-10	\$225m
Bloomberg Barclays Aggregate Index	0.02	-1.22	1.31	2.16	2.02	2.42		
Variance	-0.19	1.81	0.70	0.99	1.69	1.14		
LM Capital*	0.45	-1.49	1.94	2.59	2.37	3.90	Nov-04	\$200m
Bloomberg Barclays Aggregate Index	0.02	-1.22	1.31	2.16	2.02	3.74		
Variance	0.43	-0.27	0.63	0.43	0.35	0.16		
Pugh Capital Management	0.02	-1.28	1.36	2.28	2.21	2.62	Oct-10	\$218m
Bloomberg Barclays Aggregate Index	0.02	-1.22	1.31	2.16	2.02	2.42		
Variance	0.00	-0.06	0.05	0.12	0.19	0.20		
Taplin, Canida & Habacht	0.39	-0.71	2.59	2.72	2.92	3.77	Nov-04	\$221m
Bloomberg Barclays Aggregate Index	0.02	-1.22	1.31	2.16	2.02	3.74		
Variance	0.37	0.51	1.28	0.56	0.90	0.03		
Western Asset Management	0.23	-1.63	3.00	3.31	3.63	4.91	Feb-03	\$584m
Bloomberg Barclays Aggregate Index	0.02	-1.22	1.31	2.16	2.02	3.85		
Variance	0.21	-0.41	1.69	1.15	1.61	1.06		

*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.

**Public School Teachers' Pension and Retirement Fund of Chicago
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Table 1 (Net-of-Fees, Continued):

CTPF Investment Strategies	Net Investment Returns as of 9/30/2018						Inception Date	Qtr-End MV
	FUND	Qtr	1 Yr	3 Yr	5 Yr	7 Yr		
Large Cap Equity								
Northern Trust S&P 500 Index Fund	7.70	17.86	17.36	13.95	16.90	10.06	Apr-90	\$277m
S&P 500 Index	7.71	17.91	17.31	13.95	16.91	10.13		
Variance	-0.01	-0.05	0.05	0.00	-0.01	-0.07		
Rhumbline Russell 1000 Index Fund	7.38	17.59	16.97	13.56	16.85	8.25	Jun-07	\$1,797m
Russell 1000 Index	7.42	17.76	17.07	13.67	16.90	8.19		
Variance	-0.04	-0.17	-0.10	-0.11	-0.05	0.06		
Rhumbline Russell 1000 Growth Index Fund	9.13	26.18	-	-	-	26.18	Oct-17	\$358m
Russell 1000 Growth Index	9.17	26.30	-	-	-	26.30		
Variance	-0.04	-0.12	-	-	-	-0.12		
Zevenbergen Capital Management	5.46	36.41	22.62	15.06	19.88	11.52	Oct-92	\$189m
Russell 3000 Growth Index	8.88	25.89	20.36	16.23	18.60	9.56		
Variance	-3.42	10.52	2.26	-1.17	1.28	1.96		
Channing*	3.67	7.43	11.86	9.71	15.52	14.34	Jul-09	\$148m
Channing Benchmark	5.39	9.46	13.75	10.65	15.04	15.40		
Variance	-1.72	-2.03	-1.89	-0.94	0.48	-1.06		
BMO Harris Investment Management	5.49	11.08	13.43	12.16	16.24	7.57	Jul-99	\$325m
Harris Benchmark**	5.70	9.45	13.55	10.72	15.02	5.39		
Variance	-0.21	1.63	-0.12	1.44	1.22	2.18		
Small Cap Equity								
Northern Trust Small Cap	3.74	15.23	16.90	11.84	17.15	12.53	Jan-91	\$187m
Russell 2000 Index	3.58	15.24	17.12	11.07	16.43	11.16		
Variance	0.16	-0.01	-0.22	0.77	0.72	1.37		
BMO Disciplined Small Cap Growth	4.12	-	-	-	-	4.12	Jul-18	\$42m
Russell 2000 Growth Index	5.52	-	-	-	-	5.52		
Variance	-1.40	-	-	-	-	-1.40		
Conestoga Small Cap Growth	8.00	-	-	-	-	8.00	Jul-18	\$43m
Russell 2000 Growth Index	5.52	-	-	-	-	5.52		
Variance	2.48	-	-	-	-	2.48		
Phocas Small Cap Value	0.32	6.82	-	-	-	14.03	Jul-16	\$136m
Russell 2000 Value Index	1.60	9.33	-	-	-	17.40		
Variance	-1.28	-2.51	-	-	-	-3.37		
Manager of Managers								
Attucks***	2.24	7.74	11.24	-	-	7.33	Dec-13	\$246m
Custom Benchmark	1.83	5.42	11.58	-	-	6.60		
Variance	0.41	2.32	-0.34	-	-	0.73		

*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.

**BMO Harris benchmark reflects the S&P 500 from inception to 12/31/2002 and the Russell 1000 Value benchmark thereafter.

