MercedCERA RETIREMENT BOARD INVESTMENT MEETING AGENDA
THURSDAY, APRIL 22, 2021
MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
TELEPHONE NUMBER: 1-310-372-7549, CONFERENCE CODE: 975839
ALTERNATE CONFERENCE CALL IN NUMBER (FOR USE ONLY IF PRIMARY NUMBER MALFUNCTIONS): 669-900-6833, Meeting ID: 930 3019 5748, Passcode: 095484

CALL TO ORDER: 8:15 A.M.

Important Notice Regarding SARS-COV-2

Based on guidance from the California Department of Public Health and the California Governor's Office, in order to minimize the spread of the SARS-COV-2 virus, MercedCERA's building will be closed to the public during MercedCERA Board meetings. Members of the MercedCERA Board will participate in this meeting offsite via conference call. Members of the public may listen to the meeting and offer public comment telephonically by calling into the telephone number provided above and entering the stated conference code. If you have any issues participating in the meeting telephonically or require reasonable accommodation for your participation, please contact MercedCERA staff at 209-726-2724. Please turn your cell phone or other electronic device to non-audible mode.

ROLL CALL

APPROVAL OF MINUTES: April 8, 2021

PUBLIC COMMENT
Members of the public may comment on any item under the Board's jurisdiction. Matters presented under this item will not be discussed or acted upon by the Board at this time. For agenda items, the public may make comments at the time the item comes up for Board consideration. Persons addressing the Board will be limited to a maximum of five (5) minutes in total. Please state your name for the record.

CLOSED SESSION
As provided in the Ralph M. Brown Act, Government Code sections 54950 et seq., the Board may meet in closed session with members of its staff, county employees and its attorneys. These sessions are not open to the public and may not be attended by members of the public. The matters the Board will meet on in closed session are identified below. Any public reports of action taken in the closed session will be made in accordance with Government Code sections 54957.1.

(1) **DISCUSSION AND POSSIBLE ACTION REGARDING INVESTMENTS IN RECOMMENDED FUNDS, ROLL CALL VOTE REQUIRED.**
(Govt. Code § 54956.81)
1. Discussion and possible action to adopt the recommendation regarding Funds/Managers – Cliffwater.

RETURN TO OPEN SESSION
Report on any action taken in closed session.

REGULAR CALENDAR

BOARD ACTION[1]/DISCUSSION

Pursuant to Govt. Code § 31594 and MercedCERA's Investment Objectives & Policy Statement due diligence analysis requirement:

1. Discussion and possible action on quarterly performance and any managers and/or funds – Cliffwater.
2. Discussion and possible action regarding March monthly performance and any managers and/or funds – Meketa Group.
3. Presentation of '2021 Capital Markets Assumptions' for Meketa – Meketa Group.
4. Discussion and possible action to adopt new Superior Courts of Merced County Pay Code 'SPS' used for COVID Supplemental Paid Sick Leave as a pensionable pay code – Staff.
5. Review calendar of any training sessions and authorize expenditures for Trustees and Plan Administrator. Pursuant to Govt. Code § 31522.8 and MercedCERA's Trustees Education and Training Policy requirements. Examples of upcoming training and educational sessions:
    - SACRS Spring Conference, May 11-14, 2021 (virtual conference).
    - CALAPRS Trustee Roundtable, May 10, 2021 (virtual conference).
    - CALAPRS Advanced Principles of Pension Governance for Trustees, June 7, 9, 11, 2021.
    - SACRS/UC Berkeley Public Pension Investment Management Program, July 13-22, 2021 (virtual conference).
    - SACRS Fall Conference, November 9-12, 2021 (in person/virtual conference TBD).

INFORMATION ONLY

MercedCERA UPCOMING BOARD MEETINGS:

Please note: The MercedCERA Board Meeting and/or Education Day times and dates may be changed in accordance with the Ralph M. Brown Act by the MercedCERA Board as required.

- May 13, 2021
- May 27, 2021

ADJOURNMENT

All supporting documentation is available for public review in the office of the Merced County Employees' Retirement Association, 3199 M Street, Merced, California, 95348 during regular business hours, 8:00 a.m. – 5:00 p.m., Monday through Friday.

The Agenda is available online at www.co.merced.ca.us/retirement

Any material related to an item on this Agenda submitted to the Merced County Employees' Retirement Association, after distribution of the Agenda packet is available for public inspection in the office of the Merced County Employees' Retirement Association.

Persons who require accommodation for a disability in order to review an agenda, or to participate in a meeting of the Merced County Employees' Retirement Association per the American Disabilities Act (ADA), may obtain assistance by requesting such accommodation in writing addressed to Merced County Employees' Association, 3199 M Street, Merced, CA 95348 or telephonically by calling (209)

[1] "Action" means that the Board may dispose of any item by any action, including but not limited to the following acts: approve, disapprove, authorize, modify, defer, table, take no action, or receive and file

726-2724. Any such request for accommodation should be made at least 48 hours prior to the scheduled meeting for which assistance is requested.

MercedCERA ADMINISTRATIVE & INVESTMENT RETIREMENT BOARD
MEETING MINUTES
THURSDAY, APRIL 08, 2021
MERCED COUNTY EMPLOYEES' RETIREMENT ASSOCIATION
TELEPHONE NUMBER: 1-310-372-7549, CONFERENCE CODE: 975839
ALTERNATE CONFERENCE CALL IN NUMBER (FOR USE ONLY IF PRIMARY NUMBER MALFUNCTIONS): 669-900-6833, Meeting ID: 930 3019 5748, Passcode: 095484

CALL TO ORDER: 8:15 A.M.
Board members present: Ryan Paskin, Al Peterson, Scott Johnston, Janey Cabral, Wendy Alvares, Scott Silveira, Aaron Rosenberg and David Ness. ***Absent:*** Karen Adams, Kalisa Rochester. ***Counsel:*** Jeff Grant. ***Staff:*** Kristie Santos, Mark Harman, Martha Sanchez, Ninebra Maryoonani, Alexis Curry, Sheri Villagrana and Brenda Mojica.

APPROVAL OF MINUTES – March 11, 2021 and March 30, 2021.
The MercedCERA Board voted unanimously via roll call vote to approve the March 11, 2021 and March 30, 2021 meeting minutes.
Silveira/Johnston U/A (8-0)

PUBLIC COMMENT

No Comments.

CONSENT CALENDAR
Consent matters are expected to be routine and may be acted upon, without discussion, as one unit. If an item is taken off the Consent Calendar for discussion, it will be heard as the last item(s) of the Board Action/Discussion as appropriate.

RETIREMENTS: Pursuant to Govt. Code § 31663.25 or § 31672
All items of earnable compensation for service or disability retirements listed below are in compliance with the pay code schedule approved by the Board of Retirement. The retirement is authorized; however, administrative adjustments may be necessary to alter the amount due to: audit, late arrival of data, court order, etc.

a. Behrens, Dennis	Court Operations	9 Yrs. Svc.	Eff. 03/14/2021
b. Goins, Jason	Sheriff	27 Yrs. Svc.	Eff. 03/27/2021
c. Gallichio, Rebecca	Beh. Health	9 Yrs. Svc.	Eff. 03/12/2021
d. Shaw, Stephen	Environ. Health	2 Yrs. Svc.	Eff. 03/27/2021
e. Sotelo, Marina	Admin Svcs.	35 Yrs. Svc.	Eff. 04/01/2021
f. Davis, Sandra	Child Support	17 Yrs. Svc.	Eff. 03/27/2021
g. Wagner, Nicole	Sheriff	15 Yrs. Svc.	Eff. 03/27/2021
h. Liu, Hefeng	Admin Services	21 Yrs. Svc.	~~Eff. 03/01/2021~~ Eff. 02/27/2021

YTD fiscal year 2020/2021 retirees: 67
YTD fiscal year 2019/2020 retirees: 104
YTD fiscal year 2018/2019 retirees: 103

REFUND OF SERVICE PURCHASE: None
DEATH BENEFIT: None

QUARTERLY & MONTHLY BUDGET REPORT: Submitted.

The MercedCERA Board voted unanimously via roll call vote to approve the consent calendar.
Johnston/ Cabral U/A (8-0)

BOARD ACTION[1]/DISCUSSION

Pursuant to Govt. Code § 31594 and MercedCERA's Investment Objectives & Policy Statement due diligence analysis requirement:

1. Discussion and possible action regarding February monthly performance and any action on managers and/or funds – Meketa Group.
   No action taken.
2. Appointment by the Board Chair to the Investment Subcommittee – Chair.
   The MercedCERA Board Chair appointed Trustee Johnston to the Investment Subcommittee. Trustees on the Investment Subcommittee: Paskin, Adams, Ness and Johnston.
3. Appointment by the Board Chair to Ad Hoc Budget Subcommittee and removal of Trustee Adams from the Ad Hoc Budget Subcommittee – Chair.
   The MercedCERA Board Chair appointed Trustee Silveira to the Ad Hoc Budget Subcommittee. Trustees on the Ad Hoc Budget Subcommittee: Cabral, Johnston and Silveira. Trustee Adams was not available to participate in the Ad Hoc Budget Subcommittee.
4. Discussion and possible action to adopt new Merced County Pay Code 3064 used for COVID Supplemental Paid Sick Leave as a pensionable pay code – Staff.
   The MercedCERA Board voted unanimously via roll call vote to approve staff's recommendation to adopt the new Merced County pay code 3064 as a pensionable pay code.
   Silveira/Cabral U/A (8-0)
5. Discussion and possible action to appoint Plan Administrator as the SACRS Voting Delegate and take action on the potential candidates for SACRS Board of Directors and business packet – Staff.
   The MercedCERA Board voted unanimously via roll call vote to appoint the Plan Administrator as the SACRS Voting Delegate and voted to accept the SACRS business packet and approve the recommended candidates for SACRS Board of Directors.
   Cabral/Silveira U/A (8-0)
6. Review calendar of any training sessions and authorize expenditures for Trustees and Plan Administrator. Pursuant to Govt. Code § 31522.8 and MercedCERA's Trustees Education and Training Policy requirements. Examples of upcoming training and educational sessions:
   - SACRS Spring Conference, May 11-14, 2021 (virtual conference).
   - CALAPRS Trustee Roundtable, May 10, 2021 (virtual conference).
   - SACRS/UC Berkeley Public Pension Investment Management Program, July 13, 14, 15, 20, 21, 22, 2021 (virtual conference).
   - SACRS Fall Conference, November 9-12, 2021 (in person/virtual conference TBD).

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The MercedCERA Board voted unanimously via roll call vote to approve the following;

- **Plan Administrator to attend the SACRS Spring Conference, May 11-14, 2021.**
- **Trustees Cabral, Alvares and Rosenberg to attend the CALAPRS Trustee Roundtable, May 28, 2021.**
- **Chair Paskin to attend the SACRS/UC Berkeley Public Pension Investment Manager Program, July 18-21, 2021.**

Silveira/Johnston U/A (8-0)

INFORMATION ONLY

- **Trustee Peterson: Have a great day.**
- **There is an Investment Subcommittee meeting immediately following this meeting on this conference line, which is open to the public.**

ADJOURNMENT

The meeting adjourned at 8:53 AM

Respectfully submitted,

_____
Ryan Paskin, Chair

_____
Al Peterson, Secretary

_____
Date

All supporting documentation is available for public review at **www.co.merced.ca.us/retirement**

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CLIFFWATER LLC

INVESTMENT ADVISORY SERVICES

Los Angeles • New York

Alternative Investment Performance

Merced County Employees' Retirement Association

April 22, 2021

MCERA Private Equity Capital Budget & Implementation Plan

15% fund level target

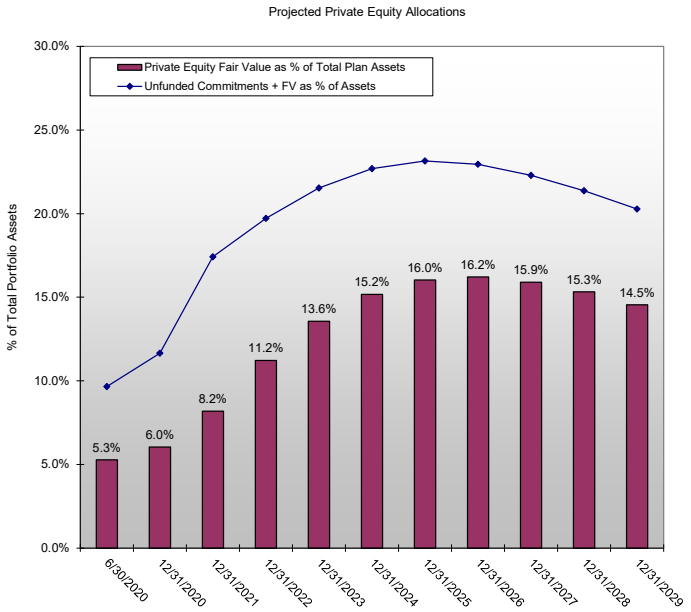
- Annual capital budget target of $40 million, range of $30-$50 million
- Target 4-7 investments, range of $5-$15 million per inv; average size of $8 million per

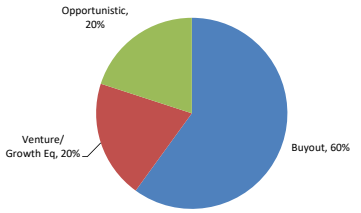
Performance comparisons:

- *Long term investment objective:* Earn a return premium over public equity (Russell 3000 + 3%)
- *Recommended primary asset class benchmark:* Cambridge Associates Global Private Equity & VC Index
- *Recommended fund benchmarks*: Each fund will be compared to the Cambridge Associates strategy universe for the respective vintage years and each vintage year will be compared to Cambridge Associates Global Private Equity & VC Index

MCERA CY 2020 commitments:

- *Summit Ventures V* – venture (VY 2020), $6 mm
- *Silver Point Sp Credit II* – corporate debt (VY 2019), $8 mm
- *Thoma Bravo Discover III* – tech buyout (VY 2020), $8 mm
- *Marlin Heritage Europe II* – European control buyout (VY 2020), €7 mm
- *Taconic Mkt Dislocation II*– distressed (VY 2020), $8 mm
- *Khosla VI & Seed D* – venture (VY 2021), $8 mm
- *GTCR XIII* – buyout (VY 2021), $8 mm
- *TCV XI* – venture (VY 2021), $8 mm





	Target	Ranges
Buyout	60%	40-80%
Venture/Growth Eq	20%	10-30%
Opportunistic	20%	10-30%
	100%	

Note: MCERA's existing private equity portfolio was modeled using vintage year drawdown/return of capital assumptions patterned after historical category averages. Total fund growth of 5.5%.

MCERA Private Equity Investment Structure & Portfolio Assessment

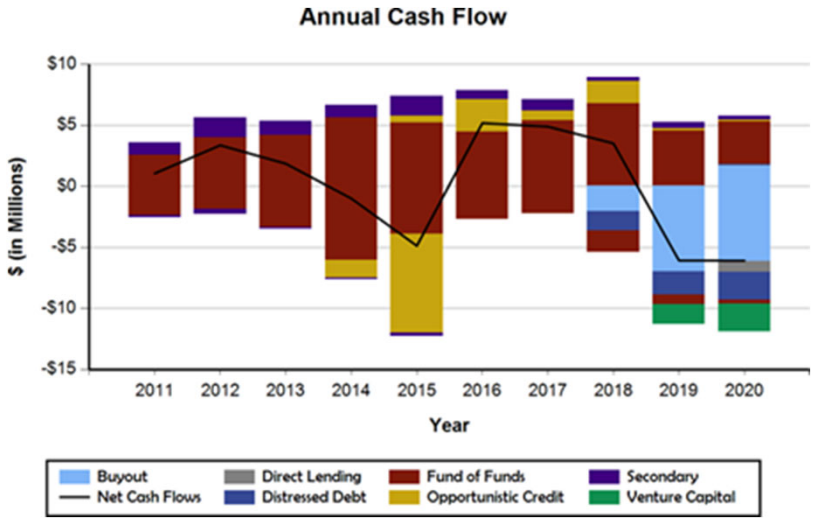
Investment structure (15% fund target; 5.8% invested as of Dec 2020):

- Current portfolio is barbelled with half of commitments in 2007 & earlier FoFs and half in 2011 & later FoFs
  - Overall portfolio has not met performance expectations; 2011 & later portfolio is still in development with the funds in VY 2017-2020 in their investment period
  - Continued rebound in 3Q valuations offsetting the 1Q20 markdowns and there were annual gains of $8 million; contributions exceed distributions by $9 million as the newer portfolios are being built
  - Portfolio is diversified by strategy but overall it is in a negative cash flow situation

Annual Summary

(in thousands)

	Total Partnerships	Total Commitments	(A) Contributions	(B) Distributions	(C) Fair Value	(B+C) Total Value	(B+C-A) Gain/ Loss	Net IRR	Benchmark
September 30, 2019	30	$130,864	$71,521	$60,399	$43,569	$103,967	$32,447	8.51%	11.32%
September 30, 2020	36	$179,269	$87,792	$67,499	$60,629	$128,128	$40,336	9.05%	11.79%
Annual Change	6	$48,405	$16,271	$7,100	$17,060	$24,161	$7,889		



Note: Net cash flow is the for the respective calendar year.

MCERA Private Equity Performance – as of Sep 30, 2020

Partnership Name ($000)	Strategy	(A) Commit. Amount	Unfund. Amount	(B) Cumulat. Cont.	% Drawn	(C) Cumulat. Dist.	(D) Fair Value	(C+D) Total Value	(C+D-B) Gain/ Loss	Net IRR	IRR Bench.	TVPI
Vintage Year 2004												
Invesco Partnership Fund IV, L.P.	Fund of Funds	10,000	2,417	7,898	76%	16,195	40	16,235	8,337	11.75%	7.00%	2.06
Vintage Year 2004 Total		10,000	2,417	7,898	76%	16,195	40	16,235	8,337	11.75%	7.66%	2.06
Vintage Year 2005												
ASP 2005 Non-US Fund	Fund of Funds	1,500	74	1,426	95%	1,670	272	1,942	516	4.69%	4.10%	1.36
ASP 2005 US Fund	Fund of Funds	3,500	177	3,323	95%	4,588	645	5,234	1,910	6.98%	8.17%	1.57
Pantheon Ventures Euro Fund IV	Fund of Funds	1,173	50	1,283	96%	1,584	78	1,663	379	4.56%	4.10%	1.30
Pantheon Ventures USA Fund VI	Fund of Funds	3,750	206	3,544	95%	5,104	279	5,383	1,839	6.51%	8.17%	1.52
Vintage Year 2005 Total		9,923	507	9,576	95%	12,946	1,275	14,221	4,645	6.19%	7.91%	1.49
Vintage Year 2006												
Pantheon Global Secondary Fund III "B"	Secondary	10,000	540	9,460	95%	10,200	380	10,580	1,120	2.00%	N/A	1.12
Vintage Year 2006 Total		10,000	540	9,460	95%	10,200	380	10,580	1,120	2.00%	7.00%	1.12
Vintage Year 2007												
ASP 2007 Direct Fund	Fund of Funds	450	12	438	97%	863	212	1,076	637	12.18%	11.15%	2.45
ASP 2007 Non-US Fund	Fund of Funds	1,575	78	1,497	95%	1,734	675	2,409	912	7.96%	7.81%	1.61
ASP 2007 US Fund	Fund of Funds	2,475	115	2,360	95%	3,525	1,015	4,540	2,180	11.95%	11.15%	1.92
Vintage Year 2007 Total		4,500	205	4,295	95%	6,123	1,902	8,025	3,730	10.72%	8.89%	1.87
Vintage Year 2011												
ASP 2011 Direct Fund	Fund of Funds	500	37	463	93%	524	396	920	457	15.16%	18.27%	1.99
ASP 2011 Emerging Markets Fund	Fund of Funds	500	64	436	87%	222	679	901	465	14.21%	11.36%	2.07
ASP 2011 Non-US Developed Fund	Fund of Funds	1,500	322	1,178	79%	1,045	1,072	2,117	938	13.54%	11.36%	1.80
ASP 2011 US Fund	Fund of Funds	2,500	326	2,175	87%	1,987	2,300	4,286	2,112	15.60%	18.27%	1.97
Pantheon Asia Fund VI	Fund of Funds	1,000	95	906	91%	468	992	1,460	554	10.20%	11.36%	1.61
Pantheon Euro Fund VII	Fund of Funds	1,636	218	1,493	87%	1,185	1,297	2,482	990	11.01%	11.36%	1.66
Pantheon Ventures USA Fund IX	Fund of Funds	2,000	212	1,788	89%	1,582	2,034	3,616	1,828	15.30%	18.27%	2.02
Vintage Year 2011 Total		9,636	1,274	8,438	87%	7,012	8,769	15,781	7,343	13.81%	14.30%	1.87
Vintage Year 2013												
Invesco Partnership Fund VI, L.P.	Fund of Funds	5,000	1,548	3,958	69%	1,633	7,580	9,213	5,254	17.94%	19.55%	2.33
Vintage Year 2013 Total		5,000	1,548	3,958	69%	1,633	7,580	9,213	5,254	17.94%	13.08%	2.33
Vintage Year 2014												
Ocean Avenue Fund II	Fund of Funds	10,000	1,000	9,000	90%	5,347	10,058	15,405	6,405	14.88%	19.40%	1.71
Raven Asset-Based Opportunity Fund II	Opportunistic Credit	10,000	474	9,526	95%	6,159	2,621	8,780	-746	-2.52%	6.69%	0.92
Vintage Year 2014 Total		20,000	1,474	18,526	93%	11,506	12,679	24,185	5,659	7.54%	17.93%	1.31

Note:. The benchmark represents the Cambridge Associates LLC median for the respective strategy and vintage year. At the vintage year level, the Cambridge Associates LLC Global Private Equity & VC ® median is used for the respective vintage year.

MCERA Private Equity Performance – as of Sep 30, 2020

Partnership Name ($000)	Strategy	(A) Commit. Amount	Unfund. Amount	(B) Cumulat. Cont.	% Drawn	(C) Cumulat. Dist.	(D) Fair Value	(C+D) Total Value	(C+D-B) Gain/ Loss	Net IRR	IRR Bench.	TVPI
Vintage Year 2017												
GTCR XII	Buyout	5,000	2,045	2,955	59%	116	3,855	3,971	1,016	29.21%	17.67%	1.34
Vintage Year 2017 Total		5,000	2,045	2,955	59%	116	3,855	3,971	1,016	29.21%	16.72%	1.34
Vintage Year 2018												
Carrick Capital Partners III, L.P.	Buyout	5,000	3,190	1,810	36%	0	2,045	2,045	235	9.04%	6.97%	1.13
Cressey & Company Fund VI LP	Buyout	5,000	3,450	1,550	31%	0	1,987	1,987	437	N/M	N/M	1.28
Davidson Kempner Long-Term Distressed Opportuni	Distressed Debt	5,000	785	4,300	84%	85	4,657	4,742	442	6.50%	N/A	1.10
Vintage Year 2018 Total		15,000	7,425	7,660	50%	85	8,689	8,774	1,114	9.86%	9.50%	1.15
Vintage Year 2019												
Accel-KKR Growth Capital Partners III	Buyout	5,000	3,726	1,274	25%	0	1,251	1,251	-23	N/M	N/M	0.98
Cortec Group Fund VII, L.P.	Buyout	10,000	7,335	4,206	27%	1,543	3,085	4,627	422	N/M	N/M	1.10
Genstar Capital Partners IX, L.P.	Buyout	7,000	4,467	2,670	36%	137	3,100	3,237	567	N/M	N/M	1.21
Summit Partners Growth Equity Fund X-A, L.P.	Buyout	8,000	7,291	709	9%	0	990	990	282	N/M	N/M	1.40
TCV X, L.P.	Venture Capital	5,000	2,196	2,805	56%	0	3,686	3,686	881	N/M	N/M	1.31
Vintage Year 2019 Total		35,000	25,014	11,663	29%	1,680	12,112	13,792	2,128	N/M	N/M	1.18
Vintage Year 2020												
Accel-KKR Capital Partners VI, LP	Buyout	8,000	8,000	0	0%	0	0	0	0	N/M	N/M	0.00
Marlin Heritage Europe II, L.P.	Buyout	8,210	8,210	0	0%	0	0	0	0	N/M	N/M	0.00
Thoma Bravo Discover Fund III, L.P.	Buyout	8,000	8,000	0	0%	0	0	0	0	N/M	N/M	0.00
Silver Point Specialty Credit Fund II, L.P.	Direct Lending	8,000	7,176	842	10%	3	948	951	109	N/M	N/M	1.13
Taconic Market Dislocation Fund III L.P.	Distressed Debt	8,000	6,560	1,440	18%	0	1,440	1,440	0	N/M	N/M	1.00
Spark Capital Growth Fund III, L.P.	Venture Capital	6,000	5,190	810	14%	0	731	731	-79	N/M	N/M	0.90
Spark Capital VI, L.P.	Venture Capital	3,000	2,730	270	9%	0	229	229	-41	N/M	N/M	0.85
Summit Partners Venture Capital Fund V-A, L.P.	Venture Capital	6,000	6,000	0	0%	0	0	0	0	N/M	N/M	0.00
Vintage Year 2020 Total		55,210	51,866	3,362	6%	3	3,349	3,352	-10	N/M	N/M	1.00
Total Portfolio:		**179,269**	**94,316**	**87,792**	**47%**	**67,499**	**60,629**	**128,128**	**40,336**	**9.05%**	**11.79%**	**1.46**
Portfolio Strategy Totals												
Buyout		61,000	47,503	15,174	22%	1,796	16,313	18,109	2,935	22.62%		
Direct Lending		8,000	7,176	842	10%	3	948	951	109	11.75%		
Distressed Debt		13,000	7,345	5,740	43%	85	6,097	6,182	442	6.30%		
Fund of Funds		40,175	6,051	34,947	85%	41,348	24,559	65,906	30,960	11.52%		
Non-US		17,094	9,111	8,219	47%	7,908	5,065	12,973	4,754	8.02%		
Opportunistic Credit		10,000	474	9,526	95%	6,159	2,621	8,780	-746	-2.52%		
Secondary		10,000	540	9,460	95%	10,200	380	10,580	1,120	2.00%		
Venture Capital		20,000	16,116	3,885	19%	0	4,646	4,646	762	N/M		
Total Portfolio:		**179,269**	**94,316**	**87,792**	**47%**	**67,499**	**60,629**	**128,128**	**40,336**	**9.05%**	**11.79%**	

Note:. The benchmark represents the Cambridge Associates LLC median for the respective strategy and vintage year. At the vintage year level, the Cambridge Associates LLC Global Private Equity & VC ® median is used for the respective vintage year.

MCERA Real Estate Capital Budget & Implementation Plan

8% fund level target

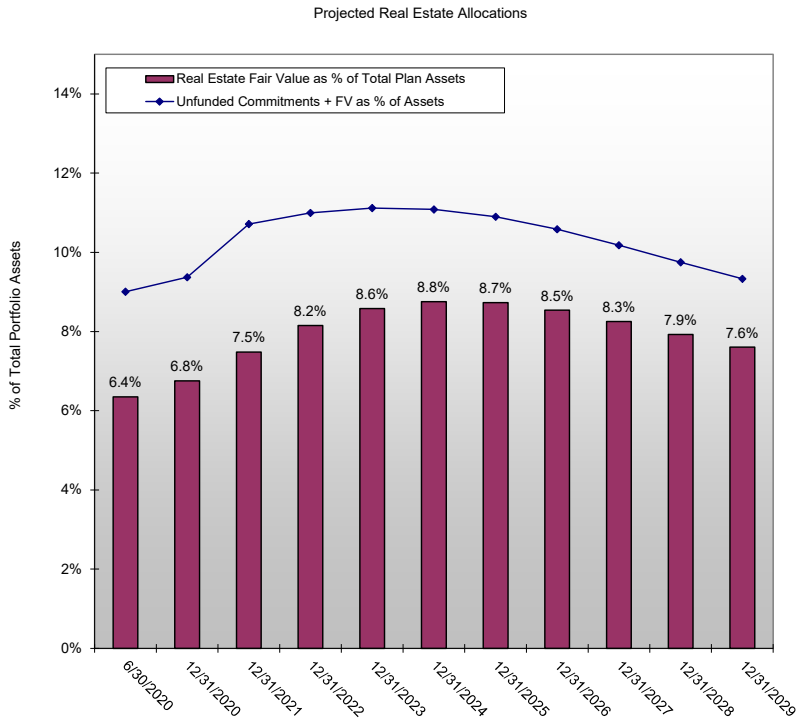
- Annual capital budget target of $15 million, range of $10-$25 million
- Target 2-4 investments, range of $5-$10 million per inv
  - Average investment size of $7 million
  - If an average of 2-4 GP partnership commitments per year, expect a total of 8-16 GP relationships over a 4 year fund raising cycle
- Retain core real estate exposure but lower it to 25% of the portfolio due to current valuations; use REITS as a substitute until funding private real estate investments is needed

Performance comparisons:

- *Long term investment objective:* Earn a return premium over inflation (CPI-U + 5%)
- *Recommended primary asset class benchmark:* NCREIF NFI-ODCE; revisit over time as the structure of the portfolio changes
- *Recommended fund benchmarks*: Cambridge Associates strategy universe for the respective vintage years and each vintage year will be compared to Cambridge Associates Global Real Estate Index

MCERA CY 2020 commitments:

- *Cerberus RE Debt – commercial* RE debt (VY 2020), $7 mm
- *Starwood Fund XII* – opportunistic RE (VY 2020), $8 mm



Note: MCERA's existing real estate portfolio was modeled using vintage year drawdown/return of capital assumptions patterned after historical averages. Total fund growth rate of 5.5%.

