MILWAUKEE ERS Employes' Retirement System

City of Milwaukee
Employes' Retirement System

Bernard J. Allen
Executive Director

David M. Silber, CFA, CAIA
Chief Investment Officer

Melody Johnson
Deputy Director

December 2, 2022

Mr. Jim Owczarski
City Clerk
Room 205, City Hall

Dear Mr. Owczarski:

Please be advised that an Investment Committee Meeting of the Annuity and Pension Board has been scheduled for **Thursday, December 8, 2022 at 9:00 a.m.** This meeting will be conducted via teleconference.

Special Notice: Instructions for the public on how to observe the meeting will be available on the ERS's website (www.cmers.com) prior to the meeting.

The agenda is as follows:

Please be advised that the Investment Committee may vote to convene in closed session on the following items (I. and II.) as provided in Section 19.85(1)(e), Wisconsin State Statutes, to deliberate or negotiate the purchasing of public properties, the investing of public funds, or conducting other specified public business, whenever competitive or bargaining reasons require a closed session. The Investment Committee may then vote to reconvene in open session following the closed session.

I. Approval of Abbott Capital Private Equity Investors 2023, L.P. Side Letter.
II. Callan Real Estate Presentation.
III. Callan 3rd Quarter 2022 Performance Report and Presentation.
IV. Due Diligence Reports.
  a. AQR Capital Management.
  b. Principal Global Investors.
V. Chief Investment Officer Report.

Sincerely,

Bernard J. Allen
Executive Director

BJA:jmw

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MILWAUKEE

Callan

September 30, 2022

City of Milwaukee Employes' Retirement System

Investment Measurement Service
Quarterly Review

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September 30, 2022

Callan Institute

Third Quarter 2022

Capital Markets Review

Mayhem Continues in the Capital Markets

ECONOMY

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Mayhem continued to plague the capital markets, with both stocks and bonds falling through the first three quarters of the year. But the underlying U.S. economy remains strong, with an uptick in GDP in 3Q and the job market reaching its pre-pandemic level in August.

Double-digit Declines for Last 12 Months

INSTITUTIONAL INVESTORS

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Institutional investors saw double-digit losses over the year ending 9/30/22. Almost every asset class was down, and it was the worst start to a year for a 60/40 portfolio in decades. Despite inflation worries, the drop in stocks and bonds became the top concern of institutional investors.

First Three Quarters The Worst in Decades

EQUITY

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The S&P 500 Index fell 4.9% in 3Q22, and equities are off to the worst three quarters in decades. All major U.S. indices across styles and market cap ranges were negative except for the Russell 2000 Growth. Global markets waned for three straight quarters as well.

Bonds Hit Hard as Rates Rose Sharply

FIXED INCOME

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The Bloomberg US Aggregate saw its worst nine-month return in its history. The yield curve inverted at quarter-end; the 10-year was at 3.83% and 2-year at 4.22%. Negative returns for global fixed income were driven by broad interest rate increases.

NPI Shows Gains; REITs Lag Equities

REAL ESTATE/REAL ASSETS

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The NCREIF Property Index rose 0.6% during 3Q22. The NCREIF Open-End Diversified Core Equity Index rose 0.5%. The FTSE EPRA Nareit Developed Asia Index (USD) fell 9.4%. The FTSE EPRA Nareit Developed Europe Index (USD) plunged 21.7%.

Activity Reflects Pre-Pandemic Levels

PRIVATE EQUITY

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All private equity activity measures dipped in 3Q22 compared to the previous quarter, except for an increase in IPOs. Steep year-to-date declines are largely in contrast to last year's stimulus-induced hyper-liquidity, with 2022 generally reflecting active pre-pandemic levels.

Appeal for Investors in Low-Yield Climate

PRIVATE CREDIT

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Clients moved away from new allocations to traditional sponsor-backed direct lending due to the increased competition and commoditization within the space. Demand has continued to be healthy for less-competitive areas of private credit with high barriers to entry.

Managers in General Outpace Benchmarks

HEDGE FUNDS/MACs

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Hedge funds fell but outperformed broader indices. The median member of the Callan Institutional Hedge Fund Peer Group rose 0.6%. The median manager of the Callan Multi-Asset Class (MAC) Style Groups saw lower returns, consistent with their underlying risk exposures.

DC Index Sees Third-Worst Decline Ever

DEFINED CONTRIBUTION

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The Callan DC Index™ fell 12.2% in 2Q22; the Age 45 Target Date Fund dropped 13.4%. Balances within the DC Index declined by 12.3%. Stable value received 47.7% of net flows, topping target date funds. U.S. large cap (25.1%) had the largest percentage decrease in allocation.

Broad Market Quarterly Returns

U.S. Equity
Russell 3000

-4.5%

Global ex-U.S. Equity
MSCI ACWI ex USA

-9.9%

U.S. Fixed Income
Bloomberg Agg

-4.8%

Global ex-U.S. Fixed Income
Bloomberg Global Agg ex US

-8.8%

Sources: Bloomberg, FTSE Russell, MSCI

Mayhem in the Capital Markets

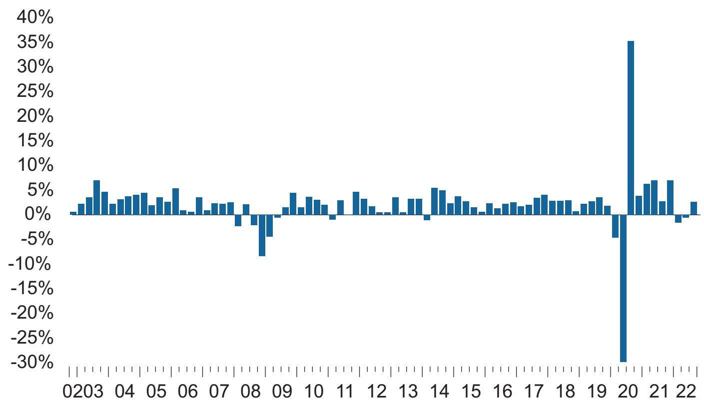
ECONOMY | Jay Kloepfer

Capital markets abhor uncertainty, and we have seen nothing but uncertainty this year. The Russian invasion of Ukraine threw expectations for an orderly transition from the pandemic era out the window. Kinks in supply chains were expected to be smoothed, energy prices and inflation in general were projected to calm and subside after surging in 2021, and market participants anticipated an orderly transition from zero interest rate policy to a more "normal" yield curve. All these were key components to a consensus view that U.S. and global economies, and their capital markets, would slow gradually toward trend growth and reach the proverbial "Goldilocks" scenario: not too hot, not too cold. Like a soft landing for the Fed, the Goldilocks scenario is aspirational and has never really been achieved.

Instead, inflation is burning out of control. Global energy markets are surging and volatile. Geopolitical uncertainty is moving toward a level some experts liken to the period after World War II, when the United States and the Soviet Union were trying to figure out a new world order. This time, China represents a third axis of power with another agenda. Stock and bond markets around the globe are down together for three quarters in a row through September 2022. The S&P 500 plunged 24% year-to-date, and developed and emerging market equities are down a similar amount, punished by the strong dollar. While painful, such a drawdown in the equity markets is expected periodically. What is not expected is the 14.6% loss in the bond market (Bloomberg Aggregate) at the same time. The nine-month returns for the Aggregate are the worst in its history. There is no place to hide for a diversified portfolio.

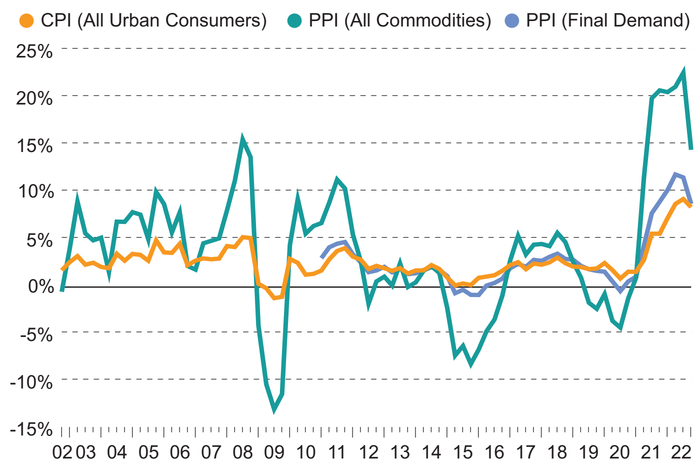
The losses in both the bond and stock markets this year are primarily due to the sharp rise in interest rates. The lack of any yield cushion at the start of 2022 makes the rise in rates particularly painful for bonds. Rates have risen this much in the past, but the last time was during the regime change for monetary policy in the early 1980s. The giant capital losses were cushioned by yields as high as 14%. We began this year with the yield on the Aggregate at 1.75%; by Sept. 30, it reached 4.75%. With a duration of over six years for the Aggregate, the capital loss implied by such a rate rise is close to 20%. The rising yield collected offsets some of this capital loss.

Quarterly Real GDP Growth (20 Years)



Source: Bureau of Economic Analysis

Inflation Year-Over-Year



Source: Bureau of Labor Statistics

The Fed announced plans to raise rates aggressively in 2022, targeting a Fed Funds rate of 3.25% to 3.5% by December, but the market didn't really believe it until the Russian invasion in February. Then investors fully priced in the Fed's plans all at once. During the long period of zero interest rate policy over the past decade, we often mused that the best way to return to normal in the bond market would be to rip the "low-rate bandage" off and move at once to the new normal. Get the pain over with, absorb the capital loss, and start collecting the higher yield. Be careful what you wish for.

Underneath this mayhem in the capital markets, the U.S. economy has been strong, with a particularly robust job market and healthy consumer spending. The economy added 263,000 jobs in September, down from the torrid pace set earlier this year, but for the quarter nonfarm employment increased by more than 1.1 million jobs. Even more importantly, we finally reached the pre-pandemic level for total employment in August 2022. Personal income growth has recovered from the withdrawal of pandemic support (transfer payments), rising 5.9% in 2Q and 5.5% in 3Q. Disposable income (after tax) rose by similar rates. However, inflation has taken a toll this year; real disposable income is 4% to 5% lower than the same month one year ago starting in May 2022, while real consumption expenditures are 6% to 7% higher.

Traditional measures of economic health are still out of whack as they often were during the pandemic. GDP is the biggest puzzle so far this year. GDP fell 1.6% in 1Q and another 0.6% in 2Q, while at the same time we generated more than 2 million new jobs. The GDP declines were deemed to be anomalies driven by inventory swings and net exports, not underlying economic weakness. Third quarter GDP grew by 2.6%, with strong contributions from exports, business fixed investment (equipment and intellectual property), and a resumption of government spending. However, fourth quarter GDP is now projected to fall. After all the mayhem, GDP growth will likely end up being positive in 2022—but it is projected to be negative in 2023, signaling more challenges ahead and the potential for a recession to extend through 2Q23.

The Long-Term View

		Periods Ended 9/30/22			
Index	**3Q22**	**1 Yr**	**5 Yrs**	**10 Yrs**	**25 Yrs**
U.S. Equity					
Russell 3000	-4.5	-17.6	8.6	11.4	7.5
S&P 500	-4.9	-15.5	9.2	11.7	7.4
Russell 2000	-2.2	-23.5	3.6	8.6	6.7
Global ex-U.S. Equity					
MSCI EAFE	-9.4	-25.1	-0.8	3.7	3.5
MSCI ACWI ex USA	-9.9	-25.2	-0.8	3.0	--
MSCI Emerging Markets	-11.6	-28.1	-1.8	1.0	--
MSCI ACWI ex USA Small Cap	-8.4	-28.9	-0.6	4.4	5.6
Fixed Income					
Bloomberg Agg	-4.8	-14.6	-0.3	0.9	4.0
90-Day T-Bill	0.5	0.6	1.1	0.7	1.9
Bloomberg Long G/C	-9.0	-27.4	-1.2	1.4	5.5
Bloomberg Gl Agg ex US	-8.8	-24.8	-4.0	-2.4	2.4
Real Estate					
NCREIF Property	0.6	16.1	8.6	9.5	9.4
FTSE Nareit Equity	-9.9	-16.4	2.9	6.3	7.7
Alternatives					
CS Hedge Fund	0.4	1.1	4.5	4.3	5.9
Cambridge PE*	-5.6	3.3	18.2	15.9	14.7
Bloomberg Commodity	-4.1	11.8	7.0	-2.1	1.5
Gold Spot Price	-7.5	-4.8	5.4	-0.6	6.6
Inflation – CPI-U	0.2	8.2	3.8	2.5	2.5

*Data for most recent period lags. Data as of 6/30/22.
Sources: Bloomberg, Bureau of Economic Analysis, Credit Suisse, FTSE Russell, MSCI, NCREIF, Refinitiv/Cambridge, S&P Dow Jones Indices

Recent Quarterly Economic Indicators

	3Q22	2Q22	1Q22	4Q21	3Q21	2Q21	1Q21	4Q20
Employment Cost–Total Compensation Growth	5.0%	5.1%	4.5%	4.0%	3.7%	2.9%	2.6%	2.5%
Nonfarm Business–Productivity Growth	0.3%	-4.1%	-5.9%	4.4%	-2.4%	2.7%	3.0%	-3.9%
GDP Growth	2.6%	-0.9%	-1.6%	6.9%	2.3%	6.7%	6.3%	4.5%
Manufacturing Capacity Utilization	79.7%	79.5%	79.1%	78.6%	77.5%	76.8%	75.7%	75.0%
Consumer Sentiment Index (1966=100)	56.1	57.8	63.1	69.9	74.8	85.6	80.2	79.8

Sources: Bureau of Economic Analysis, Bureau of Labor Statistics, Federal Reserve, IHS Economics, Reuters/University of Michigan

Double-digit Declines for Last 12 Months

INSTITUTIONAL INVESTORS

Rough year but most investors topped benchmarks

– Institutional investors saw double-digit losses over the year ending 9/30/22.
– Corporate defined benefit (DB) plans had the lowest returns, Taft-Hartley plans the best.
– All investor types aside from corporate DB plans outperformed a 60% S&P 500/40% Bloomberg Aggregate benchmark.
– And all types but corporate DB plans also outperformed equity and bond benchmarks.
– Over longer time periods, all investor types generally underperformed the stocks/bonds benchmark.

Major concern shifts

– Declines in both equities and fixed income replaced inflation as the greatest concern for institutional investors in 3Q22.
– Almost every asset class was down, and it was the worst start to a year for a 60/40 portfolio in decades.
– But … inflation is still burning out of control. One ray of hope: month-to-month inflation flattened to zero starting in June.
– Institutional investors are starting to ask questions about what to do now:
  - How does a yield of 4% change the demand for yield substitutes: investment grade credit, bank loans, high yield, private credit? Real estate and infrastructure?
- Rebalancing is a natural outcome of a market downturn, except when everything goes down.
- Alternatives are now over target allocations.
  - *This stems from the denominator effect: the plunge in stocks and bonds is immediate but there is a delay in private market loss reporting, meaning the overweight is somewhat artificial.*
  - *This is not the time to hold back on re-upping private market commitments—the "overweight" will self-correct as appraisals reflect public market performance.*

Quarterly Returns, Callan Database Groups (9/30/22)

	Public	Corporate	Nonprofit	Taft-Hartley	Insurance Assets
10th Percentile	-2.9	-3.2	-2.7	-1.8	-1.6
25th Percentile	-3.5	-4.4	-3.4	-2.4	-2.9
Median	-4.2	-5.3	-4.2	-3.3	-3.9
75th Percentile	-4.9	-7.2	-5.1	-4.2	-4.3
90th Percentile	-5.4	-8.4	-5.8	-4.8	-5.1

Source: Callan

Callan Database Median and Index Returns* for Periods Ended 9/30/22

Database Group	Quarter	1 Year	3 Years	5 Years	10 Years	20 Years
Public Database	**-4.2**	**-13.4**	**4.1**	**4.8**	**6.8**	**7.3**
Corporate Database	**-5.3**	**-17.8**	**0.8**	**3.0**	**5.6**	**6.9**
Nonprofit Database	**-4.2**	**-14.5**	**3.6**	**4.3**	**6.3**	**7.4**
Taft-Hartley Database	**-3.3**	**-11.1**	**4.8**	**5.4**	**7.2**	**7.1**
Insurance Assets Database	**-3.9**	**-11.8**	**0.7**	**2.3**	**3.8**	**4.8**
All Institutional Investors	**-4.3**	**-14.3**	**3.4**	**4.3**	**6.5**	**7.2**
Large (>$1 billion)	**-4.2**	**-13.0**	**4.2**	**5.0**	**6.8**	**7.5**
Medium ($100mm - $1bn)	**-4.3**	**-14.7**	**3.4**	**4.4**	**6.6**	**7.1**
Small (<$100 million)	**-4.3**	**-14.5**	**3.0**	**4.0**	**6.2**	**6.8**
60% S&P 500/40% Bloomberg Agg	-4.8	-14.9	3.9	5.7	7.5	7.4

*Returns less than one year are not annualized.

Source: Callan. Callan's database includes the following groups: public defined benefit (DB) plans, corporate DB plans, nonprofits, insurance assets, and Taft-Hartley plans. Approximately 10% to 15% of the database constituents are Callan's clients. All database group returns presented gross of fees. Past performance is no guarantee of future results. Reference to or inclusion in this report of any product, service, or entity should not be construed as a recommendation, approval, affiliation, or endorsement of such product, service, or entity by Callan.

Key issues for corporate DB plans

- Corporate plans are rethinking their approach to liability-driven investing (LDI). LDI portfolios were hammered by long duration exposure; the typical LDI plan treaded water in funded status.
- According to a survey of client activity, there was a big drop in concern about funded status in recent quarters; plans' interest in alternative asset classes dropped significantly.

Key issues for public DB plans

- Downward pressure on actuarial discount rates continued into 2022, with the typical rate at or below 7%. This trend may abate now as capital markets expectations rise following the market decline.
- Inflation impacts future liabilities through pressure on salary, and hits plans now with COLAs.
- According to our survey, return enhancement remains the top issue of concern; interest in adding to alternatives stayed steady.
- Clients plan to make few changes with allocations to most traditional asset classes.
- The survey started tracking private credit in 3Q20, and since then interest in increasing allocations to the asset class has held steady, with no clients saying they plan to cut their allocations.

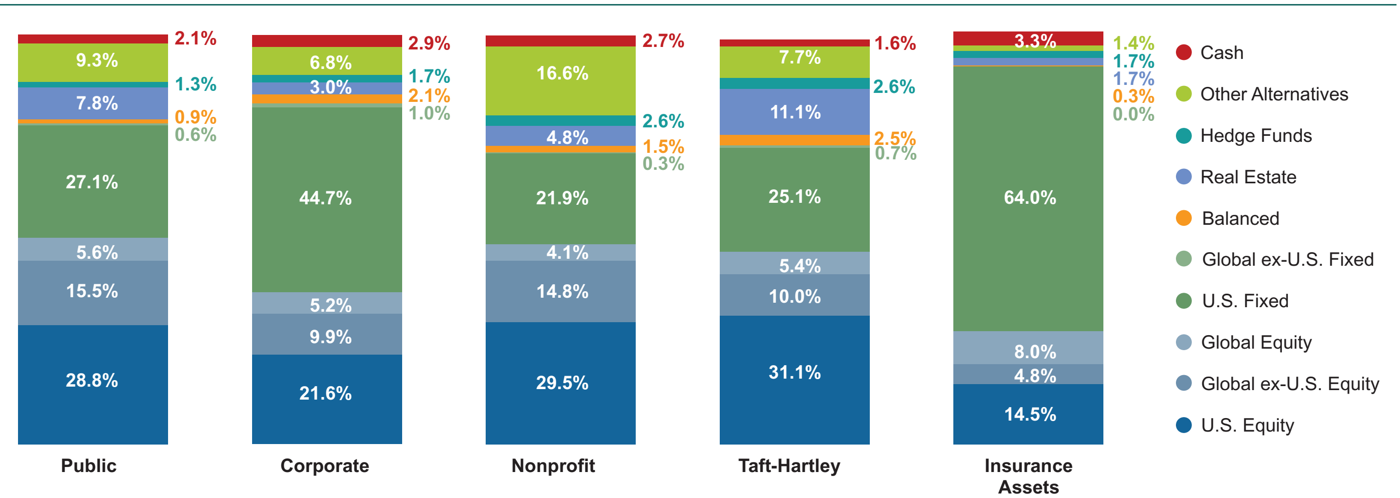
Key issues for defined contribution (DC) plans

- Use of passive target date funds hit an all-time high.
- Fees remained, as they have for years, the top issue, but some plans are focusing on participant communication amid the market turmoil.

Nonprofit priorities

- Nonprofits have expanded the depth and breadth of their private markets investments after a decade of high valuations in public markets growth assets. The inflation surge heightens concern about the erosion of the real values of their assets and distributions.
- According to our survey, there was a noticeable drop in their concerns about liquidity; interest in increasing private real estate allocations hit another high.
- There was also a significant decline in plans to increase private credit allocations between 1Q22 and 3Q22.

Average Asset Allocation, Callan Database Groups



Note: charts may not sum to 100% due to rounding. Other alternatives include but is not limited to: diversified multi-asset, private credit, private equity, and real assets.
Source: Callan

Equity

U.S. Equities

Worst three-quarter start to year in decades

- The S&P 500 Index fell 4.9% in 3Q22; all major U.S. indices across styles and market cap ranges were negative except for the Russell 2000 Growth Index, which gained 0.24%.
- During the quarter, all sectors posted negative returns except for Energy (+2%) and Consumer Discretionary (+4%). The return for Consumer Discretionary was aided by an exceptional July when the sector was up more than 18%. Returns for Real Estate and Communication Services were the worst, down 11% and 13%, respectively.
- Small cap (Russell 2000) outpaced large cap (Russell 1000) and growth outperformed value during the quarter, a reversal from previous quarters this year.
- Continued concerns around inflation and a potential recession, along with geopolitical headlines, contributed to a volatile and risk-averse environment.

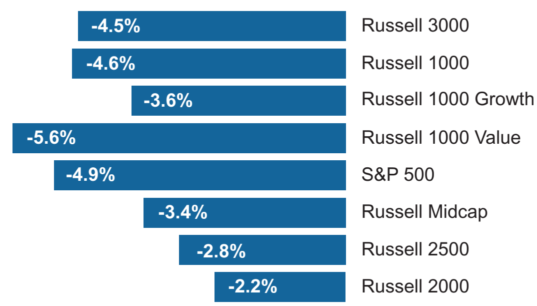
More market difficulties; no place to hide

- The pullback of the U.S. equity markets was reminiscent of other periods marked by bearish sentiment, such as 2008 (Global Financial Crisis) and 2020 (start of pandemic).
- High inflation and interest rates continued to pressure the markets. While some inflationary data (particularly around energy) seemed to soften, other data points around food, shelter, and services remained elevated.
- U.S. equity did not provide a safe haven for investors. Like most other asset classes, it has not generated YTD gains and continues to be overshadowed by the outsized outperformance of commodities.

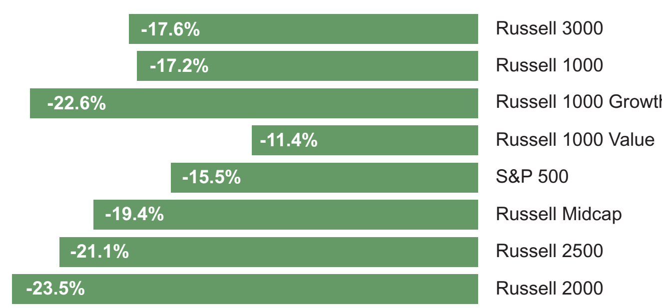
'Relief rally' but not for active managers

- The market experienced a "relief rally" in late June to August based on optimism that inflation had peaked, lessening the urgency for continued rate hikes.
- The rally was marked by a rebound of cyclical growth companies, and unprofitable companies outperformed profitable companies by wide margins across caps. Active managers underperformed significantly during this period.

U.S. Equity: Quarterly Returns (9/30/22)

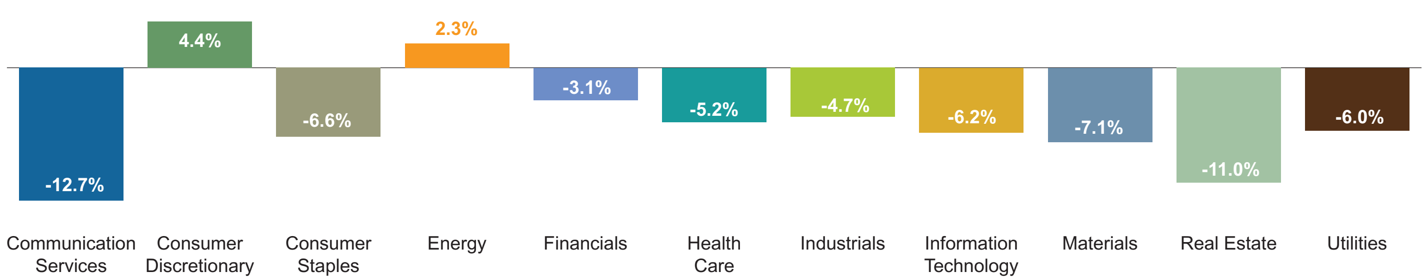


U.S. Equity: One-Year Returns (9/30/22)



Sources: FTSE Russell and S&P Dow Jones Indices

Quarterly Performance of Industry Sectors (9/30/22)



Source: S&P Dow Jones Indices

Global Equity

Market turmoil around the world

- Global and global ex-U.S. equity markets waned for three straight quarters due to inflation, rising rates, and fears of global recession.