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

**Public School Teachers' Pension and Retirement Fund of Chicago
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Table 1 (Net-of-Fees, Continued):

CTPF Investment Strategies	Net Investment Returns as of 9/30/2018						Inception Date	Qtr-End MV	
	FUND	Qtr	1 Yr	3 Yr	5 Yr	7 Yr			Since Inception
International Equity									
Ariel Investments	1.78	-0.07	-	-	-	-	7.44	Jul-16	\$77m
MSCI EAFE Index	1.35	2.74	-	-	-	-	12.46		
Variance	0.43	-2.81	-	-	-	-	-5.02		
EARNEST Partners	0.43	1.52	12.16	5.60	8.55	5.50		Apr-07	\$601m
MSCI ACWI ex-US Index	0.71	1.76	9.97	4.12	7.25	2.36			
Variance	-0.28	-0.24	2.19	1.48	1.30	3.14			
Lazard	0.28	1.23	7.64	4.55	8.49	5.68		Jan-01	\$595m
MSCI ACWI ex-US Index	0.71	1.76	9.97	4.12	7.25	4.73			
Variance	-0.43	-0.53	-2.33	0.43	1.24	0.95			
Morgan Stanley	0.34	2.73	8.28	4.41	8.55	8.52		Apr-95	\$610m
MSCI EAFE Index	1.35	2.74	9.23	4.42	8.30	5.12			
Variance	-1.01	-0.01	-0.95	-0.01	0.25	3.40			
Strategic Global Advisors	0.95	0.48	-	-	-	11.46		Jul-16	\$79m
MSCI EAFE Index	1.35	2.74	-	-	-	12.46			
Variance	-0.40	-2.26	-	-	-	-1.00			
William Blair Growth	-0.08	3.63	9.90	6.20	10.00	8.55		Feb-10	\$625m
MSCI ACWI ex-US IMI Growth Index	-0.53	3.22	10.70	5.51	8.35	6.69			
Variance	0.45	0.41	-0.80	0.69	1.65	1.86			
William Blair International Small Cap	-2.50	-1.52	8.70	5.06	9.63	4.35		Apr-07	\$197m
William Blair ISCE Benchmark*	-2.14	4.01	11.39	6.75	9.02	3.21			
Variance	-0.36	-5.53	-2.69	-1.69	0.61	1.14			
Dimensional Fund Advisors	-0.92	-2.77	10.41	6.62	--	12.33		Jun-12	\$185m
MSCI World Small Cap ex-US	-0.85	3.42	12.23	7.07	--	11.31			
Variance	-0.07	-6.19	-1.82	-0.45	--	1.02			
EARNEST Partners Emerging Markets	-0.01	0.26	12.87	3.83	--	2.30		Mar-13	\$176m
MSCI Emerging Markets Index	-1.09	-0.81	12.36	3.61	--	2.39			
Variance	1.08	1.07	0.51	0.22	--	-0.09			
International Manager of Managers									
Leading Edge	-0.00	2.11	10.38	4.96	8.90	5.65		Apr-10	\$132m
MSCI ACWI ex-US Index	0.71	1.76	9.97	4.12	7.25	4.77			
Variance	-0.71	0.35	0.41	0.84	1.65	0.88			

* 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 9/30/2018						Inception Date	Qtr-End MV
	FUND	Qtr	1 Yr	3 Yr	5 Yr	7 Yr		
Infrastructure								
Infrastructure Composite	0.15	14.92	9.44	6.10	6.70	6.27	Nov-08	\$230m
Infrastructure Benchmark*	-0.28	0.74	5.52	6.51	6.93	7.25		
Variance	0.43	14.18	3.92	-0.41	-0.23	-0.98		
Real Estate								
Real Estate Composite	1.42	8.57	8.77	10.44	9.99	7.32	Jan-02	\$754m
NFI-ODCE Value Weight	1.87	7.71	7.83	9.71	10.14	7.15		
Variance	-0.45	0.86	0.94	0.73	-0.15	0.17		
Private Equity								
Private Equity Composite	3.74	14.82	11.23	13.48	10.74	9.10	Jan-02	\$317m
Russell 3000 Index	7.12	17.58	17.07	13.46	16.86	8.21		
Variance	-3.38	-2.76	-5.84	0.02	-6.12	0.89		

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

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 9/30/2018						Inception Date	Qtr-End MV
	Qtr	1 Yr	3 Yr	5 Yr	7 Yr	Since Inception		
FUND								
Fixed Income								
Northern Trust Gov/ Credit Index Fund	0.09	-1.32	1.46	2.21	2.09	5.11	Jan-94	\$909m
Bloomberg Barclays Gov/Credit Index	0.06	-1.37	1.45	2.23	2.10	5.08		
Variance	0.03	0.05	0.01	-0.02	-0.01	0.03		
Peer Ranking – CAI Core Bond	67	93	82	91	96			
Garcia Hamilton	-0.14	0.73	2.18	3.33	3.94	3.74	Oct-10	\$225m
Bloomberg Barclays Aggregate Index	0.02	-1.22	1.31	2.16	2.02	2.42		
Variance	-0.16	1.95	0.87	1.17	1.92	1.32		
Peer Ranking – CAI Core Bond	94	1	21	3	1			
LM Capital*	0.49	-1.33	2.11	2.76	2.54	4.09	Nov-04	\$200m
Bloomberg Barclays Aggregate Index	0.02	-1.22	1.31	2.16	2.02	3.74		
Variance	0.47	-0.11	0.80	0.60	0.52	0.35		
Peer Ranking - CAI Core Plus Bond	32	89	77	71	97			
Pugh Capital Management	0.06	-1.14	1.52	2.44	2.38	2.79	Oct-10	\$218m
Bloomberg Barclays Aggregate Index	0.02	-1.22	1.31	2.16	2.02	2.42		
Variance	0.04	0.08	0.21	0.28	0.36	0.37		
Peer Ranking - CAI Core Bond	79	84	75	66	73			
Taplin, Canida & Habacht	0.42	-0.59	2.74	2.87	3.07	3.94	Nov-04	\$221m
Bloomberg Barclays Aggregate Index	0.02	-1.22	1.31	2.16	2.02	3.74		
Variance	0.40	0.63	1.43	0.71	1.05	0.20		
Peer Ranking - CAI Core Bond	8	25	4	24	18			
Western Asset Management	0.27	-1.47	3.18	3.49	3.81	5.10	Feb-03	\$584m
Bloomberg Barclays Aggregate Index	0.02	-1.22	1.31	2.16	2.02	3.85		
Variance	0.25	-0.25	1.87	1.33	1.79	1.25		
Peer Ranking - CAI Core Plus Bond	70	91	19	25	30			

