Alameda County Employees' Retirement Association
BOARD OF RETIREMENT

INVESTMENT COMMITTEE/BOARD MEETING

THIS MEETING WILL BE CONDUCTED VIA TELECONFERENCE [SEE EXECUTIVE ORDER N-29-20 ATTACHED AT THE END OF THIS AGENDA.]

ACERA MISSION:

To provide ACERA members and employers with flexible, cost-effective, participant-oriented benefits through prudent investment management and superior member services.

Wednesday, August 12, 2020
9:30 a.m.

ZOOM INSTRUCTIONS	COMMITTEE MEMBERS	
The public can view the Teleconference and comment via audio during the meeting. To join this Teleconference, please click on the link below. https://zoom.us/join Meeting ID: 881 2105 3866 Password: 538078 For help joining a Zoom meeting, see: https://support.zoom.us/hc/en-us/articles/201362193	**ELIZABETH ROGERS, CHAIR**	**ELECTED GENERAL**
	TARRELL GAMBLE, VICE CHAIR	**APPOINTED**
	DALE AMARAL	**ELECTED SAFETY**
	OPHELIA BASGAL	**APPOINTED**
	KEITH CARSON	**APPOINTED**
	JAIME GODFREY	**APPOINTED**
	LIZ KOPPENHAVER	**ELECTED RETIRED**
	HENRY LEVY	**TREASURER**
	GEORGE WOOD	**ELECTED GENERAL**
	NANCY REILLY	**ALTERNATE RETIRED[1]**
	DARRYL L. WALKER	**ALTERNATE SAFETY[2]**

The order of agenda items is subject to change without notice. Board and Committee agendas and minutes are available online at www.acera.org.

***Note regarding public comments*:** Public comments are limited to four (4) minutes per person in total.

***Note regarding accommodations*:** The Board of Retirement will provide reasonable accommodations for persons with special needs of accessibility who plan to attend Board meetings. Please contact ACERA at (510) 628-3000 to arrange for accommodation.

[1] Alternate Retired Member (Votes in the absence of the Elected Retired Member, or, if the Elected Retired Member is present, then votes if both Elected General Members, or the Elected Safety Member and an Elected General Member, are absent).
[2] Alternate Safety Member (Votes in the absence of (1) the Elected Safety, (2) either of the two Elected General Members, or (3) both the Retired and Alternate Retired Members).

INVESTMENT COMMITTEE/BOARD MEETING

Call to Order: 9:30 a.m.

Roll Call:

Public Input (Time Limit: 4 minutes per speaker)

Action Items: Matters for discussion and possible motion by the Committee

There are no action items

Information Items: These items are not presented for Committee action but consist of status updates and cyclical reports

1. Review of AQR Capital Management – Traditional Manager – (Non U.S. Equity – Quantitative)

   Lars N. Nielsen, AQR Capital Management
   Daniel Ohgi, AQR Capital Management
   Margaret Jadallah, Verus Advisory Inc.
   Thomas Taylor, ACERA

2. Education Session: Risk Management and Reporting

   Max Golitti, Verus Advisory Inc.
   Margaret Jadallah, Verus Advisory Inc.

3. Semiannual Performance Review for the Period Ending March 31, 2020 – Real Estate

   Avery Robinson, Callan LLC
   Thomas Taylor, ACERA

4. Review of JP Morgan Strategic Property Fund – Real Estate [3]

   Susan Kolasa, J.P. Morgan Asset Management
   Thomas Klugherz, J.P. Morgan Asset Management
   Shawn Parris, J.P. Morgan Asset Management
   Avery Robinson, Callan LLC
   Thomas Taylor, ACERA

3\. Review of UBS Trumbull Property Fund – Real Estate [3]

   Paul Canning, UBS Realty Investors LLC
   Mia Y. Dennis, UBS Realty Investors LLC
   Peter Shaplin, UBS Realty Investors LLC
   Avery Robinson, Callan LLC
   Thomas Taylor, ACERA

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[3] In connection with their consideration of this investment, the trustees have received materials that are confidential and exempt from disclosure under California Government Code sections 6254.26 and 6255. Those materials have not been included in the public agenda packet.

Trustee Remarks

Future Discussion Items

Establishment of Next Meeting Date

September 9, 2020 at 9:30 a.m.

EXECUTIVE DEPARTMENT
STATE OF CALIFORNIA

EXECUTIVE ORDER N-29-20

WHEREAS on March 4, 2020, I proclaimed a State of Emergency to exist in California as a result of the threat of COVID-19; and

WHEREAS despite sustained efforts, the virus continues to spread and is impacting nearly all sectors of California; and

WHEREAS the threat of COVID-19 has resulted in serious and ongoing economic harms, in particular to some of the most vulnerable Californians; and

WHEREAS time bound eligibility redeterminations are required for Medi-Cal, CalFresh, CalWORKs, Cash Assistance Program for Immigrants, California Food Assistance Program, and In Home Supportive Services beneficiaries to continue their benefits, in accordance with processes established by the Department of Social Services, the Department of Health Care Services, and the Federal Government; and

WHEREAS social distancing recommendations or Orders as well as a statewide imperative for critical employees to focus on health needs may prevent Medi-Cal, CalFresh, CalWORKs, Cash Assistance Program for Immigrants, California Food Assistance Program, and In Home Supportive Services beneficiaries from obtaining in-person eligibility redeterminations; and

WHEREAS under the provisions of Government Code section 8571, I find that strict compliance with various statutes and regulations specified in this order would prevent, hinder, or delay appropriate actions to prevent and mitigate the effects of the COVID-19 pandemic.

NOW, THEREFORE, I, GAVIN NEWSOM, Governor of the State of California, in accordance with the authority vested in me by the State Constitution and statutes of the State of California, and in particular, Government Code sections 8567 and 8571, do hereby issue the following order to become effective immediately:

IT IS HEREBY ORDERED THAT:

1. As to individuals currently eligible for benefits under Medi-Cal, CalFresh, CalWORKs, the Cash Assistance Program for Immigrants, the California Food Assistance Program, or In Home Supportive Services benefits, and to the extent necessary to allow such individuals to maintain eligibility for such benefits, any state law, including but not limited to California Code of Regulations, Title 22, section 50189(a) and Welfare and Institutions Code sections 18940 and 11265, that would require redetermination of such benefits is suspended for a period of 90 days from the date of this Order. This Order shall be construed to be consistent with applicable federal laws, including but not limited to Code of Federal Regulations, Title 42, section 435.912, subdivision (e), as interpreted by the Centers for Medicare and Medicaid Services (in guidance issued on January 30, 2018) to permit the extension of

otherwise-applicable Medicaid time limits in emergency situations.

2. Through June 17, 2020, any month or partial month in which California Work Opportunity and Responsibility to Kids (CalWORKs) aid or services are received pursuant to Welfare and Institutions Code Section 11200 et seq. shall not be counted for purposes of the 48-month time limit set forth in Welfare an Institutions Code Section 11454. Any waiver of this time limit shall not be applied if it will exceed the federal time limits set forth in Code of Federal Regulations, Title 45, section 264.1.

3. Paragraph 11 of Executive Order N-25-20 (March 12, 2020) is withdrawn and superseded by the following text:

   Notwithstanding any other provision of state or local law (including, but not limited to, the Bagley-Keene Act or the Brown Act), and subject to the notice and accessibility requirements set forth below, a local legislative body or state body is authorized to hold public meetings via teleconferencing and to make public meetings accessible telephonically or otherwise electronically to all members of the public seeking to observe and to address the local legislative body or state body. All requirements in both the Bagley-Keene Act and the Brown Act expressly or impliedly requiring the physical presence of members, the clerk or other personnel of the body, or of the public as a condition of participation in or quorum for a public meeting are hereby waived.

   In particular, any otherwise-applicable requirements that

   (i) state and local bodies notice each teleconference location from which a member will be participating in a public meeting;

   (ii) each teleconference location be accessible to the public;

   (iii) members of the public may address the body at each teleconference conference location;

   (iv) state and local bodies post agendas at all teleconference locations;

   (v) at least one member of the state body be physically present at the location specified in the notice of the meeting; and

   (vi) during teleconference meetings, a least a quorum of the members of the local body participate from locations within the boundaries of the territory over which the local body exercises jurisdiction

   are hereby suspended.

   A local legislative body or state body that holds a meeting via teleconferencing and allows members of the public to observe and address the meeting telephonically or otherwise electronically, consistent with the notice and accessibility requirements set forth below, shall have satisfied any requirement that the body allow members of the public to attend the meeting and offer public comment. Such a body need not make available any physical location from which members of the public may observe the meeting and offer public comment.

Accessibility Requirements: If a local legislative body or state body holds a meeting via teleconferencing and allows members of the public to observe and address the meeting telephonically or otherwise electronically, the body shall also:

(i) Implement a procedure for receiving and swiftly resolving requests for reasonable modification or accommodation from individuals with disabilities, consistent with the Americans with Disabilities Act and resolving any doubt whatsoever in favor of accessibility; and

(ii) Advertise that procedure each time notice is given of the means by which members of the public may observe the meeting and offer public comment, pursuant to subparagraph (ii) of the Notice Requirements below.

Notice Requirements: Except to the extent this Order expressly provides otherwise, each local legislative body and state body shall:

(i) Give advance notice of the time of, and post the agenda for, each public meeting according to the timeframes otherwise prescribed by the Bagley-Keene Act or the Brown Act, and using the means otherwise prescribed by the Bagley-Keene Act or the Brown Act, as applicable; and

(ii) In each instance in which notice of the time of the meeting is otherwise given or the agenda for the meeting is otherwise posted, also give notice of the means by which members of the public may observe the meeting and offer public comment. As to any instance in which there is a change in such means of public observation and comment, or any instance prior to the issuance of this Order in which the time of the meeting has been noticed or the agenda for the meeting has been posted without also including notice of such means, a body may satisfy this requirement by advertising such means using "the most rapid means of communication available at the time" within the meaning of Government Code, section 54954, subdivision (e); this shall include, but need not be limited to, posting such means on the body's Internet website.

All of the foregoing provisions concerning the conduct of public meetings shall apply only during the period in which state or local public health officials have imposed or recommended social distancing measures.

All state and local bodies are urged to use sound discretion and to make reasonable efforts to adhere as closely as reasonably possible to the provisions of the Bagley-Keene Act and the Brown Act, and other applicable local laws regulating the conduct of public meetings, in order to maximize transparency and provide the public access to their meetings.

IT IS FURTHER ORDERED that as soon as hereafter possible, this Order be filed in the Office of the Secretary of State and that widespread publicity and notice be given of this Order.

This Order is not intended to, and does not, create any rights or benefits, substantive or procedural, enforceable at law or in equity, against the State of California, its agencies, departments, entities, officers, employees, or any other person.

IN WITNESS WHEREOF I have hereunto set my hand and caused the Great Seal of the State of California to be affixed this 17th day of March 2020.

GAVIN NEWSOM
Governor of California

ATTEST:

ALEX PADILLA
Secretary of State

Executive Summary

AQR Capital Management – All Country International Equities Account

Investment Strategy:
AQR's strategy takes fundamental investing concepts (e.g., Price to Book ratio) and evaluates them across all stocks in their investment universe. These systematic investing concepts are known as signals or factors. AQR combines many similar or correlated signals into themes (e.g., Value) and combines themes to create their overall model. By applying these investment themes together in one portfolio, AQR believes the diversified combination of themes will tend to outperform any single theme mentioned over time. Throughout the process, AQR's guiding principles rely on comprehensive research to inform their judgment around signals, implementing that judgment in a systematic fashion, with a strong focus on diversification and efficiency.

Inception Date with ACERA: November 9, 2007

Total Assets Managed: $141.3B as of 6/30/2020

Total Assets Managed in Product: $14.5B
(including $10.2B international developed and $4.3B emerging accounts)

Total Clients in Product: 91 (including 30 international developed and 61 emerging accounts)

ACERA Assets Being Managed: $392.3M (international developed, $280.9M; emerging, $111.4M)

Percentage of ACERA's Total Fund: 4.8% (including international developed, emerging)

Manager Style: Core Non-US Equity (Quantitative)

Account Benchmark: MSCI ACWI ex US Net

Annualized Returns (%):

Annualized Returns for Periods Ending June 30, 2020 (not annualized if less than 1 year)	Year to Date	1 Year	3 Years	5 Years	Since Inception
ACERA's Account (Gross Returns)*	-12.5%	-6.4%	-0.9%	+2.0%	+1.4%
ACERA's Account (Net Returns)	-12.7%	-6.9%	-1.4%	+1.5%	+0.9%
Benchmark (MSCI ACWI ex US Net)	-11.0%	-4.8%	+1.1%	+2.3%	+0.6%
Relative Performance (Net)	-1.7%	-2.1%	-2.5%	-0.8%	+0.3%

**Please note that gross returns are simulated based on an estimated monthly effective management fee rate.*

The following portfolio characteristics are provided as of 6/30/2020.

Portfolio Characteristics (International Equity):	**Portfolio**	**Benchmark (MSCI World ex US Net)**
Number of Holdings	292	988
Average Market Cap (in millions)	$51,840	$62,496
Annual Turnover*	89%	N/A
Active Share**	32%	N/A
Information Ratio***	0.3	N/A
Sharpe Ratio****	0.1	0.0
Tracking Error	3.3%	N/A
Emerging Markets Weighting	0%	0%
Small Cap Weighting	0%	0%

Executive Summary

Portfolio Characteristics (Emerging Equities Fund):	**Portfolio**	**Benchmark (MSCI Emerging Markets)**
Number of Holdings	340	1,385
Average Market Cap (in millions)	$119,414	$136,144
Annual Turnover*	77%	N/A
Active Share**	28%	N/A
Information Ratio	0.3	N/A
Sharpe Ratio****	0.1	0.0
Tracking Error	2.6%	N/A
Emerging Markets Weighting	100%	100%
Small Cap Weighting	0%	0%

**   Annualized net turnover divided by 2 to make it 1-way turnover.*
*** Active share is defined as sum of absolute active weights, divided by 2. This is the active share of the stock selection sleeve only, and does not include the country selection sleeve.*
**** International Equity Fund IR was calculated using the benchmark as follows: from 11/9/2007 to 2/29/2012 the benchmark was MSCI All Country World Ex USA Net Index USD End of Day, after that the benchmark is MSCI World Ex United States Net Index USD End of Day*
***** Sharpe Ratio is calculated over cash, represented by the ICE BofAML U.S. 3 Mo. T-bill*

Actual Management Fees for 2019: $2,108,295 (55 bps on 1st $100M, 50 bps thereafter)
Actual Management Fees for 1Q20: $521,297 (55 bps on 1st $100M, 50 bps thereafter)

Compliance: AQR is in compliance with all ACERA reporting requirements.

Names of Portfolio Managers: Clifford Asness, John Liew, Andrea Frazzini, Michele Aghassi, John Huss, Michael Katz, Ronen Israel and Lars Nielsen.

Turnover in Key Personnel (portfolio manager) Staff Addition/Reduction: Since AQR last presented this strategy to the Committee in 2016, the following changes in Portfolio managers took place:

In 2020, John Huss, a Principal at the firm who has been overseeing AQR's multi-asset products, joined AQR's Global Stock Selection team.

In 2019, Ronen Israel and Lars Nielsen were named co-heads of Portfolio Management, Research, Risk and Trading to oversee all research, portfolio management, portfolio implementation, portfolio finance, trading and risk functions.

In 2019, Jacques Friedman and Oktay Kurbanov retired from AQR.

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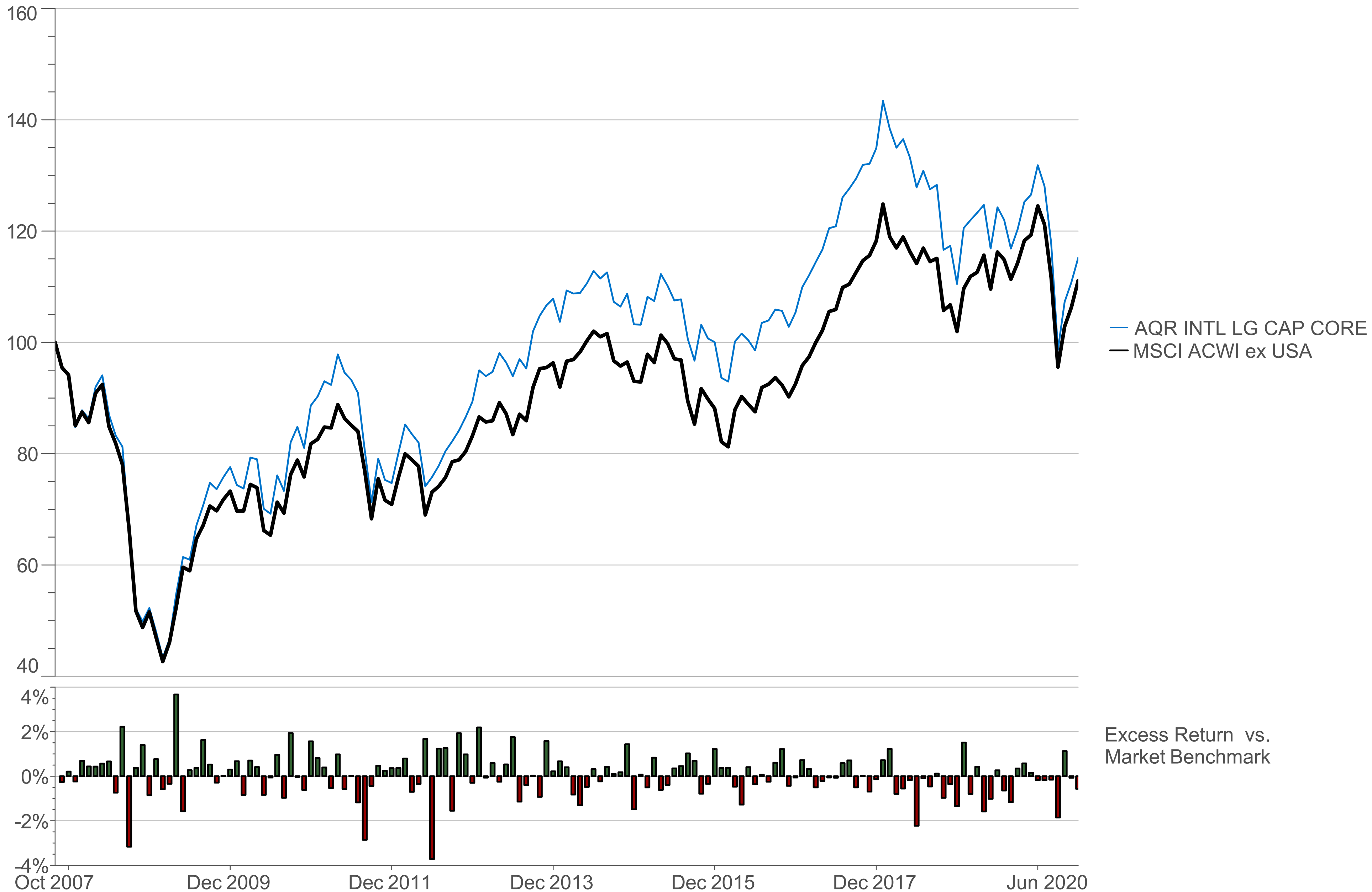
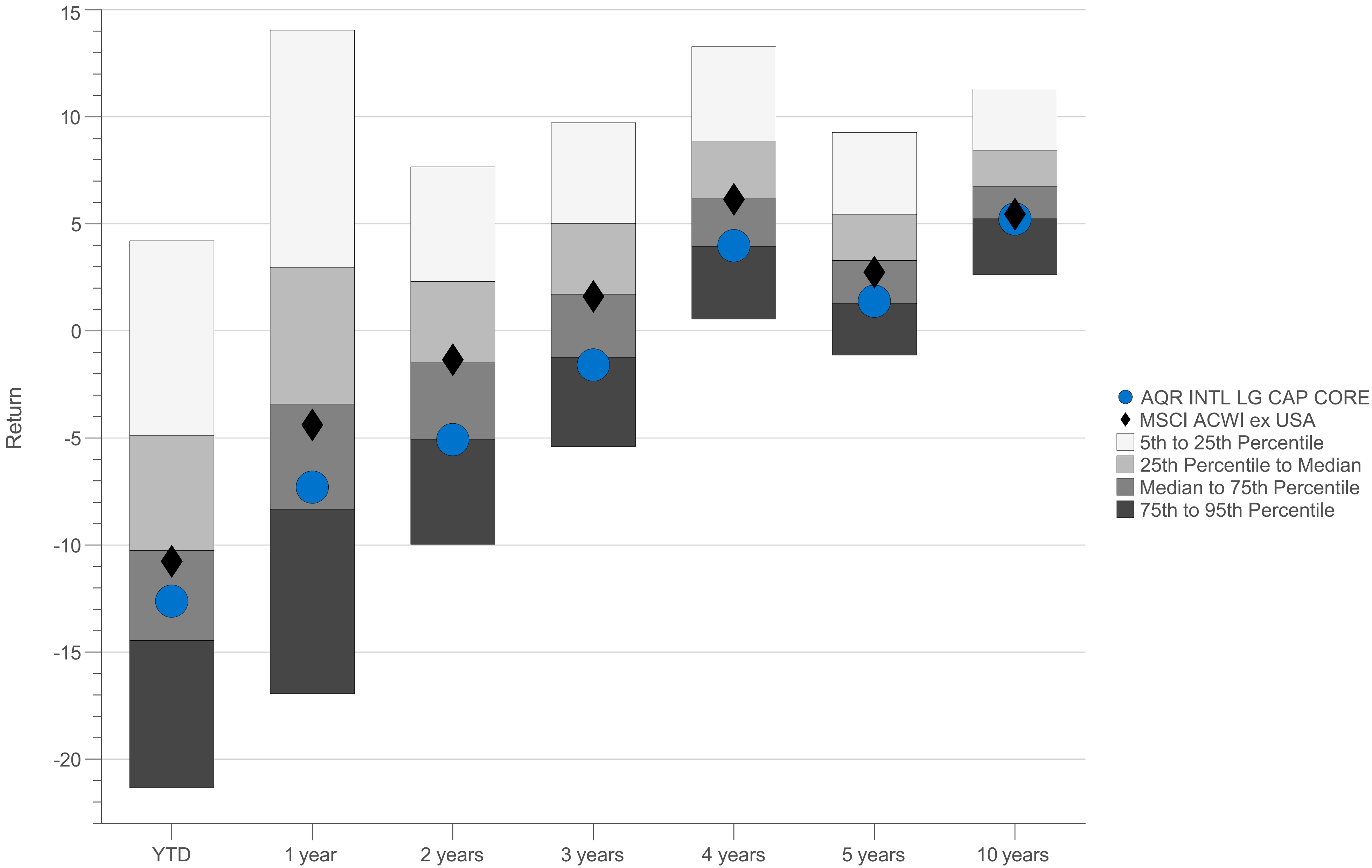
Manager Performance

November 2007 - June 2020 (Single Computation)

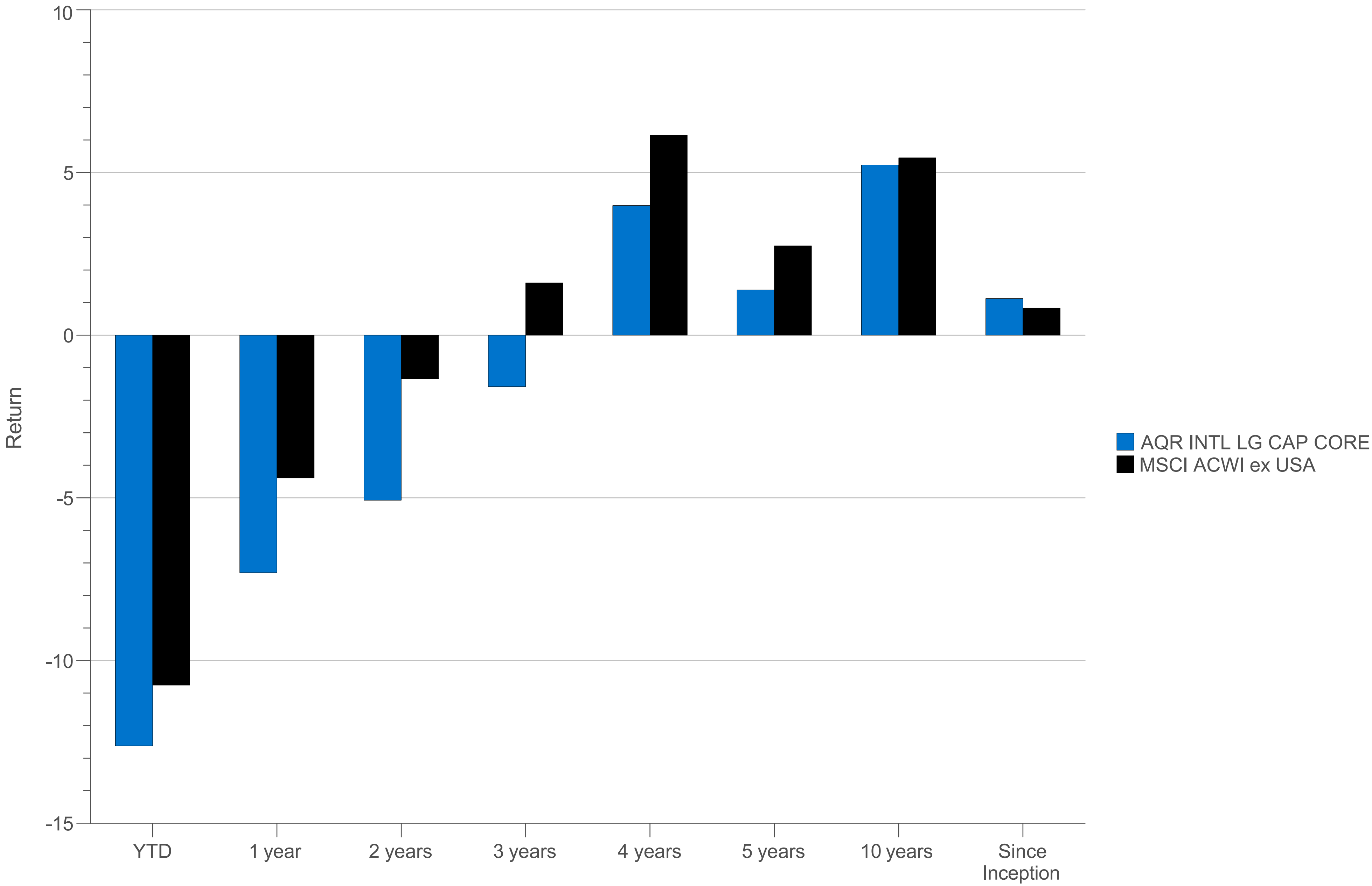


Manager vs PSN International Equity Gross: Return

November 2007 - June 2020 (not annualized if less than 1 year)

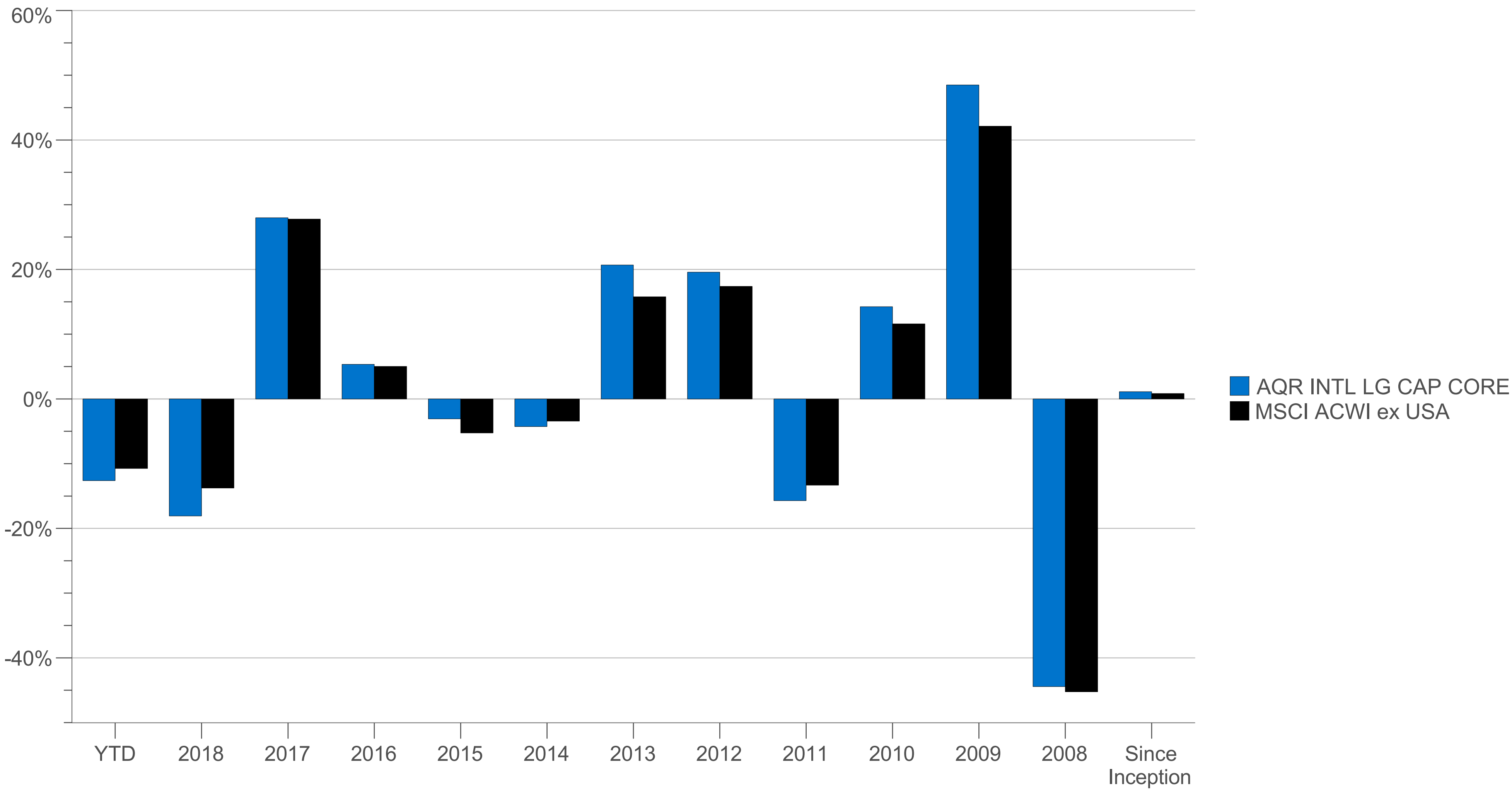


Manager vs Benchmark: Return
November 2007 - June 2020 (not annualized if less than 1 year)



