



**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, May 5, 2021
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 Webinar ID: 838 4907 0813 Passcode: 130339 For help joining a Zoom meeting, see: https://support.zoom.us/hc/en-us/articles/201362193	GEORGE WOOD, CHAIR	ELECTED GENERAL
	JAIME GODFREY, VICE-CHAIR	APPOINTED
	DALE AMARAL	ELECTED SAFETY
	OPHELIA BASGAL	APPOINTED
	KEITH CARSON	APPOINTED
	TARRELL GAMBLE	APPOINTED
	LIZ KOPPENHAVER	ELECTED RETIRED
	HENRY LEVY	TREASURER
	DARRYL L.WALKER	ELECTED GENERAL¹
	NANCY REILLY	ALTERNATE RETIRED²
	VACANT	ALTERNATE SAFETY

¹Trustee Walker is filling the vacancy created by Trustee Rogers' retirement. See Gov't Code §§ 31524, 31520.1(b)

² 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).

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.

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

The order of agenda items is subject to change without notice. Board and Committee agendas and minutes, and all documents distributed to the Board or a Committee in connection with a public meeting (unless exempt from disclosure), are available online at www.acera.org.

INVESTMENT COMMITTEE/BOARD MEETING

NOTICE and AGENDA, Page 2 of 2 – May 5, 2021

Call to Order: 9:30 a.m.

Roll Call:

Public Input (The Chair allows public input on each agenda item at the time the item is discussed)

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

1. Discussion and Possible Motion to Recommend that the Board Adopt an up to \$40 million Investment in CBRE Strategic Partners U.S. Value 9 as part of ACERA's Real Estate Portfolio – Value Added,³ Pending Completion of Legal and Investment Due Diligence and Successful Contract Negotiations

9:30 – 10:15 Robert Perry, CBRE Strategic Partners U.S. Value 9
Diann Hsueh, CBRE Strategic Partners U.S. Value 9
Nick Rittenhouse, CBRE Strategic Partners U.S. Value 9
Avery Robinson, Callan LLC
Thomas Taylor, ACERA
Betty Tse, ACERA

2. Discussion and Possible Motion to Recommend that the Board Adopt an up to \$27 million Investment in ABRY Senior Equity VI, L.P. as part of ACERA's Private Equity Portfolio – Debt Related/Special Situations,³ Pending Completion of Legal and Investment Due Diligence and Successful Contract Negotiations

10:15 – 11:00 Jay Grossman, ABRY Partners
John Hunt, ABRY Partners
Faraz Shooshani, Verus Advisory Inc.
Clint Kuboyama, ACERA
Betty Tse, ACERA

3. Discussion and Possible Motion to Recommend that the Board Approve Changes to ACERA's Portfolio Asset Allocation

11:00 – 11:45 Joe Abdou, Verus Advisory Inc.
Marc Gesell, Verus Advisory Inc.
Margaret Jadallah, Verus Advisory Inc.
Betty Tse, ACERA

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

None

Trustee Remarks

Future Discussion Items

Establishment of Next Meeting Date

June 9, 2021 at 9:30 a.m.

³ Written materials and investment recommendations from the consultants, fund managers and ACERA Investment Staff relating to this alternative investment are exempt from public disclosure pursuant to CA Gov. Codes § 6254.26 and § 6255.

**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 and 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.

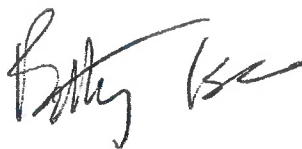


GAVIN NEWSOM
Governor of California

ATTEST:

ALEX PADILLA
Secretary of State



TO: Members of the Investment Committee
FROM: Betty Tse – Chief Investment Officer 
DATE: May 5, 2021
SUBJECT: Discussion and Possible Motion to Recommend that the Board Approve Changes to ACERA's Portfolio Asset Allocation

Recommendation:

Approve the “More Privates” Mix in the Asset Allocation Review.

Background and Discussion:

In May 2019, ACERA adopted alternative #2 in our last Asset-Liability Review with the primary long-term objective of Sustainability of the Plan – ranked as one of the top two objectives from our Long Term Enterprise Risk Tolerance (ERT) Survey conducted in the same year. Since then, the ACERA Total Fund has experienced strong performance (18.7% in 2019 and 12.5% in 2020), ushering ACERA past the exciting Total Fund milestone of \$10B in early April 2021. The Total Fund has benefited from the overall Capital Market's ascent in the named period with very low inflation. However, our asset allocation review process is forecasting increasing inflation in the intermediate and longer term. As currently allocated, higher inflation and other market factors, are expected to lower our return from the previously forecasted 6.7% to 5.5%. By comparison, the “More Privates” Mix Asset Allocation is forecasted to yield 5.8% over the next 10 years.

In keeping with the same objective of preserving Sustainability of the Plan while acknowledging that the Total Fund will be experiencing a rather low return environment in the next 10 years, Staff believes that taking on more risk or being more risk efficient to generate slightly higher return (from 5.5 to 5.8%) for the Total Fund would be an appropriate approach. Also, the “More Private” Mix will help us to meet the other top long-term objective of Preventing Deterioration of the Funded Status of the Plan which we have improved slightly upon our last review of the asset allocation in 2019. (Funding status of the Plan has improved from about 76% then to the current 77.6%).

Staff is recommending the “More Privates” Mix primarily based on our desire to steer the Total Fund to reach the top two objectives per our Long Term ERT Survey result, while potentially generating higher return. We understand that the Committee's decision making process is contingent on your preference for the risk/return balance, especially in light of the rather small percentage difference in the projected returns.

Staff also considers that a second alternative Allocation, the “ACERA Revised” Mix is a suitable option in terms of a modest increase of the 10 year projected return from 5.5. to 5.6%, while meeting multiple Long Term ERT Survey objectives including one the top two objectives, namely, the Sustainability of the Plan.

Conclusion:

Staff believes that the “More Privates” Mix is an appropriate mix in helping us to achieve our top two Long-Term ERT objectives while allowing us to potentially enhance our 10 year projected returns in a more meaningful way.

Attachment #1: Asset Allocation Review prepared by Verus



**PERSPECTIVES
THAT DRIVE
ENTERPRISE
SUCCESS**



MAY 2021

Asset Allocation Review

ACERA

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[VERUSINVESTMENTS.COM](https://verusinvestments.com)

SEATTLE 206-622-3700

LOS ANGELES 310-297-1777

SAN FRANCISCO 415-362-3484

PITTSBURGH 412-784-6678

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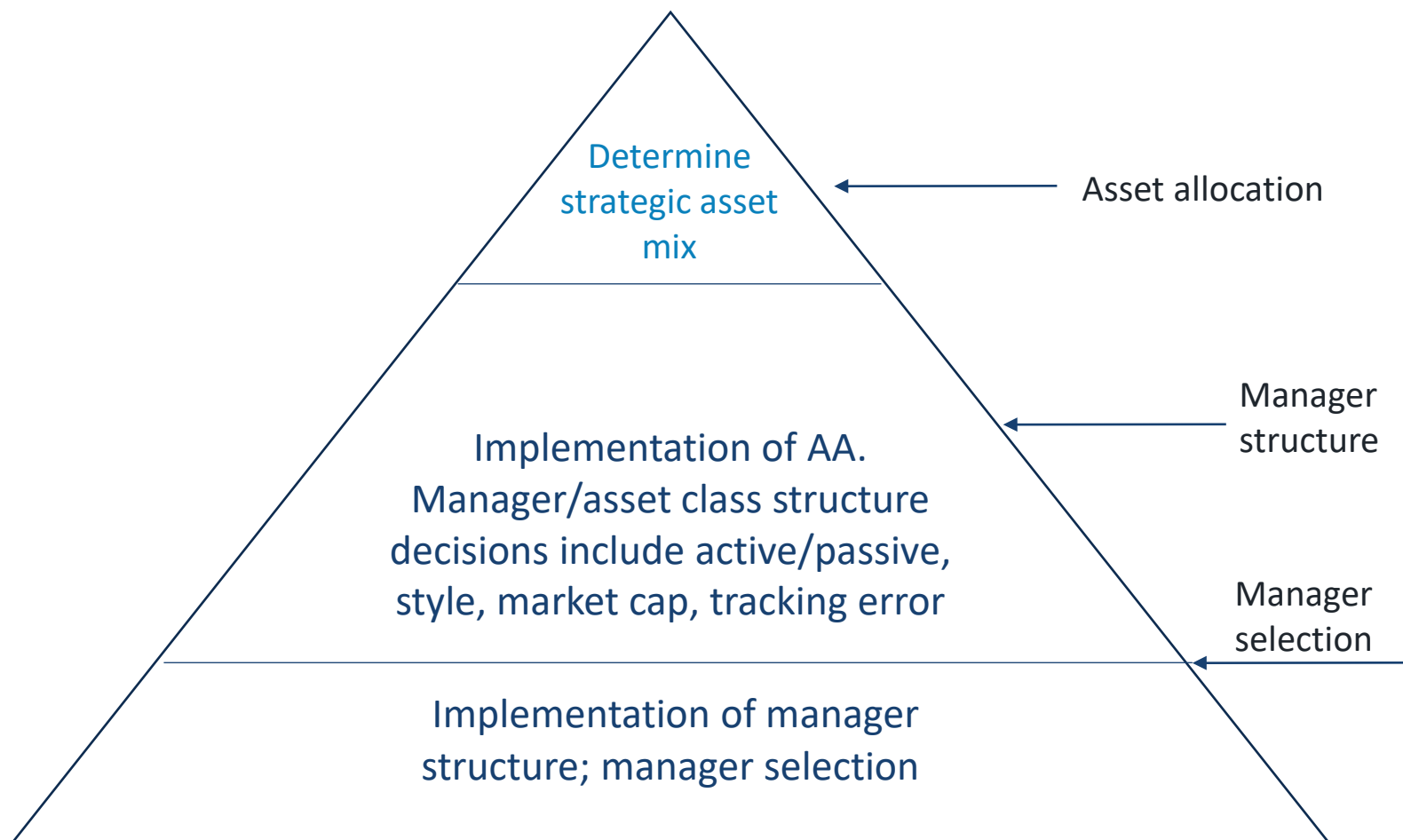
Overview

Introduction

- As fiduciaries we need to periodically review the asset allocation relative to the market environment and the enterprise objectives.
 - 2020 was an unprecedented year with a constantly evolving market environment driven by the global pandemic and its ramifications.
- The goal of this presentation is to review the current asset allocation targets relative to potential alternatives while considering:
 - Risk tolerance/liquidity
 - The market environment
- This review considers modest changes to existing asset classes in the ACERA portfolio.
 - Asset allocation of current policy reflects target asset allocation adopted during ACERA's 2019 asset-liability study.
 - The turbulence of 2020 has resulted in a meaningful reduction in 10-year expected returns compared to last year.

Many plans are reviewing their asset allocation since updated expected returns deviate from actuarial assumed rates.

Asset allocation analysis



Asset allocation is the biggest determinant of portfolio risk and return. Asset allocation analysis assumes only market beta (no alpha or manager skill).

Identifying economic drivers of return

- For each asset class, investors can usually identify the economic environments which are likely to lead to strong, or poor, performance.
- Based on these relationships, investors can work to understand how their overall portfolio is likely to perform if faced with different economic environments.
- Investors may choose to adjust asset allocation so that their portfolio is not overly exposed to one type of future environment.
- Verus recommends diversified portfolios that are designed to weather all economic environments.



The roles of asset classes

- Why do we invest in various asset classes?
- What is it we practically expect them to contribute to the portfolio over time?
- What will determine whether or not they serve the desired role?

	RETURN ROLES				DIVERSIFICATION & VOLATILITY ROLES			HOW MACRO OUTLOOK/GDP AFFECTS ROLE	
	Benefit from GDP Growth	Earn Risk Premium	Produce Stable Income	Hedge Against Inflation	Low Absolute Volatility	Low Corr. To Other Assets	Reduce Portfolio Volatility	Elements of Return for Asset Class	Sensitivity of Role to GDP
Public Equities	●	◐	◐	◑	○	◐	◐	PEs, Dividends, Earnings Growth	●
Private Equities	●	●	○	○	◐	◑	◑	PEs (exits), Financing, Opportunity Set	◐
Fixed (Treasury)	○	○	●	◑	●	◑	●	Direct Link to Yields	◑
Fixed (Credit)	◑	◐	●	◑	◐	◑	◐	Direct Link to Yields, Credit Spreads	◐
Hedge Funds (Intended role)	○	◐	○	○	●	●	●	Pes, Credit Spreads, Fat Tails	◑
Real Estate	◐	◑	◐	●	◑	◐	◑	Unemployment, Vacancies, Cap Rates	●

Investors are typically looking for a combination of return enhancement and lower correlation.

Complexity is not an advantage unless there are clear reasons why you're taking on additional risks and costs.



Methodology

CORE INPUTS

- We use a fundamental building block approach based on several inputs, including historical data and academic research to create asset class return forecasts.
- For most asset classes, we use the long-term historical volatility after adjusting for autocorrelation.
- Correlations between asset classes are calculated based on the last 10 years. For illiquid assets, such as private equity and private real estate, we use BarraOne correlation estimates.