*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 9/30/2018						Inception Date	Qtr-End MV
	FUND	Qtr	1 Yr	3 Yr	5 Yr	7 Yr		
Large Cap Equity								
Northern Trust S&P 500 Index Fund	7.71	17.87	17.37	13.96	16.91	10.07	Apr-90	\$277m
S&P 500 Index	7.71	17.91	17.31	13.95	16.91	10.13		
Variance	0.00	-0.04	0.06	0.01	0.00	-0.06		
Peer Ranking – CAI Large Cap	42	51	41	45	47			
Rhumbline Russell 1000 Index Fund	7.39	17.60	16.98	13.57	16.86	8.26	Jun-07	\$1,797m
Russell 1000 Index	7.42	17.76	17.07	13.67	16.90	8.19		
Variance	-0.03	-0.16	-0.09	-0.10	-0.04	0.07		
Peer Ranking – CAI Large Cap	49	52	46	52	49			
Rhumbline Russell 1000 Growth Index Fund	9.13	26.19	-	-	-	26.19	Oct-17	\$358m
Russell 1000 Growth Index	9.17	26.30	-	-	-	26.30		
Variance	-0.04	-0.11	-	-	-	-0.11		
Peer Ranking - CAI Large Cap Growth	26	47	-	-	-			
Zevenbergen Capital Management	5.57	36.93	23.10	15.52	20.36	11.97	Oct-92	\$189m
Russell 3000 Growth Index	8.88	25.89	20.36	16.23	18.60	9.56		
Variance	-3.31	11.04	2.74	-0.71	1.76	2.41		
Peer Ranking - CAI All Cap	89	7	6	26	4			
Channing*	3.79	7.93	12.40	10.23	16.07	14.92	Jul-09	\$148m
Channing Benchmark	5.39	9.46	13.75	10.65	15.04	15.40		
Variance	-1.60	-1.53	-1.35	-0.42	1.03	-0.48		
Peer Ranking – CAI All Cap Value	76	81	85	56	27			
BMO Harris Investment Management	5.54	11.31	13.68	12.41	16.49	7.85	Jul-99	\$325m
Harris Benchmark**	5.70	9.45	13.55	10.72	15.02	5.39		
Variance	-0.16	1.86	0.13	1.69	1.47	2.46		
Peer Ranking - CAI Large Cap Value	65	51	78	22	22			
Small Cap Equity								
Northern Trust Small Cap	3.77	15.31	17.00	11.93	17.22	12.62	Jan-91	\$187m
Russell 2000 Index	3.58	15.24	17.12	11.07	16.43	11.16		
Variance	0.19	0.07	-0.12	0.86	0.79	1.46		
Peer Ranking - CAI Small Cap	48	41	44	53	54			
BMO Disciplined Small Cap Growth	4.12	-	-	-	-	4.12	Jul-16	\$42m
Russell 2000 Growth Index	5.52	-	-	-	-	5.52		
Variance	-1.40	-	-	-	-	-1.40		
Peer Ranking - CAI Small Cap Growth	98	-	-	-	-			
Conestoga Small Cap Growth	8.00	-	-	-	-	8.00	Jul-18	\$43m
Russell 2000 Growth Index	5.52	-	-	-	-	5.52		
Variance	2.48	-	-	-	-	2.48		
Peer Ranking - CAI Small Cap Growth	48	-	-	-	-			
Phocas Small Cap Value	0.55	7.72	-	-	-	14.86	Jul-18	\$136m
Russell 2000 Value Index	1.60	9.33	-	-	-	17.40		
Variance	-1.05	-1.61	-	-	-	-2.54		
Peer Ranking - CAI Small Cap Value	79	59	-	-	-			
Manager of Managers								
Attucks***	2.39	8.37	11.89	-	-	7.93	Dec-13	\$246m
Custom Benchmark	1.83	5.42	11.58	-	-	6.60		
Variance	0.56	2.95	0.31	-	-			

*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.

**Harris benchmark reflects the S&P 500 from inception to 12/31/2002 and the Russell 1000 Value benchmark thereafter.

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

**Public School Teachers' Pension and Retirement Fund of Chicago
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Table 2 (Gross-of-Fees, Continued):