Calendar Year Return

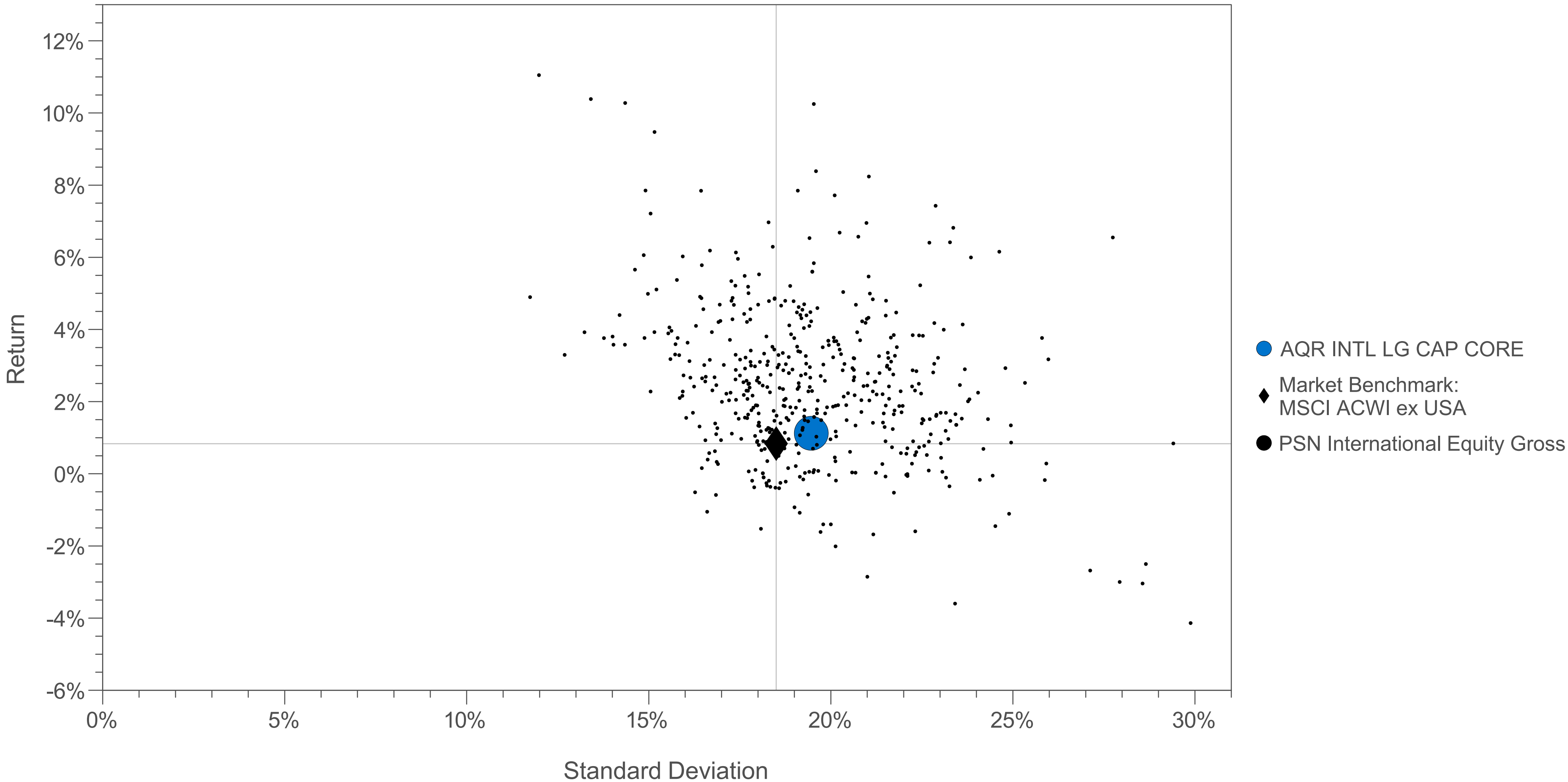
As of June 2020



	YTD	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010
INTL LG CAP CORE	-12.62%	19.32%	-18.08%	28.00%	5.33%	-3.09%	-4.27%	20.69%	19.59%	-15.72%	14.25%
MSCI ACWI ex USA	-10.76%	22.13%	-13.78%	27.77%	5.01%	-5.25%	-3.44%	15.78%	17.39%	-13.33%	11.60%

Risk / Return

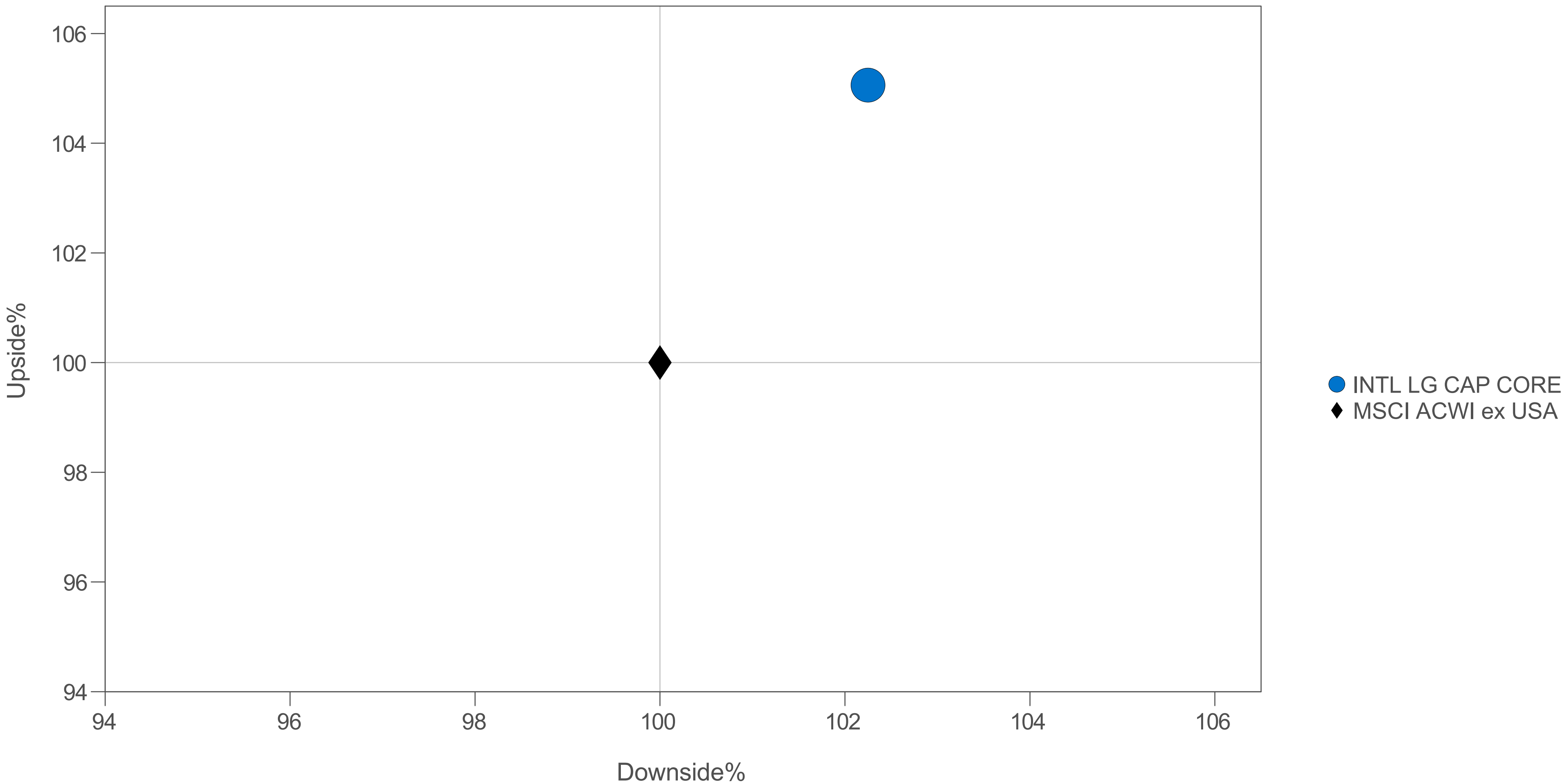
November 2007 - June 2020 (Single Computation)



	Return (%)	Std Dev (%)	Downside Risk (%)	Beta vs. Market	Alpha vs. Market (%)	R-Squared vs. Market (%)	R-Squared vs. Style (%)	Sharpe Ratio	Tracking Error vs. Market (%)	Observs.
INTL LG CAP CORE	1.12	19.46	14.60	1.0360	0.38	96.94	81.09	0.0225	3.4670	152
MSCI ACWI ex USA	0.84	18.50	13.94	1.0000	0.00	100.00	81.68	0.0081	0.0000	152

Upside / Downside

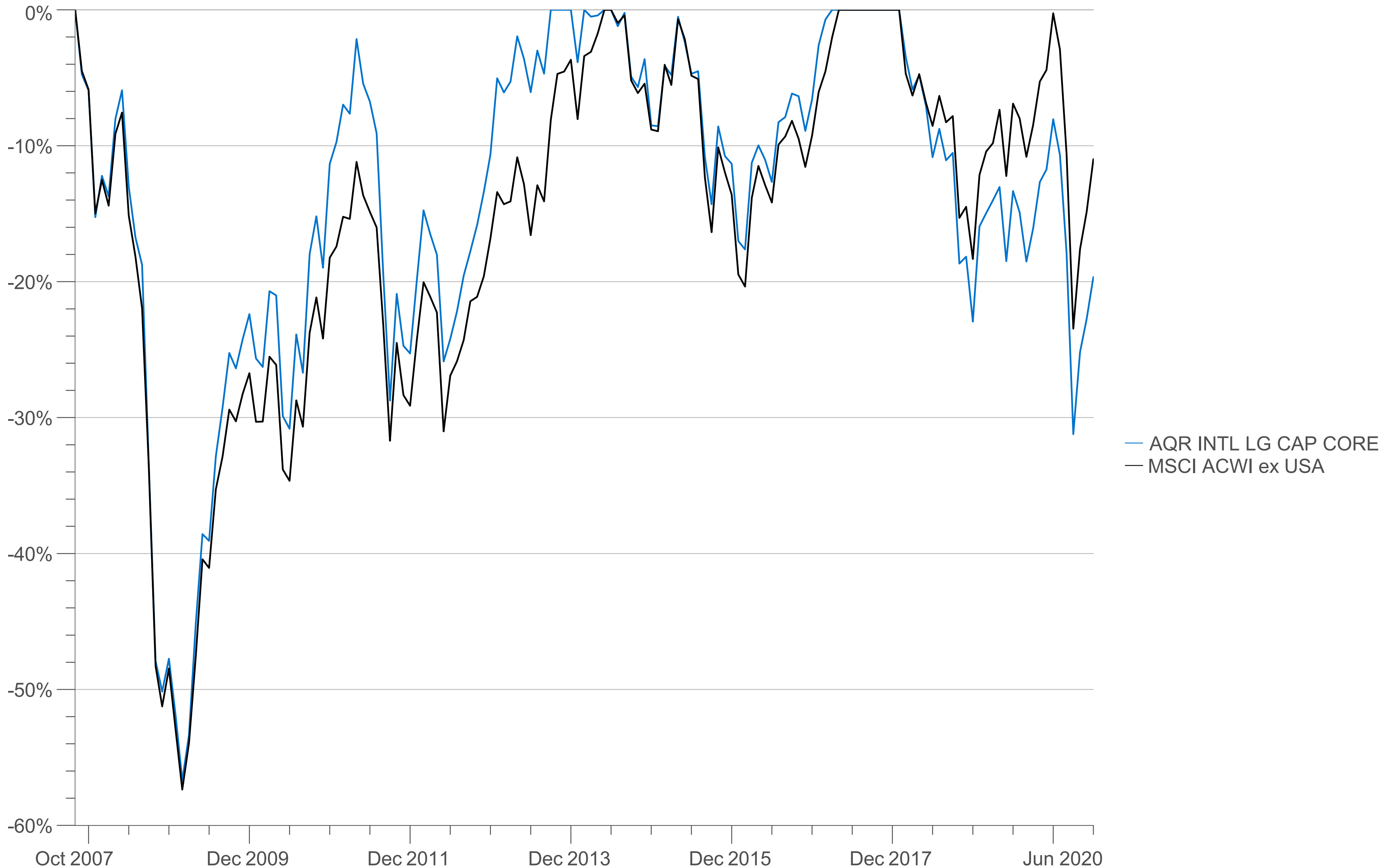
November 2007 - June 2020 (Single Computation)



	# of Months		Average Return (%) vs. Market		Month (%)		1-Year (%)		Market Benchmark (%)		
	Up	Down	Up Market	Down Market	Best	Worst	Best	Worst	Up Capture	Down Capture	R-Squared
INTL LG CAP CORE	83	69	3.97	-4.34	17.43	-21.63	70.24	-50.67	105.1	102.2	96.94
MSCI ACWI ex USA	84	68	3.81	-4.22	13.75	-22.01	63.51	-51.27	100.0	100.0	100.00

Drawdown

November 2007 - June 2020



AQR Capital Management

ACERA has contracted with Zeno Consulting Group (Zeno) to perform trading cost analyses since 1Q98. ACERA has also contracted with Zeno to monitor and analyze the efficiency of ACERA's DB program since September 2006. However, this report deals solely with trading cost analysis.

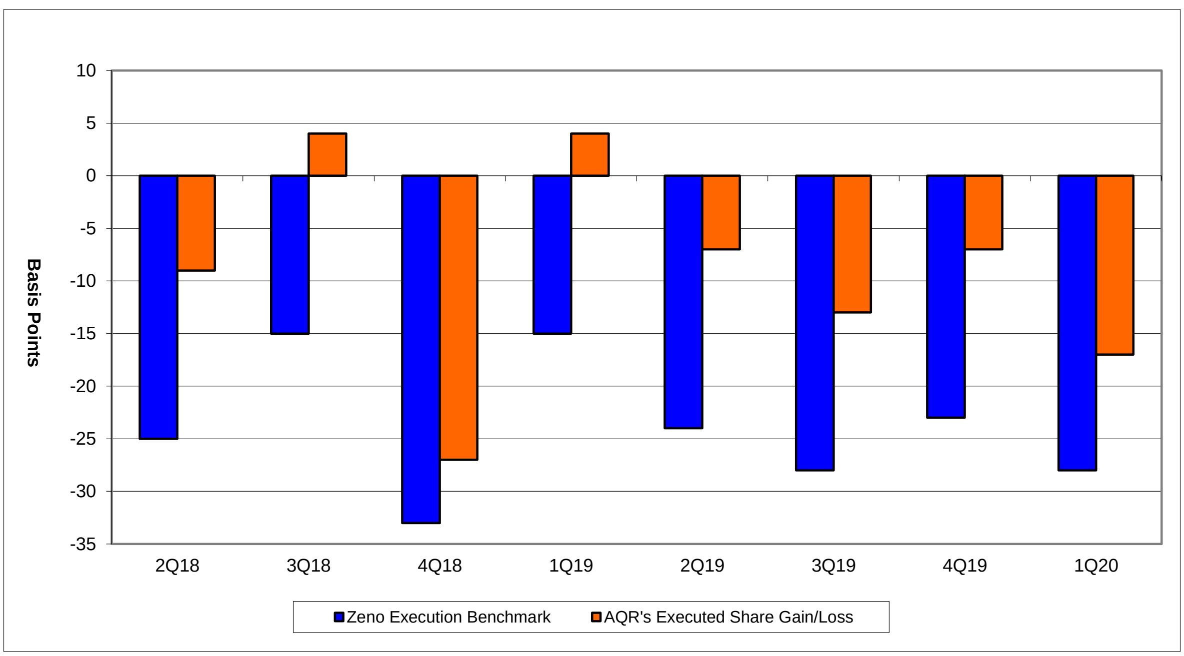
Zeno Methodology: Trades executed in the same stock, on the same side (Buy or Sell) and within five trading days of the previous trade, are grouped into the same Decision/Order. For each group of trades, Decision/Order prices are set to the opening price of the stock on the day of the first trade. For example, assume a manager's "Decision" to trade was made at the Market's close on Oct. 20th. The stock's opening price on Oct. 21st becomes the Decision/Order price against which all trade prices in each group are compared. Since either gains or losses can accrue to the accounts' assets through the process of trading stocks, Zeno nomenclature identifies "total costs" as "Executed Share Gain/Loss."

Executed Share Gain/Loss: Commission + Market Impact + Delays
Zeno Execution Benchmark: Zeno Average Execution Gain/Loss based on the average cost for all managers in the Zeno Database trading similar stocks in similar size and market conditions (risk adjusted)
Commission: Cost of transacting with a broker
Market Impact: Each day's trading cost (opening price minus trade price)
Delays: The costs of trading decisions over several days (decision price minus days opening price)

Trading Discipline: If prices are favorable (i.e. falling for buys, rising for sells) a positive Executed Share Gain/Loss number will accrue for the account if delays occur while trading. If prices are adverse (i.e. rising for buys, falling for sells), a negative Executed Share Gain/Loss number will be incurred by the account if delays occur while trading. Many growth/momentum managers incur execution losses, since they usually purchase and liquidate stocks with adverse prices (growth stocks also tend to be momentum stocks).

AQR Execution Gain/Loss vs. Zeno Execution Benchmark:

	2Q18	3Q18	4Q18	1Q19	2Q19	3Q19	4Q19	1Q20
Zeno Execution Benchmark	-25	-15	-33	-15	-24	-28	-23	-28
AQR's Executed Share Gain/Loss	-9	4	-27	4	-7	-13	-7	-17
Value Added/Lost by AQR	**16**	**19**	**6**	**19**	**17**	**15**	**16**	**11**



Summary:

Since the last annual review of AQR, the manager has incurred lower aggregated execution costs than its respective benchmark.

Verus

Memorandum

To: ACERA
From: Verus
Date: August 12, 2020
RE: AQR International Equity manager review

AQR was hired for a core international equity assignment by ACERA in October 2007, following a manager search that considered quantitatively-oriented strategies to complement ACERA's existing line up of active, fundamental international equity managers. After a long period of consistent and competitive returns, AQR All Country International Equity has had relatively poor returns since 2018, coinciding with a time period where value as a factor has been underperforming significantly and factor-based investing has generally fared poorly. AQR has also experienced asset declines and staff reductions at the firm level in recent years stemming from poor results and redemptions across multiple strategies, primarily driven by similar factor results. For this reason, ACERA has asked AQR to provide an update on the firm and international equity portfolio to ACERA's Investment Committee. This strategy was last reviewed in July, 2016.

General Information

Firm name:	AQR Capital Management LLC
Strategy name:	All Country International Equity
Firm total AUM:	$141 billion
Strategy total AUM:	$2.0 billion
ACERA portfolio value:	$392 million
Strategy inception with ACERA:	October 2007
Benchmark:	MSCI ACWI ex USA

Organization

AQR Capital Management (AQR) was created in 1998 by Clifford Asness, David Kabiller, Robert Krail and John Liew, along with several colleagues after leaving Goldman Sachs. AQR is mostly owned by its principals and employees of the firm. In 2004, Affiliated Managers Group acquired a minority stake in the company, but the firm maintains its majority ownership and operates autonomously.

AQR was an early adopter of factor-based investing through the implementation of risk premia and, at the time of hire by ACERA, was an undisputed leader in this arena. AQR steadily grew its assets and firm capabilities through the years and managed over $225 billion in total assets at its high in 2018. AQR's systematic approach to investing has been out of favor for approximately the last 24 months which has impacted assets across multiple strategies. As of 6/30/20, total firm assets were $141 billion. AQR All Country International Equity product assets as of 6/30/20 were $2.0 billion which is a decline in product assets since its high of $3.6 billion in 2017. This is a more modest decline compared to some of AQR's other strategies, and the product continues to have some large institutional client accounts, similar to ACERA.

With firm asset declines, AQR has had two rounds of modest staff reductions where the firm let go 5% of its workforce in 2019 and 9% in January 2020 to right size its team. Lastly, during this time period, AQR has experienced the retirement of some tenured, senior employees. During the second quarter of 2020, AQR combined its trading and portfolio financing teams, coinciding with the departure of its head of trading Isaac Chang for another opportunity.

Investment Professionals

The All Country International Equity strategy is managed by AQR's Global Equities Strategy team which is led by their Portfolio Management and Research team and combines contributions from the firm's Global Stock Selection (GSS) and Global Asset Allocation (GAA) teams. Some members of GSS and GAA also serve on the Portfolio Management and Research team. While team members include tenured and experienced professionals, some of whom were at AQR at the time ACERA added the international strategy, the team has had some senior change with the departure of Jacques Friedman who was head of AQR's GSS team for many years.

Philosophy & Process

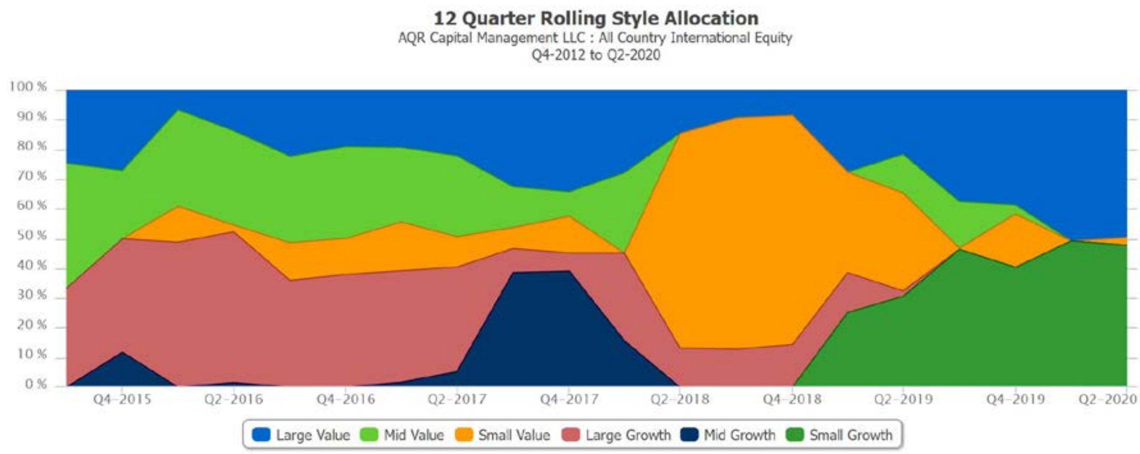
AQR's investment philosophy is based on two fundamental concepts: value and momentum. Value investing is buying securities with attractive prices relative to fundamentals and selling expensive ones. Momentum investing is buying securities with improving prices and selling ones that are worsening. Value strategies tend to favor assets that have done poorly over those that have done well (over the long-term). Momentum strategies tend to favor assets that have done well over those that have done poorly (over the short to medium term). AQR uses value and momentum in combination, because they believe that while the two strategies both have positive expected returns, they are normally negatively correlated to one another. These two fundamental factor themes are augmented by the incorporation of other widely accepted alpha-generating factors, such as stability, earnings quality, investor sentiment and carry. AQR takes the view that by applying these factors in a systematic fashion across a wide variety of strategies and markets, seeking to minimize transactions costs, and by incorporating risk-controls, they will achieve attractive long-term results.

A differentiating characteristic of AQR's All Country International Equity strategy is that it disaggregates three sources of total risk: stock/industry selection, country risk and currency risk. They believe that an optimal approach is to evaluate the relative attractiveness of stocks within each country (country neutrality) and then separately evaluate the attractiveness of each country and currency in order to provide alpha from multiple sources and minimize unintended bets. Individual developed markets and emerging markets portfolios are built separately due to liquidity differences between the two universes and them combined into the MSCI ACWI ex-US portfolio. Stock/industry exposures are implemented through individual stocks, whereas country and currency exposures are implemented with the use of derivatives (country through index futures and swaps; currency through FX forwards). The derivatives do not introduce economic leverage into the portfolio.

Over/underweights are benchmark relative with the majority of the risk budget and excess return potential driven by stock selection and in the developed markets. A secondary alpha source is the tactical, dynamic weighting of strategies based on their relative attractiveness. AQR's ex-ante risk budget for the ACERA portfolio is 4%. Approximately 40% of risk is targeted from stock selection and 30% each from country and currency selection. Buy and sell decisions are based on the trade-off between expected return, risk, transaction cost and other investment constraints.

Style

AQR's systematic approach has resulted in a greater value leaning than many of its systematic peers which has been detrimental to near-term performance. The charts below show AQR's style disaggregated into style benchmarks using both returns-based and holdings-based analysis.



Performance

Performance over the last two years has been poor and has impacted longer-term results versus the MSCI ACWI ex-US Index. Recent returns have also caused AQR's peer ranking versus the ACWI ex-US Large Cap Core Equity universe to drop into the bottom quartile across all periods measured. Calendar year results prior to 2018 had been largely competitive and within expectations.

Annualized returns

As of 6/30/20	Q2	YTD	1 Yr	3 Yrs	5 Yrs	7 Yrs	10 Yrs	si
AQR (net)	17.67	-12.56	-7.30	-1.58	1.39	3.24	5.26	0.73
MSCI ACWI ex-US (gross)	16.30	-10.76	-4.39	1.61	2.74	4.18	5.45	0.84

**Since inception 10/2007

Calendar year returns

	2019	2018	2017	2016	2015	2014	2013
AQR (net)	19.23	-18.08	28.00	5.00	-2.78	-3.78	19.14
MSCI ACWI ex-US (gross)	22.13	-13.78	27.77	5.01	-5.25	-3.44	15.78

	2012	2011	2010	2009	2008	2007*
AQR (net)	21.20	-15.93	13.79	48.48	-47.14	-2.61
MSCI ACWI ex-US (gross)	17.39	-13.33	11.60	42.14	-45.53	-3.09

**Since inception date 10/2007

Verus and ACERA staff have had periodic calls with AQR over the past two years to understand underperfomance. The detrimental impact of the value factor and lack of offset by other factor signals in their model have been a consistent theme. AQR's risk model weights on long-term expected returns which has allowed the portfolio to maintain its value tilt and to lean into it incrementally as value has become cheaper.

During Q1 '20, the currency aspect of the approach added value, but country (in particular an overweight to Italy) and stock selection exposures detracted. While there are typically low correlations between stock, country and currency, during weak periods, such as the initial phase of the global pandemic, correlations can increase. In Q2 '20, the portfolio outperformed the index driven by overall stock selection and country selection alpha. Currency selection was flat.

Summary Assessment

AQR has been a core international equity manager for ACERA since October 2007 and has been largely competitive until the last two years. However, over those two years, longer-term performance results have been impacted and the firm as a whole has lost assets and right sized in response. Its relatively poor returns, driven by a market that has punished value, are understandable from a stylistic standpoint but disappointing. Performance, in conjunction with business dynamics, warrant a manager review.

While this is an informational agenda item, Verus and ACERA staff seek feedback from ACERA's Trustees following the AQR review. We will be reviewing the portfolio's international equity structure in the next 1-2 months, and Trustee input will be taken into consideration.

AQR International Equity Annual Review

Prepared exclusively for Alameda County Employees' Retirement Association

August 12, 2020

For Existing Investor & Institutional Investors Use Only

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The investment strategy and themes discussed herein may be unsuitable for investors depending on their specific investment objectives and financial situation. Please note that changes in the rate of exchange of a currency may affect the value, price or income of an investment adversely.