Asset	Return Methodology	Volatility Methodology*
Inflation	25% weight to the University of Michigan Survey 5-10 year ahead inflation expectation and the Survey of Professional Forecasters (Fed Survey), and the remaining 50% to the market's expectation for inflation as observed through the 10-year TIPS breakeven rate	-
Cash	75% * current federal funds rate + 25% * U.S. 10-year Treasury yield	Long-term volatility
Bonds	Nominal bonds: current yield; Real bonds: real yield + inflation forecast	Long-term volatility
International Bonds	Current yield	Long-term volatility
Credit	Current option-adjusted spread + U.S. 10-year Treasury – effective default rate	Long-term volatility
International Credit	Current option-adjusted spread + foreign 10-year Treasury – effective default rate	Long-term volatility
Private Credit	Bank loan forecast + 1.75% private credit premium**	Long-term volatility
Equity	Current yield + real earnings growth (historical average) + inflation on earnings (inflation forecast) + expected P/E change	Long-term volatility
Intl Developed Equity	Current yield + real earnings growth (historical average) + inflation on earnings (intl. inflation forecast) + expected P/E change	Long-term volatility
Private Equity	US large cap domestic equity forecast * 1.85 beta adjustment	1.2 * Long-term volatility of U.S. small cap
Commodities	Collateral return (cash) + spot return (inflation forecast) + roll return (assumed to be zero)	Long-term volatility
Hedge Funds	Return coming from traditional betas + 15-year historical idiosyncratic return	Long-term volatility
Core Real Estate	Cap rate + real income growth – capex + inflation forecast	65% of REIT volatility
REITs	Core real estate	Long-term volatility
Value-Add Real Estate	Core real estate + 2%	Volatility to produce Sharpe Ratio (g) equal to core real estate
Opportunistic Real Estate	Core real estate + 4%	Volatility to produce Sharpe Ratio (g) equal to core real estate
Infrastructure	Current yield + real income growth + inflation on earnings (inflation forecast)	Long-term volatility
Risk Parity	Expected Sharpe Ratio * target volatility + cash rate	Target volatility

*Long-term historical volatility data is adjusted for autocorrelation (see Appendix)

**The private credit premium is generated by illiquidity, issuer size, and lack of credit rating

10-year return & risk assumptions

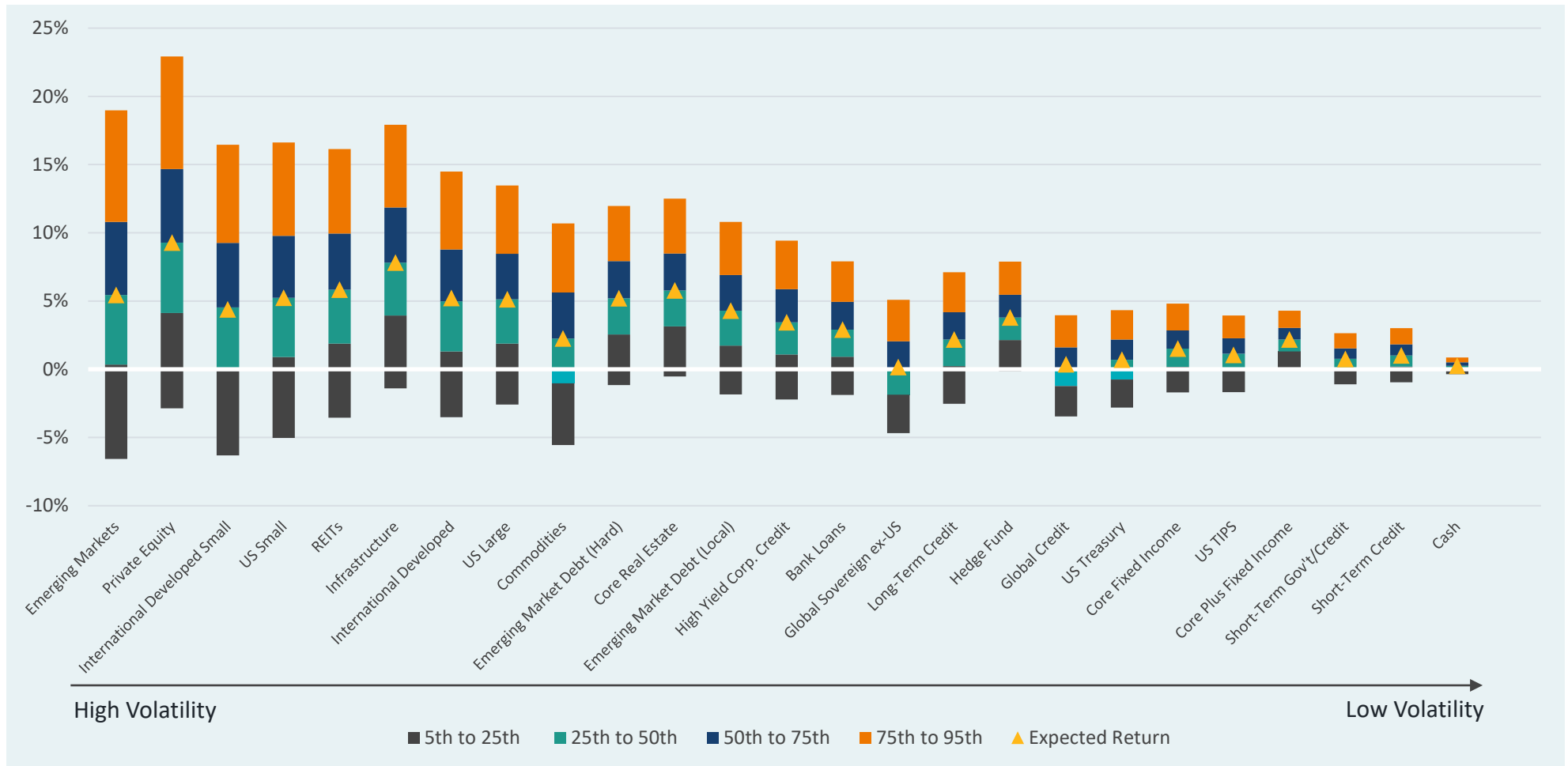
Asset Class	Index Proxy	Ten Year Return Forecast		Standard Deviation Forecast	Sharpe Ratio Forecast (g)	Sharpe Ratio Forecast (a)	10-Year Historical Sharpe Ratio (g)	10-Year Historical Sharpe Ratio (a)
		Geometric	Arithmetic					
Equities								
U.S. Large	S&P 500	5.1%	6.3%	15.7%	0.31	0.38	0.99	0.99
U.S. Small	Russell 2000	5.2%	7.3%	21.4%	0.23	0.33	0.51	0.58
International Developed	MSCI EAFE	5.2%	6.7%	17.9%	0.28	0.36	0.27	0.34
International Small	MSCI EAFE Small Cap	4.4%	6.7%	22.4%	0.19	0.29	0.43	0.49
Emerging Markets	MSCI EM	5.4%	8.3%	25.5%	0.20	0.32	0.11	0.19
Global Equity	MSCI ACWI	5.2%	6.6%	17.3%	0.29	0.37	0.58	0.62
Private Equity*	Cambridge Private Equity	9.3%	12.1%	28.1%	0.35	0.46	-	-
Fixed Income								
Cash	30 Day T-Bills	0.2%	0.2%	1.2%	-	-	-	-
U.S. TIPS	BBgBarc U.S. TIPS 5-10	1.1%	1.2%	5.3%	0.15	0.18	0.66	0.67
U.S. Treasury	BBgBarc Treasury 7-10 Year	0.7%	0.9%	6.7%	0.07	0.10	0.67	0.68
Global Sovereign ex U.S.	BBgBarc Global Treasury ex U.S.	0.2%	0.6%	9.6%	-0.01	0.04	0.09	0.12
Global Aggregate	BBgBarc Global Aggregate	1.1%	1.3%	6.1%	0.14	0.17	0.38	0.39
Core Fixed Income	BBgBarc U.S. Aggregate Bond	1.5%	1.6%	4.0%	0.31	0.36	1.02	1.01
Core Plus Fixed Income	BBgBarc U.S. Universal	2.2%	2.3%	4.0%	0.49	0.50	1.13	1.12
Short-Term Gov't/Credit	BBgBarc U.S. Gov't/Credit 1-3 Year	0.7%	0.8%	3.6%	0.14	0.16	1.23	1.22
Short-Term Credit	BBgBarc Credit 1-3 Year	1.0%	1.1%	3.6%	0.21	0.23	1.23	1.22
Long-Term Credit	BBgBarc Long U.S. Corporate	2.2%	2.6%	9.3%	0.21	0.25	0.76	0.77
High Yield Corp. Credit	BBgBarc U.S. Corporate High Yield	3.4%	4.0%	11.3%	0.28	0.34	0.82	0.83
Bank Loans	S&P/LSTA Leveraged Loan	2.9%	3.2%	9.5%	0.28	0.32	0.66	0.67
Global Credit	BBgBarc Global Credit	0.3%	0.6%	7.4%	0.01	0.05	0.63	0.64
Emerging Markets Debt (Hard)	JPM EMBI Global Diversified	5.2%	6.0%	12.7%	0.39	0.45	0.60	0.63
Emerging Markets Debt (Local)	JPM GBI-EM Global Diversified	4.3%	5.0%	12.2%	0.33	0.39	-0.01	0.05
Private Credit	Bank Loans + 175bps	4.6%	5.2%	11.2%	0.39	0.45	-	-
Other								
Commodities	Bloomberg Commodity	2.2%	3.4%	15.9%	0.13	0.20	-0.47	-0.41
Hedge Funds*	HFRI Fund Weighted Composite	3.8%	4.1%	7.8%	0.46	0.49	0.47	0.49
Real Estate Debt	BBgBarc CMBS IG	2.2%	2.5%	7.5%	0.26	0.30	1.18	1.17
Core Real Estate	NCREIF Property	5.8%	6.5%	12.6%	0.44	0.50	2.06	1.99
Value-Add Real Estate	NCREIF Property + 200bps	7.8%	9.1%	17.1%	0.44	0.52	-	-
Opportunistic Real Estate	NCREIF Property + 400bps	9.8%	11.8%	21.6%	0.44	0.54	-	-
REITs	Wilshire REIT	5.8%	7.5%	19.3%	0.29	0.38	0.46	0.52
Global Infrastructure	S&P Global Infrastructure	7.8%	9.4%	18.8%	0.40	0.49	0.28	0.35
Risk Parity	Risk Parity	5.2%	5.9%	10.0%	0.50	0.56	-	-
Currency Beta	MSCI Currency Factor Index	1.2%	1.3%	3.5%	0.28	0.30	0.15	0.16
Inflation		2.0%	-	-	-	-	-	-

Investors wishing to produce expected geometric return forecasts for their portfolios should use the arithmetic return forecasts provided here as inputs into that calculation, rather than the single-asset-class geometric return forecasts. This is the industry standard approach, but requires a complex explanation only a heavy quant could love, so we have chosen not to provide further details in this document – we will happily provide those details to any readers of this who are interested.

*Return expectations differ depending on method of implementation

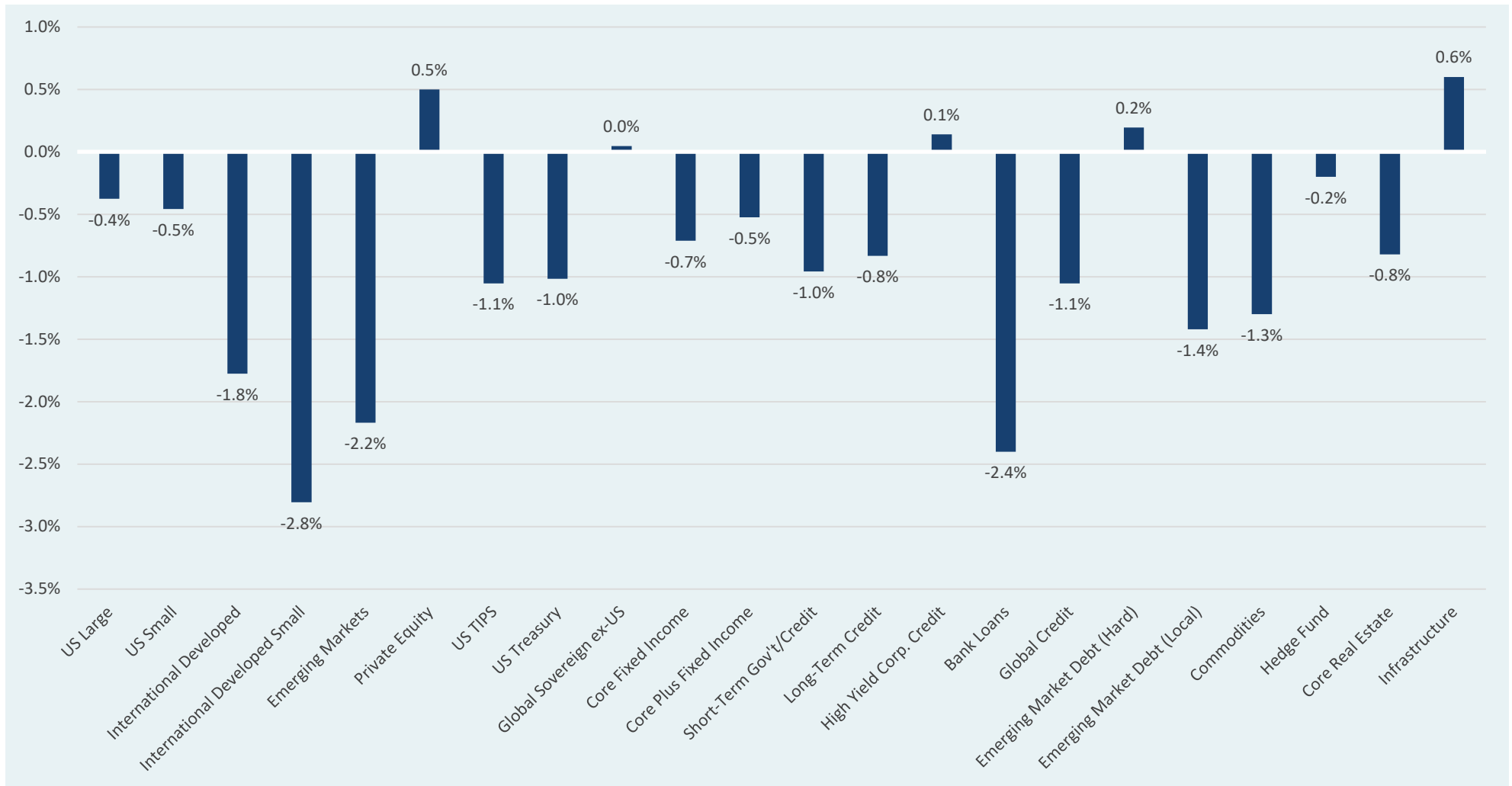
Range of likely 10-year outcomes

10-YEAR RETURN 90% CONFIDENCE INTERVAL



Source: Verus, MPI

2021 vs. 2020 return forecasts



Note: year-over-year change of the select group of asset classes above is based on the 2020 CMA methodology

Which overall risks should an investor accept?