Geopolitical and macro factors plague market

- Political instability in Italy and the U.K. as a result of prime minister departures weighed on the market.
- U.K. equities lost confidence as its newly elected prime minister Liz Truss announced her economic policy.
- China's COVID-19 lockdowns and growing concerns around the property sector sapped sentiment and economic activity.

Growth and value switch places globally

- Growth outpaced value in developed markets but lagged value in emerging markets.
- Rate-sensitive sectors in developed markets (e.g., Communication Services and Real Estate) were challenged given the tightening cycle by global central banks.
- The profitability of Chinese internet companies has compressed due to lockdowns and regulation, and a cyclical downturn in electronics weakened Taiwan and Korean semiconductors.

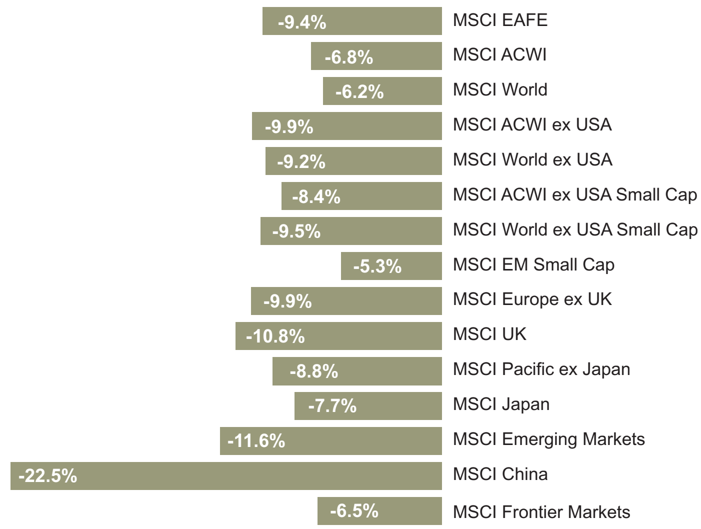
U.S. dollar vs. other currencies

- Growth and the interest rate differential as well as its safe-haven status fueled the U.S. dollar to its highest level in decades.
- The dollar gained vs. the euro and the yen by about 6%.

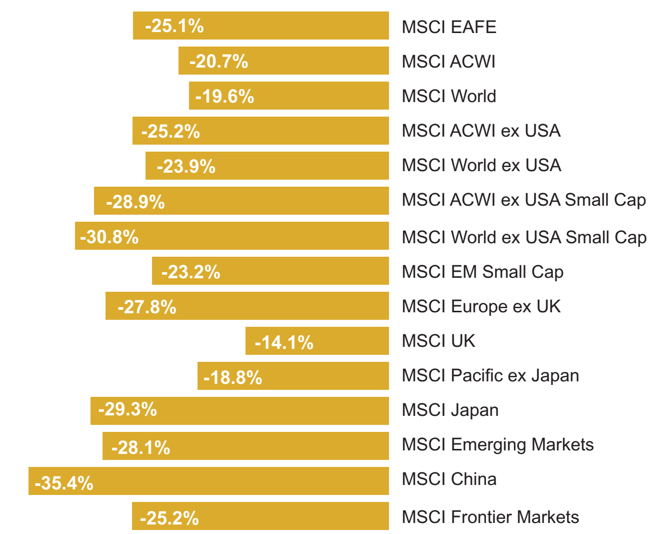
The case for global ex-U.S. equities

- Diversification: Global ex-U.S. equities remain a good diversifier to other public markets investments.
- Valuations/Yield: Valuation of U.S. stocks took off after the Global Financial Crisis (GFC); many of the tailwinds have dissipated—rates, inflation, and liquidity.
- Developed ex-U.S. stocks continue to be undervalued and currently provide a 1.6% yield premium to U.S. stocks (MSCI EAFE 3.5% vs. S&P 500 1.9%).

Global ex-U.S. Equity: Quarterly Returns (U.S. Dollar, 9/30/22)



Global ex-U.S. Equity: One-Year Returns (U.S. Dollar, 9/30/22)



Source: MSCI

- Economic exposure: Emerging market and developing economies' contribution to global GDP has increased while advanced economies' share has steadily decreased since the GFC.
- U.S. companies do not provide significant exposure to non-U.S. economies

Fixed Income

U.S. Fixed Income

Bonds hit hard as rates rose sharply (again)

- Bloomberg US Aggregate saw its worst nine-month return in its history—as did trailing 1-, 3-, 5-, and 10-year returns!
- 10-year annualized return for Aggregate is a mere 0.9%.
- Yield curve inverted at quarter-end; 10-year at 3.83% and 2-year at 4.22%
- 10-year at 4% briefly in late September; first time since 2009
- TIPS underperformed nominal Treasuries, and 10-year breakeven spreads fell to 2.11% from 2.33% as of 6/30/22.
- Fed raised rates by 150 bps during the quarter, bringing target to 3.0% to 3.25%.
- Median expectation from Fed is 4.4% at year-end and 4.6% at the end of 2023.
- Longer-term expectations are much lower.
- Volatility climbed to levels not seen since early 2020.

Spread sectors underperformed

- Mortgages had worst month ever vs. like-duration U.S. Treasuries in September; underperformed by 169 bps for 3Q.
- Corporates also underperformed: 33 bps of excess return.
- Bloomberg Corporate Bond Index yield-to-worst 5.7%
- High yield fared better and loans posted a positive return.
- Bloomberg High Yield Corp yield-to-worst 9.7%

Municipal Bonds

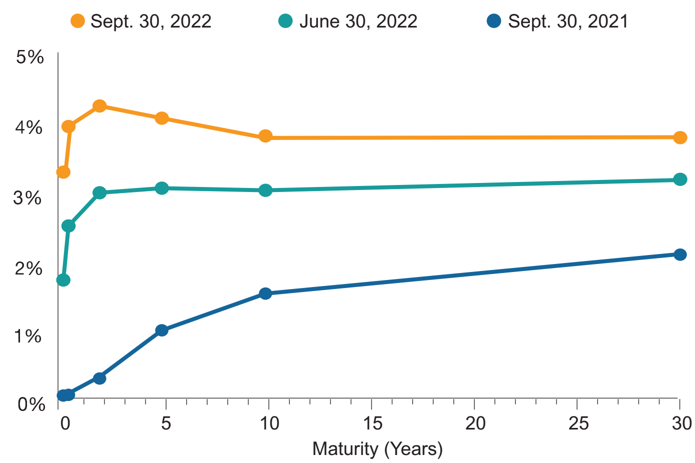
Municipal bond returns hurt by rising rates

- Lower quality continued to underperform.
- BBB: -4.1%; AAA: -3.5% (YTD BBB: -14.9%; AAA: -11.7%)

Valuations relative to U.S. Treasuries at fair value

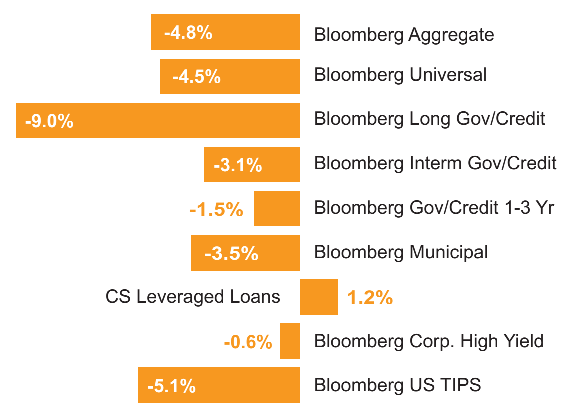
- 10-year AAA Muni/10-year U.S. Treasury yield ratio roughly 87%; in line with 10-year average
- Municipal Bond Index after-tax yield = 6.8% (source: Morgan Stanley)

U.S. Treasury Yield Curves



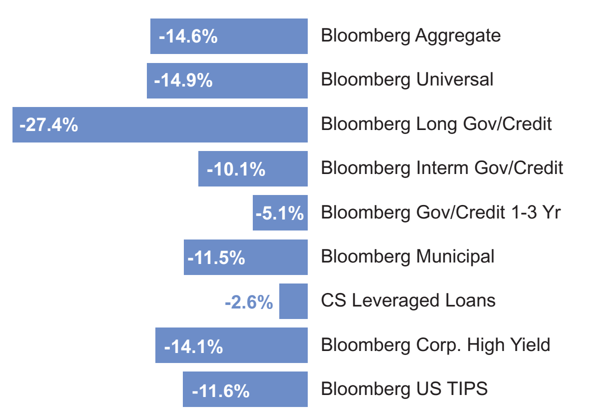
Source: Bloomberg

U.S. Fixed Income: Quarterly Returns (9/30/22)



Sources: Bloomberg and Credit Suisse

U.S. Fixed Income: One-Year Returns (9/30/22)



Sources: Bloomberg and Credit Suisse

Supply/demand

- Outflows of $91.5 billion YTD—highest cycle outflow since data series began in 1992
- YTD issuance down 14% vs. last year

Credit quality remains stable to improving

- State revenues up more than 18% vs. 2021
- Number of defaults lower than 2021 and concentrated in senior living and industrial revenue bonds

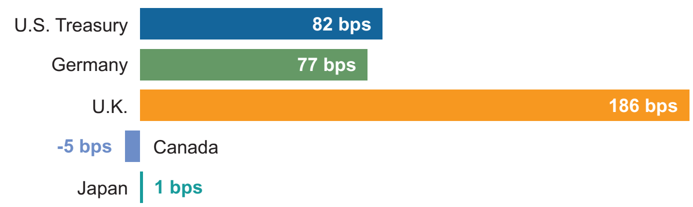
Global Fixed Income

Negative returns driven by broad interest rate increases

- U.S. dollar continued to appreciate vs. yen, euro, and pound
- Bank of Japan intervened to support currency for first time since 1998.
- Pound hit record low vs. U.S. dollar.
- Double-digit negative returns were widespread across developed markets.
- U.K. government bonds were hard-hit on U.K.'s "mini-budget" fiasco.
- ICE BofA U.K. Gilts Index -20.6% in 3Q
- Emerging market debt returns also sharply negative
- Most countries in the USD-denominated JPM EMBI Global Diversified Index posted negative returns, hurt by rising rates in the U.S.
- JPM GBI-EM Global Diversified also fell due largely to EM currency depreciation vs. the U.S. dollar.

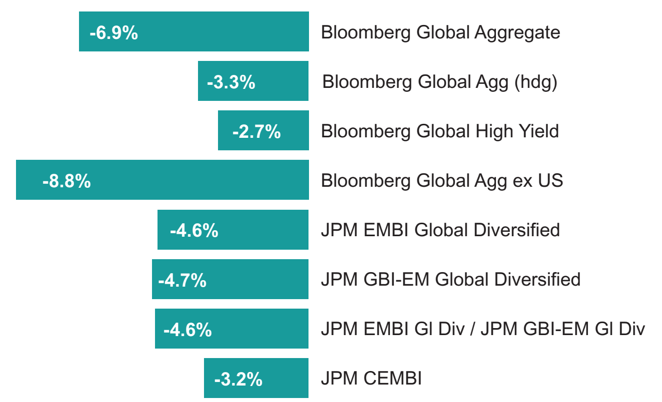
Change in 10-Year Global Government Bond Yields

2Q22 to 3Q22



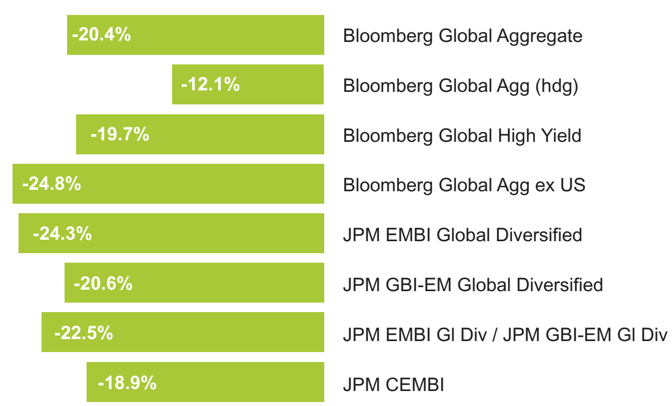
Source: Bloomberg

Global Fixed Income: Quarterly Returns (9/30/22)



Sources: Bloomberg and JPMorgan Chase

Global Fixed Income: One-Year Returns (9/30/22)



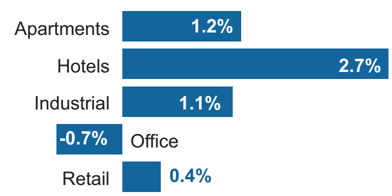
Sources: Bloomberg and JPMorgan Chase

NPI Shows Gains but REITs Lag Equity Indices

REAL ESTATE/REAL ASSETS | Munir Iman

- The NCREIF Property Index, an unlevered measure of U.S. institutional real estate assets, rose 0.6% during 3Q22. The income return was 0.9%; the appreciation return was -0.4%.
- Hotels, which represent a small portion of the index, led property sector performance with a gain of 2.7%. Office finished last with a loss of 0.7%.
- Regionally, the South led with a 1.1% gain, while the Midwest was the worst performer but still rose 0.2%.
- The NCREIF Open-End Diversified Core Equity Index, representing equity ownership positions in U.S. core real estate with leverage, rose 0.3% during 3Q, with an income return of 0.6% and an appreciation return of -0.3%.
- U.S. REITs underperformed the S&P 500 (-4.9%) but exhibited strong performance relative to European REITs. Real estate securities underperformed on the cloudy economic outlook as well as a sizeable upward move in U.S. government bond yields.
- While all property sectors traded lower during the quarter, the sectors that were most resilient included self-storage and hotels amid strong fundamentals and pricing power. Malls also outperformed after being a meaningful laggard year to date.
- The poorest-performing sectors included data centers, due to fears around power costs and higher cost of capital; office, due to sluggish return-to-office momentum; and health care, due to labor cost pressures in senior housing.
- The FTSE EPRA Nareit Developed Asia Index (USD) fell 9.4% during the quarter.
- Australian REITs (-11.5%) were the weakest performers in the region, driven by concerns over slowing demand in office and cap rate expansion in industrial stocks.
- The FTSE EPRA Nareit Developed Europe Index (USD) fell 21.7% during the quarter, led by the United Kingdom (-25.9%), which lagged on the new government's approach to a debt-financed fiscal expansion that resulted in a sharp decline in the pound and government bonds.
- Continental Europe (-19.2%) performed better on a relative basis, but was still weighed down by currency headwinds, accelerating inflation, rate hike expectations, soaring energy prices, and continued conflict between Russia and Ukraine.

Sector Quarterly Returns by Property Type (9/30/22)



Source: NCREIF

Callan Database Median and Index Returns* for Periods Ended 9/30/22

Private Real Assets	Quarter	Year to Date	1 Year	3 Years	5 Years	10 Years	15 Years
Real Estate ODCE Style	**3.1**	**14.8**	**23.3**	**12.4**	**9.9**	**10.4**	**6.0**
NFI-ODCE (value-weighted, net)	0.3	12.4	21.0	11.4	9.3	9.9	5.8
NCREIF Property	0.6	9.4	16.1	9.9	8.6	9.5	7.0
NCREIF Farmland	2.0	7.4	11.5	6.9	6.6	9.6	10.6
NCREIF Timberland	2.4	7.6	12.5	5.8	4.7	5.9	5.0
Public Real Estate							
Global Real Estate Style	**-11.4**	**-29.9**	**-22.0**	**-3.7**	**2.0**	**5.1**	**2.8**
FTSE EPRA Nareit Developed	-11.6	-29.9	-22.8	-6.5	-0.9	2.9	0.9
Global ex-U.S. Real Estate Style	**-13.8**	**-32.0**	**-30.8**	**-8.6**	**-2.3**	**3.7**	**0.7**
FTSE EPRA Nareit Dev ex US	-13.8	-31.4	-30.0	-10.1	-3.7	0.7	-1.2
U.S. REIT Style	**-10.4**	**-28.3**	**-16.6**	**-0.4**	**4.5**	**7.1**	**5.8**
FTSE EPRA Nareit Equity REITs	-9.9	-28.1	-16.4	-2.0	2.9	6.3	4.9

*Returns less than one year are not annualized.
Sources: Callan, FTSE Russell, NCREIF

Persistence Amid Volatility

PRIVATE EQUITY | Gary Robertson

Private equity activity measures in 3Q22 fell from 2Q, although totals reflect reasonable pre-pandemic levels. The IPO market for both venture capital and buyouts increased, but dollar volumes remained miniscule.

Fundraising ▶ Based on preliminary data, private equity partnerships holding final closes in 3Q totaled $226 billion, with 484 new partnerships formed (unless otherwise noted, all data are from PitchBook). The dollar volume fell 6% from 2Q22, and the number of funds holding final closes declined 9%. So far, capital raised is running only 2% behind YTD 2021, but the number of funds trails by 31%.

Buyouts ▶ New buyout transactions and dollar volume fell moderately. Funds closed 2,881 company investments with $152 billion of disclosed deal value, a 10% decrease in count and a 7% drop in dollar value from 2Q22.

VC Investments ▶ New financing rounds in venture capital companies totaled 9,985, with $97 billion of announced value. The number of investments was down 17% from the prior quarter, and the announced value plunged 32%.

Exits ▶ There were 594 private M&A exits of private equity-backed companies (excluding venture capital), with disclosed values totaling $128 billion. Exits fell 3% from the prior quarter and announced dollar volume dropped 10%. There were 62 private equity-backed IPOs in 3Q raising $11 billion, up from 46 totaling $7 billion in 2Q.

Venture-backed M&A exits totaled 520 transactions with disclosed value of $24 billion. The number of sales declined 26% but announced dollar volume fell only 4%. There were 104 VC-backed IPOs with a combined float of $15 billion.

Returns ▶ With the strong 2Q retreat in public equity markets, private equity outperformance has widened given private equity's more gradual quarterly mark-to-market valuation methodology. While GPs have put forward persistently high valuations relative to public markets, continued declines are expected.

Funds Closed 1/1/22 to 9/30/22

Strategy	No. of Funds	Amt ($mm)	Share
Venture Capital	1,030	222,528	32%
Growth Equity	106	81,859	12%
Buyouts	350	297,832	43%
Mezzanine Debt	13	24,423	3%
Distressed/Special Credit	29	36,121	5%
Energy	7	2,050	0%
Secondary and Other	81	29,338	4%
Fund-of-funds	20	5,807	1%
Totals	**1,636**	**699,958**	**100%**

Source: PitchBook (Figures may not total due to rounding.)

Private Equity Performance (%) (Pooled Horizon IRRs through 6/30/22*)

Strategy	Quarter	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years	25 Years
All Venture	-8.5	0.8	29.2	25.2	19.5	14.0	12.1	22.6
Growth Equity	-7.6	-3.1	21.4	19.7	16.1	13.1	14.1	14.9
All Buyouts	-4.5	5.4	19.7	17.6	15.8	10.8	14.5	13.3
Mezzanine	-0.5	9.3	12.1	11.9	11.6	10.3	11.0	10.1
Credit Opportunities	-1.7	5.4	7.9	7.4	8.8	8.6	9.8	9.6
Control Distressed	-1.1	20.5	20.0	14.5	13.4	10.7	12.0	12.0
All Private Equity	**-5.7**	**3.6**	**21.2**	**18.6**	**15.9**	**11.5**	**13.5**	**14.1**
S&P 500	-16.1	-10.6	10.6	11.3	13.0	8.5	9.1	8.0
Russell 3000	-16.7	-13.9	9.8	10.6	12.6	8.4	9.1	8.1

Note: Private equity returns are net of fees. Sources: Refinitiv/Cambridge and S&P Dow Jones Indices
*Most recent data available at time of publication

Note: Transaction count and dollar volume figures across all private equity measures are preliminary figures and are subject to update in subsequent versions of the *Capital Markets Review* and other Callan publications.

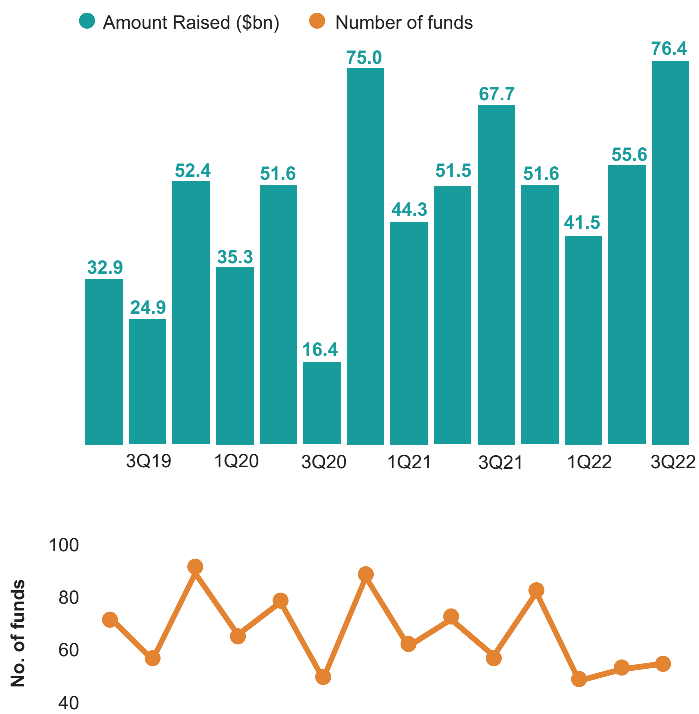
Appealing to Investors in Low-Yield Climate

PRIVATE CREDIT | Catherine Beard

Illiquidity premium close to zero

- There is continued strong private credit demand in a rising rate environment where the returns of floating-rate loans are bolstered.
- During 3Q22, clients moved away from new allocations to traditional sponsor-backed direct lending due to the increased competition and commoditization within the space.
- Demand has continued to be robust for less-competitive areas of private credit with high barriers to entry and attractive risk/reward opportunities.
  - Includes opportunistic lending, specialty finance, and industry or other niche-focused lending strategies such as venture debt and health care lending
- Limited partners (LPs) are seeking alternative structures designed to streamline the investment process while improving underlying liquidity. A number of general partners are launching evergreen structures as a response to LP interest.
- Private credit fundraising was robust leading into the COVID dislocation with a particular focus on direct lending, asset-based lending, and distressed strategies.
- Fundraising activity increased year-over-year, with $68 billion in capital raised in 3Q21 vs. $76 billion in 3Q22.
- The average fund size year-over-year increased from $1.4 billion in 3Q21 to $1.6 billion in 3Q22 as established managers grow fund sizes in response to strong LP demand.
- For mature private credit programs, demand is increasing for diversifying strategies like specialty finance and royalties' strategies to capture opportunities outside of traditional sponsor-backed direct lending.

Private Credit Fundraising ($bn)



Source: Preqin

Private Credit Performance (%) (Pooled Horizon IRRs through 6/30/22*)

Strategy	Quarter	1 Year	3 Years	5 Years	8 Years	10 Years	15 Years	20 Years
Senior Debt	-2.2	0.0	5.3	6.3	6.3	6.5	6.8	6.7
Mezzanine	-0.5	9.3	12.1	11.9	11.1	11.6	10.3	11.0
Credit Opportunities	-1.7	5.4	7.9	7.4	6.4	8.8	8.6	9.8
Total Private Credit	-1.6	5.0	8.3	8.2	7.4	9.1	8.8	9.7

Source: Refinitiv/Cambridge
*Most recent data available at time of publication

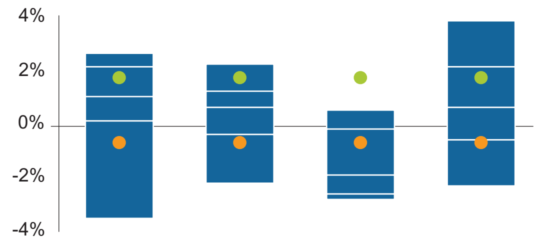
Managers See Declines but Outpace Benchmarks

HEDGE FUNDS/MACs | Joe McGuane

Global markets were volatile throughout 3Q22, as persistent inflation, slowing economic growth, and interest rate hikes by central banks caused most asset classes to fall. The S&P 500 dropped 4.9% as U.S. equities ended 3Q back in bear market territory, reversing a bounce upward that began in the final weeks of 2Q. Within technology, the Nasdaq ended the quarter down 4.0%, as the communication and media sectors fell meaningfully for the quarter, slightly offset by mega-cap stocks like Apple, Amazon, and Tesla. Credit markets remained choppy for the quarter as high yield bond prices whipsawed.

Hedge funds again finished the quarter lower but outperformed broader market indices, as equity hedge strategies that focused on growth spaces like tech, media, and telecom continued to be a drag on performance. Some of those declines were offset by managers that focused on the energy sector.