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Our Firm

Systematic investing grounded in economic theory

Investment innovation at the nexus of economics, behavioral finance, data and technology

- Dedicated to the pursuit of investment excellence for our clients
- Pioneer in quantitative investing through applied research
- Leading provider of long-only and liquid alternative strategies
- Clients representing some of the largest and most sophisticated investors across the globe

1998
Year founded

~800
Employees in 9 offices globally

$141
Billion in AUM

~60
Ph.D.s and ~20 professors

Source: AQR. All figures approximate as of 6/30/2020; AUM includes assets managed by AQR and its advisory affiliates. Includes current and former professors

Executive Summary

Principals of AQR have been managing fundamentally-driven equity strategies for over 25 years

- The long-term track record has delivered outperformance and meaningful diversification

The market environment during the last 3 years was challenging for our process

- Our International Equity strategy draws on 3 distinct alpha sources: stock, country, and currency selection
- In the last 3 years, stock selection was the primary driver of poor performance
- This period was unusually painful for cheap (i.e., Value) stocks compared to expensive ones
- Performance by other investment themes was more muted, not enough to offset Value's significant losses
- Value stocks' fundamentals have held up, but prices have collapsed, suggesting a price bubble is at play

Current spreads in price multiples indicate a historic dislocation in Value

- Cheap stocks are cheaper than at almost any time in the past 30+ years, relative to expensive stocks
- In the past, these dislocations have tended to revert, yielding strong Value performance

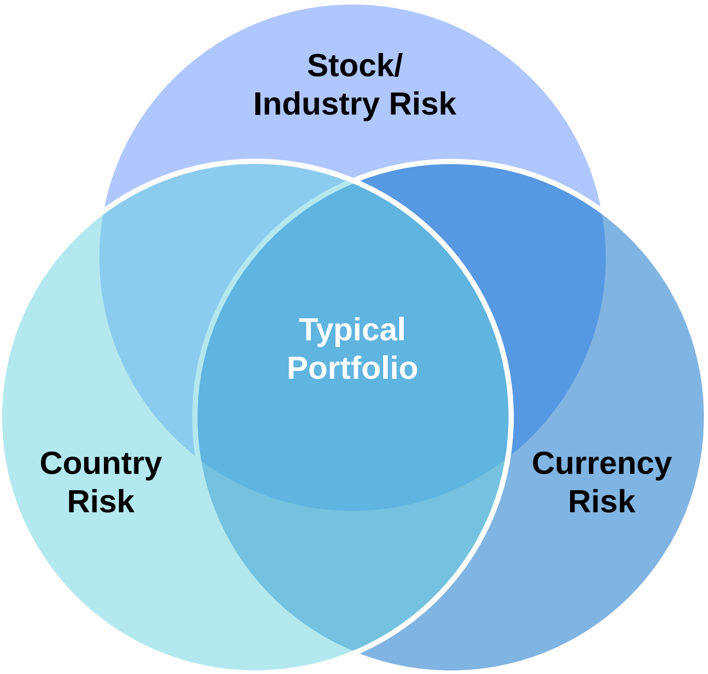
Source: AQR. Information is as of June 30, 2020. Past performance is not a guarantee of future returns. Diversification does not eliminate the risk of experiencing investment losses.

Our Investment Approach

Risk-managed, multi-strategy investment approach

Typical Approach

Multiple risks
embedded in one instrument



AQR Approach

AQR seeks to separate these risks,
managing each proactively
to avoid unintended bets

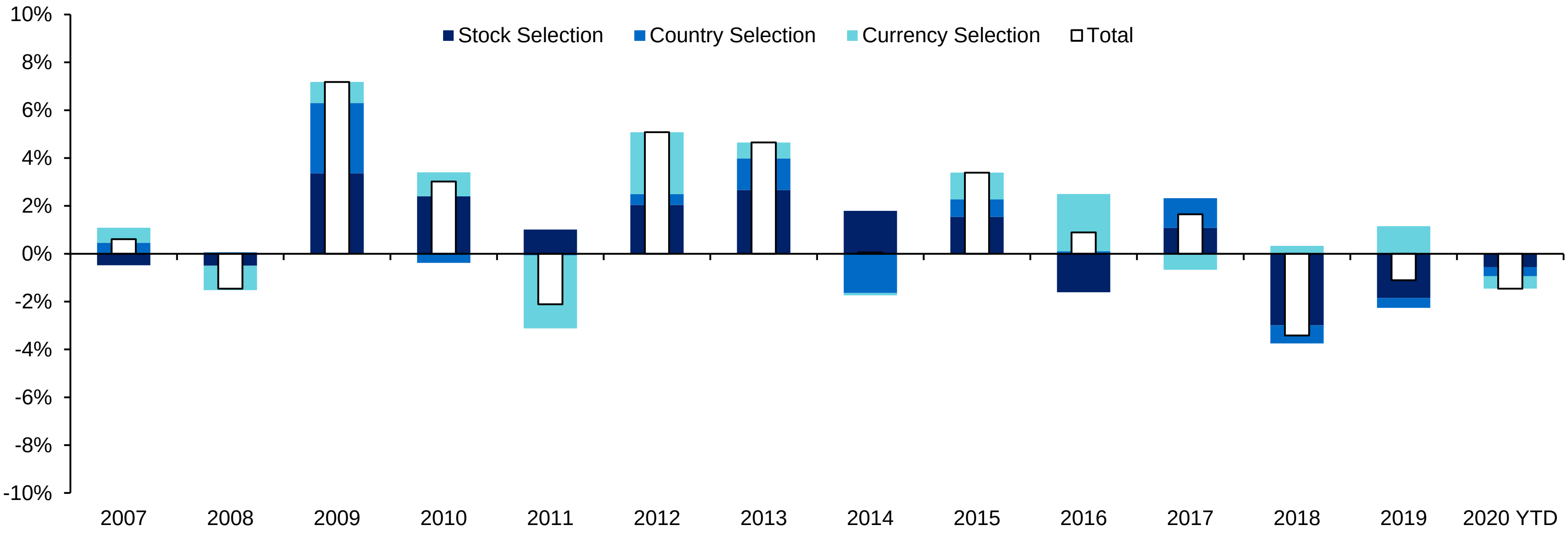
Source: AQR. For illustrative purposes only. Please read important disclosures in the Appendix.

Performance Review

Outperformance in most years, with diversification benefits from 3 sleeves

Yearly Gross Excess Return Attribution

November 9, 2007 – June 30, 2020



	Portfolio Return (Gross)	Benchmark*	Gross Excess Return	Gross Performance Attribution		
				Stock	Country	Currency
Q2 2020	17.8%	16.1%	1.7%	1.5%	0.0%	0.1%
3 Years (Annl)	-0.9%	1.1%	-2.1%	-1.9%	-0.3%	0.1%
Since Inception (Annl)	1.4%	0.6%	0.8%	0.4%	0.1%	0.3%

Source: AQR. Performance above representative of ACERA's ACWI ex-US portfolio, incepted on November 9, 2007. Performance figures herein represent unaudited estimates of realized and unrealized gains and losses prepared by AQR. Gross performance does not reflect the deduction of investment advisory fees. Please see the Appendix for important risk and performance disclosures. Excess returns are calculated as portfolio returns minus the benchmark. *Benchmark: MSCI All Country World Ex USA Net Index USD End of Day. Past performance is not a guarantee of future performance. Please refer to the monthly statements provided by your custodian or administrator for actual returns. Attributions are subject to change without notice. Diversification does not eliminate the risk of experiencing investment losses.

Fundamentally-Driven Stock Selection

A systematic approach based on diversified investment ideas

Four Key Diversified Investment Ideas	
Value	Companies that trade at attractive prices
Momentum	Companies with catalysts, based on price or fundamentals
Quality	Companies that are profitable with resilient business models
Sentiment	Companies favored by higher-conviction investors

Portfolio Characteristics	
Overweight	Cheap and improving companies with stable business models and positive sentiment
Underweight	Expensive and deteriorating companies with poor business models and negative sentiment

Source: AQR. For illustrative purposes only. Investment process subject to change without notice. Diversification does not eliminate the risk of experiencing investment losses.

The Portfolio Reflects Desirable Stock Characteristics

The investment themes come together to form a diversified portfolio

Portfolio Characteristics

Stock Selection Exposure
June 30, 2020

	Portfolio	Benchmark
Number of Stocks	632	2,373
Weighted Avg Market Cap ($M)	70,761	83,118
Median Market Cap ($M)	10,163	7,342
P/E (trailing)	12.7	16.9
P/E (forward)	12.7	16.5
P/B	1.3	1.6
P/CF	7.4	9.4
ROE (5-yr)	14.6	15.4
Debt/EQ	0.6	0.8
Sales/EV	0.8	0.5
Earnings Growth (5 yr trailing)	8.2	7.0
12 Month Return of Holdings*	6.6%	7.1%

Sector Exposure

Stock Selection Exposure
June 30, 2020

	Portfolio	Benchmark	Active Weight
Communication Services	7.0%	7.5%	-0.5%
Consumer Discretionary	10.6%	12.5%	-1.9%
Consumer Staples	6.0%	10.0%	-4.0%
Energy	3.7%	4.8%	-1.1%
Financials	12.8%	18.1%	-5.3%
Health Care	15.0%	10.7%	4.3%
Industrials	11.9%	11.4%	0.5%
Information Technology	15.5%	11.1%	4.4%
Materials	10.9%	7.6%	3.4%
Real Estate	3.3%	2.8%	0.5%
Utilities	3.3%	3.5%	-0.2%
Total	**100.0%**	**100.0%**	**0.0%**

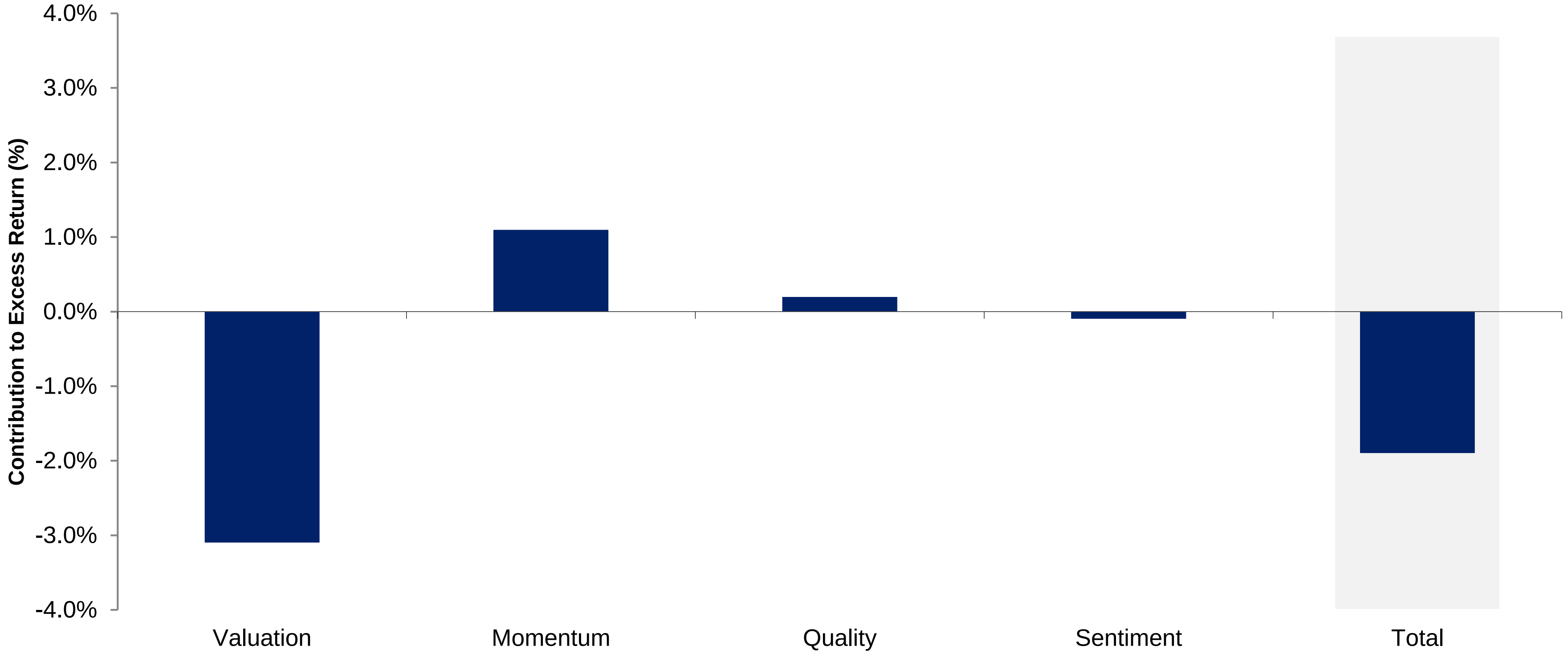
Sources: AQR, Compustat, Datastream, Bloomberg, Worldscope and IBES. Portfolio characteristics above representative of ACERA's ACWI ex-US portfolio, incepted on November 9, 2007. Data includes the stock selection portfolio only – country and currency overlays are not included. Average P/E ratios of the stocks in the portfolios exclude individual stock price-to-earnings ratios that are negative and the top and bottom 1 percentile of the remaining. Average P/B ratios of the stocks in the portfolios exclude individual stock price-to-book ratios that are negative and the top and bottom 1 percentile of the remaining. Average Sales/EV ratios of the portfolios exclude individual stocks that have sales-to-enterprise values that are negative and the top and bottom 1 percentile of the remaining. Portfolio characteristics are subject to change. Past performance is not a guarantee of future performance. Benchmark: MSCI World Ex United States Net Index USD End of Day. Diversification does not eliminate the risk of experiencing investment losses. *12 Month Return of Holdings is representative of how stocks held in the account or benchmark would have performed over the previous 12 months in USD, gross of fees and weighted as of the date reported. This performance is not representative of the actual performance of the benchmark, account, or any other portfolio that AQR manages.

Performance Review

Trailing 3-year Stock Selection investment theme performance

Stock Selection: Contributions to Gross Excess Returns

July 1, 2017 – June 30, 2020



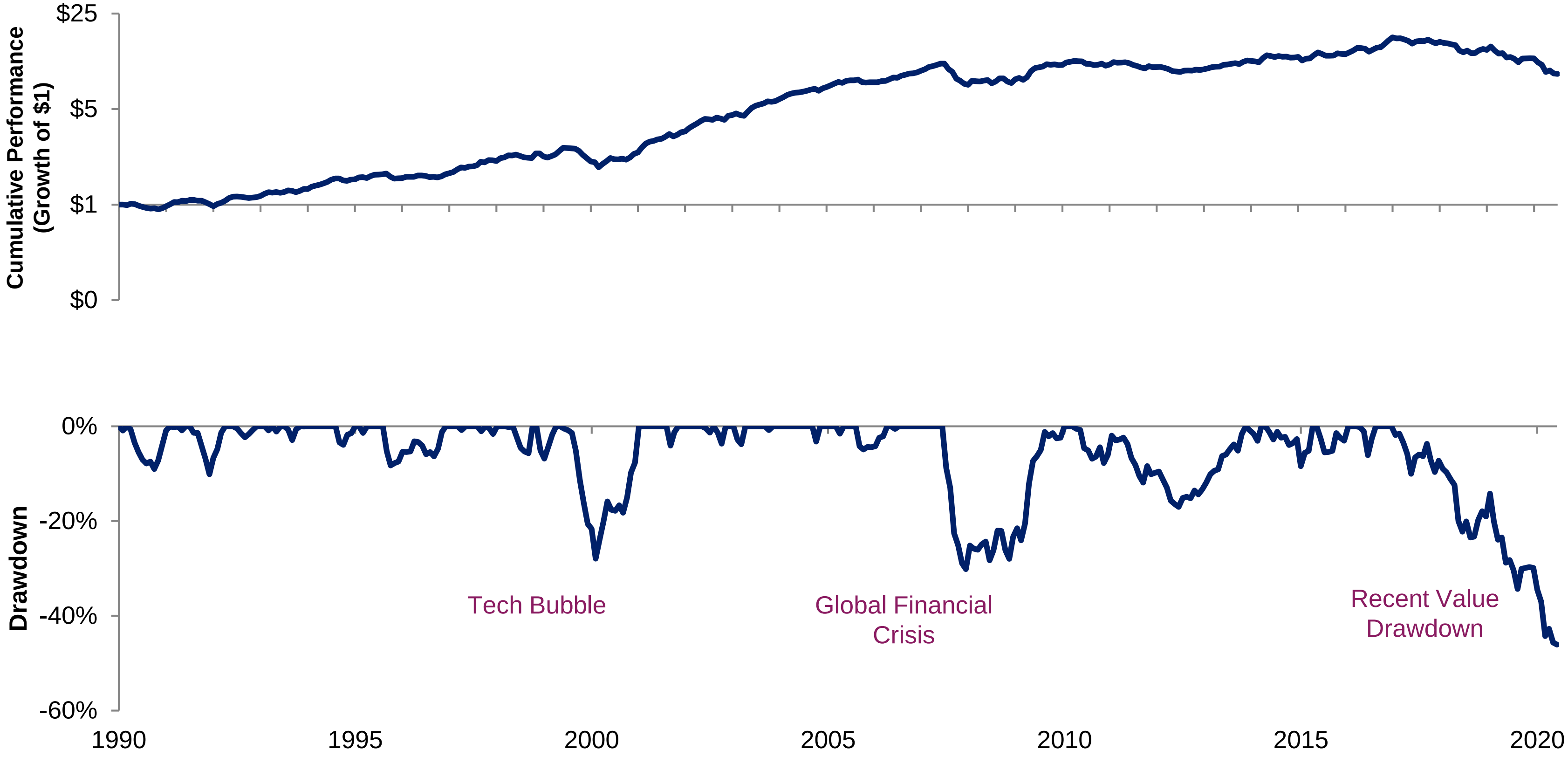
Source: AQR. Data from July 1, 2017 – June 30, 2020. Contributions above representative of ACERA's ACWI ex-US portfolio, incepted on November 9, 2007. Contributions to Excess Returns are in USD, gross of fees, and based on AQR's internal profit and loss reporting system. Past performance is not a guarantee of future performance. Gross performance results do not reflect the deduction of investment advisory fees, which would reduce an investor's actual return. Please see additional performance disclosures in the Appendix. Excess returns are calculated as portfolio returns minus the benchmark. Benchmark: MSCI World Ex United States Net Index USD End of Day. Please refer to the monthly statements provided by custodian and administrator for actual returns. Attributions are subject to change without notice.

The Last Three Years Have Been Painful for Value Investors

We see strong signs of a price bubble in cheap vs. expensive

Hypothetical AQR Global Value Factor Portfolio Cumulative Performance and Historical Drawdown

January 1, 1990 – June 30, 2020



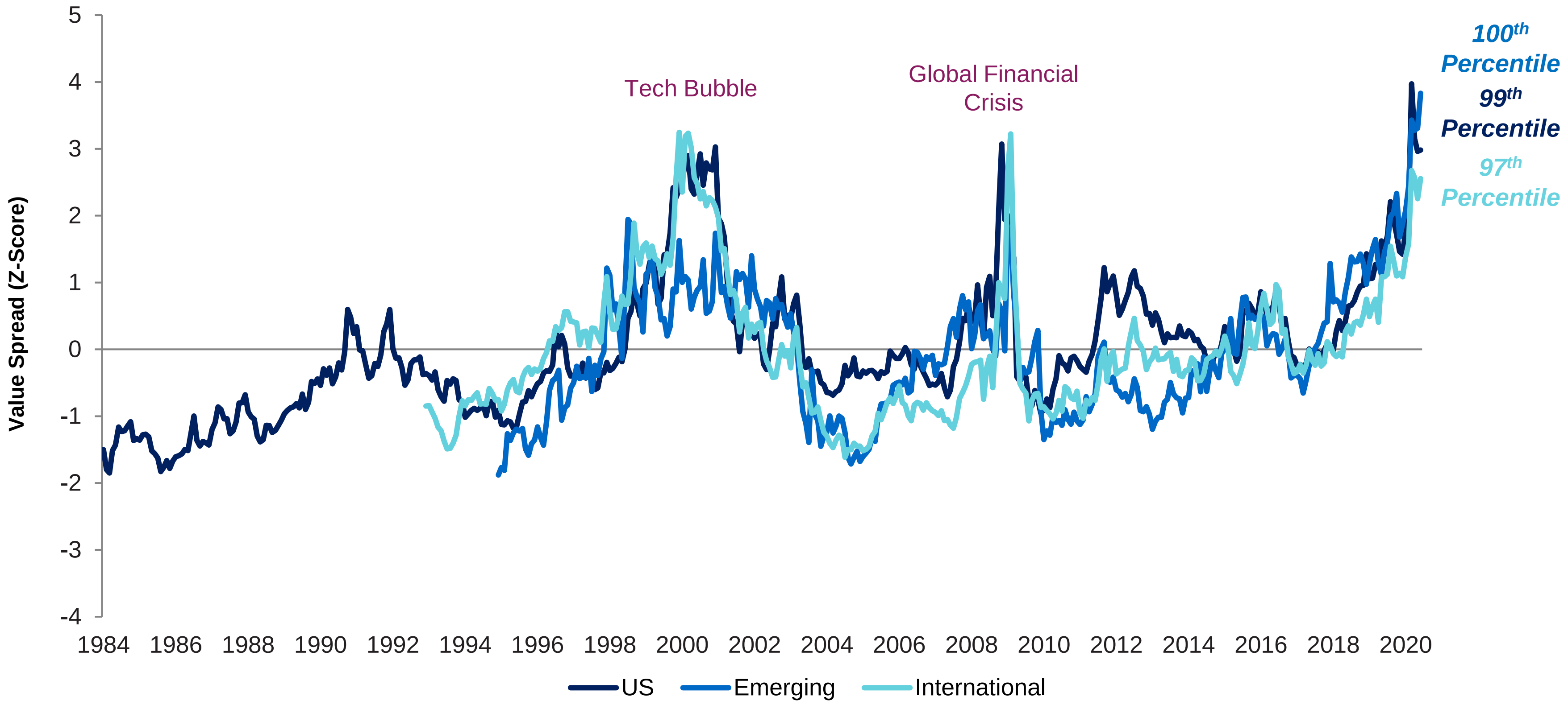
Source: Data is the AQR Hypothetical Style Premia Standalone Global Value Factor Backtest targets 7% volatility and is gross of trading costs, undiscounted, excess of cash returns. Please read performance disclosures in the Appendix for a description of the methodology. Hypothetical data has inherent limitations, some of which are disclosed in the Appendix. Gross performance does not reflect the deduction of investment advisory fees. For illustrative purposes only and not representative of an actual portfolio AQR currently manages. Please read important disclosures in the Appendix. All performance figures contained herein are in USD unless noted otherwise.

A Historic Dislocation in Value

Spreads in valuation across stocks are nearly the widest ever

Value Spreads for Hypothetical AQR Industry-and-Dollar-Neutral Value Portfolios*

January 1, 1984 – June 30, 2020



*Spreads are constructed using the Hypothetical AQR Value portfolio as described below, and are adjusted to be dollar-neutral, but not necessarily beta-neutral through time.

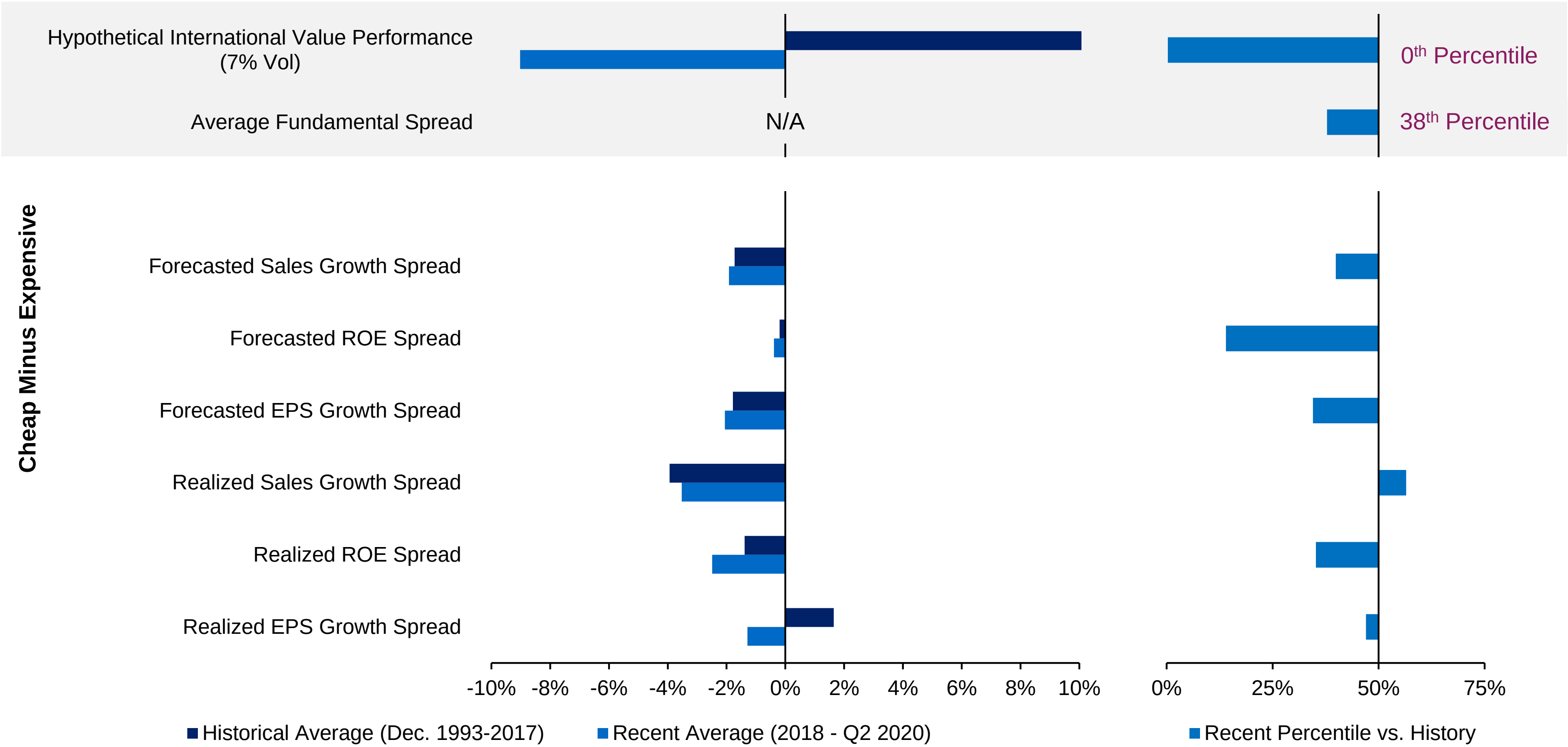
Source: AQR. Hypothetical value composite includes four value measures: book-to-price, earnings-to-price, forecast earnings-to-price, and sales-to-enterprise value; spreads are measured based on ratios. To construct industry-neutrality, the value spreads are constructed by comparing the aforementioned value measures within each industry, which are then aggregated up to represent an entire portfolio. Hypothetical data has inherent limitations, some of which are disclosed in the Appendix. Please see the Hypothetical AQR U.S., International, and Emerging Value Backtest Descriptions in the Appendix. For illustrative purposes only and not representative of an actual portfolio AQR currently manages. Please read the Appendix for important disclosures.

Seemingly No Reason for Value Stocks To Be This Cheap

Value performance has been extreme, fundamental characteristics have not

Hypothetical AQR International Value Average Forecasted Fundamentals: Cheap minus Expensive

December 1, 1993 – June 30, 2020*



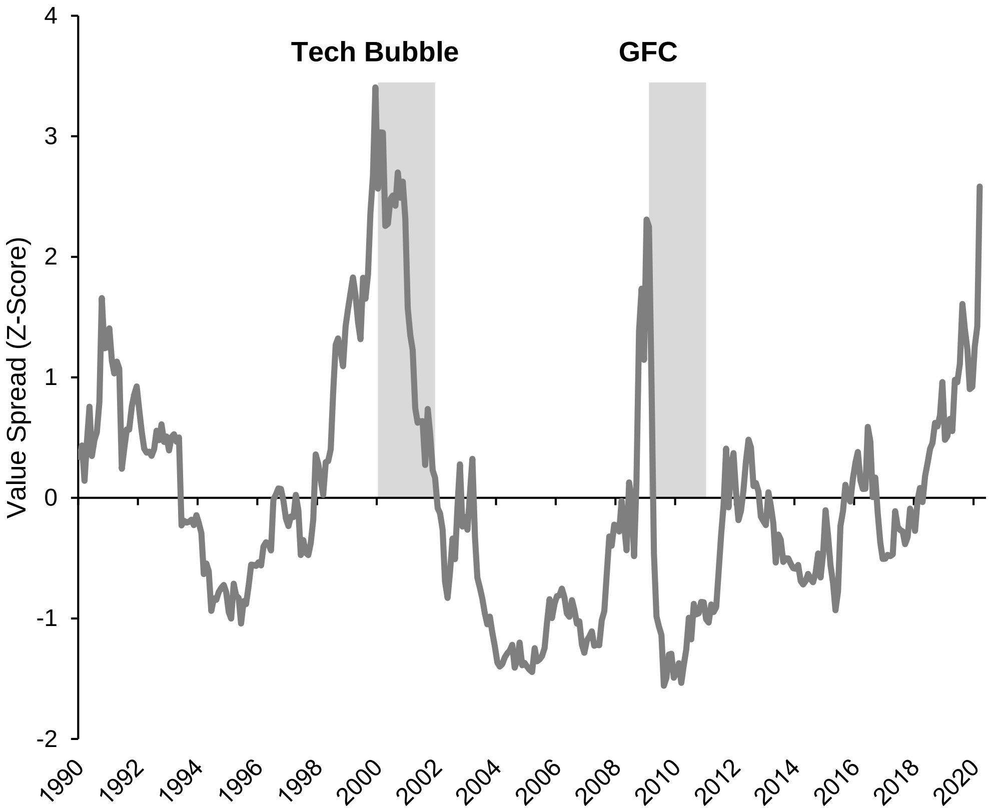
Source: AQR, IBES. *Start date depends on data availability for the different sets of fundamentals. Percentiles compare the average recent period versus periods of the same length through the entire backtest sample. Value views as determined by the Hypothetical AQR International Value Backtest. Hypothetical data has inherent limitations, some of which are disclosed in the Appendix. For illustrative purposes only and not representative of an actual portfolio AQR currently manages. Please see the Hypothetical AQR Value Backtest Description in the Appendix. Please read the Appendix for important disclosures. Forecasts are not a guarantee of performance and are subject to change.