CTPF Investment Strategies	Gross Investment Returns as of 9/30/2018						Inception Date	Qtr-End MV	
	FUND	Qtr	1 Yr	3 Yr	5 Yr	7 Yr			Since Inception
International Equity									
Ariel Investments	1.95	0.61	-	-	-	-	8.09	Jul-16	\$77m
MSCI EAFE Index	1.35	2.74	-	-	-	-	12.46		
Variance	0.60	-2.13	-	-	-	-	-4.37		
Peer Ranking - CAI Non-US Equity	18	72	-	-	-	-			
EARNEST Partners	0.54	1.93	12.61	6.03	8.99	6.01		Apr-07	\$601m
MSCI ACWI ex-US Index	0.71	1.76	9.97	4.12	7.25	2.36			
Variance	-0.17	0.17	2.64	1.91	1.74	3.65			
Peer Ranking - CAI Non-US Equity	65	57	16	42	67				
Lazard	0.33	1.39	7.82	4.73	8.67	6.03		Jan-01	\$595m
MSCI ACWI ex-US Index	0.71	1.76	9.97	4.12	7.25	4.73			
Variance	-0.38	-0.37	-2.15	0.61	1.42	1.30			
Peer Ranking - CAI Non-US Equity	75	65	88	73	74				
Morgan Stanley	0.45	3.14	8.73	4.86	9.01	8.98		Apr-95	\$610m
MSCI EAFE Index	1.35	2.74	9.23	4.42	8.30	5.12			
Variance	-0.90	0.40	-0.50	0.44	0.71	3.86			
Peer Ranking - CAI Non-US Equity	70	40	74	71	65				
Strategic Global Advisors	1.08	0.98	-	-	-	11.95		Jul-16	\$79m
MSCI EAFE Index	1.35	2.74	-	-	-	12.46			
Variance	-0.27	-1.76	-	-	-	-0.51			
Peer Ranking - CAI Non-US Equity	42	70	-	-	-				
William Blair Growth	0.01	3.99	10.28	6.57	10.39	8.95		Feb-10	\$625m
MSCI ACWI ex-US IMI Growth Index	-0.53	3.22	10.70	5.51	8.35	6.69			
Variance	0.54	0.77	-0.42	1.06	2.04	2.26			
Peer Ranking - CAI Core Growth Int'l Equity	67	42	71	55	37				
William Blair International Small Cap	-2.30	-0.70	9.61	5.94	10.57	5.35		Apr-07	\$197m
William Blair ISCE Benchmark*	-2.14	4.01	11.39	6.75	9.02	3.21			
Variance	-0.16	-4.71	-1.78	-0.81	1.55	2.14			
Peer Ranking - CAI Int'l Small Cap Equity	74	77	86	89	87				
Dimensional Fund Advisors	-0.92	-2.77	10.41	6.72	--	12.44		Jun-12	\$185m
MSCI World Small Cap ex-US	-0.85	3.42	12.23	7.07	--	11.31			
Variance	-0.07	-6.19	-1.82	-0.35	--	1.13			
Peer Ranking - CAI Int'l Small Cap Equity	33	88	74	79	--				
EARNEST Partners Emerging Markets	0.12	0.79	13.46	4.37	--	2.82		Mar-13	\$176m
MSCI Emerging Markets Index	-1.09	-0.81	12.36	3.61	--	2.39			
Variance	1.21	1.60	1.10	0.76	--	0.43			
Peer Ranking - CAI EM Equity	17	20	33	55	--				
International Manager of Managers									
Leading Edge	0.20	2.92	11.25	5.78	9.75	6.48		Apr-10	\$132m
MSCI ACWI ex-US Index	0.71	1.76	9.97	4.12	7.25	4.77			
Variance	-0.51	1.16	1.28	1.66	2.50	1.71			
Peer Ranking - CAI Non-US Equity	79	44	28	47	49				

* 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 9/30/2018						Inception Date	Qtr-End MV
	Qtr	1 Yr	3 Yr	5 Yr	7 Yr	Since Inception		
FUND								
Infrastructure								
Infrastructure Composite	0.22	15.41	10.03	6.67	7.29	6.79	Nov-08	\$230m
Infrastructure Benchmark*	-0.28	0.74	5.52	6.51	6.93	7.25		
Variance	0.50	14.67	4.51	0.16	0.36	-0.46		
Real Estate								
Real Estate Composite	1.52	9.30	9.53	11.19	10.74	7.78	Jan-02	\$754m
NFI-ODCE Value Weight	1.87	7.71	7.83	9.71	10.14	7.15		
Variance	-0.35	1.59	1.70	1.48	0.60	0.63		
Private Equity								
Private Equity Composite	3.86	15.13	11.55	13.75	10.95	9.20	Jan-02	\$317m
Russell 3000 Index	7.12	17.58	17.07	13.46	16.86	8.21		
Variance	-3.26	-2.45	-5.52	0.29	-5.91	0.99		

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

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	DATE WATCH STARTED, REASON	LAST DUE DILIGENCE MEETING	ACTIONS TAKEN	POLICY/ RECOMMENDED ACTIONS	AUM as of 9/30/2018	Current Quarter Watch List Score	Previous Quarter Watch List Score
Ariel	May – 18 Organizational Issues	May - 18	Monitor	Monitor	\$77 mil.	0.6	0.5
Channing	January - 18 Personnel Turnover	18-Mar	Monitor	Monitor	\$148 mil.	0.3	0.1

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

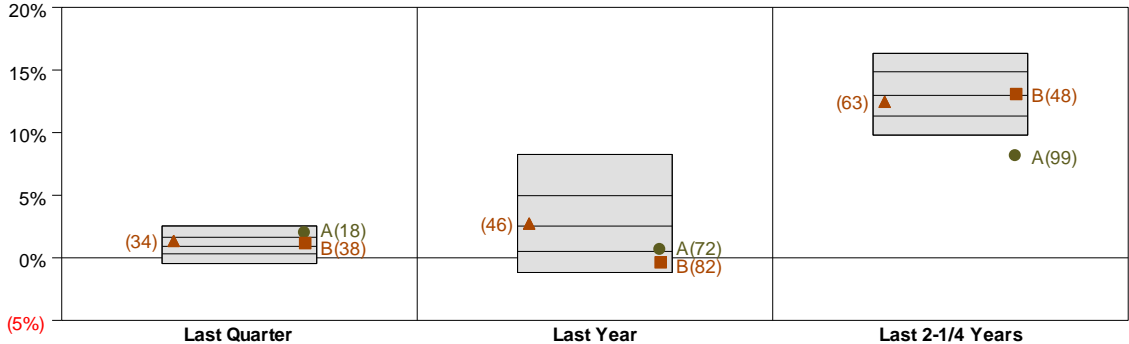
Monitor = Recommended action for the Board