Hedge Fund Style Group Returns (9/30/22)



	Absolute Return FOF	Core Div. FOF	Long/Short Equity FOF	Institutional Hedge Funds
10th Percentile	2.6	2.2	0.5	3.8
25th Percentile	2.1	1.2	-0.2	2.1
Median	1.0	0.6	-1.9	0.6
75th Percentile	0.1	-0.4	-2.6	-0.6
90th Percentile	-3.5	-2.2	-2.8	-2.3
HFRI Fund Weighted ●	-0.7	-0.7	-0.7	-0.7
90-Day T-Bill +5% ●	1.7	1.7	1.7	1.7

Sources: Callan, Credit Suisse, Federal Reserve

Callan Peer Group Median and Index Returns* for Periods Ended 9/30/22

Hedge Fund Universe	Quarter	Year to Date	1 Year	3 Years	5 Years	10 Years
Callan Institutional Hedge Fund Peer Group	**0.6**	**3.2**	**4.0**	**5.4**	**6.0**	**6.2**
Callan Fund-of-Funds Peer Group	**0.5**	**-3.4**	**-3.5**	**4.7**	**3.8**	**4.3**
Callan Absolute Return FOF Style	**1.0**	**3.0**	**3.0**	**5.9**	**4.3**	**4.6**
Callan Core Diversified FOF Style	**0.6**	**-4.3**	**-4.2**	**4.7**	**3.7**	**4.1**
Callan Long/Short Equity FOF Style	**-1.9**	**-13.5**	**-15.5**	**2.7**	**2.9**	**4.3**
HFRI Fund-Weighted Index	-0.7	-6.3	-5.9	6.1	4.5	4.6
HFRI Fixed Convertible Arbitrage	0.9	-4.1	-2.6	6.0	4.8	5.0
HFRI Distressed/Restructuring	-1.4	-5.0	-4.3	7.1	4.8	5.0
HFRI Emerging Markets	-5.5	-16.9	-17.3	1.8	0.7	2.9
HFRI Equity Market Neutral	0.7	0.4	1.0	2.5	2.1	3.0
HFRI Event-Driven	-0.4	-7.7	-6.8	5.2	4.0	4.9
HFRI Relative Value	0.0	-2.1	-1.9	3.5	3.3	4.1
HFRI Macro	1.8	10.5	10.1	7.8	5.6	3.1
HFRI Equity Hedge	-2.3	-13.8	-13.2	6.2	4.4	5.3
HFRI Multi-Strategy	-1.7	-10.8	-11.9	4.2	2.0	3.0
HFRI Merger Arbitrage	2.3	0.3	1.9	6.1	5.2	4.5
90-Day T-Bill + 5%	1.7	4.3	5.6	5.6	6.1	5.7

*Net of fees. Sources: Callan, Credit Suisse, Hedge Fund Research

Serving as a proxy for large, broadly diversified hedge funds with low-beta exposure to equity markets, the median member of the Callan Institutional Hedge Fund Peer Group rose 0.6%. Within this style group of 50 peers, the average rates manager gained 1.9%, driven by the continued volatility in interest rates. Meanwhile, hedged credit managers were slightly higher at 0.6%, as managers were actively trading around interest rate volatility. The average equity hedge manager gained 1.9%, as this group of managers was able to profit off dispersion in equity indices.

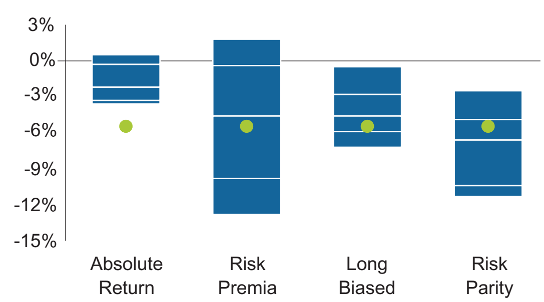
Within the HFRI indices, the best-performing strategy last quarter continued to be macro (+1.8%), aided by its exposure to commodities, currencies, and rates trading. Equity hedge had its third consecutive quarter of negative performance (-2.3%), as managers with a focus on growth sectors continued to be the main drag on performance.

Across the Callan Hedge FOF Database, the median Absolute Return FOF gained 1.0%, the median Callan Long-Short Equity FOF fell 1.9%, and the median Callan Core Diversified FOF rose 0.6%.

The Bloomberg GSAM Risk Premia Index increased 3.0% based upon a 6% volatility target. Within the underlying styles of the index's derivative-based risk premia, Bond Futures Value (+5.8%) and FX Trend (+4.7%) profited from the volatility in interest rates, along with commodity and currency exposures. The weakest risk premia strategy was FX G10 Value (-1.6%).

Within Callan's database of liquid alternative solutions, the median manager in the Callan Multi-Asset Class (MAC) Style Groups generated lower returns for the quarter, gross of fees, consistent with their underlying risk exposures. For example, the median Callan Long Biased MAC manager fell 4.6%, as exposure to equity and fixed income continued to be a drag on performance. The Callan Risk Parity MAC Index, which typically targets an equity risk-weighted allocation to the major asset classes with leverage, fell 6.6%.

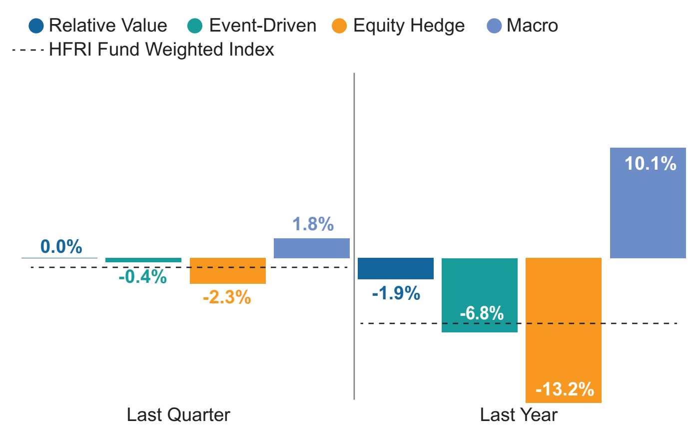
MAC Style Group Returns (9/30/22)



	Absolute Return	Risk Premia	Long Biased	Risk Parity
10th Percentile	0.5	1.8	-0.5	-2.5
25th Percentile	-0.3	-0.4	-2.8	-4.9
Median	-2.2	-4.6	-4.6	-6.6
75th Percentile	-3.3	-9.8	-5.9	-10.4
90th Percentile	-3.6	-12.8	-7.2	-11.3
60% MSCI ACWI/ 40% Bloomberg Agg ●	-5.9	-5.9	-5.9	-5.9

Sources: Bloomberg, Callan, Eurekahedge, S&P Dow Jones Indices

HFRI Hedge Fund-Weighted Strategy Returns (9/30/22)



Source: HFRI

DC Index Sees Third-Worst Decline Ever

DEFINED CONTRIBUTION | Patrick Wisdom

Performance: Index dips again

- The Callan DC Index™ fell 12.2% in 2Q22, its third-largest quarterly decline ever.
- The Age 45 Target Date Fund fell 13.4%.

Growth Sources: Balances take a hit

- Balances within the DC Index declined by 12.3% after a 5.4% decrease the previous quarter.

Turnover: Net transfers fall

- Turnover (i.e., net transfer activity levels within DC plans) decreased to 0.37% from the previous quarter's 0.42%.

Net Cash Flow Analysis: Stable value takes top spot

- Bucking the trend of the last five quarters, TDFs (29.1% of net flows) took a back seat to stable value, which received 47.7% of net flows in perhaps a signal that some participants sought a flight to safety.
- Also of note, real return/TIPS (0.6%) did not attract a large share of flows, even as inflation has remained elevated.

Equity Allocation: Exposure drops sharply

- The Index's overall allocation to equity (69.8%) fell meaningfully from the previous quarter's level (72.0%), which had been within reach of the Index's high mark of 4Q07 (72.9%). The decrease was driven by a combination of investor outflows and declines in equity markets.

Asset Allocation: U.S. large cap equity falls

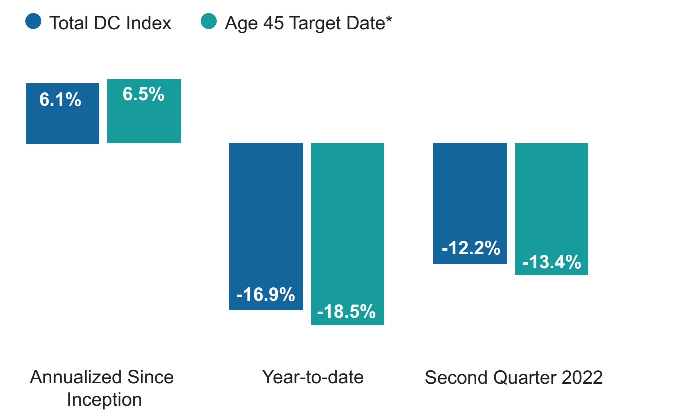
- U.S. large cap (25.1%) had the largest percentage decrease in allocation.
- Stable value (10.0%) had the largest percentage increase.

Prevalence of Asset Class: Balanced funds dip again

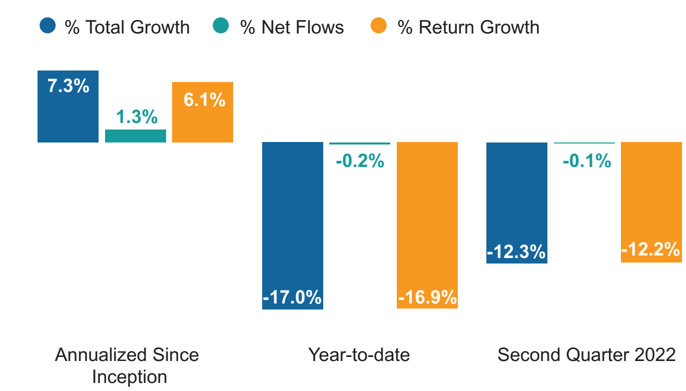
- The prevalence of a balanced fund (41.4%) decreased again to its lowest level since the inception of the Index in 2006.
- Other notable movements included a 1.1 percentage point decrease in the prevalence of a money market offering (49.6%); on the other hand, the prevalence of a real estate offering (21.8%) increased by 0.6 percentage points.

Underlying fund performance, asset allocation, and cash flows of more than 100 large defined contribution plans representing approximately $400 billion in assets are tracked in the Callan DC Index.

Investment Performance (6/30/22)



Growth Sources (6/30/22)



Net Cash Flow Analysis (2Q22)
(Top Two and Bottom Two Asset Gatherers)

Asset Class	Flows as % of Total Net Flows
Stable Value	47.7%
Target Date Funds	29.1%
U.S. Fixed Income	-19.5%
U.S. Large Cap	-48.1%
Total Turnover**	**0.37%**

Data provided here is the most recent available at time of publication.

Source: Callan DC Index

Note: DC Index inception date is January 2006.

* The Age 45 Fund transitioned from the average 2035 TDF to the 2040 TDF in June 2018.

** Total Index "turnover" measures the percentage of total invested assets (transfers only, excluding contributions and withdrawals) that moved between asset classes.

Total Fund

Investment Manager Asset Allocation

The table below contrasts the distribution of assets across the Fund's investment managers as of September 30, 2022, with the distribution as of June 30, 2022.

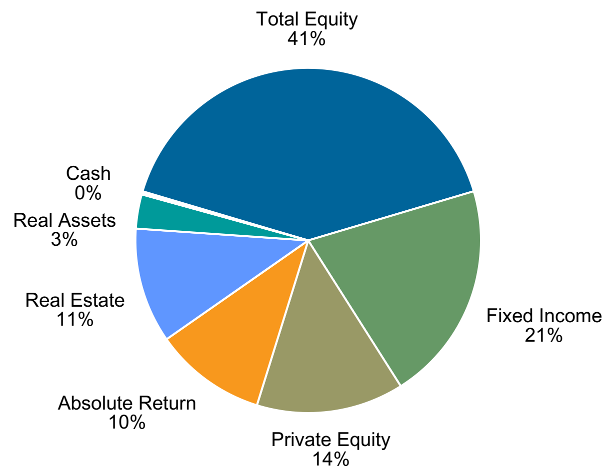
Asset Distribution Across Investment Managers

	September 30, 2022		June 30, 2022	
	Market Value	**Weight**	**Market Value**	**Weight**
Total Domestic Equity	**$1,004,422,485**	**19.04%**	**$1,070,256,720**	**19.00%**
BlackRock Russell 1000 Value	184,380,302	3.49%	141,446,858	2.51%
DFA Large Cap Value	133,161,129	2.52%	140,730,102	2.50%
Northern Trust Global	213,518,523	4.05%	289,720,143	5.14%
Polen Capital Management	127,889,338	2.42%	139,966,344	2.48%
Earnest Partners LLC	97,854,432	1.85%	103,691,710	1.84%
DFA Small Cap Value	168,408,832	3.19%	174,051,599	3.09%
CastleArk Management	79,209,929	1.50%	80,649,963	1.43%
Total Global Equity	**$389,617,509**	**7.38%**	**$421,452,750**	**7.48%**
BlackRock Global Alpha Tilts	227,465,237	4.31%	245,862,083	4.36%
MFS Investment Management	162,152,272	3.07%	175,590,667	3.12%
Total International Equity	**$762,113,942**	**14.44%**	**$841,508,868**	**14.94%**
AQR Emerging Markets	68,504,708	1.30%	78,538,816	1.39%
Brandes Investment Partners	297,467,028	5.64%	337,504,272	5.99%
William Blair & Company	238,613,385	4.52%	259,090,729	4.60%
DFA International Small Cap	157,528,821	2.99%	166,375,050	2.95%
Total Fixed Income	**$1,087,309,840**	**20.61%**	**$1,217,919,587**	**21.62%**
BlackRock US Govt Bond	262,553,288	4.98%	304,037,990	5.40%
Reams Asset Management	488,308,869	9.26%	553,352,425	9.82%
Loomis, Sayles & Company, L.P.	336,447,684	6.38%	360,529,171	6.40%
Total Private Equity	**$726,042,198**	**13.76%**	**$765,319,709**	**13.58%**
Abbott Capital Management 2010	23,347,046	0.44%	27,065,426	0.48%
Abbott Capital Management 2011	47,323,208	0.90%	55,329,663	0.98%
Abbott Capital Management 2012	41,854,246	0.79%	48,214,460	0.86%
Abbott Capital Management 2013	40,721,219	0.77%	46,725,968	0.83%
Abbott Capital Management 2014	46,093,103	0.87%	51,294,490	0.91%
Abbott Capital Management 2015	35,270,416	0.67%	37,767,328	0.67%
Abbott Capital Management 2016	28,253,925	0.54%	29,637,407	0.53%
Abbott Capital Management 2018	20,392,486	0.39%	19,982,940	0.35%
Abbott Capital Management 2019	16,935,416	0.32%	14,701,270	0.26%
Abbott Capital Management 2020	17,193,929	0.33%	17,392,726	0.31%
Abbott Capital Management 2021	6,169,260	0.12%	4,845,758	0.09%
Abbott Capital Management 2022	5,383,816	0.10%	1,212,100	0.02%
Mesirow V	47,671,706	0.90%	55,052,439	0.98%
Mesirow VI	74,761,820	1.42%	85,253,616	1.51%
Mesirow VII	121,745,407	2.31%	122,621,933	2.18%
Mesirow VIII	36,569,307	0.69%	36,750,733	0.65%
NB Secondary Opp Fund III	7,899,732	0.15%	8,446,195	0.15%
NB Secondary Opp Fund IV	18,240,430	0.35%	18,568,328	0.33%
NB Secondary Opp Fund V	10,761,635	0.20%	9,040,512	0.16%
Private Advisors VI	22,870,482	0.43%	23,466,883	0.42%
Private Advisors VII	15,313,691	0.29%	15,770,069	0.28%
Private Advisors VIII	16,559,772	0.31%	15,222,546	0.27%
Private Advisors IX	24,710,146	0.47%	20,956,919	0.37%
Absolute Return	**$551,864,157**	**10.46%**	**$463,617,768**	**8.23%**
Aptitude	85,238,000	1.62%	-	-
UBS A & Q	466,626,157	8.84%	463,617,768	8.23%
Real Assets	**$168,887,943**	**3.20%**	**$198,354,663**	**3.52%**
Principal DRA	168,887,943	3.20%	198,354,663	3.52%
Total Real Estate	**$569,084,172**	**10.79%**	**$610,309,679**	**10.83%**
Real Estate	569,084,172	10.79%	610,309,679	10.83%
Total Cash	**$16,789,067**	**0.32%**	**$44,994,945**	**0.80%**
Cash	16,789,067	0.32%	44,994,945	0.80%
Total Fund	**$5,276,131,314**	**100.0%**	**$5,633,734,690**	**100.0%**

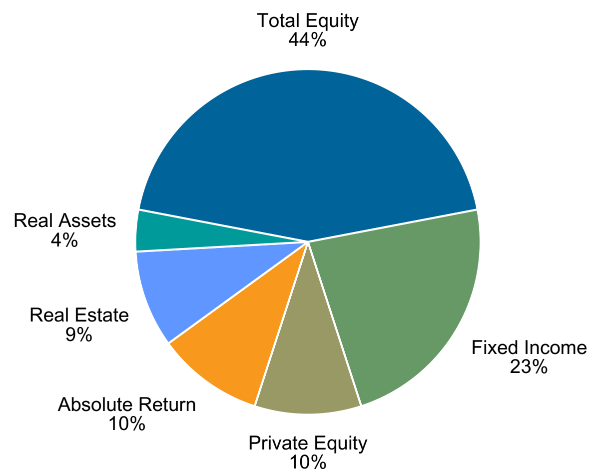
Actual vs Target Asset Allocation
As of September 30, 2022

The first chart below shows the Fund's asset allocation as of September 30, 2022. The second chart shows the Fund's target asset allocation as outlined in the investment policy statement.

Actual Asset Allocation



Target Asset Allocation



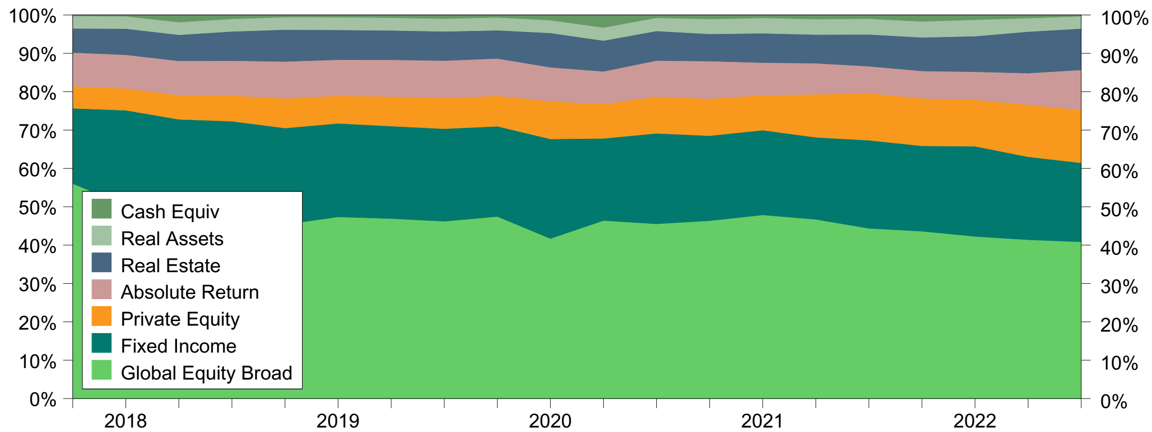
Asset Class	$000s Actual	Weight Actual	Target	Percent Difference	$000s Difference
Total Equity	2,156,154	40.9%	44.0%	(3.1%)	(165,344)
Fixed Income	1,087,310	20.6%	23.0%	(2.4%)	(126,200)
Private Equity	726,042	13.8%	10.0%	3.8%	198,429
Absolute Return	551,864	10.5%	10.0%	0.5%	24,251
Real Estate	569,084	10.8%	9.1%	1.7%	88,956
Real Assets	168,888	3.2%	3.9%	(0.7%)	(36,881)
Cash	16,789	0.3%	0.0%	0.3%	16,789
Total	5,276,131	100.0%	100.0%		

* Current Quarter Target = 44.0% MSCI ACWI IMI, 23.0% Blmbg Aggregate, 10.0% Russell 3000 Index lagged 3 months+2.0%, 10.0% 3-month Treasury Bill+3.0%, 9.1% NCREIF NFI-ODCE Eq Wt Net lagged 3 months and 3.9% Principal DRA Blend Index.

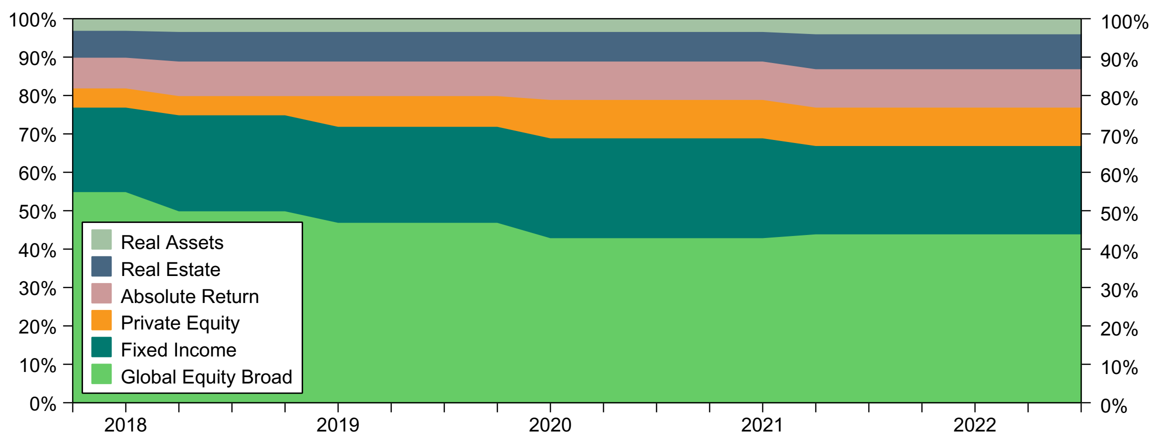
Actual vs Target Historical Asset Allocation

The Historical asset allocation for a fund is by far the largest factor explaining its performance. The charts below show the fund's historical actual asset allocation, the fund's historical target asset allocation, and the historical asset allocation of the average fund in the Callan Public Fund Sponsor Database.

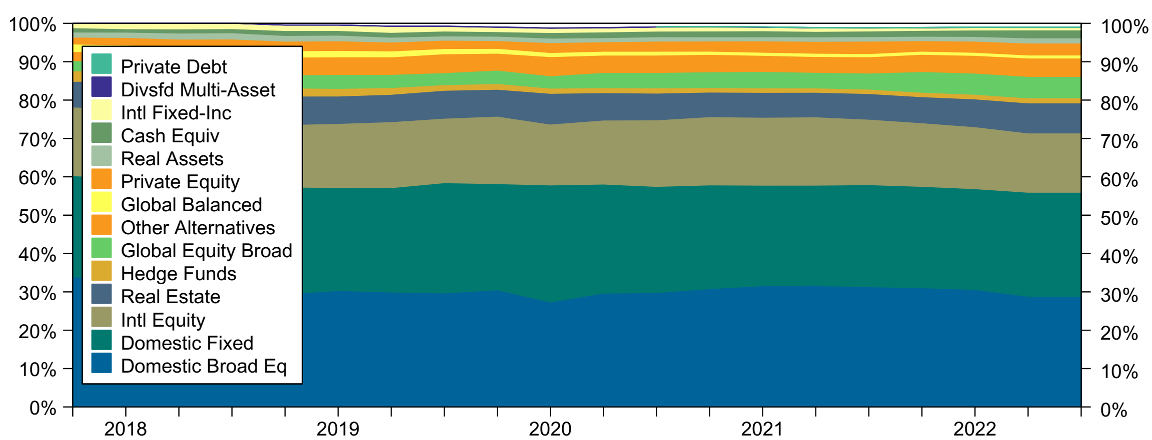
Actual Historical Asset Allocation



Target Historical Asset Allocation



Average Callan Public Fund Sponsor Database Historical Asset Allocation



* Current Quarter Target = 44.0% MSCI ACWI IMI, 23.0% Blmbg Aggregate, 10.0% Russell 3000 Index lagged 3 months+2.0%, 10.0% 3-month Treasury Bill+3.0%, 9.1% NCREIF NFI-ODCE Eq Wt Net lagged 3 months and 3.9% Principal DRA Blend Index.

Total Fund
Period Ended September 30, 2022

Investment Philosophy

The Public Fund Sponsor Database consists of public employee pension total funds including both Callan Associates client and surveyed non-client funds. Current Quarter Target = 44.0% MSCI ACWI IMI, 23.0% Blmbg Aggregate, 10.0% Russell 3000 Index lagged 3 months+2.0%, 10.0% 3-month Treasury Bill+3.0%, 9.1% NCREIF NFI-ODCE Eq Wt Net lagged 3 months and 3.9% Principal Blended Benchmark.