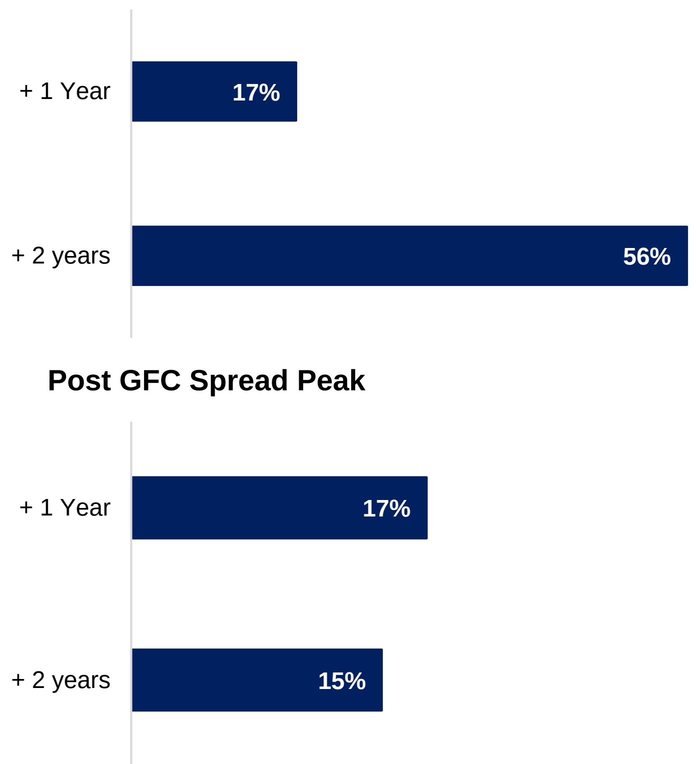
Outlook for Value Performance

Historically, Value strongly outperformed following severe dislocations

Value Spreads and Hypothetical Performance for AQR Global Value Backtest*

January 1, 1990 – June 30, 2020





*Spreads are constructed using the Hypothetical AQR Value portfolio as described below, and are adjusted to be dollar-neutral, but not necessarily beta-neutral through time. Return data is the AQR Hypothetical Style Premia Standalone Global Value Factor Backtest targets 7% volatility and is net of trading costs, excess of cash returns.

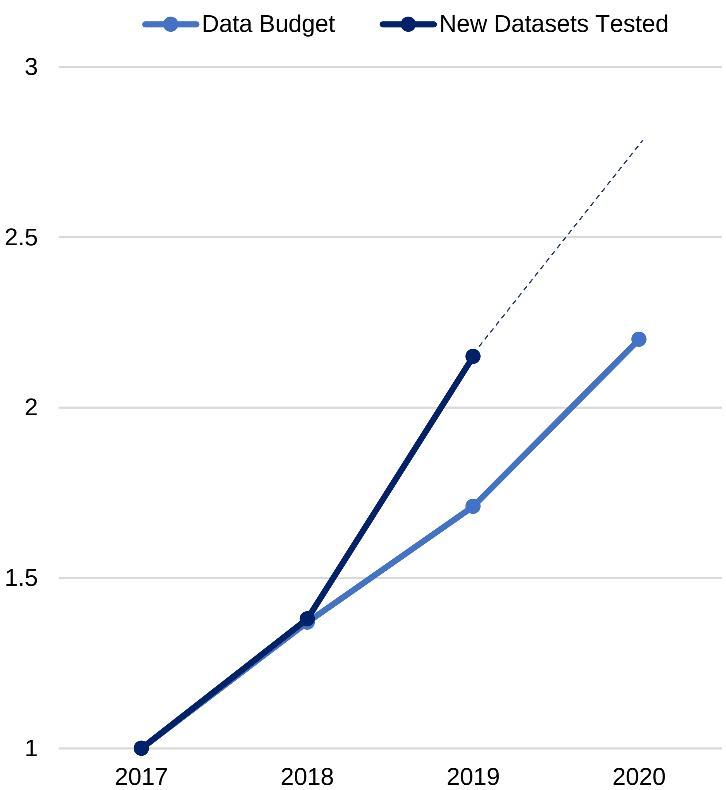
Source: AQR. Hypothetical value spread composite includes four value measures: book-to-price, earnings-to-price, forecast earnings-to-price, and sales-to-enterprise value; spreads are measured based on ratios. Hypothetical data has inherent limitations, some of which are disclosed in the Appendix. Return data is the Hypothetical AQR Style Premia Global Value (Net of Transaction Costs) Backtest, which targets roughly 7% volatility over time, and is net of trading costs, excess of cash returns. Please read performance disclosures in the Appendix for a description of the methodology. Hypothetical data has inherent limitations, some of which are disclosed in the Appendix. Gross performance does not reflect the deduction of investment advisory fees. For illustrative purposes only and not representative of an actual portfolio AQR currently manages. Please read important disclosures in the Appendix. All performance figures contained herein are in USD unless noted otherwise.

Global Stock Selection Going Forward

We Constantly Seek to Innovate

Data Budget

Indexed to 2017



Changes & Enhancements

Subset of Examples Since 2017

2018	2019	2020
Alternative Data Expansion	Textual Analysis Expansion	Alternative Data Upweight
Custom Peer Groups	Additional Custom Linkages	Custom Peer Group Upweight
Industry Specific Factor Expansion	Social Sentiment	Enhanced Signal Construction
Corporate Bond Investor Sentiment	Operating Lease Adjustments	Additional Creditworthiness Measures
Corporate Bond Spillover Factors	Implement Value tilt	Increase Value tilt

COVID-Related Adjustments

- Re-weight Forecasted Measures
- Adjust Guidance Factors
- Adapt for Financial Reporting Delays
- Risk Model Adjustments
- Implement Shorting Restrictions

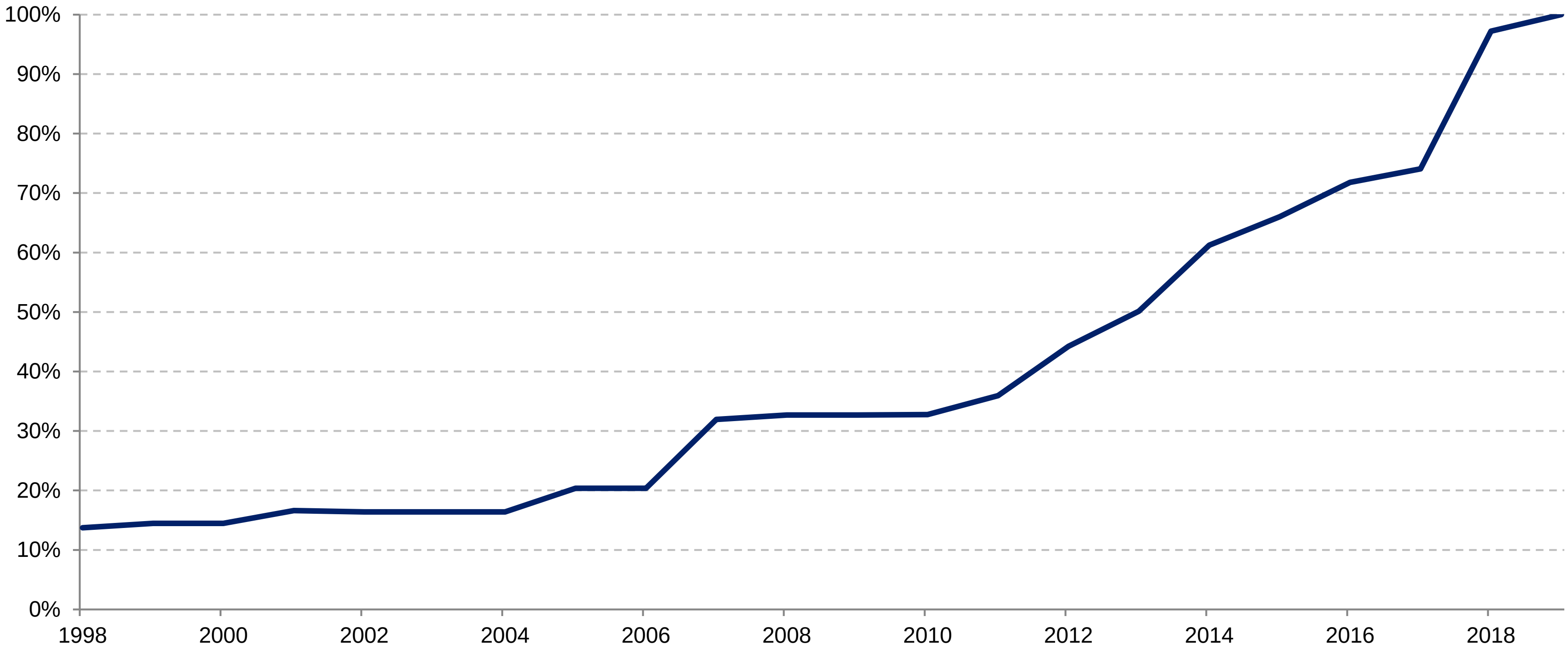
Note the data is indexed to 2017 as a base year and we won't know the number of new data sets tested in 2020 until year end.
Source: AQR. All dates are approximate. Please read important disclosures in the Appendix.

Global Stock Selection Going Forward

We Constantly Seek to Innovate

Evolution of AQR Global Stock Selection Model:
Model Weight Commonality Then vs. Now

October 1, 1998 – December 31, 2019



Source: AQR. Graph depicts the weight of signals in the model through time as a percentage of weight in the current model, from October 1, 1998 – December 31, 2019. For illustrative purposes only. Model portfolios are an essential component of AQR's stock selection process.

Appendix

Performance Review
Since inception performance

Alameda County Employees Retirement Association (ACERA)
November 9, 2007 – June 30, 2020

	Portfolio Return (Gross)	Benchmark*	Gross Excess Return	Gross Performance Attribution		
				Stock	Country	Currency
1 Year	-6.4%	-4.8%	-1.6%	-1.3%	-0.3%	0.0%
3 Years (Annl)	-0.9%	1.1%	-2.1%	-1.9%	-0.3%	0.1%
5 Years (Annl)	2.0%	2.3%	-0.3%	-1.1%	-0.1%	0.9%
7 Years (Annl)	3.7%	3.7%	0.0%	-0.3%	-0.1%	0.5%
10 Years (Annl)	5.8%	5.0%	0.8%	0.3%	0.1%	0.4%
Since Inception (Cuml)	19.9%	7.9%	12.0%	5.3%	2.1%	4.7%
Since Inception (Annl)	1.4%	0.6%	0.8%	0.4%	0.1%	0.3%
Tracking Error			3.0%			
Information Ratio**			0.3			

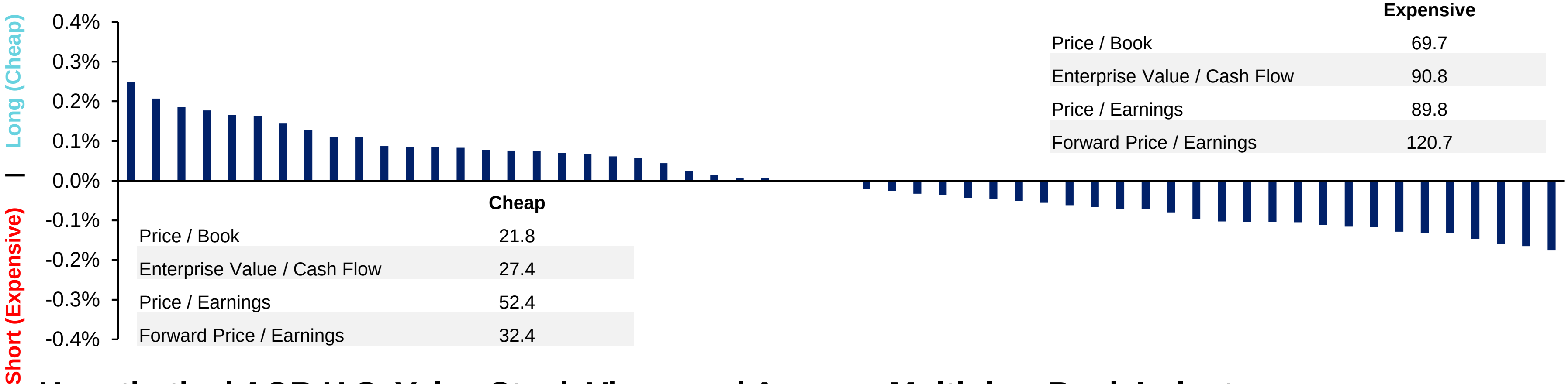
Source: AQR. Performance figures herein represent unaudited estimates of realized and unrealized gains and losses prepared by AQR. Gross performance does not reflect the deduction of investment advisory fees. Please see the Appendix for important risk and performance disclosures. Excess returns are calculated as portfolio returns minus the benchmark. *Benchmark: MSCI All Country World Ex USA Net Index USD End of Day. Past performance is not a guarantee of future performance. Please refer to the monthly statements provided by your custodian or administrator for actual returns. Attributions are subject to change without notice.
**Information Ratio is calculated as the Annualized Excess Return divided by Tracking Error.

What Do Wide Value Spreads Mean?

We measure cheap and expensive only relative to industry peers

Hypothetical AQR U.S. Value Stock Views and Average Multiples, Software Industry

June 30, 2020

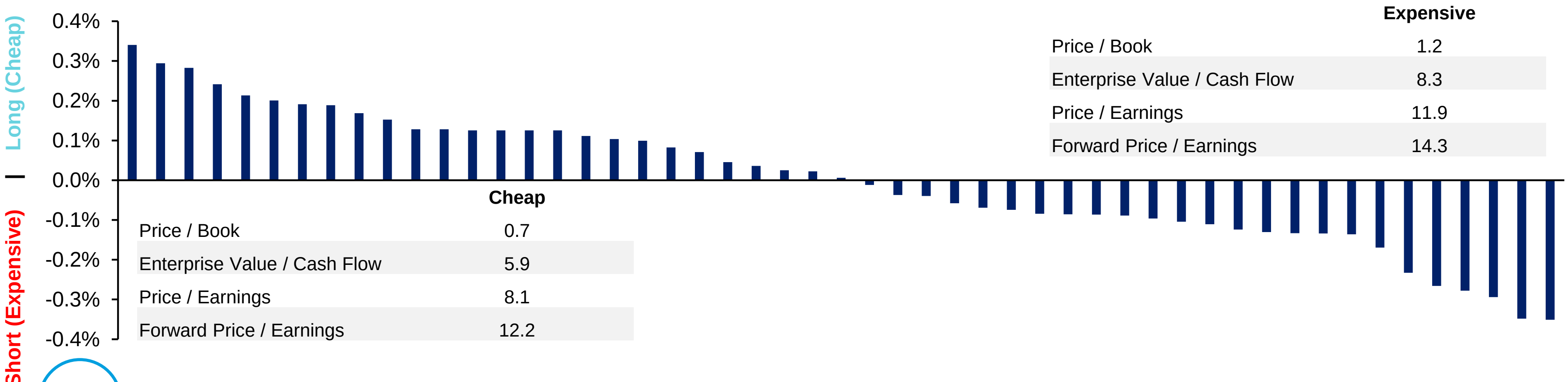


Expensive	
Price / Book	69.7
Enterprise Value / Cash Flow	90.8
Price / Earnings	89.8
Forward Price / Earnings	120.7

Cheap	
Price / Book	21.8
Enterprise Value / Cash Flow	27.4
Price / Earnings	52.4
Forward Price / Earnings	32.4

Hypothetical AQR U.S. Value Stock Views and Average Multiples, Bank Industry

June 30, 2020



Expensive	
Price / Book	1.2
Enterprise Value / Cash Flow	8.3
Price / Earnings	11.9
Forward Price / Earnings	14.3

Cheap	
Price / Book	0.7
Enterprise Value / Cash Flow	5.9
Price / Earnings	8.1
Forward Price / Earnings	12.2

Source: AQR, IBES, XpressFeed. Outlier data have been trimmed. The bars represent individual stock Value views as determined by the Hypothetical AQR Value Backtest. Hypothetical data has inherent limitations, some of which are disclosed in the Appendix. Please see the Hypothetical AQR Value Backtest Description in the Appendix. For illustrative purposes only and not representative of an actual portfolio AQR currently manages. Please read the Appendix for important disclosures.

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Gross performance results do not reflect the deduction of investment advisory fees, which would reduce an investor's actual return. For example, assume that $1 million is invested in an account with the Firm, and this account achieves a 10% compounded annualized return, gross of fees, for five years. At the end of five years that account would grow to $1,610,510 before the deduction of management fees. Assuming management fees of 1.00% per year are deducted monthly from the account, the value of the account at the end of five years would be $1,532,886 and the annualized rate of return would be 8.92%. For a ten-year period, the ending dollar values before and after fees would be $2,593,742 and $2,349,739, respectively. AQR's asset based fees may range up to 2.85% of assets under management, and are generally billed monthly or quarterly at the commencement of the calendar month or quarter during which AQR will perform the services to which the fees relate. Performance fees are generally equal to 20% of net realized and unrealized profits each year, after restoration of any losses carried forward from prior years. In addition, AQR funds incur expenses (including start-up, legal, accounting, audit, administrative and regulatory expenses) and may have redemption or withdrawal charges up to 2% based on gross redemption or withdrawal proceeds. Please refer to the Fund's Private Offering Memoranda and AQR's ADV Part 2A for more information on fees. Consultants supplied with gross results are to use this data in accordance with SEC, CFTC, NFA or the applicable jurisdiction's guidelines.

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There is a risk of substantial loss associated with trading commodities, futures, options and leverage. Before investing carefully consider your financial position and risk tolerance to determine if the proposed trading style is appropriate. Investors should realize that when engaging in leverage, trading futures, commodities and/or granting/writing options one could lose the full balance of their account. It is also possible to lose more than the initial deposit when engaging in leverage, trading futures and/or granting/writing options. All funds committed should be purely risk capital.

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AQR

Performance Disclosures

Broad-based securities indices are unmanaged and are not subject to fees and expenses typically associated with managed accounts or investment funds. Investments cannot be made directly in an index.

The MSCI U.S. Growth Index, MSCI U.S. Value Index, MSCI U.S. Enhanced Value Index captures large cap representation in the U.S. and has roughly 500 constituents. MSCI also creates indices that express factor tilts such as Growth, Value, and Enhanced Value (industry-neutral Value), which are used in this presentation.

The S&P 500 Growth Index, S&P 500 Value Index captures large cap representation in the U.S. and has roughly 500 constituents. S&P 500 also creates indices that express factor tilts such as Growth and Value, which are used in this presentation.

The Russell 10000 Growth Index, Russell 1000 Value Index captures large cap representation in the U.S. and has roughly 1000 constituents. Russell also creates indices that express factor tilts such as Growth and Value, which are used in this presentation.

Performance Disclosures

Hypothetical AQR U.S. Large Cap, Europe, Japan, and Emerging Markets Valuation Theme Backtest Descriptions:
The AQR U.S. Value Portfolio Backtest utilizes the full set of underlying factors that compose the Valuation theme within AQR's Global Stock Selection strategy to evaluate stocks and create a long-short, market-neutral and industry-neutral equity portfolio based exclusively on these signals. The Valuation Theme is designed to capture the tendency for relatively cheap assets to outperform relatively expensive ones. Backtest returns are gross of advisory fees and transaction costs from September 1, 1984 – June 30, 2020. Regional data begins at varying dates: Emerging (October 1994), Europe (February 1990), U.S. (January 1984), U.S. Small Cap (January 1990), Emerging Small Cap (October 1997), Canada (February 1990), Japan (January 1990), Australia (January 1994), Developed Asia (January 1990), Europe Small Cap (February 1997). . The investment universes include a broad subset of liquid tradeable large cap stocks within the various regions. The risk models used are the Barra U.S. Equity Risk Model (USE3L), Barra Developed Equity Risk Model (BIMDEV_noCURR_301L), and Barra Global Equity Risk Model (GEM3L_noCurr).

Hypothetical AQR U.S. Large Cap, International, Emerging Markets Short Term and Long Term Forecasted Growth Backtest Description:
The AQR Short Term and Long Term Forecasted Growth Backtest utilizes IBES forecasts for 1 year ahead (Short Term) beyond 1 year (Long term) to evaluate stocks and create a long-short, market-neutral and industry-neutral equity portfolio based exclusively on these signals. These factors are designed to capture the premium associated with stocks that have a strong expected long-term growth potential. Backtest returns are gross of advisory fees and transaction costs from January 1, 1990 – June 30, 2020. The backtest utilizes a monthly rebalancing schedule and targets 7% annual volatility. The investment universes include a broad subset of liquid tradeable large cap stocks within the various regions. The risk models used are the Barra U.S. Equity Risk Model (USE3L), Barra Developed Equity Risk Model (BIMDEV_noCURR_301L), and Barra Global Equity Risk Model (GEM3L_noCurr).

AUGUST 12, 2020

Risk Management Presentation for

ACERA

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Verus

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ACERA exposure to risk management

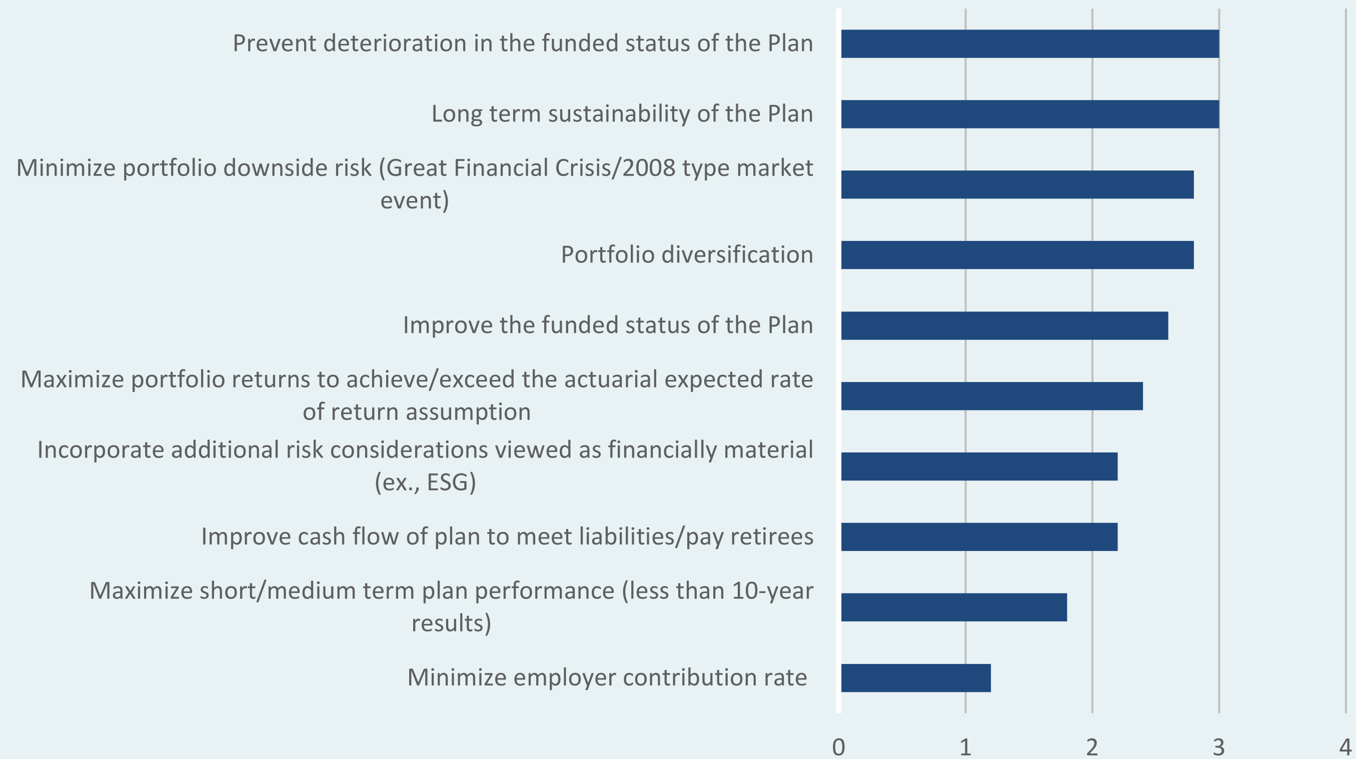
How has ACERA incorporated risk?

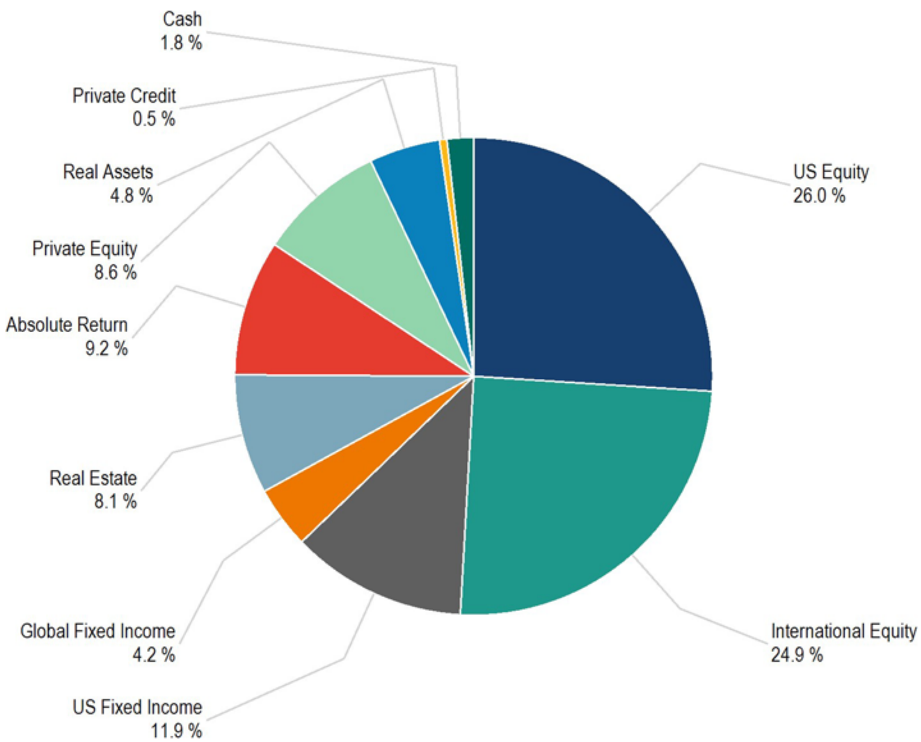
- Explicit identification of Enterprise Risk tolerance (identifying primary objectives and risks) into asset-liability study
- Integral understanding that all decisions/risks taken should support strategic asset allocation (SAA), the primary driver of risks and returns
- Scenario analysis of asset mixes and factor risk measurement in asset-liability study to consider multiple lenses of risk in determining optimal SAA
- Asset class studies to measure and disaggregate active risk (tracking error) versus the policy benchmarks
- Ongoing measurement of risk and risk-adjusted returns in performance reporting at the total fund and asset class levels
- Liquidity analysis to measure liquidity risk in ACERA portfolio
- Other forms of risk identification:
  - Manager selection risk and risk-adjusted criteria
  - IPS outlines return/risk guidelines and risk restrictions (prohibited securities)