Search = Board authorized a manager search

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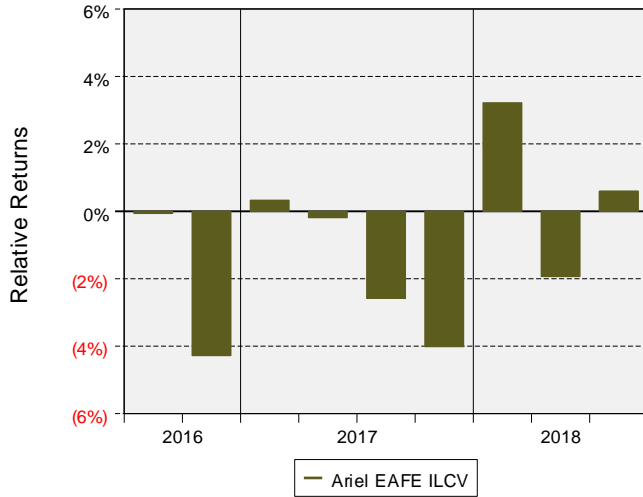
Manager Watch List: Ariel

Performance vs Callan Non-US Equity (Gross)

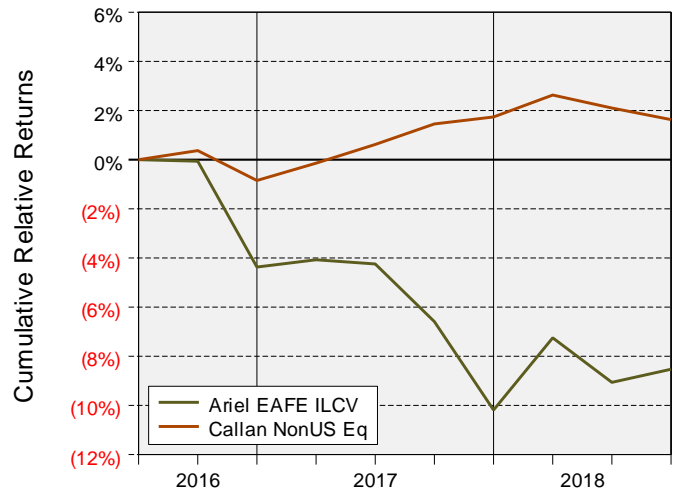


	Last Quarter	Last Year	Last 2-1/4 Years
10th Percentile	2.54	8.26	16.33
25th Percentile	1.64	4.96	14.86
Median	0.91	2.53	12.97
75th Percentile	0.32	0.51	11.32
90th Percentile	(0.46)	(1.17)	9.80
Ariel EAFE ILCV (A)	1.95	0.61	8.09
MSCI EAFE Value (B)	1.18	(0.36)	13.08
MSCI EAFE	1.35	2.74	12.46