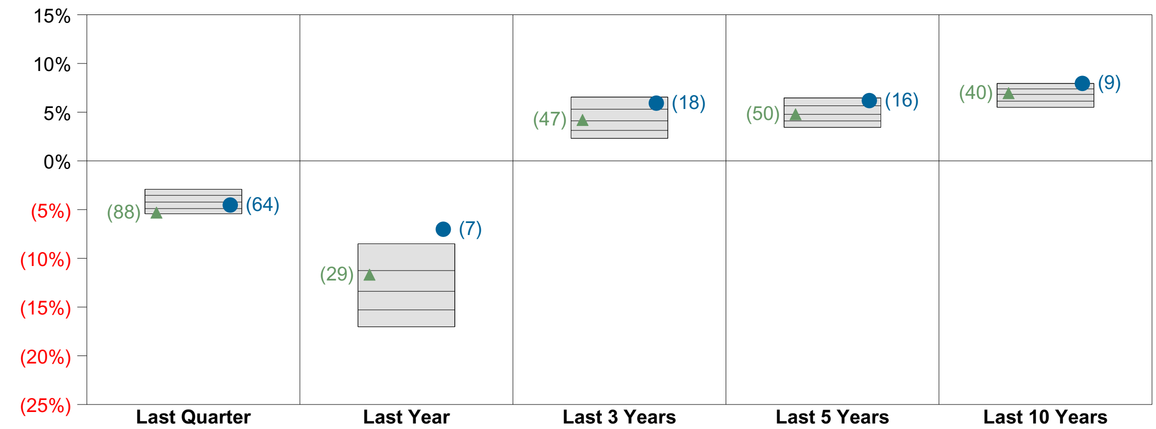
Quarterly Summary and Highlights

- Total Fund's portfolio posted a (4.53)% return for the quarter placing it in the 64 percentile of the Callan Public Fund Sponsor Database group for the quarter and in the 7 percentile for the last year.
- Total Fund's portfolio outperformed the Total Fund Index by 0.78% for the quarter and outperformed the Total Fund Index for the year by 4.66%.

Quarterly Asset Growth

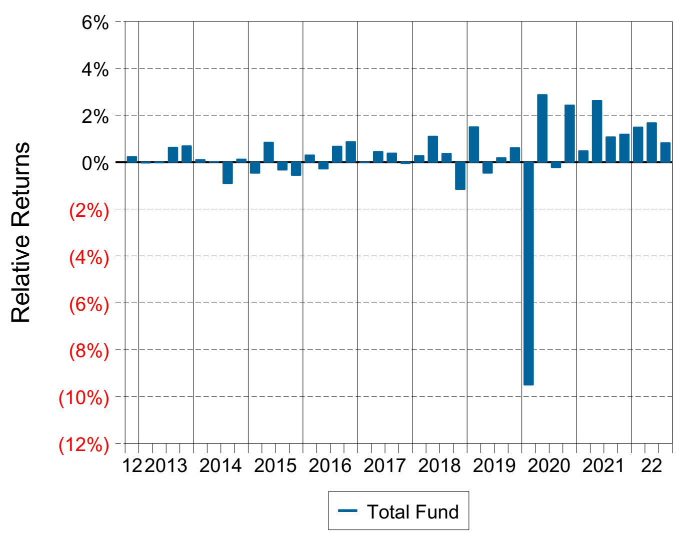
Beginning Market Value	$5,633,734,690
Net New Investment	$-110,105,352
Investment Gains/(Losses)	$-247,498,024
Ending Market Value	$5,276,131,314

Performance vs Callan Public Fund Sponsor Database (Gross)

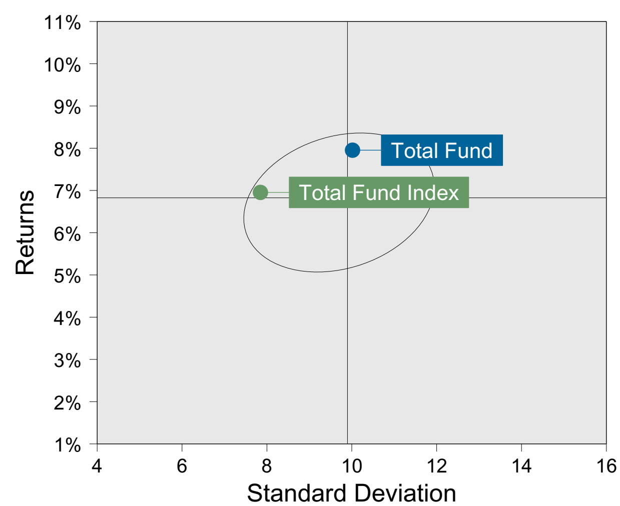


	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	(2.91)	(8.50)	6.55	6.46	7.95
25th Percentile	(3.54)	(11.25)	5.31	5.66	7.39
Median	(4.23)	(13.39)	4.11	4.78	6.83
75th Percentile	(4.89)	(15.29)	3.13	4.10	6.13
90th Percentile	(5.43)	(17.03)	2.32	3.44	5.50
Total Fund ●	(4.53)	(7.02)	5.93	6.19	7.95
Total Fund Index ▲	(5.31)	(11.67)	4.21	4.79	6.95

Relative Return vs Total Fund Index



Callan Public Fund Sponsor Database (Gross) Annualized Ten Year Risk vs Return

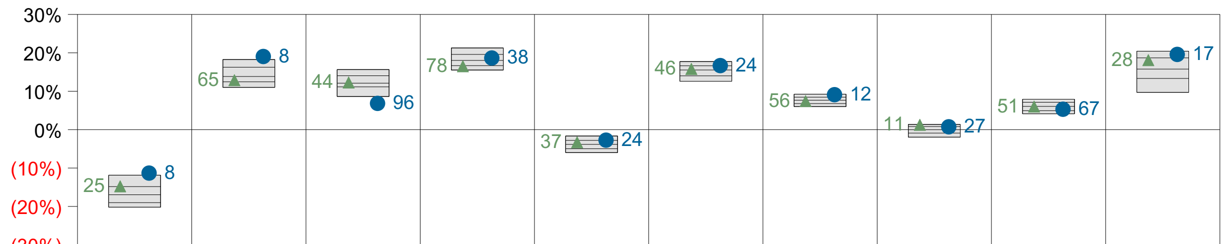


Total Fund
Return Analysis Summary

Return Analysis

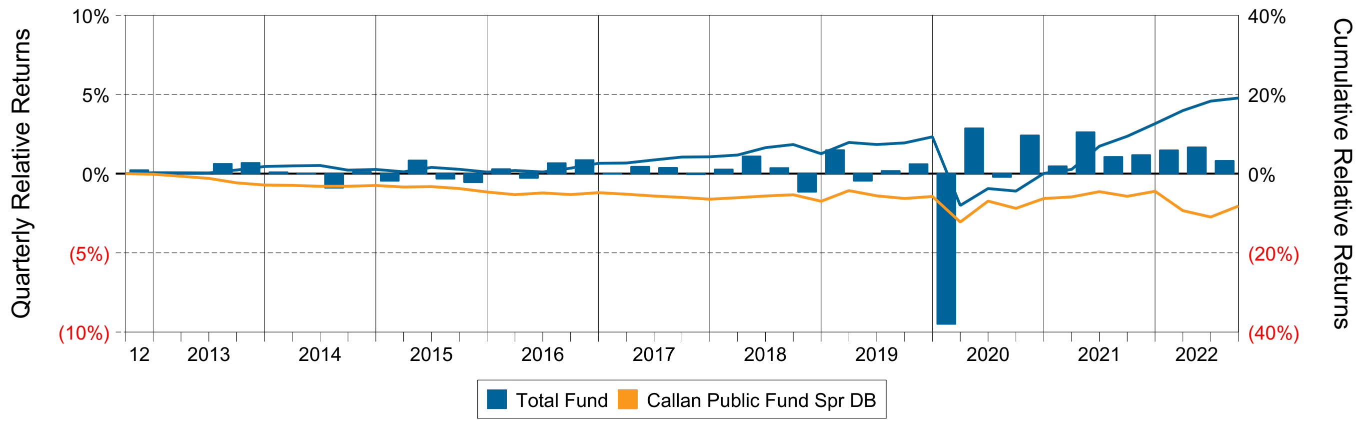
The graphs below analyze the manager's return on both a risk-adjusted and unadjusted basis. The first chart illustrates the manager's ranking over different periods versus the appropriate style group. The second chart shows the historical quarterly and cumulative manager returns versus the appropriate market benchmark. The last chart illustrates the manager's ranking relative to their style using various risk-adjusted return measures.

Performance vs Callan Public Fund Sponsor Database (Gross)

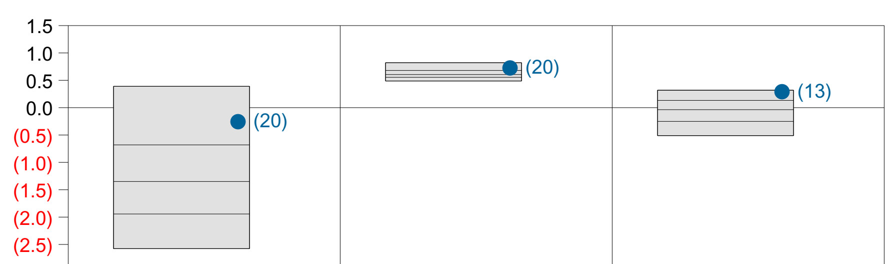


		12/21- 9/22	2021	2020	2019	2018	2017	2016	2015	2014	2013
10th Percentile		(11.86)	18.25	15.65	21.28	(1.65)	17.73	9.23	1.36	7.92	20.43
25th Percentile		(14.83)	16.25	14.04	19.59	(2.80)	16.63	8.46	0.82	7.13	18.69
Median		(16.96)	13.84	12.10	18.03	(3.83)	15.54	7.67	(0.02)	6.05	15.77
75th Percentile		(19.01)	12.45	11.14	16.66	(4.96)	14.01	6.79	(0.90)	4.94	13.33
90th Percentile		(20.19)	11.01	8.63	15.52	(5.98)	12.60	6.00	(1.96)	4.13	9.71
Total Fund	●	(11.31)	19.05	6.84	18.66	(2.74)	16.68	9.11	0.74	5.31	19.59
Total Fund Index	▲	(14.75)	12.88	12.29	16.52	(3.29)	15.80	7.43	1.27	6.02	18.10

Cumulative and Quarterly Relative Returns vs Total Fund Index



Risk Adjusted Return Measures vs Total Fund Index
Rankings Against Callan Public Fund Sponsor Database (Gross)
Ten Years Ended September 30, 2022



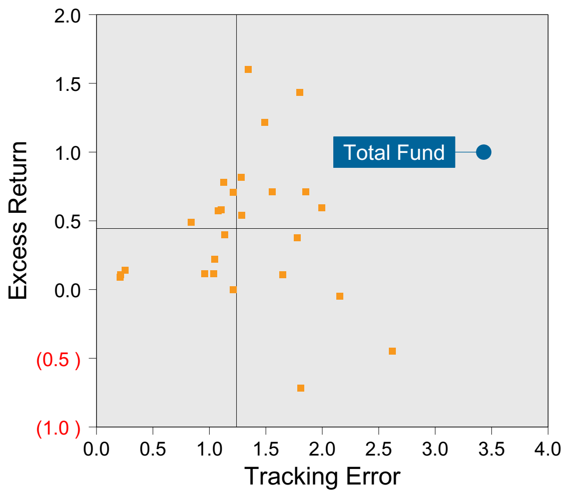
		Alpha	Sharpe Ratio	Excess Return Ratio
10th Percentile		0.39	0.82	0.32
25th Percentile		(0.68)	0.68	0.13
Median		(1.35)	0.61	(0.04)
75th Percentile		(1.94)	0.56	(0.25)
90th Percentile		(2.58)	0.49	(0.51)
Total Fund	●	(0.26)	0.73	0.29

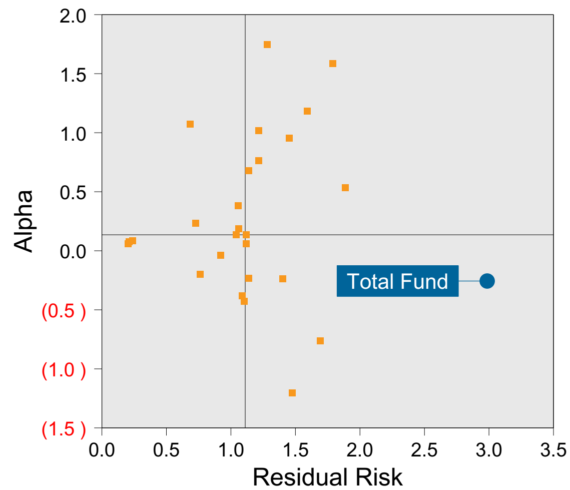
Total Fund
Total Fund vs Target Risk Analysis

Risk Analysis

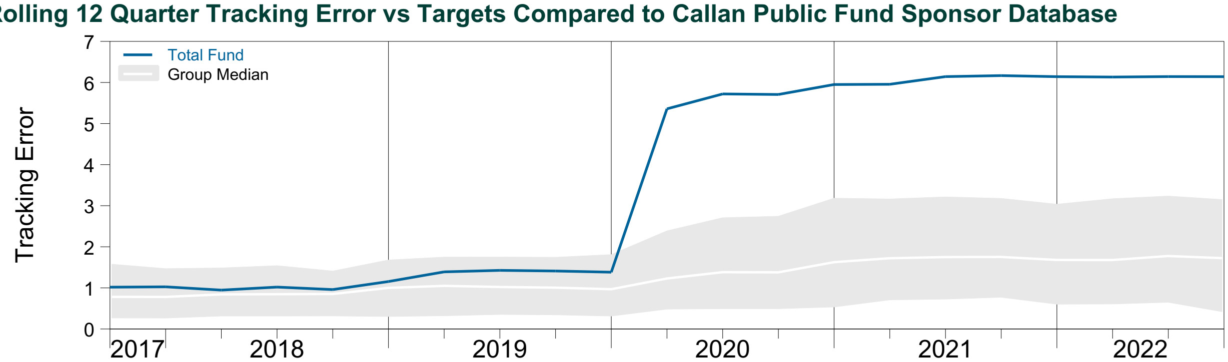
The graphs below analyze the performance and risk of the fund relative to the appropriate target mix. This relative performance is compared to a peer group of funds wherein each member fund is measured against its own target mix. The first scatter chart illustrates the relationship, called Excess Return Ratio, between excess return and tracking error relative to the target. The second scatter chart displays the relationship, sometimes called Information Ratio, between alpha (market-risk or "beta" adjusted return) and residual risk (non-market or "unsystematic" risk). The third chart shows tracking error patterns over time compared to the range of tracking error patterns for the peer group. The last two charts show the ranking of the fund's risk statistics versus the peer group.

Risk Analysis vs Callan Public Fund Sponsor Database
Ten Years Ended September 30, 2022

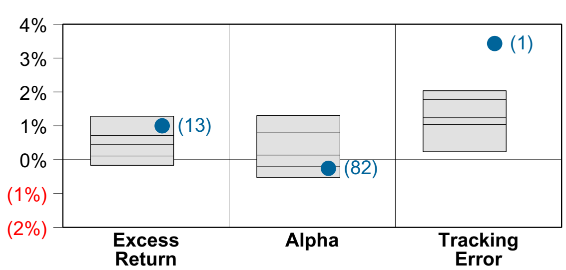




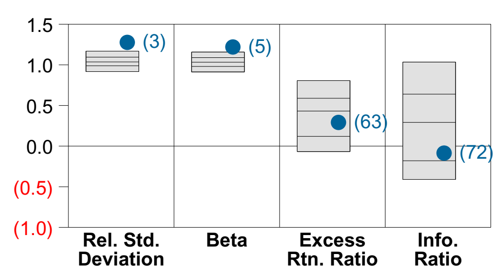
Rolling 12 Quarter Tracking Error vs Targets Compared to Callan Public Fund Sponsor Database



Risk Statistics Rankings vs Targets
Rankings Against Callan Public Fund Sponsor Database
Ten Years Ended September 30, 2022



	Excess Return	Alpha	Tracking Error
10th Percentile	1.28	1.31	2.04
25th Percentile	0.71	0.81	1.78
Median	0.44	0.14	1.24
75th Percentile	0.11	(0.21)	1.04
90th Percentile	(0.17)	(0.53)	0.23
Total Fund ●	1.00	(0.26)	3.43



	Rel. Std. Deviation	Beta	Excess Rtn. Ratio	Info. Ratio
10th Percentile	1.17	1.16	0.81	1.03
25th Percentile	1.10	1.09	0.59	0.64
Median	1.04	1.03	0.43	0.29
75th Percentile	0.99	0.98	0.12	(0.18)
90th Percentile	0.92	0.91	(0.07)	(0.41)
Total Fund ●	1.28	1.22	0.29	(0.09)

Investment Manager Returns and Peer Group Rankings

The table below details the rates of return and peer group rankings for the Fund's investment managers over various time periods ended September 30, 2022. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

Returns and Rankings for Periods Ended September 30, 2022

	Last Quarter		Last Year		Last 3 Years		Last 5 Years		Since Inception	
Total Public Equity	**(7.16%)**		**(20.87%)**		**4.38%**		**4.69%**		**7.49%**	(1/16)
MSCI ACWI IMI	(6.64%)		(21.18%)		3.64%		4.16%		6.79%	(1/16)
Total Domestic Equity	**(4.57%)**	**73**	**(16.56%)**	**40**	**7.71%**	**36**	**8.22%**	**45**	**7.33%**	(7/98)
Russell 3000 Index	(4.46%)	64	(17.63%)	66	7.70%	37	8.62%	28	6.99%	(7/98)
Pub Pln- Dom Equity	(4.27%)		(16.94%)		7.38%		8.13%		-	
BlackRock Russell 1000 Value	(5.61%)	56	(11.34%)	72	4.53%	85	5.47%	70	5.87%	(3/17)
Russell 1000 Value Index	(5.62%)	56	(11.36%)	72	4.36%	88	5.29%	78	5.36%	(3/17)
Callan Large Cap Value	(5.24%)		(9.37%)		5.97%		6.37%		-	
DFA Large Cap Value	(5.38%)	51	(11.07%)	70	4.49%	86	-		4.48%	(11/17)
Russell 1000 Value Index	(5.62%)	56	(11.36%)	72	4.36%	88	5.29%	78	5.22%	(11/17)
Callan Large Cap Value	(5.24%)		(9.37%)		5.97%		6.37%		-	
Northern Trust Global	(4.86%)	56	(15.44%)	49	8.18%	53	9.27%	37	10.22%	(8/88)
S&P 500 Index	(4.88%)	57	(15.47%)	49	8.16%	53	9.24%	37	10.17%	(8/88)
Callan Large Cap Core	(4.73%)		(15.54%)		8.40%		8.96%		-	
Polen Capital Management	(5.10%)	76	(34.72%)	88	4.97%	84	10.76%	45	13.31%	(7/12)
S&P 500 Index	(4.88%)	70	(15.47%)	5	8.16%	48	9.24%	78	12.07%	(7/12)
Callan Large Cap Growth	(4.20%)		(25.84%)		7.85%		10.52%		-	
Earnest Partners LLC	(5.63%)	82	(12.12%)	38	9.15%	11	10.20%	6	10.63%	(5/05)
Russell MidCap Index	(3.44%)	47	(19.39%)	60	5.19%	65	6.48%	52	8.86%	(5/05)
Callan Mid Capitalization	(3.84%)		(16.25%)		6.10%		6.55%		-	
DFA Small Cap Value	(3.24%)	23	(8.40%)	11	10.86%	7	5.50%	17	11.17%	(11/96)
Russell 2000 Value Index	(4.61%)	46	(17.69%)	82	4.72%	70	2.87%	77	8.59%	(11/96)
Callan Small Cap Value	(4.73%)		(13.50%)		6.13%		3.78%		-	
CastleArk Management	1.67%	14	(27.33%)	36	6.57%	46	8.41%	48	9.49%	(9/13)
Russell 2000 Growth Index	0.24%	31	(29.27%)	56	2.94%	89	3.60%	96	7.13%	(9/13)
Callan Small Cap Growth	(0.98%)		(28.75%)		6.14%		8.37%		-	
Total Global Equity	**(7.55%)**	**68**	**(20.00%)**	**40**	**4.61%**	**40**	**6.30%**	**29**	**7.75%**	(4/10)
MSCI World	(6.19%)	37	(19.63%)	39	4.56%	42	5.30%	48	7.68%	(4/10)
Callan Global Equity	(6.78%)		(21.39%)		4.32%		5.19%		-	
BlackRock Global Alpha Tilts	(7.48%)	67	(20.10%)	41	3.90%	57	4.56%	57	8.86%	(3/16)
MSCI ACWI Gross	(6.71%)	49	(20.29%)	42	4.23%	51	4.96%	52	8.80%	(3/16)
Callan Global Equity	(6.78%)		(21.39%)		4.32%		5.19%		-	
MFS Investment Management	(7.65%)	69	(19.80%)	40	5.75%	22	8.90%	5	10.50%	(12/12)
MSCI ACWI Gross	(6.71%)	49	(20.29%)	42	4.23%	51	4.96%	52	7.90%	(12/12)
Callan Global Equity	(6.78%)		(21.39%)		4.32%		5.19%		-	
Total International Equity	**(10.33%)**	**69**	**(26.69%)**	**47**	**0.03%**	**25**	**(0.57%)**	**66**	**5.97%**	(5/96)
MSCI EAFE	(9.36%)	19	(25.13%)	26	(1.83%)	79	(0.84%)	78	3.70%	(5/96)
Pub Pln- Intl Equity	(10.02%)		(27.08%)		(0.76%)		(0.19%)		-	
AQR Emerging Markets	(12.59%)	80	(27.92%)	42	(0.27%)	21	(2.11%)	67	2.79%	(8/16)
MSCI EM Gross	(11.42%)	60	(27.80%)	42	(1.71%)	44	(1.44%)	45	2.82%	(8/16)
Callan Emerging Broad	(10.95%)		(29.12%)		(2.18%)		(1.71%)		-	
Brandes Investment Partners	(11.86%)	93	(22.97%)	23	(2.06%)	73	(1.34%)	77	6.46%	(2/98)
MSCI EAFE	(9.36%)	52	(25.13%)	42	(1.83%)	70	(0.84%)	65	3.69%	(2/98)
Callan NonUS Eq	(9.30%)		(25.79%)		(0.57%)		(0.13%)		-	
William Blair & Company	(7.87%)	15	(34.57%)	92	1.65%	11	1.78%	13	6.48%	(12/03)
MSCI ACWIxUS Gross	(9.80%)	63	(24.79%)	36	(1.07%)	60	(0.34%)	54	5.37%	(12/03)
Callan NonUS Eq	(9.30%)		(25.79%)		(0.57%)		(0.13%)		-	
DFA International Small Cap	(10.00%)	58	(22.56%)	4	0.14%	30	(2.79%)	76	3.34%	(5/06)
MSCI EAFE Small	(9.83%)	57	(32.06%)	61	(2.16%)	69	(1.79%)	51	2.84%	(5/06)
Callan Intl Small Cap	(9.72%)		(31.16%)		(0.97%)		(1.75%)		-	

Investment Manager Returns and Peer Group Rankings

The table below details the rates of return and peer group rankings for the Fund's investment managers over various time periods ended September 30, 2022. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