ACERA portfolio built with risk considerations at all levels of the plan

Long-term objectives – ERT results

LONG TERM OBJECTIVES





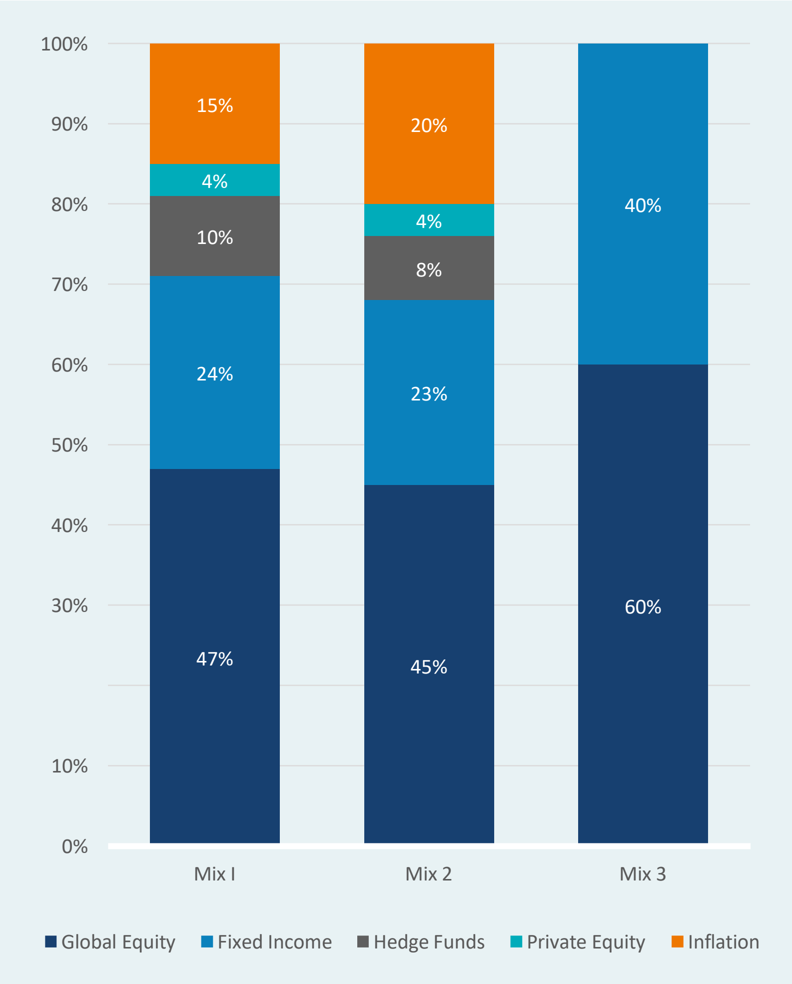
	Actual	Actual
US Equity	$1,931,768,113	26.0%
International Equity	$1,844,318,924	24.9%
US Fixed Income	$881,915,606	11.9%
Global Fixed Income	$312,857,319	4.2%
Real Estate	$601,208,408	8.1%
Absolute Return	$683,711,944	9.2%
Private Equity	$634,239,427	8.6%
Real Assets	$359,586,148	4.8%
Private Credit	$36,070,411	0.5%
Cash	$130,547,692	1.8%
Total	$7,416,223,994	100.0%

	Actual	Target
US Equity	26.0%	25.0%
International Equity	24.9%	25.0%
US Fixed Income	11.9%	13.0%
Global Fixed Income	4.2%	3.0%
Real Estate	8.1%	8.0%
Absolute Return	9.2%	9.0%
Private Equity	8.6%	8.0%
Real Assets	4.8%	5.0%
Private Credit	0.5%	4.0%
Cash	1.8%	0.0%
Total	100.0%	100.0%

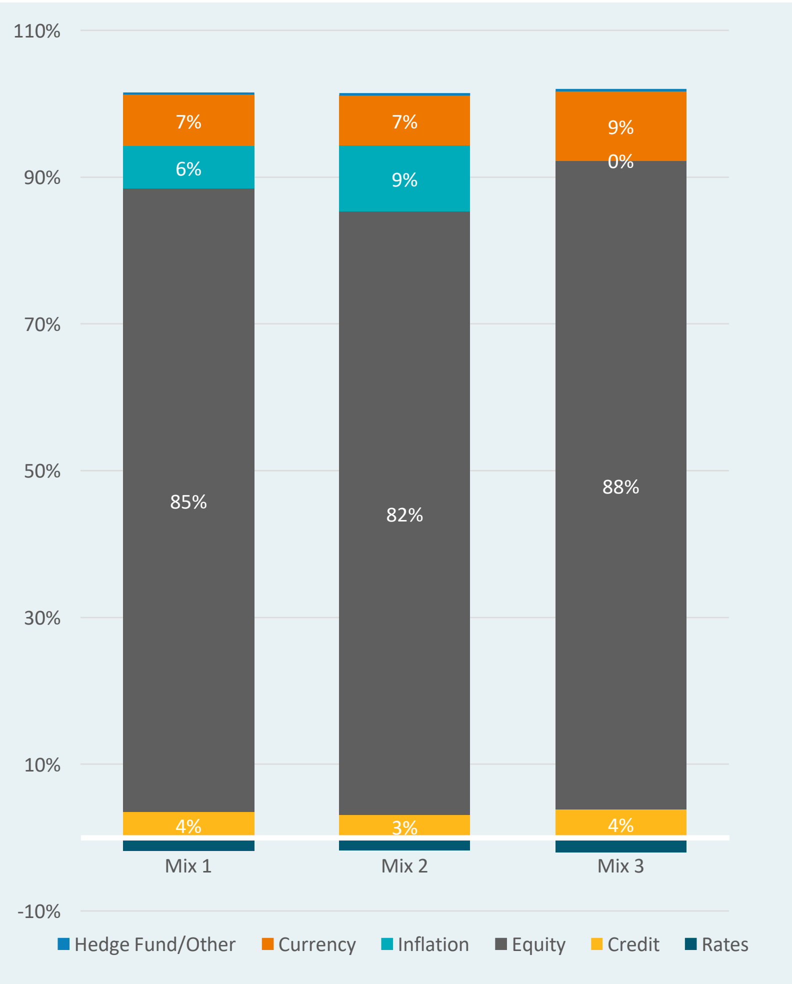
Bivium Portfolio Liquidated U.S. Equities and invested in International Equities

Asset allocation ≠ risk allocation

ASSET ALLOCATION MIXES

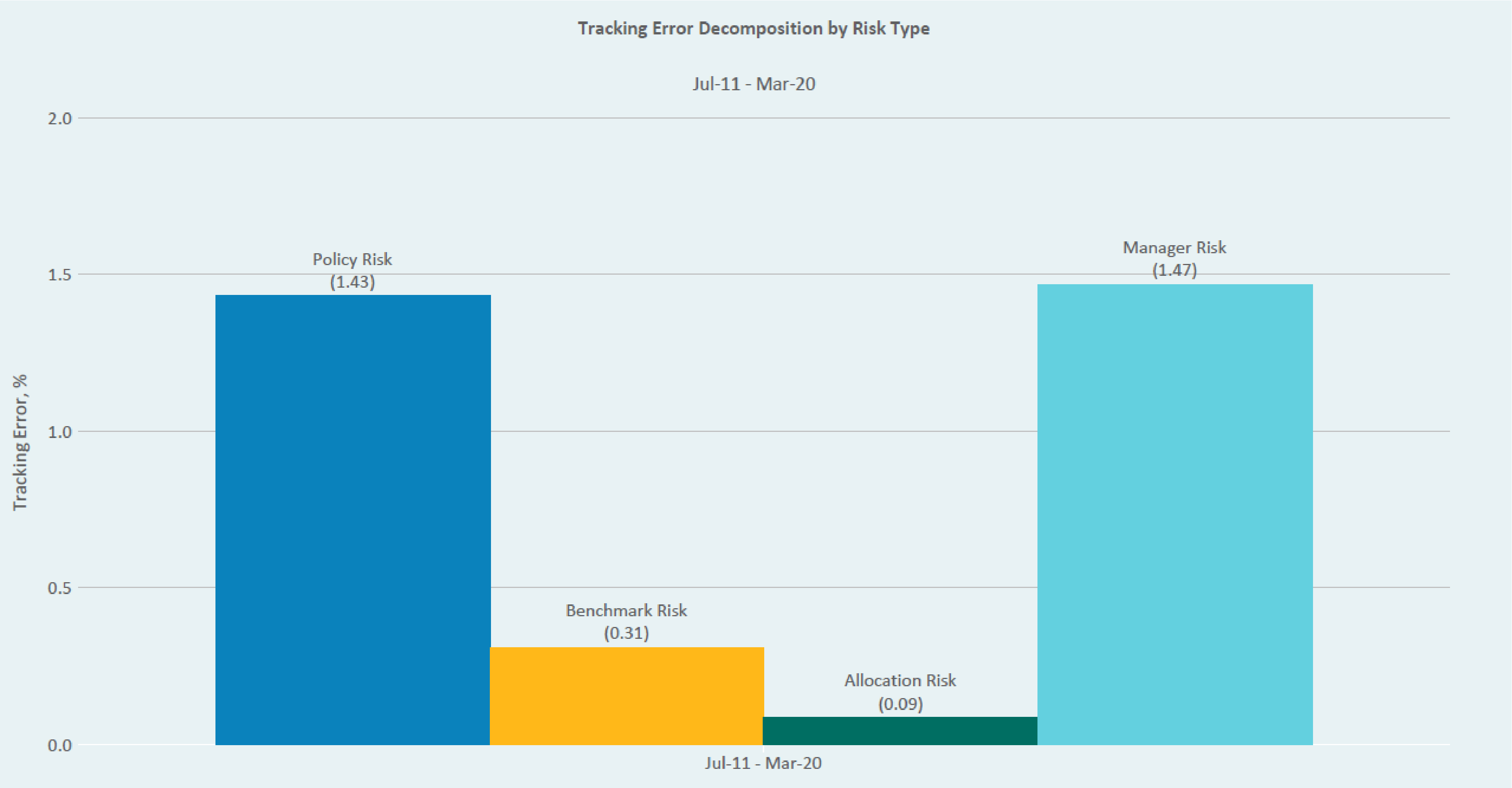


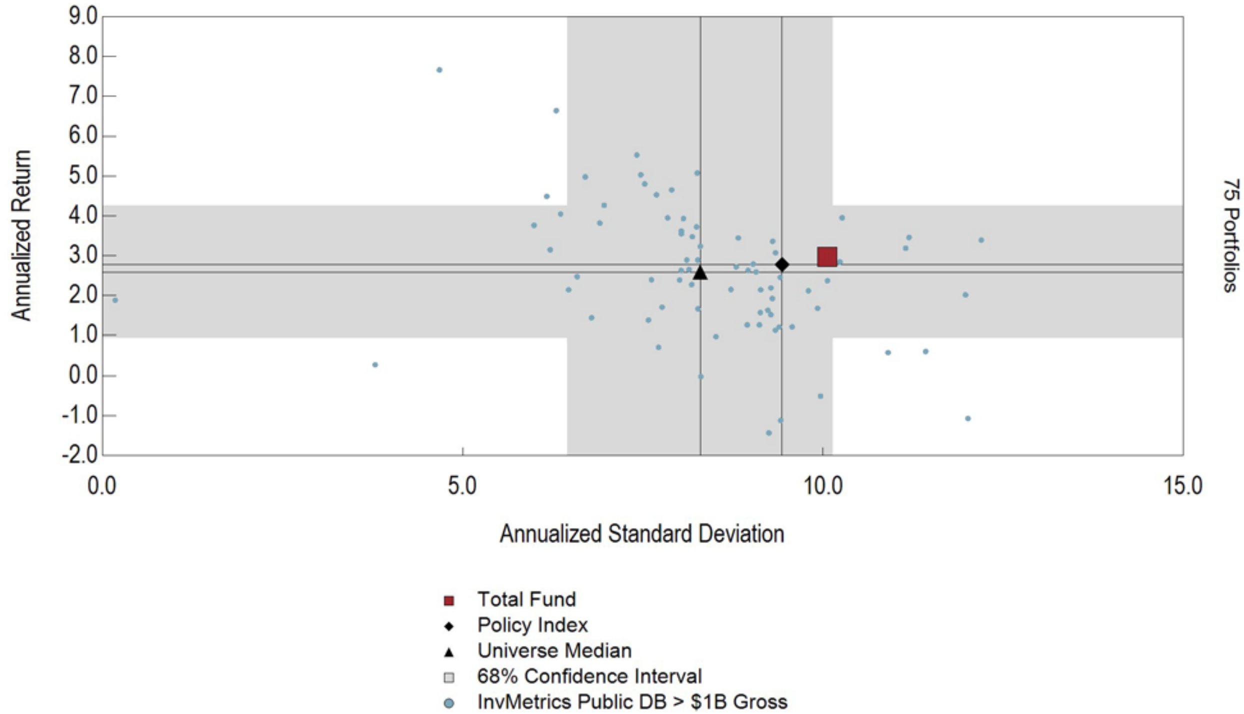
RISK CONTRIBUTION BY RISK FACTOR



Traditional asset allocation does not take into account that different asset classes can contain the same risk factors.

Tracking Error: PR, BR, AR, MR

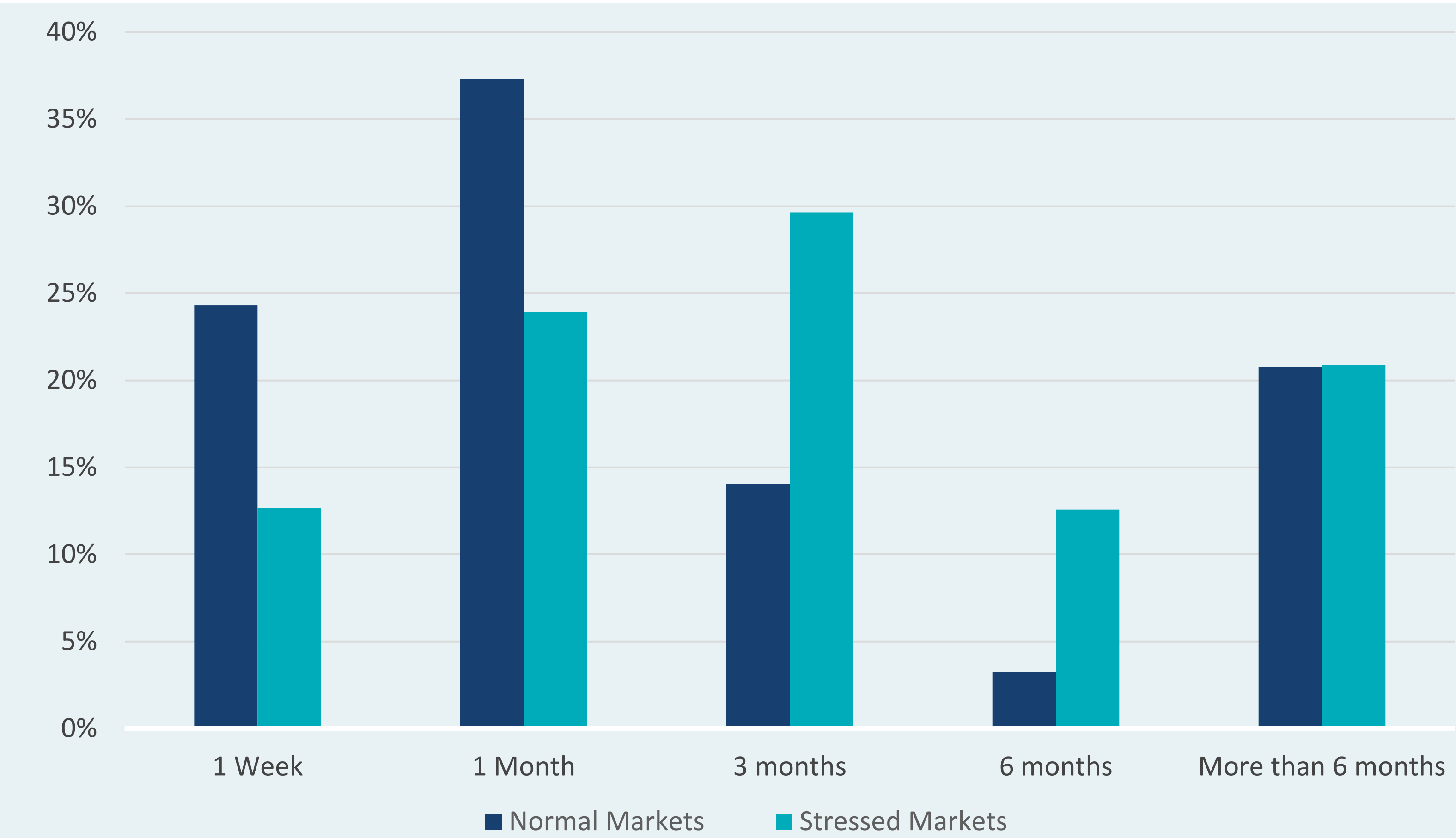




	Anlzd Return	Anlzd Return Rank	Anlzd Standard Deviation	Anlzd Standard Deviation Rank	Sharpe Ratio	Sharpe Ratio Rank	Information Ratio	Information Ratio Rank	Tracking Error	Tracking Error Rank
Total Fund	2.98%	39	10.06%	88	0.12	43	0.15	49	1.26%	58
Policy Index	2.78%	44	9.43%	82	0.11	49	--	--	0.00%	1
Allocation Index	2.72%	45	9.86%	85	0.10	52	-0.10	59	0.61%	6
InvMetrics Public DB > $1B Gross Median	2.59%	--	8.30%	--	0.11	--	0.09	--	1.21%	--

Stressed market liquidity

Example 1: Liquidity can change in stressed periods



Understanding how portfolio liquidity changes in stressed periods allows investors to better anticipate reactions during drawdowns.

Liquidity coverage ratio sensitivities

Example 2: Understanding what drives changes to the LCR

LCR FOR GIVEN DRAWDOWN AND SUBSEQUENT RETURNS

Annualized subsequent returns (5yrs)

Immediate drawdown	1.75%	2.75%	3.75%	4.75%	5.75%	6.75%
-50%	1.68	1.72	1.76	1.79	1.84	1.88
-40%	1.83	1.87	1.92	1.97	2.02	2.08
-30%	1.98	2.04	2.10	2.16	2.23	2.30
-20%	2.14	2.21	2.29	2.37	2.43	2.49
-10%	2.32	2.39	2.45	2.52	2.59	2.66
0%	2.46	2.53	2.60	2.67	2.75	2.82

LCR FOR GIVEN CHANGES TO PRIVATE MARKET CAPITAL CALLS AND DISTRIBUTION

Capital call reduction

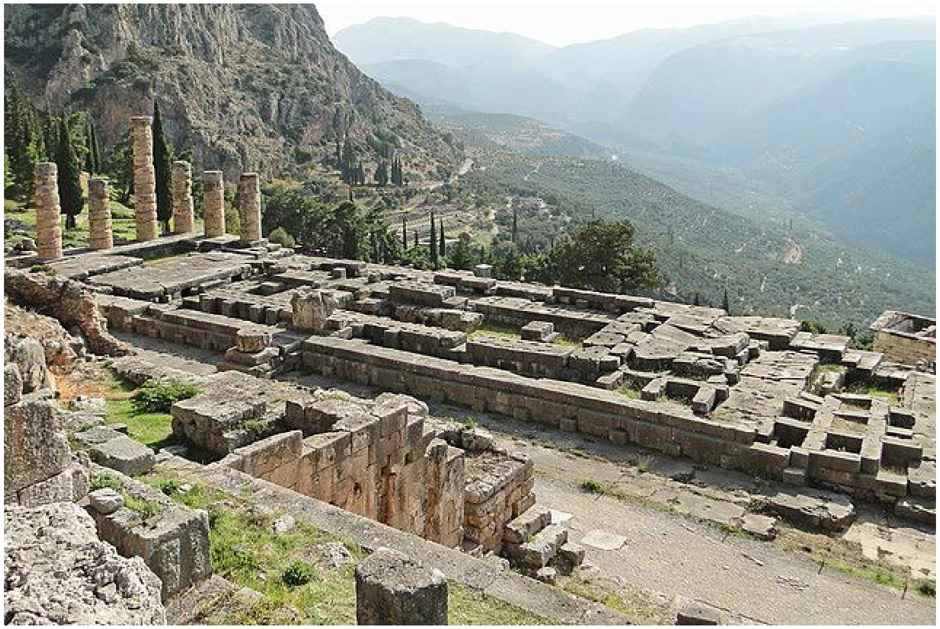
Distribution Reduction	5%	15%	25%	35%	45%	55%
95%	2.04	2.10	2.16	2.23	2.31	2.38
85%	2.09	2.15	2.22	2.29	2.36	2.44
75%	2.14	2.20	2.27	2.34	2.42	2.50
65%	2.19	2.26	2.33	2.40	2.48	2.56
55%	2.24	2.31	2.38	2.46	2.54	2.62
45%	2.29	2.36	2.43	2.51	2.59	2.68

Stressed market conditions require consideration of the magnitude of the drawdown, subsequent returns, changes to capital calls & distributions among other dynamics.

LCR < 1 implies the need to sell illiquids to meet cash flows.

Verus risk management

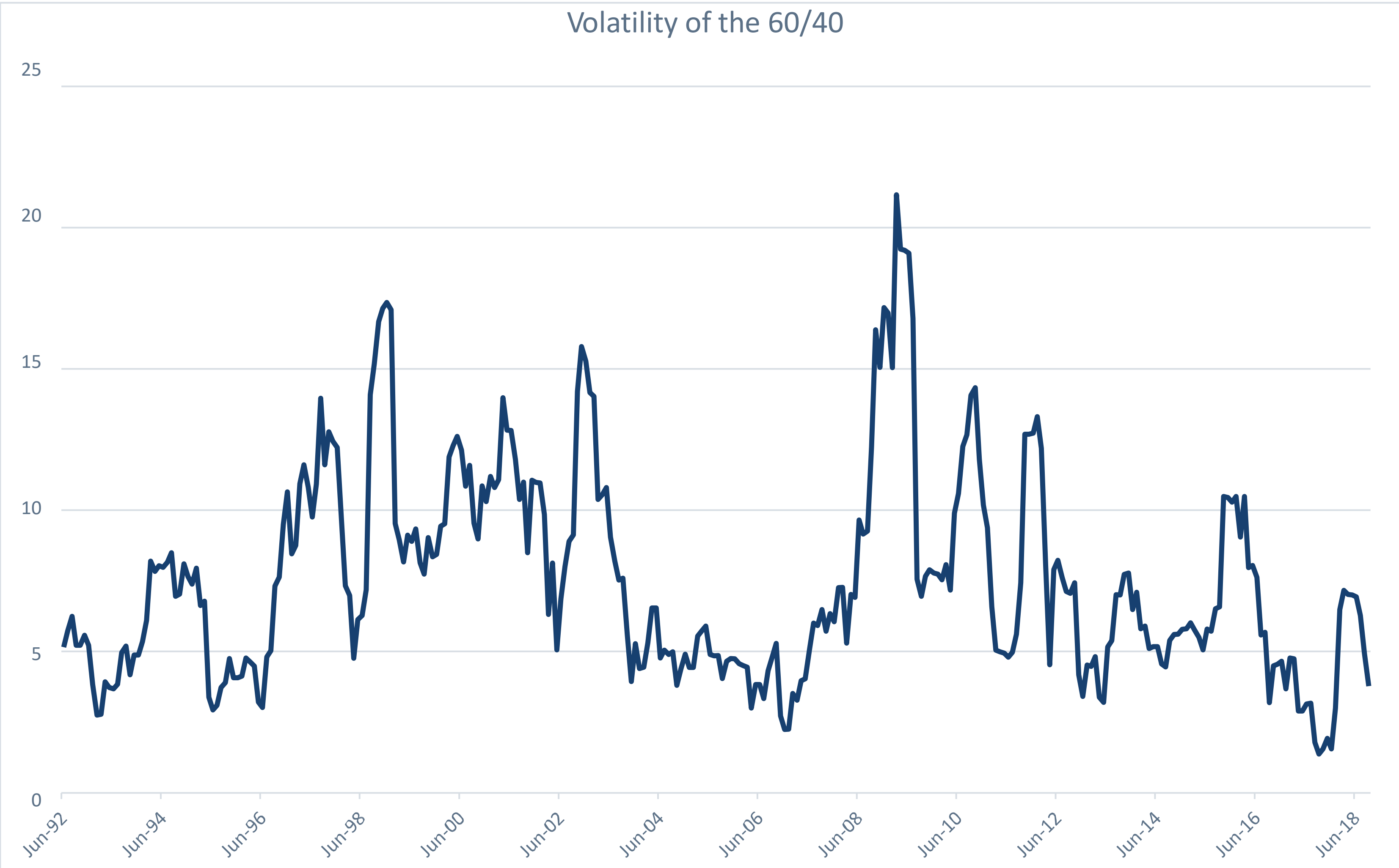
Oracle at Delphi-Temple of Apollo



Maxims of the Seven Sages:

— Know thyself (Know what you own)
— Nothing to excess (Diversify)
— Surety brings ruin (Overconfidence)

Risk is Dynamic



Creating the culture

An approach to creating a risk management culture, includes:

Enterprise alignment - Accepting the appropriate level of investment risk hinges on the sponsor's financial health. Aligning investment risk with the health of the sponsor benefits both participants and the sponsor.

Volatility & correlations - Volatilities and correlations are not static; they must be attended to regularly. We show how they can be used to dynamically allocate assets in a risk-controlled approach to improve investment results.

Actual vs. intended exposures - Active management allows for exposures away from the benchmark. When those exposures stray too far, they can give rise to unintended consequence. We show that knowing what you own can reduce those consequences significantly.

Asset and factor allocations - Large, complex portfolios effectively bundle various factors together, which can cause a plan to have significant factor exposures while maintaining target allocation weights. We show how factor reporting can unpack the factor exposures to answer some very fundamental questions.

Leverage - The use of leverage is increasingly common across investment strategies. And while it magnifies returns in up markets, it also magnifies them in down markets. Understanding how much leverage is being utilized and the potential impact on the portfolio is critical in managing risk. We show how leverage can be calculated within a portfolio so that it can be managed appropriately.

Liquidity - In stressed markets, liquidity can seemingly vanish over night while liabilities still need to be met. We show an intuitive and pragmatic calculation to prepare for stressed market conditions.

The Golden Rule of portfolio construction

	GLOBAL 60/40 TOTAL RETURN		RISK FREE RATE		BETA		TACTICAL OPPORTUNITIES (ALPHA)
Since 1970	8.5%	=	5.2%	+	3.3%		
					Absolute Risk 11% / Sharpe Ratio 0.3		
Next 10 Years	6.75%	=	*Verus CMAs* 2.2%	+	?	+	?
					Absolute Risk ? / Sharpe Ratio ?		?% Active Risk / ? Information Ratio

Beta return since 1970 is calculated by subtracting the return of the risk free rate since 1970 from the Global 60/40 portfolio return.

Actual vs. intended exposures

The Challenge: Knowing what you own

Actively managed strategies typically follow guidelines designed to give the manager enough freedom to execute the desired strategy while providing safeguards to prevent unintended exposures. The results:

— Investment strategy contains "out of benchmark" positions
  - Benchmarks inaccurately assume 100% of the strategy corresponds to the selected benchmark

— Investment strategy contains positions in other benchmarks
  - Securities may belong within other identifiable asset classes but are being overlooked

— This is particularly relevant where benchmarks poorly describe strategy holdings

Tracking error captures the net result of the differences between actual holdings and the benchmarks'; however,

— Tracking error is measured after the fact;

— The tracking error of individual strategies may offset, thus masking true embedded deviations; and

— Transitional periods may cause significant deviations from benchmarks making tracking error difficult to interpret.

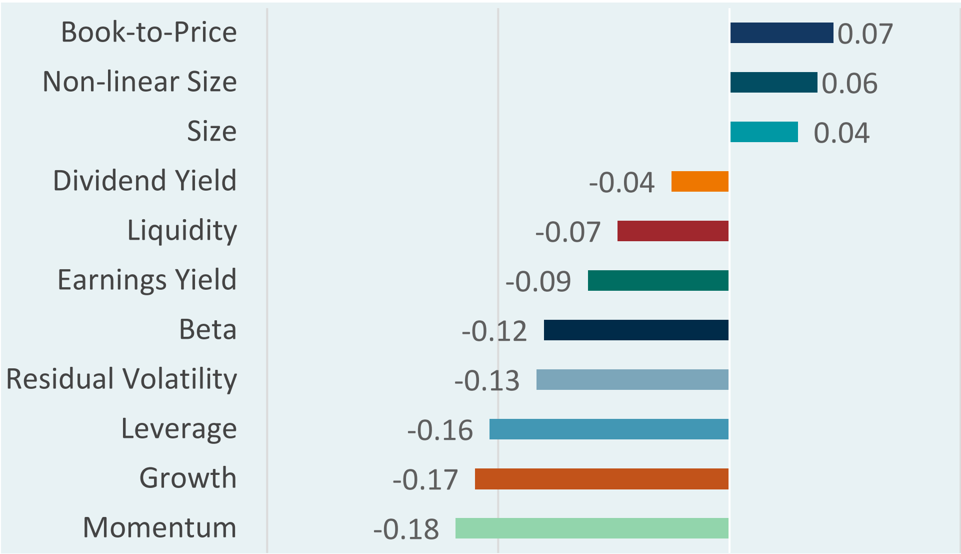
Actual vs. intended exposures

Portfolio characteristics

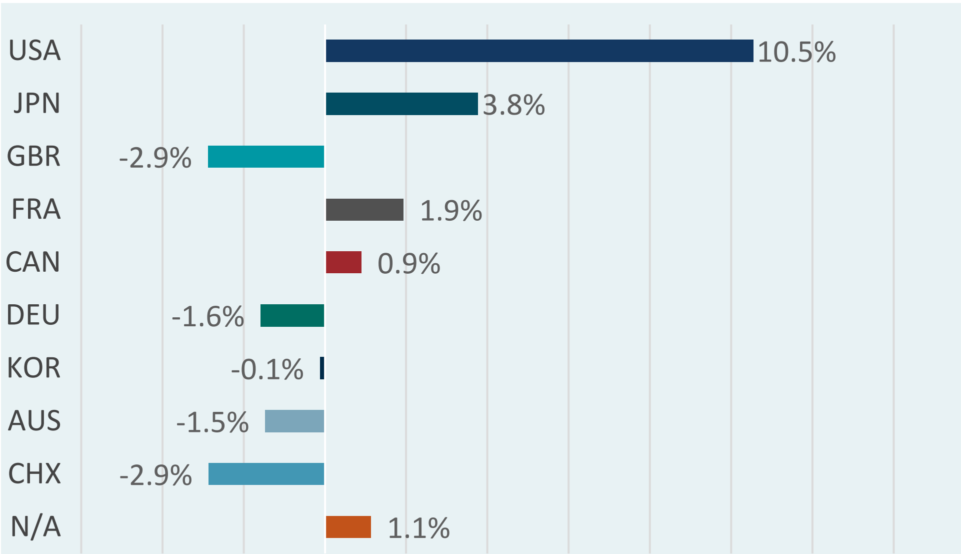
Portfolio vol	8.59
Benchmark vol (MSCI ACWI IMI)	10.89
Active risk	4.13
Beta	0.71
Active Share	0.91

A risk management lens improves transparency and helps illustrate what contributes to absolute and active risk.