MCERA Real Estate Investment Structure & Portfolio Assessment

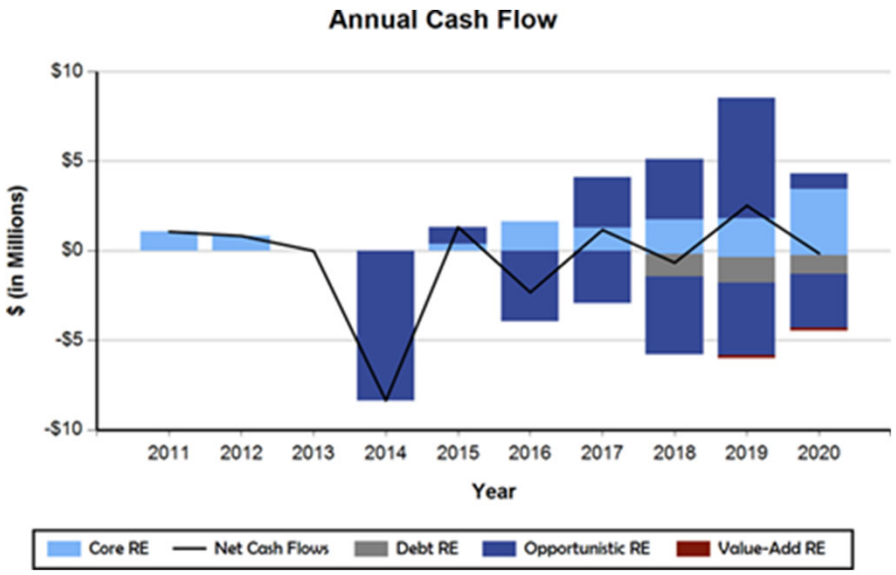
Real estate investment structure (8% target, 6.1% actual as of Dec 2020)

- MCERA invested in 1999 in a private core real estate fund; direct program began in 2014
- Contributions exceed distributions by $2 million over the past year as overall RE activity has declined and valuations remain muted

Annual Summary

(in thousands)

	Total Partnerships	Total Commitments	(A) Contributions	(B) Distributions	(C) Fair Value	(B+C) Total Value	(B+C-A) Gain/ Loss	Net IRR	Benchmark
September 30, 2019	8	$67,990	$40,366	$35,664	$58,343	$94,007	$53,641	9.00%	8.88%
September 30, 2020	10	$83,957	$47,676	$40,625	$60,544	$101,169	$53,493	8.63%	8.56%
Annual Change	2	$15,967	$7,310	$4,961	$2,201	$7,162	-$148		



Note: Net cash flow is the for the respective calendar year.

MCERA Real Estate Performance – as of Sep 30, 2020

Real Estate Portfolio

- MCERA began investing in the UBS Trumbull core real estate fund in 1999 and this represents the bulk of the real estate portfolio
  - Opportunistic funds began being added in 2014 and they are in the early stages of development with the VY 2016 fund now out of its "j-curve"
- Overall performance has met objectives, driven by the core RE fund; opportunistic fund performance is not meaningful

Partnership Name ($000)	Strategy	(A) Commit. Amount	Unfund. Amount	(B) Cumulat. Cont.	% Drawn	(C) Cumulat. Dist.	(D) Fair Value	(C+D) Total Value	(C+D-B) Gain/ Loss	Net IRR	IRR Bench.	TVPI
Vintage Year 1999												
UBS Trumbull Property Fund	Core RE	17,000	0	17,794	100%	26,732	36,335	63,066	45,273	8.50%	10.20%	3.54
Vintage Year 1999 Total		17,000	0	17,794	100%	26,732	36,335	63,066	45,273	8.50%	12.95%	3.54
Vintage Year 2014												
Greenfield Acquisition Partners VII, L.P.	Opportunistic RE	13,000	1,876	12,662	86%	10,341	9,043	19,384	6,722	12.05%	11.07%	1.53
Vintage Year 2014 Total		13,000	1,876	12,662	86%	10,341	9,043	19,384	6,722	12.05%	10.38%	1.53
Vintage Year 2016												
Patron Capital Fund V	Opportunistic RE	13,957	4,614	9,105	67%	3,312	6,742	10,054	949	5.60%	9.65%	1.11
Vintage Year 2016 Total		13,957	4,614	9,105	67%	3,312	6,742	10,054	949	5.60%	10.15%	1.11
Vintage Year 2017												
Carlyle Realty Partners VIII, L.P.	Opportunistic RE	5,000	3,442	1,791	31%	227	1,696	1,923	132	6.90%	6.35%	1.07
Vintage Year 2017 Total		5,000	3,442	1,791	31%	227	1,696	1,923	132	6.90%	7.98%	1.07
Vintage Year 2018												
Taconic CRE Dislocation Fund II	Debt RE	5,000	1,950	3,122	61%	0	3,548	3,548	426	N/M	N/M	1.14
AG Realty Value Fund X, L.P.	Opportunistic RE	5,000	3,513	1,487	30%	13	1,494	1,507	20	N/M	N/M	1.01
Vintage Year 2018 Total		10,000	5,463	4,609	45%	13	5,042	5,055	446	N/M	N/M	1.10
Vintage Year 2019												
Rockpoint Real Estate Fund VI, L.P.	Opportunistic RE	5,000	4,235	764	15%	0	736	736	-28	N/M	N/M	0.96
Carmel Partners Investment Fund VII, L.P	Value-Add RE	5,000	4,624	376	8%	0	234	234	-142	N/M	N/M	0.62
Vintage Year 2019 Total		10,000	8,859	1,140	11%	0	970	970	-170	N/M	N/M	0.85
Vintage Year 2020												
Cerberus Real Estate Debt Fund, L.P.	Debt RE	7,000	6,429	576	8%	0	717	717	141	N/M	N/M	1.24
Starwood Distressed Opportunity Fund X	Opportunistic RE	8,000	8,000	0	0%	0	0	0	0	N/M	N/M	0.00
Vintage Year 2020 Total		15,000	14,429	576	4%	0	717	717	141	N/M	N/M	1.24
Total Portfolio:		**83,957**	**38,682**	**47,676**	**54%**	**40,625**	**60,544**	**101,169**	**53,493**	**8.63%**	**8.56%**	**2.12**

Note: The benchmark at the total portfolio level is NCREIF NFI-ODCE . Private real estate benchmark at the fund level is the Cambridge Value Add or Opportunistic RE Indices while the Cambridge Global Real Estate Index at the vintage year level.

MCERA Real Asset Capital Budget & Implementation Plan

5% fund level target

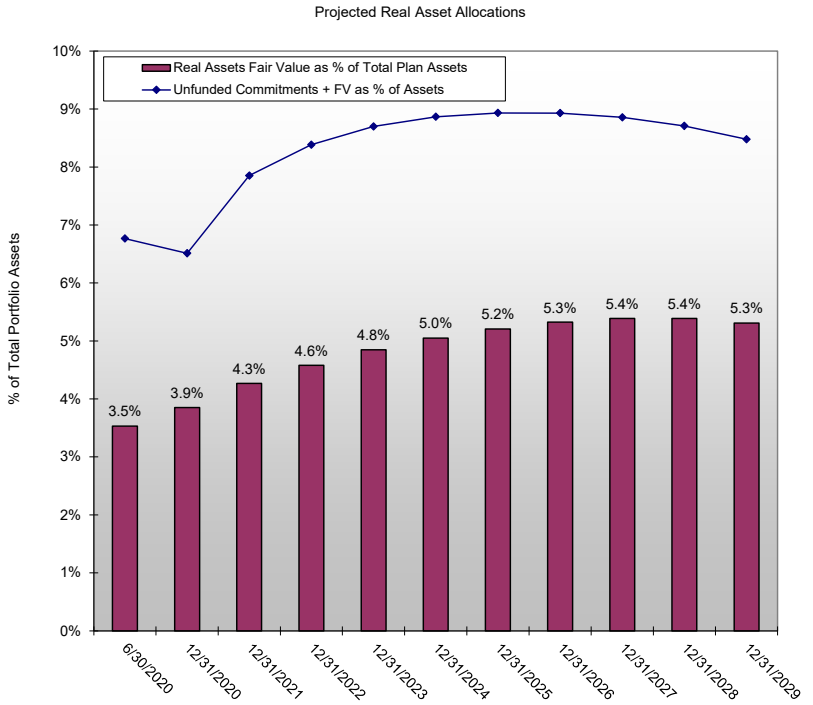
- Annual capital budget target of $15 million, range of $10-$25 million
- Target 2-4 investments, range of $5-$10 million per inv
  - Average investment size of $7 million
  - If an average of 2-4 GP partnership commitments per year, expect a total of 8-16 GP relationships over a 4 year fund raising cycle
- Portfolio targeted to be equally split between infrastructure and energy/natural resource funds

Performance comparisons:

- *Long term investment objective:* Earn a return premium over inflation (CPI-U + 5%)
- *Recommended primary asset class benchmark:* 50/50 Cambridge Global Infrastructure/Cambridge Energy Upstream & Royalties and Private Energy Index
- *Recommended fund benchmarks:* Each fund will be compared to the Cambridge Associates strategy universe for the respective vintage years and each vintage year will be compared to the 50/50 index

MCERA CY 2020 commitments ($5 mm):

- *iSquared III* - global infrastructure (VY 2020)



Note: MCERA's existing real asset portfolio was modeled using vintage year drawdown/return of capital assumptions patterned after historical category averages. Total fund growth rate of 5.5%.

MCERA Real Assets Investment Structure & Portfolio Assessment

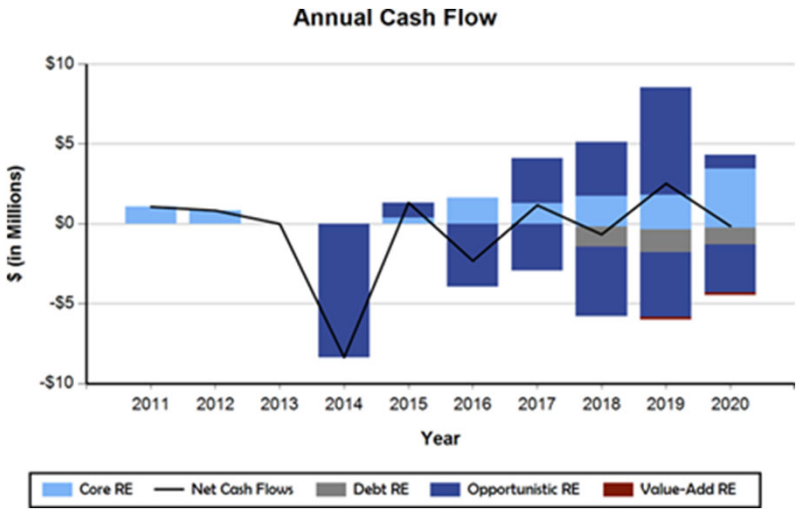
Real assets investment structure (5% target, 4.1% actual as of Dec 2020)

- Program is designed to be equally divided between private infrastructure and natural resource funds along with a public real asset component
- Private fund commitments began in 2014 to infrastructure and 2015 to natural resources
- The overall portfolio is immature with the funds in the early stage of development
  - Distributions exceed contributions by $5 mm as the infrastructure funds continue to return capital

Annual Summary

(in thousands)

	Total Partnerships	Total Commitments	(A) Contributions	(B) Distributions	(C) Fair Value	(B+C) Total Value	(B+C-A) Gain/ Loss	Net IRR	Benchmark
September 30, 2019	12	$69,890	$39,367	$10,731	$36,436	$47,167	$7,800	11.91%	0.59%
September 30, 2020	12	$70,649	$47,202	$24,005	$33,057	$57,062	$9,860	9.99%	-3.30%
Annual Change	0	$759	$7,835	$13,274	-$3,379	$9,895	$2,060		



Note: Net cash flow is the for the respective calendar year.

MCERA Real Assets Performance – as of Sep 30, 2020

Real Asset Portfolio

- MCERA began allocating to real assets in 2014 via direct fund commitments
- Portfolio is in its early stages of development so performance is not meaningful; the gains in infrastructure funds offset the losses in the energy funds; the VY 2017-19 funds are being built out

Partnership Name ($000)	Strategy	(A) Commit. Amount	Unfund. Amount	(B) Cumulat. Cont.	% Drawn	(C) Cumulat. Dist.	(D) Fair Value	(C+D) Total Value	(C+D-B) Gain/ Loss	Net IRR	IRR Bench.	TVPI
Vintage Year 2014												
KKR Global Infrastructure II	Infrastructure	10,000	528	10,837	95%	8,572	7,815	16,387	5,550	15.59%	5.85%	1.51
Vintage Year 2014 Total		10,000	528	10,837	95%	8,572	7,815	16,387	5,550	15.59%		1.51
Vintage Year 2015												
GSO Energy Select Opportunities Fund	Energy	7,500	3,486	4,470	54%	1,715	3,108	4,823	354	2.97%	1.80%	1.08
North Haven Infrastructure Partners II LP	Infrastructure	10,000	1,333	11,245	87%	6,547	7,180	13,727	2,483	9.49%	8.11%	1.22
Taurus Mining Finance Fund	Mining	5,000	665	5,212	87%	3,397	2,454	5,851	640	7.53%	N/A	1.12
Vintage Year 2015 Total		22,500	5,484	20,926	76%	11,659	12,743	24,402	3,476	7.48%		1.17
Vintage Year 2016												
Taurus Mining Finance Annex Fund	Mining	5,000	1,118	4,488	78%	2,951	2,689	5,639	1,151	21.19%	N/A	1.26
Vintage Year 2016 Total		5,000	1,118	4,488	78%	2,951	2,689	5,639	1,151	21.19%		1.26
Vintage Year 2017												
EnCap Energy Capital Fund XI, L.P.	Energy	5,000	3,418	1,582	32%	0	915	915	-667	-31.95%	-4.39%	0.58
ISQ Global Infrastructure Fund II	Infrastructure	5,000	2,002	3,368	60%	371	3,506	3,877	509	13.26%	N/A	1.15
Vintage Year 2017 Total		10,000	5,420	4,950	46%	371	4,421	4,792	-158	-2.60%		0.97
Vintage Year 2018												
EnCap Flatrock Midstream IV, L.P.	Energy	3,000	1,953	1,125	35%	78	1,140	1,219	94	4.70%	-0.01%	1.08
Ardian Infrastructure Fund V	Infrastructure	5,149	4,490	659	13%	20	575	595	-64	N/M	N/M	N/A
KKR Global Infrastructure Investors III	Infrastructure	5,000	3,124	2,098	38%	130	2,007	2,136	39	1.91%	N/A	N/A
Vintage Year 2018 Total		13,149	9,567	3,881	27%	228	3,722	3,950	69	1.53%		1.02
Vintage Year 2019												
Global Energy & Power Infrastructure Fund III	Energy	5,000	3,918	1,184	22%	224	1,051	1,274	90	N/M	N/M	1.08
Tailwater Energy Fund IV, LP	Energy	5,000	4,063	936	19%	0	617	617	-318	N/M	N/M	0.66
Vintage Year 2019 Total		10,000	7,981	2,120	20%	224	1,668	1,892	-228	N/M		0.89
Total Portfolio:		**70,649**	**30,099**	**47,202**	**57%**	**24,005**	**33,057**	**57,062**	**9,860**	**9.99%**	**-3.30%**	**1.21**
Portfolio Strategy Totals												
Energy		20,500	12,920	8,111	37%	1,794	5,780	7,574	-537	-3.35%		0.93
Infrastructure		25,000	4,986	24,180	80%	15,248	17,003	32,251	8,071	12.67%		1.33
Non-US		25,149	12,193	14,911	52%	6,963	10,274	17,237	2,326	11.98%		1.16
Total Portfolio:		**70,649**	**30,099**	**47,202**	**57%**	**24,005**	**33,057**	**57,062**	**9,860**	**9.99%**	**-3.30%**	**1.21**

Note: Benchmark is 50% S&P Natural Resources and 50% S&P Infrastructure. Benchmarks for individual funds are the respective Cambridge strategy benchmark.

MCERA Hedge Fund Performance – as of Mar 31, 2021

Fund	Market Value	Actual %	Returns Mar	QTD	YTD	1 Year	3 Year	5 Year	Incep	Std Dev	Sharpe Ratio	Incep Date
Market Neutral												
KLS Diversified Fund LP	8,644,168	8.7%	-0.25%	3.47%	3.47%	14.46%	-1.35%	-	-0.82%	11.03%	-0.16	Oct-17
Laurion Capital, Ltd.	13,707,848	13.7%	6.34%	17.22%	17.22%	34.60%	-	-	20.36%	11.86%	1.49	Jul-18
Market Neutral - HF Total	22,352,016	22.4%	3.69%	11.49%	11.49%	26.03%	8.12%	-	7.29%	7.52%	0.75	Oct-17
HFRI Relative Value (Total) Index			0.71%	3.90%	3.90%	19.70%	4.58%	-	4.35%	6.54%	0.43	Oct-17
Credit/Distressed												
Silver Point Capital Fund, L.P.	15,341,956	15.4%	2.30%	9.01%	9.01%	34.10%	7.73%	-	7.79%	8.44%	0.73	Dec-17
Credit/Distressed - HF Total	15,341,956	15.4%	2.30%	9.01%	9.01%	34.10%	7.73%	-	7.79%	8.44%	0.73	Dec-17
HFRI ED: Distressed/Restructuring Index			1.22%	8.76%	8.76%	37.73%	7.07%	-	6.85%	9.16%	0.59	Dec-17
Event Driven												
Taconic Opportunity Fund L.P.	13,543,968	13.6%	0.80%	4.76%	4.76%	18.20%	-	-	5.03%	7.09%	0.53	Dec-18
Event Driven - HF Total	13,543,968	13.6%	0.80%	4.76%	4.76%	18.20%	-	-	5.03%	7.09%	0.53	Dec-18
HFRI Event-Driven (Total) Index			1.85%	8.21%	8.21%	38.95%	-	-	9.71%	11.58%	0.74	Dec-18
Equity Long/Short												
Archipelago Partners, L.P.	13,504,635	13.5%	0.28%	1.11%	1.11%	20.16%	5.40%	-	6.28%	8.85%	0.55	Sep-17
Marshall Wace Funds LP - MW Eureka (US) Fund	3,904,354	3.9%	-2.00%	1.10%	1.10%	22.14%	7.55%	-	8.23%	6.83%	0.95	Dec-17
Marshall Wace Funds LP - MW Global Opportunities (US) Fu	9,620,712	9.6%	-4.85%	-7.37%	-7.37%	6.90%	-	-	6.90%	12.70%	0.56	Apr-20
Equity Long/Short - HF Total	27,029,702	27.1%	-1.93%	-2.08%	-2.08%	16.64%	4.81%	-	5.83%	8.32%	0.53	Sep-17
HFRI Equity Hedge (Total) Index			1.12%	7.36%	7.36%	48.17%	10.03%	-	9.86%	11.25%	0.74	Sep-17
Global Macro-Discretionary												
Graham Absolute Return Trading Ltd.	8,145,113	8.2%	2.28%	6.65%	6.65%	26.25%	4.45%	-	4.37%	9.69%	0.32	Sep-17
Global Macro-Discretionary - HF Total	8,145,113	8.2%	2.28%	6.65%	6.65%	26.25%	4.45%	-	4.37%	9.69%	0.32	Sep-17
HFRI Macro (Total) Index			0.69%	3.83%	3.83%	11.21%	4.34%	-	3.59%	5.10%	0.40	Sep-17
Global Macro-Systematic												
HFRI Macro (Total) Index			0.69%	3.83%	3.83%	11.21%	4.34%	-	3.44%	5.10%	0.37	Nov-17
Multi-Strategy												
Sculptor Domestic Partners II, L.P.	13,466,662	13.5%	-0.22%	3.62%	3.62%	31.59%	11.47%	11.47%	8.52%	7.29%	1.00	Jul-14
Multi-Strategy - HF Total	13,466,662	13.5%	-0.22%	3.62%	3.62%	31.59%	11.47%	11.47%	8.52%	7.29%	1.00	Jul-14
HFRI Relative Value (Total) Index			0.71%	3.90%	3.90%	19.70%	4.58%	5.46%	3.81%	5.07%	0.53	Jul-14
MCERA Hedge Fund Portfolio	99,879,417	100.0%	0.88%	4.82%	4.82%	22.11%	5.69%	6.95%	4.90%	5.75%	0.66	Jul-14
Benchmarks												
HFRI Fund of Funds Composite Index			0.42%	2.47%	2.47%	24.56%	5.64%	5.74%	3.88%	5.40%	0.52	Jul-14
Market Indices												
Libor3Month			0.02%	0.05%	0.05%	0.27%	1.60%	1.44%	1.15%	0.25%	-	Jul-14
Bloomberg Barclays US Aggregate Bond Index			-1.25%	-3.37%	-3.37%	0.71%	4.66%	3.11%	3.13%	3.17%	0.63	Jul-14
Bloomberg Barclays US High Yield Bond Index			0.15%	0.85%	0.85%	23.72%	6.84%	8.06%	5.26%	7.41%	0.57	Jul-14
S&P 500 TR			4.38%	6.17%	6.17%	56.35%	16.78%	16.30%	13.27%	14.35%	0.86	Jul-14
MSCI AC World Index Free - Net			2.67%	4.57%	4.57%	54.60%	12.07%	13.21%	8.97%	14.21%	0.60	Jul-14
MSCI EAFE - Net			2.30%	3.48%	3.48%	44.57%	6.02%	8.85%	4.36%	14.67%	0.29	Jul-14
MSCI EMF (Emerging Markets Free) - Net			-1.51%	2.29%	2.29%	58.39%	6.48%	12.07%	5.82%	17.20%	0.35	Jul-14

Cliffwater Disclosures

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MEKETA
INVESTMENT GROUP

Merced County Employees' Retirement Association

April 22, 2021

Market Outlook & Performance Update

Capital Markets Outlook & Risk Metrics

As of March 31, 2021

Capital Markets Outlook

Takeaways

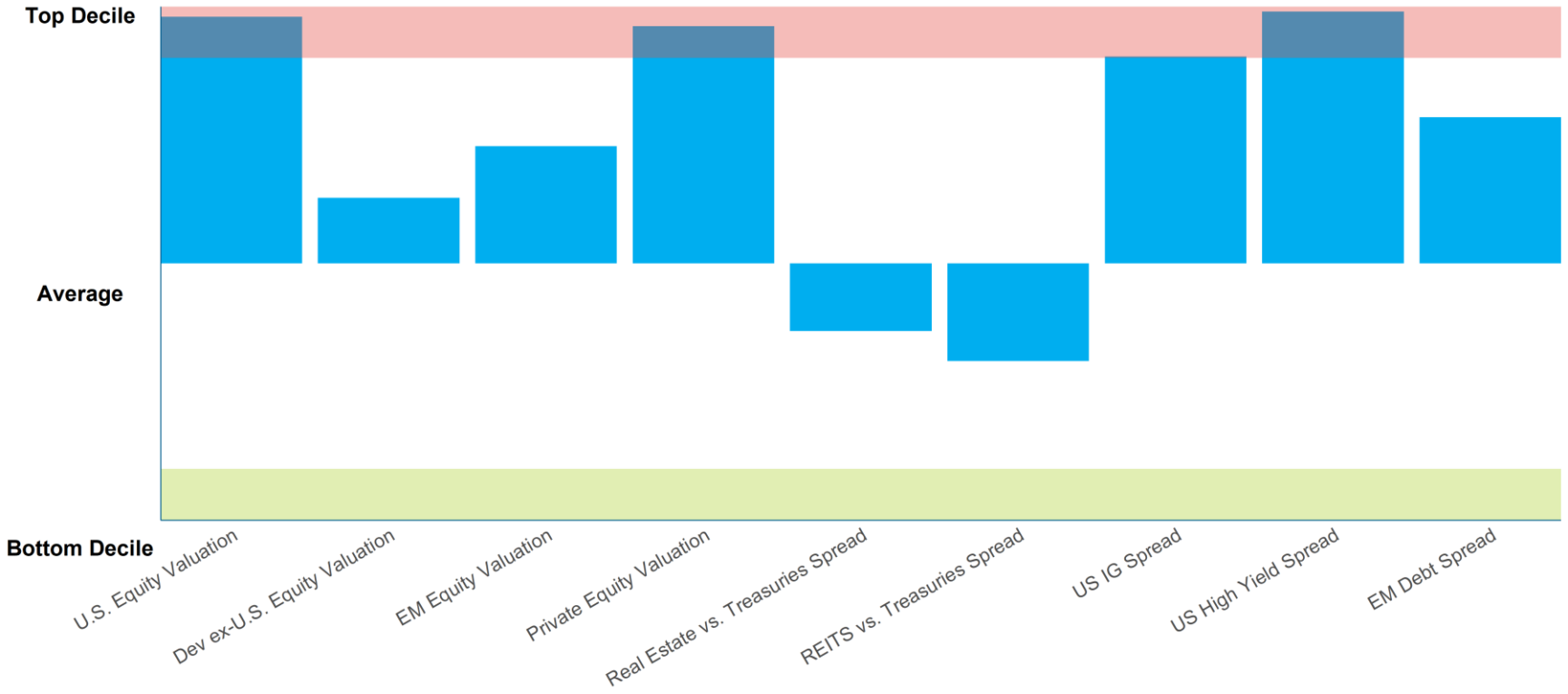
- The advent of ambitious global vaccination campaigns has begun to shift market focus to repricing of cyclical stocks, commodities, and real assets that may benefit from economic growth.
- The rotation to value and cyclical stocks continued in March as the Russell 1000 Value Index outperformed the Russell 1000 Growth Index.
- Developed markets outside of the US outperformed emerging market equities, and like US markets, value outperformed growth.
- The MSCI China index continued its underperformance with a -6.3% return in March. The negative performance of China was a drag on the MSCI Emerging Market Index, which posted -1.5% return.
- Fixed income markets generally experienced negative returns as the yield curve steepened rapidly to reflect higher inflation expectations.
- The Barclays TIPS index returned -0.2% in March, but the Barclays 1-3 Year TIPS Index posted a 0.5% gain, reflecting a rise in near-term inflation expectations.
- While the Bloomberg Commodities index finished March in negative territory, the S&P Global Natural Resources Index returned 2.2%.
- Global infrastructure posted strong monthly returns, with the DJ Brookfield Global Infrastructure gaining 7.4% and the S&P Infrastructure index returning 4.4%.

Capital Markets Outlook

Takeaways

- Global REITs have continued to recover from steep 2020 losses, with the MSCI US REITS and FTSE NAREIT Equity Index returning 4.4% and 4.6% respectively in March.
- The US vaccination efforts combined with the American Recovery Act have lifted 2021 GDP forecasts for the US to 6.5%, while COVID-related setbacks in Europe have muted growth expectations there for 2021.
- According to the World Health Organization, global COVID cases have been falling since January. While the efficacy of many of the vaccines is promising, governments are closely monitoring new COVID variants as these may prove less susceptible to currently available vaccines.
- While the markets appear as though they are looking past COVID, the next few months are projected to be challenging as widespread distribution of the vaccine continues. Returning to pre-COVID levels of economic activity is not expected to occur until mid-2021 at the earliest.
- As the new administration in the US implements its policy agenda, investors will continue to examine its actions as it relates to monetary and fiscal policy, with a particular focus on economic stimulus, taxation, and broad infrastructure spending.

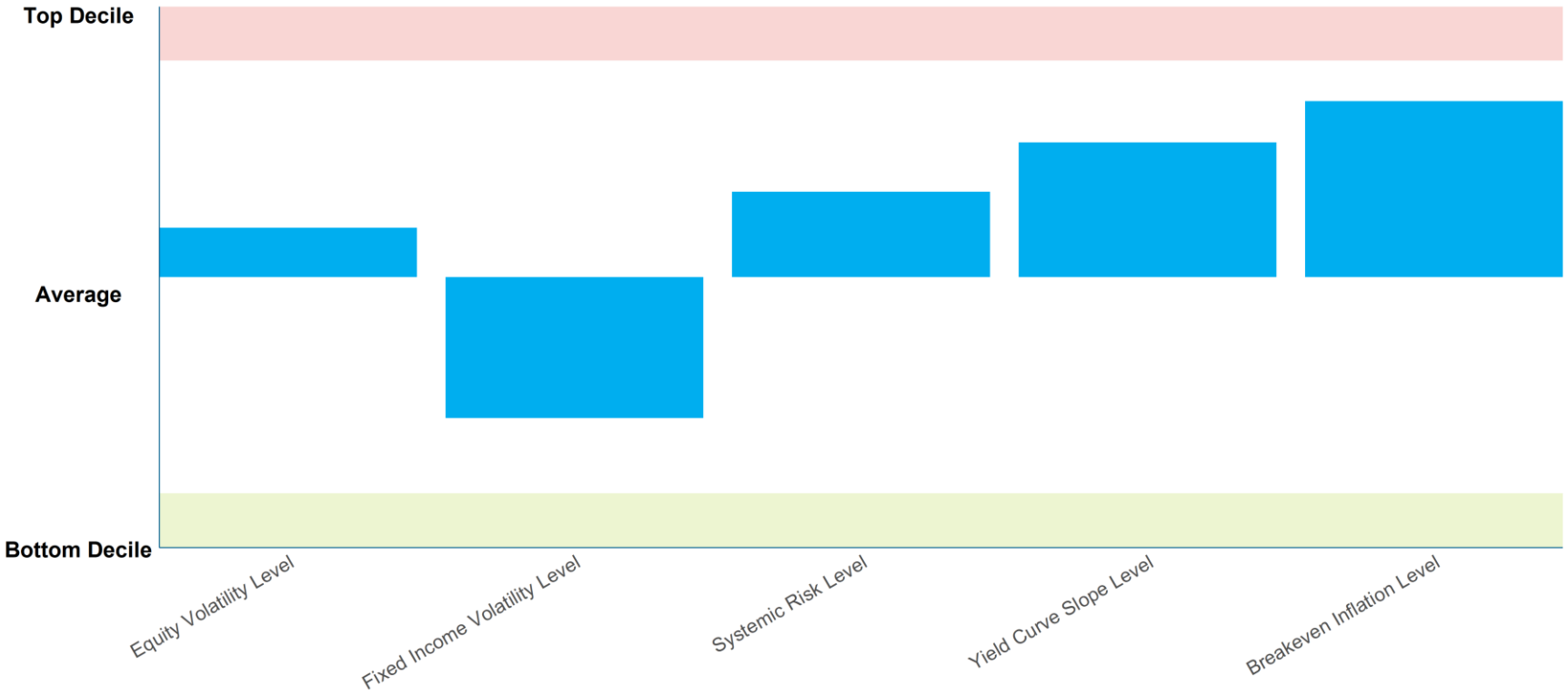
Risk Overview/Dashboard (1)
(As of March 31, 2021)[1]



- Dashboard (1) summarizes the current state of the different valuation metrics per asset class relative to their own history.