Returns and Rankings for Periods Ended September 30, 2022

	Last Quarter		Last Year		Last 3 Years		Last 5 Years		Since Inception	
Total Fixed Income	**(3.92%)**	**63**	**(9.20%)**	**10**	**(3.57%)**	**98**	**(0.08%)**	**94**	**6.56%**	(12/87)
Blmbg Aggregate	(4.75%)	86	(14.60%)	75	(3.26%)	98	(0.27%)	97	5.44%	(12/87)
Pub Pln- Dom Fixed	(3.45%)		(13.37%)		(1.69%)		0.60%		-	
BlackRock US Govt Bond	(4.19%)	7	-		-		-		(13.12%)	(12/21)
Blmbg Government	(4.30%)	15	(12.81%)	2	(3.05%)	86	(0.20%)	93	(13.39%)	(12/21)
Callan Core Bond FI	(4.56%)		(14.47%)		(2.70%)		0.19%		-	
Reams Asset Management	(4.58%)	70	(14.00%)	25	(0.24%)	4	2.00%	4	4.84%	(1/01)
Blmbg Aggregate	(4.75%)	88	(14.60%)	43	(3.26%)	94	(0.27%)	96	3.61%	(1/01)
Callan Core Plus FI	(4.30%)		(14.86%)		(2.45%)		0.41%		-	
Loomis, Sayles & Company, L.P.	(2.70%)	6	(14.58%)	43	(1.59%)	17	1.15%	11	8.08%	(12/87)
Blmbg Aggregate	(4.75%)	88	(14.60%)	43	(3.26%)	94	(0.27%)	96	5.44%	(12/87)
Callan Core Plus FI	(4.30%)		(14.86%)		(2.45%)		0.41%		-	
Total Private Equity	**(4.42%)**		**7.68%**		**26.94%**		**23.87%**		**13.97%**	(6/10)
Private Equity Benchmark (3)	(15.75%)		(11.49%)		12.41%		13.56%		-	
Abbott Capital Management 2010	(10.26%)		(0.90%)		21.42%		22.43%		1.96%	(6/10)
Abbott Capital Management 2011	(10.35%)		(2.07%)		25.65%		24.98%		5.82%	(6/11)
Abbott Capital Management 2012	(8.17%)		3.41%		27.56%		25.31%		13.50%	(7/12)
Abbott Capital Management 2013	(6.85%)		3.63%		27.45%		25.91%		14.49%	(5/13)
Abbott Capital Management 2014	(5.54%)		7.99%		28.60%		25.79%		14.10%	(4/14)
Abbott Capital Management 2015	(4.67%)		10.55%		27.66%		21.77%		15.81%	(4/15)
Abbott Capital Management 2016	(3.27%)		14.96%		29.08%		20.24%		14.94%	(3/16)
Abbott Capital Management 2018	(0.88%)		20.77%		27.50%		-		18.35%	(7/18)
Abbott Capital Management 2019	(1.78%)		16.10%		-		-		25.47%	(1/20)
Abbott Capital Management 2020	(1.14%)		2.81%		-		-		35.24%	(1/21)
Abbott Capital Management 2021	(2.12%)		9.24%		-		-		7.87%	(2/21)
Abbott Capital Management 2022	(0.41%)		-		-		-		(1.46%)	(2/22)
Mesirow V	(9.90%)		(12.34%)		22.49%		20.74%		16.22%	(6/10)
Mesirow VI	(9.02%)		(2.46%)		31.88%		27.67%		15.50%	(7/13)
Mesirow VII	(3.16%)		12.25%		23.43%		10.60%		3.76%	(6/17)
Mesirow VIII	(0.49%)		4.25%		-		-		(0.94%)	(9/20)
NB Secondary Opp Fund III	(3.42%)		1.03%		11.66%		12.80%		12.11%	(12/13)
NB Secondary Opp Fund IV	(3.76%)		9.68%		21.35%		17.70%		23.45%	(4/17)
NB Secondary Opp Fund V	(8.85%)		-		-		-		163.68%	(3/22)
Private Advisors VI	0.82%		26.93%		35.95%		26.71%		15.66%	(4/15)
Private Advisors VII	8.36%		34.06%		24.40%		20.30%		16.97%	(1/17)
Private Advisors VIII	14.18%		36.11%		25.69%		-		22.28%	(8/18)
Private Advisors IX	12.58%		27.59%		-		-		29.50%	(2/20)
Absolute Return	**0.63%**		**25.52%**		**5.79%**		**5.91%**		**5.70%**	(6/14)
90 Day T-Bill + 3%	1.19%		3.62%		3.59%		4.14%		3.80%	(6/14)
UBS A & Q	0.65%	67	7.91%	11	9.79%	12	7.67%	11	6.12%	(12/14)
1-month LIBOR + 4%	1.54%	35	4.82%	44	4.67%	65	5.24%	21	4.98%	(12/14)
Callan Abs Rtn Hedge FoF	1.00%		2.97%		5.95%		4.31%		-	
Real Assets	**(7.85%)**		**(7.86%)**		**4.44%**		**3.53%**		**4.76%**	(1/16)
Principal DRA	(7.85%)	96	(7.86%)	85	4.44%	60	3.53%	70	4.76%	(1/16)
Principal DRA Blend Index (1)	(7.91%)	96	(8.70%)	87	2.59%	73	2.75%	75	4.01%	(1/16)
Callan Alterntive Inv DB	0.14%		8.83%		8.17%		6.20%		-	
Total Real Estate	**1.31%**		**27.70%**		**14.18%**		**11.73%**		**7.28%**	(7/86)
Real Estate	1.31%	79	27.70%	11	14.18%	10	11.73%	15	7.28%	(7/86)
Blended Benchmark (2)	3.35%	35	27.66%	11	11.92%	30	9.86%	38	-	
Callan Tot Real Est DB	3.07%		17.91%		10.18%		9.15%		-	
Total Fund	**(4.53%)**	**64**	**(7.02%)**	**7**	**5.93%**	**18**	**6.19%**	**16**	**-**	
Total Fund Index*	(5.31%)	88	(11.67%)	29	4.21%	47	4.79%	50	-	
Callan Public Fund Spr DB	(4.23%)		(13.39%)		4.11%		4.78%		-	

* Current Quarter Target = 44.0% MSCI ACWI IMI, 23.0% Blmbg Aggregate, 10.0% Russell 3000 Index lagged 3 months+2.0%, 10.0% 3-month Treasury Bill+3.0%, 9.1% NCREIF NFI-ODCE Eq Wt Net lagged 3 months and 3.9% Principal DRA Blend Index.
(1) Current Principal DRA Blend Index = 15% Bloomberg US TIPS Idx, 15% Bloomberg Commodity Idx, 30% S&P Global Infrastructure Idx, 15% S&P Global Natural Resources Idx and 25% FTSE EPRA/NAREIT Developed Market Idx.
(2) Blended Benchmark = NCREIF (NPI) through 6/30/06, NCREIF (NPI 1 Qtr Arrears) through 12/31/13 and NFI-ODCE (1 Qtr Arrears) thereafter.
(3) Private Equity Benchmark = Russell 3000 Index lagged 3 months+3.0% through 12/31/19, Russell 3000 Index lagged 3 months+2.0% thereafter.

Investment Manager Returns and Peer Group Rankings

The table below details the rates of return and peer group rankings for the Fund's investment managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

	12/2021-9/2022		2021		2020		2019		2018	
Total Public Equity	**(25.04%)**		**20.92%**		**14.78%**		**26.90%**		**(9.67%)**	
MSCI ACWI IMI	(25.72%)		18.22%		16.25%		26.35%		(10.08%)	
Total Domestic Equity	**(22.89%)**	**19**	**28.12%**	**14**	**16.35%**	**76**	**29.24%**	**74**	**(5.80%)**	**48**
Russell 3000 Index	(24.62%)	75	25.66%	55	20.89%	26	31.02%	30	(5.24%)	33
Pub Pln- Dom Equity	(23.83%)		25.78%		18.71%		30.26%		(5.85%)	
BlackRock Russell 1000 Value	(17.76%)	80	25.18%	79	3.28%	46	26.79%	46	(8.12%)	43
Russell 1000 Value Index	(17.75%)	80	25.16%	79	2.80%	52	26.54%	50	(8.27%)	45
Callan Large Cap Value	(15.96%)		28.39%		3.04%		26.52%		(8.70%)	
DFA Large Cap Value	(16.83%)	58	27.52%	65	(1.56%)	90	26.71%	47	(12.40%)	84
Russell 1000 Value Index	(17.75%)	80	25.16%	79	2.80%	52	26.54%	50	(8.27%)	45
Callan Large Cap Value	(15.96%)		28.39%		3.04%		26.52%		(8.70%)	
Northern Trust Global	(23.84%)	64	28.69%	53	18.42%	53	31.54%	39	(4.34%)	31
S&P 500 Index	(23.87%)	65	28.71%	53	18.40%	53	31.49%	39	(4.38%)	32
Callan Large Cap Core	(23.56%)		28.98%		19.19%		30.50%		(5.41%)	
Polen Capital Management	(38.00%)	89	24.84%	43	35.13%	55	38.85%	11	9.14%	4
S&P 500 Index	(23.87%)	4	28.71%	20	18.40%	98	31.49%	76	(4.38%)	91
Callan Large Cap Growth	(31.97%)		24.26%		35.55%		34.55%		0.51%	
Earnest Partners LLC	(21.23%)	48	26.09%	48	21.61%	41	38.38%	12	(9.80%)	45
Russell MidCap Index	(24.27%)	56	22.58%	58	17.10%	48	30.54%	52	(9.06%)	41
Callan Mid Capitalization	(21.44%)		25.38%		16.17%		31.00%		(10.60%)	
DFA Small Cap Value	(14.13%)	13	40.61%	16	3.85%	45	18.79%	89	(14.84%)	53
Russell 2000 Value Index	(21.12%)	74	28.27%	64	4.63%	37	22.39%	64	(12.86%)	23
Callan Small Cap Value	(18.94%)		31.82%		2.88%		24.31%		(14.79%)	
CastleArk Management	(30.75%)	51	12.30%	42	45.10%	46	23.28%	86	3.29%	15
Russell 2000 Growth Index	(29.28%)	41	2.83%	80	34.63%	73	28.48%	54	(9.31%)	84
Callan Small Cap Growth	(30.58%)		10.91%		44.48%		30.25%		(2.91%)	
Total Global Equity	**(25.68%)**	**45**	**19.03%**	**54**	**18.78%**	**43**	**31.05%**	**27**	**(8.18%)**	**40**
MSCI World	(25.42%)	43	21.82%	28	15.90%	55	27.67%	49	(8.71%)	44
Callan Global Equity	(26.38%)		19.50%		17.13%		27.49%		(9.52%)	
BlackRock Global Alpha Tilts	(25.41%)	43	18.73%	57	16.53%	52	26.86%	53	(11.20%)	67
MSCI ACWI Gross	(25.34%)	43	19.04%	54	16.82%	51	27.30%	51	(8.93%)	46
Callan Global Equity	(26.38%)		19.50%		17.13%		27.49%		(9.52%)	
MFS Investment Management	(26.08%)	48	19.56%	50	22.42%	32	37.31%	4	(3.75%)	11
MSCI ACWI Gross	(25.34%)	43	19.04%	54	16.82%	51	27.30%	51	(8.93%)	46
Callan Global Equity	(26.38%)		19.50%		17.13%		27.49%		(9.52%)	
Total International Equity	**(27.56%)**	**43**	**13.08%**	**11**	**10.84%**	**73**	**21.68%**	**75**	**(15.19%)**	**69**
MSCI EAFE	(27.09%)	36	11.26%	23	7.82%	91	22.01%	64	(13.79%)	42
Pub Pln- Intl Equity	(28.16%)		8.40%		13.19%		22.93%		(14.04%)	
AQR Emerging Markets	(27.17%)	37	1.23%	36	18.26%	49	20.54%	63	(18.31%)	86
MSCI EM Gross	(26.89%)	35	(2.22%)	55	18.69%	44	18.90%	71	(14.24%)	28
Callan Emerging Broad	(29.16%)		(0.57%)		18.17%		22.12%		(15.34%)	
Brandes Investment Partners	(23.15%)	12	14.42%	18	(1.30%)	96	15.31%	98	(8.79%)	6
MSCI EAFE	(27.09%)	46	11.26%	52	7.82%	66	22.01%	66	(13.79%)	36
Callan NonUS Eq	(27.69%)		11.45%		11.48%		23.64%		(15.13%)	
William Blair & Company	(36.25%)	92	13.27%	30	31.44%	6	31.58%	9	(16.86%)	73
MSCI ACWIxUS Gross	(26.18%)	39	8.29%	71	11.13%	51	22.13%	64	(13.77%)	36
Callan NonUS Eq	(27.69%)		11.45%		11.48%		23.64%		(15.13%)	
DFA International Small Cap	(24.14%)	4	16.47%	14	1.47%	89	21.62%	81	(23.31%)	91
MSCI EAFE Small	(32.11%)	52	10.10%	72	12.34%	45	24.96%	50	(17.89%)	30
Callan Intl Small Cap	(31.80%)		12.78%		11.08%		24.96%		(19.67%)	

Investment Manager Returns and Peer Group Rankings

The table below details the rates of return and peer group rankings for the Fund's investment managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

	12/2021-9/2022		2021		2020		2019		2018	
Total Fixed Income	**(9.22%)**	**13**	**(0.36%)**	**43**	**(1.82%)**	**98**	**11.82%**	**5**	**(0.33%)**	**72**
Blmbg Aggregate	(14.61%)	72	(1.54%)	91	7.51%	66	8.72%	58	0.01%	57
Pub Pln- Dom Fixed	(13.17%)		(0.70%)		8.40%		8.97%		0.11%	
BlackRock US Govt Bond	(12.84%)	2	-		-		-		-	
Blmbg Government	(12.95%)	2	(2.28%)	100	7.94%	85	6.83%	100	0.88%	4
Callan Core Bond FI	(14.47%)		(1.04%)		8.70%		9.17%		0.11%	
Reams Asset Management	(14.35%)	27	(1.23%)	91	17.28%	2	8.82%	92	1.91%	1
Blmbg Aggregate	(14.61%)	41	(1.54%)	97	7.51%	91	8.72%	93	0.01%	30
Callan Core Plus FI	(14.95%)		(0.28%)		9.25%		10.03%		(0.24%)	
Loomis, Sayles & Company, L.P.	(14.51%)	36	2.13%	5	7.14%	92	14.42%	1	(2.11%)	98
Blmbg Aggregate	(14.61%)	41	(1.54%)	97	7.51%	91	8.72%	93	0.01%	30
Callan Core Plus FI	(14.95%)		(0.28%)		9.25%		10.03%		(0.24%)	
Total Private Equity	**(2.81%)**		**67.66%**		**22.14%**		**16.63%**		**21.48%**	
Private Equity Benchmark (3)	(11.88%)		34.08%		17.99%		6.65%		20.71%	
Abbott Capital Management 2010	(14.19%)		65.55%		24.43%		16.52%		26.90%	
Abbott Capital Management 2011	(14.98%)		76.29%		29.13%		19.64%		25.70%	
Abbott Capital Management 2012	(9.69%)		72.85%		29.04%		17.91%		24.39%	
Abbott Capital Management 2013	(8.86%)		70.21%		28.65%		21.13%		25.17%	
Abbott Capital Management 2014	(6.72%)		75.52%		26.51%		19.74%		22.58%	
Abbott Capital Management 2015	(0.56%)		75.81%		16.62%		15.14%		13.57%	
Abbott Capital Management 2016	3.41%		71.04%		20.02%		9.08%		9.43%	
Abbott Capital Management 2018	8.28%		47.06%		22.73%		7.26%		-	
Abbott Capital Management 2019	7.88%		57.22%		10.04%		-		-	
Abbott Capital Management 2020	2.57%		65.36%		-		-		-	
Abbott Capital Management 2021	1.89%		-		-		-		-	
Mesirow V	(16.52%)		78.52%		21.39%		16.29%		18.01%	
Mesirow VI	(10.66%)		88.26%		29.10%		22.73%		24.87%	
Mesirow VII	0.41%		60.27%		16.43%		3.33%		(7.82%)	
Mesirow VIII	2.08%		10.14%		-		-		-	
NB Secondary Opp Fund III	(1.29%)		30.34%		4.23%		12.18%		16.65%	
NB Secondary Opp Fund IV	1.87%		48.73%		14.80%		14.76%		68.26%	
Private Advisors VI	10.04%		83.78%		16.54%		17.98%		15.19%	
Private Advisors VII	21.31%		52.55%		3.97%		11.23%		19.02%	
Private Advisors VIII	24.34%		47.25%		15.78%		(4.08%)		-	
Private Advisors IX	17.47%		37.25%		-		-		-	
Absolute Return	**22.41%**		**8.87%**		**(14.04%)**		**12.79%**		**1.61%**	
90 Day T-Bill + 3%	2.84%		3.05%		3.67%		5.28%		4.85%	
UBS A & Q	5.24%	15	8.08%	45	12.18%	11	9.53%	4	2.65%	12
1-month LIBOR + 4%	3.78%	22	4.11%	77	4.63%	45	6.32%	30	6.03%	2
Callan Abs Rtn Hedge FoF	3.05%		6.76%		4.03%		4.71%		0.58%	
Real Assets	**(12.11%)**		**18.24%**		**4.69%**		**15.39%**		**(7.47%)**	
Principal DRA	(12.11%)	92	18.24%	41	4.69%	25	15.39%	15	(7.47%)	51
Principal DRA Blend Index (1)	(12.20%)	92	15.87%	45	2.08%	34	14.86%	17	(7.27%)	49
Callan Alterntive Inv DB	5.61%		13.49%		(0.39%)		7.90%		(7.42%)	
Total Real Estate	**16.76%**		**23.85%**		**0.76%**		**6.21%**		**9.18%**	
Real Estate	16.76%	19	23.85%	35	0.76%	54	6.21%	65	9.18%	40
Blended Benchmark (2)	19.59%	7	14.83%	60	0.89%	53	5.26%	72	7.89%	50
Callan Tot Real Est DB	10.89%		19.69%		1.40%		7.71%		7.92%	
Total Fund	**(11.31%)**	**8**	**19.05%**	**8**	**6.84%**	**96**	**18.66%**	**38**	**(2.74%)**	**24**
Total Fund Index*	(14.75%)	25	12.88%	65	12.29%	44	16.52%	78	(3.29%)	37
Callan Public Fund Spr DB	(16.96%)		13.84%		12.10%		18.03%		(3.83%)	

* Current Quarter Target = 44.0% MSCI ACWI IMI, 23.0% Blmbg Aggregate, 10.0% Russell 3000 Index lagged 3 months+2.0%, 10.0% 3-month Treasury Bill+3.0%, 9.1% NCREIF NFI-ODCE Eq Wt Net lagged 3 months and 3.9% Principal DRA Blend Index.
(1) Current Principal DRA Blend Index = 15% Bloomberg US TIPS Idx, 15% Bloomberg Commodity Idx, 30% S&P Global Infrastructure Idx, 15% S&P Global Natural Resources Idx and 25% FTSE EPRA/NAREIT Developed Market Idx.
(2) Blended Benchmark = NCREIF (NPI) through 6/30/06, NCREIF (NPI 1 Qtr Arrears) through 12/31/13 and NFI-ODCE (1 Qtr Arrears) thereafter.
(3) Private Equity Benchmark = Russell 3000 Index lagged 3 months+3.0% through 12/31/19, Russell 3000 Index lagged 3 months+2.0% thereafter.

Investment Manager Returns

The table below details the rates of return for the Fund's investment managers over various time periods ended September 30, 2022. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

Returns for Periods Ended September 30, 2022

	Last Quarter	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
Net of Fee Returns					
Total Domestic Equity Net	(4.60%)	(16.74%)	7.48%	7.96%	10.92%
Russell 3000 Index	(4.46%)	(17.63%)	7.70%	8.62%	11.39%
BlackRock Russell 1000 Value	(5.61%)	(11.35%)	4.52%	5.46%	-
Russell 1000 Value Index	(5.62%)	(11.36%)	4.36%	5.29%	9.17%
DFA Large Cap Value	(5.42%)	(11.23%)	4.29%	-	-
Russell 1000 Value Index	(5.62%)	(11.36%)	4.36%	5.29%	9.17%
Northern Trust Global	(4.86%)	(15.45%)	8.17%	9.25%	11.73%
S&P 500 Index	(4.88%)	(15.47%)	8.16%	9.24%	11.70%
Polen Capital Management	(5.20%)	(34.99%)	4.55%	10.28%	12.56%
S&P 500 Index	(4.88%)	(15.47%)	8.16%	9.24%	11.70%
Earnest Partners LLC	(5.76%)	(12.47%)	8.61%	9.64%	12.37%
Russell MidCap Index	(3.44%)	(19.39%)	5.19%	6.48%	10.30%
DFA Small Cap Value	(3.24%)	(8.73%)	10.64%	5.20%	9.63%
Russell 2000 Value Index	(4.61%)	(17.69%)	4.72%	2.87%	7.94%
CastleArk Management	1.67%	(27.70%)	5.91%	7.72%	-
Russell 2000 Growth Index	0.24%	(29.27%)	2.94%	3.60%	8.81%
Total Global Equity Net	(7.61%)	(20.17%)	4.36%	6.00%	8.44%
MSCI World	(6.19%)	(19.63%)	4.56%	5.30%	8.11%
BlackRock Global Alpha Tilts	(7.50%)	(20.15%)	3.80%	4.44%	-
MFS Investment Management	(7.76%)	(20.15%)	5.29%	8.44%	-
MSCI ACWI Gross	(6.71%)	(20.29%)	4.23%	4.96%	7.84%
Total International Equity Net	(10.44%)	(27.03%)	(0.45%)	(1.04%)	4.25%
MSCI EAFE Index	(9.36%)	(25.13%)	(1.83%)	(0.84%)	3.67%
AQR Emerging Markets	(12.78%)	(28.48%)	(1.02%)	(2.85%)	-
MSCI EM Gross	(11.42%)	(27.80%)	(1.71%)	(1.44%)	1.42%
Brandes Investment Partners	(11.95%)	(23.27%)	(2.43%)	(1.73%)	3.59%
MSCI EAFE Index	(9.36%)	(25.13%)	(1.83%)	(0.84%)	3.67%
William Blair & Company	(7.98%)	(34.88%)	1.18%	1.33%	5.07%
MSCI ACWI ex-US Index	(9.80%)	(24.79%)	(1.07%)	(0.34%)	3.48%
DFA International Small Cap	(10.09%)	(22.90%)	(0.41%)	(3.17%)	4.89%
MSCI EAFE Small	(9.83%)	(32.06%)	(2.16%)	(1.79%)	5.28%
Total Fixed Income Net	(3.95%)	(9.29%)	(3.66%)	(0.20%)	1.18%
Blmbg Aggregate	(4.75%)	(14.60%)	(3.26%)	(0.27%)	0.89%
BlackRock US Govt Bond	(4.20%)	-	-	-	-
Blmbg Government	(4.30%)	(12.81%)	(3.05%)	(0.20%)	0.53%
Reams Asset Management	(4.61%)	(14.12%)	(0.38%)	1.85%	2.04%
Loomis, Sayles & Company, L.P.	(2.74%)	(14.71%)	(1.73%)	1.00%	2.91%
Blmbg Aggregate	(4.75%)	(14.60%)	(3.26%)	(0.27%)	0.89%
Total Private Equity	(4.42%)	7.68%	26.94%	23.87%	17.73%
Private Equity Benchmark	(15.75%)	(11.49%)	12.41%	13.56%	-
Abbott Capital Management 2010	(10.26%)	(0.90%)	21.42%	22.43%	16.62%
Abbott Capital Management 2011	(10.35%)	(2.07%)	25.65%	24.98%	16.31%
Abbott Capital Management 2012	(8.17%)	3.41%	27.56%	25.31%	14.21%
Abbott Capital Management 2013	(6.85%)	3.63%	27.45%	25.91%	-
Abbott Capital Management 2014	(5.54%)	7.99%	28.60%	25.79%	-
Abbott Capital Management 2015	(4.67%)	10.55%	27.66%	21.77%	-
Abbott Capital Management 2016	(3.27%)	14.96%	29.08%	20.24%	-
Abbott Capital Management 2018	(0.88%)	20.77%	27.50%	-	-
Abbott Capital Management 2019	(1.78%)	16.10%	-	-	-
Abbott Capital Management 2020	(1.14%)	2.81%	-	-	-
Abbott Capital Management 2021	(2.12%)	9.24%	-	-	-
Abbott Capital Management 2022	(0.41%)	-	-	-	-
Mesirow V	(9.90%)	(12.34%)	22.49%	20.74%	18.96%
Mesirow IV	(9.02%)	(2.46%)	31.88%	27.67%	-
Mesirow VII	(3.16%)	12.25%	23.43%	10.60%	-
Mesirow VIII	(0.49%)	4.25%	-	-	-
NB Secondary Opp Fund III	(3.42%)	1.03%	11.66%	12.80%	-
NB Secondary Opp Fund IV	(3.76%)	9.68%	21.35%	17.70%	-
NB Secondary Opp Fund V	(8.85%)	-	-	-	-
Private Advisors VI	0.82%	26.93%	35.95%	26.71%	-
Private Advisors VII	8.36%	34.06%	24.40%	20.30%	-
Private Advisors VIII	14.18%	36.11%	25.69%	-	-
Private Advisors IX	12.58%	27.59%	-	-	-
Absolute Return	0.63%	25.52%	5.67%	5.80%	-
90 Day T-Bill + 3%	1.19%	3.62%	3.59%	4.14%	3.68%
UBS A & Q	0.65%	7.91%	9.79%	7.67%	-
1-month LIBOR + 4%	1.54%	4.82%	4.67%	5.24%	4.80%
Real Assets	(8.01%)	(8.46%)	3.77%	3.06%	-
Principal DRA	(8.01%)	(8.46%)	3.77%	3.06%	-
Principal DRA Blend Index	(7.91%)	(8.70%)	2.59%	2.75%	-
Total Real Estate	1.22%	27.34%	13.81%	11.41%	11.47%
Real Estate	1.22%	27.34%	13.81%	11.41%	11.47%
Blended Benchmark	3.35%	27.66%	11.92%	9.86%	10.26%
Total Fund Net	(4.57%)	(7.20%)	5.70%	5.93%	7.67%
Total Fund Index	(5.31%)	(11.67%)	4.21%	4.79%	6.95%

*Net returns are simulated with the use of fee schedules through March 31, 2019. Actual fees paid are used thereafter.

Investment Manager Returns

The table below details the rates of return for the Fund's investment managers over various time periods. Negative returns are shown in red, positive returns in black. Returns for one year or greater are annualized. The first set of returns for each asset class represents the composite returns for all the fund's accounts for that asset class.