Accept greater volatility

Be truly different from peers

Add portfolio leverage, which can change risk profile

Maintain same risk, but with weaker expected return

Take on illiquidity risk, which may lead to forced selling in stressed markets

Tilt into assets with higher expected return, but forecasts may be wrong

Make portfolio "bets" which might fail to pay off

Rely on active managers who may fail to produce alpha

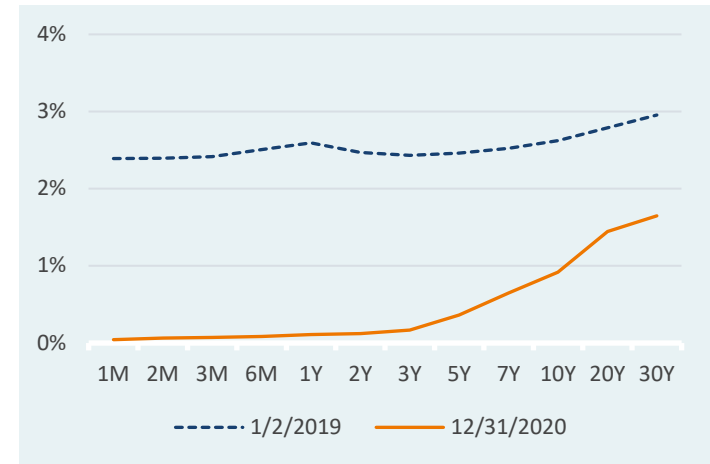
Over-diversify which might reduce return

Source: Bridgewater, Verus

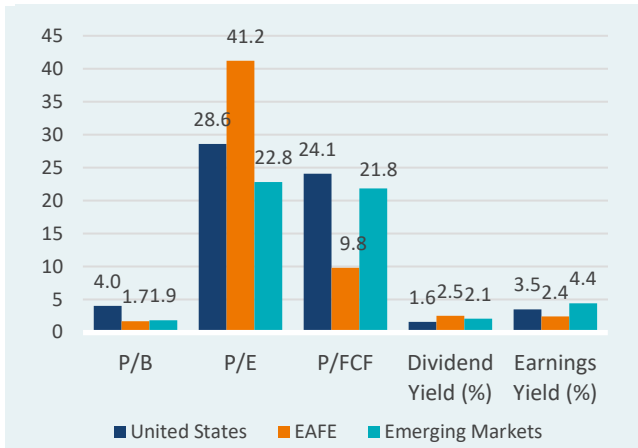
Market environment

- Stocks broadly are relatively expensive, bolstered by high valuations
- Interest rates are low but with potential for longer term reflation trade
- Credit spreads are relatively tight
- Fiscal stimulus likely under new administration
- Assumption of full reopening of the global economy after COVID vaccinations are widely distributed

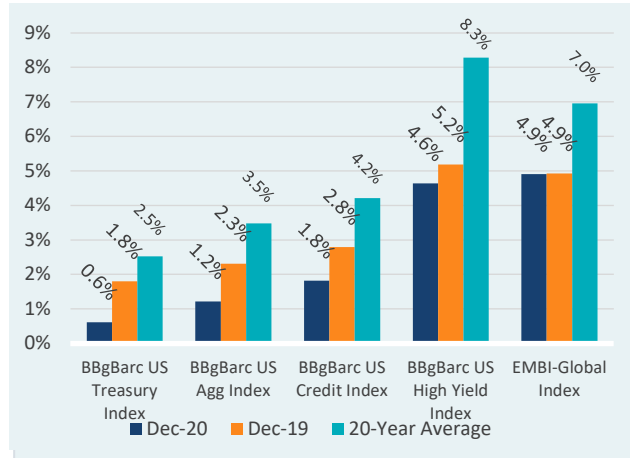
YIELD CURVE PRE- AND POST-COVID



MSCI STOCK VALUATIONS(3-MONTH AVG)



NOMINAL YIELDS



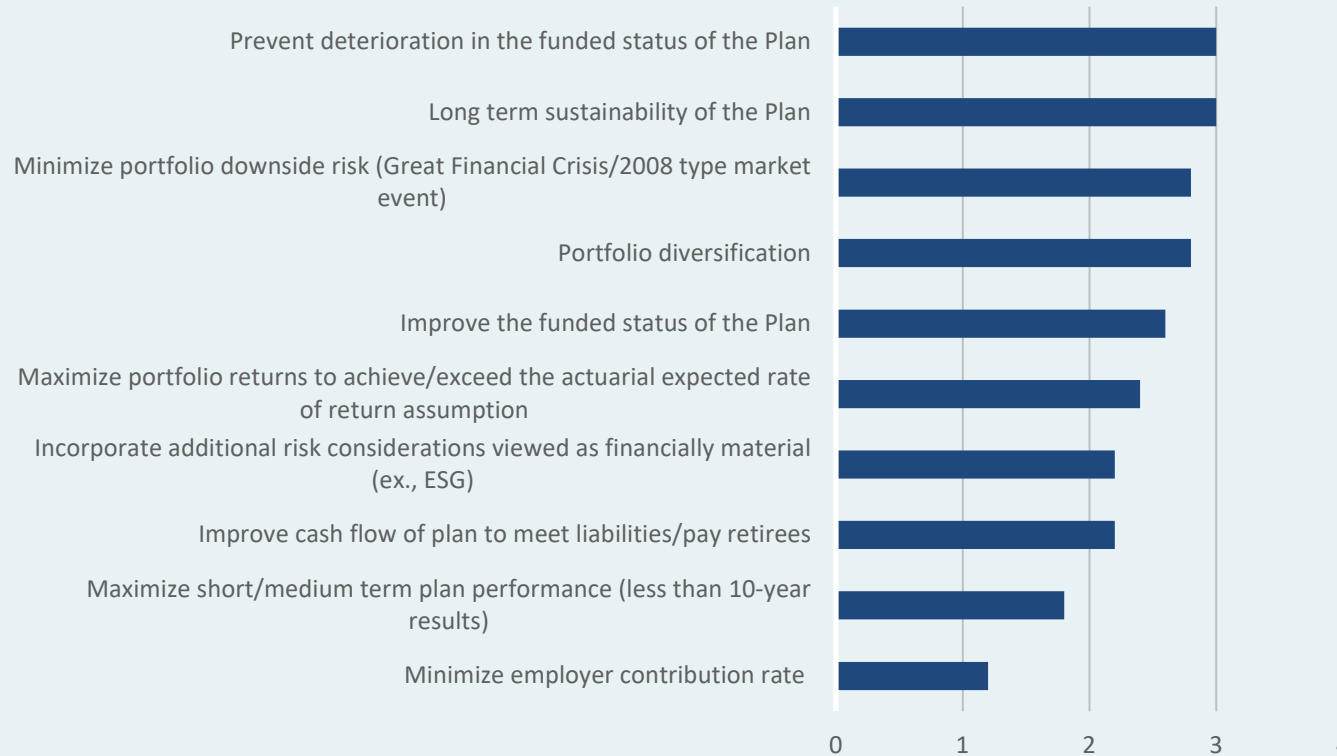
GDP GROWTH EXPECTATIONS (%)



Data as of 12/31/20

Long-term objectives – ERT results

LONG TERM OBJECTIVES



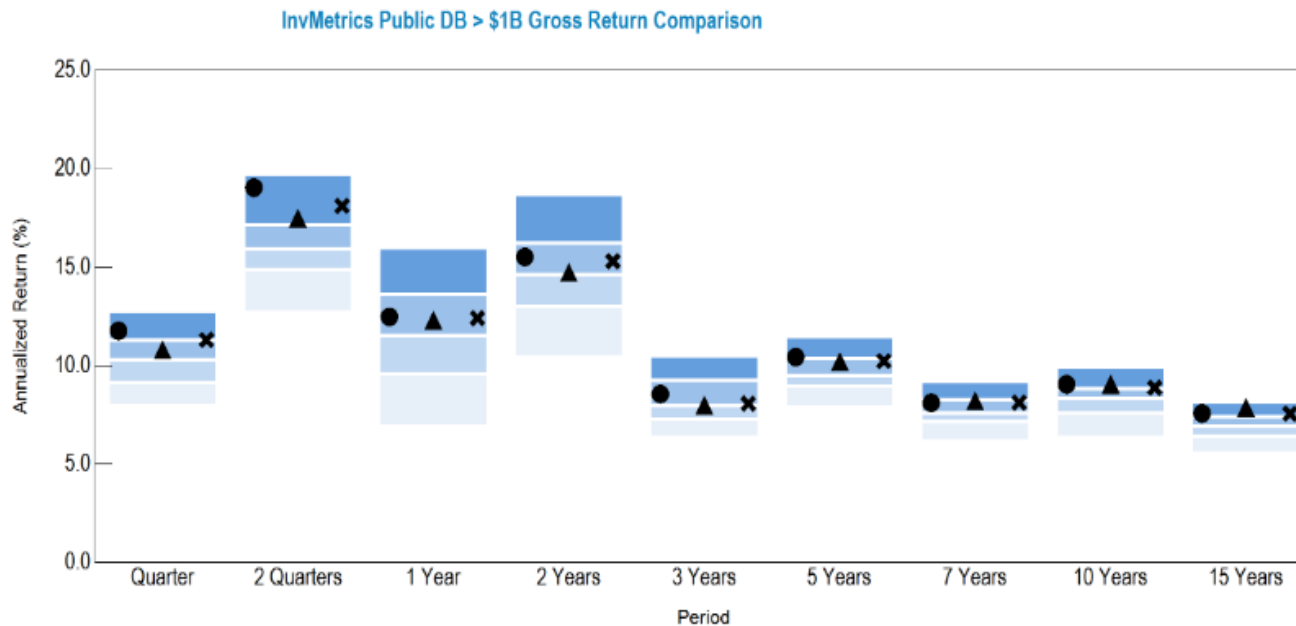
Enterprise Risk Tolerance survey results from 2019 asset-liability study

Assesses the Trustees' ability, willingness and comfort in taking different types of risks to achieve the objectives of ACERA

Objectives can be at odds with one another at times

ACERA's Portfolio

Historical performance



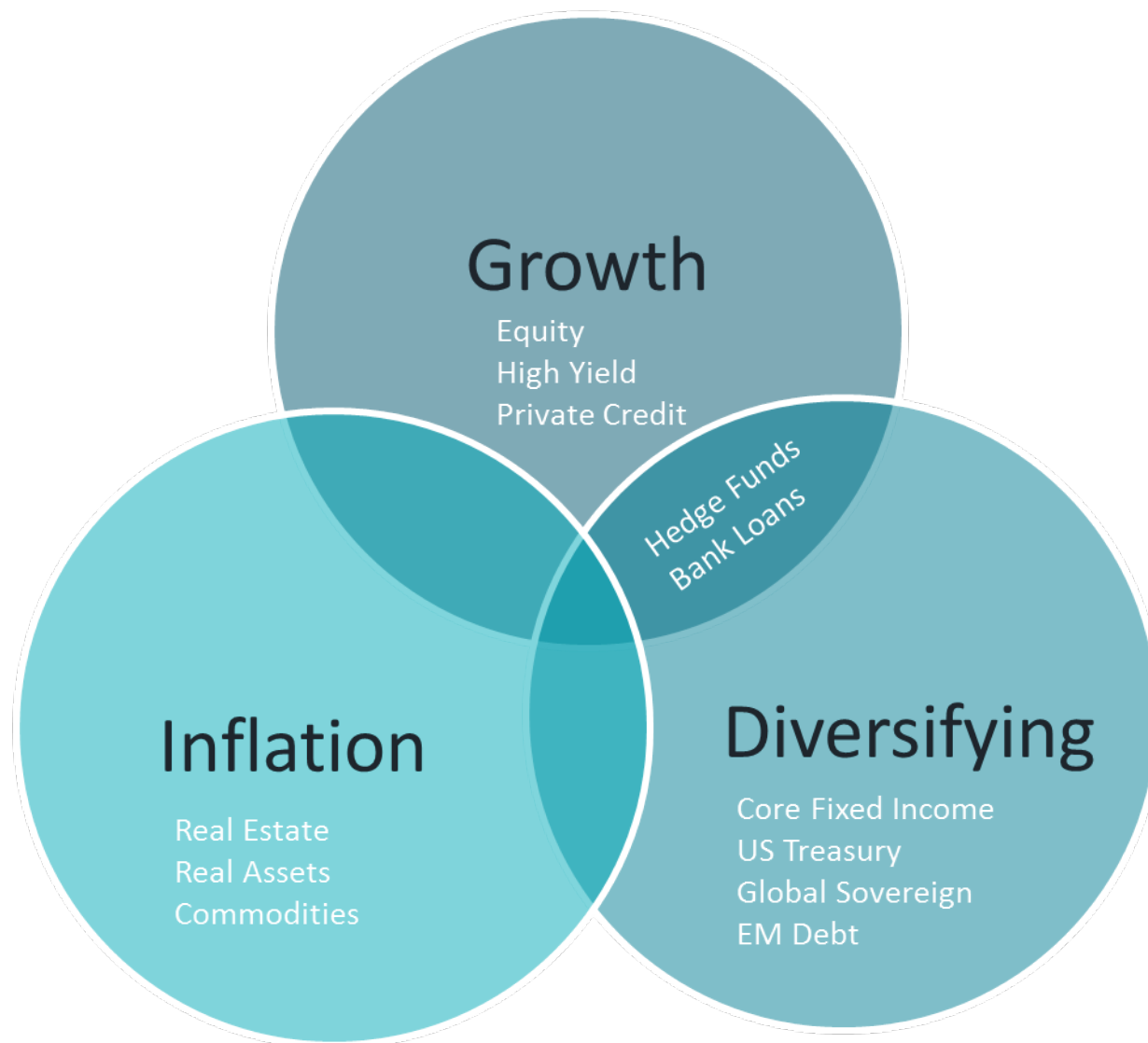
ACERA's returns have exceeded the actuarial assumed rate by a large margin in recent years.

Over the past 30 years, a 60/40 US portfolio returned 8.9% and a 60/40 global portfolio returned 6.9%.

High equity valuations and lower bond yields reduce future expected returns.

	Return (Rank)								
	Quarter	2 Quarters	1 Year	2 Years	3 Years	5 Years	7 Years	10 Years	15 Years
5th Percentile	12.75	19.69	15.98	18.68	10.48	11.45	9.18	9.89	8.11
25th Percentile	11.33	17.14	13.64	16.25	9.29	10.37	8.31	8.86	7.42
Median	10.31	15.94	11.54	14.67	7.99	9.50	7.58	8.35	6.94
75th Percentile	9.17	14.90	9.60	13.02	7.27	8.97	7.16	7.61	6.41
95th Percentile	7.98	12.72	6.93	10.43	6.35	7.93	6.20	6.35	5.57
# of Portfolios	94	94	94	94	94	94	92	88	82
● Total Fund	11.76 (16)	19.04 (8)	12.48 (39)	15.52 (33)	8.56 (37)	10.44 (23)	8.11 (34)	9.05 (20)	7.57 (19)
▲ Policy Index	10.83 (36)	17.48 (21)	12.30 (41)	14.74 (49)	8.00 (50)	10.21 (30)	8.23 (29)	9.05 (20)	7.88 (9)
✕ Allocation Index	11.30 (26)	18.11 (15)	12.41 (40)	15.30 (35)	8.07 (47)	10.23 (30)	8.12 (34)	8.88 (25)	7.55 (20)

Functional labels



Asset allocation

- ACERA “Current Target” Mix – Approved strategic asset allocation as of 6/1/19
 - Public equity lowered by 4% from prior asset-liability study
 - Addition of Private Credit +4%
- “ACERA Revised” Mix – Incorporates feedback and modest suggested changes by ACERA
 - Private Real Assets -1%; Real Estate +2%
 - Absolute Return -2%; Global Fixed Income +1%
 - US Fixed -2%; Private Credit +2%
 - EM Equity increased (from 20% to 30% of Intl Equity)
- “More Equities” Mix – Moderately increases public equities with the aim of increasing portfolio expected returns
 - Public Equity +4%
 - Fixed Income -3%
 - Absolute Return -1%
- “More Privates” Mix – Moderately increases private investments with the aim of increasing portfolio expected returns
 - Private Equity +3%; Public Equity -2%
 - Diversifying -3%
 - Inflation Hedge +2%: Real Estate +1%; Private Real Assets +1%