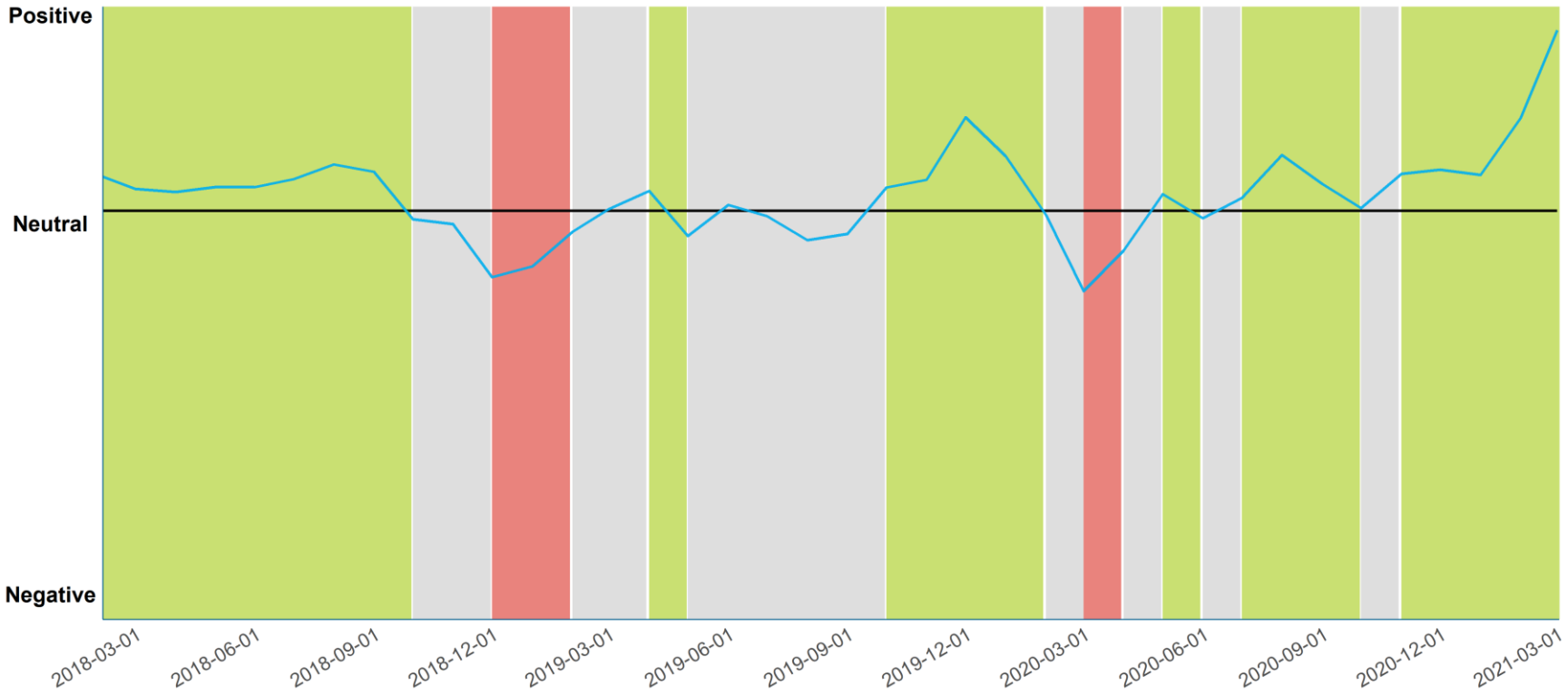
[1] With the exception of Private Equity Valuation, that is YTD as of December 31, 2020.

Risk Overview/Dashboard (2)
(As of March 31, 2021)

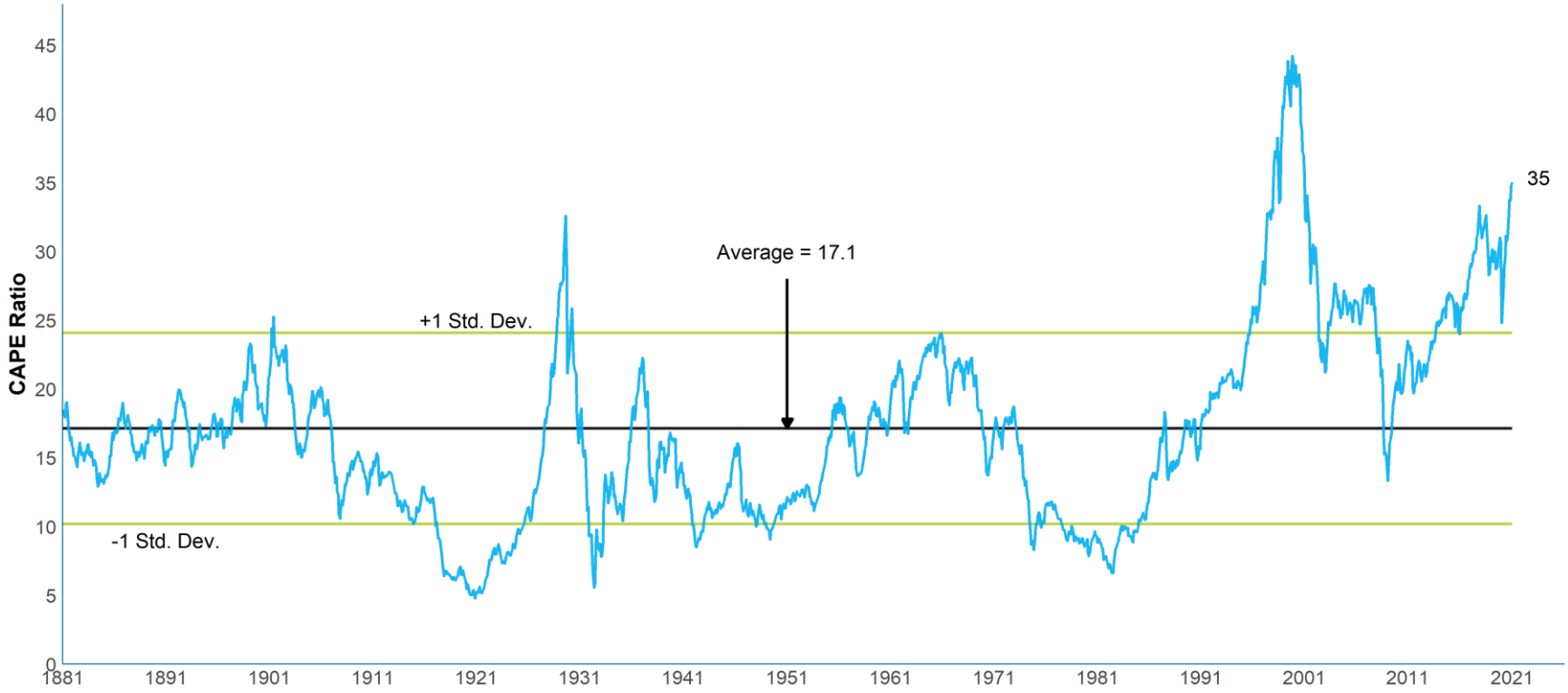


- Dashboard (2) shows how the current level of each indicator compares to its respective history.

Market Sentiment Indicator (Last Three Years)
(As of March 31, 2021)



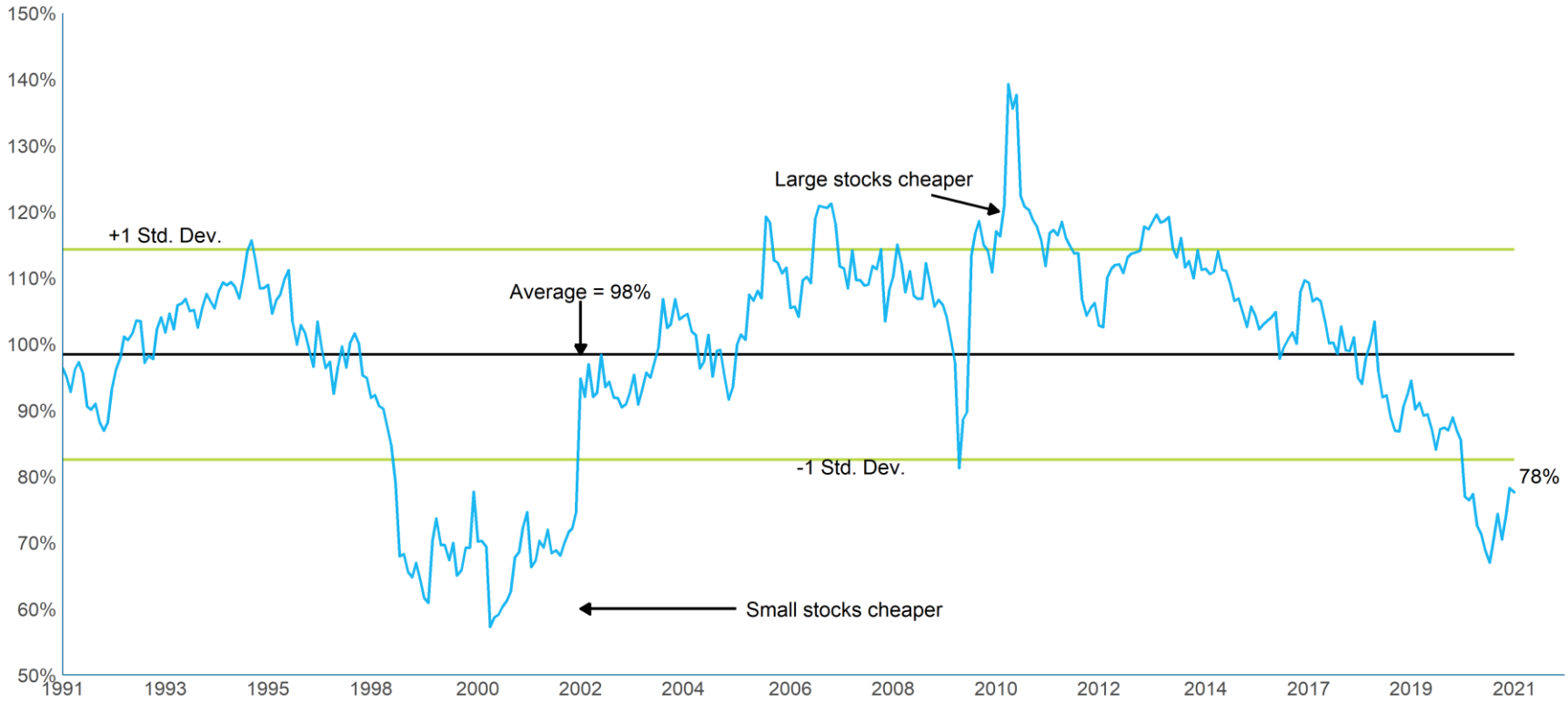
US Equity Cyclically Adjusted P/E[1]
(As of March 31, 2021)



- This chart details one valuation metric for US equities. A higher (lower) figure indicates more expensive (cheaper) valuation relative to history.

[1] US Equity Cyclically Adjusted P/E on S&P 500 Index. Source: Robert Shiller, Yale University, and Meketa Investment Group.

Small Cap P/E vs. Large Cap P/E[1]
(As of March 31, 2021)



- This chart compares the relative attractiveness of small cap US equities vs. large cap US equities on a valuation basis. A higher (lower) figure indicates that large cap (small cap) is more attractive.

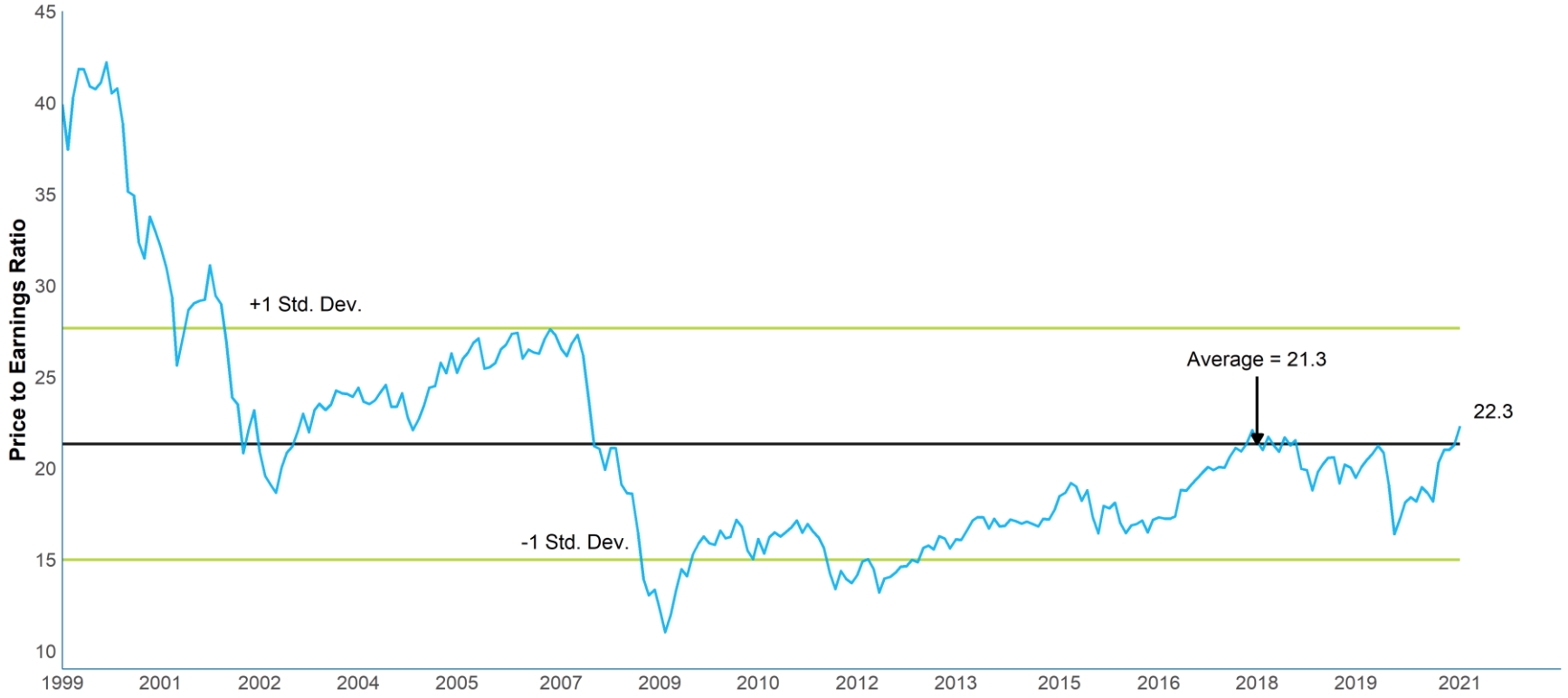
[1] Small Cap P/E (Russell 2000 Index) vs. Large Cap P/E (Russell 1000 Index) - Source: Russell Investments. Earnings figures represent 12-month "as reported" earnings.

Growth P/E vs. Value P/E[1]
(As of March 31, 2021)

- This chart compares the relative attractiveness of US growth equities vs. US value equities on a valuation basis. A higher (lower) figure indicates that value (growth) is more attractive.

[1] Growth P/E (Russell 3000 Growth Index) vs. Value (Russell 3000 Value Index) P/E - Source: Bloomberg, MSCI, and Meketa Investment Group. Earnings figures represent 12-month "as reported" earnings.

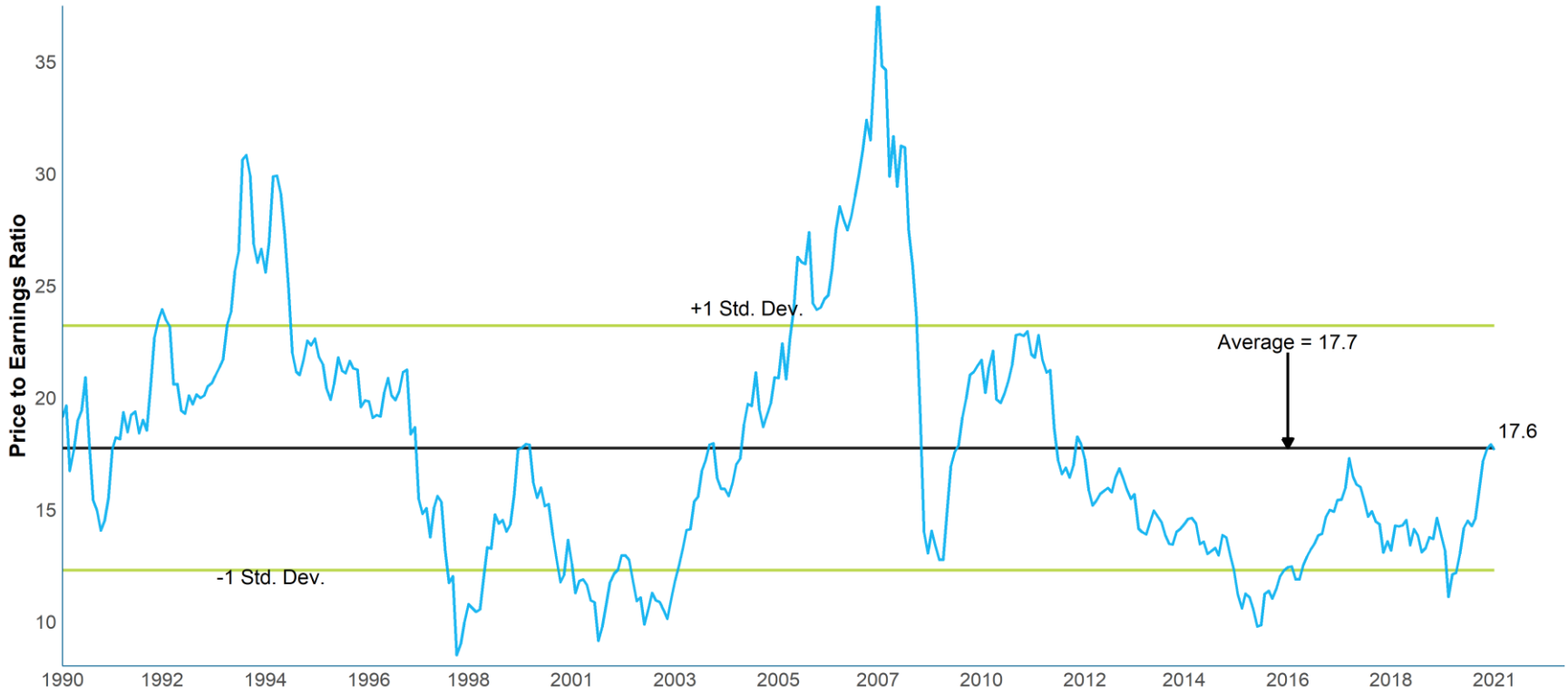
Developed International Equity Cyclically Adjusted P/E[1]
(As of March 31, 2021)



- This chart details one valuation metric for developed international equities. A higher (lower) figure indicates more expensive (cheaper) valuation relative to history.

[1] Developed International Equity (MSCI EAFE Index) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years.

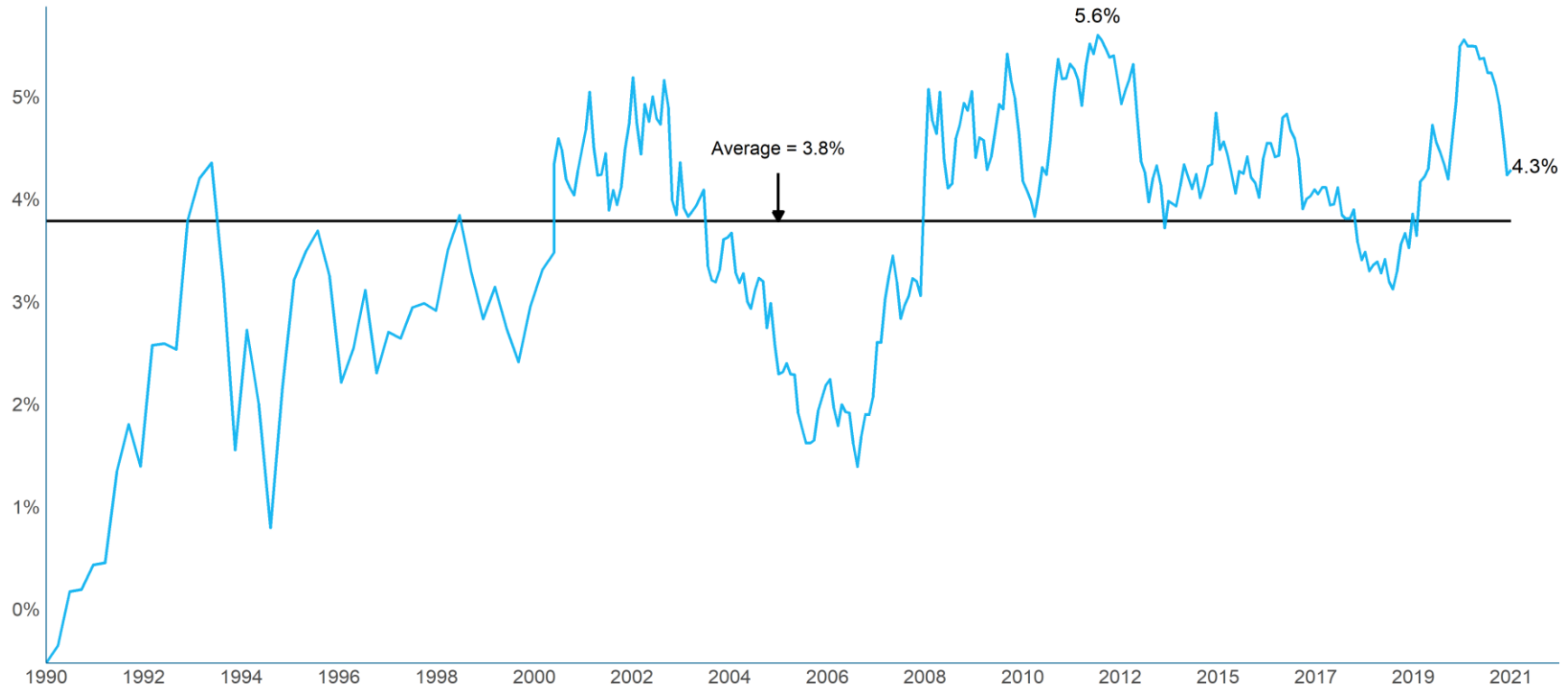
Emerging Market Equity Cyclically Adjusted P/E[1]
(As of March 31, 2021)



- This chart details one valuation metric for emerging markets equities. A higher (lower) figure indicates more expensive (cheaper) valuation relative to history.

[1] Emerging Market Equity (MSCI Emerging Markets Index) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years.

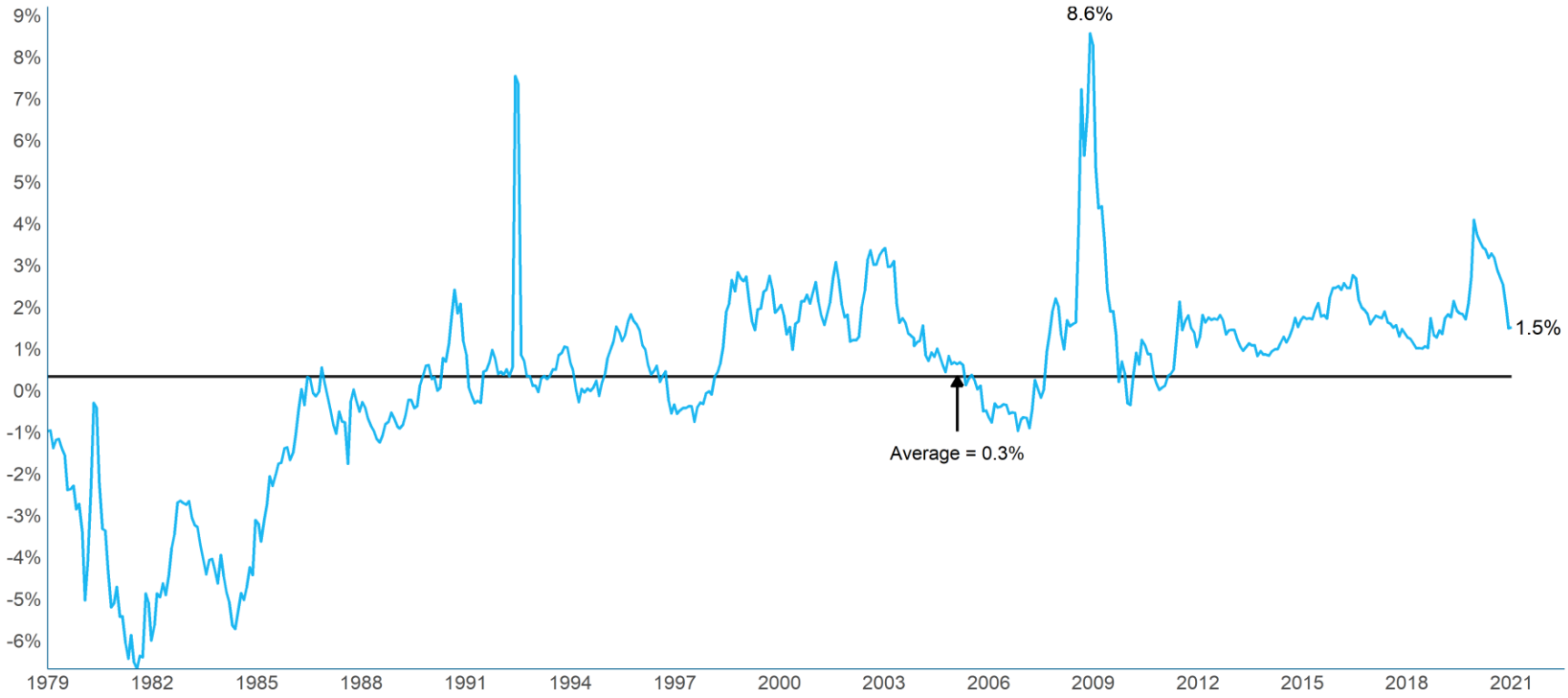
Core Real Estate Spread vs. Ten-Year Treasury[1]
(As of March 31, 2021)



- This chart details one valuation metric for the private core real estate market. A higher (lower) figure indicates cheaper (more expensive) valuation.

[1] Core Real Estate Spread vs. Ten-Year Treasury – Source: Real Capital Analytics, US Treasury, Bloomberg, and Meketa Investment Group. Core Real Estate is proxied by weighted sector transaction based indices from Real Capital Analytics and Meketa Investment Group.

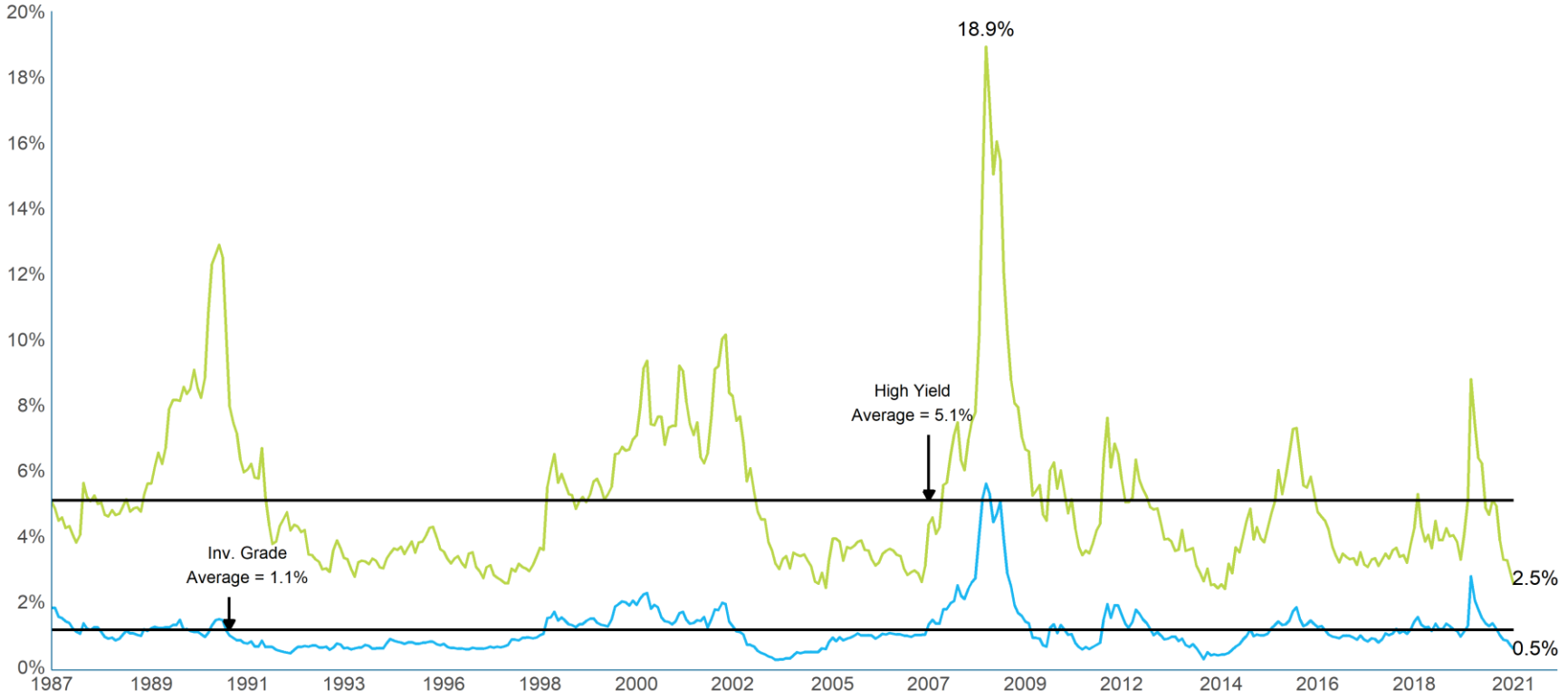
REITs Dividend Yield Spread vs. Ten-Year Treasury[1]
(As of March 31, 2021)



- This chart details one valuation metric for the public REITs market. A higher (lower) figure indicates cheaper (more expensive) valuation.