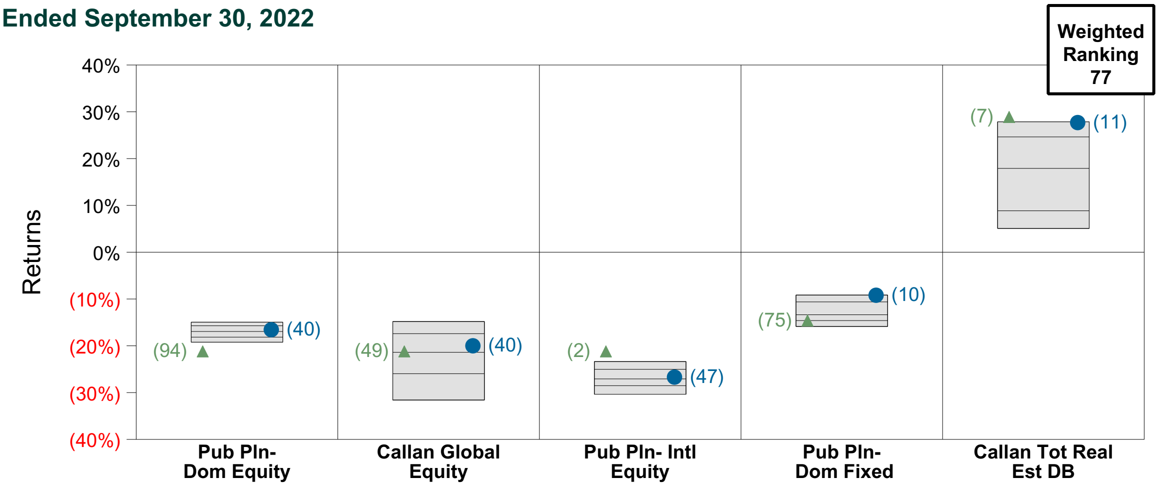
	12/2021-9/2022	2021	2020	2019	2018
Net of Fee Returns					
Total Domestic Equity Net	(23.02%)	27.88%	16.09%	28.94%	(6.10%)
Russell 3000 Index	(24.62%)	25.66%	20.89%	31.02%	(5.24%)
BlackRock Russell 1000 Value	(17.76%)	25.17%	3.27%	26.77%	(8.13%)
Russell 1000 Value Index	(17.75%)	25.16%	2.80%	26.54%	(8.27%)
DFA Large Cap Value	(16.94%)	27.35%	(1.78%)	26.42%	(12.60%)
Russell 1000 Value Index	(17.75%)	25.16%	2.80%	26.54%	(8.27%)
Northern Trust Global	(23.84%)	28.68%	18.41%	31.53%	(4.37%)
S&P 500 Index	(23.87%)	28.71%	18.40%	31.49%	(4.38%)
Polen Capital Management	(38.19%)	24.34%	34.59%	38.27%	8.60%
S&P 500 Index	(23.87%)	28.71%	18.40%	31.49%	(4.38%)
Earnest Partners LLC	(21.54%)	25.59%	20.96%	37.65%	(10.29%)
Russell MidCap Index	(24.27%)	22.58%	17.10%	30.54%	(9.06%)
DFA Small Cap Value	(14.38%)	40.38%	3.74%	18.58%	(15.30%)
Russell 2000 Value Index	(21.12%)	28.27%	4.63%	22.39%	(12.86%)
CastleArk Management	(30.99%)	11.55%	44.12%	22.47%	2.60%
Russell 2000 Growth Index	(29.28%)	2.83%	34.63%	28.48%	(9.31%)
Total Global Equity Net	(25.80%)	18.80%	18.48%	30.55%	(8.51%)
MSCI World	(25.42%)	21.82%	15.90%	27.67%	(8.71%)
BlackRock Global Alpha Tilts	(25.45%)	18.67%	16.39%	26.48%	(11.24%)
MFS Investment Management	(26.32%)	19.05%	21.88%	36.74%	(4.16%)
MSCI ACWI Gross	(25.34%)	19.04%	16.82%	27.30%	(8.93%)
Total International Equity Net	(27.81%)	12.57%	10.28%	21.08%	(15.60%)
MSCI EAFE Index	(27.09%)	11.26%	7.82%	22.01%	(13.79%)
AQR Emerging Markets	(27.60%)	0.47%	17.38%	19.64%	(18.93%)
MSCI EM Gross	(26.89%)	(2.22%)	18.69%	18.90%	(14.24%)
Brandes Investment Partners	(23.37%)	14.00%	(1.69%)	14.86%	(9.17%)
MSCI EAFE Index	(27.09%)	11.26%	7.82%	22.01%	(13.79%)
William Blair & Company	(36.48%)	12.77%	30.84%	31.01%	(17.20%)
MSCI ACWI ex-US Index	(26.18%)	8.29%	11.13%	22.13%	(13.77%)
DFA International Small Cap	(24.38%)	15.89%	0.81%	21.00%	(23.31%)
MSCI EAFE Small	(32.11%)	10.10%	12.34%	24.96%	(17.89%)
Total Fixed Income Net	(9.30%)	(0.45%)	(1.91%)	11.68%	(0.47%)
Blmbg Aggregate	(14.61%)	(1.54%)	7.51%	8.72%	0.01%
BlackRock US Govt Bond	(12.86%)	-	-	-	-
Blmbg Government	(12.95%)	(2.28%)	7.94%	6.83%	0.88%
Reams Asset Management	(14.43%)	(1.36%)	17.11%	8.65%	1.76%
Loomis, Sayles & Company, L.P.	(14.61%)	1.98%	6.99%	14.25%	(2.24%)
Blmbg Aggregate	(14.61%)	(1.54%)	7.51%	8.72%	0.01%
Total Private Equity	(2.81%)	67.66%	22.14%	16.63%	21.48%
Private Equity Benchmark	(11.88%)	34.08%	17.99%	6.65%	20.71%
Abbott Capital Management 2010	(14.19%)	65.55%	24.43%	16.52%	26.90%
Abbott Capital Management 2011	(14.98%)	76.29%	29.13%	19.64%	25.70%
Abbott Capital Management 2012	(9.69%)	72.85%	29.04%	17.91%	24.39%
Abbott Capital Management 2013	(8.86%)	70.21%	28.65%	21.13%	25.17%
Abbott Capital Management 2014	(6.72%)	75.52%	26.51%	19.74%	22.58%
Abbott Capital Management 2015	(0.56%)	75.81%	16.62%	15.14%	13.57%
Abbott Capital Management 2016	3.41%	71.04%	20.02%	9.08%	9.43%
Abbott Capital Management 2018	8.28%	47.06%	22.73%	7.26%	-
Abbott Capital Management 2019	7.88%	57.22%	10.04%	-	-
Abbott Capital Management 2020	2.57%	65.36%	-	-	-
Abbott Capital Management 2021	1.89%	-	-	-	-
Mesirow V	(16.52%)	78.52%	21.39%	16.29%	18.01%
Mesirow IV	(10.66%)	88.26%	29.10%	22.73%	24.87%
Mesirow VII	0.41%	60.27%	16.43%	3.33%	(7.82%)
Mesirow VIII	2.08%	10.14%	-	-	-
NB Secondary Opp Fund III	(1.29%)	30.34%	4.23%	12.18%	16.65%
NB Secondary Opp Fund IV	1.87%	48.73%	14.80%	14.76%	68.26%
Private Advisors VI	10.04%	83.78%	16.54%	17.98%	15.19%
Private Advisors VII	21.31%	52.55%	3.97%	11.23%	19.02%
Private Advisors VIII	24.34%	47.25%	15.78%	(4.08%)	-
Private Advisors IX	17.47%	37.25%	-	-	-
Absolute Return	22.41%	8.77%	(14.21%)	12.52%	1.61%
90 Day T-Bill + 3%	2.84%	3.05%	3.67%	5.28%	4.85%
UBS A & Q	5.24%	8.08%	12.18%	9.53%	2.65%
1-month LIBOR + 4%	3.78%	4.11%	4.63%	6.32%	6.03%
Real Assets	(12.55%)	17.51%	4.02%	14.84%	(7.47%)
Principal DRA	(12.55%)	17.51%	4.02%	14.84%	(7.47%)
Principal DRA Blend Index	(12.20%)	15.87%	2.08%	14.86%	(7.27%)
Total Real Estate	16.52%	23.45%	0.39%	5.95%	8.94%
Real Estate	16.52%	23.45%	0.39%	5.95%	8.94%
Blended Benchmark	19.59%	14.83%	0.89%	5.26%	7.89%
Total Fund Net	(11.45%)	18.80%	6.59%	18.34%	(3.01%)
Total Fund Index	(14.75%)	12.88%	12.29%	16.52%	(3.29%)

*Net returns are simulated with the use of fee schedules through March 31, 2019. Actual fees paid are used thereafter.

Asset Class Rankings

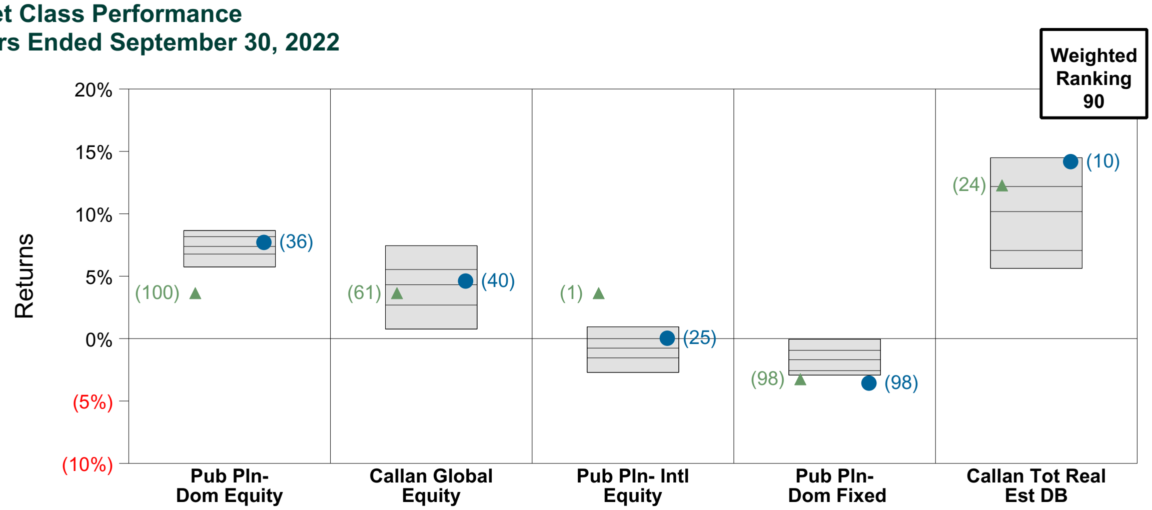
The charts below show the rankings of each asset class component of the Total Fund relative to appropriate comparative databases. In the upper right corner of each graph is the weighted average of the rankings across the different asset classes. The weights of the fund's actual asset allocation are used to make this calculation. The weighted average ranking can be viewed as a measure of the fund's overall success in picking managers and structuring asset classes.

Total Asset Class Performance
One Year Ended September 30, 2022



	Pub Pln- Dom Equity	Callan Global Equity	Pub Pln- Intl Equity	Pub Pln- Dom Fixed	Callan Tot Real Est DB
10th Percentile	(14.95)	(14.82)	(23.37)	(9.16)	27.86
25th Percentile	(15.72)	(17.41)	(25.02)	(10.62)	24.63
Median	(16.94)	(21.39)	(27.08)	(13.37)	17.91
75th Percentile	(18.15)	(25.96)	(28.52)	(14.61)	8.85
90th Percentile	(19.23)	(31.59)	(30.36)	(15.87)	5.08
Asset Class Composite ●	(16.56)	(20.00)	(26.69)	(9.20)	27.70
Composite Benchmark ▲	(21.18)	(21.18)	(21.18)	(14.60)	28.90

Total Asset Class Performance
Three Years Ended September 30, 2022



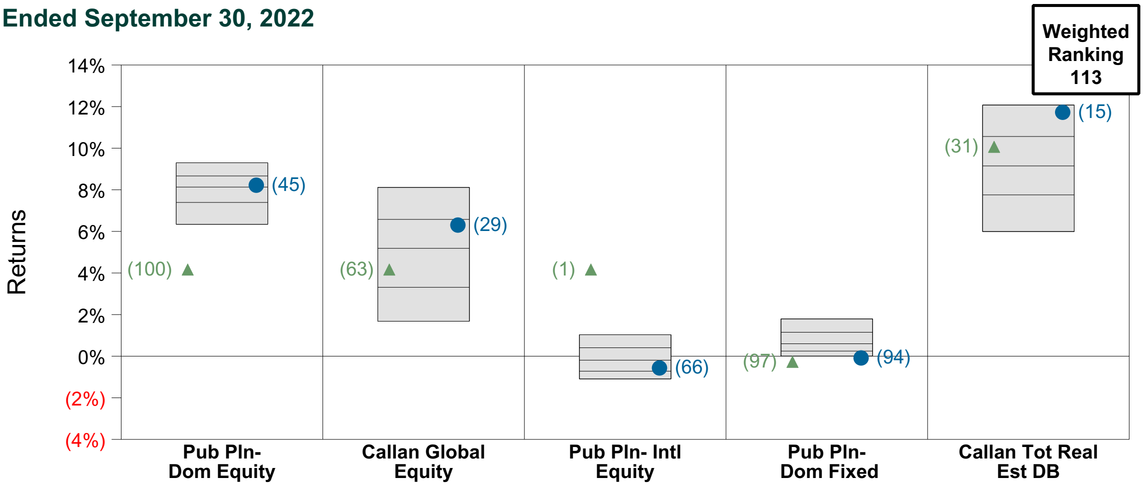
	Pub Pln- Dom Equity	Callan Global Equity	Pub Pln- Intl Equity	Pub Pln- Dom Fixed	Callan Tot Real Est DB
10th Percentile	8.66	7.44	0.95	(0.05)	14.49
25th Percentile	8.17	5.53	(0.00)	(0.94)	12.19
Median	7.38	4.32	(0.76)	(1.69)	10.18
75th Percentile	6.78	2.69	(1.55)	(2.57)	7.06
90th Percentile	5.74	0.77	(2.71)	(2.93)	5.63
Asset Class Composite ●	7.71	4.61	0.03	(3.57)	14.18
Composite Benchmark ▲	3.64	3.64	3.64	(3.26)	12.28

* Current Quarter Target = 44.0% MSCI ACWI IMI, 23.0% Blmbg Aggregate, 10.0% Russell 3000 Index lagged 3 months+2.0%, 10.0% 3-month Treasury Bill+3.0%, 9.1% NCREIF NFI-ODCE Eq Wt Net lagged 3 months and 3.9% Principal DRA Blend Index.

Asset Class Rankings

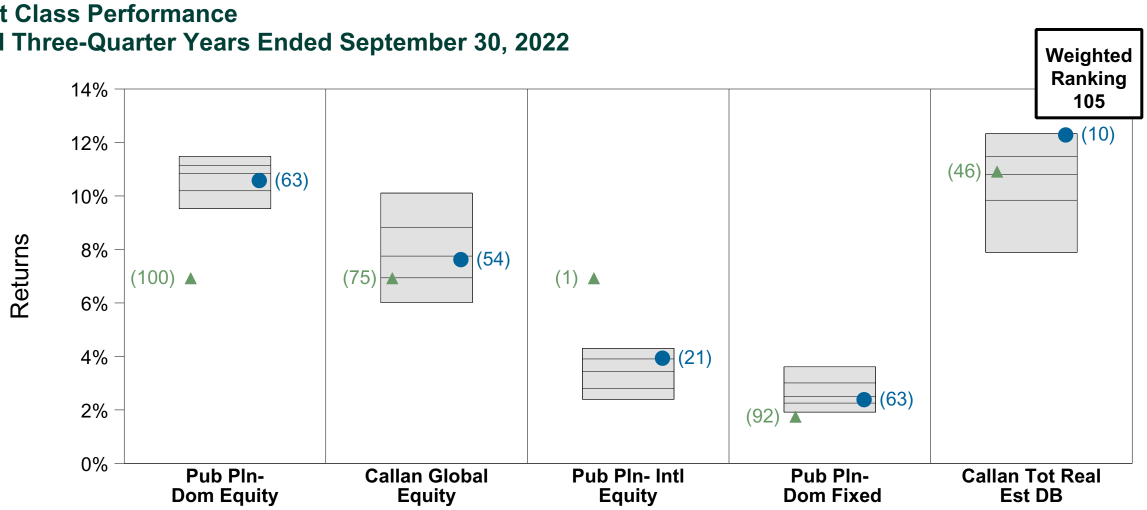
The charts below show the rankings of each asset class component of the Total Fund relative to appropriate comparative databases. In the upper right corner of each graph is the weighted average of the rankings across the different asset classes. The weights of the fund's actual asset allocation are used to make this calculation. The weighted average ranking can be viewed as a measure of the fund's overall success in picking managers and structuring asset classes.

Total Asset Class Performance
Five Years Ended September 30, 2022



	Pub Pln- Dom Equity	Callan Global Equity	Pub Pln- Intl Equity	Pub Pln- Dom Fixed	Callan Tot Real Est DB
10th Percentile	9.30	8.12	1.03	1.79	12.08
25th Percentile	8.67	6.58	0.41	1.15	10.56
Median	8.13	5.19	(0.19)	0.60	9.15
75th Percentile	7.39	3.31	(0.72)	0.25	7.76
90th Percentile	6.34	1.68	(1.09)	0.00	5.99
Asset Class Composite ●	8.22	6.30	(0.57)	(0.08)	11.73
Composite Benchmark ▲	4.16	4.16	4.16	(0.27)	10.07

Total Asset Class Performance
Eleven and Three-Quarter Years Ended September 30, 2022



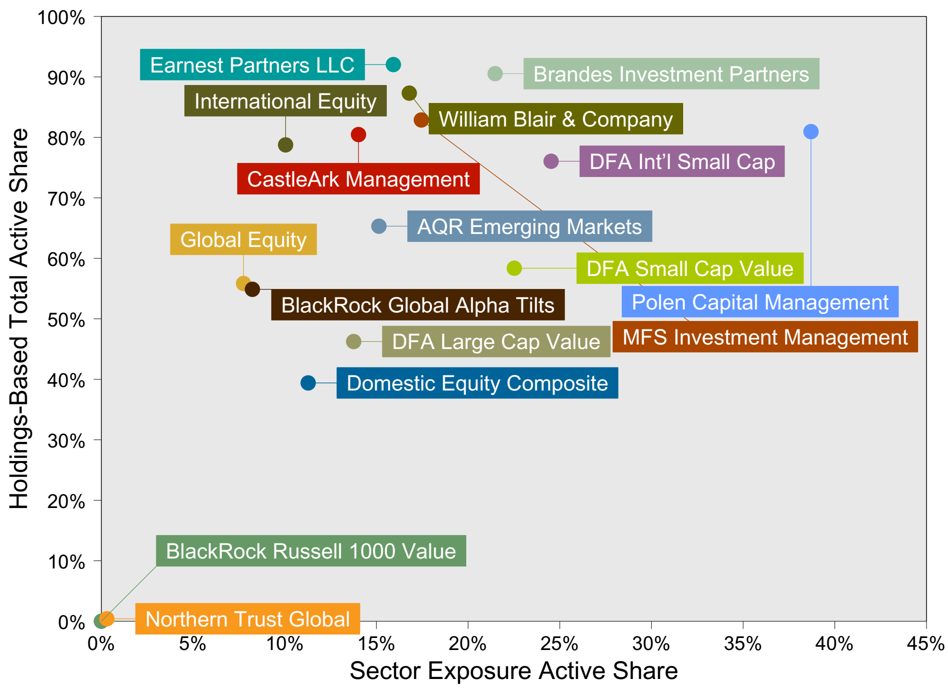
	Pub Pln- Dom Equity	Callan Global Equity	Pub Pln- Intl Equity	Pub Pln- Dom Fixed	Callan Tot Real Est DB
10th Percentile	11.48	10.11	4.30	3.61	12.33
25th Percentile	11.14	8.83	3.91	3.01	11.47
Median	10.85	7.75	3.43	2.50	10.81
75th Percentile	10.19	6.94	2.81	2.26	9.84
90th Percentile	9.53	6.01	2.39	1.92	7.89
Asset Class Composite ●	10.58	7.62	3.93	2.38	12.28
Composite Benchmark ▲	6.92	6.92	6.92	1.75	10.91

* Current Quarter Target = 44.0% MSCI ACWI IMI, 23.0% Blmbg Aggregate, 10.0% Russell 3000 Index lagged 3 months+2.0%, 10.0% 3-month Treasury Bill+3.0%, 9.1% NCREIF NFI-ODCE Eq Wt Net lagged 3 months and 3.9% Principal DRA Blend Index.

Active Share Structure Analysis
For One Quarter Ended September 30, 2022

This analysis compares multiple portfolios and composites in an active share context, illustrating the varying degrees of active risk taken by individual portfolios, and how they combine into active risk profiles for composites and the equity structure. Two sources of active share (active risk) are shown: 1) Total Holdings-Based Active Share based on individual position comparisons to the index (and the subcomponent from holding non-index securities), and 2) Sector Exposure Active Share that quantifies the more macro-level sector differences from the index.

Active Share Analysis
Ended September 30, 2022

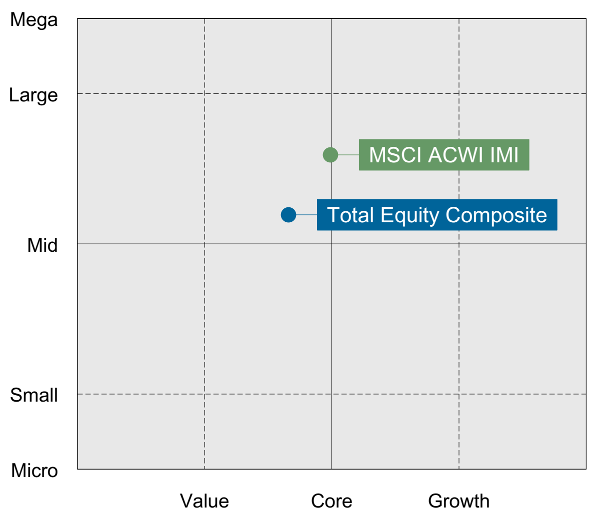


	Index	Total Act Share	Non-Idx Act Share	Sector Act Share	Number Securities	Security Diverse
Domestic Equity Composite	**Russell 3000**	**39.40%**	**0.60%**	**11.28%**	**1894**	**118.57**
BlackRock Russell 1000 Value	Russell 1000 Value	0.00%	0.00%	0.00%	855	65.15
DFA Large Cap Value	Russell 1000 Value	46.25%	0.59%	13.76%	311	38.54
Northern Trust Global	S&P 500	0.41%	0.00%	0.30%	501	41.28
Polen Capital Management	S&P 500	80.96%	2.87%	38.70%	22	7.48
Earnest Partners LLC	Russell MidCap	92.04%	8.14%	15.93%	58	21.71
DFA Small Cap Value	Russell 2000 Value	58.37%	15.69%	22.52%	955	128.78
CastleArk Management	Russell 2000 Growth	80.47%	16.87%	14.03%	107	33.63
Global Equity	**MSCI World**	**55.84%**	**6.72%**	**7.75%**	**818**	**54.31**
BlackRock Global Alpha Tilts	MSCI ACWI GD	54.88%	3.57%	8.24%	781	50.54
MFS Investment Management	MSCI ACWI GD	82.88%	3.31%	17.45%	77	22.57
International Equity	**MSCI EAFE**	**78.76%**	**27.48%**	**10.05%**	**2576**	**69.48**
AQR Emerging Markets	MSCI EM GD	65.32%	3.20%	15.14%	420	34.32
Brandes Investment Partners	MSCI EAFE	90.54%	15.06%	21.47%	63	21.90
William Blair & Company	MSCI ACWI xUS GD	87.32%	18.16%	16.79%	296	50.47
DFA Int'l Small Cap	MSCI EAFE Small	76.05%	15.75%	24.53%	1964	175.50

Current Holdings Based Style Analysis
Total Equity Composite
As of September 30, 2022

This page analyzes the current investment style of a portfolio utilizing a detailed holdings-based style analysis to determine actual exposures to various regional and style segments of the international/global equity market. The market is segmented quarterly by region and style. The style segments are determined using the "Combined Z Score", based on the eight fundamental factors used in the MSCI stock style scoring system. The upper-left style map illustrates the current market capitalization and style score of the portfolio relative to indices and/or peers. The upper-right style exposure matrix displays the current portfolio and index weights and stock counts (in parentheses) in each region/style segment of the market. The middle chart illustrates the total exposures and stock counts in the three style segments, with a legend showing the total growth, value, and "combined Z" (growth - value) scores. The bottom chart exhibits the sector weights as well as the style weights within each sector.