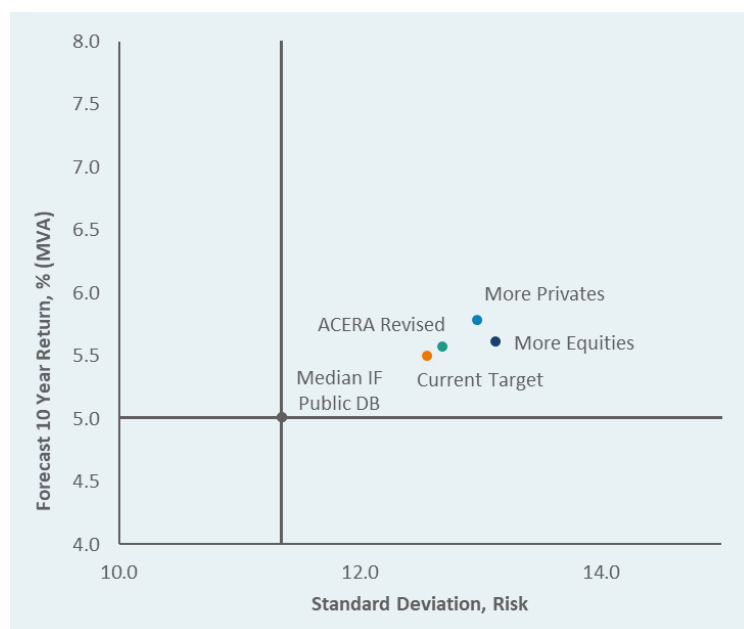
Asset allocation

	Current Target	ACERA Revised	More Equities	More Privates	Median IF Public DB	CMA's (10 Yr)		
						Return (g)	Standard Deviation	Sharpe Ratio (a)
Total Domestic Equity	25	25	27	24	27	5.2	16.1	0.38
International Developed	17.0	14.9	18.4	16.3	17.2	5.2	17.9	0.36
International Developed Small	3.0	2.6	3.2	2.9		4.4	22.4	0.29
Emerging Markets	5.0	7.5	5.4	4.8	5.2	5.4	25.5	0.32
Total Int'l Equity	25	25	27	24	22			
Total Equity	50	50	54	48	50			
Private Equity	8.0	8.0	8.0	11.0	7.0	9.3	28.1	0.46
Private Credit	4.0	6.0	4.0	4.0		4.6	11.2	0.45
Total Growth	62	64	66	63	57			
Core Fixed Income	11.4	9.6	9.6	10.5	18.2	1.5	4.0	0.36
High Yield Corp. Credit	1.6	1.4	1.4	1.5		3.4	11.3	0.34
Total US Fixed	13	11	11	12	18			
Global Sovereign	3.0	4.0	2.0	2.0	3.8	0.5	7.3	0.07
Emerging Market Debt					3.8	5.2	12.7	0.45
Total Global Fixed	3	4	2	2	8			
Absolute Return	9.0	7.0	8.0	8.0	5.4	3.8	7.8	0.49
Total Diversifying	25	22	21	22	31			
Core Real Estate	5.6	7.0	5.6	6.3	9.1	5.8	12.6	0.50
Value Add Real Estate	1.6	2.0	1.6	1.8		7.8	17.1	0.52
Opportunistic Real Estate	0.8	1.0	0.8	0.9		9.8	21.6	0.54
Total Real Estate	8	10	8	9	9			
Private Real Assets	5.0	4.0	5.0	6.0		7.8	18.8	0.49
Commodities					3.2	2.2	15.9	0.20
Total Real Assets	5	4	5	6	3			
Total Infl Hedge	13	14	13	15	12			
Cash						0.2	1.2	-
Total Allocation	100	100	100	100	100			

	Current Target	ACERA Revised	More Equities	More Privates	Median IF Public DB
Mean Variance Analysis					
Forecast 10 Year Return	5.5	5.6	5.6	5.8	5.0
Standard Deviation	12.6	12.7	13.1	13.0	11.4
1st percentile ret. 1 year	-19.8	-20.0	-20.7	-20.2	-18.2
Sharpe Ratio	0.47	0.47	0.46	0.48	0.46
Probability 1 year return > 7%	45.2	45.5	45.8	46.3	43.0
Probability 10 year return > 7%	35.2	36.1	36.9	38.3	29.0
Verus Scenario Analysis					
10 Year Return Forecast					
Stagflation	2.3	2.2	2.3	2.3	2.9
Weak	-0.7	-0.8	-0.9	-0.9	-0.3
Feb 2021	5.6	5.7	5.7	5.9	5.2
Strong	12.7	13.0	13.2	13.5	11.6
Shock (1 year)	-30.0	-29.7	-31.6	-31.5	-25.1

Expected 10-year forecasts

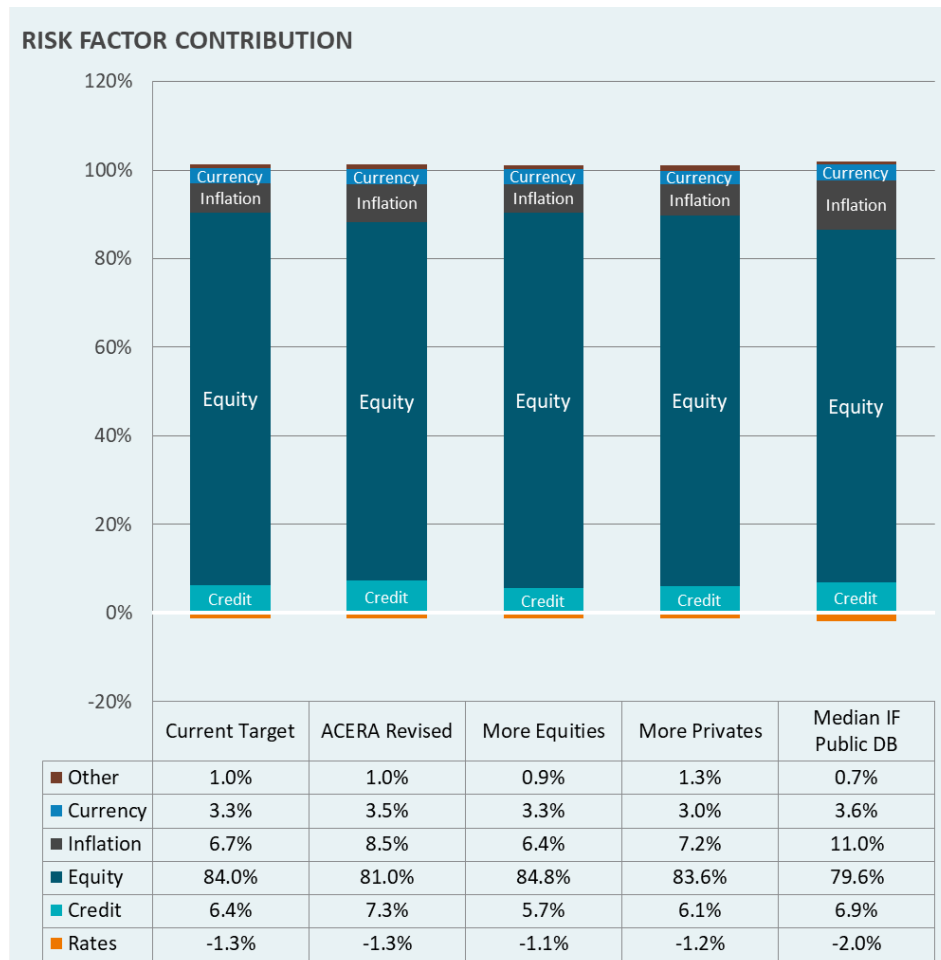
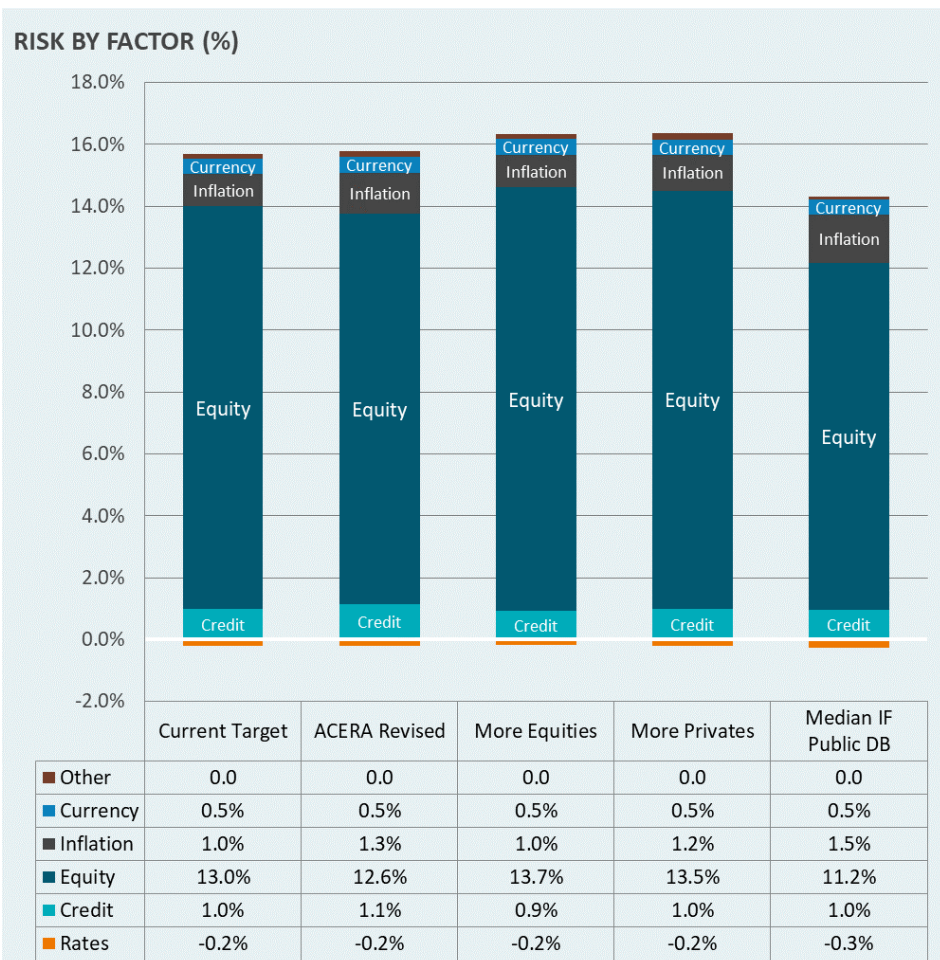
- “ACERA Revised” expected to provide 10 bps more return with same risk-efficiency (Sharpe Ratio)
- “More Equities” expected to provide 10 bps more return with slightly less risk-efficiency
- “More Privates” expected to provide 30 bps more return with slightly better risk-efficiency



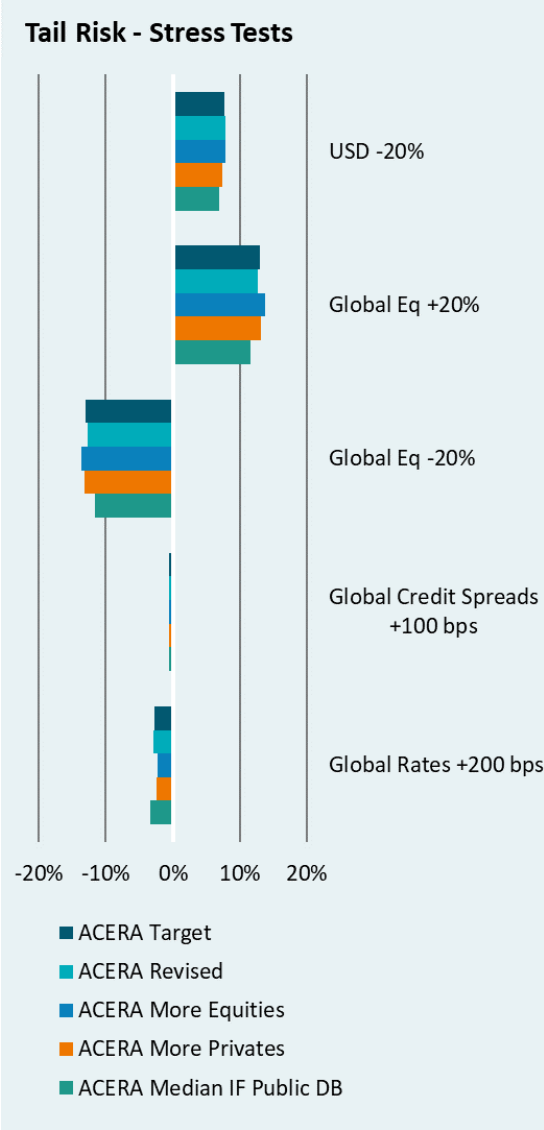
	Current Target	ACERA Revised	More Equities	More Privates	Median IF Public DB
Mean Variance Analysis					
Forecast 10 Year Return	5.5	5.6	5.6	5.8	5.0
Standard Deviation	12.6	12.7	13.1	13.0	11.4
<i>1st percentile ret. 1 year</i>	<i>-19.8</i>	<i>-20.0</i>	<i>-20.7</i>	<i>-20.2</i>	<i>-18.2</i>
Sharpe Ratio	0.47	0.47	0.46	0.48	0.46
Probability 1 year return > 7%	45.2	45.5	45.8	46.3	43.0
Probability 10 year return > 7%	35.2	36.1	36.9	38.3	29.0
Verus Scenario Analysis					
10 Year Return Forecast					
Stagflation	2.3	2.2	2.3	2.3	2.9
Weak	-0.7	-0.8	-0.9	-0.9	-0.3
Feb 2021	5.6	5.7	5.7	5.9	5.2
Strong	12.7	13.0	13.2	13.5	11.6
<i>Shock (1 year)</i>	<i>-30.0</i>	<i>-29.7</i>	<i>-31.6</i>	<i>-31.5</i>	<i>-25.1</i>

Risk Decomposition

- “ACERA Revised” provides slightly more hedging of Barra inflation risk factor and less exposure to equity risk factor than does current target