ACTIVE STYLE EXPOSURES VS. BENCHMARK



COUNTRY EXPOSURES VS. BENCHMARK



The challenge

Allocation models assume stable volatilities and correlations

Mean-Variance Analysis is quite sensitive to volatility and correlation assumptions. This has meaningful impact on the construction of the investment program:

— The asset allocation establishes not only the return an investment program should expect to achieve but also the volatility it should expect to endure.

— Alternatively, and in combination with the Enterprise alignment analysis, the asset allocation establishes the allowable risk level to be assumed in pursuit of expected returns.

— Because market volatility is dynamic, it is important to monitor current volatility vs. that which had been projected. Too much volatility can cause the permanent impairment of capital in drawdowns, while too little can cause sub-par returns.

— While volatility can be measured over any time period, results vary significantly depending on the time period chosen. This can cause disparate views of "current" market volatility.

— Individual asset classes also demonstrate different volatilities at different times. This causes correlations to behave dynamically.

Before, during, now

Risk Source	Portfolio Risk Contribution 02/14/20	Portfolio Risk Contribution 03/23/20	Portfolio Risk Contribution 06/01/20
Total Risk	7.1	13.6	15.0
Local Market Risk	6.7	13.2	14.6
Common Factor Risk	6.6	13.1	14.5
Industry	0.0	-0.1	-0.1
Style	0.1	0.1	0.1
Term Structure	-0.2	-0.4	-0.4
Implied Volatility	0.0	0.0	0.0
Spread	0.2	0.9	1.2
Private Real Estate	0.2	0.5	0.7
Country	0.0	0.0	0.0
Market	6.1	12.0	12.7
Private Equity	0.2	0.1	0.3
Selection Risk	0.1	0.1	0.1
Currency Risk	0.3	0.4	0.4

Last column uses a shorter half life

Asset and factor allocations

The Challenge: How to unbundle the factors inherent in asset classes

Asset allocation is widely recognized as the dominant driver of portfolio level risk and return. It provides a well understood approach to creating portfolios based on expected returns, volatility, and correlations among asset classes.

Factor allocations provide transparency into a portfolio's exposures to economic drivers, styles, and other characteristics that:

— May be more aligned to the liability profile (e.g. interest rate sensitivity);

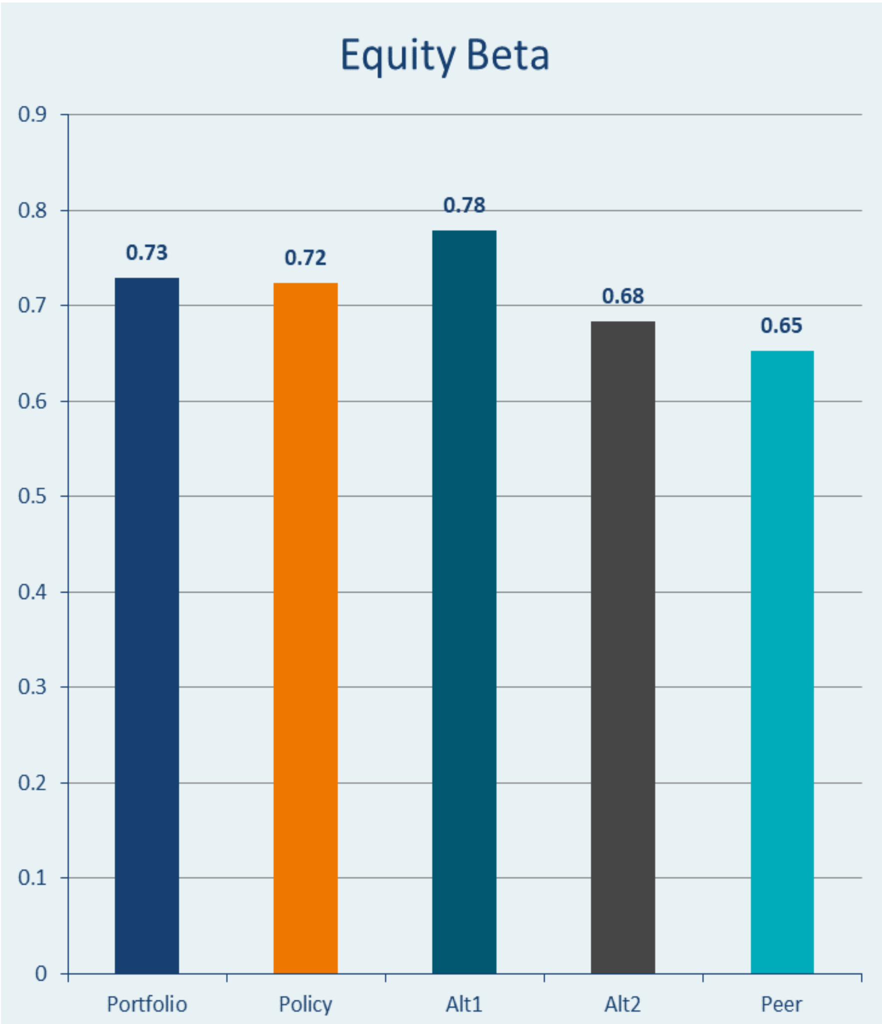
— Are shared across multiple asset classes (e.g. equity and credit sensitivities); - OR -

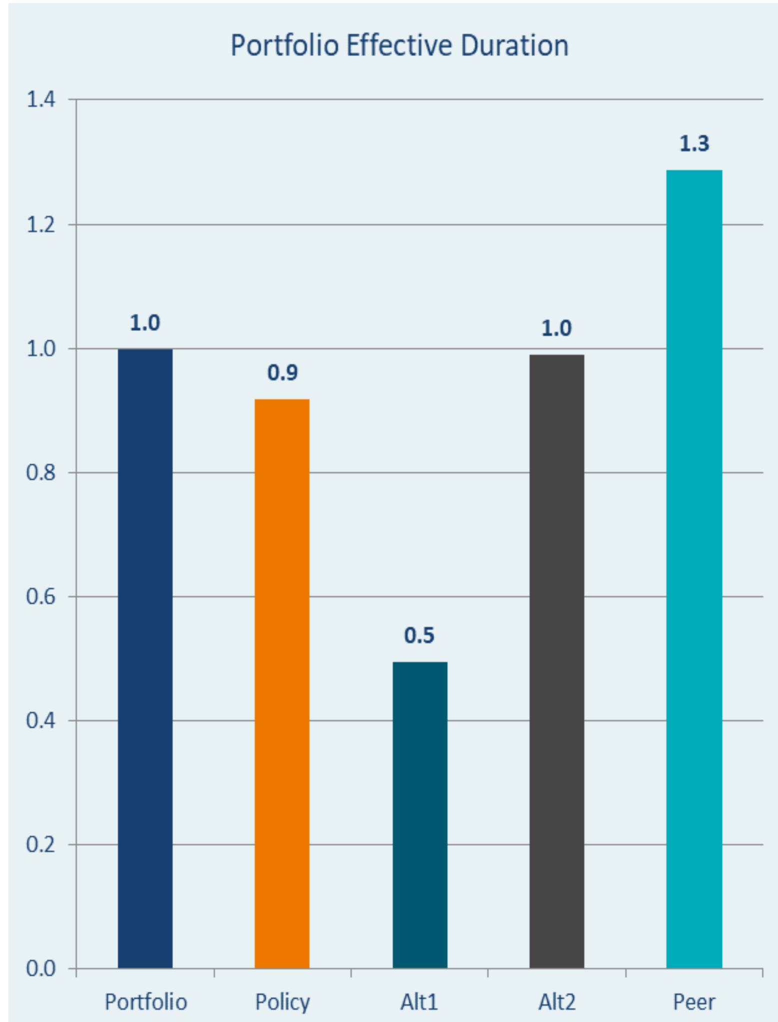
— Are not captured explicitly in asset allocation approaches (e.g. currency exposures), among others.

Both active and passive investment strategies effectively represent the bundling of factors and, in fact, the individual securities within the portfolios themselves represent combinations of factors. Unbundling individual strategies or total plan exposures into factors provides great insight into what drives risk and return.

While thousands of factors are available to describe investment returns, it is important to identify which are most effective in practice.

Sources of risk



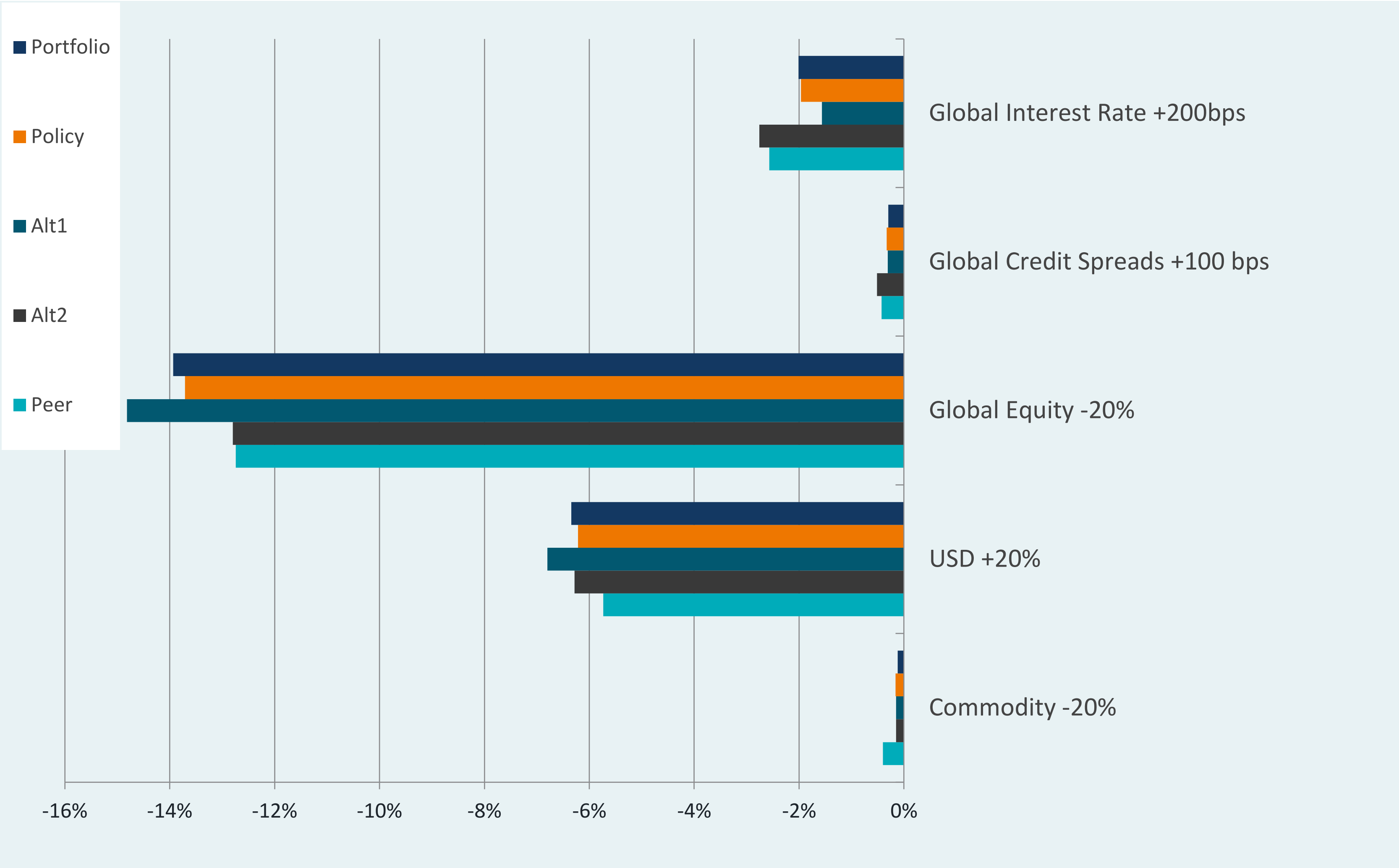


Equity beta measures the sensitivity to the risks of the broad equity market.

Duration measures the sensitivity of the portfolio to a change in interest rates.

Source: MSCI BARRA

Stress tests



Stress testing reveals how extreme shocks can impact different asset mixes

Source: MSCI BARRA

Importance of model inputs

The Challenge: Developing appropriate benchmark proxies

One can learn a lot by using simply proxied indices, particularly at the overall plan level.

Caveats to this statement are:

— Understanding that alpha portfolios, and sometimes beta ones, require careful attention to modeling.
  - Proxies that work well with public equities don't work well in other asset classes.
  - Leverage needs particular attention.
  - The risk view, rather than the dollar view, is required.

— Multi asset portfolios have different betas and they change often, so they are a challenge to model.

— A simple rule of thumb for when you should use holdings-based analysis is if the work involved in loading securities is less than the work in creating a credible proxy.

Active risk implications

Asset	Weight
Portfolio	
MSCI World SRI	60%
MSCI USD Multifactor IG Corporate Bond	40%
Benchmark	
MSCI World	60%
MSCI Corporate Index	40%

All in USD

ESG

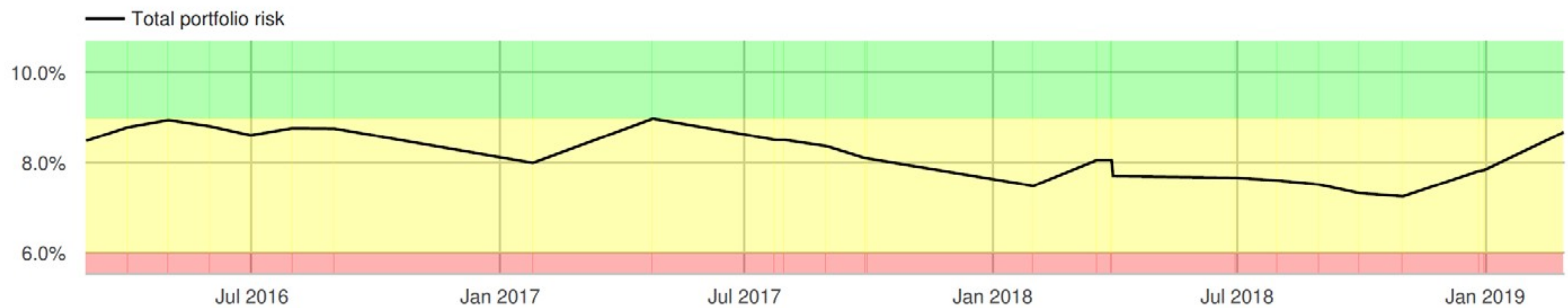
Risk Source (2/14/20)	Portfolio Risk Contribution	Benchmark Risk Contribution	Active Portfolio Risk Contribution
Total Risk	**6.89**	**6.94**	**1.17**
Local Market Risk	6.58	6.69	1.17
Common Factor Risk	6.42	6.64	0.43
Industry	0.06	0.03	0.24
Style	-0.16	-0.04	0.14
Term Structure	-0.13	-0.16	-0.01
Implied Volatility	0.00	0.00	0.00
Spread	0.64	0.61	0.02
Country	0.01	0.01	0.00
Market	5.98	6.17	0.02
Selection Risk	0.17	0.05	0.75
Currency Risk	0.31	0.25	0.00

Governance

6 Total portfolio risk

Standard deviation

	2019-02-28	Staff CIO	ICM ED	Board Board
	8.68%	9% — 15%	6 — 9%; 15 — 18%	< 6%; > 18%

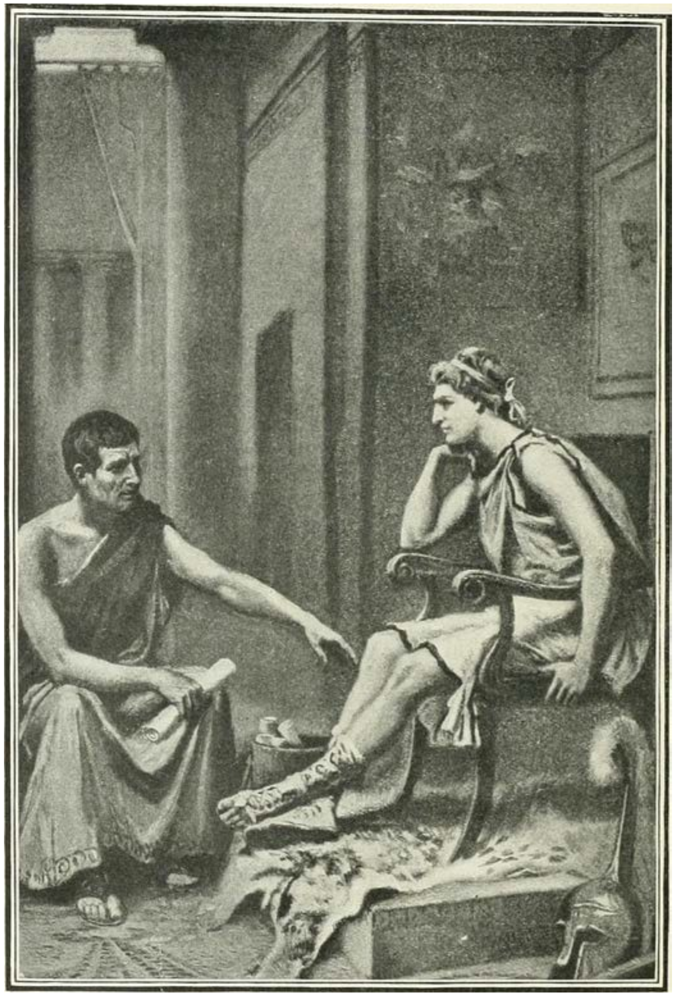


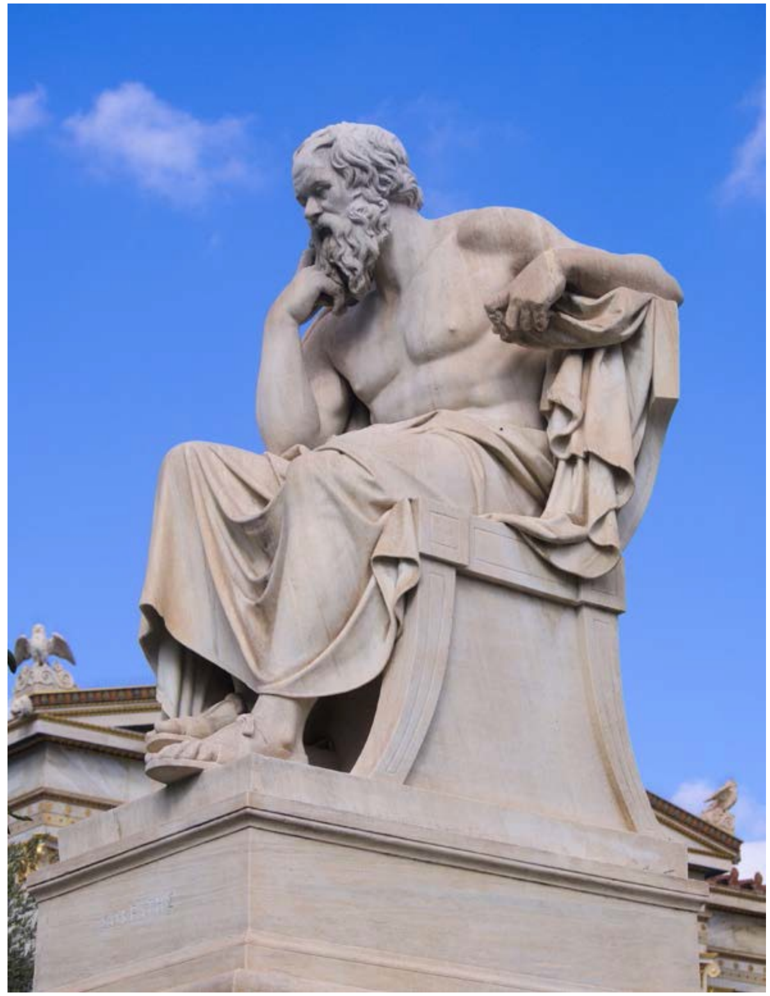
Total portfolio risk notes:

Once compliance risk guidelines have been officially adopted, when a guideline falls outside of the green zone, a note will appear here to document cause and recommended course of action, including targeted date for next review.

Risk management can identify zones of governance, magnitudes of risk (and their impact on total portfolio returns) and helps us to focus on the important vs. the urgent (the Eisenhower Principle).

Alexander the Great or Socrates's mom?





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Summary

Why view the portfolio through a risk lens?

— Optimal portfolio management involves making many decisions that exchange anticipated return for the assumption of different types of risks.

— Deciding which risks will pay requires an understanding how these risks interrelate and sum together.

— Portfolio decisions are made in isolation, without an overarching framework designed to tie them together and communicate them to stakeholders.

Viewing your portfolio through a risk lens, well-established analytical tools and the common language of widely accepted risk principles helps to:

— Better align the portfolio with your enterprise objectives

— Improve investment decision making

— Aid in governance and communication.

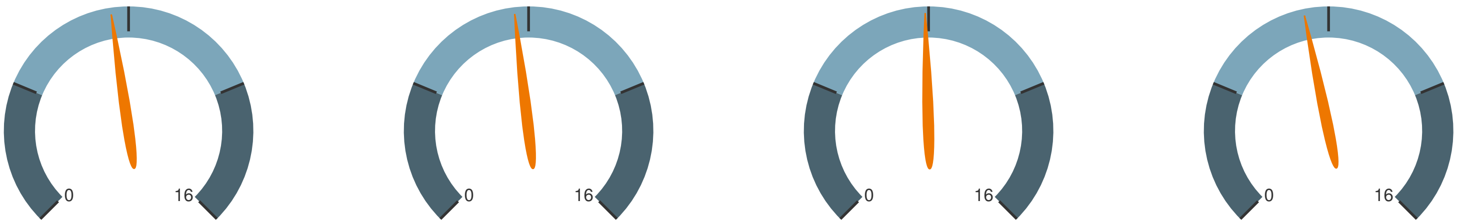
Appendix

Verus

Portfolio Risk Report

December 31, 2019

1 Portfolio risk



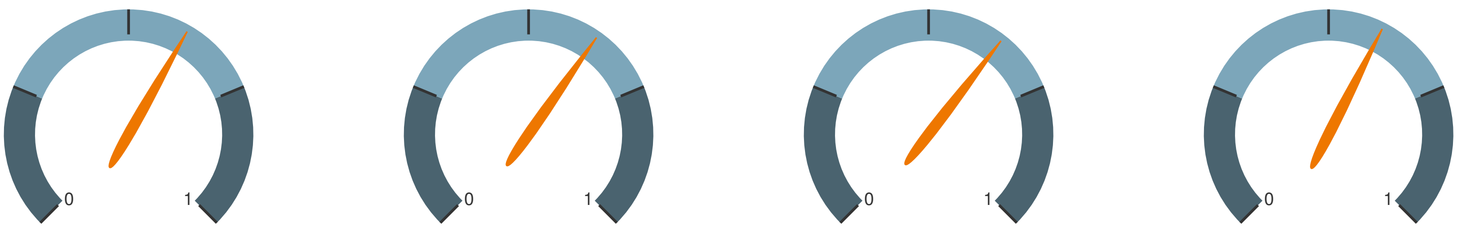
Portfolio: 7.5%

Policy: 7.6%

Average Public Pension: 7.9%

Global 60/40: 7.3%

2 Portfolio equity beta



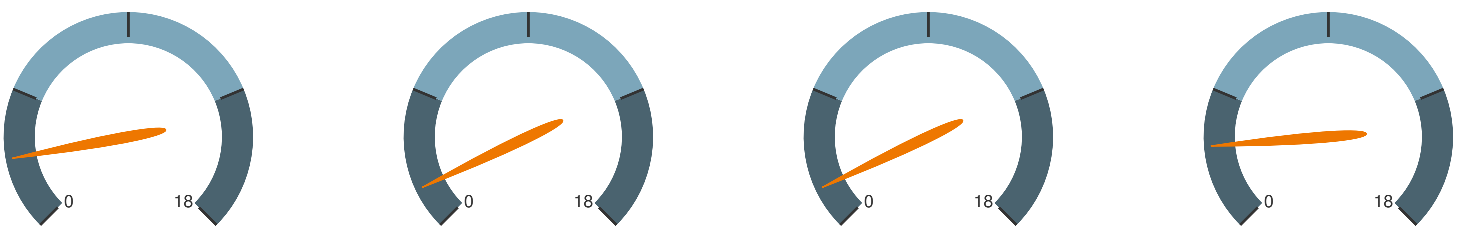
Portfolio: 0.61

Policy: 0.63

Average Public Pension: 0.64

Global 60/40: 0.60

3 Portfolio interest rate risk - Duration



Portfolio: 2.3

Policy: 1.3

Average Public Pension: 1.3

Global 60/40: 2.7

4 Portfolio credit risk - Spread duration

Portfolio: 0.8

Policy: 0.8

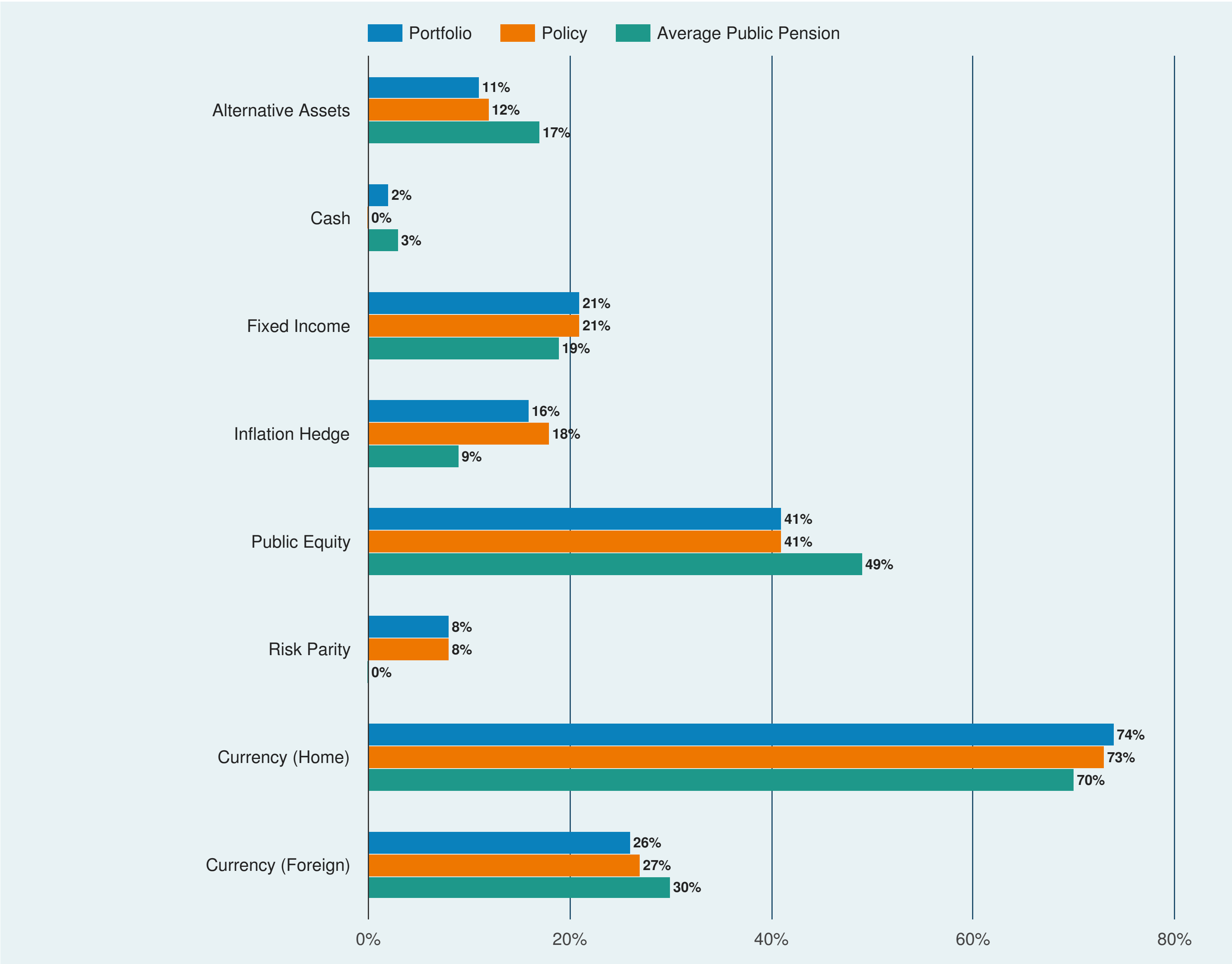
Average Public Pension: 0.7

Global 60/40: 1.1

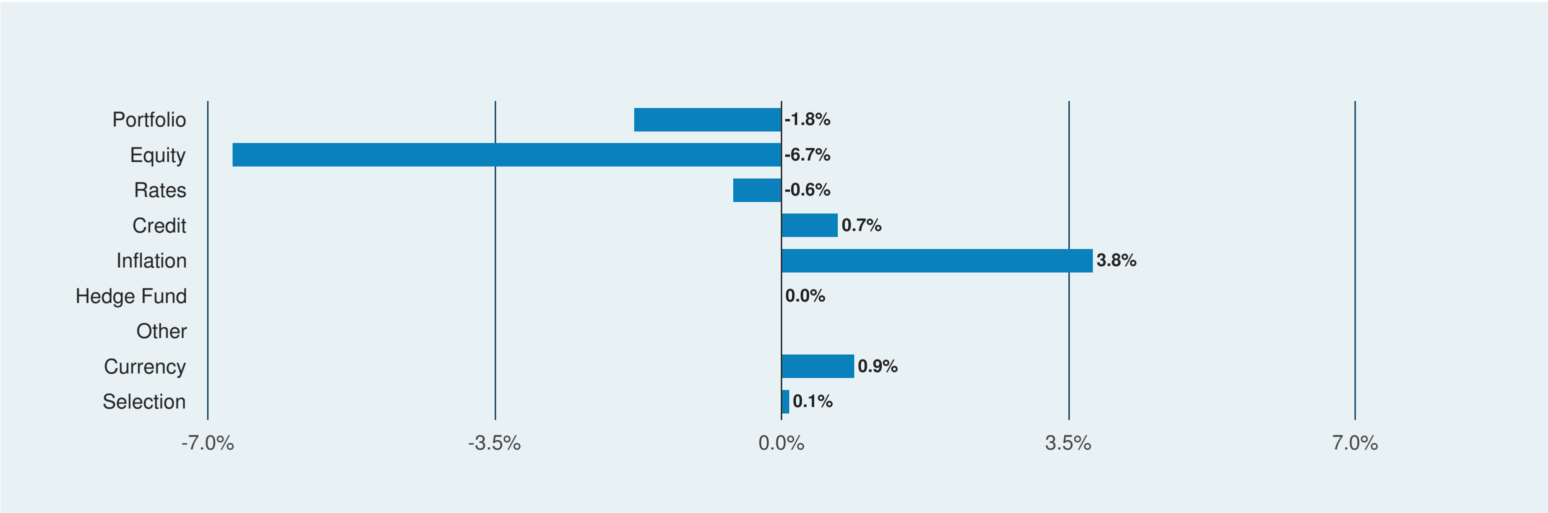
5 Exposure allocation by asset class

		Portfolio	Policy	Average Public Pension
Alternative Assets	Absolute Return	4.9%	6.0%	7.0%
	Private Equity	6.1%	6.0%	10.1%
Alternative Assets Total		**11.0%**	**12.0%**	**17.1%**
Cash	Cash	2.1%		2.9%
Cash Total		**2.1%**		**2.9%**
Fixed Income	Private Credit	1.9%		
	Opportunistic Credit	5.6%	7.0%	2.2%
	Core Fixed	13.7%	14.0%	16.7%
Fixed Income Total		**21.2%**	**21.0%**	**18.9%**
Inflation Hedge	TIPS	0.0%	2.0%	
	Private Real Assets	1.8%	2.0%	1.0%
	Public Real Assets	6.7%	6.0%	
	Real Estate	7.8%	8.0%	8.4%
Inflation Hedge Total		**16.4%**	**18.0%**	**9.4%**
Public Equity	Small Cap Equity	1.9%	2.0%	
	Emerging Markets	1.9%	2.0%	4.7%
	Developed International	16.7%	17.0%	20.0%
	Large Cap Equity	20.5%	20.0%	24.3%
Public Equity Total		**41.0%**	**41.0%**	**49.0%**
Risk Parity	Risk Parity	8.3%	8.0%	
Risk Parity Total		**8.3%**	**8.0%**	
Total Portfolio		**100%**	**100%**	**100%**