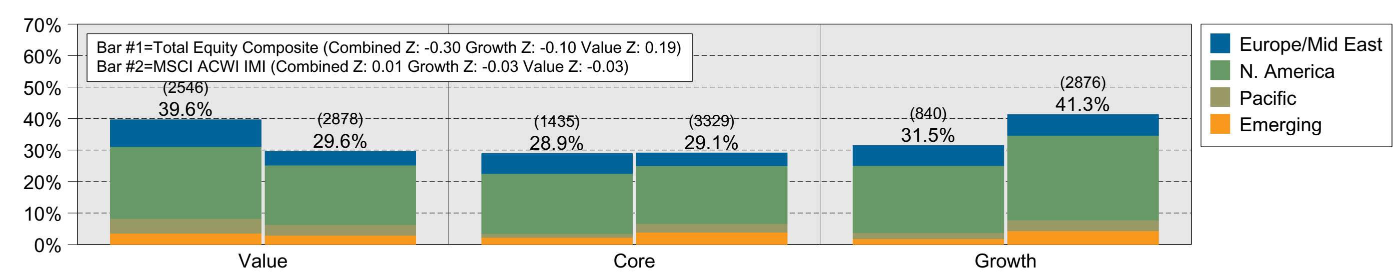
Style Map vs Callan Public Fund Spr DB
Holdings as of September 30, 2022



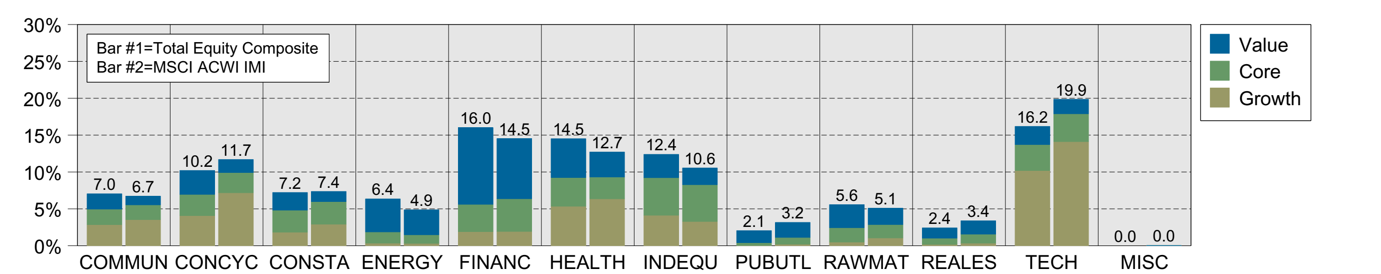
Style Exposure Matrix
Holdings as of September 30, 2022

	Value	Core	Growth	Total
Europe/ Mid East	8.6% (449) 4.4% (480)	6.4% (311) 4.1% (539)	6.4% (162) 6.6% (518)	**21.3% (922)** **15.1% (1537)**
N. America	22.9% (995) 18.9% (909)	19.1% (683) 18.4% (1170)	21.3% (381) 26.9% (801)	**63.2% (2059)** **64.2% (2880)**
Pacific	4.6% (898) 3.3% (500)	1.2% (262) 2.7% (547)	2.0% (94) 3.4% (515)	**7.8% (1254)** **9.4% (1562)**
Emerging	3.6% (204) 3.0% (989)	2.2% (179) 3.9% (1073)	1.8% (203) 4.4% (1042)	**7.7% (586)** **11.3% (3104)**
Total	**39.6% (2546)** **29.6% (2878)**	**28.9% (1435)** **29.1% (3329)**	**31.5% (840)** **41.3% (2876)**	**100.0% (4821)** **100.0% (9083)**

Combined Z-Score Style Distribution
Holdings as of September 30, 2022



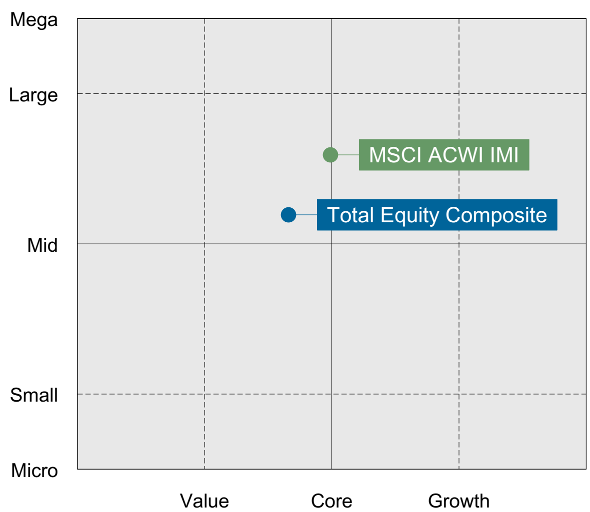
Sector Weights Distribution
Holdings as of September 30, 2022



Current Holdings Based Style Analysis
Total Equity Composite
As of September 30, 2022

This page analyzes the current investment style of a portfolio utilizing a detailed holdings-based style analysis to determine actual exposures to various regional and style segments of the international/global equity market. The market is segmented quarterly by region and style. The style segments are determined using the "Combined Z Score", based on the eight fundamental factors used in the MSCI stock style scoring system. The upper-left style map illustrates the current market capitalization and style score of the portfolio relative to indices and/or peers. The upper-right style exposure matrix displays the current portfolio and index weights and stock counts (in parentheses) in each capitalization/style segment of the market. The middle chart illustrates the total exposures and stock counts in the three style segments, with a legend showing the total growth, value, and "combined Z" (growth - value) scores. The bottom chart exhibits the sector weights as well as the style weights within each sector.

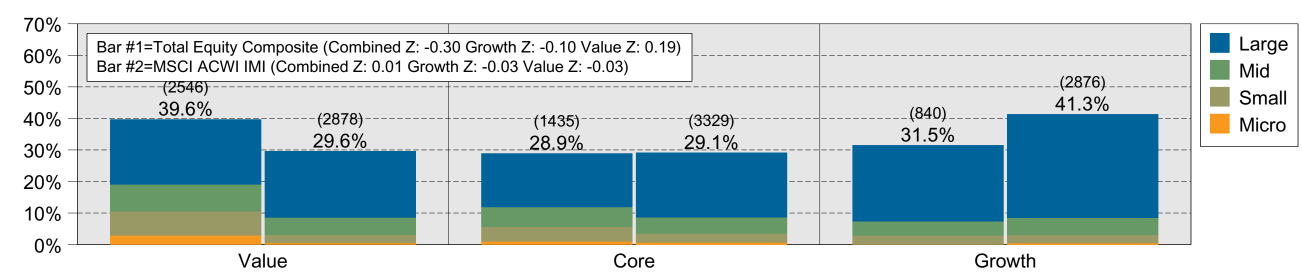
Style Map vs Callan Public Fund Spr DB
Holdings as of September 30, 2022



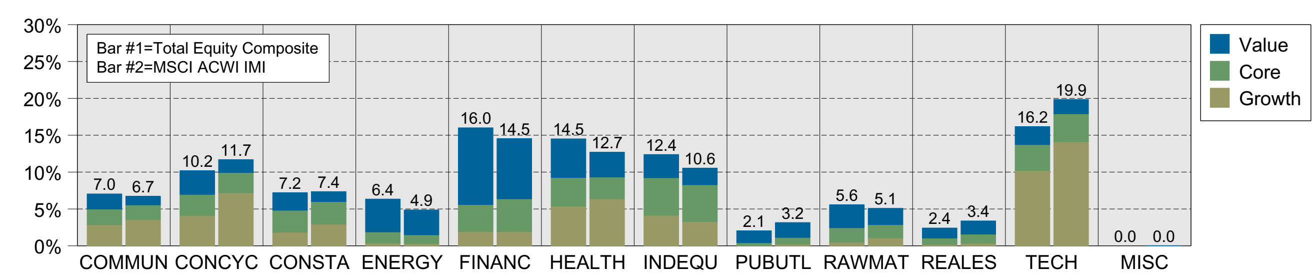
Style Exposure Matrix
Holdings as of September 30, 2022

	Value	Core	Growth	Total
Large	20.6% (246) 21.0% (318)	16.9% (197) 20.4% (267)	24.1% (229) 32.8% (324)	**61.6% (672)** **74.2% (909)**
Mid	8.6% (315) 5.5% (547)	6.2% (327) 5.1% (590)	4.5% (296) 5.4% (679)	**19.3% (938)** **16.1% (1816)**
Small	7.6% (529) 2.6% (1110)	4.7% (441) 2.9% (1355)	2.8% (210) 2.6% (1168)	**15.0% (1180)** **8.0% (3633)**
Micro	2.9% (1456) 0.5% (903)	1.0% (470) 0.7% (1117)	0.1% (105) 0.5% (705)	**4.1% (2031)** **1.7% (2725)**
Total	**39.6% (2546)** **29.6% (2878)**	**28.9% (1435)** **29.1% (3329)**	**31.5% (840)** **41.3% (2876)**	**100.0% (4821)** **100.0% (9083)**

Combined Z-Score Style Distribution
Holdings as of September 30, 2022



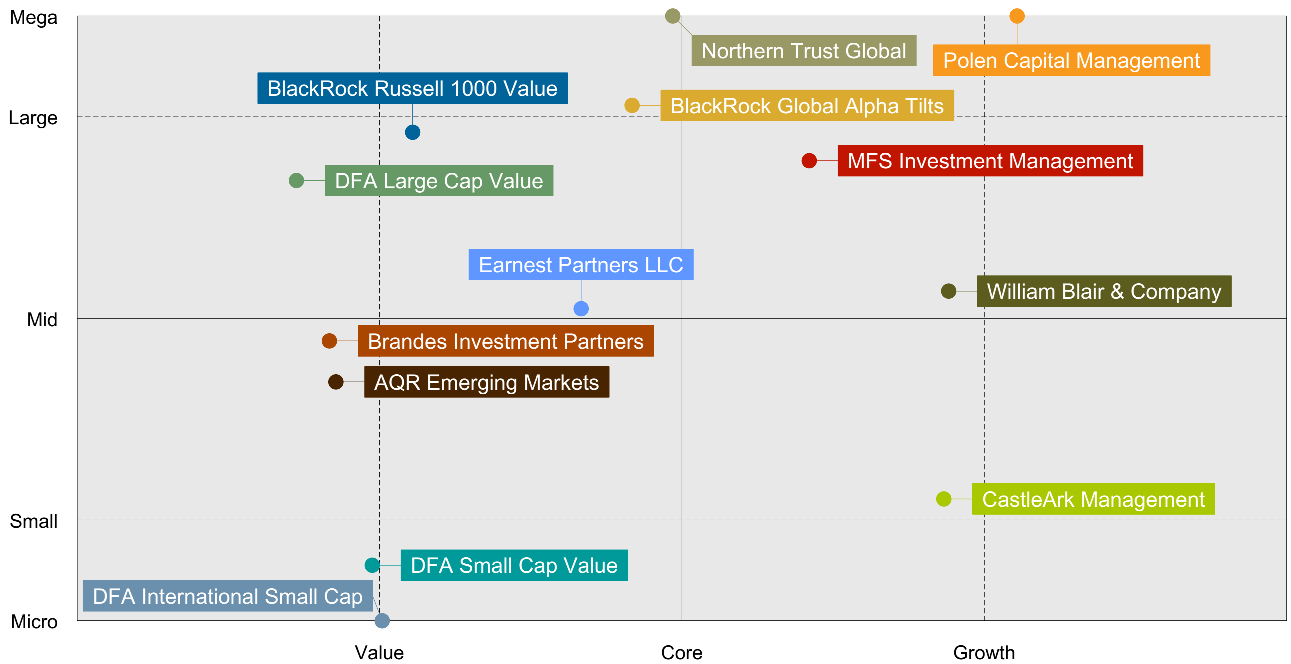
Sector Weights Distribution
Holdings as of September 30, 2022



Global Holdings Based Style Analysis
For One Quarter Ended September 30, 2022

This page analyzes and compares the investment styles of multiple portfolios using a detailed holdings-based style analysis methodology. The size component of style is measured by the weighted median market capitalization of the holdings. The value/core/growth style dimension is captured by the "Combined Z-Score" of the portfolio. This score is based on eight fundamental factors used in the MSCI stock style scoring system. The table below gives a more detailed breakdown of several relevant style metrics on the portfolios.

Style Map
Holdings for One Quarter Ended September 30, 2022



	Weight %	Wtd Median Mkt Cap	Combined Z-Score	Growth Z-Score	Value Z-Score	Number of Securities	Security Diversification
BlackRock Russell 1000 Value	8.55%	71.65	(0.81)	(0.37)	0.43	855	65.15
DFA Large Cap Value	6.18%	57.44	(1.16)	(0.37)	0.79	311	38.54
Northern Trust Global	9.90%	143.75	(0.01)	(0.02)	(0.01)	501	41.28
Polen Capital Management	5.93%	167.87	1.07	0.43	(0.64)	22	7.48
Earnest Partners LLC	4.54%	19.68	(0.29)	(0.10)	0.19	58	21.71
DFA Small Cap Value	7.81%	2.17	(0.93)	(0.22)	0.71	955	128.78
CastleArk Management	3.67%	4.26	0.84	0.21	(0.63)	107	33.63
MFS Investment Management	7.52%	63.28	0.42	(0.02)	(0.43)	77	22.57
BlackRock Global Alpha Tilts	10.55%	83.74	(0.13)	(0.05)	0.08	781	50.54
AQR Emerging Markets	3.18%	12.40	(1.04)	(0.19)	0.85	420	34.32
Brandes Investment Partners	13.80%	15.25	(1.06)	(0.36)	0.70	63	21.90
William Blair & Company	11.07%	24.86	0.85	0.25	(0.60)	296	50.47
DFA International Small Cap	7.31%	1.33	(0.90)	(0.16)	0.74	1964	175.50

Quarterly Highlights

The Callan Institute provides research to update clients on the latest industry trends and carefully structured educational programs to enhance the knowledge of industry professionals. Visit www.callan.com/research-library to see all of our publications, and www.callan.com/blog to view our blog. For more information contact Barb Gerraty at 415-274-3093 / institute@callan.com.

New Research from Callan's Experts

Research Cafe: Preliminary Mid-Year Capital Markets Assumptions | In this coffee break session, our experts, Jay Kloepfer and Adam Lozinski, describe our preliminary 2023-2032 Capital Markets Assumptions, discuss the process and rationale behind the adjustments of these long-term projections, and explain the potential implications for strategic recommendations.

Is Financial Wellness the Right Prescription for Your DC Plan? Jana Steele discusses what financial wellness is and how it can be incorporated effectively into a defined contribution (DC) plan.

Blog Highlights

Do Active Core Plus Fixed Income Managers Add Value With Sector Rotation? | To help answer this question, we used benchmark indices and risk-adjusted them to disentangle an active manager's contribution to performance from a strategic overweight to credit vs. the contribution added by true sector rotation. This provides a quantitative framework for evaluating potential performance, which can be balanced against other considerations, including fees and expenses, complexity, and desired risk and performance patterns.

Bubbles Bursting Everywhere | The S&P 500 posted its worst six-month return in over 50 years to start the year. Inflation is surging, hitting 40-year highs in the United States. At the same time, interest rates are rising, and, to top it off, a recession may be on the horizon. For institutional investors, navigating these treacherous cross-currents requires an understanding of just how we arrived at this point.

The Fading Unicorn: How Volatility, Inflation, and Rate Hikes Impact Venture Capital | With Fed rate hikes, skyrocketing prices, and a Nasdaq selloff, venture capital (VC) limited partners have no shortage of worries. The unicorn stampede of the past decade has begun to fade, with many technology companies drastically declining in value in the public markets. By understanding venture capital's relationship with interest rates, inflation, and the public markets, institutional investors can better navigate the effect on their portfolios in 2022 and beyond.

Target Date Funds and the Ever-Evolving Glidepath | In 2021 and the first half of 2022, multiple target date fund (TDF) providers announced changes to their strategic TDF glidepaths. The timing of these changes was unique, as capital markets adjusted to a post-pandemic world and a vastly different global outlook.

Quarterly Periodicals

Private Equity Update, 2Q22 | A high-level summary of private equity activity in the quarter through all the investment stages

Active vs. Passive Charts, 2Q22 | A comparison of active managers alongside relevant benchmarks over the long term

Market Pulse, 2Q22 | A quarterly market reference guide covering trends in the U.S. economy, developments for institutional investors, and the latest data on the capital markets

Capital Markets Review, 2Q22 | Analysis and a broad overview of the economy and public and private markets activity each quarter across a wide range of asset classes

Hedge Fund Update, 2Q22 | Commentary on developments for hedge funds and multi-asset class (MAC) strategies

Real Assets Update, 2Q22 | A summary of market activity for real assets and private real estate during the quarter

Private Credit Update, 2Q22 | A review of performance and fundraising activity for private credit during the quarter

Events

A complete list of all upcoming events can be found on our website: callan.com/events-education.

Please mark your calendar and look forward to upcoming invitations:

2023 Capital Markets Projections Webinar
Jan. 18, 2023 – Virtual

2023 National Conference
April 2-4, 2023 – Scottsdale, AZ

For more information about events, please contact Barb Gerraty: 415-274-3093 / gerraty@callan.com

Education: By the Numbers

50+	Unique pieces of research the Institute generates each year
525	Attendees (on average) of the Institute's annual National Conference
3,700	Total attendees of the "Callan College" since 1994

Education

Founded in 1994, the "Callan College" offers educational sessions for industry professionals involved in the investment decision-making process.

Introduction to Investments
March 1-2 – Chicago
May 23-25 – Virtual

This program familiarizes institutional investor trustees and staff and asset management advisers with basic investment theory, terminology, and practices. Our virtual session is held over three days with virtual modules of 2.5-3 hours, while the in-person session lasts one-and-a-half days. This course is designed for individuals with less than two years of experience with asset-management oversight and/or support responsibilities. Virtual tuition is $950 per person and includes instruction and digital materials. In-person tuition is $2,350 per person and includes instruction, all materials, breakfast and lunch on each day, and dinner on the first evening with the instructors.

Additional information including registration can be found at: callan.com/events-education

"Research is the foundation of all we do at Callan, and sharing our best thinking with the investment community is our way of helping to foster dialogue to raise the bar across the industry."

Greg Allen, CEO and Chief Research Officer

List of Callan's Investment Manager Clients

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Fund sponsor clients may request a copy of the most currently available list at any time. Fund sponsor clients may also request specific information regarding the fees paid to Callan by particular fund manager clients. Per company policy, information requests regarding fees are handled exclusively by Callan's Compliance department.

Manager Name
abrdn (Aberdeen Standard Investments)
Acadian Asset Management LLC
Adams Street Partners, LLC
AEGON USA Investment Management Inc.
AllianceBernstein
Allianz
Allspring Global Investments
American Century Investments
Amundi US, Inc.
Antares Capital LP
AQR Capital Management
Ares Management LLC
Ariel Investments, LLC
Aristotle Capital Management, LLC
Atlanta Capital Management Co., LLC
AXA Investment Managers
Baillie Gifford International, LLC
Baird Advisors

Manager Name
Barings LLC
Baron Capital Management, Inc.
Barrow, Hanley, Mewhinney & Strauss, LLC
BentallGreenOak
BlackRock
Blackstone Group (The)
BNY Mellon Asset Management
Boston Partners
Brandes Investment Partners, L.P.
Brandywine Global Investment Management, LLC
Brookfield Asset Management Inc.
Brown Brothers Harriman & Company
Capital Group
Carillon Tower Advisers
CastleArk Management, LLC
Chartwell Investment Partners
ClearBridge Investments, LLC
Cohen & Steers Capital Management, Inc.

Manager Name
Columbia Threadneedle Investments North America
Credit Suisse Asset Management, LLC
Crescent Capital Group LP
DePrince, Race & Zollo, Inc.
Dimensional Fund Advisors L.P.
Doubleline
Duff & Phelps Investment Management Co.
DWS
EARNEST Partners, LLC
Epoch Investment Partners, Inc.
Fayez Sarofim & Company
Federated Hermes, Inc.
Fidelity Institutional Asset Management
Fiera Capital Corporation
First Hawaiian Bank Wealth Management Division
First Sentier Investors
Fisher Investments
Franklin Templeton
Fred Alger Management, LLC
GAM (USA) Inc.
GlobeFlex Capital, L.P.
GoldenTree Asset Management, LP
Goldman Sachs
Golub Capital
Guggenheim Investments
GW&K Investment Management
Harbor Capital Group Trust
Hardman Johnston Global Advisors LLC
Heitman LLC
Hotchkis & Wiley Capital Management, LLC
Impax Asset Management LLC
Income Research + Management
Insight Investment
Intech Investment Management LLC
Intercontinental Real Estate Corporation
Invesco
J.P. Morgan
Janus
Jennison Associates LLC
Jobs Peak Advisors

Manager Name
KeyCorp
Lazard Asset Management
LGIM America
Lincoln National Corporation
Longview Partners
Loomis, Sayles & Company, L.P.
Lord Abbett & Company
LSV Asset Management
MacKay Shields LLC
Macquarie Asset Management
Manning & Napier Advisors, LLC
Manulife Investment Management
Marathon Asset Management, L.P.
McKinley Capital Management, LLC
Mellon
MetLife Investment Management
MFS Investment Management
MidFirst Bank
MLC Asset Management
Mondrian Investment Partners Limited
Montag & Caldwell, LLC
Morgan Stanley Investment Management
MUFG Union Bank, N.A.
Natixis Investment Managers
Neuberger Berman
Newton Investment Management
Ninety One North America, Inc.
Northern Trust Asset Management
Nuveen
P/E Investments
Pacific Investment Management Company
Pantheon Ventures
Parametric Portfolio Associates LLC
Partners Group (USA) Inc.
Pathway Capital Management, LP
Peregrine Capital Management, LLC
PFM Asset Management LLC
PGIM Fixed Income
PGIM Quantitative Solutions LLC
Pictet Asset Management

Manager Name
PineBridge Investments
Polen Capital Management, LLC
Principal Global Investors
Putnam Investments, LLC
Raymond James Investment Management
RBC Global Asset Management
Regions Financial Corporation
Richard Bernstein Advisors LLC
Robeco Institutional Asset Management, US Inc.
Rothschild & Co. Asset Management US
S&P Dow Jones Indices
Schroder Investment Management North America Inc.
Segall Bryant & Hamill
SLC Management
Smith Graham & Co. Investment Advisors, L.P.
State Street Global Advisors
Strategic Global Advisors, LLC
T. Rowe Price Associates, Inc.

Manager Name
The TCW Group, Inc.
Thompson, Siegel & Walmsley LLC
Thornburg Investment Management, Inc.
Tri-Star Trust Bank
UBS Asset Management
VanEck
Versus Capital Group
Victory Capital Management Inc.
Virtus Investment Partners, Inc.
Vontobel Asset Management
Voya
Walter Scott & Partners Limited
WCM Investment Management
Wellington Management Company, LLP
Western Asset Management Company LLC
Westfield Capital Management Company, LP
William Blair & Company LLC

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Past performance is no guarantee of future results.

Memorandum

To: CMERS Investment Committee
From: David Walters, CFA, CTP
Date: December 8, 2022
Re: AQR Due Diligence Meeting: October 3, 2022
Team: Erich Sauer and Dave Walters

Background
AQR Capital Management (AQR) has managed an Emerging Markets Core Equity mandate for the City of Milwaukee ERS (ERS) since August of 2016. As of October 31, 2022, AQR managed 2.0% of the Fund's assets, or $80.1 million.

Key Takeaways from the Recent Meeting

- AQR's performance improved modestly as the value factor showed signs of rebounding in 2021 and YTD 2022. Returns are in line with the benchmark over all periods.
- Firm assets have continued to contract as a result of outflows and market impact. AQR experienced a period of rapid growth in assets and headcount leading up to 2019 that has reversed in the years since. The organization is still in transition as it finds the right structure to match its current asset levels.
- In 2021, AQR unwound a recent reorganization of investment leadership that created new positions for two individuals as Co-heads of Portfolio Management, Research, Risk and Trading. One of the former Co-heads left the firm to pursue personal interests in another field while the other moved to a business development role at AQR. The result has been to have co-founders Cliff Asness and John Liew directly overseeing all investment functions – a return to the structure in place prior to the noted firm growth.
- AQR has focused its headcount reduction on back office operations, including an initiative to offshore a meaningful portion of the labor supporting these functions. Investment and research staff appear to have been relatively insulated from reductions. Staff and Callan believe that AQR's investment teams remain adequately staffed, but will continue to monitor this.

Firm Summary
AQR was founded in 1998 and is headquartered in Greenwich, CT with additional offices in the UK, Australia, Hong Kong, India, and Germany. The satellite offices are primarily focused on client service, except for India, which houses technology staff. Since its founding, the firm has grown significantly to become a global asset manager with approximately $100 billion in assets under management (AUM) and 583 employees. Both AUM and headcount have fluctuated since we hired AQR, starting at $150 billion and 645 employees in 2016, and reaching $225 billion and 914 employees when we visited in 2018, before falling back to current levels. Recent AUM losses have impacted both the firm's alternative products and equity strategies. The Firm also discontinued its traditional long-only fixed income strategies at the end of 2021, further reducing AUM. AQR is employee-owned with 32 principals owning approximately 70% of the business, while Affiliated Managers Group (AMG) has a minority ownership interest of approximately 30% of the business. Since AMG's ownership is a minority position, AQR employees retain full independence with respect to both operational and investment process decisions.