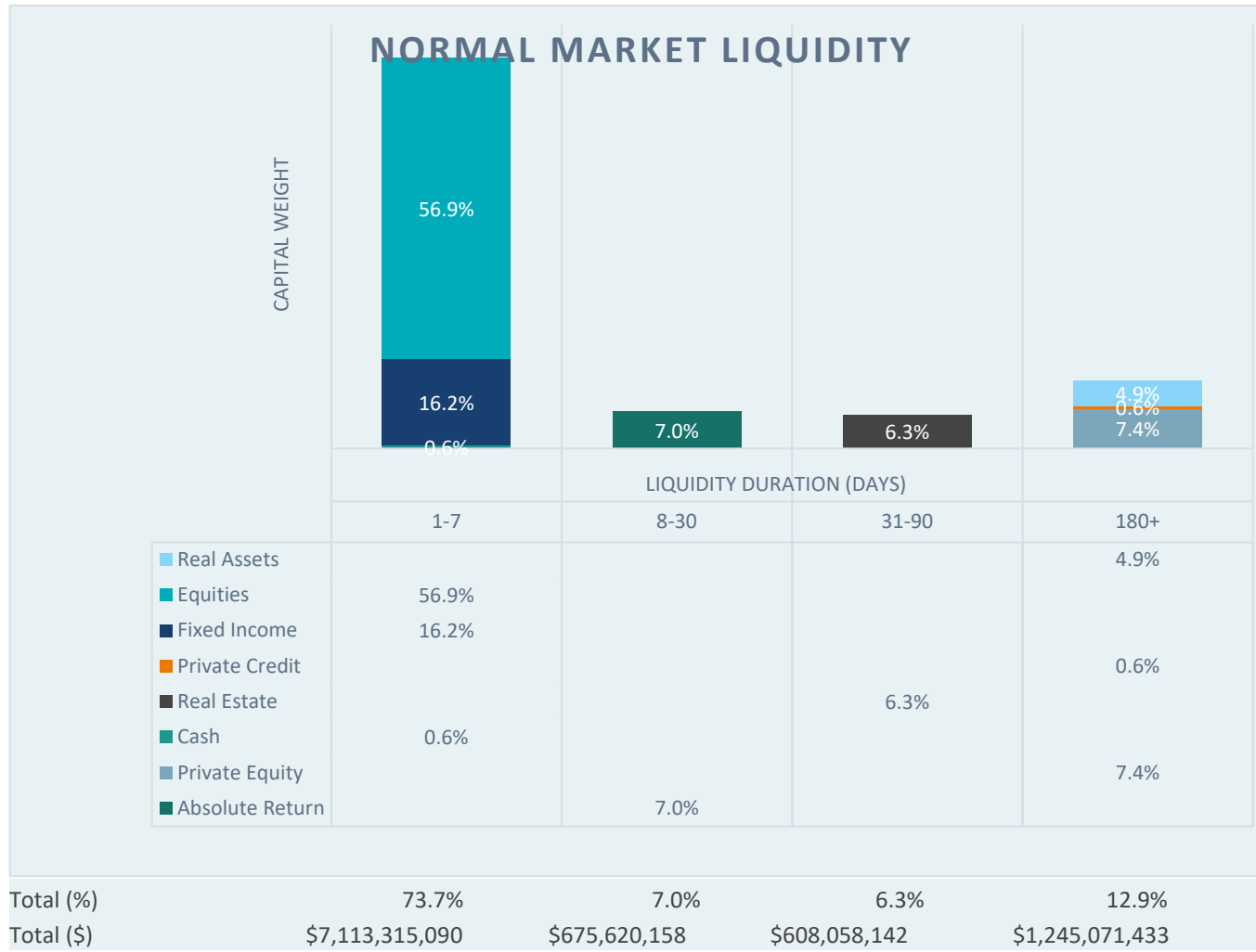


Scenario Analysis



Liquidity – Current Portfolio

NORMAL MARKET LIQUIDITY



74% of ACERA' portfolio can be converted to cash within 1-7 days in a normal market environment

Around 18.0% of ACERA' assets would be considered mostly or completely illiquid

ACERA LCR

Liquidity Available	Liquid Financial Assets	\$	10,105,201,628.62
	Distributions from Illiquids	\$	872,993,894.00
	Employer + Employee Contributions	\$	2,296,554,990.00
	Investment Income		482,585,827.15
Liquidity Needs	Benefit Payments	\$	3,259,088,106.00
	Capital Calls	\$	732,119,750.00
	Plan Expenses	\$	89,521,771.80
	UAAL Amortization	-	
LCR			3.4

LCR = 3.4

3.4x coverage in liquidity available relative to your spending needs over the next 5 years

DRAWDOWN SCENARIO AND CHANGE IN FUTURE RETURN

Drawdown Scenario (Immediate)	Assumed Return (Subsequent 5-years)						
	3.37	2.50%	3.50%	4.50%	5.50%	6.50%	7.50%
-50%	1.66	1.71	1.76	1.81	1.87	1.94	
-40%	1.86	1.93	2.00	2.08	2.17	2.26	
-30%	2.10	2.19	2.29	2.40	2.52	2.65	
-20%	2.37	2.49	2.63	2.72	2.81	2.90	
-10%	2.67	2.76	2.85	2.95	3.05	3.15	
0%	2.87	2.97	3.07	3.18	3.29	3.40	

SENSITIVITY TO CAPITAL CALL AND DISTRIBUTION CHANGES

Distribution Reduction	Capital Call Reduction						
	3.37	5%	15%	25%	35%	45%	55%
95%	3.20	3.26	3.32	3.38	3.45	3.51	
85%	3.22	3.28	3.34	3.40	3.47	3.54	
75%	3.24	3.30	3.36	3.43	3.49	3.56	
65%	3.26	3.32	3.38	3.45	3.52	3.59	
55%	3.28	3.34	3.41	3.47	3.54	3.61	
45%	3.30	3.37	3.43	3.49	3.56	3.63	

ACERA More Privates LCR

Liquidity Available	Liquid Financial Assets	\$	9,618,674,485.40
	Distributions from Illiquids	\$	927,081,000.00
	Employer + Employee Contributions	\$	2,296,554,990.00
	Investment Income		482,585,827.14
Liquidity Needs	Benefit Payments	\$	3,259,088,106.00
	Capital Calls	\$	1,006,253,000.00
	Plan Expenses	\$	89,521,771.80
	UAAL Amortization	-	
LCR			3.1

LCR = 3.1

3.1x coverage in liquidity available relative to your spending needs over the next 5 years

DRAWDOWN SCENARIO AND CHANGE IN FUTURE RETURN

Drawdown Scenario (Immediate)	Assumed Return (Subsequent 5-years)						
	3.37	2.50%	3.50%	4.50%	5.50%	6.50%	7.50%
-50%	1.55	1.60	1.64	1.69	1.74	1.80	
-40%	1.73	1.79	1.86	1.92	2.00	2.08	
-30%	1.94	2.02	2.10	2.20	2.30	2.42	
-20%	2.18	2.28	2.40	2.48	2.56	2.64	
-10%	2.44	2.51	2.60	2.68	2.77	2.86	
0%	2.61	2.70	2.79	2.89	2.98	3.09	

Contribution Sensitivity Analysis

		3.06
Contribution Reduction	0%	3.06
	10%	3.01
	20%	2.95
	30%	2.90
	40%	2.85
	50%	2.80
	60%	2.74

Illiquid Asset Sensitivity Analysis

		3.06
Illiquid Asset Allocation Increase	0%	3.06
	2%	3.00
	4%	2.93
	6%	2.87
	8%	2.81
	10%	2.75
	12%	2.68

Conclusions

- Plan sponsors are expected to have difficulty meeting actuarial returns in the current low expected return environment without taking on additional risk.
 - There are some key differences between investment and actuarial assumptions (shorter vs longer time periods, inflation differences) which must be considered in decision-making.
- Forecasting expected returns uses a precise methodology to estimate what is unknowable.
 - Standard deviation around a mean estimate
 - Changing market conditions impacting building block inputs for CMAs
 - The exclusion of alpha (AA only considers market beta)
- Objectives and risks must be discussed and prioritized to determine the right asset allocation decision for the ACERA portfolio.
 - Key plan objectives can be in conflict, and market risks are fluid and subject to change.
- It is important to revisit (and/or reaffirm) the Plan's asset allocation when market conditions change meaningfully and impact capital market assumptions and expected returns.

Comparison of mixes relative to ERT objectives

— Current	Objective Rank
<ul style="list-style-type: none">• Minimize downside risk• Improved diversification	<ul style="list-style-type: none">• 3• 4
— ACERA Revised	Objective Rank
<ul style="list-style-type: none">• Long term sustainability of plan• Minimize downside risk• Improved diversification	<ul style="list-style-type: none">• 2• 3• 4
— More Equities	Objective Rank
<ul style="list-style-type: none">• Long term sustainability of plan	<ul style="list-style-type: none">• 2
— More Privates	Objective Rank
<ul style="list-style-type: none">• Long term sustainability of plan• Prevent deterioration of funded status• Maximize return/meet or exceed actuarial return	<ul style="list-style-type: none">• 2• 1• 6

Recommendation

- Current Target may be appropriate to maintain depending on Trustees' time horizon for decision-making and objective/risk prioritization (>10 yrs; downside risk sensitivity).
- More equities reduces risk efficiency, and Verus believes that this asset mix should not be implemented.
- Updated asset allocation analysis points to a modest increase in risk efficiency with the ACERA Revised and More Privates mixes.
 - More Privates increases expected return and supports several ERT objectives.
 - ACERA Revised keeps similar risk profile as Current and supports several ERT objectives.

Appendix

Correlation assumptions

	Cash	US Large	US Small	Intl Large	Intl Small	EM	Global Equity	PE	US TIPS	US Treasury	Global Sovereign ex-US	US Core	Core Plus	Short-Term Gov't/Credit	Short-Term Credit	Long-Term Credit	US HY	Bank Loans	Global Credit	EMD USD	EMD Local	Commodities	Hedge Funds	Real Estate	REITs	Infrastructure	Risk Parity	Currency Beta			
Cash	1.0																														
US Large	-0.2	1.0																													
US Small	-0.2	0.9	1.0																												
Intl Large	-0.1	0.9	0.8	1.0																											
Intl Small	-0.2	0.9	0.8	1.0	1.0																										
EM	-0.1	0.7	0.7	0.8	0.8	1.0																									
Global Equity	-0.2	1.0	0.9	1.0	0.9	0.9	1.0																								
PE	-0.2	0.6	0.6	0.6	0.6	0.5	0.7	1.0																							
US TIPS	0.0	0.1	0.1	0.2	0.2	0.3	0.2	0.1	1.0																						
US Treasury	0.2	-0.4	-0.5	-0.4	-0.4	-0.3	-0.4	-0.2	0.7	1.0																					
Global Sovereign ex-US	0.1	0.2	0.1	0.3	0.3	0.5	0.3	0.0	0.6	0.3	1.0																				
US Core	0.1	-0.1	-0.2	-0.1	-0.1	0.1	-0.1	0.0	0.8	0.9	0.5	1.0																			
Core Plus	0.1	0.1	0.0	0.1	0.1	0.2	0.1	0.0	0.8	0.7	0.6	0.9	1.0																		
Short-Term Gov't/Credit	0.4	-0.1	-0.2	0.0	-0.1	0.1	0.0	-0.2	0.6	0.7	0.5	0.8	0.8	1.0																	
Short-Term Credit	0.0	0.4	0.4	0.4	0.4	0.5	0.4	0.0	0.5	0.2	0.5	0.5	0.8	0.7	1.0																
Long-Term Credit	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.7	0.5	0.5	0.8	0.9	0.5	0.6	1.0															
US HY	-0.2	0.8	0.7	0.8	0.8	0.8	0.8	0.5	0.4	-0.2	0.4	0.2	0.4	0.1	0.7	0.5	1.0														
Bank Loans	-0.3	0.7	0.7	0.6	0.7	0.6	0.7	0.4	0.2	-0.3	0.2	0.0	0.2	0.0	0.6	0.4	0.9	1.0													
Global Credit	-0.1	0.6	0.5	0.7	0.7	0.7	0.7	0.4	0.6	0.1	0.7	0.5	0.6	0.4	0.8	0.7	0.8	0.6	1.0												
EMD USD	-0.2	0.5	0.5	0.6	0.6	0.7	0.6	0.4	0.6	0.1	0.5	0.5	0.6	0.3	0.7	0.6	0.8	0.7	0.9	1.0											
EMD Local	0.0	0.5	0.4	0.7	0.7	0.8	0.7	0.4	0.4	0.0	0.6	0.3	0.4	0.3	0.5	0.4	0.7	0.5	0.8	0.8	1.0										
Commodities	-0.1	0.5	0.5	0.6	0.6	0.6	0.6	0.3	0.2	-0.3	0.4	-0.1	0.0	0.0	0.3	0.1	0.6	0.5	0.5	0.5	0.6	1.0									
Hedge Funds	-0.2	0.8	0.8	0.8	0.9	0.7	0.9	0.6	0.2	-0.4	0.2	0.0	0.2	0.0	0.5	0.3	0.8	0.8	0.7	0.6	0.5	0.5	1.0								
Real Estate	-0.1	0.5	0.5	0.4	0.5	0.4	0.5	0.4	0.1	-0.1	0.1	0.0	-0.1	0.0	0.1	0.0	0.3	0.3	0.4	0.3	0.3	0.3	0.4	1.0							
REITs	-0.2	0.6	0.6	0.6	0.6	0.5	0.6	0.5	0.4	0.1	0.3	0.4	0.4	0.2	0.5	0.5	0.6	0.6	0.7	0.6	0.5	0.4	0.5	0.8	1.0						
Infrastructure	-0.2	0.8	0.7	0.8	0.8	0.7	0.8	0.7	0.4	-0.2	0.5	0.2	0.4	0.2	0.6	0.5	0.8	0.7	0.8	0.8	0.7	0.5	0.7	0.3	0.7	1.0					
Risk Parity	-0.1	0.6	0.6	0.7	0.6	0.6	0.7	0.3	0.4	0.0	0.4	0.2	0.5	0.3	0.6	0.5	0.8	0.6	0.7	0.7	0.6	0.6	0.7	0.0	0.5	0.7	1.0				
Currency Beta	0.0	0.2	0.2	0.1	0.1	0.1	0.2	0.0	0.0	-0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	1.0			

Note: Correlation assumptions are based on the last ten years. Private Equity and Real Estate correlations are especially difficult to model – we have therefore used BarraOne correlation data to strengthen these correlation estimates.

Relevant forecast changes

- Fixed income return expectations fell markedly across most asset classes as bond yields headed towards zero. Equity return expectations also fell due to a corporate earnings recession and quick recovery in prices, both of which pushed valuations significantly higher. Most of our fixed income forecasts are 0.5-1.5% lower, while our equity forecasts are 0.4-2.8% lower.
- Inflation expectations were mixed during the year. The U.S. TIPS breakeven inflation rate increased from 1.5% to 1.7%, and household inflation expectations (University of Michigan) rose from 2.4% to 2.7%. However, the Survey of Professional Forecasters moved in the opposite direction, indicating a decrease from 2.20% to 2.04%. Overall, our inflation forecast increased very slightly from 1.9% to 2.0%. Inflation is an important component of the performance of asset classes such as equities, real estate, and commodities. It is important to note that inflation expectations affect *nominal* returns, rather than *real* returns.
- Credit spreads spiked in March and April as the spread of COVID-19 contributed to extreme market volatility. Although spreads later moved back towards normal levels, they remain elevated and supportive of long-term return expectations. Core fixed income spreads increased from 62 bps to 90 bps, and high yield spreads rose from 396 bps to 551 bps.
- The yield curve fell as the Federal Reserve brought interest rates down to zero. The short end of the curve felt most of this move, though the longer end of the curve was also considerably impacted. As indicated by the Federal Reserve, interest rates will likely be kept at 0% for the foreseeable future. The three-month U.S. dollar LIBOR reference rate fell from 2.09% to 0.23%.
- Emerging market hard and local currency debt forecasts were mixed. Hard currency-denominated debt spreads to U.S. Treasury yields jumped from 351 bps to 471 bps, although the broader 1% fall in interest rates brought expectations down commensurately, leading to little overall change. The yield of local-denominated debt fell from 6.0% to 4.6% alongside the broader fixed income market.

All data cited above is as of 9/30/20

Inflation

We use a weighted average of market expectations (50%), consumer expectations (25%), and professional forecasts (25%) to create a 10-year inflation forecast. The market's expectations for 10-year inflation can be inferred by taking the difference between the U.S. 10-year Treasury yield and the 10-year Treasury Inflation-Protected (TIPS) yield (referred to as the breakeven inflation rate).