[1] REITs Dividend Yield Spread vs. Ten-Year Treasury – Source: NAREIT, US Treasury. REITs are proxied by the yield for the NAREIT Equity index.

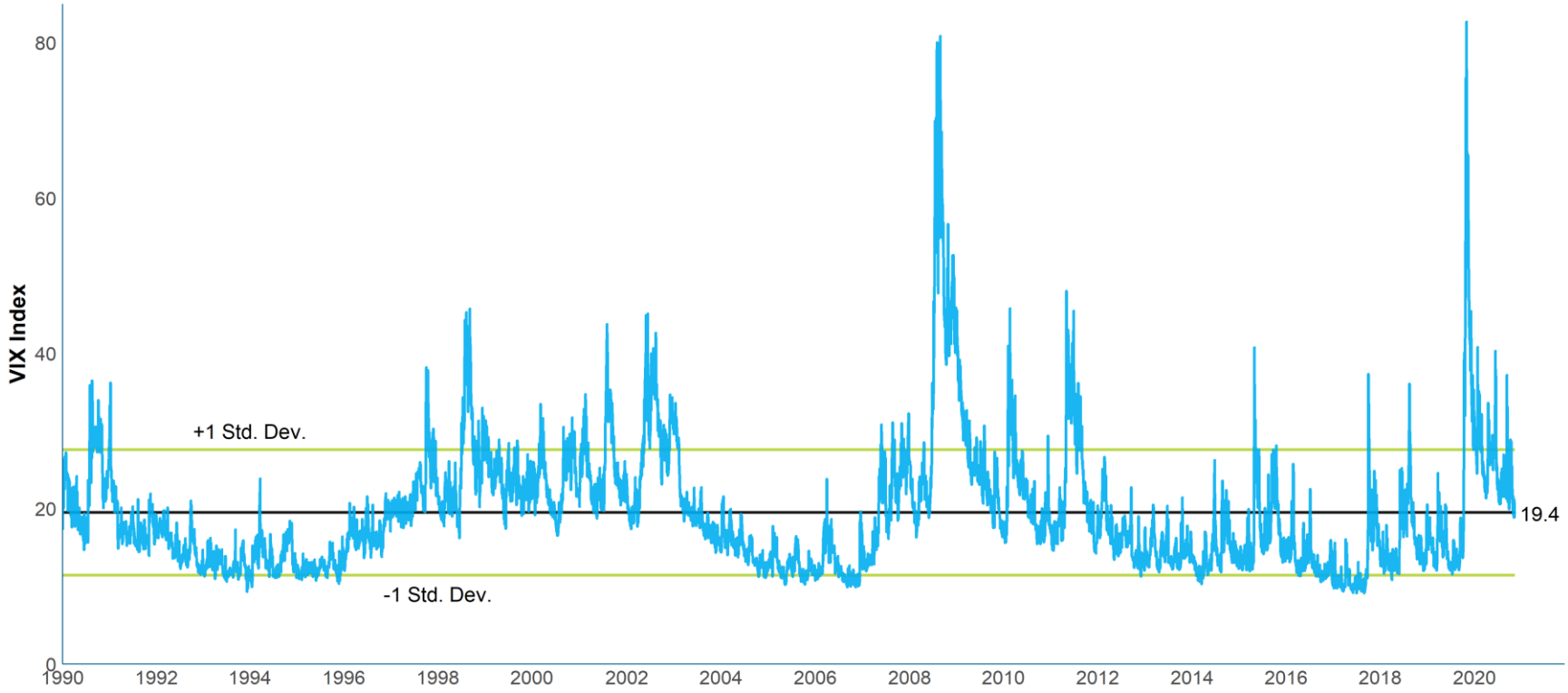
Credit Spreads[1]
(As of March 31, 2021)



- This chart details one valuation metric for the US credit markets. A higher (lower) figure indicates cheaper (more expensive) valuation relative to history.

[1] Credit Spreads – Source: Barclays Capital. High Yield is proxied by the Barclays High Yield index and Investment Grade Corporates are proxied by the Barclays US Corporate Investment Grade index. Spread is calculated as the difference between the Yield to Worst of the respective index and the 10-Year US Treasury yield.

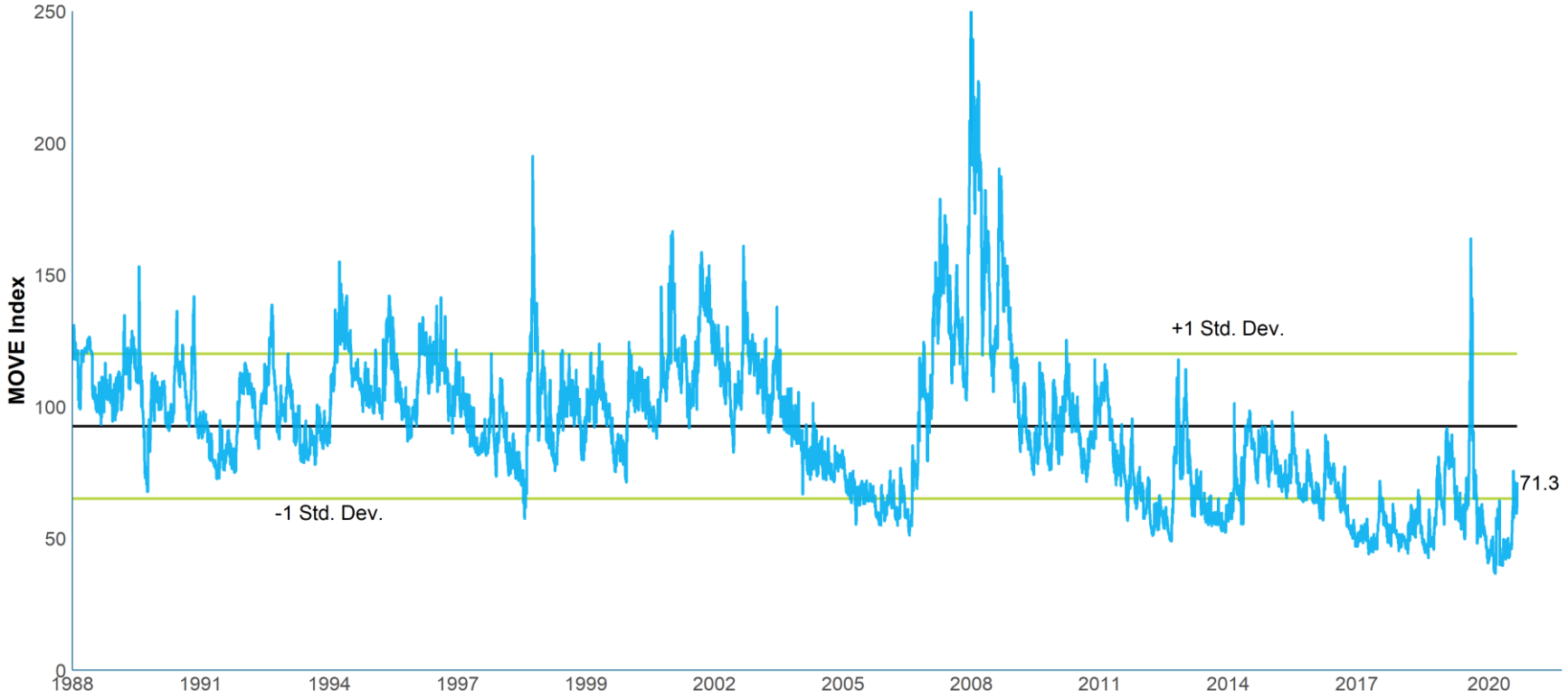
Equity Volatility[1]
(As of March 31, 2021)



- This chart details historical implied equity market volatility. This metric tends to increase during times of stress/fear and while declining during more benign periods.

[1] Equity Volatility – Source: Bloomberg, and Meketa Investment Group. Equity Volatility proxied by VIX Index, a Measure of implied option volatility for US equity markets.

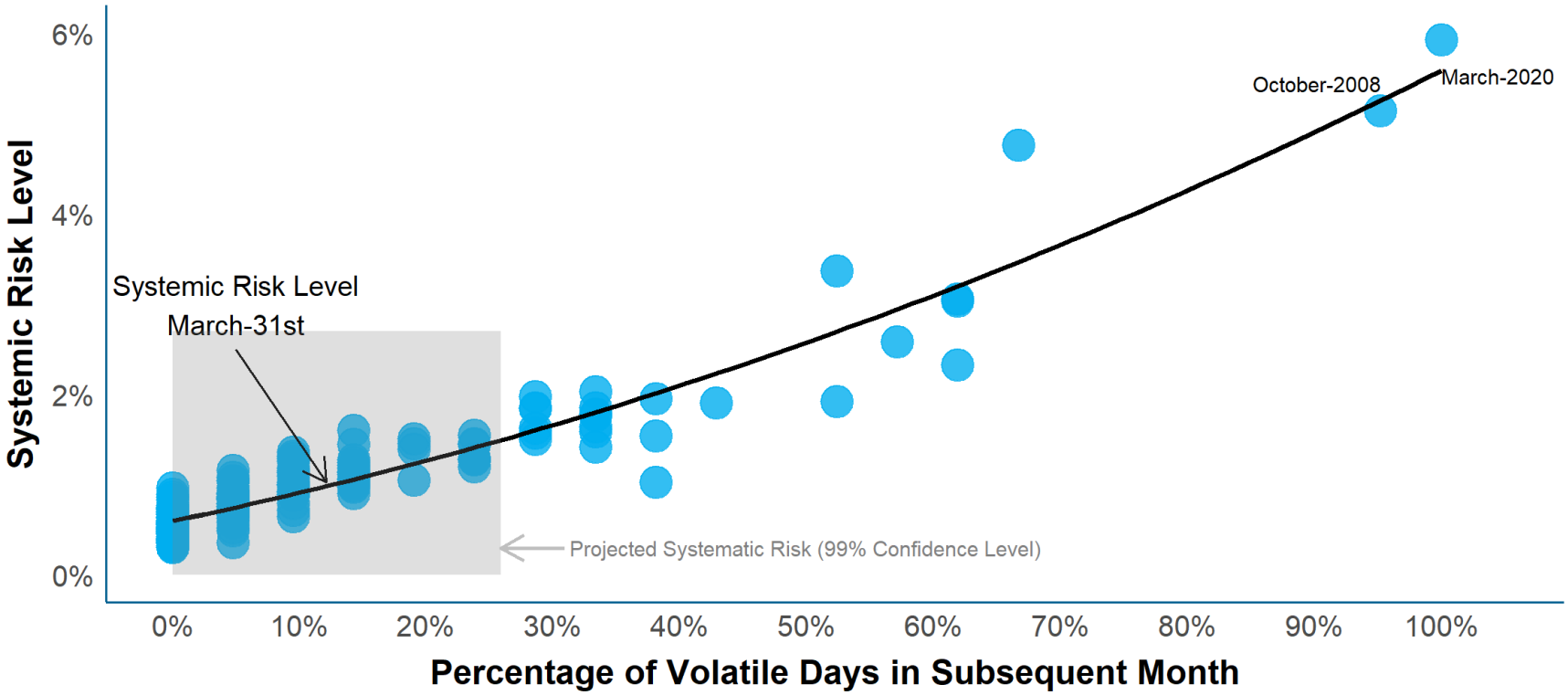
Fixed Income Volatility[1]
(As of March 31, 2021)



- This chart details historical implied fixed income market volatility. This metric tends to increase during times of stress/fear and while declining during more benign periods.

[1] Fixed Income Volatility – Source: Bloomberg, and Meketa Investment Group. Fixed Income Volatility proxied by MOVE Index, a Measure of implied option volatility for US Treasury markets.

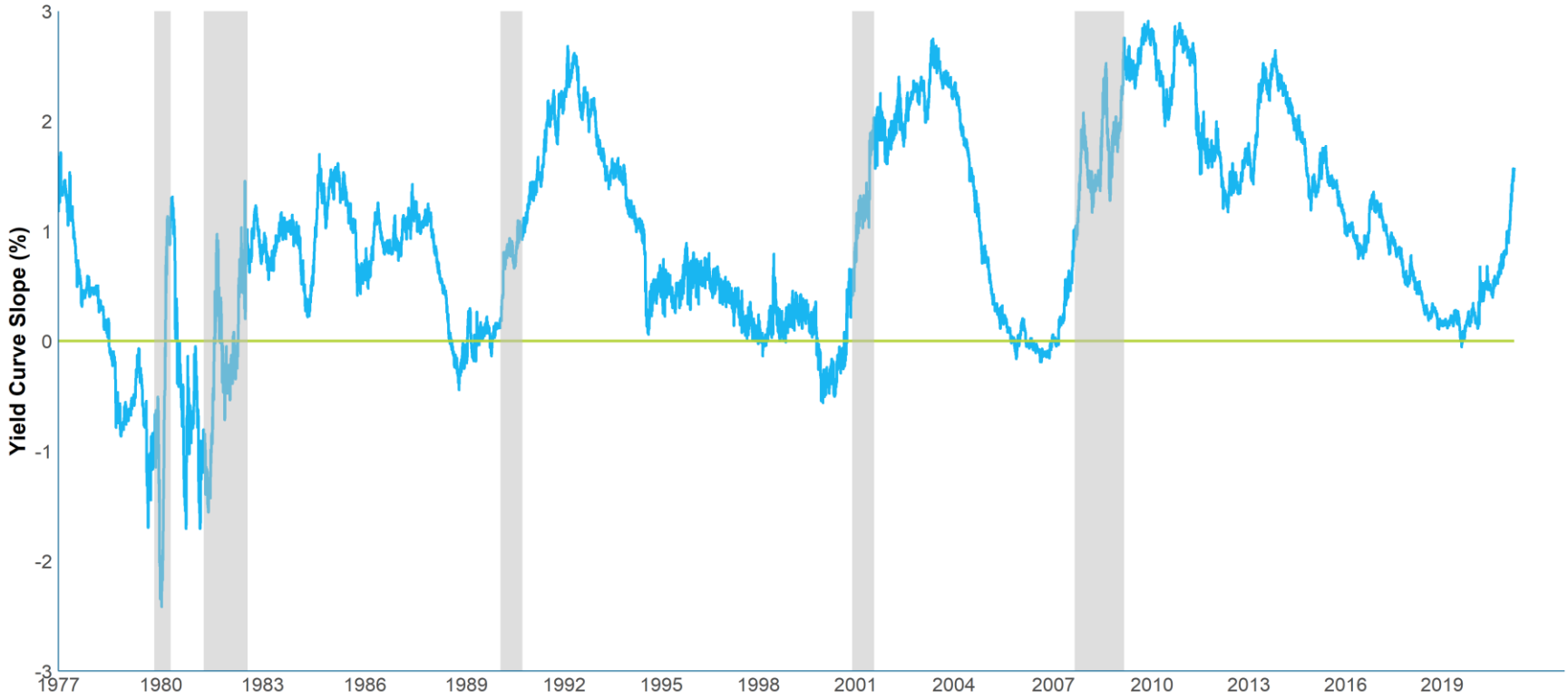
Systemic Risk and Volatile Market Days[1]
(As of March 31, 2021)



- Systemic Risk is a measure of 'System-wide' risk, which indicates herding type behavior.

[1] Source: Meketa Investment Group. Volatile days are defined as the top 10 percent of realized turbulence, which is a multivariate distance between asset returns.

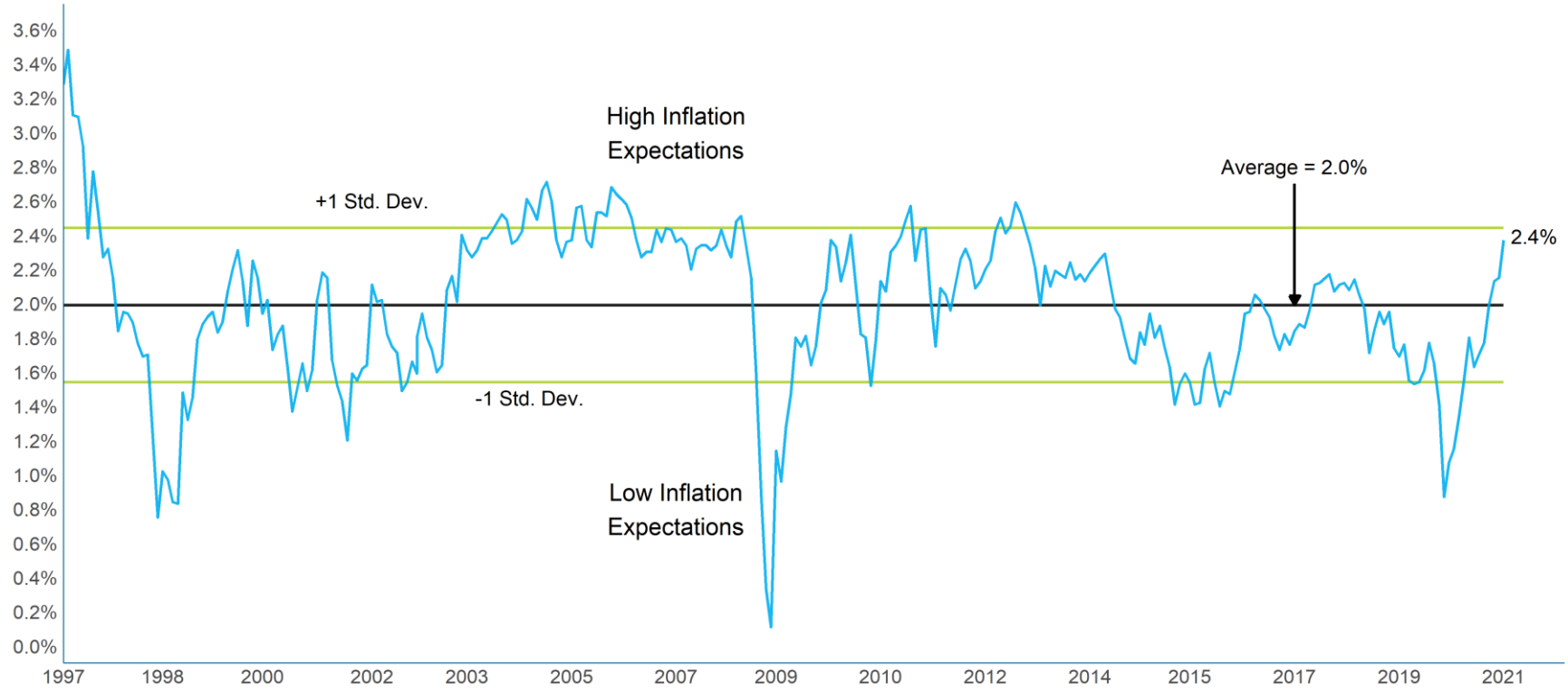
Yield Curve Slope (Ten Minus Two)[1]
(As of March 31, 2021)



- This chart details the historical difference in yields between ten-year and two-year US Treasury bonds/notes. A higher (lower) figure indicates a steeper (flatter) yield curve slope.

[1] Yield Curve Slope (Ten Minus Two) – Source: Bloomberg, and Meketa Investment Group. Yield curve slope is calculated as the difference between the 10-Year US Treasury Yield and 2-Year US Treasury Yield.

Ten-Year Breakeven Inflation[1]
(As of March 31, 2021)



- This chart details the difference between nominal and inflation-adjusted US Treasury bonds. A higher (lower) figure indicates higher (lower) inflation expectations.

[1] Ten-Year Breakeven Inflation – Source: US Treasury and Federal Reserve. Inflation is measured by the Consumer Price Index (CPI-U NSA).

Appendix

Data Sources and Explanations[1]

- US Equity Cyclically Adjusted P/E on S&P 500 Index – Source: Robert Shiller and Yale University.
- Small Cap P/E (Russell 2000 Index) vs. Large Cap P/E (Russell 1000 Index) - Source: Russell Investments. Earnings figures represent 12-month "as reported" earnings.
- Growth P/E (Russell 3000 Growth Index) vs. Value (Russell 3000 Value Index) P/E - Source: Bloomberg, MSCI, and Meketa Investment Group. Earnings figures represent 12-month "as reported" earnings.
- Developed International Equity (MSCI EAFE) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years.
- Emerging Market Equity (MSCI Emerging Markets Index) Cyclically Adjusted P/E – Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years.
- Private Equity Multiples – Source: S&P LCD Average EBITDA Multiples Paid in All LBOs.
- Core Real Estate Spread vs. Ten-Year Treasury – Source: Real Capital Analytics, US Treasury, Bloomberg, and Meketa Investment Group. Core Real Estate is proxied by weighted sector transaction based indices from Real Capital Analytics and Meketa Investment Group.

[1] All Data as of March 31, 2021 unless otherwise noted.

Appendix

Data Sources and Explanations[1]

- REITs Dividend Yield Spread vs. Ten-Year Treasury – Source: NAREIT, US Treasury. REITs are proxied by the yield for the NAREIT Equity index.
- Credit Spreads – Source: Barclays Capital. High Yield is proxied by the Barclays High Yield index and Investment Grade Corporates are proxied by the Barclays US Corporate Investment Grade index.
  - Spread is calculated as the difference between the Yield to Worst of the respective index and the 10-Year Treasury Yield.
- EM Debt Spreads – Source: Bloomberg, and Meketa Investment Group. Option Adjusted Spread (OAS) for the Bloomberg Barclays EM USD Aggregate Index.
- Equity Volatility – Source: Bloomberg, and Meketa Investment Group. Equity Volatility proxied by VIX Index, a Measure of implied option volatility for US equity markets.
- Fixed Income Volatility – Source: Bloomberg, and Meketa Investment Group. Equity Volatility proxied by MOVE Index, a Measure of implied option volatility for US Treasury markets.
- Systemic Risk and Volatile Market Days – Source: Meketa Investment Group. Volatile days are defined as the top 10 percent of realized turbulence, which is a multivariate distance between asset returns.
- Systemic Risk, which measures risk across markets, is important because the more contagion of risk that exists between assets, the more likely it is that markets will experience volatile periods.

[1] All Data as of March 31, 2021 unless otherwise noted.

Appendix

Data Sources and Explanations[1]

- Yield Curve Slope (Ten Minus Two) – Source: Bloomberg, and Meketa Investment Group. Yield curve slope is calculated as the difference between the 10-Year US Treasury Yield and 2-Year US Treasury Yield.
- Ten-Year Breakeven Inflation – Source: US Treasury and Federal Reserve. Inflation is measured by the Consumer Price Index (CPI-U NSA).

[1] All Data as of March 31, 2021 unless otherwise noted.

Meketa Market Sentiment Indicator

Explanation, Construction and Q&A

Meketa has created the MIG Market Sentiment Indicator (MIG-MSI) to complement our valuation-focused Risk Metrics. This measure of sentiment is meant to capture significant and persistent shifts in long-lived market trends of economic growth risk, either towards a risk-seeking trend or a risk-aversion trend.

This appendix explores:

- What is the Meketa Market Sentiment Indicator?
- How do I read the indicator graph?
- How is the Meketa Market Sentiment Indicator constructed?
- What do changes in the indicator mean?

Meketa has created a market sentiment indicator for monthly publication (the MIG-MSI – see below) to complement Meketa's Risk Metrics.

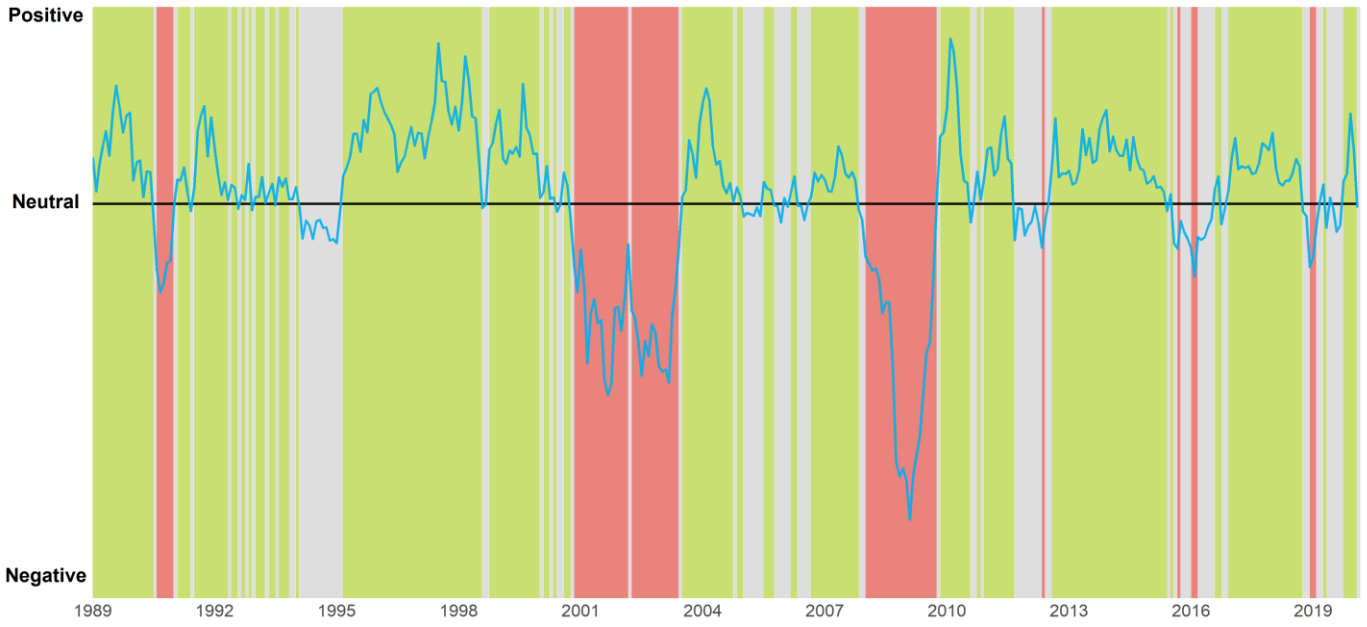
- Meketa's Risk Metrics, which rely significantly on standard market measures of relative valuation, often provide valid early signals of increasing long-term risk levels in the global investment markets. However, as is the case with numerous valuation measures, the Risk Metrics may convey such risk concerns long before a market corrections take place. The MIG-MSI helps to address this early-warning bias by measuring whether the markets are beginning to acknowledge key Risk Metrics trends, and / or indicating non-valuation based concerns. Once the MIG-MSI indicates that the market sentiment has shifted, it is our belief that investors should consider significant action, particularly if confirmed by the Risk Metrics. Importantly, Meketa believes the Risk Metrics and MIG-MSI should always be used in conjunction with one another and never in isolation. The questions and answers below highlight and discuss the basic underpinnings of the Meketa MIG-MSI:

What is the Meketa Market Sentiment Indicator (MIG-MSI)?

- The MIG-MSI is a measure meant to gauge the market's sentiment regarding economic growth risk. Growth risk cuts across most financial assets, and is the largest risk exposure that most portfolios bear. The MIG-MSI takes into account the momentum (trend over time, positive or negative) of the economic growth risk exposure of publicly traded stocks and bonds, as a signal of the future direction of growth risk returns; either positive (risk seeking market sentiment), or negative (risk averse market sentiment).

How do I read the Meketa Market Sentiment Indicator graph?

- Simply put, the MIG-MSI is a color-coded indicator that signals the market's sentiment regarding economic growth risk. It is read left to right chronologically. A green indicator on the MIG-MSI indicates that the market's sentiment towards growth risk is positive. A gray indicator indicates that the market's sentiment towards growth risk is neutral or inconclusive. A red indicator indicates that the market's sentiment towards growth risk is negative. The black line on the graph is the level of the MIG-MSI. The degree of the signal above or below the neutral reading is an indication the signal's current strength.
- Momentum as we are defining it is the use of the past behavior of a series as a predictor of its future behavior.



How is the Meketa Market Sentiment Indicator (MIG-MSI) Constructed?

- The MIG-MSI is constructed from two sub-elements representing investor sentiment in stocks and bonds:
  - Stock return momentum: Return momentum for the S&P 500 Equity Index (trailing 12-months).
  - Bond yield spread momentum: Momentum of bond yield spreads (excess of the measured bond yield over the identical duration US Treasury bond yield) for corporate bonds (trailing 12-months) for both investment grade bonds (75% weight) and high yield bonds (25% weight).
  - Both measures are converted to Z-scores and then combined to get an "apples to apples" comparison without the need of re-scaling.
- The black line reading on the graph is calculated as the average of the stock return momentum measure and the bonds spread momentum measure[1]. The color reading on the graph is determined as follows:
  - If both stock return momentum and bond spread momentum are positive = GREEN (positive).
  - If one of the momentum indicators is positive, and the other negative = GRAY (inconclusive).
  - If both stock return momentum and bond spread momentum are negative = RED (negative).