As of June 30, 2022, the Emerging Market Equity (EM) strategy that the ERS is invested in had $8.5 billion in AUM. This is a decrease from $15.9 billion in 2018. The EM strategy has 13 public pension fund clients, representing $4.2 billion in assets. The remaining $4.3 billion is diversified primarily among sovereign wealth, corporate pension, Taft-Hartley, Foundation, and Endowment clients. In terms of the AUM split by vehicle, the LP vehicle in which the ERS is invested has 30 total investors and $2.5 billion in AUM, while 7 separate accounts have $6.0 billion in AUM. This is a decrease of 23 clients and $1.2 billion for the LP vehicle since 2020.

AQR has taken a measured approach in attempting to manage the growth of its strategies. Because numerous strategies of the firm utilize the same research in targeting alpha, capacity is assessed on a firm wide basis. Based on these capacity assessments, AQR did hard close the EM strategy to existing and new investors in the third quarter of 2017, before re-opening the strategy in the first quarter of 2018 after experiencing outflows that alleviated capacity concerns. In 2022, AQR noted that it believes the growth of equity markets in emerging countries and increased trade volume in these stocks have increased the firm's capacity within EM strategies well beyond the current strategy AUM. Capacity assessment is critical when investing in areas such as emerging markets. While not a current concern due to recent outflows, staff and Callan will continue to closely monitor AQR's capacity for the strategy.

AQR has three of the four original founding principals still actively managing the firm. Dr. Clifford Asness is the Managing Principal and public face of the firm. Dr. John Liew oversees the Portfolio Management and Research department, and Mr. David Kabiller is head of business development. AQR's investment management is conducted out of the firm's headquarters, and the EM strategy draws on centralized resources from the firm's 32-person macro and multi-strategy (MMS) team for country and currency selection, and the 30-person global stock selection (GSS) team for stock selection research, modeling, and portfolio management. The investment process is somewhat insulated from key-person risk through its utilization of the MMS, GSS, and other specialty teams. AQR had 267 investment professionals as of June 30, 2022. While investment headcount has fallen in recent years, it is worth noting that investment professional headcount as of June 30, 2022 is greater than the investment professional headcount at the firm as of March 31, 2016 when AUM were more than 50% higher (221 individuals).

In 2019, Ronen Israel and Lars Nielsen were named co-heads of Portfolio Management, Research, Risk and Trading. AQR created these new positions, directly under the founding principals, in order to better organize the investment team and promote collaboration between the different investment departments. Mr. Israel announced his retirement in 2021 to pursue interests outside of the investment field, triggering another reorganization among investment leadership. As part of this restructuring, Mr. Nielsen moved to a business development role with the firm and all investment teams began reporting directly to founding principals Cliff Asness and John Liew. Staff and Callan are comfortable with the most recent reorganization as this represents a return to the way the investment team was led prior to the firm's rapid expansion. We will continue to monitor the firm's ability to identify its next generation of investment leaders and execute an eventual succession plan for the founders.

Strategy Overview

AQR believes that fundamentals drive asset returns. While markets are not perfectly efficient, they are difficult to outperform. They also recognize that international investing exposes investors to additional risks beyond just stock specific risk, in the form of country and currency risk. AQR's approach is to isolate each of these risks and manage them separately, which they accomplish by using derivative overlays for the country and currency components. Country exposure is provided by equity index futures and currency exposure is provided by currency forwards. The strategy seeks to have 50% of active risk come from stock selection, and 25% each from country and currency.

The strategy is quantitative in nature, taking a set of fundamental inputs and applying them in a disciplined and systematic process, with the goal of accumulating many small "edges." For the stock selection process, the two primary factors will be familiar – valuation (cheaper stocks expected to outperform more expensive) and momentum, in both stock price and business fundamentals (improvements in recent periods expected to continue in subsequent periods). Factors receiving smaller weights in the process relate to earnings quality, company stability, investor sentiment, and management signaling. Stocks are ranked based on each of these factors, and the combined ranking determines a stock's weight in the portfolio. This process determines which stocks the strategy buys within a country, but in order to keep the country and currency risks separate, the stocks are bought in quantities that keep the total portfolio's country weights even with the benchmark. The strategy will typically hold approximately 400 stocks, as well as approximately 60 country investment positions and 100 currency investment positions. The number of holdings may fluctuate as the models attempt to precisely target the desired tracking error.

Country and currency tilts are then determined independently, this time based on a mix of fundamental and technical factors. The primary factors are again valuation and momentum in both cases, but the country selection model will consider additional factors such as futures mispricing and carry, while the currency selection model adds interest rates and investor sentiment. One of the benefits of constructing the portfolio in this fashion is it allows for different views on country and currency to be reflected in the portfolio. An example of where this would be of a particular advantage is an expansionary monetary policy, which would be expected to be a positive for a country's equity index, but a negative for the currency.

The quantitative model for determining stock, country, and currency allocation is run daily. However, AQR carefully evaluates the costs of additional trading against how much closer that trading moves the portfolio to the "ideal" model portfolio. This means that even with the daily running of the model, the portfolio does not typically experience large changes day-to-day. The strategy also has a crisis management model that seeks to control risk by limiting overweight exposures to countries or currencies perceived to have an elevated risk of crisis. In the case of extreme events, the portfolio managers are able to step in and override the model portfolio, but do so rarely, and always with the goal of reducing active risk.

The strategy had gone through two changes in custodian shortly after we hired AQR, from State Street to Citigroup, and then from Citigroup to JP Morgan. Staff was monitoring the situation because while these are all well qualified custodial banks, changes that rapid are somewhat rare. The situation has been stable since 2016, with JP Morgan still in place as custodian.

Trading

AQR has built an impressive trading operation with the goal of reducing trading costs and increasing net returns for clients. The trading team has 26 members, not including researchers and developers, who trade around the clock, making extensive use of algorithms and electronic trading systems. The number of traders has been reduced in line with the Firm's lower AUM. We spoke with Vinod Addidam, the Head of Commodities, Equities, and Equity-Linked trading who indicated that they still have plenty of staff to cover the continuous trading day. It was also noted that as trading operations have become more automated, fewer traders are required. A dedicated transaction cost analysis team allows the trading department to build models to help balance the tradeoff between expected returns and costs.

Whenever possible, AQR avoids using brokers, instead bringing trades directly to market through their proprietary electronic trading platform, Evo, which allows for significant savings on commissions. The alpha sources of AQR's investment strategies are typically long-term in nature, such that the trading department can trade patiently, providing liquidity to the market rather than taking it. AQR has estimated that approximately 76% of trades are executed on a passive basis, earning the spread, and only 24% of trades are executed on an active basis, paying the spread. This is another benefit of bringing the trades directly to market, as the savings flow directly through to the net performance of the strategy.

In addition to the Evo system mentioned above, AQR also uses Charles River, a third party system for trade order management, as well as ATOM (AQR Trade Order Management), an internally developed system that is integrated with Charles River, Portfolio Management, and Compliance. AQR also utilizes O2, a proprietary order management system that interfaces with Charles River to create trade orders. For asset classes that require communicating with brokers, such as FX and swaps, AQR utilizes Adroit and Bloomberg trading platforms.

Turnover is reasonable for a quantitative strategy. Over the past three years, the average turnover for the equity portfolio was approximately 78%. The average turnover for the country and currency components, based on the notional value of the derivate contracts, was approximately 120% and 243%, respectively. The differences in turnover rates between the equity, country, and currency components of the portfolio illustrate the importance of managing these components independently in the portfolio.

AQR recently discontinued its securities lending program within the fund. The firm determined that the costs of the program exceeded the benefit in the current environment but may reinstitute the program if lending conditions change.

Compliance

H.J. Willcox, AQR's Chief Compliance Officer (CCO), is responsible for monitoring all compliance matters at the firm. Mr. Willcox reports to John Howard, Chief Financial Officer and Co-Chief Operating Officer, as well as periodically to the Founding Principals and Executive Committee. AQR uses the previously mentioned ATOM system to perform pre-trade compliance checks on every trade order to ensure compliance with client guidelines. The compliance team uses ION Sentinel to monitor portfolios post-trade on a daily basis and review for possible compliance violations. On an annual basis, AQR completes a SOC 1 examination of the firm's internal control framework. The most recent report noted no key deficiencies.

AQR has a Code of Ethics Policy that specifies the rules and procedures for personal trading. The firm also has a compliance manual and gives all of its new employees a compliance orientation that reviews relevant policies and procedures. All employees receive ongoing compliance training on an annual basis.

Risk Management

Amir Becher succeeded Mike Patchen as Chief Risk Officer in 2021. He reports to John Liew, Founder, and H.J. Willcox, Chief Legal Officer and Global Head of Compliance and Risk, to ensure that the risk management function remains independent of investment strategy. Mr. Becher previously served as the Head of the Market and Model risk group at AQR after working in risk management at another hedge fund earlier in his career.

Mr. Becher is responsible for overseeing market, liquidity, and model risk. He took us through a demonstration of Intercept, the risk-monitoring dashboard that they use for our EM strategy. Intercept appears to be a very powerful tool capable of monitoring a strategy as complex as EM. Intercept monitors against internal limits that are more conservative than regulatory or client guideline limits. The dashboard includes an additional program, Constellation, responsible for flagging escalation items within Intercept when limits are approached or exceeded. While the risk team works collaboratively with investment researchers and portfolio managers, they are responsible for generating independent risk models and metrics.

AQR has an Enterprise Risk Committee to oversee risks across the firm, including counterparty, legal & regulatory, operational, and technology risk. The Committee is made up of the firm's Founding Principals, senior portfolio managers, and senior business and function heads.

Information Technology and Disaster Recovery

Steven Mock was named as the sole Chief Technology Officer for the firm in 2021 and is responsible for managing a team of approximately 205 IT professionals. Ian Roche had served as co-CTO with Mr. Mock since 2019, but moved into the firm's Research organization, a signal of the firm's technology-intensive research approach. AQR has separate disaster recovery sites located in Connecticut and Virginia. The disaster recovery network infrastructure is identical to that of the Greenwich facility in order to ensure equal performance and functionality of all systems. All server data is replicated to the disaster recovery sites, which provide near real-time data recovery. AQR provides all employees with network access through a virtual private network to support continuity when working remotely. This prepared the firm well for the remote working environment of the COVID-19 pandemic and continues to serve as a pillar of the disaster recovery plan.

AQR typically tests its disaster recovery plan annually. The most recent firm-wide test was in April 2022, and critical functions such as portfolio management, trading, and cash management were able to run remotely with no issues.

Proxies

AQR works with ISS Governance Services (ISS) for proxy voting, and will generally vote proxies according to the voting guidelines developed by ISS. ISS provides in-depth analysis of shareholder meeting agendas, vote recommendations, and recordkeeping. The firm also uses Glass Lewis for additional research and recommendations on proxy issues. AQR attempts to vote all proxies, but may not do so in cases where the cost of voting outweighs the benefit, which is more common with foreign securities than it is with domestic. In the case where AQR believes a vote contrary to the AQR Voting Guidelines is in the best interest of shareholders, the AQR Compliance Department must approve the vote.

Performance Summary and Conclusion

Net of fee performance for the AQR Emerging Market Equity strategy in which the ERS is invested, as of October 31, 2022, is presented below.

	1-year	3-year	5-year	Inception (8/1/2016)
AQR Emerging Equity	-29.8%	-3.3%	-3.7%	2.3%
MSCI Emerging Market	*-31.0%*	*-4.4%*	*-3.1%*	*2.4%*

As discussed above, strategy performance has improved modestly after a period of underperformance, similar to many other AQR strategies, due to the underperformance of the value factor. Recent outperformance has been driven by AQR's stock selection, evidencing its ability to execute on its desired equity exposures. Staff discussed performance and portfolio composition with AQR and Callan, and while there are no guarantees, we do have the expectation that the strategy is positioned to perform well once the extreme outperformance of growth vs. value normalizes. Importantly, during periods where stock selection lagged due to the value factor, the country and currency portions of the investment process have been additive to performance, which helps to validate AQR's process of separating those sources of risk into distinct components.

Overall, ERS staff continue to be impressed by AQR and confident in the firm's abilities. In addition to performance, other issues we will continue to monitor are asset levels at the firm, staffing of investment functions, and turnover among key personnel. AQR's internal investment research, portfolio construction process, and trading strategies are key strengths that should allow the strategy to be successful over the long term. Going forward, AQR appears capable of fulfilling ERS' mandate of emerging markets core equity manager.

Memorandum

To: CMERS Investment Committee
From: Erich Sauer, CFA, CAIA
Date: December 8, 2022
Re: Principal Virtual Due Diligence Meeting November 8, 2021
Team: Erich Sauer and Anthony Lubarsky

Background

The City of Milwaukee Employes' Retirement System (ERS) hired Principal Global Investors (PGI) in January 2016 to manage the real assets portion of the Fund's portfolio. ERS is invested in the Diversified Real Assets (DRA) strategy, a fund of underlying sub-advisors selected by Principal. As of October 30, 2022, Principal managed $176.8 million, or 3.3% of the Fund's assets.

Key Takeaways From Most Recent Meeting

- The DRA strategy has outperformed both stocks and bonds over the past 1 year, which is encouraging in the first truly inflationary environment since our inception with the strategy.
- Several changes to the DRA PM team in 2022 are detailed below. Staff discussed these changes with Callan, and ultimately feels comfortable with the team going forward, but will continue to monitor.
- Principal updated the custom benchmark for the strategy in January 2022, to better reflect how they believe the strategy needs to be allocated in order to deliver on its return target of CPI + 3-5% over the long term. Staff also discussed this change with Callan, and feels comfortable that it aligns with the intent of the strategy, but will continue to monitor.
- Overall, staff is comfortable with the DRA team, and believes they have the capability to construct a successful real assets strategy going forward.

Firm Summary

PGI is a wholly-owned, indirect subsidiary of Principal Financial Group (PFG), with assets under management totaling $484.6 billion as of September 30, 2022. PGI is an SEC-registered investment adviser that provides investment advisory services to institutional investors and individuals. PGI's investment operations are divided into several boutiques (equities, fixed income, currency, asset allocation). Principal Global Asset Allocation (PGAA) is a specialized boutique within PGI that focuses solely on asset allocation solutions. The DRA strategy is part of PGAA and was launched in 2008 alongside other outcome-based strategies to address specific investor needs. DRA is a beneficiary of utilizing shared services within PFG, as both economists and marketing professionals are shared among the organization.

DRA Team

In March of 2022, Principal announced several updates to the team that manages the DRA strategy. May Tong, a PM who joined the strategy in May of 2021, shortly after the departure of PM Jake Anonson, was named the lead PM. Marc Dummer, who had been the de facto lead PM, took a role as lead of a newly created client portfolio management team. Finally, Kelly Grossman, who was a named PM on the DRA strategy, but had been playing a smaller and smaller role over the years, left the DRA team to become head of investment analytics on Principal's OCIO platform.

Since joining the team, Ms. Tong has been focused on integrating the resources of the broader PGI platform into the DRA strategy, by more fully utilizing the firm's Global Insights, Manager Research, and Risk and Analytics departments. This allows the PMs to focus more on asset allocation, and allows the strategy's dedicated analysts to focus more on monitoring existing managers. Since Ms. Tong is the architect of these enhancements, it is logical that she lead the team going forward. Mr. Dummer's new role also helps alleviate a concern noted in past memos, which is that the PM team had been spending 30-40% of their time on marketing. Having someone with Mr. Dummer's experience in a role that is focused on the client side will remove that burden.

The DRA strategy has 71 clients in the CIT vehicle. The investment team manages a total of $5.4 billion of client assets in the DRA strategy as of September 30, 2022, which includes $4.0 billion in mutual fund assets and $1.4 billion in CIT assets. The portfolio management team also advises the Principal Global Diversified Income, Global Multi-Strategy, and Global Diversified Select Real Asset strategies.

The DRA team estimates capacity for the strategy to be $25 billion. This estimation has increased from $12 billion since the inception of ERS' mandate primarily due to capacity agreements of the existing sub-advisors along with expectations of increased market liquidity.

Strategy

Principal's investment objective is to construct a broad based fund of funds that invests across a number of inflation-hedging asset classes in order to generate annual returns that are 3%-to-5% above inflation over a full market cycle, which they define as three to five years. The DRA team currently allocates to strategies within eight categories. The current sub-advisors, and the respective allocation percentages for the DRA sleeves, as of September 30, 2022, are listed below:

Infrastructure (Clearbridge, MacQuarie)	31%	TIPS (BlackRock)	17%
Natural Resources (Impax, Newton)	13%	Commodities (CoreCommodity, Wellington)	15%
Global REITs (Principal Real Estate)	12%	Floating Rate Debt (Nuveen)	6%
Equitized Cash (PGAA)	4%	Global Timber (Pictet)	2%

The allocation can vary with the economic or credit cycles as new asset classes or strategies are identified and determined to be appropriate for inclusion in the DRA strategy. The investment team simulates the permissible combinations of the underlying asset classes to identify the weighting schemes that would allow the total portfolio to provide returns of 3%-to-5% above inflation while simultaneously minimizing risk by plotting on the efficient frontier. The underlying sub-advisors are not allowed to employ any borrowing in the implementation of their investment strategies. Although DRA legal documents do not prohibit the use of leverage, PGAA has indicated it has never employed leverage in the management of the CIT and it does not intend to.

Early in 2022, Principal changed the DRA's blended benchmark, reducing the allocations to TIPS from 35% to 15%, and Natural Resources from 20% to 15%, and increasing REITs from 10% to 25%, and Infrastructure from 20% to 30%. Commodities remained unchanged at 15%. Around the same time, CoreCommodity and Wellington replaced Credit Suisse in the commodities allocation, and the Global Water and MLP allocations were removed from the portfolio. Water and MLP each had small allocations, and Principal felt they could achieve better inflation protection by redeploying those assets to other areas of the portfolio. CMBS was also removed from the portfolio at this time.

Staff discussed these changes with Callan, and they were comfortable that the portfolio still fits its intended objectives of providing a diversification benefit, inflation mitigation, and enhancing total returns.

Investment Philosophy and Process

The DRA strategy is based upon the premise that stocks and bonds exhibit low correlations to inflation over short and long time horizons, and real assets have been excellent inflation hedges over long time periods. The DRA team believes there is an opportunity to capture an attractive long-term return by investing in real asset classes while also improving portfolio diversification.

Given the difficulty in predicting inflation, the DRA investment team believes that it is both imprudent and impractical to attempt to rotate among different inflation hedges. Rather, the team believes that the most effective method is to perpetually maintain a prudently balanced and diverse portfolio of real asset classes. The investment team follows a seven-step process, which includes a combination of both bottom-up and top-down analysis.

1. Identify and select the asset classes and strategies that exhibit a persistent high sensitivity (beta) to inflation, generate a reliable return, and provide diversification benefits.

2. Utilize capital market forecasts, generated from economists dedicated to the DRA strategy in collaboration with the investment team, which provide macroeconomic and risk outlooks for inflation, interest rates, and equity markets. Forward-looking return forecasts are developed by analyzing historical returns, volatility, and correlations.

3. Using the capital market forecasts derived above, target weights are established for each strategy in order to optimize portfolio return per unit of risk, while keeping risk within a target standard deviation of 10-12% over a market cycle.

4. Use a multi-strategy and multi-manager approach that covers a broad array of inflation-sensitive asset class portfolios that are actively managed to a tactical allocation target. Active and passive sub-advisors are considered as well as single or multiple sub-advisors per sleeve. Manager weightings reflect the team's outlook for opportunities within the respective asset classes, while remaining cognizant of sub-advisor proliferation.

5. Conduct extensive searches to hire specialist managers for each investment strategy. A key part of the process is determining whether active management has historically been successful in the asset class, which will inform the choice between active and passive. If the DRA team determines active management is appropriate, they outline specific search criteria, and conduct a comprehensive due diligence process to select the appropriate manager. The due diligence process is both quantitative and qualitative, focusing on the investment philosophy and process, to ensure it aligns with the intended outcome in the DRA portfolio. Managers are hired to manage customized separate accounts, with investment guidelines that outline the expectations and risk-management framework for the strategy.

6. Monitor strategy positioning and performance on a daily basis. Risk reports were historically run through FactSet on a monthly basis, but Principal's risk team recently built a tool in-house, PRIME, that allows the DRA team to run risk reports daily. The manager oversight analysts on the DRA team perform monthly monitoring calls with each manager, as well as review the managers' monthly performance and risk attribution. The team also performs an annual re-underwriting of the investment and operations due diligence.

7. Employ rules-based-rebalancing methodology such that a sub-advisor's allocation will be adjusted half-way back to target as the sleeve allocation approaches the upper or lower band of the target allocation range, while also utilizing portfolio cash flows wherever possible in order to mitigate transaction costs.

The DRA investment team communicates throughout the day in an informal fashion and also meets at least weekly to formally discuss market conditions, economic data, and research ideas. The team also conducts a quarterly asset allocation meeting at which target weights are discussed in the context of the current market, the economic outlook, and feedback from sub-advisors.

Compliance and Internal Controls

ERS staff met with John Mills, Compliance Director, who reports directly to Justin Lang, Global Head of Compliance for PGI. Mr. Lang reports directly to the Chief Compliance Officer for PFG, Betsy Happe. Mr. Mills' team is responsible for ongoing education on compliance and the Code of Ethics (Code), which is a firm wide compliance policy that PGI and PGAA employees must adhere to. The Code includes: disclosure of personal holdings of securities; prohibited securities, disclosure of gifts, and monitoring of broker statements. Mr. Mills' team also is responsible for overseeing pre/post trade compliance via Charles River, and all regulatory filings.

ERS staff also met with Traci Knox, Director of Subadvisor Compliance. While Mr. Mills' team is responsible for firm compliance, Ms. Knox' team is responsible for compliance of hired and potential future sub-advisors. Ms. Knox orchestrates compliance assessments during the sub-advisor hiring process, including information regarding sub-advisor compliance monitoring, insurance coverage, the firm's CCO, SEC exams, litigation, and soft dollar policies. Her team conducts on-site visits typically every two years, but will visit higher risk managers on a more frequent basis.

State Street is the custodian for all CIT assets. ERS staff spoke with Benjamin Hackett, Senior Trust Operations Analyst. Mr. Hackett is located in Portland, Oregon and, his group is primarily responsible for oversight of State Street as the Administrator, Custodian, Transfer Agent and Accountant for the DRA CIT. The investment team has decided to not participate in any securities lending programs with the custodian and therefore none of the securities are ever loaned out to counterparties.

PGI is evaluated by the United States Securities and Exchange Commission. The last routine examination of PGI was conducted during the period beginning August 2016 and concluding September 2017. There were no material deficiencies noted in the examination.

Information Systems and Disaster Recovery

PGI has an in-house IT department that manages IT resources for PGAA. In addition, PGI's parent, PFG, provides infrastructure services and support. PGI has IT development and support staff dedicated to their operations as well, which includes PGAA.

PFG maintains Business Continuity (BC) and Disaster Recovery (DR) Programs. The design of the programs follow professional practices established by the Disaster Recovery Institute International (DRII) as well as PFG's standards, which include a formal Business Impact Analysis (BIA). The BIA identifies the business processes that are considered critical within the first 72 hours of an incident, which are then prioritized. An emphasis and objective of the Program is to protect customer financial assets and data. As part of the DRA Program, PFG has workspace recovery locations that are located in West Des Moines, IA and Urbandale, IA. The workspace facilities have high speed access to the off-site data center as well as all documented office requirements. In addition, a mobile recovery unit and a work from home capability are available as alternate workspace recovery solutions.

DR and BC tests are conducted annually in Q4 of each year. Business continuity exercises include calling trees and testing functionality of alternate worksites. There were no significant issues identified as a result of the most recent test.

Performance Summary and Conclusion
Principal's DRA strategy takes a benchmark-agnostic approach, with the goal of achieving annual returns that are 3%-to-5% above inflation over a full market cycle, which Principal defines as three to five years. Real assets have historically been excellent inflation hedges over longer time periods, but less effective over time horizons shorter than one year, since short-term security pricing can be influenced by many strategy specific and macro-economic factors.

The table below shows returns as of October 31, 2022. While the strategy has seen a negative return over the past one year due to the drawdown in the overall markets, the inflation protection embedded in the strategy has allowed it to hold up much better than either stocks (ACWI IMI -20.2%) or bonds (BBG Agg -15.7%). 2022 has been our first experience with the strategy in an inflationary environment, and it is nice to see an early indication of it providing inflation protection.

Overall, Principal has been a stable real assets manager and provides a nice diversification benefit to the rest of CMERS' portfolio. Staff will continue to monitor the changes to the PM team, changes to the strategy benchmark, and performance in what could potentially be a higher inflation environment going forward. Net of fee returns, along with benchmark returns, are provided in the table below.

	1-Year	3-Year	5-Year	Since Inception (2/1/2016)
Principal (Net)	-7.4%	5.0%	3.9%	5.7%
*Principal Custom Index**	*-7.6%*	*3.6%*	*3.4%*	*5.0%*

*The Principal Custom Index was last updated in January 2022. New and old weights for the index are shown below:

	New Weight	Old weight
Barclays US Treasury TIPS Index	15%	35%
S&P Global Infrastructure Index	30%	20%
S&P Global Natural Resources Index	15%	20%
Bloomberg Commodity Index	15%	15%
FTSE EPRA/NAREIT Developed Market Index	25%	10%