6 Exposure allocation

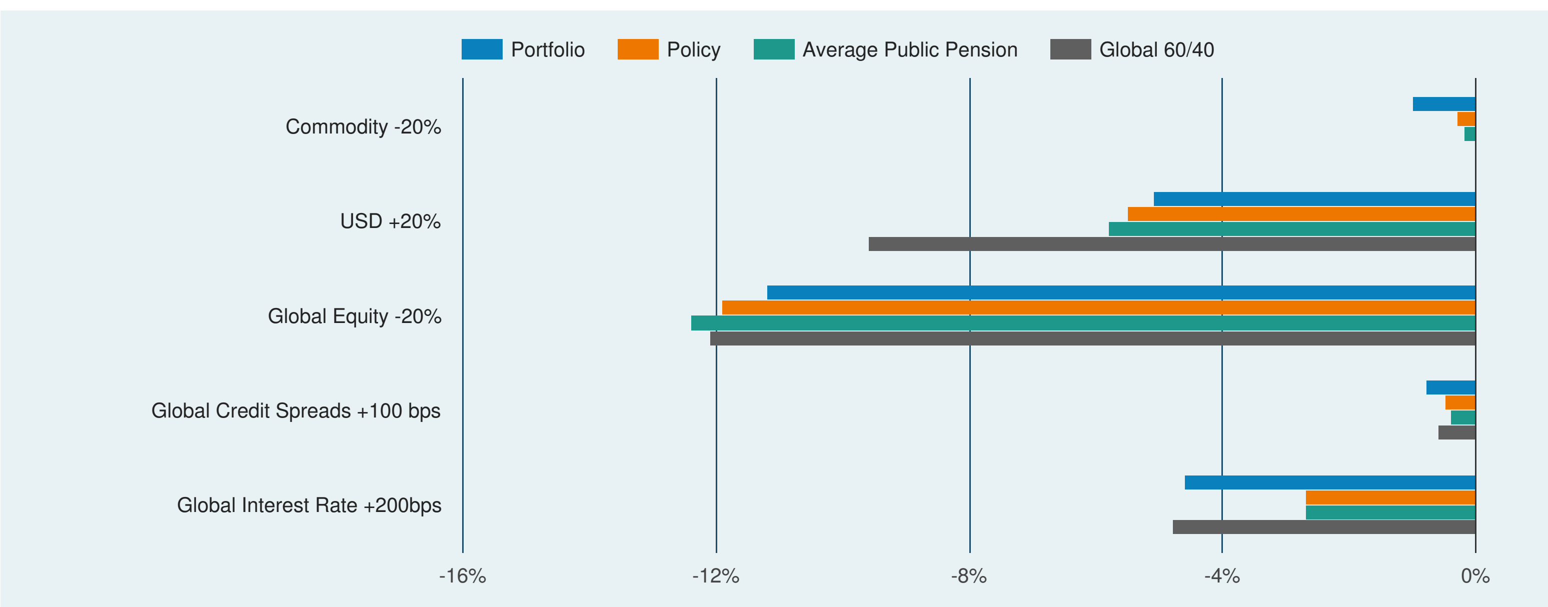


9 Risk factor weight relative to target

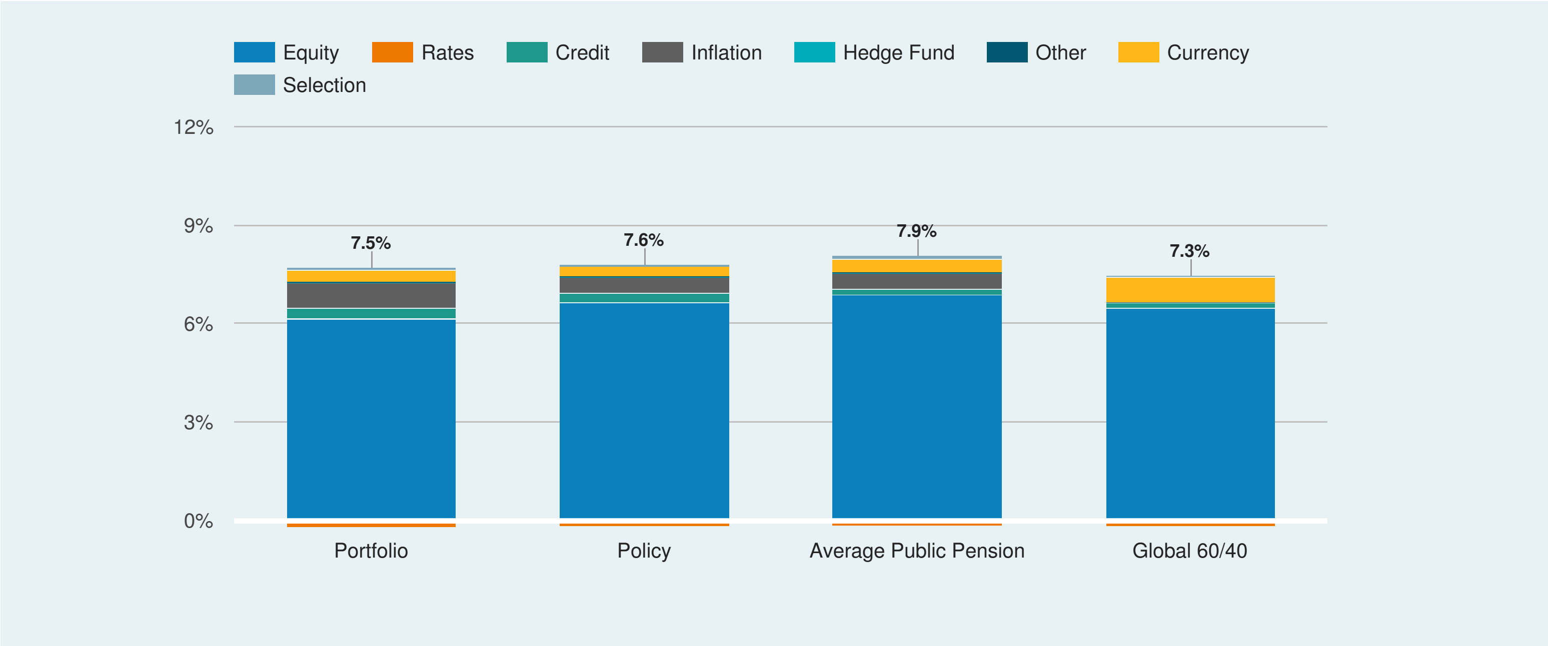


10 Tail risk - Scenario analysis

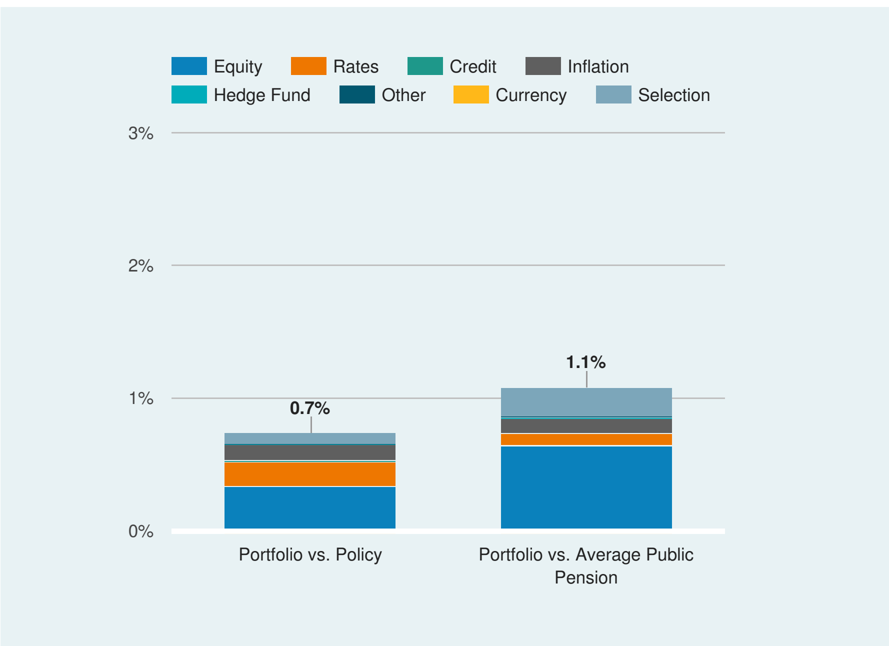
11 Tail risk - Stress tests



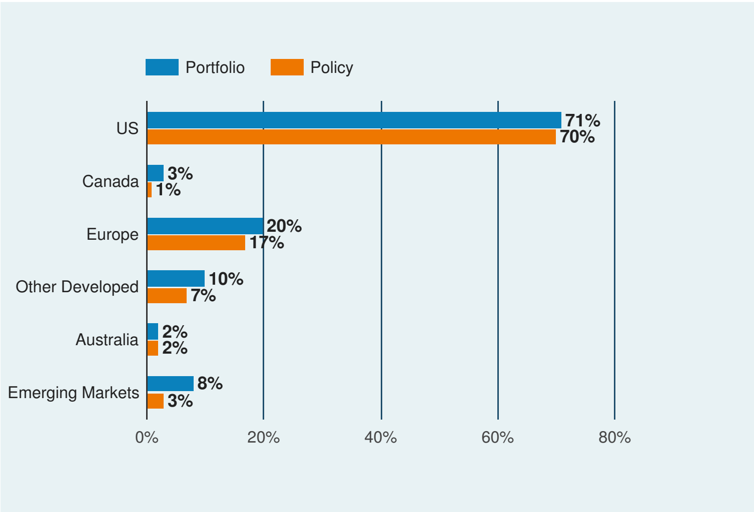
12 Risk contribution by risk factor



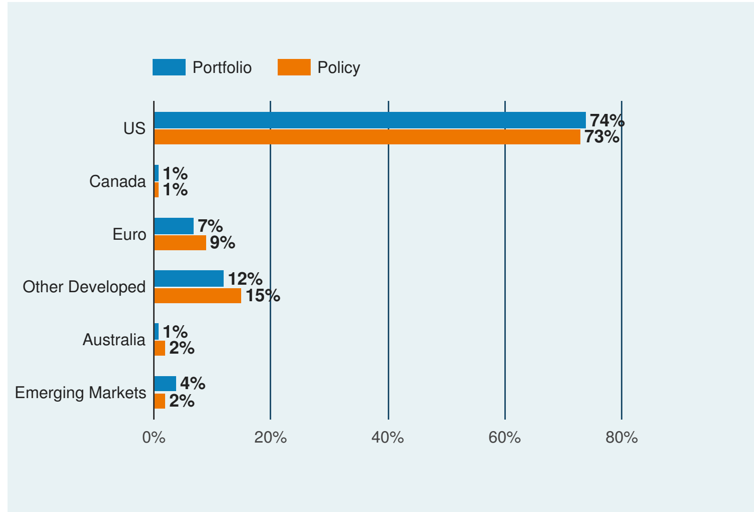
13 Active risk contribution by risk factor



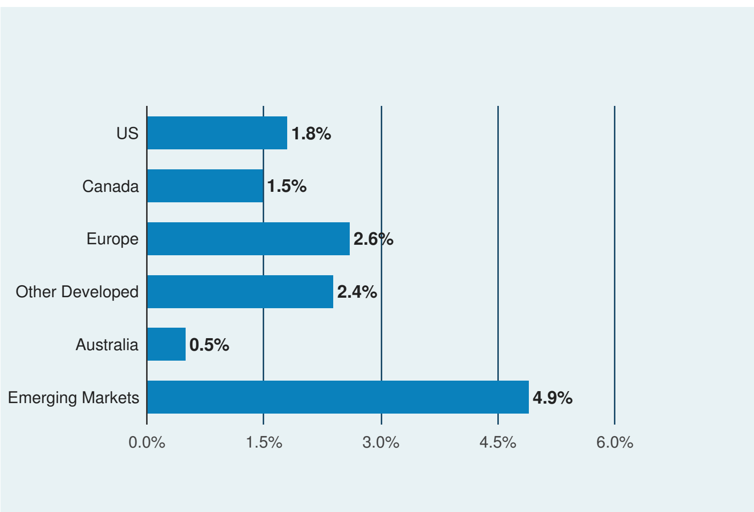
14 Geographic exposure



15 Currency exposure



16 Net geographic exposure



17 Net currency exposure

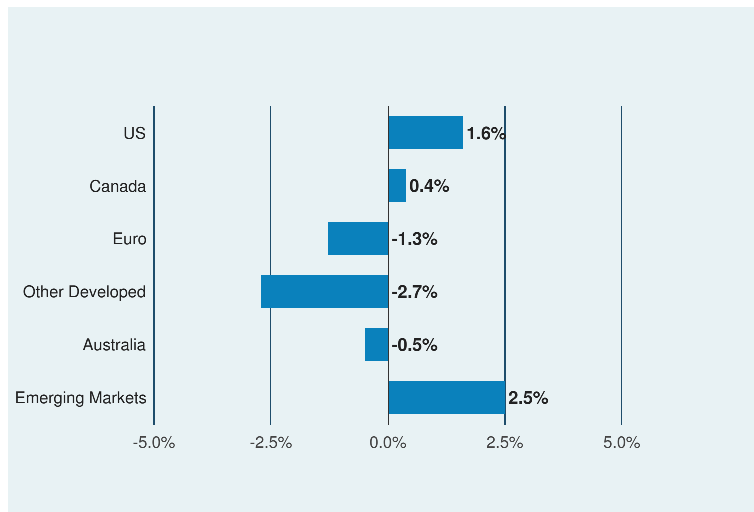


Chart Definitions

1 **Portfolio risk**
Total risk comparison of Portfolio, Policy, and Peer Group. Policy is composed of: 2.0% MSCI Emerging Markets, 7.0% Bloomberg Barclays U.S. Corporate High Yield, 14.0% Bloomberg Barclays Aggregate Index, 2.0% Custom Real Asset Index, 6.0% Custom Real Asset Index, 8.0% NCREIF ODCE, 17.0% MSCI EAFE, 6.0% HFRI FOF Diversified Index, 7.0% Private Equity, 3.2% Bloomberg Barclays Global Aggregate, 4.8% MSCI World, 18.0% Russell 1000 Index, 2.0% Bloomberg Barclays U.S. Treasury: U.S. TIPS, and 3.0% Russell 2000 Index. Average Public Pension consists of: 26.0% S&P 500 Index, 4.0% MSCI ACWI IMI, 16.6% MSCI ACWI ex USA IMI, 2.6% MSCI EAFE, 3.5% MSCI EM, 1.5% Bloomberg Barclays Global Aggregate, 2.0% Bloomberg Barclays Global Treasury ex US, 17.1% Bloomberg Barclays U.S. Aggregate, 1.3% Bloomberg Barclays Emerging Markets, 7.6% HFRI FOF Index, 8.3% Private Equity, 2.0% Bloomberg Commodity Index, 6.2% NCREIF Property Index, and 1.3% Barclays U.S. Treasury Bills 1-3 Months. Average Public Pension is defined as the average allocation of > $1b InvestorForce Public defined benefit plans. Global 60/40 is composed of 60% MSCI ACWI IMI and 40% Bloomberg Barclays Global Aggregate.

2 **Portfolio equity beta**
Equity risk presented by equity beta to market. Equity beta is a measure describing the sensitivity of portfolio returns with returns of the equity market (MSCI ACWI).

3 **Portfolio interest rate risk - Duration**
Interest rate risk presented by duration and dollar movement of portfolios. Duration of a financial asset that consists of fixed cash flows is the weighted average of the times until those fixed cash flows are received (measured in years). It also measures the percentage change in price for a given change in yields (the price sensitivity to yield). DV01 $ (dollar duration) is the change in price in dollars of a financial instrument resulting from a one basis point change in yield.

4 **Portfolio credit risk - Spread duration**
Credit risk presented by spread duration and dollar movement of portfolios. Spread duration measures the percentage change in price for a one percentage point change in spreads.

5 **Exposure allocation by asset class**
Actual exposures to various asset classes and sub-asset classes are as allocated in investment policy and are compared vs a reference benchmark. Assignment to sub-asset classes is at the custodial account level according to manager mandate.

6 **Exposure allocation**
Exposure allocation among major risk buckets (rates, credit, equity, inflation, currency) and net currency exposure (domestic vs. foreign). Full Cash collateral is assumed for all derivatives.

7 **Relative risk vs target by bucket**
Comparative riskiness of Portfolio vs. Target on total portfolio and risk bucket levels: For example, equity bucket relative risk compares the riskiness of the Portfolio equity bucket vs the Target equity bucket.

8 **Relative risk vs target by risk factor**
Disregarding any specific asset class mandates and having a look through on the portfolio decomposing risk in respective risk factor contributions, this measure looks at the relative risk contributions specific factors of the portfolio vs. the reference benchmark. Formula: (factor risk contribution within portfolio / factor risk contribution within reference benchmark) - 1. "Other" includes Country factors and World factors.

9 **Risk factor weight relative to target**
Contribution by factor to total relative risk of the Portfolio vs the Policy: For example, Equity is equity risk contribution to Portfolio minus equity risk contribution to the Policy, divided by total risk of the Policy. The factor overweights are additive to the total relative risk at the top line. "Other" includes Country factors and World factors.

10 **Tail risk - Scenario analysis**
Tail risk is a form of risk measurement that considers the possibility that a market will experience losses greater than what the normal distribution would suggest. This graph shows the expected performance under various historical scenarios (described in the appendix at the end of this report). For each historical scenario, the current market value is recalculated to determine return under identical market conditions, assuming an instantaneous shock.

11 **Tail risk - Stress tests**
This display shows expected performance when individual risk factors are subjected to instantaneous shocks. Directly affected assets are revalued at factor level.

12 **Risk contribution by risk factor**
Risk contribution by risk factor. Volatility measures the price variation of a portfolio or financial instrument over time.

13 **Active risk contribution by risk factor**
Active risk in terms of annual tracking error: Tracking Error (TE) measures how closely a portfolio follows its benchmark. It is the standard deviation of the difference between the portfolio and benchmark returns.

14 **Geographic exposure**
Geographic exposures are calculated using the notional exposure as a percentage of market value, including derivatives, cash securities and currency holdings, but excluding currency derivatives. Any portfolio that uses derivatives may have a total different than 100% because both cash and derivative country exposures are included.

15 **Currency exposure**
Currency portfolio allocation. Currency exposures from both the underlying securities and the purchasing currency of the futures contract are included.

16 **Net geographic exposure**
Difference between portfolio and policy allocation among major geographic areas.

17 **Net currency exposure**
Difference between portfolio and policy allocation among major currencies.

18 **Market value summary per BarraOne**
Market Value is presented by account and risk bucket in dollars as reported by BarraOne. Some differences may exist due to timing, pricing sources and availability of information on new investments.

18 **Interest rate bucket**
Coupon yield (nominal yield) of a fixed income security is a fixed percentage of the par value that does not vary with the market price of the security. Yield to Maturity (YTM) is the interest rate of return earned by an investor who buys a fixed-interest security today at the market price and holds it until maturity. Ratings indicate credit quality of a security and the issuer's ability to make payments of interest and principal.

19 **Rates bucket - Geographic exposure**
Geographic exposures specific to the Rates bucket are calculated using the notional exposure as a percentage of market value, including derivatives, cash securities and currency holdings, but excluding currency derivatives. Any portfolio that uses derivatives may have a total different than 100% because both cash and derivative country exposures are included.

20 **Rates bucket - Currency exposure**
Currency allocation of interest rate instruments.

21 **Rates bucket - Security type**
Allocation of interest rate instruments among different security types.

22 **Credit bucket**
Various characteristics of credit instruments.

23 **Credit bucket - Geographic exposure**
Geographic exposures specific to the Credit bucket are calculated using the notional exposure as a percentage of market value, including derivatives, cash securities and currency holdings, but excluding currency derivatives. Any portfolio that uses derivatives may have a total different than 100% because both cash and derivative country exposures are included.

24 **Credit bucket - Currency exposure**
Currency allocation of credit instruments.

25 **Credit bucket - Security type**
Allocation of credit instruments among different security types.

26 **Inflation bucket**
Composition of inflation hedging instruments in portfolio and benchmark. Notional duration of real rates instruments is also included.

27 **Inflation bucket - Geographic exposure**
Geographic exposures specific to the Inflation bucket are calculated using the notional exposure as a percentage of market value, including derivatives, cash securities and currency holdings, but excluding currency derivatives. Any portfolio that uses derivatives may have a total different than 100% because both cash and derivative country exposures are included.

28 **Inflation bucket - Currency exposure**
Currency allocation of inflation instruments.

29 **Inflation bucket - Security type**
Allocation of inflation instruments among different security types.

30 **Equity bucket**
P/E ratio is a valuation ratio of a company's current share price compared to its per-share earnings. Beta measures sensitivity to Global Equities.

31 **Equity bucket - Geographic exposure**
Geographic exposures specific to the Equity bucket are calculated using the notional exposure as a percentage of market value, including derivatives, cash securities and currency holdings, but excluding currency derivatives. Any portfolio that uses derivatives may have a total different than 100% because both cash and derivative country exposures are included.

32 **Equity bucket - Currency exposure**
Currency allocation of equity assets.

33 **Equity bucket - Security type**
Allocation of equity assets among different security types.

Tail Risk Scenario Definitions

1 **2007-2009 Subprime and Credit Crisis**
(9/30/2007 - 3/4/2009) The burst of the housing bubble in mid-2007 marked the beginning of the years-long subprime mortgage crisis, rooted from the easy credit, low interest rates, and loose regulatory environment in the early 2000s, which made low quality (subprime) mortgaging extremely easy. The contagious meltdown quickly led to plunging asset prices in the financial markets, rising bankruptcies, delinquencies, and foreclosures, and central bank monetary rescues and fiscal interventions by governments around the globe.

2 **2006 Emerging Market Crash**
(5/10/2006 - 6/14/2006) A number of emerging markets, including Brazil, India, and Argentina, plunged rapidly in May 2006.

3 **2001 Sept 11**
(9/7/2001 - 9/21/2001) The U.S. stock market was closed for a week upon a series of coordinated suicide attacks upon the United States on September 11, 2001. It plunged sharply over the week upon reopening.

4 **2000-2003 Tech Crash & Recession**
(1/19/2000 - 3/12/2003) Period of crisis and slowdown for technological firms due to a rapid jump in stock prices when a speculative technology bubble began to burst, triggering a sell-off of companies. The period includes a slowdown for internet companies that went out of business as the stock market plummeted further.

5 **1994 US Rate Hike**
(1/31/1994 - 12/13/1994) In combating inflation, the U.S. Federal Reserve raised its interest rate from 3.25% in February to 5.5% in November 1994.

6 **1989-1990 Nikkei Stock Price Correction**
(12/29/1989 - 3/30/1990) After hitting the Nikkei stock index's all-time high on December 29, 1989, the Japan financial market crashed and plunged to a low in March 1990.

7 **1987 Market Crash (Aug. to Nov.)**
(8/3/1987 - 11/30/1987) The U.S. stock market began to topple on October 14, 1987 after reaching a record high. It was triggered by reports of a larger trade deficit and the elimination of the tax benefits of financing mergers. The aggravating selling pressure in October 19 from confused and fearful investors and the failing portfolio insurers' models led to a substantial global market sell-off.

August 2020

Semi-Annual Real Estate Performance Measurement Report

Callan

PUBLIC VERSION

Avery Robinson, CAIA
Senior Vice President

Alameda County Employees' Retirement Association
Performance Measurement Report Summary

Portfolio Measurement Presentation

This is the Performance Measurement Report presentation for the Alameda County Employees' Retirement Association ("ACERA") Real Estate Portfolio ("Portfolio") Quarter ending March 31, 2020 ("Quarter").

Funding Status as of March 31, 2020

	($) Millions	(%)
ACERA Plan Assets	7,418.829	100.00%
Real Estate Target[1]	593.506	8.00%
Plan's Real Estate Market Value	607.429	8.19%
Net Unfunded Commitments	83.143	1.12%
RE Market Value & Unfunded Commitments	690.516	9.31%
Remaining Allocation	-13.922	(0.19%)

	Target	Funded	Funded & Committed
Core	70.00%	72.49%	61.48%
Non-Core	30.00%	27.51%	38.52%

Real Estate Market Update – COVID-19

Prior to the COVID-19 pandemic, the overall real estate market was relatively healthy from a fundamental standpoint, albeit there were indications of the market being late in the cycle. Positive indicators included strong occupancy, upward rent growth and steady transaction volumes. While moderating total returns and the flattening of property value appreciation, particularly in the retail sector, was causing some cautiousness among investors.

While the impact of the pandemic on real estate will continue to playout over time, it is clear that all property types have and will be negatively impacted by the crisis to varying degrees. The market consensus suggest that retail properties will be the most negatively impacted out of the four main property types. This will be followed by office and industrial, with apartments remaining the most resilient. This perspective is has been supported by April and May rent collection figures, with retail by far the lowest and apartments the strongest.

Given the U.S. stay-at-home measures began in mid to late March, the impact of COVID-19 on 1Q returns was limited, with the private market benchmark still delivering a positive 1.0% return. 2Q20 core real estate returns were approximately -1.6%, which is stronger than many expectations. This suggests additional value declines may be still to come.

Although the transactions market slowed dramatically, the crisis will eventually bring about some buying for manager poised to take advantage.