[1] Momentum as we are defining it is the use of the past behavior of a series as a predictor of its future behavior.
"Time Series Momentum" Moskowitz, Ooi, Pedersen, August 2010. *http://pages.stern.nyu.edu/~lpederse/papers/TimeSeriesMomentum.pdf*

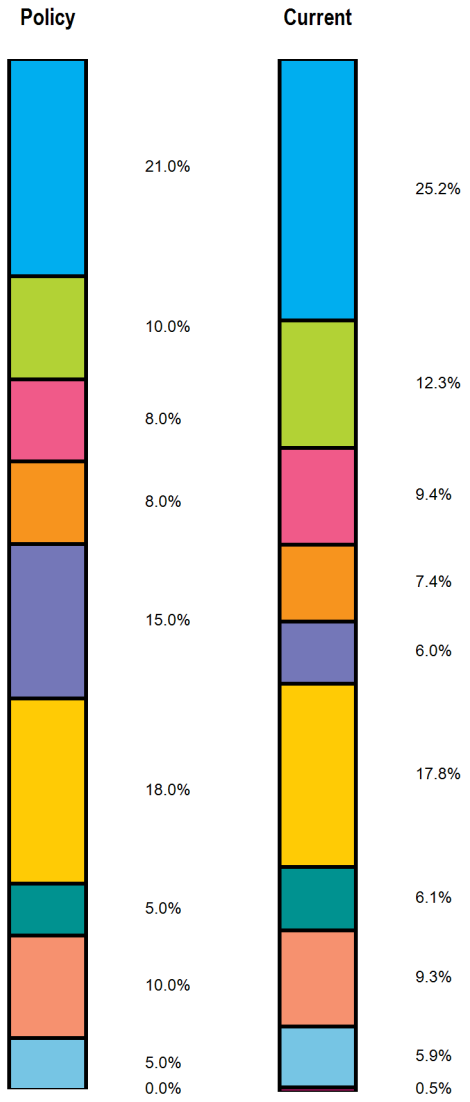
What does the Meketa Market Sentiment Indicator (MIG-MSI) mean? Why might it be useful?

- There is strong evidence that time series momentum is significant and persistent. In particular, across an extensive array of asset classes, the sign of the trailing 12-month return (positive or negative) is indicative of future returns (positive or negative) over the next 12-month period. The MIG-MSI is constructed to measure this momentum in stocks and corporate bond spreads. A reading of green or red is agreement of both the equity and bond measures, indicating that it is likely that this trend (positive or negative) will continue over the next 12 months. When the measures disagree, the indicator turns gray. A gray reading does not necessarily mean a new trend is occurring, as the indicator may move back to green, or into the red from there. The level of the reading (black line) and the number of months at the red or green reading, gives the user additional information on which to form an opinion, and potentially take action.

Performance Update as of March 31, 2021

Merced County Employees' Retirement Association

Total Fund | As of March 31, 2021

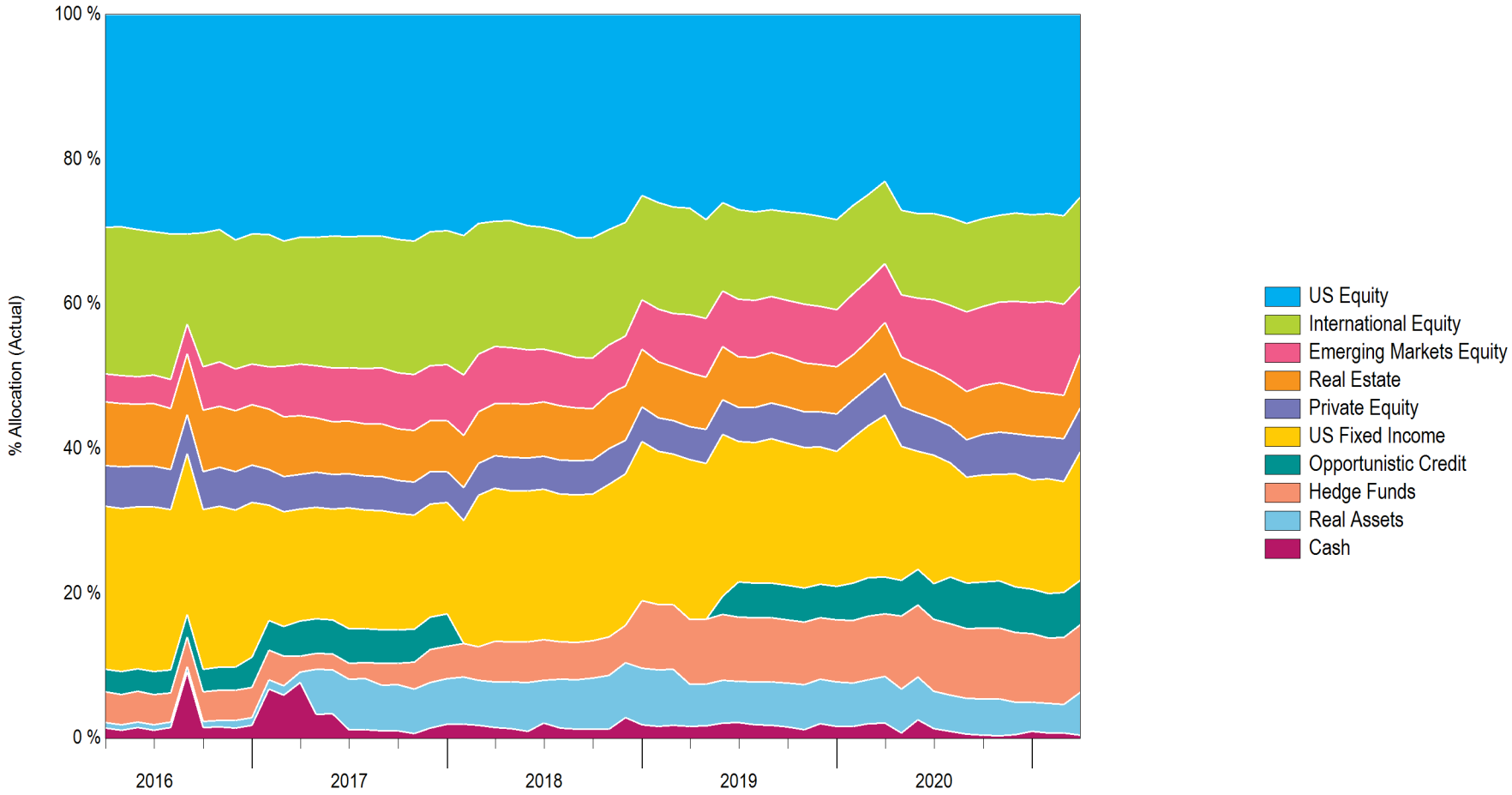


Allocation vs. Targets and Policy

	Current Balance	Current Allocation	Policy	Difference	Policy Range	Within IPS Range?
US Equity	$271,560,272	25.2%	21.0%	4.2%	15.0% - 26.0%	Yes
International Equity	$132,513,436	12.3%	10.0%	2.3%	5.0% - 15.0%	Yes
Emerging Markets Equity	$100,828,220	9.4%	8.0%	1.4%	4.0% - 12.0%	Yes
Real Estate	$80,087,132	7.4%	8.0%	-0.6%	6.0% - 10.0%	Yes
Private Equity	$64,923,643	6.0%	15.0%	-9.0%	5.0% - 20.0%	Yes
US Fixed Income	$191,439,727	17.8%	18.0%	-0.2%	13.0% - 23.0%	Yes
Opportunistic Credit	$66,096,746	6.1%	5.0%	1.1%	3.0% - 7.0%	Yes
Hedge Funds	$99,879,417	9.3%	10.0%	-0.7%	5.0% - 15.0%	Yes
Real Assets	$63,582,955	5.9%	5.0%	0.9%	3.0% - 7.0%	Yes
Cash	$5,057,472	0.5%	0.0%	0.5%	0.0% - 5.0%	Yes
Total	**$1,075,969,020**	**100.0%**	**100.0%**			

Cash range displayed for illustrative purposes only.

Asset Allocation History
5 Years Ending March 31, 2021



Asset Class Performance Summary

	Market Value ($)	% of Portfolio	1 Mo (%)	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Total Fund (Net)*	**1,075,969,020**	**100.0**	**0.6**	**1.9**	**18.1**	**31.6**	**10.2**	**10.5**	**8.2**	**8.4**	**Dec-94**
Total Fund (Gross)*			**0.6**	**2.0**	**18.4**	**32.2**	**10.5**	**10.8**	**8.6**	**8.5**	
Policy Index			*0.7*	*1.6*	*17.4*	*26.2*	*9.1*	*10.1*	*8.5*	*6.4*	*Dec-94*
Total Fund w/o Alternatives (Net)	**762,438,401**	**70.9**	**0.6**	**1.9**	**21.1**	**40.4**	**12.0**	**12.1**	**9.4**	**--**	**Dec-94**
Total Fund w/o Alternatives (Gross)			**0.6**	**2.0**	**21.5**	**41.0**	**12.4**	**12.4**	**9.1**	**--**	
Policy Index w/o Al			*1.1*	*2.8*	*21.7*	*39.1*	*10.3*	*11.0*	*--*	*--*	*Dec-94*
US Equity (Net)	**271,560,272**	**25.2**	**3.5**	**5.5**	**30.0**	**57.3**	**16.0**	**16.4**	**13.5**	**10.7**	**Dec-94**
US Equity (Gross)			**3.6**	**5.5**	**30.2**	**57.7**	**16.2**	**16.6**	**13.7**	**10.8**	
Russell 3000			*3.6*	*6.3*	*33.2*	*62.5*	*16.5*	*16.5*	*13.6*	*10.7*	*Dec-94*
International Equity (Net)	**233,341,656**	**21.7**	**-1.2**	**1.4**	**31.5**	**63.7**	**13.9**	**14.3**	**7.4**	**6.7**	**Dec-98**
International Equity (Gross)			**-1.2**	**1.6**	**32.4**	**65.1**	**14.5**	**14.9**	**8.0**	**7.0**	
International Equity Custom			*0.7*	*3.1*	*30.0*	*51.4*	*7.0*	*10.6*	*6.0*	*5.0*	*Dec-98*
Developed International Equity (Net)	**132,513,436**	**12.3**	**2.0**	**3.1**	**21.8**	**41.8**	**7.7**	**10.0**	**5.8**	**4.6**	**Jan-08**
Developed International Equity (Gross)			**2.0**	**3.3**	**22.5**	**42.8**	**8.1**	**10.4**	**6.3**	**5.1**	
Custom Blended Developed International Equity Benchmark			*2.2*	*3.9*	*28.3*	*49.4*	*6.6*	*9.2*	*5.7*	*3.6*	*Jan-08*
Emerging Markets Equity (Net)	**100,828,220**	**9.4**	**-5.0**	**-1.0**	**42.3**	**93.2**	**21.4**	**21.2**	**--**	**10.2**	**Apr-12**
Emerging Markets Equity (Gross)			**-5.0**	**-0.8**	**43.3**	**95.1**	**22.5**	**22.3**	**--**	**11.2**	
Custom Blended Emerging Markets Benchmark			*-1.5*	*2.3*	*34.1*	*58.4*	*6.7*	*12.4*	*4.0*	*5.7*	*Apr-12*
US Fixed Income (Net)	**191,439,727**	**17.8**	**-1.2**	**-3.4**	**-2.1**	**1.0**	**4.2**	**3.6**	**3.8**	**5.2**	**Dec-94**
US Fixed Income (Gross)			**-1.1**	**-3.3**	**-2.0**	**1.2**	**4.3**	**3.7**	**4.0**	**5.3**	
BBgBarc US Aggregate TR			*-1.2*	*-3.4*	*-2.1*	*0.7*	*4.4*	*3.8*	*3.6*	*5.5*	*Dec-94*
Opportunistic Credit (Net)	**66,096,746**	**6.1**	**0.5**	**2.5**	**12.1**	**22.0**	**--**	**--**	**--**	**6.8**	**May-19**
Opportunistic Credit (Gross)			**0.5**	**2.6**	**12.4**	**22.5**	**--**	**--**	**--**	**7.1**	
50% Barclays US Aggregate / 25% Barclays US High Yield / 25% Credit Suisse Leveraged Loans			*-0.6*	*-1.0*	*4.4*	*11.0*	*--*	*--*	*--*	*5.3*	*May-19*

The current US Fixed Income benchmark is the Barclays US Agg. Please refer to the benchmark history for the composition of the US Fixed Income benchmark in earlier periods.
Data prior to March 2018 provided by prior consultant.

Total Fund | As of March 31, 2021

	Market Value ($)	% of Portfolio	1 Mo (%)	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Real Estate (Net)	**80,087,132**	**7.4**	**0.9**	**1.2**	**1.6**	**0.8**	**2.5**	**4.3**	**6.7**	**--**	**Mar-99**
Real Estate (Gross)			**0.9**	**1.2**	**1.6**	**0.8**	**2.5**	**4.4**	**7.4**	**7.9**	
Custom Blended Real Estate Benchmark			*1.3*	*1.3*	*0.2*	*1.2*	*4.1*	*5.4*	*8.7*	*7.0*	*Mar-99*
CPI + 5% (Seasonally Adjusted)			*1.0*	*2.5*	*6.9*	*7.9*	*7.1*	*7.3*	*6.8*	*--*	*Mar-99*
Private Real Estate (Net)	**59,590,020**	**5.5**	**0.0**	**0.0**	**-0.1**	**-0.9**	**1.9**	**3.9**	**6.5**	**--**	**Mar-99**
Private Real Estate (Gross)			**0.0**	**0.0**	**-0.1**	**-0.8**	**1.9**	**4.1**	**7.2**	**7.8**	
Custom Blended Real Estate Benchmark			*1.3*	*1.3*	*0.2*	*1.2*	*4.1*	*5.4*	*8.7*	*7.0*	*Mar-99*
Private Equity (Net)	**64,923,643**	**6.0**	**0.0**	**0.0**	**16.6**	**12.6**	**10.8**	**10.6**	**9.7**	**8.2**	**Jun-05**
Private Equity (Gross)			**0.0**	**0.0**	**16.6**	**12.6**	**10.8**	**10.6**	**10.0**	**8.4**	
Custom Blended Private Equity Benchmark			*0.0*	*0.0*	*23.1*	*15.9*	*16.2*	*16.9*	*--*	*--*	*Jun-05*
Russell 3000 +3% 1-Quarter Lag			*4.7*	*15.5*	*56.1*	*24.5*	*17.9*	*18.9*	*17.2*	*13.3*	*Jun-05*
Hedge Fund (Net)	**99,879,417**	**9.3**	**0.9**	**4.7**	**14.6**	**21.3**	**5.2**	**6.7**	**--**	**4.7**	**Jun-14**
Hedge Fund (Gross)			**0.9**	**4.9**	**15.4**	**22.4**	**5.8**	**7.1**	**--**	**5.0**	
Custom Blended Hedge Fund Benchmark			*0.4*	*2.5*	*15.5*	*24.6*	*5.6*	*6.0*	*--*	*4.4*	*Jun-14*
Real Assets (Net)	**63,582,955**	**5.9**	**0.1**	**1.3**	**9.7**	**10.8**	**7.2**	**6.9**	**8.0**	**--**	**Mar-99**
Real Assets (Gross)			**0.1**	**1.3**	**9.8**	**11.0**	**7.4**	**7.1**	**8.6**	**--**	
Custom Blended Real Assets Benchmark			*0.0*	*0.0*	*6.7*	*-9.0*	*3.6*	*6.3*	*--*	*--*	*Mar-99*
CPI + 5% (Seasonally Adjusted)			*1.0*	*2.5*	*6.9*	*7.9*	*7.1*	*7.3*	*6.8*	*--*	*Mar-99*
Private Infrastructure (Net)	**21,128,134**	**2.0**	**0.0**	**0.0**	**3.5**	**11.2**	**10.5**	**11.0**	**--**	**8.5**	**Dec-14**
Private Infrastructure (Gross)			**0.0**	**0.0**	**3.5**	**11.4**	**10.6**	**11.0**	**--**	**8.5**	
S&P Global Infrastructure Net TR USD			*4.3*	*2.8*	*19.7*	*36.0*	*4.7*	*5.8*	*5.3*	*3.8*	*Dec-14*
Private Natural Resources (Net)	**12,101,715**	**1.1**	**0.0**	**0.0**	**10.0**	**-10.0**	**3.2**	**9.8**	**--**	**10.7**	**Sep-15**
Private Natural Resources (Gross)			**0.0**	**0.0**	**10.0**	**-10.0**	**3.2**	**9.8**	**--**	**10.7**	
S&P Global Natural Resources Index TR USD			*2.2*	*11.8*	*39.2*	*67.7*	*5.5*	*11.4*	*1.1*	*12.2*	*Sep-15*
Cash (Net)	**5,057,472**	**0.5**	**0.0**	**0.0**	**0.2**	**0.3**	**0.9**	**--**	**--**	**--**	
Cash (Gross)			**0.0**	**0.0**	**0.2**	**0.3**	**0.9**	**--**	**--**	**--**	

**One or more accounts have been excluded from the composite for the purposes of performance calculations and market value.*

Private Markets values are cash flow adjusted from 9/30/2020 NAVs unless otherwise noted.

Real Assets includes State Street Real Asset NL Fund.

Trailing Net Performance	Market Value ($)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Total Fund(Net)*	**1,075,969,020**	**100.0**	**--**	**0.6**	**1.9**	**18.1**	**31.6**	**10.2**	**10.5**	**8.2**	**8.4**	**Dec-94**
Policy Index				*0.7*	*1.6*	*17.4*	*26.2*	*9.1*	*10.1*	*8.5*	*6.4*	*Dec-94*
Total Fund w/o Alternatives(Net)	**762,438,401**	**70.9**	**70.9**	**0.6**	**1.9**	**21.1**	**40.4**	**12.0**	**12.1**	**9.4**	**--**	**Dec-94**
Policy Index w/o Al				*1.1*	*2.8*	*21.7*	*39.1*	*10.3*	*11.0*	*--*	*--*	*Dec-94*
US Equity(Net)	**271,560,272**	**25.2**	**35.6**	**3.5**	**5.5**	**30.0**	**57.3**	**16.0**	**16.4**	**13.5**	**10.7**	**Dec-94**
Russell 3000				*3.6*	*6.3*	*33.2*	*62.5*	*16.5*	*16.5*	*13.6*	*10.7*	*Dec-94*
Mellon Dynamic US Equity(Net)	128,120,784	11.9	47.2	4.5	5.2	26.9	51.6	17.8	18.1	--	18.2	Dec-12
S&P 500				*4.4*	*6.2*	*29.7*	*56.4*	*16.8*	*16.3*	*13.9*	*15.5*	*Dec-12*
Mellon Large Cap(Net)	108,057,302	10.0	39.8	4.0	6.1	32.0	60.8	17.4	16.7	--	16.7	Mar-16
Russell 1000				*3.8*	*5.9*	*31.8*	*60.6*	*17.3*	*16.7*	*14.0*	*16.7*	*Mar-16*
Champlain Small Cap(Net)	35,382,185	3.3	13.0	-1.3	4.9	--	--	--	--	--	30.3	Nov-20
Russell 2000				*1.0*	*12.7*	*55.4*	*94.8*	*14.8*	*16.4*	*11.7*	*45.0*	*Nov-20*
International Equity(Net)	**233,341,656**	**21.7**	**30.6**	**-1.2**	**1.4**	**31.5**	**63.7**	**13.9**	**14.3**	**7.4**	**6.7**	**Dec-98**
International Equity Custom				*0.7*	*3.1*	*30.0*	*51.4*	*7.0*	*10.6*	*6.0*	*5.0*	*Dec-98*
Developed International Equity(Net)	**132,513,436**	**12.3**	**56.8**	**2.0**	**3.1**	**21.8**	**41.8**	**7.7**	**10.0**	**5.8**	**4.6**	**Jan-08**
Custom Blended Developed International Equity Benchmark				*2.2*	*3.9*	*28.3*	*49.4*	*6.6*	*9.2*	*5.7*	*3.6*	*Jan-08*
GQG International Equity(Net)	53,441,735	5.0	40.3	0.6	2.5	17.4	37.9	--	--	--	13.7	Dec-19
MSCI ACWI ex USA				*1.3*	*3.5*	*28.7*	*49.4*	*6.5*	*9.8*	*4.9*	*14.3*	*Dec-19*
First Eagle International Value Fund(Net)	48,911,110	4.5	36.9	2.6	1.3	16.7	30.3	--	--	--	6.5	Dec-19
MSCI EAFE				*2.3*	*3.5*	*25.8*	*44.6*	*6.0*	*8.8*	*5.5*	*11.2*	*Dec-19*
MSCI World ex USA				*2.6*	*4.0*	*26.5*	*45.9*	*6.3*	*8.9*	*5.2*	*11.4*	*Dec-19*

Historical returns for the US Equity Composite prior to January 2012 and for the International Equity Composite prior to December 2010 are gross only.
Developed International Equity and Emerging Markets Equity composites were only reported as one composite prior to March 2018.

	Market Value ($)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Driehaus International Small Cap Growth(Net)	15,879,543	1.5	12.0	2.0	4.4	41.6	78.7	--	--	--	25.6	May-19
MSCI ACWI ex US Small Cap Growth NR USD				*0.9*	*3.3*	*35.7*	*72.6*	*8.9*	*11.7*	*7.2*	*18.7*	*May-19*
Acadian ACWI ex U.S. Small Cap Equity(Net)	14,281,049	1.3	10.8	5.0	10.7	40.7	73.7	--	--	--	19.4	May-19
MSCI ACWI ex US Small Cap				*2.0*	*5.5*	*38.3*	*69.8*	*6.6*	*10.4*	*6.3*	*15.1*	*May-19*
Emerging Markets Equity(Net)	**100,828,220**	**9.4**	**43.2**	**-5.0**	**-1.0**	**42.3**	**93.2**	**21.4**	**21.2**	**--**	**10.2**	**Apr-12**
Custom Blended Emerging Markets Benchmark				*-1.5*	*2.3*	*34.1*	*58.4*	*6.7*	*12.4*	*4.0*	*5.7*	*Apr-12*
Artisan Developing World TR(Net)	71,016,029	6.6	70.4	-6.0	-2.3	39.3	92.8	--	--	--	53.5	Dec-19
MSCI Emerging Markets				*-1.5*	*2.3*	*34.1*	*58.4*	*6.5*	*12.1*	*3.7*	*21.8*	*Dec-19*
RWC(Net)	29,812,190	2.8	29.6	-2.6	2.7	51.8	93.0	--	--	--	27.3	Dec-19
MSCI Emerging Markets				*-1.5*	*2.3*	*34.1*	*58.4*	*6.5*	*12.1*	*3.7*	*21.8*	*Dec-19*
US Fixed Income(Net)	**191,439,727**	**17.8**	**25.1**	**-1.2**	**-3.4**	**-2.1**	**1.0**	**4.2**	**3.6**	**3.8**	**5.2**	**Dec-94**
BBgBarc US Aggregate TR				*-1.2*	*-3.4*	*-2.1*	*0.7*	*4.4*	*3.8*	*3.6*	*5.5*	*Dec-94*
Vanguard Total Bond Market Index Fund(Net)	91,146,071	8.5	47.6	-1.4	-3.6	-2.4	0.6	--	--	--	4.9	May-19
BBgBarc US Aggregate TR				*-1.2*	*-3.4*	*-2.1*	*0.7*	*4.7*	*3.1*	*3.4*	*4.9*	*May-19*
Barrow Hanley(Net)	89,697,244	8.3	46.9	-1.1	-3.5	-1.9	2.5	5.1	3.3	3.5	3.7	Mar-10
BBgBarc US Aggregate TR				*-1.2*	*-3.4*	*-2.1*	*0.7*	*4.7*	*3.1*	*3.4*	*3.6*	*Mar-10*
Vanguard Short-Term Treasury Index Fund(Net)	10,596,412	1.0	5.5	0.0	-0.1	0.1	0.3	2.7	--	--	2.7	Feb-18
BBgBarc US Govt 1-3 Yr TR				*0.0*	*-0.1*	*0.1*	*0.4*	*2.8*	*1.7*	*1.3*	*2.8*	*Feb-18*
BBgBarc US Govt 1-5 Yr TR				*-0.2*	*-0.6*	*-0.4*	*0.0*	*3.3*	*1.9*	*1.7*	*3.3*	*Feb-18*

The current US Fixed Income benchmark is the Barclays US Agg. Please refer to the benchmark history for the composition of the US Fixed Income benchmark in earlier periods.
Historical returns for the US Fixed Income Composite prior to December 2010 and for Barrow Hanley prior to June 2010 are gross only.

	Market Value ($)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Opportunistic Credit(Net)	**66,096,746**	**6.1**	**8.7**	**0.5**	**2.5**	**12.1**	**22.0**	**--**	**--**	**--**	**6.8**	**May-19**
50% Barclays US Aggregate / 25% Barclays US High Yield / 25% Credit Suisse Leveraged Loans				*-0.6*	*-1.0*	*4.4*	*11.0*	*--*	*--*	*--*	*5.3*	*May-19*
PIMCO Income Fund(Net)	25,331,186	2.4	38.3	-0.1	-0.2	7.4	14.4	--	--	--	5.0	Apr-19
BBgBarc US Aggregate TR				*-1.2*	*-3.4*	*-2.1*	*0.7*	*4.7*	*3.1*	*3.4*	*4.9*	*Apr-19*
GoldenTree Multi-Sector Credit(Net)	23,206,182	2.2	35.1	0.3	2.4	13.8	27.3	--	--	--	7.1	Jun-19
50% BBgBarc US High Yield TR/50% Credit Suisse Leveraged Loans				*0.1*	*1.4*	*11.2*	*22.3*	*5.5*	*6.7*	*5.5*	*6.0*	*Jun-19*
Sculptor Credit Opportunities Domestic Partners, LP(Net)	17,559,378	1.6	26.6	1.5	6.8	17.1	--	--	--	--	17.1	Jul-20
50% BBgBarc US High Yield TR/50% Credit Suisse Leveraged Loans				*0.1*	*1.4*	*11.2*	*22.3*	*5.5*	*6.7*	*5.5*	*11.2*	*Jul-20*
Real Estate(Net)	**80,087,132**	**7.4**	**7.4**	**0.9**	**1.2**	**1.6**	**0.8**	**2.5**	**4.3**	**6.7**	**--**	**Mar-99**
Custom Blended Real Estate Benchmark				*1.3*	*1.3*	*0.2*	*1.2*	*4.1*	*5.4*	*8.7*	*7.0*	*Mar-99*
CPI + 5% (Seasonally Adjusted)				*1.0*	*2.5*	*6.9*	*7.9*	*7.1*	*7.3*	*6.8*	*--*	*Mar-99*
Vanguard REIT Index(Net)	20,497,112	1.9	25.6	5.1	8.7	--	--	--	--	--	15.6	Aug-20
Spliced Vanguard REIT Benchmark				*5.1*	*8.7*	*20.4*	*36.7*	*11.1*	*6.2*	*9.0*	*15.7*	*Aug-20*
Private Real Estate(Net)	**59,590,020**	**5.5**	**74.4**	**0.0**	**0.0**	**-0.1**	**-0.9**	**1.9**	**3.9**	**6.5**	**--**	**Mar-99**
Custom Blended Real Estate Benchmark				*1.3*	*1.3*	*0.2*	*1.2*	*4.1*	*5.4*	*8.7*	*7.0*	*Mar-99*
UBS Trumbull Property(Net)	35,029,523	3.3	58.8	0.0	0.0	-3.0	-2.6	0.3	1.9	6.0	6.4	Mar-99
Patron Capital V(Net)	7,772,596	0.7	13.0	0.0	0.0	11.2	3.8	-0.1	7.2	--	6.9	Jan-16

GoldenTree Multi-Sector Credit market value based on manager estimate.

Sculptor Credit Opportunities Domestic Partners market value based on manager estimate.

Private Markets values are cash flow adjusted from 9/30/2020 NAVs.

Data prior to March 2018 provided by prior consultant.

Private Real Estate results prior to 1/1/2019 were included in the Real Assets composite. All results for the Private Real Estate composite that include the period prior to 1/1/2019 will reflect only the latest lineup of managers that Meketa received information for, therefore it may not reflect the entire Private Real Estate composite at that given time.

	Market Value ($)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Greenfield Gap VII(Net)	5,478,611	0.5	9.2	0.0	0.0	2.5	-2.2	8.6	10.7	--	11.4	Dec-14
Taconic CRE Dislocation Fund II(Net)	4,598,011	0.4	7.7	0.0	0.0	2.2	4.0	--	--	--	7.0	Nov-18
AG Realty Value Fund X, L.P.(Net)	2,356,402	0.2	4.0	0.0	0.0	6.0	3.6	--	--	--	-7.2	Jun-19
Carlyle Realty VIII(Net)	1,782,013	0.2	3.0	0.0	0.0	-4.4	12.0	-4.3	--	--	-12.8	Dec-17
Cerberus Real Estate Debt Fund, L.P.(Net)	1,491,829	0.1	2.5	0.0	0.0	16.7	--	--	--	--	16.7	Jul-20
Rockpoint Real Estate Fund VI, L.P.(Net)	736,386	0.1	1.2	0.0	0.0	-2.8	-5.8	--	--	--	-5.8	May-20
Carmel Partners Investment Fund VII(Net)	344,649	0.0	0.6	0.0	0.0	-15.2	-22.4	--	--	--	-39.1	Apr-19
Private Equity(Net)	**64,923,643**	**6.0**	**6.0**	**0.0**	**0.0**	**16.6**	**12.6**	**10.8**	**10.6**	**9.7**	**8.2**	**Jun-05**
Custom Blended Private Equity Benchmark				*0.0*	*0.0*	*23.1*	*15.9*	*16.2*	*16.9*	--	--	*Jun-05*
Russell 3000 +3% 1-Quarter Lag				*4.7*	*15.5*	*56.1*	*24.5*	*17.9*	*18.9*	*17.2*	*13.3*	*Jun-05*
Invesco VI(Net)	6,853,465	0.6	10.6	0.0	0.0	30.6	24.8	14.8	13.9	--	13.2	Jun-13
Adams Street(Net)	6,119,513	0.6	9.4	0.0	0.0	30.7	16.7	12.4	12.4	13.0	7.7	Sep-05
Davidson Kempner Long-Term Distressed Opportunities Fund IV(Net)	4,906,517	0.5	7.6	0.0	0.0	14.2	-0.1	7.7	--	--	7.7	Apr-18
Ocean Avenue II(Net)	4,858,439	0.5	7.5	0.0	0.0	8.5	14.7	17.7	17.4	--	12.0	Jun-14
Summit Partners Growth Equity Fund X-A(Net)	4,634,691	0.4	7.1	0.0	0.0	10.5	30.3	--	--	--	8.3	Mar-20
TCV X(Net)	4,193,082	0.4	6.5	0.0	0.0	38.6	35.7	--	--	--	11.3	Apr-19
Pantheon II(Net)	3,672,109	0.3	5.7	0.0	0.0	27.5	21.8	14.8	14.3	--	12.3	Dec-11
GTCR Fund XII(Net)	3,455,664	0.3	5.3	0.0	0.0	36.5	28.5	--	--	--	9.3	Jun-18

Adams Street includes Adams Street 2005, Adams Street 2007, and Adams Street 2011.
Pantheon I includes Pantheon US Fund VI and Pantheon Europe Fund IV.
Pantheon II includes Pantheon US Fund IX, Pantheon Asia Fund VI, and Pantheon Europe Fund VII.
Pantheon Secondary includes Pantheon GLO SEC III B.