Relative Return vs MSCI EAFE



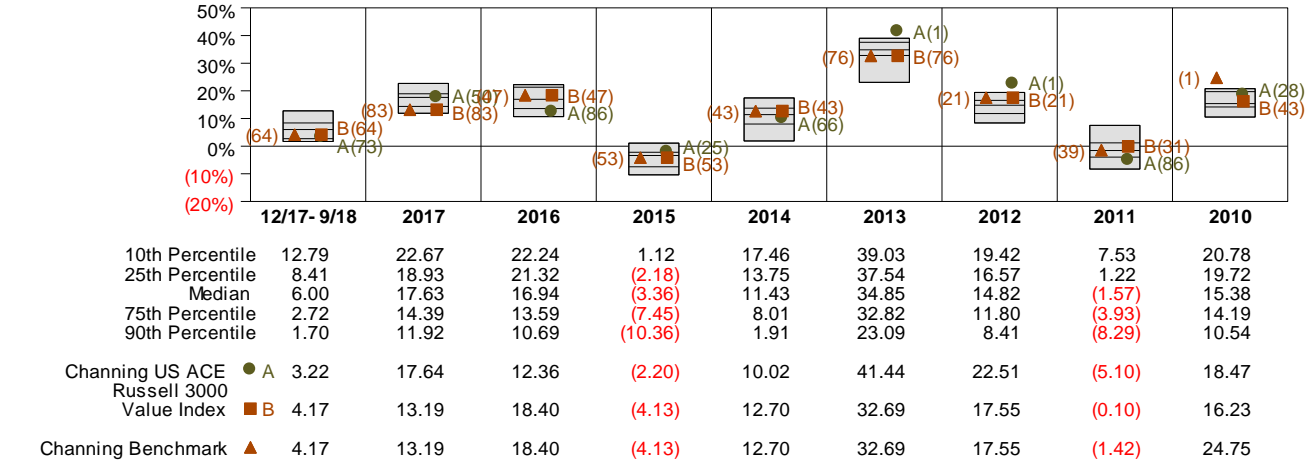
Cumulative Returns vs MSCI EAFE



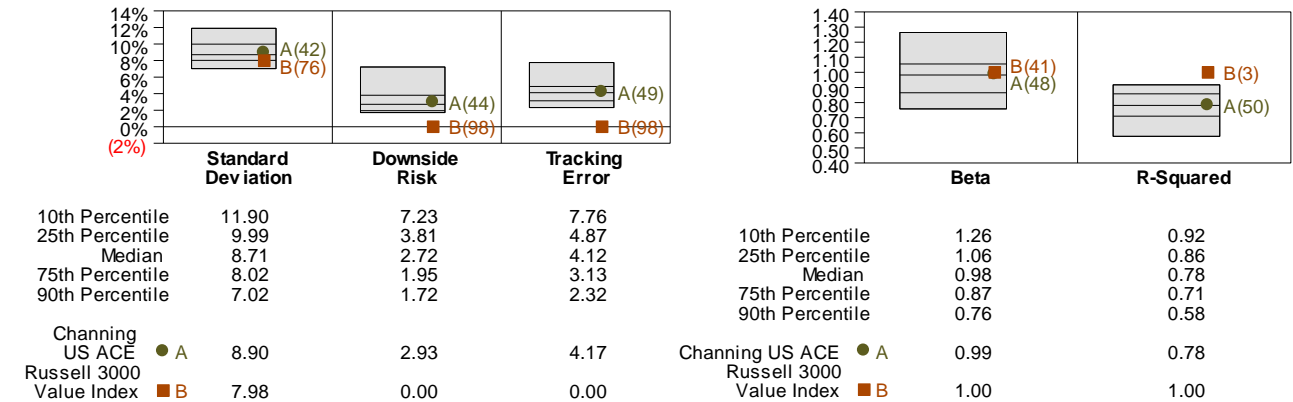
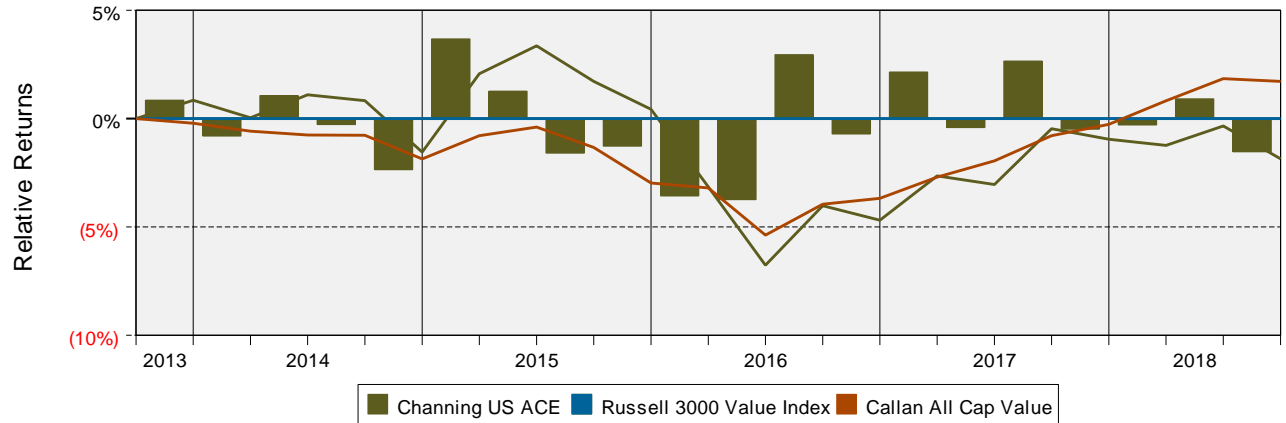
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Manager Watch List: Channing

Performance vs Callan All Cap Value (Gross)



Cumulative and Quarterly Relative Return vs Channing Benchmark



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General Market and Economic Conditions

Happy 10-year anniversary to the Global Financial Crisis! Just a decade ago, some of the world's largest and most revered financial institutions, along with the modern financial system itself, were left staring into the abyss. Several events, beginning with the fire sale of Bear Stearns and failure of Lehman Brothers, quickly transitioned into a bailout of AIG, conservatorship of Fannie Mae and Freddie Mac, multiple emergency relief programs, and forced marriages of several global investment and commercial banks. The series of events would eventually translate into one of the most painful economic recessions on record. And yet, as grave as things appeared in September 2008 and during the months that followed, the global economy just 10 years later finds itself in the midst of one of the longest economic expansions in the modern era. But as much as there is a great deal of positive news to go around as the current economic expansion grinds on, nearly all global economies face headwinds of some kind in the near term.

At the head of the pack, the U.S. economy has continued to feel the shot of adrenaline provided by early 2018 tax cuts and fiscal stimulus, recording 4.2% growth in the second quarter and a 3.5% increase in the third quarter, which is the highest two-quarter clip in nearly four years. Unemployment, which was hovering near the 10% mark during the depth of the financial crisis, is at 3.7% and wage growth, which has been anemic throughout the recovery period, has shown some signs of life recently with gains of approximately 4.7% over last year's wages. U.S. Inflation remains subdued with a 2.3% (y/y) increase through September; prices were held in check with a slowdown in fuel and housing costs. Tempering the enthusiasm, however, most market observers acknowledge that the stoked growth in the U.S. is unlikely sustainable, due to demographic trends (aging population, fewer new job entrants), uncertainty around the full impact of tariffs with China and other trading partners, and an unsettled political environment.

Looking abroad, global growth has continued to show resiliency, though moving at a slower pace than earlier this year. The Global Purchasing Managers' Index (PMI), which provides a survey-based reflection of the economic health of the manufacturing and service sectors, continued to offer encouraging readings across much of the developed and emerging world throughout the third quarter. However, the steady rise in U.S. interest rates and U.S. dollar appreciation have begun to create some headaches for many parts of the world, particularly in the form of higher interest costs for EM countries with significant USD-based debt burdens. Within the euro zone, investors are trying to balance the health of the PMI, lower unemployment figures, and stable inflation with headwinds such as ascendant populism (e.g., Italy), declining net export and trade activity, and stalling progress on Brexit negotiations (with a rapidly approaching deadline).