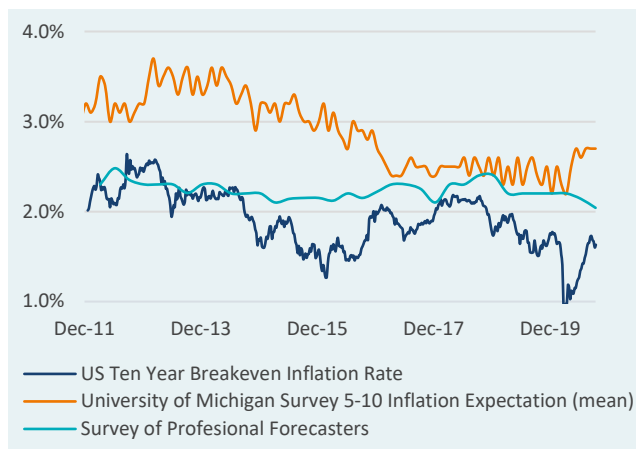
Inflation fell suddenly in the first half of 2020 as COVID-19 led to a global economic slowdown. In the third quarter inflation increased to a normal level as the broader economic recovered. Investors generally expect the

low inflation environment to continue well into the future.

Consumer inflation expectations decoupled from investor inflation expectations during the year. While investors are pricing lower-for-longer inflation, American households are expecting 2.7% long-term inflation—the highest forecast since 2016. Inflation expectations from the Survey of Professional Forecasters fell from 2.20% to 2.04% over the year.

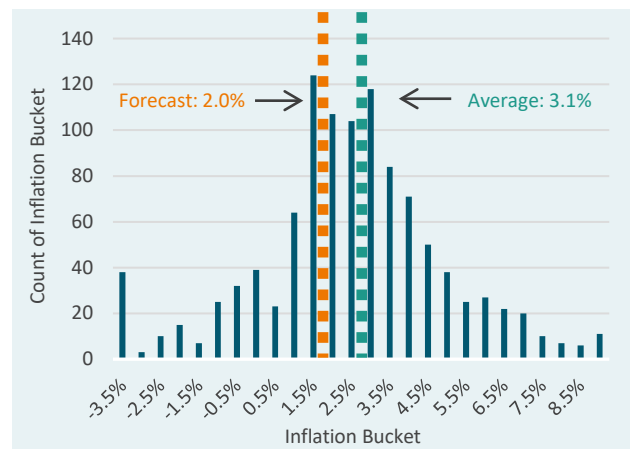
Our inflation forecast increased very slightly from 1.9% to 2.0%.

INFLATION EXPECTATIONS



Source: U. of Michigan, Philly Fed, as of 9/30/20

U.S. 10-YR ROLLING AVERAGE INFLATION SINCE 1923



Source: Bloomberg, as of 9/30/20

FORECAST

	10-Year Forecast
University of Michigan Survey (25% weight)	+2.7%
Survey of Professional Forecasters (25% weight)	+2.0%
US 10-Year TIPS Breakeven Rate (50% weight)	+1.6%
Inflation Forecast	2.0%

Source: Verus, as of 9/30/20

Cash

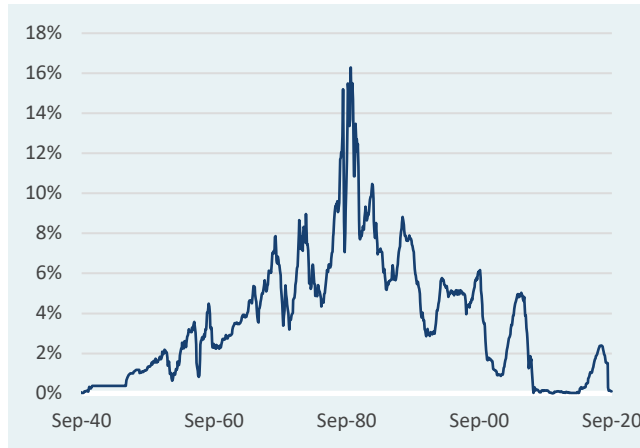
The U.S. Treasury yield curve collapsed to nearly zero in the first half of 2020, but the curve retained steepness similar to that experienced in recent years. Unprecedented monetary policy and central bank involvement in the markets has led bond yields towards zero, or negative, in most developed countries. As indicated by the Federal Reserve, interest rates will likely be kept at 0% for the foreseeable future. This brings the real cash rate deeply negative.

The return of cash seems to have decoupled from the rate of inflation in the current environment, as zero or negative interest rates have

become the new normal. We believe that the current federal funds rate, as well as the steepness of the U.S. Treasury yield curve, may provide guidance regarding the future longer-term cash return. We place a 75% forecasting weight on the current federal funds rate and a 25% weight to the 10-year U.S. Treasury.

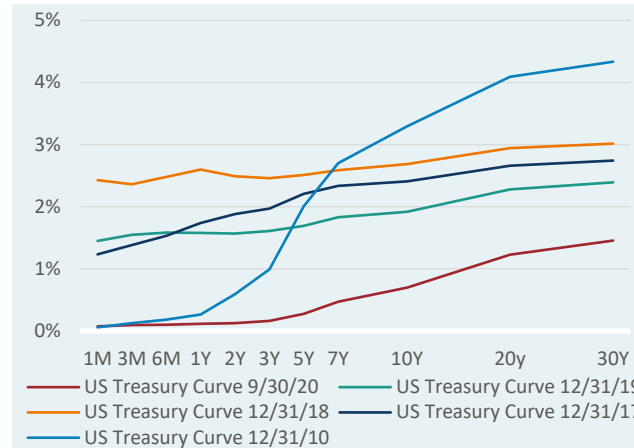
Applying these relationships result in a 10-year cash forecast of 0.2%.

CASH YIELD (3-MONTH T-BILL)



Source: FRED, as of 9/30/20

U.S. TREASURY YIELD CURVE



Source: Bloomberg, as of 9/30/20

FORECAST

	10-Year Forecast
Cash	+0.2%
Inflation Forecast	-2.0%
Real Return	-1.8%

Source: Verus, as of 9/30/20

Rates

We forecast the return from rates based upon the current 10-year Treasury yield, with all cash flows reinvested at the current yield. The 10-year yield fell from 1.7% to 0.7% through September.

U.S. Treasury yields remain high relative to other developed nations, specifically Japan and Germany, though less so since U.S. rates collapsed during the COVID-19 pandemic. Investors generally believe U.S. yields will stay lower-for-longer, though the Federal Reserve has expressed no interest in bringing rates into negative territory, which may limit significant downward movement from this point. The U.S.

yield curve remains surprisingly flat.

Developed world central banks have begun to recognize the limitations of monetary policy in spurring economic growth, and many have commented on the need for greater fiscal policy support. It appears that interest rates in many countries have hit or are close to hitting a natural floor.

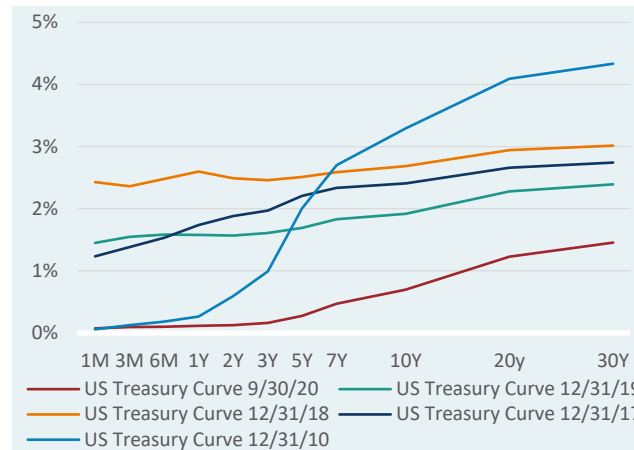
Our expectations are for a 0.7% return over the next ten years, in line with the current U.S. 10-year Treasury yield.

U.S. 10-YR TREASURY YIELD



Source: Bloomberg, as of 9/30/20

U.S. TREASURY YIELD CURVE



Source: Bloomberg, as of 9/30/20

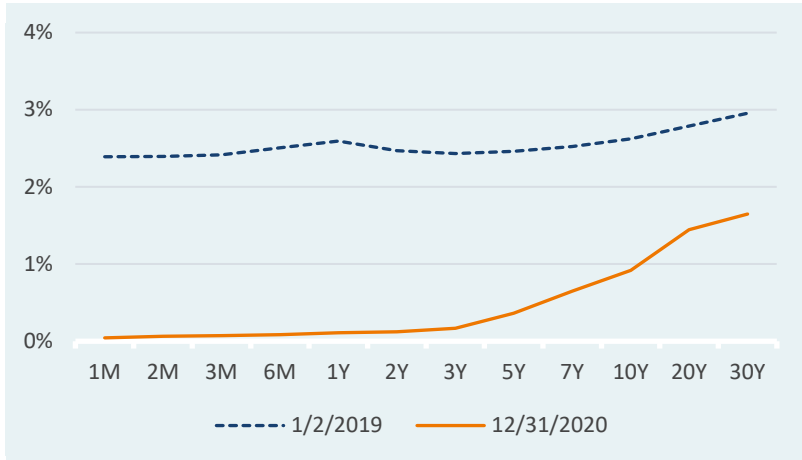
FORECAST

	10-Year Forecast
U.S. 10-Year Treasury	+0.7%
Inflation Forecast	-2.0%
Real Return	-1.3%

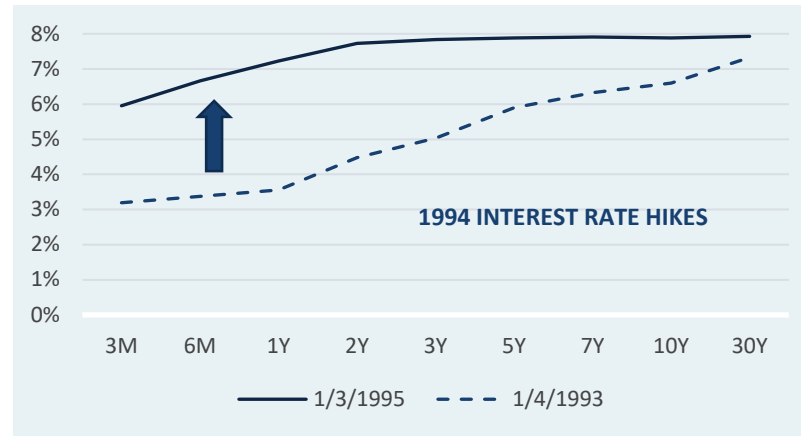
Source: Verus, as of 9/30/20

Interest rates

JANUARY 2019 TO DECEMBER 2020



JANUARY 1993 TO JANUARY 1995

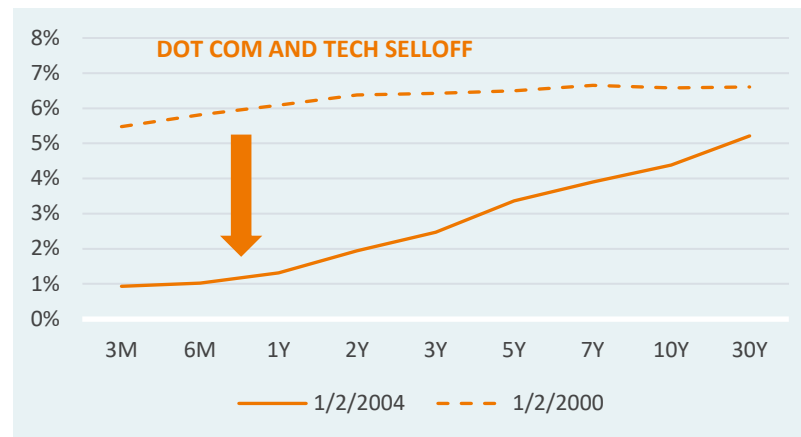


The anchor or ballast potential of fixed income has decreased due to low rates.

JANUARY 2007 – JANUARY 2009



JANUARY 2000 TO JANUARY 2004



Source: FRED

Real rates

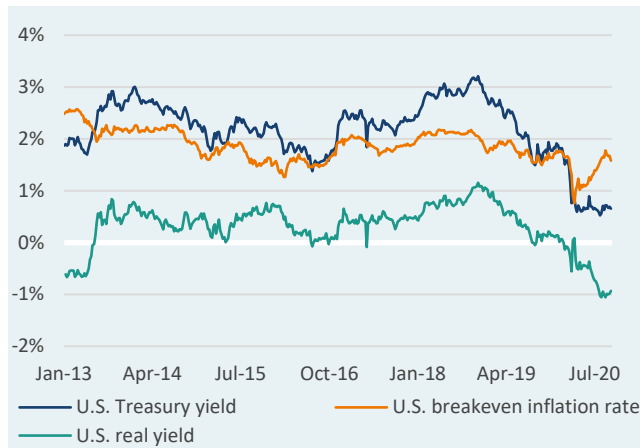
TIPS provide high sensitivity to duration (interest rate risk) over short periods and track inflation (CPI) fairly well over longer periods. Changing inflation expectations, demand for inflation protection, and rate movements contribute to the price volatility of TIPS. Currently, future inflation is expected to be mild, there is low demand for inflation protection, and interest rates arguably cannot move much lower.

The U.S. 10-year real yield fell into deeply negative territory in 2020, along with falling interest rates. While inflation expectations bounced

back in Q3 to prior levels, interest rates have stayed depressed. The breakeven inflation rate bottomed at 0.5% in March, but recovered to 1.64% in the third quarter.

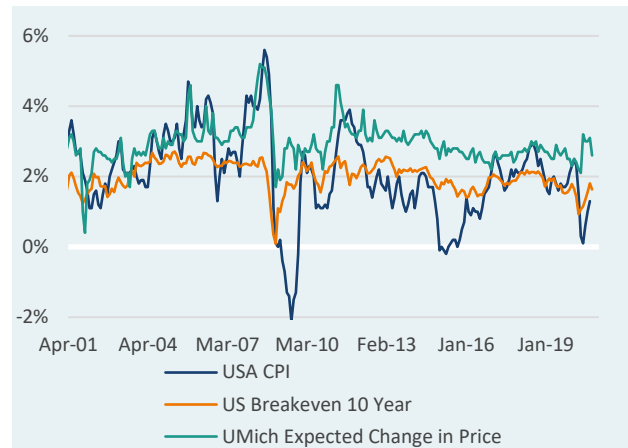
To arrive at a nominal 10-year forecast, we add the current real TIPS yield to our 10-year inflation forecast. Our real rates forecast fell into deeply negative territory from 0.14% to -0.95% as nominal interest rate collapsed and inflation expectations are relatively unchanged from one year prior.