COVID-19 Impact Heat Map

Real Estate Assets

Implementation Issues	Low	Moderate	High
High	Industrial development Apartment development	Workforce housing Senior housing Mezzanine, preferred equity, participating loans	Re-development/re-leasing malls Recapitalizations/rescue capital Certain types of development
Moderate	Urban class A/B apartments	Real estate re-leasing strategies Low LTV real estate loans	Real estate owned by distressed/non-strategic owners Non-mall retail Hotels Mezzanine lending Broad opportunistic real estate strategies Co-working office
Low	E-commerce linked industrial Medical/life science office	Self-storage Class B/C suburban apartments Multi-tenant office	Mispriced publicly traded real estate, both equity and debt

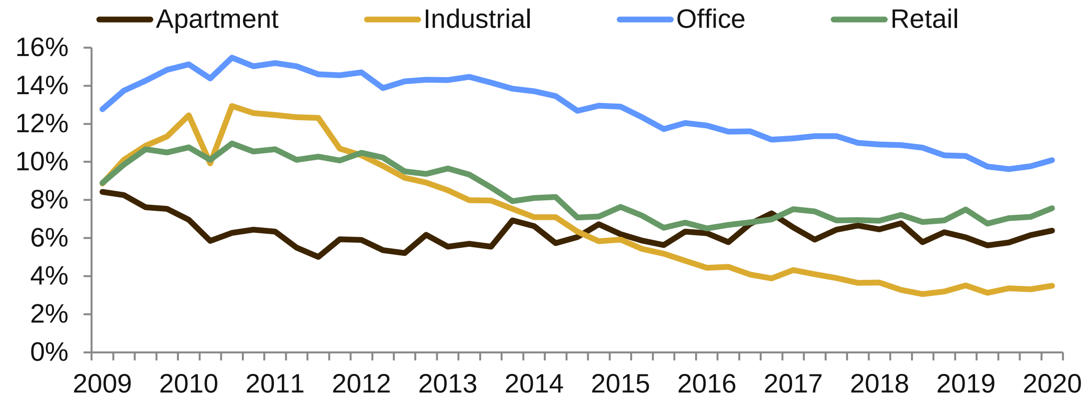
Level

– As the pandemic continues, real estate distress will spread with more severe impact causing a rightward shift on the chart and more opportunities.

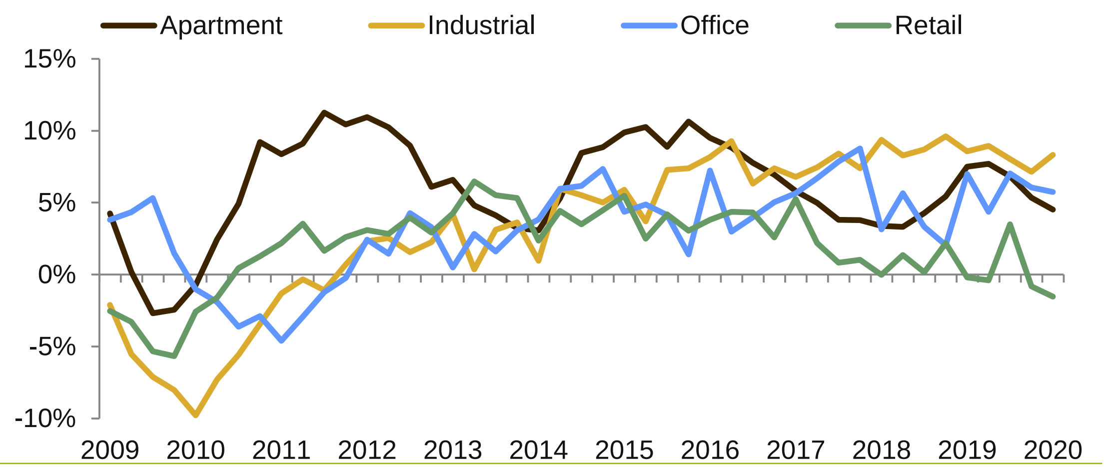
U.S. Private Real Estate Market Trends

- U.S. real estate fundamentals
  - Vacancy rates for all property types are or will be impacted.
  - Limited change in net operating income but the second quarter will show declines.
  - April/May rent collections show malls severely impacted followed by other types of retail. Class A/B urban apartments are relatively strong, followed by certain types of Industrial and Office.
  - Supply was in check prior to the pandemic.
  - Construction is limited to finishing up existing projects but has been hampered by shelter in place and material shortages.
  - New construction will be basically halted in future quarters except for pre-leased properties.

Vacancy by Property Type



4-Quarter Rolling NOI Growth by Property Type



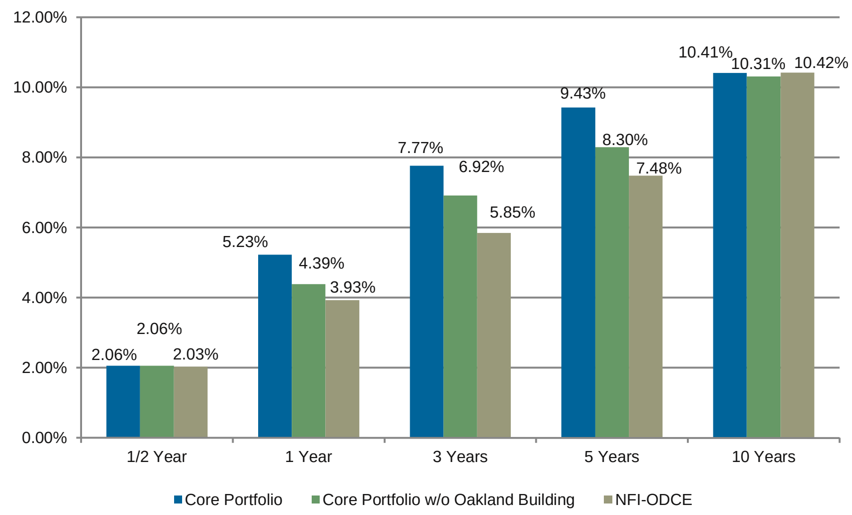
- Source: NCREIF

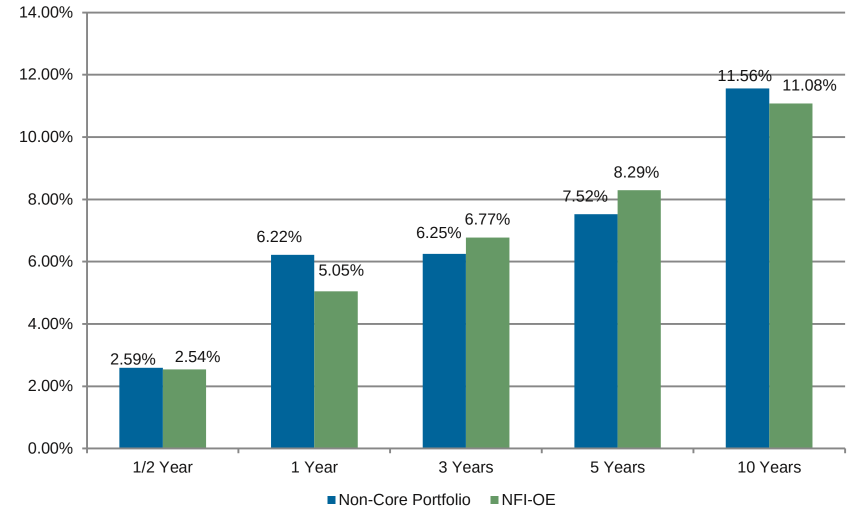
Portfolio Net Returns

For Period Ended March 31, 2020

Portfolio Returns by Style

For Period Ended March 31, 2020

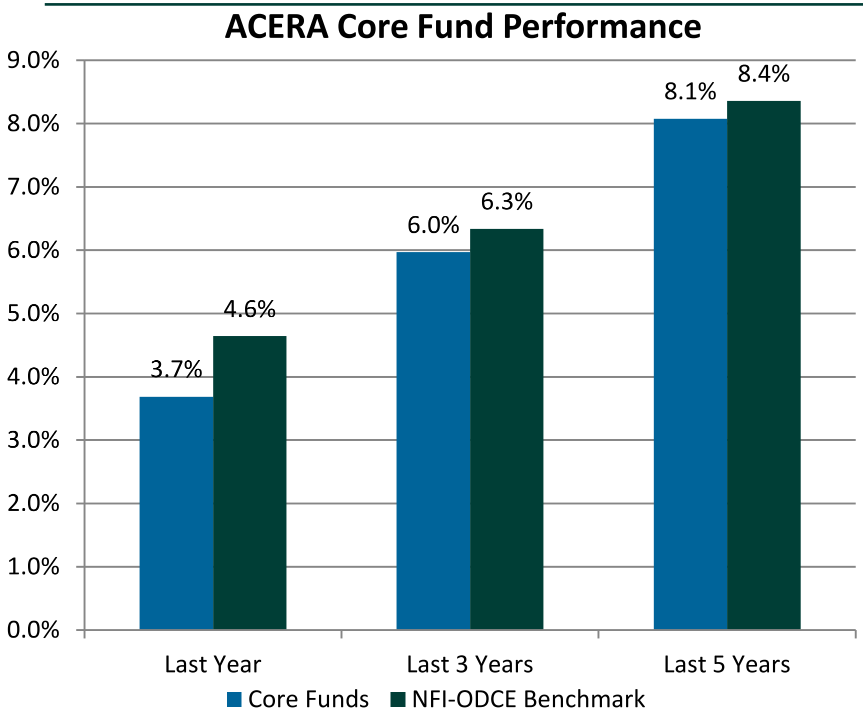


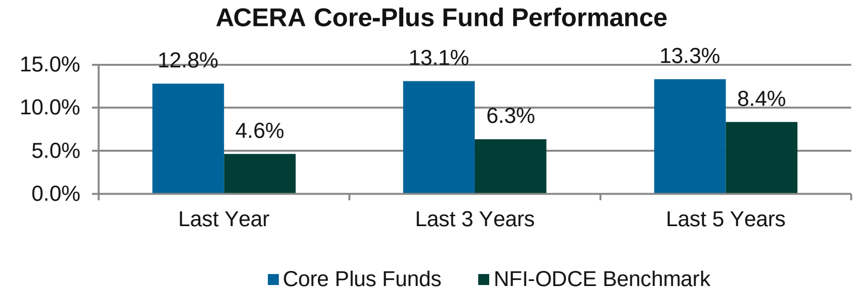


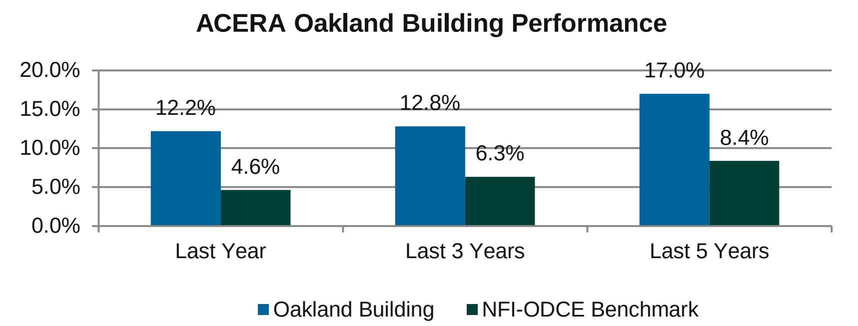
Net Portfolio w/o Oakland Building	½ Year	1 Year	3 Years	5 Years	10 Years
Core Portfolio w/o Oakland Building	2.06%	4.39%	6.92%	8.30%	10.31%
Non-Core Portfolio	2.59%	6.22%	6.25%	7.52%	11.56%
Total Portfolio w/o Oakland Building	**2.17%**	**4.77%**	**6.78%**	**8.12%**	**10.95%**

Net Total Portfolio	½ Year	1 Year	3 Years	5 Years	10 Years
Core Portfolio	2.42%	6.00%	7.99%	9.86%	10.39%
Non-Core Portfolio	2.59%	6.22%	6.25%	7.52%	11.56%
Total Portfolio	**2.15%**	**5.40%**	**7.47%**	**9.00%**	**10.84%**

Core Portfolio Returns – A Closer Look







ACERA's core funds have consistently underperformed the ODCE benchmark during the recent cycle. The collective underperformance has grown larger recently, underperforming the benchmark by 24% during the past year. Last year's underperformance equaled $2.7 million in unachieved value to ACERA.

This is despite ACERA's five core funds representing over 40% of the ODCE Index market value.

If it were not for the enormous outperformance from the other components of the core portfolio as illustrated, the core portfolio as a whole would have underperformed its benchmark, as well as the entire real estate program.

Manager selection and allocation weightings is the source of the core fund underperformance.

ACERA Core Fund Exposure Considerations

ACERA has two feasible options to address the core fund underperformance:

1. Seek to replace the underperforming managers with other competitor core funds
2. Increase the diversification of the core fund portfolio by investing in additional core funds and rebalancing the positions of the exiting funds, thusly pursuing a index-like market weighted approach that will mirror the benchmark and reducing the risk profile of the portfolio

Callan recommends that ACREA pursue the market weighted approach for the following reasons

– The core fund exposure should serve a beta role within the real estate portfolio, which it is currently not providing given its wide variance from the index return.

– Given the changes within the core index constituents and the underlying shifts in core real estate as a whole, it has become increasingly challenging to achieve and maintain truly diversified exposure through investments with a limited number of funds.

– The number of funds in the ODCE has increased by 78% during the past eight years alone.

– Consistent outperformance amongst the core managers has become increasingly rare, with the timing and weighting of an investment becoming more important. For example, three of the five core fund managers for ACERA have significantly underperformed the index since ACERA began investing in those products. However, all three of those funds were outperformers at the time right before ACERA made initial investments, indicating they were attractive selections at the time.

– This approach will provide exposure to smaller, nibble managers who have been outperforming recently and will further the diversification of the portfolio.

– It is unreasonable to believe the core-plus and Oakland Building will continue to sustain the level of outperformance endured during the past cycle offsetting the underperformance of the core funds.

– ACERA successfully utilizes index approaches in other asset classes.

Performance Drivers and Detractors by Style

Core Portfolio (Excluding Oakland Building)

– The ACERA Core Portfolio outperformed the NFI-ODCE Value Weight Index (Net) by 3 bps for the half year ending 03/31/2020. The core portfolio has outperformed the benchmark over the last year, last 3 years, and last 5 years.

– The Lion Industrial Trust was the strongest performer.

– The J.P. Morgan Strategic Property Fund and PRISA SA were also strong performers.

– Heitman HART, Jamestown Premier Property Fund, and the UBS Trumbull Property Fund were all detractors from performance.

Non-Core Portfolio

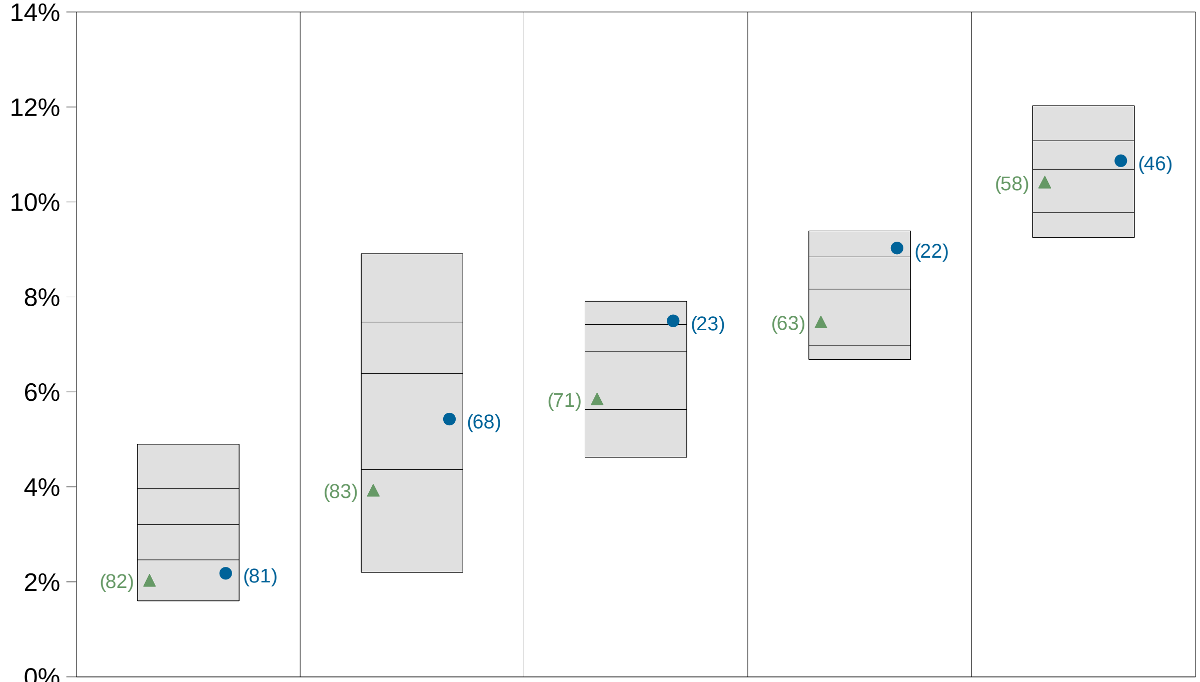
– The Non-Core Portfolio outperformed the NFI-OE Value Weight Index (Net) for the half year ending 03/31/2020.

– PRISA III and AEW Partners VIII performed the best over the ½ year.

Performance vs. Peer Group

For Period Ended March 31, 2020

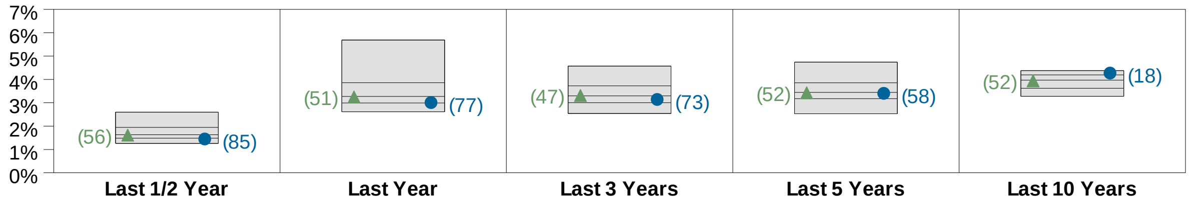
Performance vs Callan Open End Core Cmmingled Real Est



	Last 1/2 Year	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	4.90	8.91	7.91	9.39	12.03
25th Percentile	3.96	7.47	7.42	8.84	11.29
Median	3.21	6.39	6.84	8.16	10.69
75th Percentile	2.46	4.37	5.63	6.98	9.78
90th Percentile	1.60	2.20	4.63	6.68	9.25
ACERA Total RE Portfolio ●	2.15	5.40	7.47	9.00	10.84
NCREIF NFI-ODCE Val Wt Nt ▲	2.03	3.93	5.85	7.48	10.42

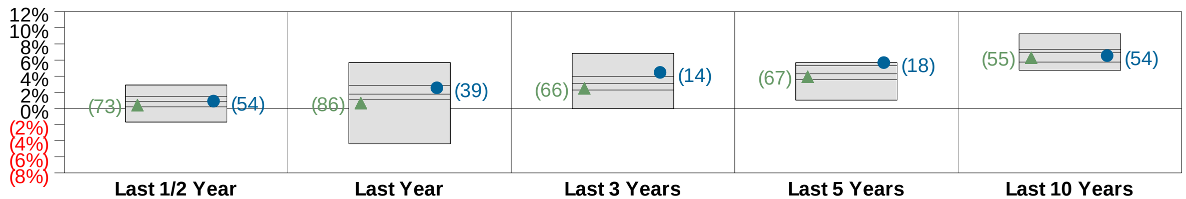
Performance vs. Peer Group

Income Rankings vs Callan OE Core Cmngld RE
Periods ended March 31, 2020



	Last 1/2 Year	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	2.60	5.69	4.57	4.74	4.38
25th Percentile	1.94	3.86	3.72	3.85	4.20
Median	1.63	3.27	3.29	3.44	3.97
75th Percentile	1.49	2.99	3.00	3.17	3.62
90th Percentile	1.26	2.62	2.54	2.53	3.28
ACERA Total RE Portfolio ●	1.39	2.95	3.08	3.34	4.22
NCREIF NFI-ODCE Val Wt Nt ▲	1.61	3.25	3.31	3.43	3.94

Appreciation Rankings vs Callan OE Core Cmngld RE
Periods ended March 31, 2020

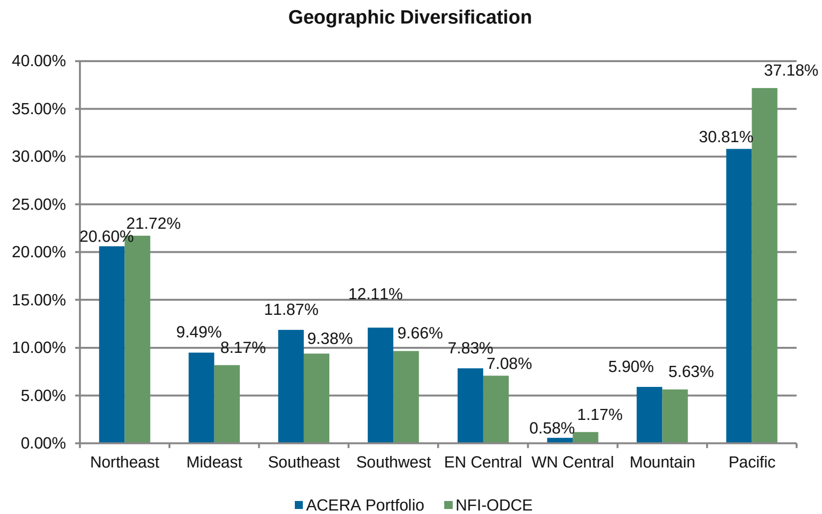


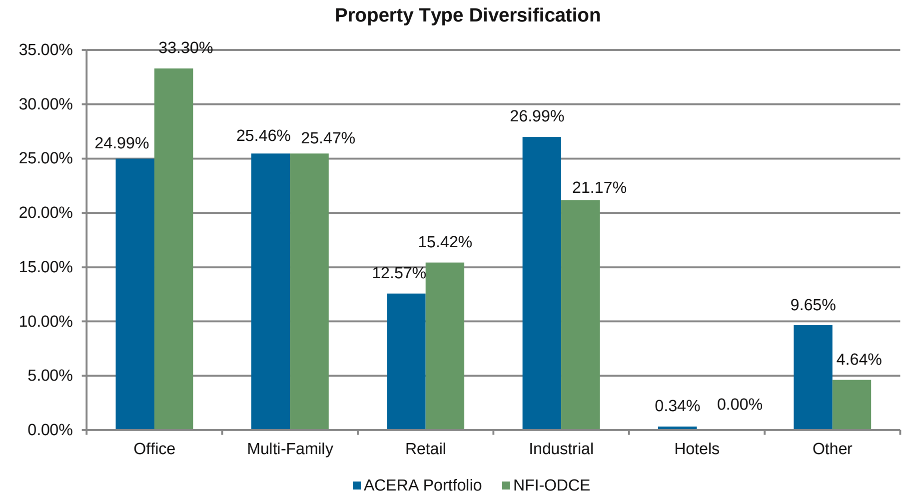
	Last 1/2 Year	Last Year	Last 3 Years	Last 5 Years	Last 10 Years
10th Percentile	2.91	5.71	6.84	5.68	9.26
25th Percentile	1.49	2.85	3.96	5.29	7.32
Median	0.89	1.77	3.09	4.30	6.91
75th Percentile	0.20	1.06	2.29	3.56	5.76
90th Percentile	(1.70)	(4.38)	(0.04)	1.04	4.73
ACERA Total RE Portfolio ●	0.75	2.40	4.29	5.52	6.39
NCREIF NFI-ODCE Val Wt Nt ▲	0.42	0.66	2.49	3.95	6.29

Diversification & Debt

Diversification – Total Portfolio (excluding Oakland Building)

– The ACERA Portfolio is well diversified by both property type and region.





Debt Compliance

– The ACERA Strategic Plan limits leverage to 40.0% at the Portfolio level. As of March 31, 2020, the loan-to-value ("LTV") ratio of the Portfolio was 27.51%.

ACERA Real Estate Portfolio Snapshot – 1Q2020

Portfolio Composition ($)

Total Plan Assets	Target Allocation		Market Value		Commitments		Remaining Allocations	
$7,418,829,530	$593,506,349	8.00%	$607,428,802	8.19%	$83,143,180	1.12%	$-13,922,453	(0.19%)

Performance Summary	Last Quarter		Last Year		Last 3 Years		Last 5 Years		Last 10 Years	
	TGRS	TNET	TGRS	TNET	TGRS	TNET	TGRS	TNET	TGRS	TNET
Total Fund	0.94%	0.66%	6.57%	5.40%	8.67%	7.47%	10.14%	9.00%	11.94%	10.84%
NCREIF NFI-ODCE Val Wt Nt	0.75%	0.75%	3.93%	3.93%	5.85%	5.85%	7.48%	7.48%	10.42%	10.42%

Funding Status ($)	Investment Vintage Year	Original Commitment Amount	Funded Amount	Unfunded Amount	Capital Returned	Market Value	Market Value (%)
Total Portfolio		**$547,636,048**	**$464,492,868**	**$83,143,180**	**$171,967,393**	**$607,373,037**	**100%**

- Unfunded amounts shown for AEW Partners VIII and Artemis REP Healthcare include of $827,602 and $5,059,716 of distributions of recallable capital, respectively.
- CIM Commercial Trust and Heitman Value Partners II are nearly fully liquidated, and are excluded from the funding status table.

Definitions

Performance

Capitalization rate: Commonly known as cap rate, is a rate that helps in evaluating a real estate investment. Cap rate = Net operating income / Current market value (Sale price) of the asset.

Net operating income: Commonly known as NOI, is the annual income generated by an income-producing property, taking into account all income collected from operations, and deducting all expenses incurred from operations.

Real Estate Appraisal: The act of estimating the value of a property. A real estate appraisal may take into account the quality of the property, values of surrounding properties, and market conditions in the area.

Income Return ("INC"): Net operating income net of debt service before deduction of capital items (e.g., roof replacement, renovations, etc.)

Appreciation Return ("APP"): Increase or decrease in an investment's value based on internal or third party appraisal, recognition of capital expenditures which did not add value, uncollectible accrued income, or realized gain or loss from sales.

Total Gross Return ("TGRS"): The sum of the income return and appreciation return before adjusting for fees paid to and/or accrued by the manager.

Total Net Return ("TNET"): Total gross return less Advisor fees reported. All fees are requested (asset management, accrued incentives, paid incentives). No fee data is verified. May not include any fees paid directly by the investor as opposed to those paid from cash flows.

Inception Returns: The total net return for an investment or portfolio over the period of time the client has had funds invested. Total portfolio Inception Returns may include returns from investments no longer held in the current portfolio.

Net IRR: IRR after advisory fees, incentive, and promote. This includes actual cash flows and a reversion representing the LP Net Assets at market value as of the period end reporting date.

Equity Multiple: The ratio of Total Value to Paid-in-Capital (TVPIC). It represents the Total Return of the investment to the original investment not taking into consideration the time invested. Total Value is computed by adding the Residual Value and Distributions. It is calculated net of all investment advisory and incentive fees and promote.

Definitions

Style Groups

The Style Groups consist of returns from commingled funds with similar risk/return investment strategies. Investor portfolios/investments are compared to comparable style groupings.

Core: Direct investments in operating, fully leased, office, retail, industrial, or multifamily properties using little or no leverage (normally less than 30%).

Value-Added: Core returning investments that take on moderate additional risk from one or more of the following sources: leasing, re-development, exposure to non-traditional property types, the use of leverage.

Opportunistic: Investments that take on additional risk in order to achieve a higher return. Typical sources of risks are: development, land investing, operating company investing, international exposure, high leverage, distressed properties.

Definitions

Indices

Stylized Index: Weights the various style group participants so as to be comparable to the investor's portfolio holdings for each period.

Open-End Diversified Core Equity Index ("ODCE"): A core index that includes only open-end diversified core strategy funds with at least 95% of their investments in U.S. markets. The ODCE is the first of the NCREIF Fund Database products, created in May 2005, and is an index of investment returns reporting on both a historical and current basis (24 active vehicles). The ODCE Index is capitalization-weighted and is reported gross and net of fees. Measurement is time-weighted and includes leverage.

NCREIF Fund Index Open-End Index ("OE"): NFI-OE is an aggregate of open-end, commingled equity real estate funds with diverse investment strategies. Funds comprising NFI-OE have varied concentrations of sector and region, core and non-core, leverage, and life cycle.

NAREIT Equity Index: This is an index of Equity Real Estate Investment Trust returns reflecting the stock value changes of REIT issues as determined through public market transactions.

Definitions

Cash Flow Statements

Beginning Market Value: Value of real estate, cash, and other holdings from prior period end.

Contributions: Cash funded to the investment for acquisition and capital items (i.e., initial investment cost or significant capital improvements).

Distributions: Actual cash returned from the investment, representing distributions of income from operations.

Withdrawals: Cash returned from the investment, representing returns of capital or net sales proceeds.

Ending Market Value: The value of an investment as determined by actual sales dollars invested and withdrawn plus the effects of appreciation and reinvestment; market value is equal to the ending cumulative balance of the cash flow statement (NAV).

Unfunded Commitments: Capital allocated to managers which has not yet been called for investment. Amounts are as reported by managers.

Remaining Allocation: The difference between the ending market value + the unfunded commitments and the target allocation. This figure represents dollars available for allocation.

NCREIF Region Map