In Japan, corporate earnings, export activity, and business sentiment remain relatively strong. Meanwhile, a tight labor market (a 2.4% jobless rate as of August) has yet to translate into higher wages and private consumption has remained weak, though the latter could see a bump in advance of a planned sales tax hike (to 10%) in October 2019 along with other fiscal reforms. And in China, President Xi Jinping's national team of economists continue to focus efforts on deleveraging (non-financial corporate debt is estimated at 164% of GDP, according to the Bank of International Settlements) and structural reforms while balancing the need for policy stimulus, likely in the form of more infrastructure investment, to counteract the impact of U.S. tariffs that have yet to take full effect.

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Third Quarter 2018 Market Performance

The U.S. equity market posted broad gains in the third quarter, fueled by strong economic growth, soaring corporate profits, and record levels of stock buybacks. Several major indices hit record levels during the quarter, and the S&P 500 Index's 7.7% gain was its biggest since the fourth quarter of 2013. Volatility was muted in spite of persistent headlines around the tariff threats and the ever-changing negotiations. Large growth stocks were the top performers (R1000G: +9.2%) and small value (R2000V: +1.6%) occupied the bottom slot. All sectors posted positive returns within the S&P 500, but the differences were stark. Health Care (+14.5), Industrials (+10.0%), Technology (+8.8%), and the new Communication Services (+9.9%) sectors were the top performers, bookended by Materials, Energy, and Real Estate, all of which returned less than 1% for the quarter. The new Communication Services sector replaced Telecommunications and adopted names from Technology and Consumer Discretionary, including Facebook, Alphabet, Netflix, Twitter, and Disney and now includes over 20 holdings (initially, the new sector represented 10% of the S&P 500.) FAANG stocks plus Microsoft contributed nearly a quarter of the S&P 500's return in the third quarter, which was a lower impact than prior quarters. Apple (+22.4%) was the largest FAANG stock contributor while Facebook (-15.4%) was a detractor.

Non-U.S. developed markets underperformed the U.S. in the third quarter as the MSCI ACWI ex-U.S. Index rose a meager 0.7% (in USD terms). Japan was a top performer (+3.7%) as Prime Minister Shinzo Abe won his inter-party leadership battle and retained his role as president of the Liberal Democratic Party. The U.K. dropped 1.7% on uncertainty around Brexit, while Europe ex-UK finished up 1.8% despite being weighed down by political turmoil and financial woes in Italy (-4.5%). Emerging market equities declined (MSCI Emerging Markets Index: -1.1%), but returns were highly divergent. Turkey (-21%) and Greece (-18%) fell the most due to macro-economic concerns. As a region, Latin America gained 5% with Mexico (+7%) and Brazil (+6%) up the most. Elsewhere, Russia (+6%) rebounded, largely due to the surge in its Energy sector (+16%). Conversely, China (-8%) dropped given a large sell-off in Chinese technology companies (-14%) and India (-2%) posted a modest loss due to a significant decline in its Financial sector (-12%).

Yields rose during the quarter; the 2-year U.S. Treasury Note climbed nearly 30 basis points to close at a multi-year high of 2.81% while the 10- and 30-year Treasuries rose roughly 20 bps. The yield curve continued to flatten with the spread between the 2-year Treasury yield and the 10-year Treasury yield falling to 24 bps as of quarter-end. As expected, the Fed hiked rates by 25 bps in September, and one more hike in December 2018 appears likely. Markets expect two more hikes in 2019 while the median Fed projection is for three. The 10-year breakeven inflation rate rose modestly to 2.14% (9/30) from 2.11% (6/30) and the Bloomberg Barclays TIPS Index fell 0.8% as rates rose.

The return on the Bloomberg Barclays US Aggregate Bond Index was flat (+0.0%) for the quarter with the U.S. Treasury sector (-0.6%) underperforming the Corporate bond sector (+1.0%). High yield (Bloomberg Barclays High Yield Index: +2.4%) outperformed and leveraged loans rose 1.8% (S&P LSTA Leveraged Loan). Meanwhile, returns for the Bloomberg Barclays Global Aggregate ex-US Bond Index fell 1.7% on an unhedged basis while the hedged version was flat (+0.0%). The U.S. dollar strengthened versus the Japanese yen and U.K. pound but was roughly flat versus the euro. As a result, Japan (-3.7%) and the U.K. (-3.1%) were among the worst performers in U.S. dollar terms. Canada was the only source of a positive result (+0.7%) due solely to currency appreciation versus the U.S. dollar. In local terms, Canada also

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delivered a negative return (-1.1%).

The quarterly return for the JPM EMBI Global Diversified Index (USD denominated) was +2.3% with all sub-regions delivering positive results. Local currency emerging markets, however, fared more poorly. The JPM GBI-EM Global Diversified Index fell 1.8% for the quarter, but also endured significant intra-quarter volatility including a 6.1% drop in August. Further, return dispersion among countries was significant. Argentina (-35%) has seen its peso fall more than 50% this year to a record low as investors were spooked by previous currency debacles and worries over the economic picture. In addition to securing support from the International Monetary Fund, the country's central bank hiked short-term interest rates 15 percentage points to a global high of 60%. Turkey (-27%) endured a similar currency rout, though for different reasons. U.S.-imposed sanctions and concerns over central bank policy were the twin drivers of the lira's weakness. Turkey hiked short rates by 6.25% to 24% to stem its currency slide. Elsewhere, returns were far more modest (positive or negative) with only Russia (-6%) and Mexico (+6%) being noteworthy.