NOMINAL YIELD VS. REAL



Source: Bloomberg, as of 9/30/20

INFLATION EXPECTATIONS



Source: Bloomberg, as of 9/30/20

FORECAST

	10-Year Forecast
U.S. 10-Year TIPS Real Yield	-0.95%
Inflation Forecast	+2.00%
Nominal Return	1.05%

Source: Verus, as of 9/30/20

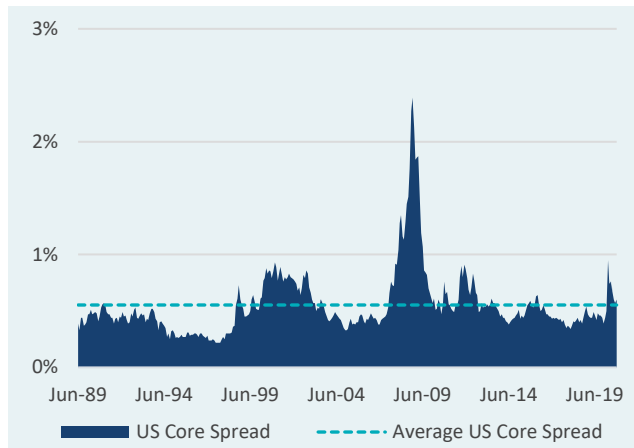
Core fixed

Credit fixed income return is composed of a bond term premium (duration) and credit spread. The bond term premium is represented by the 10-year U.S. Treasury yield.

We use default rates and credit spreads for each respective fixed income category to provide our 10-year return forecast. Our default rate assumption is derived from a variety of sources, including historical data and academic research. The effective default that is subtracted from the return forecast is based on our assumed default and recovery rates.

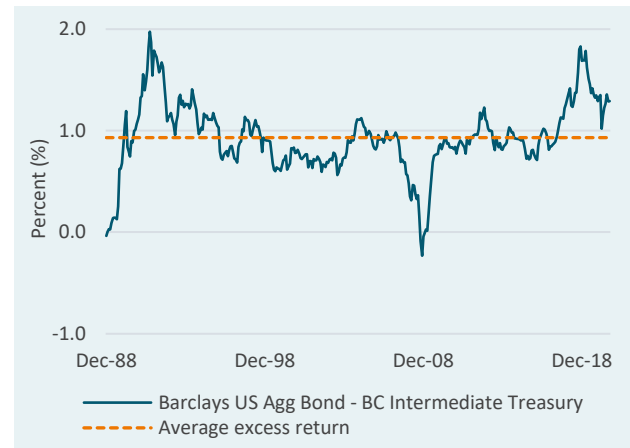
Core fixed income spreads increased from 62 bps to 90 bps over the year, but remain below the 30-year average of 1.25%. Although higher credit spreads have bolstered core fixed income expectations slightly, materially lower interest rates had a greater impact, bringing our forecast from 2.2% to 1.5%.

U.S. CORE CREDIT SPREAD



Source: Barclays, as of 9/30/20

ROLLING EXCESS RETURN (10-YR)



Source: Barclays, as of 9/30/20

FORECAST

	10-Year Forecast
Barclays U.S. Option-Adjusted Spread	+0.9%
Effective Default	-0.1%
U.S. 10-Year Treasury	+0.7%
Nominal Return	1.5%
Inflation Forecast	-2.0%
Real Return	-0.5%

Source: Verus, as of 9/30/20

Credit summary

	Core	Long-Term Credit	Global Credit	High Yield*	Bank Loans*	EM Debt (USD)	EM Debt (Local)	Private Credit	Real Estate Debt
Index	BBgBarc U.S. Aggregate	BBgBarc Long U.S. Corporate	BBgBarc Global Credit	BBgBarc U.S. High Yield	S&P LSTA	JPM EMBI	JPM GBI-EM	S&P LTSA + 1.75%	BBgBarc CMBS IG
Method	OAS + U.S. 10-Year	OAS + U.S. 10-Year	OAS + Global 10-Year Treasuries	OAS + U.S. 10-Year	LIBOR + Spread	OAS + U.S. 10-Year	Current Yield	Bank Loans+ 1.75% private premium	LIBOR + Spread
Spread to	Intermediate U.S. Treasury	Long-Term U.S. Treasury	Global Long-Term Treasuries	Intermediate U.S. Treasury	LIBOR	Intermediate U.S. Treasury	-	-	LIBOR
Default Assumption	-0.5%	-4.5%	-3.0%	-	-	-0.5%	-0.5%	-	-3.7%
Recovery Assumption	80%	95%	40%	-	-	60%	40%	-	47%
Spread	0.9%	1.7%	1.7%	5.5%	5.3%	4.7%	-	-	4.0%
Yield	-	-	-	-	-	-	4.6%	-	-
Risk Free Yield	0.7%	0.7%	0.4%	0.7%	0.2%	0.7%	-	-	0.2%
Effective Default	-0.1%	-0.2%	-1.8%	-2.8%	-2.6%	-0.2%	-0.3%	-	-2.0%
Nominal Return	1.5%	2.2%	0.3%	3.4%	2.9%	5.2%	4.3%	4.6%	2.2%
Inflation Forecast	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Real Return	-0.5%	0.2%	-1.6%	1.4%	0.9%	3.2%	2.3%	2.6%	0.2%

*We assume half of the spread of higher risk credit will be lost to defaults, as this has roughly been the case throughout history.

Source: Verus

Equities

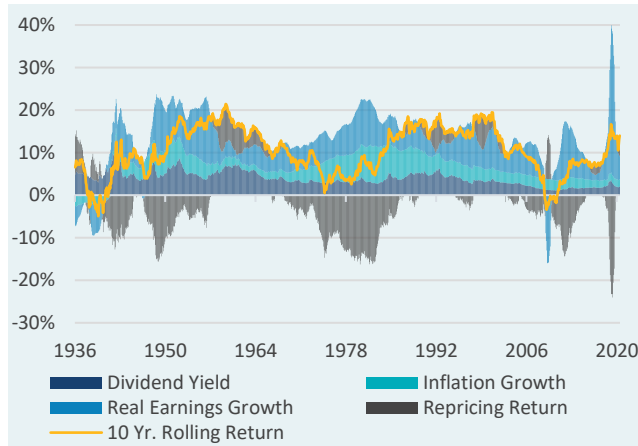
Investment returns in the equity space can be broken down into earnings growth, dividend yield, inflation, and repricing. Over the very long-term, repricing represents a small portion of return to equity investors, but over shorter time frames, the impacts on return can vary considerably.

If investors are willing to pay more for earnings, it could signal that investors are more confident in positive earnings growth going forward, while the opposite is true if investors pay less for earnings. It is somewhat surprising that investor confidence varies so much given that the long-term earnings growth is relatively stable.

Investor confidence in earnings growth can be measured using both the Shiller P/E ratio and the trailing 12-month P/E ratio. We take an average of these two valuations metrics when determining our repricing assumption. In short, if the P/E ratio is too high (low) relative to history, we expect future returns to be lower (higher) than the long-term average. Implicit in this analysis is the assumption that P/E's will exhibit mild mean reversion over 10 years.

We make a conservative repricing estimate given how widely repricing can vary over time. We then skew the repricing adjustment because the percentage change in index price is larger with each incremental rise in valuations when P/E's are low, compared to when they are high.

TRAILING 10-YR S&P 500 RETURN COMPOSITION



Source: Shiller, Standard & Poor's, as of 6/30/20

U.S. LARGE SHILLER P/E



Source: Shiller, S&P 500, as of 9/30/20

P/E REPRICING ASSUMPTION

Average P/E Percentile Bucket	Lower P/E	Upper P/E	Repricing Assumption
Lower 10%	-	10	2.00%
10% - 20%	10	13	1.50%
20% - 30%	13	15	0.75%
30% - 45%	15	18	0.50%
45% - 55%	18	19	0.0%
55% - 70%	19	21	-0.25%
70% - 80%	21	22	-0.50%
80% - 90%	22	24	-0.75%
Top 10%	24	-	-1.00%

Source: Verus

Equity summary

	U.S. Large	U.S. Small	EAFE	EAFE Small	EM
Index	S&P 500	Russell 2000	MSCI EAFE Large	MSCI EAFE Small	MSCI EM
Method	Building Block Approach: current dividend yield + historical average real earnings growth + inflation on earnings + repricing				
Current Shiller P/E Ratio	30.8	43.1	17.0	-	11.2
Regular P/E Ratio	26.0	13,764**	34.6	28.6	20.1
2020 Shiller P/E Change	+6.2%	-4.4%	-2.9%	-	+6.7%
2020 Regular P/E Change	+33.3%	+33,571%	+207.1%	+53%	+51.1%
Current Shiller P/E Percentile Rank	86%	91%	32%	-	34%
Current Regular P/E Percentile Rank	94%	100%	97%	63%*	93%
Average of P/E Methods' Percentile Rank	90%	95%	64%	63%*	63%
2020 YTD Return	5.6%	-8.7%	-7.1%	-4.2%	-1.2%
Shiller PE History	1982	1988	1982	Not Enough History	2005
Long-Term Average Shiller P/E	23.1	31.4	22.4	-	14.8
Current Dividend Yield	1.8%	1.3%	2.8%	2.3%	2.3%
Long-Term Average Real Earnings Growth	2.4%	2.9%	1.8%	1.6%	1.4%
Inflation on Earnings	2.0%	2.0%	0.8%	0.8%	2.0%
Repricing Effect (Estimate)	-1.0%	-1.0%	-0.3%	-0.3%	-0.3%
Nominal Return	5.1%	5.2%	5.2%	4.4%	5.4%
Inflation Forecast	2.0%	2.0%	0.8%	0.8%	2.0%
Real Return	3.1%	3.2%	4.4%	3.6%	3.4%

Data as of 9/30/20

*Average trailing P/E from previous 12 months is used

**Earnings have fallen to nearly zero, which is the cause of this extremely high figure (the denominator of the Price/Earnings equation is nearly zero)

NOTE: For all equities, we exclude data prior to 1972, which allows for a more appropriate comparison between data sets

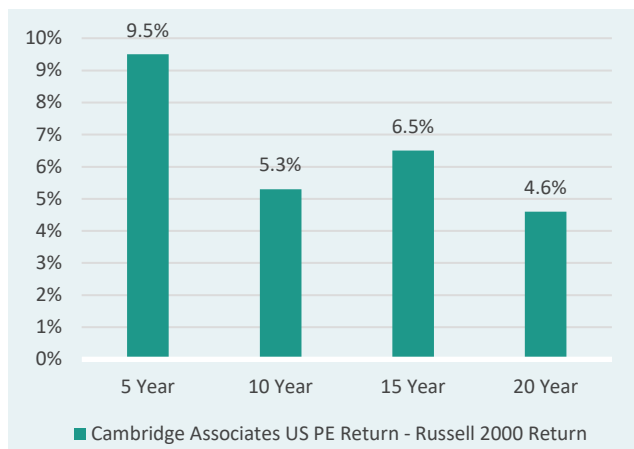
Private equity

Private equity and public equity returns have been correlated historically because the underlying economic forces driving these asset class returns are quite similar. The return relationship between the two can vary in the short-term, but over the long-term investors have received a premium, driven by leverage, concentrated factor exposure (smaller and undervalued companies), skill, and possibly illiquidity.

Historically, the beta of private equity relative to public equities has been high. We use a beta assumption of 1.85 to U.S. large cap equities in our capital market forecast.

Private equity performance typically differs based on the implementation approach. We provide a 10-year forecast for the entire private equity universe of 9.3%. Direct private equity programs have historically outperformed the broader universe by approximately 1.0%, and we forecast direct private equity accordingly with a forecast of 10.3%. Private equity fund-of-fund (FoF) programs have historically lagged the universe by 1.0%, and we forecast private equity fund-of-funds at 8.3% to reflect this drag.

PRIVATE EQUITY EXCESS RETURN (PE – U.S. SMALL CAP EQUITY)



Source: Cambridge, Russell, as of 3/31/20

PRIVATE EQUITY IMPLEMENTATION FORECASTS

	10-Year Forecast
Private Equity Universe Forecast	9.3%
Private Equity FoF Forecast	8.3%
Private Equity Direct Forecast	10.3%

Source: Verus, as of 9/30/20

PRIVATE EQUITY UNIVERSE FORECAST

	10-Year Forecast
U.S. Large Cap Forecast	+5.1%
1.85 Beta Multiplier	+4.2%
Nominal Return	9.3%
Inflation Forecast	-2.0%
Real Return	7.3%

Source: Verus, as of 9/30/20

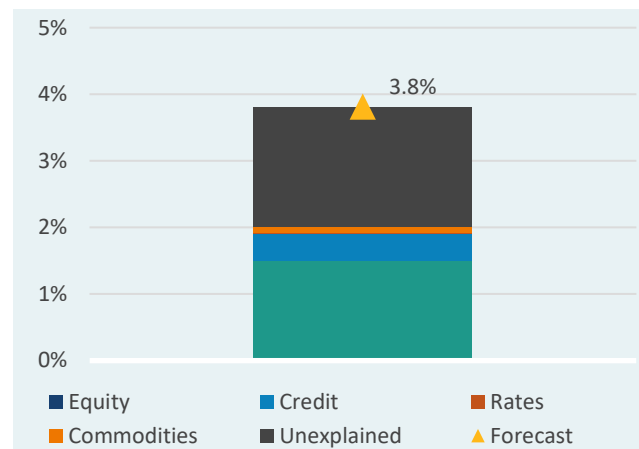
Hedge funds

Hedge fund performance variation through time can be partly explained by public market betas (ex: equity, rates, credit, etc.) and partly explained by non-public sources of return (ex: alternative betas, skill, luck). Certain hedge funds can be mostly explained by public market betas, while others are driven mostly by non-public sources of return. We do not believe hedge funds should be thought of as an asset class, and in most cases we recommend benchmarking and modeling individual hedge funds in line with the underlying asset class exposure set (equity hedge funds modeled as equity exposure, fixed income hedge funds modeled as fixed income exposure, etc.) Our forecast for “hedge funds” that we show here can be thought of as a forecast of the broad universe of hedge funds.

To forecast hedge fund returns, we identified the portion of historical hedge fund performance that can be attributed to public market betas, and the portion of hedge fund returns that cannot be attributed to public market beta. This means our forecast has two components: the public market return (explained return) and the non-public market return (unexplained return).

To forecast the public market beta portion of hedge funds, we take the historical sensitivity of hedge funds to equity, rates, credit, and commodities and pair these with our current 10-year public market forecasts for each asset class. To forecast the non-public market return portion of hedge funds (unexplained return) we simply assume the historical performance contribution of these sources will continue.

HEDGE FUND FORECAST



Source: Verus, as of 9/30/20

HEDGE FUND PUBLIC MARKET SOURCES OF RETURN (EXPLAINED RETURN)

Equity
Rates
Credit
Commodities

HEDGE FUND NON-PUBLIC SOURCES OF RETURN (UNEXPLAINED RETURN)

Alternative betas
Skill
Luck

Source: Verus

FORECAST

	10-Year Forecast
Public Market % of Return	+2.0%
Non-Public Market % of Return	+1.8%
Nominal Return	+3.8%
Inflation Forecast	-2.0%
Real Return	+1.8%

Source: Verus, as of 9/30/20

Private core real estate/REITS

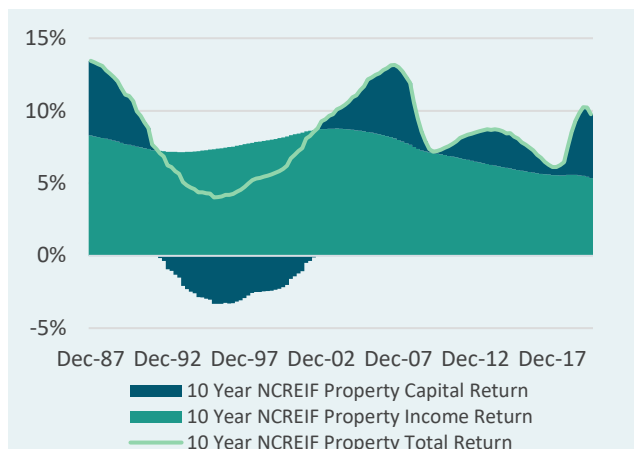
Performance of the NCREIF property index can be decomposed into an income return (cap rate) and capital return. The return coming from income has historically been more stable than the return derived from capital changes.