	Market Value ($)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Carrick Capital Partners III(Net)	3,339,768	0.3	5.1	0.0	0.0	9.4	3.8	--	--	--	3.3	Aug-18
Cortec Group Fund VII(Net)	3,162,379	0.3	4.9	0.0	0.0	20.7	16.9	--	--	--	11.5	Dec-19
Genstar Capital Partners IX(Net)	3,152,074	0.3	4.9	0.0	0.0	25.9	18.6	--	--	--	14.3	Jul-19
Cressey & Company Fund VI(Net)	2,862,473	0.3	4.4	0.0	0.0	22.9	21.4	--	--	--	7.8	Jan-19
Raven Asset Fund II(Net)	2,620,858	0.2	4.0	0.0	0.0	-17.6	-17.4	-4.7	-4.1	--	-4.3	Aug-14
Spark Capital Growth Fund III(Net)	2,471,129	0.2	3.8	0.0	0.0	-9.4	-9.4	--	--	--	-8.7	Mar-20
Taconic Market Dislocation Fund III L.P.(Net)	1,990,602	0.2	3.1	0.0	0.0	0.0	--	--	--	--	0.0	Jul-20
Silver Point Specialty Credit Fund II, L.P.(Net)	1,960,129	0.2	3.0	0.0	0.0	7.7	--	--	--	--	7.7	Jul-20
Accel-KKR Growth Capital Partners III(Net)	1,677,416	0.2	2.6	0.0	0.0	4.4	4.5	--	--	--	-7.5	Jul-19
Marlin Heritage Europe II, L.P.(Net)	1,199,693	0.1	1.8	0.0	0.0	--	--	--	--	--	0.0	Oct-20
Spark Capital VI(Net)	934,409	0.1	1.4	0.0	0.0	-12.2	-12.2	--	--	--	-11.3	Mar-20
Pantheon Secondary(Net)	280,373	0.0	0.4	0.0	0.0	15.4	4.6	2.0	2.1	2.1	2.9	Jun-07
Accel-KKR Capital Partners VI(Net)	189,576	0.0	0.3	0.0	--	--	--	--	--	--	0.0	Feb-21
Pantheon I(Net)	177,482	0.0	0.3	0.0	0.0	0.2	-4.6	-11.5	-4.7	0.8	0.3	Dec-05
Khosla Ventures VII(Net)	138,000	0.0	0.2	0.0	0.0	--	--	--	--	--	0.0	Jan-21
Khosla Ventures Seed E(Net)	42,000	0.0	0.1	0.0	--	--	--	--	--	--	0.0	Feb-21
TCV XI(Net)	27,200	0.0	0.0	0.0	--	--	--	--	--	--	0.0	Feb-21
Invesco IV(Net)	4,602	0.0	0.0	0.0	0.0	-19.6	-42.3	7.9	12.1	11.3	9.9	Jun-05

Historical returns for Invesco IV prior to April 2012 are gross only.

	Market Value ($)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
Hedge Fund(Net)	**99,879,417**	**9.3**	**9.3**	**0.9**	**4.7**	**14.6**	**21.3**	**5.2**	**6.7**	**--**	**4.7**	**Jun-14**
Custom Blended Hedge Fund Benchmark				*0.4*	*2.5*	*15.5*	*24.6*	*5.6*	*6.0*	*--*	*4.4*	*Jun-14*
Silver Point Capital(Net)	15,341,956	1.4	15.4	2.3	9.0	25.5	34.1	7.8	--	--	7.8	Nov-17
Laurion Capital(Net)	13,707,848	1.3	13.7	6.3	17.2	25.9	34.6	--	--	--	21.5	Aug-18
Taconic Opportunity Fund(Net)	13,543,968	1.3	13.6	0.8	4.8	12.9	18.2	--	--	--	5.4	Dec-18
Wellington-Archipelago(Net)	13,504,635	1.3	13.5	0.3	0.9	9.1	18.6	4.7	--	--	5.6	Aug-17
Sculptor (OZ) Domestic II(Net)	13,466,662	1.3	13.5	-0.2	3.3	15.1	29.2	10.5	10.9	--	8.1	Jun-14
Marshall Wace Global Opportunities(Net)	9,620,712	0.9	9.6	-4.8	-7.4	5.6	--	--	--	--	6.9	May-20
KLS Diversified(Net)	8,644,168	0.8	8.7	-0.2	3.5	12.0	14.5	-1.3	--	--	-0.9	Oct-17
Graham Absolute Return(Net)	8,145,113	0.8	8.2	2.3	6.3	16.5	23.8	3.4	--	--	3.5	Aug-17
Marshall Wace Eureka(Net)	3,904,354	0.4	3.9	-2.2	0.5	13.5	19.2	5.8	--	--	6.6	Nov-17
Real Assets(Net)	**63,582,955**	**5.9**	**5.9**	**0.1**	**1.3**	**9.7**	**10.8**	**7.2**	**6.9**	**8.0**	**--**	**Mar-99**
Custom Blended Real Assets Benchmark				*0.0*	*0.0*	*6.7*	*-9.0*	*3.6*	*6.3*	*--*	*--*	*Mar-99*
CPI + 5% (Seasonally Adjusted)				*1.0*	*2.5*	*6.9*	*7.9*	*7.1*	*7.3*	*6.8*	*--*	*Mar-99*
SSgA(Net)	30,353,106	2.8	47.7	0.3	5.3	21.5	34.1	5.3	--	--	5.2	Apr-17
Real Asset NL Custom Blended Index				*0.9*	*6.1*	*22.8*	*35.7*	*5.6*	*--*	*--*	*5.5*	*Apr-17*
Private Infrastructure(Net)	**21,128,134**	**2.0**	**33.2**	**0.0**	**0.0**	**3.5**	**11.2**	**10.5**	**11.0**	**--**	**8.5**	**Dec-14**
S&P Global Infrastructure Net TR USD				*4.3*	*2.8*	*19.7*	*36.0*	*4.7*	*5.8*	*5.3*	*3.8*	*Dec-14*
KKR Global II(Net)	7,365,970	0.7	34.9	0.0	0.0	10.5	36.9	17.8	14.5	--	14.0	Dec-14
North Haven Infrastructure II(Net)	7,180,485	0.7	34.0	0.0	0.0	-1.3	-3.3	7.2	10.3	--	6.6	May-15

	Market Value ($)	% of Portfolio	% of Sector	1 Mo (%)	QTD (%)	Fiscal YTD (%)	1 Yr (%)	3 Yrs (%)	5 Yrs (%)	10 Yrs (%)	Inception (%)	Inception Date
ISQ Global Infrastructure Fund II(Net)	3,556,295	0.3	16.8	0.0	0.0	6.4	7.4	--	--	--	-4.4	Jul-18
KKR Global Infrastructure Investors III(Net)	2,354,341	0.2	11.1	0.0	0.0	7.5	3.1	--	--	--	-5.9	Jan-19
Ardian Infrastructure Fund V(Net)	671,043	0.1	3.2	0.0	0.0	-34.7	-40.2	--	--	--	-30.7	Oct-19
Private Natural Resources(Net)	**12,101,715**	**1.1**	**19.0**	**0.0**	**0.0**	**10.0**	**-10.0**	**3.2**	**9.8**	**--**	**10.7**	**Sep-15**
S&P Global Natural Resources Index TR USD				*2.2*	*11.8*	*39.2*	*67.7*	*5.5*	*11.4*	*1.1*	*12.2*	*Sep-15*
GSO Energy Opportunities(Net)	2,771,065	0.3	22.9	0.0	0.0	26.9	-17.4	-3.0	8.1	--	7.2	Nov-15
Tailwater Energy Fund IV, LP(Net)	2,010,843	0.2	16.6	0.0	0.0	5.2	-23.1	--	--	--	-24.6	Oct-19
BlackRock Global Energy and Power Infrastructure Fund III LP(Net)	1,769,520	0.2	14.6	0.0	0.0	34.1	-0.8	--	--	--	21.1	Jul-19
Taurus Mining(Net)	1,580,154	0.1	13.1	0.0	0.0	-0.6	-13.6	5.1	8.1	--	10.7	Sep-15
Taurus Mining Annex(Net)	1,567,697	0.1	13.0	0.0	0.0	7.6	14.0	20.8	--	--	24.4	Jan-17
EnCap IV(Net)	1,252,944	0.1	10.4	0.0	0.0	3.8	-5.6	-0.6	--	--	-0.5	Feb-18
EnCap XI(Net)	1,149,492	0.1	9.5	0.0	0.0	-6.5	-29.7	-21.8	--	--	-28.7	Jul-17
Cash(Net)	**5,057,472**	**0.5**	**0.5**	**0.0**	**0.0**	**0.2**	**0.3**	**0.9**	**--**	**--**	**--**	
Cash(Net)	4,332,363	0.4	85.7	0.0	0.0	0.2	0.3	1.2	1.1	-1.6	--	Sep-03
Treasury Cash(Net)	725,108	0.1	14.3									

**One or more accounts have been excluded from the composite for the purposes of performance calculations and market value.*

Benchmark History
As of March 31, 2021

Total Fund		
1/1/2020	Present	21% Russell 3000 / 10% Custom Blended Developed International Equity Benchmark / 8% Custom Blended Emerging Markets Benchmark / 18% BBgBarc US Aggregate TR / 10% Custom Blended Hedge Fund Benchmark / 15% Custom Blended Private Equity Benchmark / 5% Custom Blended Real Assets Benchmark / 8% Custom Blended Real Estate Benchmark / 5% 50% Barclays US Aggregate / 25% Barclays US High Yield / 25% Credit Suisse Leveraged Loans
7/1/2019	12/31/2019	21% US Equity Custom / 18% International Equity Custom / 18% US Fixed Custom / 10% Custom Blended Hedge Fund Benchmark / 15% Thomson Reuters Cambridge Private Equity Index / 5% Real Asset Custom / 8% NCREIF ODCE (net) / 5% 50% Barclays US Aggregate / 25% Barclays US High Yield / 25% Credit Suisse Leveraged Loans
1/1/2019	6/30/2019	21% US Equity Custom / 18% International Equity Custom / 23% US Fixed Custom / 10% Custom Blended Hedge Fund Benchmark / 15% Thomson Reuters Cambridge Private Equity Index / 5% Real Asset Custom / 8% NCREIF ODCE (net)
1/1/2017	12/31/2018	27% US Equity Custom / 23% International Equity Custom / 22% US Fixed Custom / 5% Custom Blended Hedge Fund Benchmark / 9% Thomson Reuters Cambridge Private Equity Index / 14% Real Asset Custom
7/1/2014	12/31/2016	22.7% Russell 1000 / 5.7% Russell 2000 / 23.6% International Equity Custom / 28.5% US Fixed Custom / 4.5% Custom Blended Hedge Fund Benchmark / 8% NCREIF ODCE (net) / 7% Cambridge Assoc. U.S. Private Equity Legacy Index
Total Fund w/o Alternatives		
1/1/2017	Present	37.5% US Equity Custom / 31.94% International Equity Custom / 30.56% US Fixed Custom
7/1/2014	12/31/2016	28.2% Russell 1000 / 7.1% Russell 2000 / 29.3% International Equity Custom / 35.4% US Fixed Custom
US Equity		
1/1/2020	Present	Russell 3000
12/31/1994	12/31/2019	80% R1000 / 20% R2000
International Equity		
1/1/2019	Present	56% MSCI EAFE Gross / 44% MSCI Emerging Markets Gross
1/1/2017	12/31/2018	69.56% MSCI EAFE Gross / 30.44% MSCI Emerging Markets Gross
7/1/2013	12/31/2016	MSCI ACWI ex USA Gross
Developed International Equity		
1/1/2020	Present	80% MSCI EAFE / 20% MSCI ACWI ex US Small Cap
1/31/2008	12/31/2019	MSCI EAFE
Emerging Markets Equity		
1/1/2020	Present	MSCI Emerging Markets
4/30/2012	12/31/2019	MSCI Emerging Markets Gross
US Fixed Income		
1/1/2020	Present	BBgBarc US Aggregate TR
3/1/2018	12/31/2019	77.27% BBgBarc US Aggregate TR / 22.73% BBgBarc US Govt 1-5 Yr TR
1/1/2017	2/28/2018	77.27% BBgBarc US Aggregate TR / 22.73% Credit Suisse Leveraged Loans
8/1/2014	12/31/2016	71.93% BBgBarc US Aggregate TR / 17.54% ICE BofA US High Yield TR / 10.53% Credit Suisse Leveraged Loans
12/31/1994	7/31/2014	US Fixed Custom

Opportunistic Credit		
5/1/2019	Present	50% BBgBarc US Aggregate TR / 25% BBgBarc US High Yield TR / 25% Credit Suisse Leveraged Loans
Real Estate		
1/1/2020	Present	NCREIF ODCE (lagged one quarter)
3/31/1999	12/31/2019	NCREIF ODCE (net)
Vanguard REIT Index		
8/31/2020	Present	MSCI US IMI Real Estate 25-50 GR USD
Private Real Estate		
1/1/2020	Present	NCREIF ODCE (lagged one quarter)
3/31/1999	12/31/2019	NCREIF ODCE (net)
Private Equity		
1/1/2020	Present	50% Cambridge Glob Priv Eq Qtr Lag / 50% Cambridge Venture Capital (1 Quarter Lagged)
6/30/2005	12/31/2019	Thomson Reuters Cambridge Private Equity Index
Hedge Fund		
7/1/2017	Present	100% HFRI Fund of Funds Composite Index
1/1/2015	6/30/2017	50% HFRI Fund of Funds Composite Index / 50% HFRI RV: Multi-Strategy Index
Real Assets		
1/1/2020	Present	50% Cambridge Infrastructure (1 Quarter Lagged) / 50% Cambridge Energy Upstream & Royalties & Private Energy
3/31/1999	12/31/2019	Real Asset Custom
Private Infrastructure		
12/31/2014	Present	S&P Global Infrastructure Net TR USD
Private Natural Resources		
9/30/2015	Present	S&P Global Natural Resources Index TR USD
SSgA		
4/30/2017	Present	25% Bloomberg Roll Select Commodities Index TR USD / 25% S&P Global LargeMidCap Commodity and Resources NR USD / 10% S&P Global Infrastructure TR USD / 15% DJ US Select REIT TR USD / 25% BBgBarc US TIPS TR

Annual Investment Expense Analysis
As Of March 31, 2021

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
Total Fund w/o Alternatives		**$762,438,401**		
US Equity		**$271,560,272**		
Mellon Dynamic US Equity	0.30% of Assets	$128,120,784	$384,362	0.30%
Mellon Large Cap	0.04% of First 100.0 Mil, 0.02% Thereafter	$108,057,302	$41,611	0.04%
Champlain Small Cap	1.00% of Assets	$35,382,185	$353,822	1.00%
International Equity		**$233,341,656**		
Developed International Equity		**$132,513,436**		
Acadian ACWI ex U.S. Small Cap Equity	0.99% of Assets	$14,281,049	$141,382	0.99%
Driehaus International Small Cap Growth	0.90% of Assets	$15,879,543	$142,916	0.90%
GQG International Equity	0.50% of Assets	$53,441,735	$267,209	0.50%
First Eagle International Value Fund	0.79% of Assets	$48,911,110	$386,398	0.79%
Emerging Markets Equity		**$100,828,220**		
Artisan Developing World TR	1.05% of Assets	$71,016,029	$745,668	1.05%
RWC	0.87% of Assets	$29,812,190	$259,366	0.87%
US Fixed Income		**$191,439,727**		
Barrow Hanley	0.30% of First 50.0 Mil, 0.20% of Next 100.0 Mil, 0.15% Thereafter	$89,697,244	$229,394	0.26%
Vanguard Short-Term Treasury Index Fund	0.05% of Assets	$10,596,412	$5,298	0.05%
Vanguard Total Bond Market Index Fund	0.04% of Assets	$91,146,071	$31,901	0.04%
Opportunistic Credit		**$66,096,746**		
PIMCO Income Fund	0.50% of Assets	$25,331,186	$126,656	0.50%
GoldenTree Multi-Sector Credit	0.70% of Assets	$23,206,182	$162,443	0.70%
Sculptor Credit Opportunities Domestic Partners, LP	Performance-based 1.00 and 20.00	$17,559,378	$175,594	1.00%

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
Real Estate		**$80,087,132**		
Vanguard REIT Index	0.10% of Assets	$20,497,112	$20,497	0.10%
Private Real Estate		**$59,590,020**		
Greenfield Gap VII		$5,478,611		
Patron Capital V		$7,772,596		
UBS Trumbull Property		$35,029,523		
Carlyle Realty VIII		$1,782,013		
Taconic CRE Dislocation Fund II		$4,598,011		
Carmel Partners Investment Fund VII		$344,649		
AG Realty Value Fund X, L.P.		$2,356,402		
Rockpoint Real Estate Fund VI, L.P.		$736,386		
Cerberus Real Estate Debt Fund, L.P.		$1,491,829		
Invesco IV		$4,602		
Invesco VI		$6,853,465		
Ocean Avenue II		$4,858,439		
Pantheon I		$177,482		
Pantheon II		$3,672,109		
Pantheon Secondary		$280,373		
Raven Asset Fund II		$2,620,858		
Davidson Kempner Long-Term Distressed Opportunities Fund IV		$4,906,517		
GTCR Fund XII		$3,455,664		
Carrick Capital Partners III		$3,339,768		
Cressey & Company Fund VI		$2,862,473		
TCV X		$4,193,082		
Accel-KKR Growth Capital Partners III		$1,677,416		
Genstar Capital Partners IX		$3,152,074		

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
Cortec Group Fund VII		$3,162,379		
Spark Capital Growth Fund III		$2,471,129		
Spark Capital VI		$934,409		
Summit Partners Growth Equity Fund X-A		$4,634,691		
Taconic Market Dislocation Fund III L.P.		$1,990,602		
Silver Point Specialty Credit Fund II, L.P.		$1,960,129		
Marlin Heritage Europe II, L.P.		$1,199,693		
Khosla Ventures VII		$138,000		
Accel-KKR Capital Partners VI		$189,576		
Khosla Ventures Seed E		$42,000		
TCV XI		$27,200		
Hedge Fund		**$99,879,417**		
Sculptor (OZ) Domestic II	Performance-based 1.50 and 20.00	$13,466,662	$202,000	1.50%
Graham Absolute Return	Performance-based 1.75 and 20.00	$8,145,113	$179,681	2.21%
Wellington-Archipelago	Performance-based 1.00 and 20.00	$13,504,635	$142,544	1.06%
KLS Diversified	Performance-based 2.00 and 20.00	$8,644,168	$172,883	2.00%
Marshall Wace Eureka	Performance-based 2.00 and 20.00	$3,904,354	$78,087	2.00%
Silver Point Capital	Performance-based 1.50 and 20.00	$15,341,956	$300,702	1.96%
Laurion Capital	Performance-based 2.00 and 20.00	$13,707,848	$447,972	3.27%
Taconic Opportunity Fund	Performance-based 1.40 and 20.00	$13,543,968	$211,286	1.56%
Marshall Wace Global Opportunities	Performance-based 2.00 and 20.00	$9,620,712	$192,414	2.00%
Real Assets		**$63,582,955**		
SSgA	0.30% of First 50.0 Mil, 0.27% of Next 50.0 Mil, 0.25% Thereafter	$30,353,106	$91,059	0.30%
Private Infrastructure		**$21,128,134**		
KKR Global II		$7,365,970		
North Haven Infrastructure II		$7,180,485		

Name	Fee Schedule	Market Value	Estimated Fee Value	Estimated Fee
ISQ Global Infrastructure Fund II		$3,556,295		
KKR Global Infrastructure Investors III		$2,354,341		
Ardian Infrastructure Fund V		$671,043		
Private Natural Resources		**$12,101,715**		
EnCap XI		$1,149,492		
EnCap IV		$1,252,944		
GSO Energy Opportunities		$2,771,065		
Taurus Mining		$1,580,154		
Taurus Mining Annex		$1,567,697		
BlackRock Global Energy and Power Infrastructure Fund III LP		$1,769,520		
Tailwater Energy Fund IV, LP		$2,010,843		
Cash		**$5,057,472**		
Cash		$4,332,363		
Treasury Cash		$725,108		

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Meketa Investment Group

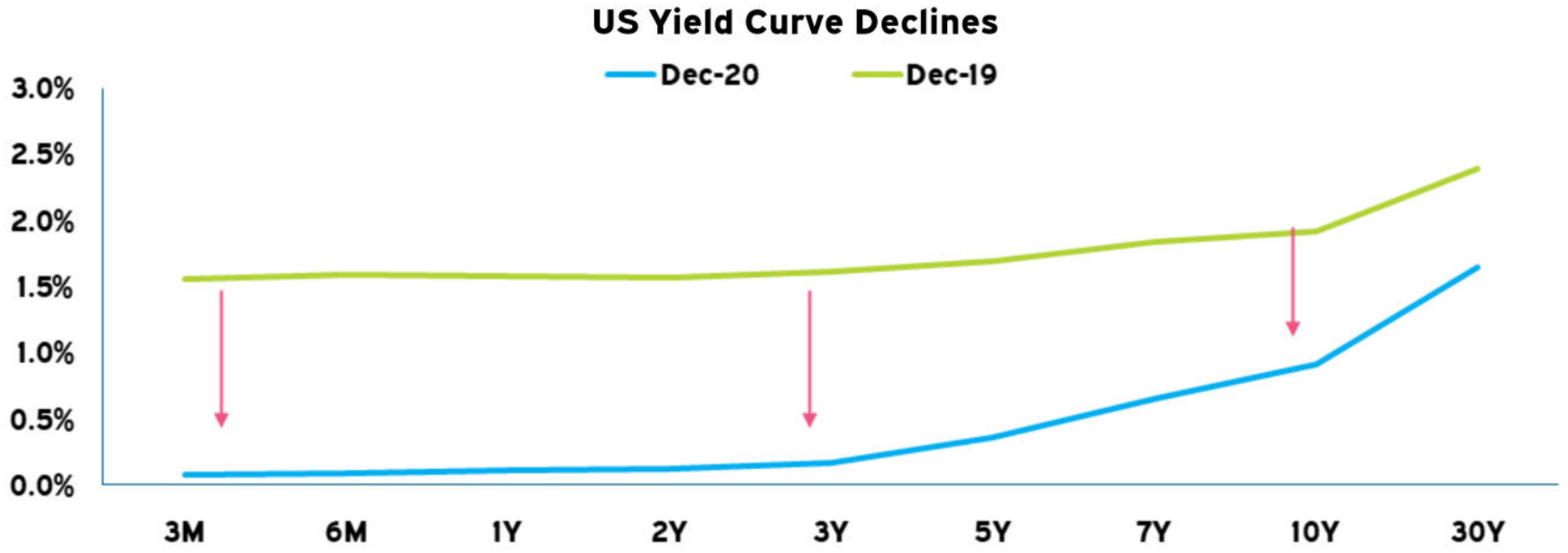
2021
Capital Markets Expectations

Executive Summary

- We update our capital markets expectations each year in January.
  - Changes are driven by many factors, including interest rates, credit spreads, and equity prices.
- The good news is that most investors achieved returns in 2020 that were above their target return.
  - The bad news is the impact this has on our expectations for future returns.
- In 2020, yields went down, credit spreads tightened, and prices for most risk assets went up.
  - Hence our expected returns have declined for almost every asset class.

Declining Interest Rates

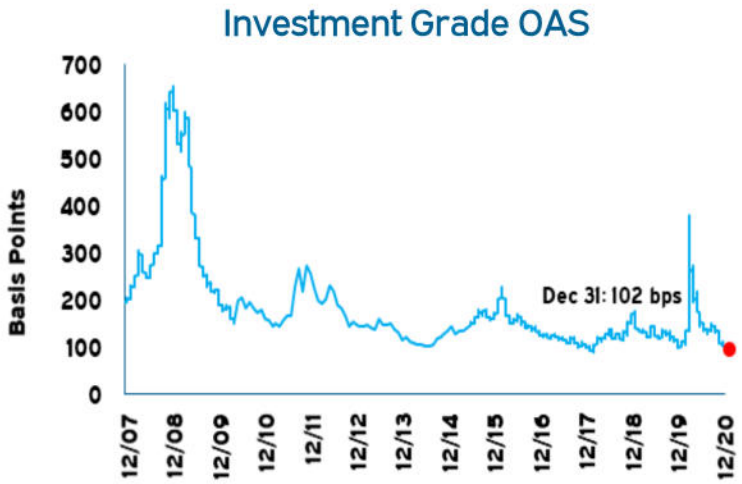
- The US Treasury yield curve declined materially during 2020, driven by demand for safe-haven assets (e.g., Treasuries), Federal Reserve polices (e.g., policy rate cuts and the quantitative easing program), and weak US economic fundamentals.
- The change was most dramatic at the shorter end of the curve, but even longer-dated maturities saw significant declines.

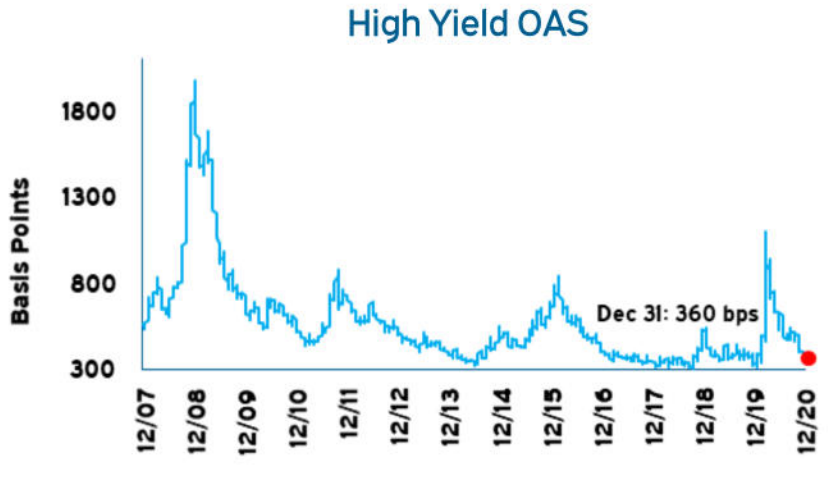


Source: Bloomberg. Data is as of December 31, 2020.

Tighter Credit Spreads

- Credit spreads (the spread above a comparable Treasury) for investment grade and high yield corporate debt tightened in 2020.
- Despite a widening of spreads at the outset of the pandemic, a combination of policy support (by the Fed) and the search for yield led to a decline in spreads to below long-term averages.
- A tighter spread on top of an already low yield for Treasuries equals lower yields for corporate bonds and other riskier bonds.





Source: Bloomberg. Data is as of December 31, 2020.

Declining Rates + Tighter Spreads = Lower Yields

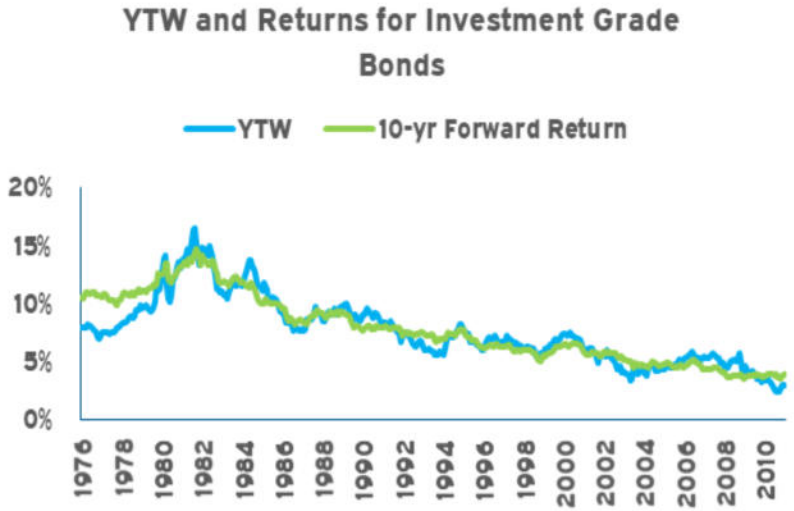
- The combination of declining rates and tight spreads resulted in lower yields across every major sector of the global bond market.

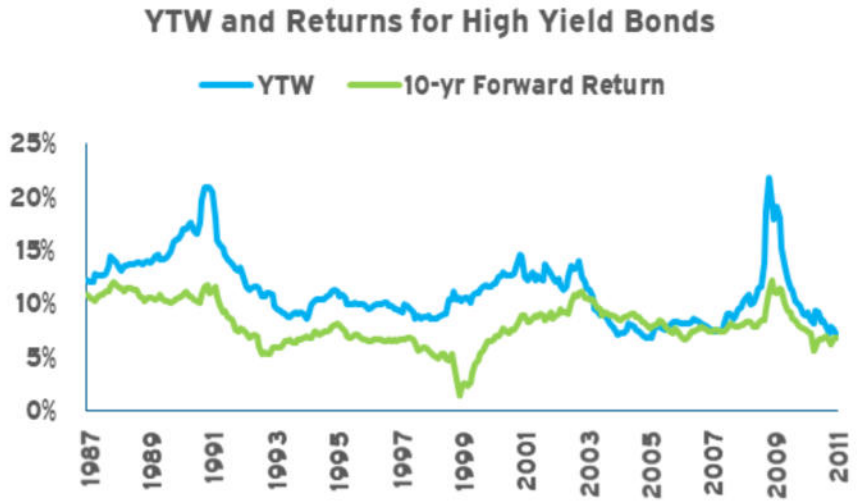
Index	Yield to Worst 12/31/20 (%)	Yield to Worst 12/31/19 (%)
Fed Funds Rate	0.1	1.6
10-year Treasury	0.93	1.92
Barclays Aggregate	1.12	2.31
Barclays Corporate	1.74	2.84
Barclays Securitized	1.24	2.53
Barclays Global Aggregate	0.83	1.45
Barclays EM Local Currency Government	3.20	3.72
Barclays EM Hard Currency Aggregate	3.20	4.45
Barclays US Corporate High Yield	4.18	5.19

Source: Bloomberg. Data is as of December 31, 2020 and 2019.