The municipal bond market delivered modest negative returns in the third quarter as yields rose. The Bloomberg Barclays 1-10 Year Blend fell 0.1% and the broader Municipal Bond Index dropped 0.2%. Issuance remained muted and is down 15% from last year's pace (through 9/30). In an ongoing trend, lower-quality bonds continued to outperform higher quality. The highest-quality sector, AAA-rated bonds, declined 0.3% for the quarter while the BBB sector was up 0.2%.

Across real assets, MLPs were once again a top-performing category during the third quarter, as shown in the Alerian MLP Index gain of 6.6%. Interestingly, two other rate-sensitive real asset categories—REITs and Listed Infrastructure—were relatively flat during the quarter, with the FTSE NAREIT Equity Index returning a meager 0.8% while the DJ Brookfield Global infrastructure Index shed 0.8%. It's a relationship worth monitoring and one that may continue as Real Estate and Infrastructure are somewhat more dependent upon leverage as part of their capital structures. Meanwhile, Natural Resource equities were the only other broad area of relatively positive performance within real assets, with the S&P 1200 Energy and S&P 1200 Materials Indices up 1.3% and 0.1%, respectively. With the gain in the U.S. dollar in the third quarter, most commodities sold off with the exception of Energy (Bloomberg Commodity Sub Energy: +4.4%) and Livestock (Bloomberg Commodity Sub Livestock: +2.9%). Given the much higher weighting to Energy in the GSCI Commodity Index as compared to Bloomberg, the former produced a modestly positive return (+1.3%) during the quarter.

Closing Thoughts

With noted exceptions, we remain cautiously optimistic regarding the resilient global growth that has been exhibited by both the U.S. and foreign economies over the most recent quarter and year-to-date. And despite markets in both financial and real assets continuing to feel extended, such cycles are born without an assigned expiration date. Nevertheless, we are also realists and acknowledge that all good things must end, which is why we continue to encourage investors to maintain a long-term perspective and prudent asset allocation with appropriate levels of diversification.

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Appendix

Appendix - 9/30/18

Manager	Watch List Criteria: Rolling three year returns rank below median (Gross of Fees).		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.		Watch List Criteria: Rolling seven year returns rank below median (Gross of Fees).		Watch List Criteria: Rolling seven year returns are below the return of the index (Net of Fees).		Watch List Criteria: Five year information ratio is negative and ranks below median.		Watch List Criteria: Five year up market capture is below 90% and ranks below median.		Watch List Criteria: Five year down market capture is above 90% and ranks below median.		Weighted Averages	
	06/30/2018	09/30/2018	06/30/2018	09/30/2018	06/30/2018	09/30/2018	06/30/2018	09/30/2018	06/30/2018	09/30/2018	06/30/2018	09/30/2018	06/30/2018	09/30/2018	06/30/2018	09/30/2018
Large Cap Value Equity BMO-Harris	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	0.10	0.10
Small Cap Growth Equity BMO***	No	No	No	No	No	No	No	No	No	No	No	No	No	No	0.00	0.00
Conestoga***	No	No	No	No	No	No	No	No	No	No	No	No	No	No	0.00	0.00
Small Cap Value Equity Phocas**	No	Yes	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No	No	0.20	0.60
Small Cap Equity NTGI Structured Small Cap	No	No	No	No	No	Yes	No	No	No	No	No	No	No	No	0.00	0.20
All Cap Growth Equity Zevenbergen	No	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	0.10	0.10
All Cap Value Equity Channing	Yes	Yes	No	No	No	No	No	No	No	Yes	No	No	No	No	0.10	0.30
International Equity EARNEST Partners	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No	0.20	0.20
Lazard	Yes	Yes	No	Yes	Yes	Yes	No	No	No	No	No	No	No	No	0.30	0.40
Morgan Stanley	Yes	Yes	No	No	No	Yes	No	No	No	No	No	No	No	No	0.10	0.30
Leading Edge	No	No	No	No	No	No	No	No	No	No	No	No	No	No	0.00	0.00
William Blair	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	0.10	0.10
Ariel**	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No	0.50	0.60
Strategic Global**	Yes	Yes	No	No	No	No	No	No	No	No	No	No	No	No	0.10	0.10
International Small Cap William Blair	Yes	Yes	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	0.50	0.80
DFA*	Yes	Yes	Yes	No	Yes	Yes	No	No	No	No	No	No	Yes	Yes	0.50	0.40
Emerging Market Equity EARNEST Partners*	Yes	No	No	No	Yes	Yes	Yes	Yes	No	No	No	No	No	No	0.50	0.40
Active Core Fixed Income Taplin, Canida & Habacht	No	No	No	No	No	No	No	No	No	No	No	No	No	No	0.00	0.00
Pugh	Yes	Yes	No	No	Yes	Yes	No	No	No	No	No	Yes	Yes	Yes	0.40	0.40
Garcia Hamilton	No	No	No	No	No	No	No	No	No	No	No	No	No	No	0.00	0.00
Active Core Plus Fixed Income LM Capital	Yes	Yes	No	No	Yes	Yes	No	No	No	No	No	No	No	No	0.30	0.30
Active Opportunistic Fixed Income WAMCO	No	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	0.10	0.10

*Manager does not yet have 7 years of portfolio data. CTFP portfolio data has been linked with a representative historical manager composite to populate 7-year gross returns relative to a peer group and 7-year net returns relative to a market index.
 **Manager inception date was in 2016. Historical composite data is used to populate the above. Please note that Ariel International Equity (DM) only has historical data going back to the 1st quarter of 2012. In order to populate seven year figures above for Ariel as of 9/30/18, we have used 6 3/4 year figures dating back to the 1st quarter of 2012.
 ***Manager inception date was in 2018. Historical composite data is used to populate the above.