The cap rate is the ratio of earnings less expenses to price and does not include extraordinary expenses. A more accurate measure of the yield investors receive should include non-recurring capital expenditures; we assume a 2.0% capex expenditure. We also assume income growth will roughly equal the rate of broad economic growth, and we use GDP forecasts as an estimate for future income growth.

Private real estate and REITs have provided very similar returns over the long-term. Investors should be careful when comparing risk-adjusted returns of publicly traded assets to returns of appraisal priced assets, due to data problems and smoothing effects. While private real estate appears to be less volatile than REITs, the true risks to investors are likely very similar.

We assume the effects of leverage and liquidity offset each other. Therefore, our return forecast is the same for private real estate and REITs.

TRAILING 10-YR NCREIF RETURN COMPOSITION



Source: NCREIF, as of 6/30/20

PRIVATE REAL ESTATE

	Private Real Estate 10-Year Forecast
Current Cap Rate	+4.1%
Real Income Growth	+1.7%
Capex Assumption	-2.0%
Inflation	+2.0%
Nominal Return	5.8%
Inflation Forecast	-2.0%
Real Return	3.8%

Source: Verus, as of 9/30/20

REITS

	10-Year Forecast
Nominal Return Forecast	5.8%
Inflation Forecast	-2.0%
Real Return	3.8%

Source: Verus, as of 9/30/20

Value-add & opportunistic real estate

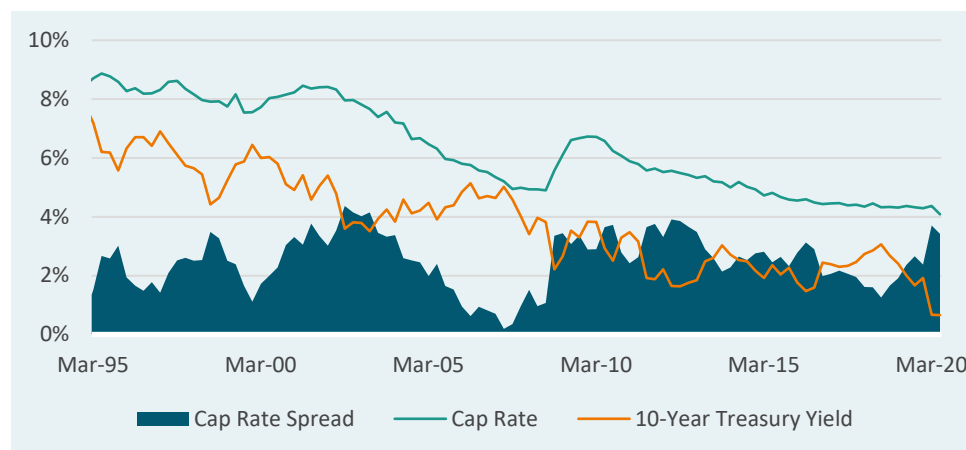
Value-add real estate includes properties which are in need of renovation, repositioning, and/or lease-up. Properties may also be classified as value-add due to their lower quality and/or location. Opportunistic real estate can also include development and distressed or very complex transactions. Greater amounts of leverage are usually employed within these strategies. Leverage increases beta (risk) by expanding the purchasing power of property managers via a greater debt load, which magnifies gains or losses. Increased debt also results in greater interest rate sensitivity. An increase/decrease in interest rates may result in a write-up/write-down of fixed rate debt, since debt holdings are typically marked-to-market.

Performance of value-add real estate is composed of the underlying private

real estate market returns, plus a premium for additional associated risk, which is modeled here as 200 bps above our core real estate return forecast. Performance of opportunistic real estate strategies rests further out on the risk spectrum, and is modeled as 400 bps above the core real estate return forecast.

Additional expected returns above core real estate are justified by the higher inherent risk of properties which need improvement (operational or physical), price discounts built into properties located in non-core markets, illiquidity, and the ability of real estate managers to potentially source attractive deals in this less-than-efficient marketplace.

CAP RATE SPREADS



Source: NCREIF, Bloomberg, as of 6/30/20

FORECAST

	Value-Add 10-Year Forecast	Opportunistic 10-Year Forecast
Premium above core	+2.0%	+4.0%
Current Cap Rate	+4.1%	+4.1%
Real Income Growth	+1.7%	+1.7%
Capex Assumption	-2.0%	-2.0%
Inflation	+2.0%	+2.0%
Nominal Return	7.8%	9.8%
Inflation Forecast	-2.0%	-2.0%
Real Return	5.8%	7.8%

Source: Verus, as of 9/30/20

Infrastructure

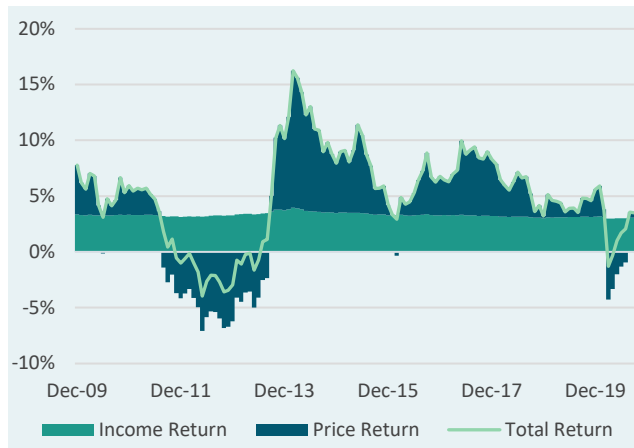
Infrastructure includes a variety of investment types across a subset of industries. There is not one definition for what can be included within infrastructure. The asset class has grown dramatically during the last decade as investors sought assets that might provide more attractive yield relative to fixed income along with the potential for inflation protection.

Similar to real estate investment, income plays a significant role in the returns which investors receive. Income yields are currently lower than average due to higher prices and competition in the space, which

might reasonably be expected to translate into lower expected future returns.

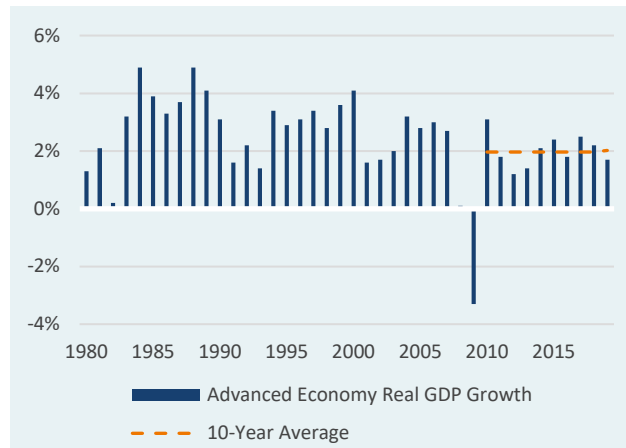
Due to the discount rate effect, infrastructure asset valuations would generally be negatively affected by material increases in interest rates. Because leverage is used in this space, higher interest rates would also impact investors in the form of higher borrowing costs.

5-YR ROLLING RETURN COMPOSITION



Source: S&P Global Infrastructure Index, as of 9/30/20

ADVANCED ECONOMY REAL GDP GROWTH



Source: IMF, as of 9/30/20

FORECAST

	10-Year Forecast
Inflation	1.7%
Yield	4.1%
Income Growth	2.0%
Nominal Return	7.8%
Global Inflation Forecast	-1.7%
Real Return	6.2%

Source: Verus, as of 9/30/20

Commodities

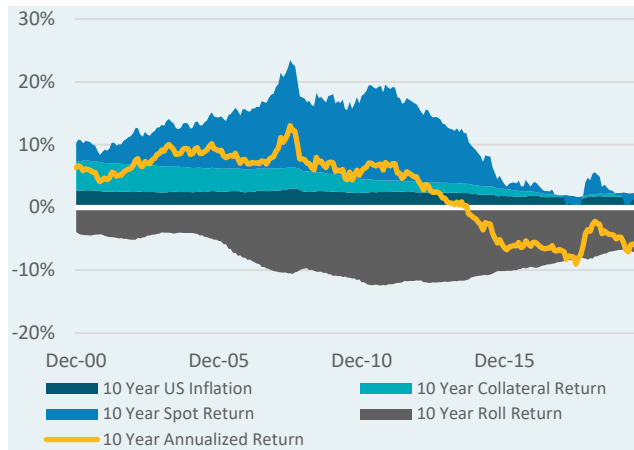
Commodity returns can be decomposed into three sources: collateral return (cash), spot changes (inflation), and roll yield.

Roll return is generated by either backwardation or contango present in futures markets. Backwardation occurs when the futures price is below the spot price, which results in positive yield. Contango occurs when the futures price is above the spot price, and this results in a loss to commodity investors. Historically, futures markets have fluctuated between backwardation and contango but with a net-zero effect over the very long-term (since 1877). Therefore, roll return is assumed to

be zero in our forecast. Over the most recent 10-year period, roll return has been negative, though this is likely the result of multiple commodity crises and a difficult market environment.

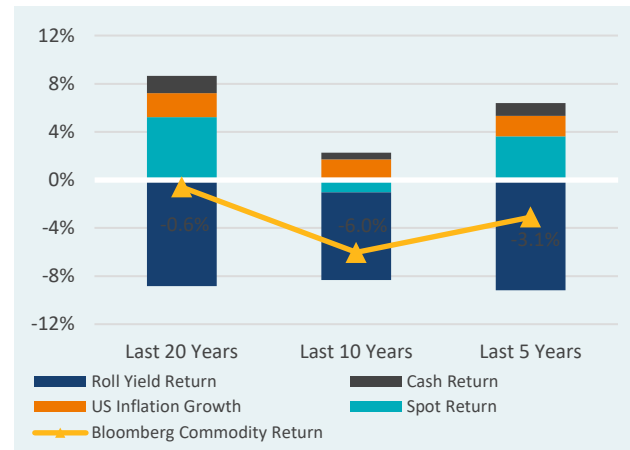
Our 10-year commodity forecast combines collateral (cash) return with spot return (inflation) to arrive at the nominal return, and subtracts out inflation to arrive at the real return.

TRAILING 10YR BLOOMBERG COMMODITY RETURN COMPOSITION (%)



Source: MPI, Bloomberg, as of 9/30/20

BLOOMBERG COMMODITY RETURN COMPOSITION (%)



Source: MPI, Bloomberg, as of 9/30/20

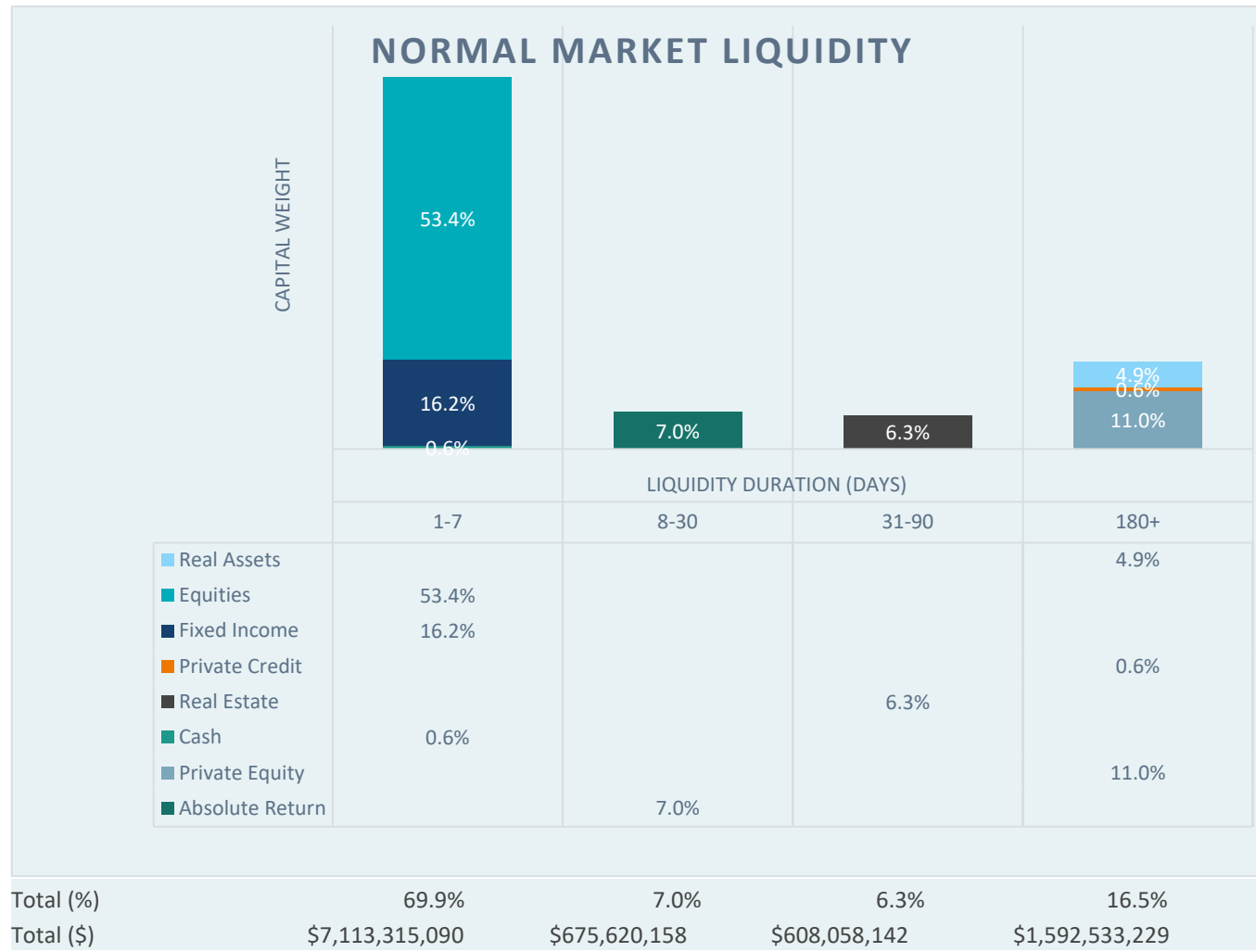
FORECAST

	10-Year Forecast
Collateral Return (Cash)	+0.2%
Roll Return	+0.0%
Spot Return (Inflation)	+2.0%
Nominal Return	2.2%
Inflation Forecast	-2.0%
Real Return	0.2%

Source: Verus, as of 9/30/20

Liquidity – More Privates

NORMAL MARKET LIQUIDITY



70% of ACERA' portfolio can be converted to cash within 1-7 days in a normal market environment

Around 16.5% of ACERA' assets would be considered mostly or completely illiquid

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