Lower Yields Means Lower Future Returns

- This decline in interest rates matters because yields are a very good predictor of future returns for bonds[1], at least over a 10-year horizon.



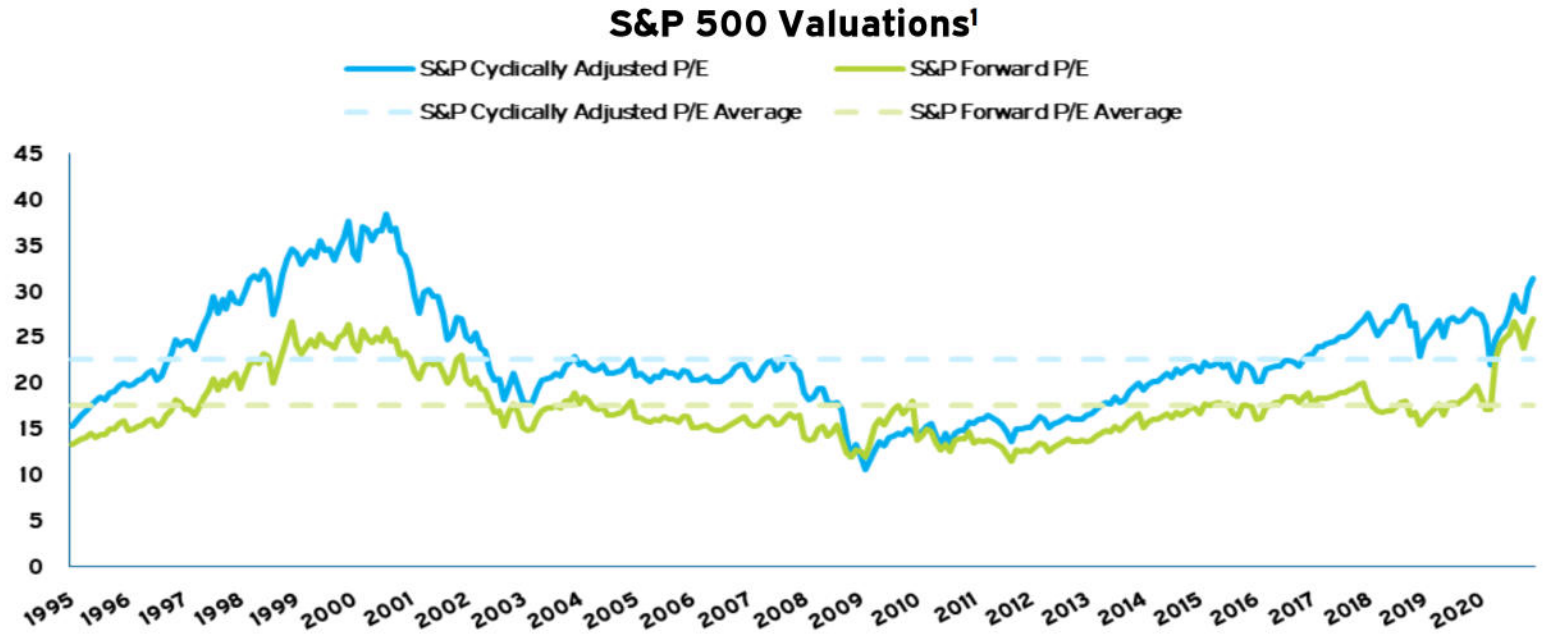


[1] When predicting returns for bonds, default risk should also be taken into account. For example, defaults are why the return for high yield bonds have generally been below the starting yield.

Source: Bloomberg. Data is as of December 31, 2020.

Higher Prices for Equities

- After the initial downturn during the outset of the pandemic, stocks rebounded strongly and finished the year well above where they started.
- Valuations based on both forward- and backward-looking earnings rose to levels not seen since 2001.



[1] Source: Bloomberg. Data is as of December 31, 2020.

Higher Prices in Non-US Equities, too

- It is not just US equities that saw a jump in PE ratios.
- EM equities had a strong 2020, led by Chinese stocks.
- EAFE equities lagged behind, but because they experienced a much larger hit to earnings[1], their PE ratios likewise moved up.

Developed International Equity Cyclically Adjusted P/E

Emerging Market Equity Cyclically Adjusted P/E

[1] Trailing 12-month EPS for MSCI EAFE dropped from 115.4 to 49.1 from December 2019 to December 2020.
[2] Source: MSCI and Bloomberg. Earnings figures represent the average of monthly "as reported" earnings over the previous ten years. Data as of December 31, 2020.

Impact of Low Rates on Equity Prices

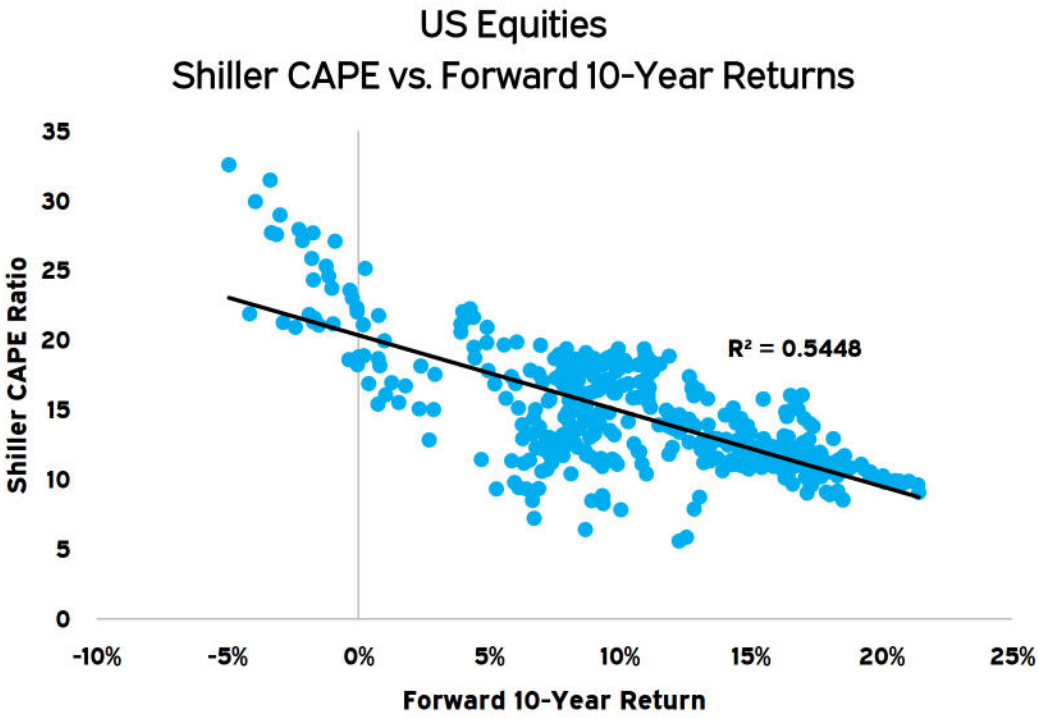
- Looking at Price-Earnings (or PE10, or PB) ratios alone results in most equity markets looking historically expensive.
- It is unclear how much of an impact low interest rates are having in supporting these elevated valuations and whether they will continue to provide that support if rates remain low.
- Low rates drive up valuations when discounting future cash flows (or earnings).
  - This is based on the time value of money concept.
- One way analysts quantify this is by using what's known as the dividend discount model (DDM).
  - The bond market's current (lower) interest rates can be used to calculate a present value for the stock market using the DDM.
- Using this approach, equities do not look quite as expensive as they do upon initial inspection.

Correction in Prices Needed to Return to Historical Average

	US Equities (%)	EAFE Equities (%)	EM Equities (%)
Using PE10	-23.4	-15.9	-9.9
Adjusting for Rates	-9.8	-2.7	-8.3

Higher Prices Imply Lower Returns for Equities

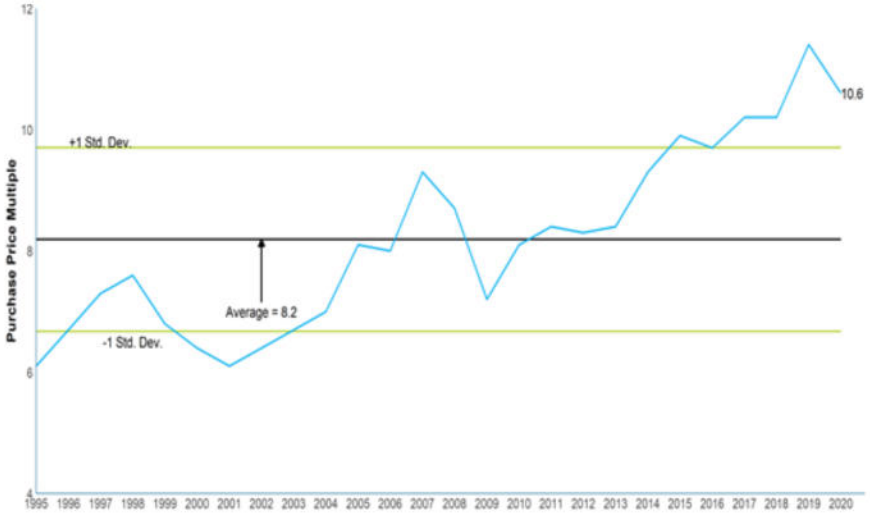
- Relative prices have been indicative of future equity returns.
- Higher prices have led to lower future returns, and vice versa.



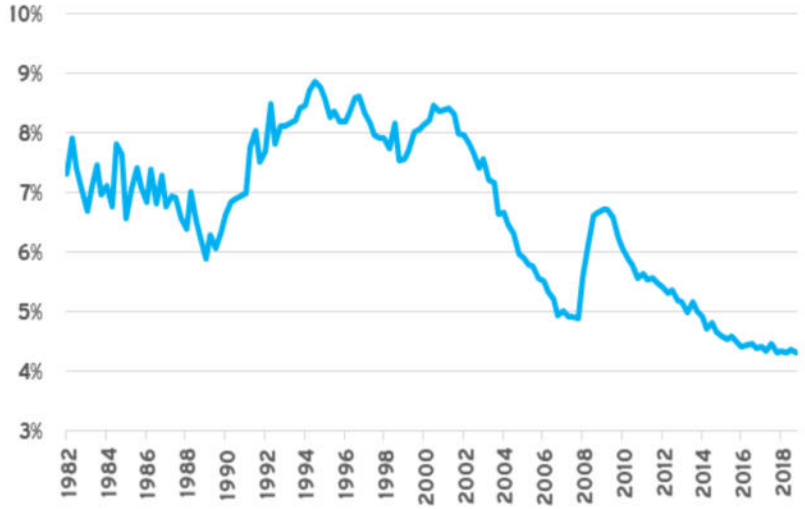
Higher Prices in Private Markets, too

- EBITDA multiples are the closest proxy to a PE ratio for private equity.
  - Like public markets, private markets have seen prices climb gradually higher.
- Real estate cap rates are similar to an earnings yield (the inverse of the PE ratio) for equities.
  - Cap rates are indicative of future returns and have been gradually moving down.

Private Equity Multiples[1]



Core Real Estate Cap Rates[2]



[1] Source: S&P LCD Average EBITDA Multiples Paid in All LBOs. Annual figures, except for 2020 (YTD), as of September 30, 2020.
[2] Source: NCREIF NPI value-weighted cap rates. As of September 30, 2020.

20-year Geometric Expected Returns
Rate Sensitive

	2021 E(R) (%)	2020 E(R) (%)	Δ From 2020 (%)	Notes
Cash Equivalents	1.1	2.4	-1.3	Lower rates
Short-term Investment Grade Bonds	1.3	2.6	-1.3	Lower yields
Investment Grade Bonds	1.8	3.0	-1.2	Lower yields
Intermediate Government Bonds	1.4	2.4	-1.0	Lower yields
Long-term Government Bonds	2.5	3.2	-0.7	Lower yields
Mortgage Backed Securities	1.8	3.1	-1.3	Lower yields
Investment Grade Corporate Bonds	2.3	3.6	-1.3	Lower yields, tighter spreads
Long-term Corporate Bonds	3.2	4.2	-1.0	Lower yields, tighter spreads
Short-term TIPS	1.4	2.7	-1.3	Lower yields
TIPS	1.8	2.9	-1.1	Lower yields
Long-term TIPS	2.9	3.3	-0.4	Lower yields
Global ILBs	1.9	2.4	-0.5	Lower yields
Foreign Bonds	1.7	2.4	-0.7	Lower yields

20-year Geometric Expected Returns
Credit

	2021 E(R) (%)	2020 E(R) (%)	Δ From 2020 (%)	Notes
High Yield Bonds	4.2	5.2	-1.0	Lower yields and tighter spreads
Higher Quality High Yield	3.8	4.5	-0.7	Lower yields and tighter spreads
Bank Loans	4.0	5.0	-1.0	Lower yields
Collateralized Loan Obligations(CLOs)	4.2	NA	NA	*New Asset Class*
Emerging Market Bonds (major)	3.7	4.5	-0.8	Lower yields
Emerging Market Bonds (local)	3.9	4.8	-0.9	Lower yields
Private Debt	6.8	6.9	-0.1	Lower yields
Direct Lending	6.7	NA	NA	*Consolidated Asset Class*
Mezzanine Debt	6.9	7.0	-0.1	Lower yields
Distressed Debt	7.0	7.0	0.0	Lower yields

20-year Geometric Expected Returns
Equities

	2021 E(R) (%)	2020 E(R) (%)	Δ From 2020 (%)	Notes
US Equity	6.8	7.4	-0.6	Higher price-to-earnings, lower dividend
US Large Cap	6.7	7.2	-0.5	Higher price-to-earnings, lower dividend
US Mid Cap	6.9	7.6	-0.7	Higher price-to-earnings, lower dividend
US Small Cap	7.1	7.9	-0.8	Higher price-to-earnings
Developed Non-US Equity	7.1	7.9	-0.8	Higher price-to-earnings, lower dividend
Dev. Non-US Small Cap	7.0	7.8	-0.8	Higher price-to-earnings, lower dividend
Emerging Market Equity	8.1	9.1	-1.0	Higher price-to-earnings, lower dividend
Emerging Market Small Cap	8.2	9.0	-0.8	Higher price-to-earnings, lower dividend
Frontier Market Equity	8.9	10.0	-1.1	Higher price-to-earnings, lower dividend
Global Equity	7.1	7.8	-0.7	Higher price-to-earnings, lower dividend
Low Volatility Equity	6.4	NA	NA	*New Asset Class*
Private Equity	9.1	9.4	-0.3	Higher prices, offset by lower borrowing costs
Buyouts	9.0	9.4	-0.4	Higher prices, offset by lower borrowing costs
Venture Capital	9.6	9.3	0.3	Higher earnings

20-year Geometric Expected Returns
Real Assets

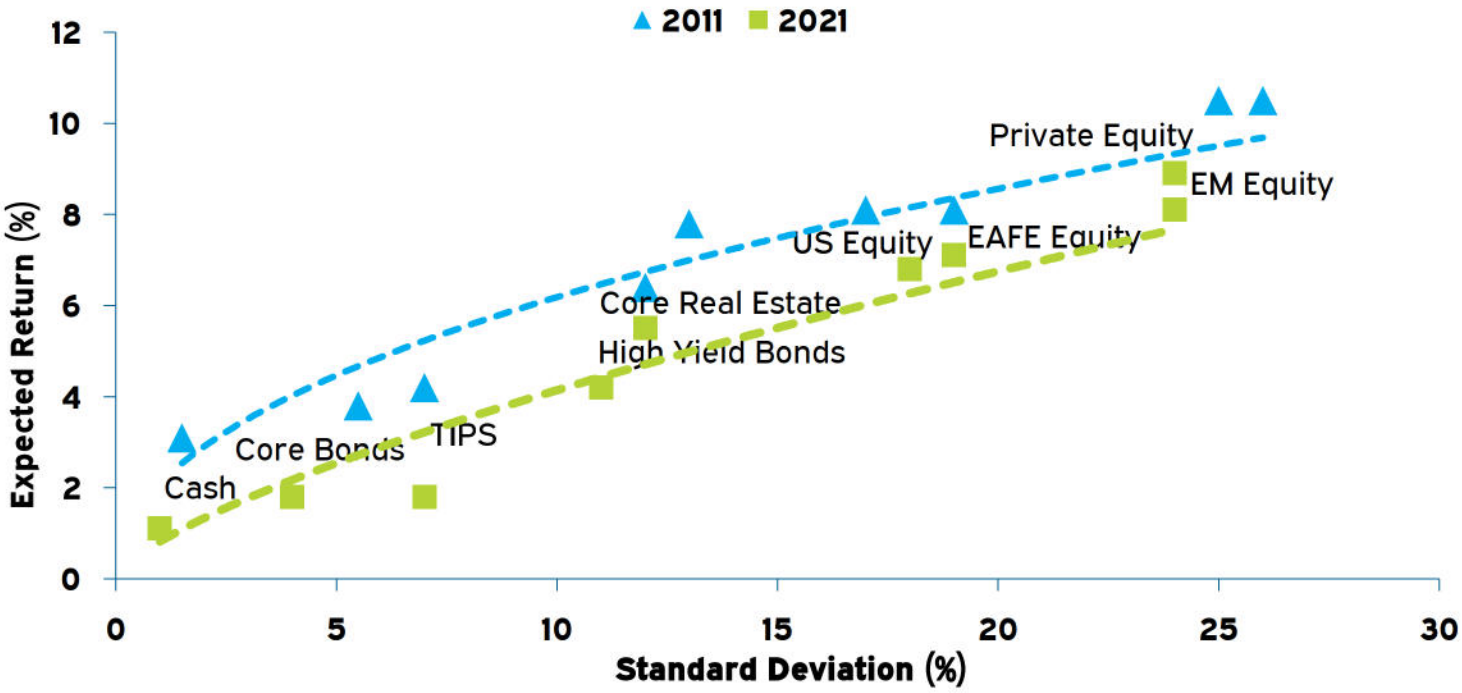
	2021 E(R) (%)	2020 E(R) (%)	Δ From 2020 (%)	Notes
Real Estate	6.9	7.5	-0.6	Lower cap rates
REITs	7.2	7.0	0.2	Higher yields
Core Private Real Estate	5.5	6.3	-0.8	Lower cap rate, partially offset by lower cost of borrowing
Value-Added Real Estate	7.7	8.4	-0.7	Lower cap rate, partially offset by lower cost of borrowing
Opportunistic Real Estate	9.2	9.9	-0.7	Lower cap rate, partially offset by lower cost of borrowing
Natural Resources (Public)	7.3	8.3	-1.0	Higher price-to-earnings
Natural Resources (Private)	8.3	8.8	-0.5	Higher Prices
Energy	9.0	9.4	-0.4	Lower prices offset by lower earnings expectations
Opportunistic Green Strategies	8.8	NA	NA	*New Asset Class*
Gold Mining	7.9	NA	NA	*New Asset Class*
Gold (Metal)	2.3	NA	NA	*New Asset Class*
Commodities	3.7	4.3	-0.6	Lower collateral returns
Infrastructure (Public)	7.4	7.5	-0.1	Lower price-to-earnings
Infrastructure (Core Private)	7.0	6.7	0.3	Lower prices and lower cost of borrowing
Infrastructure (Non-Core Private)	9.0	9.1	-0.1	Higher prices offset by lower cost of borrowing

20-year Geometric Expected Returns
Alternative Strategies (Other)

	2021 E(R) (%)	2020 E(R) (%)	Δ From 2020 (%)	Notes
Hedge Funds	4.3	4.9	-0.6	Higher prices, lower yields
Long-Short	3.8	4.3	-0.5	Higher prices, lower cash return
Event Driven	4.9	5.8	-0.9	Higher prices, lower yields
Global Macro	4.3	4.6	-0.3	Higher prices, lower yields
CTA – Trend Following	4.7	4.8	-0.1	Higher leverage assumption offset by lower cash return
Fixed Income/L-S Credit	3.4	4.0	-0.6	Lower yields
Relative Value/Arbitrage	4.6	5.3	-0.7	Lower yields
Insurance Linked Strategies	4.6	4.1	0.5	Higher yields
Risk Parity (10% vol)	4.0	5.4	-1.4	Higher prices, lower yields
TAA	4.1	4.4	-0.3	Higher prices, lower yields
Alternative Risk Premia	4.1	NA	NA	*New Asset Class*
US Inflation	2.1	2.6	-0.5	

The Big Picture: Less Return for the Same Risk[1]

- The relationship between long-term return expectations and the level of risk accepted is not static.
- We anticipate investors will have to take on greater levels of risk than they have historically if they want to achieve the returns they have in the past.



[1] Expected return and standard deviation are based upon Meketa Investment Group's 2011 and 2021 Capital Markets Expectations.

Structural Changes and FAQs

Structural Changes for 2021:

- We added the following assets (total now at 86):
  - Gold (metal)
  - Gold Mining
  - Alternative Risk Premia strategies (sometimes found in RMS portfolios)
  - Collateralized Loan Obligations (with a BBB bias)
  - Low Volatility Equity (global)
  - Opportunistic Green strategies (within natural resources)
- We consolidated first and second lien lending into a single Direct Lending category.
  - Most strategies utilized by our clients are now unitranche.

Model Changes for 2021

- Dividend Discount Model for Equities:
  - We changed the way we are modeling the mean reversion aspect for equities to use a form of the dividend discount model (DDM). This was based on the premise that low rates drive up valuations when discounting future cash flows (or earnings).
  - First, we figure out what the implied cost of equity (i.e., discount rate) has been historically, based on historical interest rates, growth rates, and prices. We then turn that into a "premium" over government bond rates that can be applied to the current level of (real) interest rates to arrive at a new, lower discount rate.
  - This can be used to calculate a present value for the market using the DDM. Taking this approach provided fairly intuitive results for US and non US equities (see caveat about earnings, next).

Model Changes for 2021 (cont.)

- Risk premia approach:
  - We changed the way we move from 10-year to 20-year projections. We are using a risk premia approach for years 11-20.
  - Previously, we tried to use the historical returns for an asset class for years 11-20. This worked reasonably well for an asset class like US equities, with its long history. But it did not work well for many other asset classes with shorter histories. And the historical returns for many fixed income asset classes is a poor predictor of future returns. This resulted in the need to make frequent qualitative adjustments or rely heavily on the 10-year model.
  - Instead, we will now start with an assumption (market informed, such as the 10-year forward rate) for what the risk free rate will be in ten years, and then add a risk premia for each asset class. We will use historical risk premia for each asset class as a guide, but many will differ from this. We will seek consistency with finance theory (i.e., riskier assets will have a higher risk premia assumption).

Model Changes for 2021 (cont.)

- The link between economic and earnings growth.
  - We have long assumed that earnings growth is linked to economic growth. However, we are now allowing earnings (per share) growth to exceed economic growth if we believe:
    - Corporate profits will grow faster than the rest of the economy.
    - Share buybacks will exceed new issuance, causing EPS to grow faster than earnings.
  - We believe both of these will be true for the US over the next decade, but to a lesser extent than they have for the past decade.
  - Conversely, earnings growth can be less than economic growth due to the opposite of the above, as well as other factors, such as state intervention (e.g., maximizing shareholder wealth not being a primary objective).
    - Most non-US markets fall in this category, but to varying extents.

FAQs for 2021

How do these CMEs compare to last year's assumptions?

- To help evaluate this, we created a weighted average of expected returns for the asset classes that comprise a typical Meketa client portfolio. The value of the expected return for the portfolio is not a precise expected return (i.e., it has not been run via MVO), but the magnitude of the change is what is relevant. In short, the average of 20-year expected returns is 90 basis points lower than last January and 50 basis points lower than our July interim CMEs.
- Looking at past years' CMEs, this is the largest change in recent years. However, the volatility of late 2018 and early 2019 caused fairly large changes in the following years' CMEs as well.

Year	Weighted Average Expected Return (%)	Change from Prior Year (%)
2021	5.9	-0.9
2020	6.8	-0.6
2019	7.4	+0.7
2018	6.7	-0.2
2017	6.9	-0.3
2016	7.2	

FAQs for 2021 (cont.)

What is driving the changes from last year (and mid-year)?

- The changes relative to last year are being driven by what happened in the market (primarily lower yields), not by methodology changes. The latter are serving to dampen the former.
- The broad decline in interest rates was reflected in the interim CMEs we published in July. The additional decline since then is primarily due to the strong rebound in risk assets in the second half of 2020 (i.e., tighter credit spreads & higher valuations).

How do Meketa's CMEs compare to peers?

- We believe our CMEs are in the same ballpark as our peers. A preliminary survey of a small group in early 2021 indicates that our CMEs are generally consistent, with a couple of exceptions. We note what appears to be a continuation of the trend of money managers tending to have lower return expectations than consultants.
- We generally cite the survey conducted each year by Horizon Actuarial Services for making peer comparisons, as it is the most comprehensive survey of CMEs that we are aware of. However this survey is usually not published until July or August.
- It is important to distinguish between intermediate term assumptions (e.g., 7-10 years) and long-term assumptions (e.g., 20-30 years) when making these comparisons.

FAQs for 2021 (cont.)

Did volatility expectations increase?

- Yes. Our methodology includes a 15-year look back, and 2020 had the effect of bumping many of these numbers up by 1-2%. The outlier is MLPs, which jumped 6%.
- We also intentionally increased the volatility for CTAs by 9%, to reflect the way they are typically implemented in our clients' RMS approach.

Did Meketa make any qualitative adjustments?

- As usual, we made some qualitative adjustments to the CMEs.
- The largest increase (+1%) was for EAFE equities, as the precipitous decline in earnings (e.g., EAFE small cap EPS dropped in half year over year) resulted in non-intuitive outcomes from our models, and we expect that the trajectory for earnings will follow that of other countries that are further ahead in re-opening their economies once the effects of the virus are under control.
- The biggest decreases (-1%) were for energy, as we expect lower prices reflect a re-pricing of risk and lower secular earnings for the sector.

FAQs for 2021 (cont.)

Is Meketa comfortable with the equity risk premium implied by the CMEs?

- The risk premium for US equities is within its historical range (4-6% over intermediate government bonds), albeit at the high end.

Are equity risk premiums rising?

- The appearance of rising risk premia has to do with our model change this year of adjusting for the level of interest rates.

Is Meketa assuming that interest rates will go up?

- Yes, though indirectly. We use the market's own projections for future rates, as they were priced in at the time of our analysis. For example, we observed that the market was projecting that the ten-year Treasury would be yielding approximately 2.0% in ten years.

Why is the 10-year expected return for long-term corporate bonds lower than the yield?

- Defaults (modest, but there is credit risk) and rising rates. When rates have gone up historically, the return has been lower than the starting yield. This is particularly true with longer duration assets.

FAQs for 2021 (cont.)

How does Meketa arrive at its inflation assumption? Is it based on a combination of breakeven rates and other data?

- Most of our economic projections come from the IMF's World Economic Outlook. Their inflation projections are in the table below. In short, they are expecting a modest jump in 2021, then a return to what we are used to. We combine that five year average with the 5-year-5 inflation swap (i.e., what the market is projecting 5-year inflation will be five years from now), which is 2.4%, to arrive at our 10-year number.

Inflation Estimates

	2021	2022	2023	2024	2025	5-Year Average
US	2.8	2.1	2.1	2.2	2.2	2.3
Euro Area	0.9	1.2	1.4	1.6	1.7	1.9
UK	1.2	1.7	1.9	2.0	2.0	1.8
Japan	0.3	0.7	0.8	0.8	1.0	0.7

Source: IMF World Economic Outlook, October 2020.

FAQs for 2021 (cont.)

If US inflation is expected to be 2.1%, and the real yield on 20 year TIPS is -0.6%, shouldn't the expected return for long TIPS be closer to 1.5% than 1.8%?

- Arguably, it is only our 10-year inflation number that matters, as it flows through the models for several asset classes, while the 20-year does not. This includes our TIPS models. Hence it is possible for there to be a disconnect for the 20-year horizon.
- It is not uncommon to see modest disconnects between economists' projections, the swap market, and the BEI.

Why do put/write expected returns decline along with higher equity prices (i.e., declines in equity expected returns)?

- It makes intuitive sense that as expected returns for equities decline, the ER for options based on those equities also declines (else you could get a much better risk-adjusted return from the options).

FAQs for 2021 (cont.)

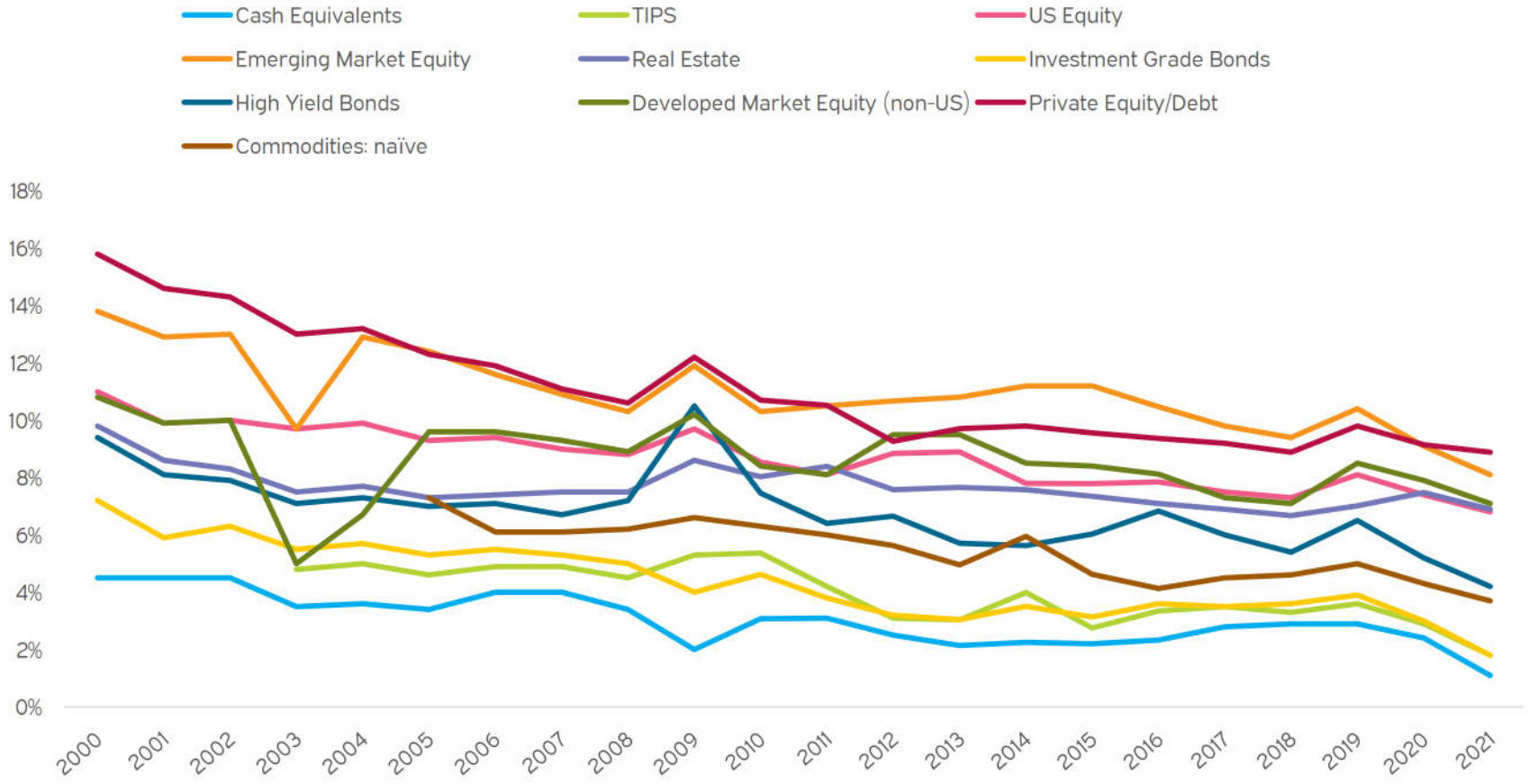
Why did the spread for private equity over public equity widen?

- Quite simply, multiples moved up more quickly for public equities than they did for private equity (e.g., EBITDA multiples for buyouts).
- Of note, the private equity data (as always) is through 9/30; it is possible that buyout multiples will "catch up" with public equity in early 2021.

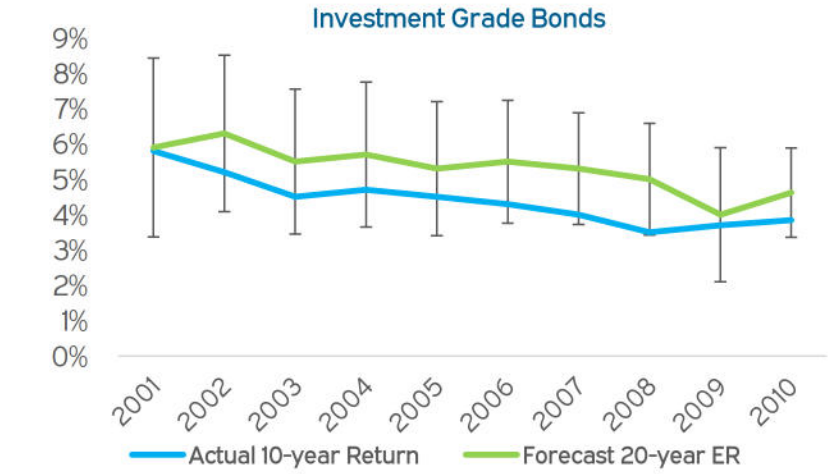
For venture capital, do the public tech sectors Meketa uses as a proxy for pricing really trade at a discount to the Russell 2000?

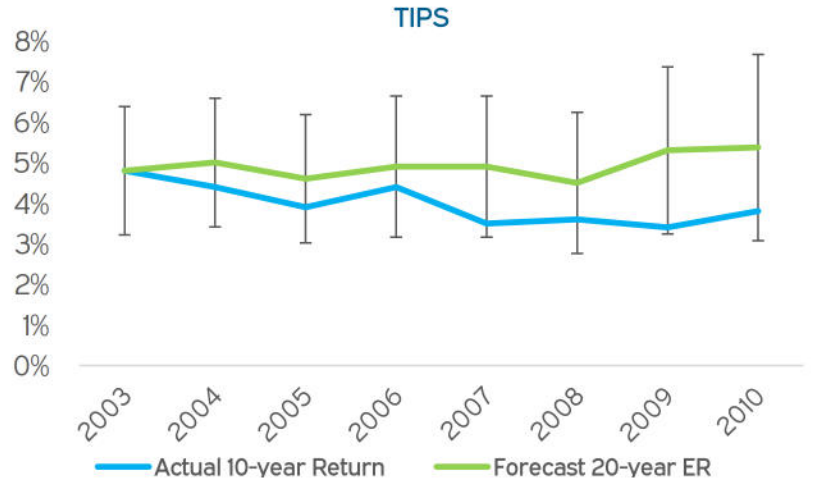
- Yes, though we take our VC model with a large grain of salt, as there is very little data available. That said, yes, the indices we use as a proxy have traded at a PE ratio discount to the R2k for 17 of the past 25 years, including this year.
- Note that the proxy is currently composed of: NASDAQ; Pharma, Biotech & Life Sciences; IT Services; and Clean Tech/Environment. The composition and weightings have changed over time.

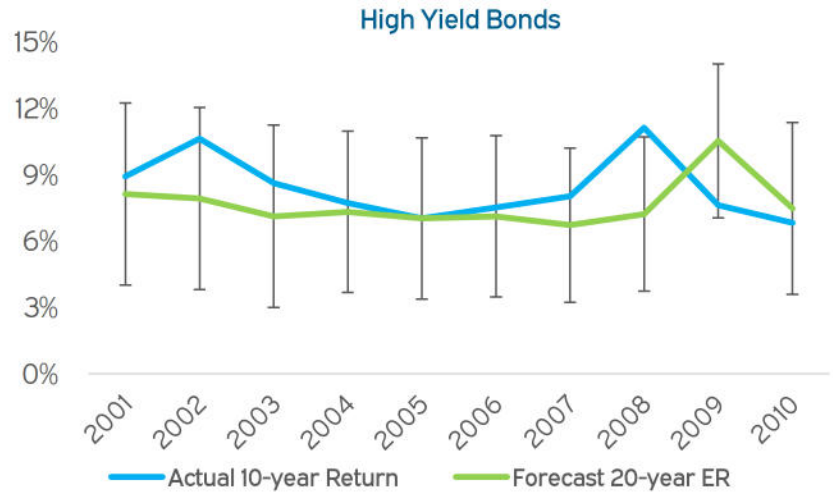
Our 20-year CMEs since 2000



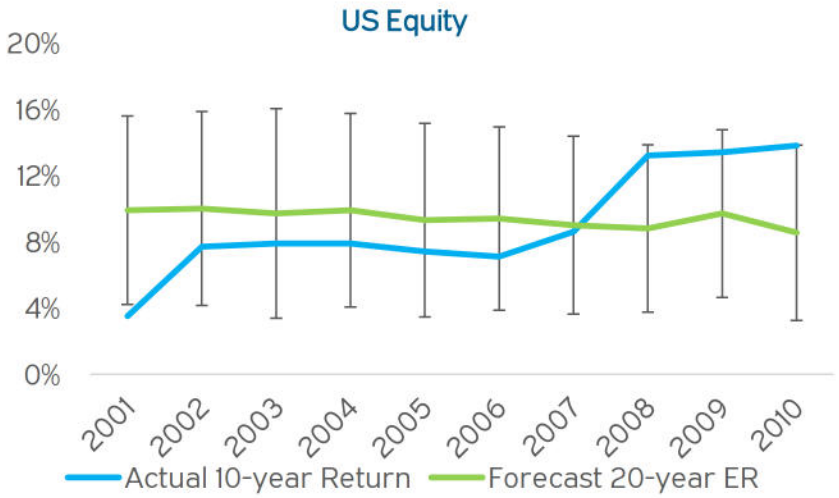
Our Track Record

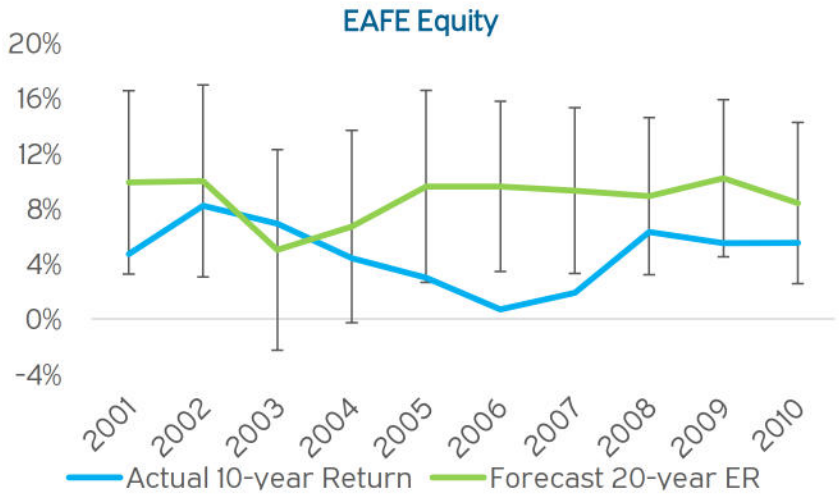


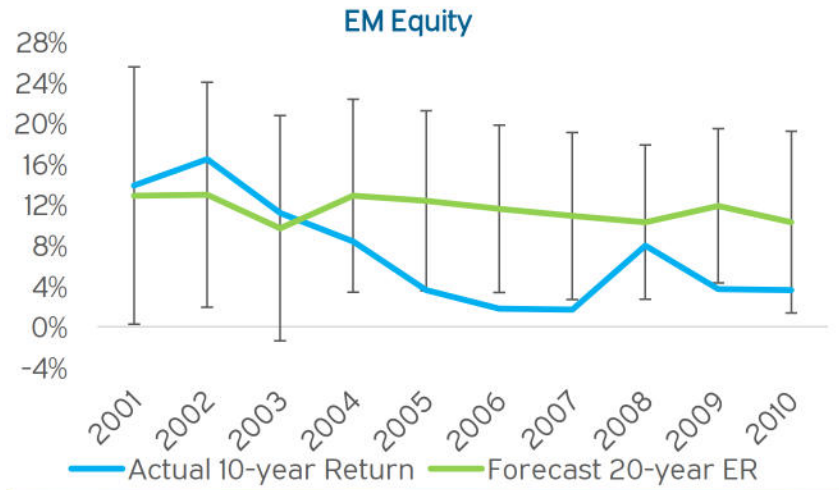


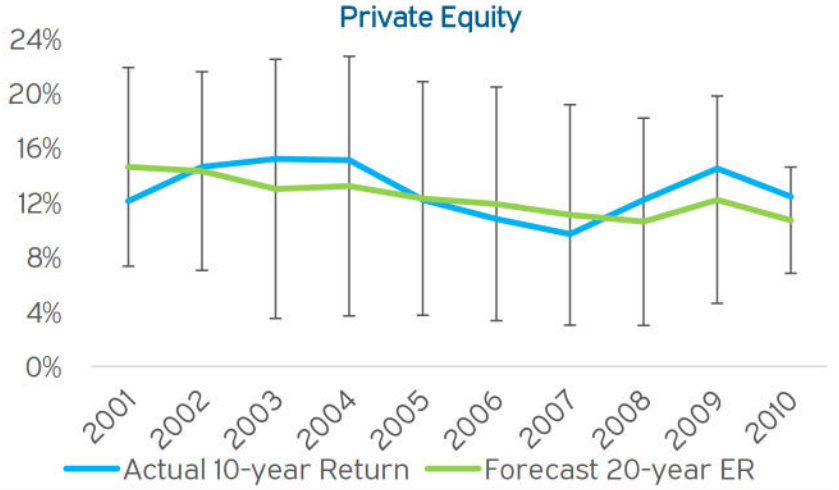


Our Track Record (cont.)









Our Process

Setting Capital Market Expectations

- Capital Markets Expectations are the inputs needed to conduct MVO.
  - MVO is the traditional starting point for determining asset allocation.
- Consultants (including Meketa) generally set them once a year.
  - Our results are published in January and based on December 31 data.
- This involves setting long-term expectations for a variety of asset classes for:
  - Returns
  - Standard Deviation
  - Correlations (i.e., covariance)
- Our process relies on both quantitative and qualitative methodologies.

Asset Class Definitions

- We identify asset classes and strategies that are both investable and appropriate for the long-term allocation of funds.
- Several considerations influence this process:
  - Unique return behavior,
  - Observable historical track record,
  - A robust market,
  - And client requests.
- We then make forecasts for each asset class.
  - We created inputs for 86 "asset classes" in 2021.

Building 10-year Forecasts

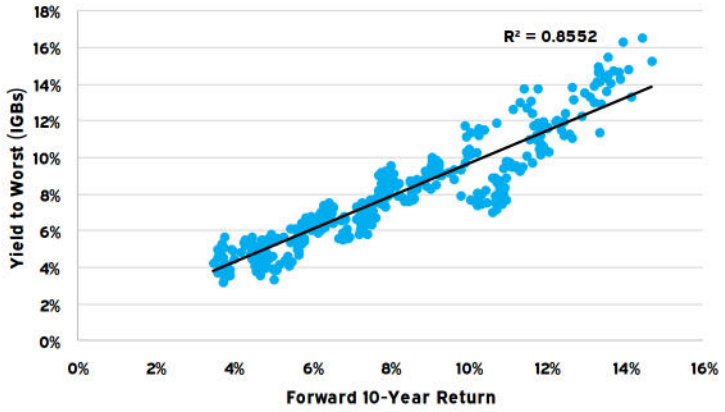
- Our first step is to develop 10-year forecasts based on fundamental models.
  - Each model is based on the most important factors that drive returns for that asset class:

Asset Class Category	Major Factors
Equities	Dividend Yield, GDP Growth, Valuation
Bonds	Yield to Worst, Default Rate, Recovery Rate
Commodities	Collateral Yield, Roll Yield, Inflation
Infrastructure	Public IS Valuation, Income, Growth
Natural Resources	Price per Acre, Income, Public Market Valuation
Real Estate	Cap Rate, Yield, Growth
Private Equity	EBITDA Multiple, Debt Multiple, Public VC Valuation
Hedge Funds and Other	Leverage, Alternative Betas

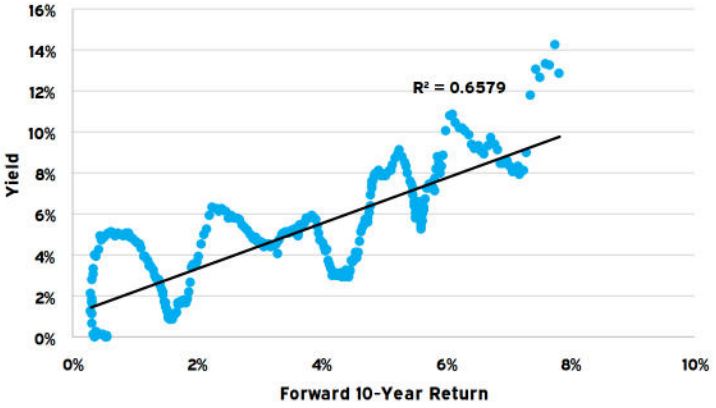
  - The common components are income, growth, and valuation.

Some factors are naturally more predictive than others

Investment Grade Bonds
Yield to Worst vs. Forward 10-Year Returns

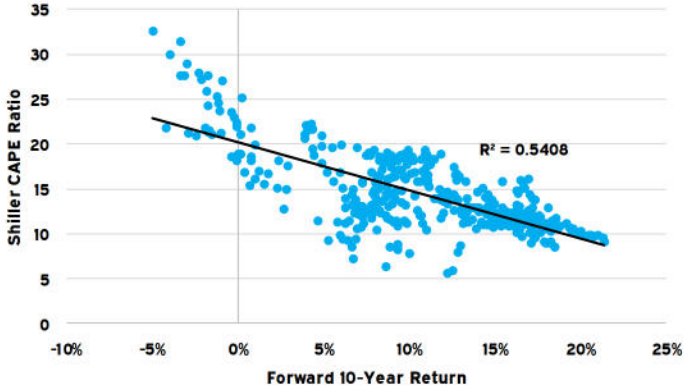


Cash (90-day T-Bill)
Yield vs. Forward 10-Year Returns



Core Real Estate
Cap Rates vs. Forward 10-Year Returns

US Equities
Shiller CAPE vs. Forward 10-Year Returns



10-year Model Example: Equities

- We use a fundamental model for equities that combines income and capital appreciation.

$$E(R) = \text{Dividend Yield} + \text{Expected Earnings Growth} + \text{Multiple Effect} + \text{Currency Effect}$$

- Meketa evaluates historical data to develop expectations for dividend yield, earnings growth, the multiple effect, and currency effect.
- Our models assume that there is a reversion toward mean pricing over this time frame.

10-year Model Example: Bonds

- The short version for investment grade bond models is:

  $E(R) = \text{Current YTW (yield to worst)}$

- Our models assume that there is a reversion to the mean for spreads (though not yields).
- For TIPS, we add the real yield of the TIPS index to the breakeven inflation rate.
- As with equities, we make currency adjustments when necessary for foreign bonds.
- For bonds with credit risk, Meketa Investment Group estimates default rates and loss rates in order to project an expected return:

  $E(R) = \text{YTW} - (\text{Annual Default Rate} \times \text{Loss Rate})$

Moving from 10-Year to 20-Year Forecasts

- Our next step is to combine our 10-year forecasts with projections for years 11-20 for each asset class.
- We use a risk premia approach to forecast 10-year returns in ten years (i.e., years 11-20).
  - We start with an assumption (market informed, such as the 10-year forward rate) for what the risk free rate will be in ten years,
  - We then add a risk premia for each asset class.
  - We use historical risk premia as a guide, but many asset classes will differ from this, especially if they have a shorter history.
  - We seek consistency with finance theory (i.e., riskier assets will have a higher risk premia assumption).
- Essentially, we assume mean-reversion over the first ten years (where appropriate), and consistency with CAPM thereafter.
- The final step is to make any qualitative adjustments.
  - The Investment Policy Committee reviews the output and may make adjustments.

Equities

- We use a fundamental model for equities that combine income and capital appreciation:

$$E(R) = Dividend\ Yield + Price\ Return + Currency\ Effect$$

$$Price\ Return = Earnings\ Growth + Multiple\ Effect$$

- We use the current dividend yield on the respective index.[1]
- Earnings growth is a function of Real GDP growth, inflation, and exposure to foreign revenue sources.
- We use three approaches to calculate the multiple effect.
  - The models assume reversion to the mean or fair value.
- We arrive at our preliminary 10-year assumption (in local currency)

$$\text{US } Equity\ E(R) = 1.5\% + [(1 + 5.3\%) \times (1 - 1.8\%) - 1] = 4.9\%$$

- For non-US equities, we add the expected currency effect vs. the US Dollar to the local expected return.

[1] The source for dividend yields is S&P 500 for the US and MSCI for non-US equities.

Equities: Model [1]

- To calculate the price return, we estimate the fair value of the index in ten years.
  - We first calculate future EPS by compounding current EPS[1] at the projected earnings growth rate.
  - We average the next ten years of projected EPS to arrive at an EPS 10.

	US	EAFE	EM	EAFE Sm	EM Small	Frontier
2021	125.6	49.1	50.7	3.9	26.3	39.9
2022	132.2	51.4	54.1	4.0	28.1	42.3
2023	139.3	53.8	57.8	4.2	30.0	44.9
2024	146.7	56.3	61.7	4.3	32.1	47.7
2025	154.4	58.9	65.9	4.5	34.3	50.6
2026	162.6	61.7	70.4	4.7	36.7	53.8
2027	171.3	64.6	75.2	4.9	39.3	57.1
2028	180.4	67.6	80.3	5.1	42.0	60.6
2029	190.0	70.8	85.7	5.3	44.9	64.4
2030	200.1	74.1	91.5	5.5	48.0	68.3
2031	210.7	77.6	97.7	5.7	51.4	72.6
Average EPS10 in 10 years	*168.8*	*63.7*	*74.0*	*4.8*	*38.7*	*56.2*

[1] We use *As Reported* trailing 12-month earnings for the S&P 500, and trailing 12 month earnings from MSCI for the non-US indices.

Equities: Model 1 (cont.)

- For projected earnings growth, we add expected real GDP and expected inflation to arrive at nominal GDP.[1]
  - We are inherently assuming that GDP growth is a close long-term proxy for earnings growth.[2]

1948 - 2019[3]	
Nominal GDP Growth P.A.	Corporate Earnings Growth P.A.
6.4%	6.5%

  - The model is based on the theory that a region's companies will grow at roughly the same rate as its economy, as defined by GDP, over the long term.
  - However, we also adjust for the percentage of earnings that is derived from foreign countries.[4]

	Earnings from EAFE (%)	Earnings from EM (%)	Earnings Frontier (%)	Earnings from US (%)
S&P 500	17	18	1	63
MSCI EAFE	54	23	2	21
MSCI Emerging Markets	8	80	1	11
MSCI Frontier Markets	4	10	85	2

[1] We constructed 5-year GDP based on the IMF World Economic Outlook as of October 2020 and Oxford Economics projections, and then use Oxford Economics projections for the remaining five years to arrive at a ten-year forecast for each. Note that the inflation history for emerging and frontier markets is subjective. We constructed inflation projections based on the IMF World Economic Outlook as of October 2020, historical averages and 5yr Inflation swaps maturing 5 years from now where available (US, Euro Area, UK, and Japan).
[2] For Emerging and Frontier Markets, we assumed a meaningful percentage of GDP growth does not translate to earnings growth due to net issuance, state intervention, etc.
[3] Source: Federal Reserve Economic Data. Corporate earnings defined as Corporate Profits After Tax (without IVA and CCAdj).
[4] Source: MSCI Economic Exposure indices for North America, EAFE, and Emerging Markets; estimates for small cap and frontier markets.

Equities: Model 1 (cont.)

- We multiply EPS10 by our projected PE10 ratio to arrive at a ten-year price target.
  - We assume investors will pay slightly different ratios for earnings in different regions[1]

$$\text{US Price Target} = 168.8 \times 26.9 = 4532.4$$

- We divide this future price by the current price and then annualize the price change.

$$\text{US Price Return} = (4532.4 \div 3756.1)1/10 - 1 = 1.9\%$$

- We subtract the projected earnings growth[2] from the price change to arrive at the Multiplier Effect.

$$Multiplier\ Effect_{Model\ 1} = 1.9\% - 5.3\% = -3.4\%$$

[1] We assume that PE reverts 75% of the way back to its historical median. For the US, we use 25.0x, which is consistent with its median PE10 since 1990. We assume a lower PE10 for other regions that is consistent with their valuation relative to the US over the past two decades.
[2] Projected Earnings growth for Model 1 equals the US nominal GDP growth projection.

Equities: Model 2

- To calculate the price return, we estimate the fair value of the index in ten years.
  - We first calculate future EPS by multiplying current EPS by projected earnings growth.

$$US\ EPS = 125.6 \times (1 + 5.0\%)10 = 204.52$$

  - For projected earnings growth, we used a subjective growth rate.
    - For the US, we used a rate lower than the historical average due to our current assessment that we are nearer a peak than a trough in the earnings cycle.
- We multiply EPS by our projected PE ratio[1] to arrive at a ten-year price target.

$$\text{US Price Target} = 204.52 \times 17.0 = 4137.2$$

- We divide this future price by the current price and then annualize the price change.

$$\text{US Price Return} = (4137.2 \div 3756.1)1/10 - 1 = 1.0\%$$

- We subtract the projected earnings growth[2] from the US Price return to arrive at the Multiplier Effect.

$$Multiplier\ Effect_{Model\ 2} = 1.0\% - 5.0\% = -4.0\%$$

[1] For the US, we use a PE (trailing twelve months) of 17.0x which is consistent with its median since 1954. We assume a lower PE for other regions that is consistent with their valuation relative to the US over the past two decades.
[2] Projected Earnings growth for Model 2 equals an assumed rate of 5% for the US, 4.5% for EAFE, and 6.5% for EM.

Equities: Model 3

- To calculate fair value, we use the Dividend Discount Model.

$$Fair\ Value = E \times (1 + G) \div (D - G)$$

  - For earnings (E), we use EPS10
  - For the growth rate (G), we use a subjective earnings growth rate
  - For the discount rate (D), we use a rate implied by the projected real rate, the historical discount rate, and the historical real rate[1]

$$\text{Implied Discount Rate} = -0.5\% + 11.3\% - 2.3\% = 8.5\%$$

- The fair value can be calculated as:

$$Fair\ Value = 115.3 \times (1 + 4.9\%) \div (8.5\% - 4.9\%) = 3{,}388.1$$

- We find the difference between fair value and current value, and we assume reversion to fair value is achieved over a ten year period.

$$Multiplier\ Effect_{Model\ 3} = [1 + (3{,}388.1 - 3756.1) \div 3756.1] \wedge (1/10) - 1 = -1.8\%$$

[1] The historical discount rate is calculated based on historical valuations, earnings, and growth rates.

Currency Effect

- For non-US equities, we calculate an adjustment for the expected impact of currency movements.
  - We use a three-factor model that weights 40% on PPP theory, 30% on IRP theory, and 30% on current account differential theory.
    - PPP posits that money will flow to the currency with lower cost of goods and services[1]
    - IRP posits that money will flow to the currency with the lower interest rate[2]
    - Current account differential posits that money will flow to the currency with the lower current account deficit[3]

Market	Expected Inflation (%)	PPP Impact (%)	Interest Rates (%)	IRP Impact (%)	Current Account Impact (%)	Net Effect (%)	Adjusted Net Effect[4] (%)
EAFE	1.5	2.8	-0.4	-0.5	1.8	+1.5	+1.0
EM	4.5	6.5	3.9	3.8	1.5	+4.2	+1.0
US	2.3	NA	0.1	NA	NA	NA	NA

[1] Sources for PPP data: World Bank (PPP Conversion Factor) and *The Economist* (Big Mac Index).
[2] We use the central bank discount rate or equivalent for the major countries of each region (source: FRED). Due to lack of data for frontier markets, we used yield-to-worst on longer-term bonds and then adjusted the yield down subjectively (to adjust for term structure).
[3] We use the differential between each region's current account as a % of global trade (source: FRED & The World Fact Book)
[4] We cap the currency adjustment at +/- 1% per annum, given the unpredictable nature of currency markets.

Equities: US Mid, Small & Micro

- The models are similar to that used for the overall equity model.
- To calculate the price return, we estimate the fair value of the index in ten years. We do this using both price-earnings and price-book ratios.
- We calculate future EPS by looking at a similar ratio of historical earnings growth for each index vs. the R1k.
  - We assume earnings will grow 1.1x faster for midcap, 1.15x faster for small cap, and 1.2x faster for microcap (subjective yet fairly consistent with their respective relationships since 1978).
  - We multiply EPS by our projected PE ratio[1] to arrive at a ten-year price target.
- We take a similar approach for price-book, comparing current ratios to historical ratios.
  - Price-book can be particularly helpful for small and micro cap, as short term earnings volatility can distort PE comparisons.
- We divide the future price by the current price and then annualize the price change.
- We add the price change to the dividend yield to arrive at the expected return.

[1] For the US, we use the median PE (trailing twelve months) for the longest available period. For the Russell Top 200, this was 17.8x. We assume a higher PE for mid, small, and micro that is consistent with their historical valuations relative to large cap. We assume reversion 75% back toward the median.

Bonds

- The short version for most investment grade bond models is: E(R) = current YTW.
- The longer version accounts for the expected term structure in the future.
  - If the average duration is roughly five years, we calculate the expected yield in five years.
  - The net effect tends to be minimal, since higher income in years 5 to 10 is offset by price declines in years 1 to 5.
- For corporate bonds, we assume the spread vs. Treasuries will revert most of the way back to their mean since 1990.
- For Cash, we use an average of the current rate and the rate suggested by the Taylor Rule (inputs are current & potential GDP, current & desired inflation).
- For TIPS, we add the real yield for the TIPS index to the Expected Inflation rate used in the Equities models.
- As with equities, we also make currency adjustments when necessary.
  - This currently provides a tailwind to foreign and EM local currency debt.

Bonds (con't)

- For anything with credit risk, we also take into account the expected default & recovery rates.

	Inv. Grade Corporate (%)	LT Corporate (%)	Foreign Debt (%)	EM Debt (major) (%)	EM Debt (local) (%)	High Yield (%)	Bank Loans (%)
Default Rate	0.08	0.08	0.10	1.52	0.26	3.00	3.00
Loss Rate	50	60	50	50	50	55	38

  - As a guide, we use Moody's historical global default & recovery data for each bucket as it is currently rated.
    - Example: EM Debt (local currency)

Rating	Weighting (%)	Default Rate (%)	Weighted Default (%)
Aaa	15.7	0.06	0.01
Aa	43.5	0.09	0.04
Baa	32.9	0.27	0.09
Ba	6.4	1.06	0.07
B	1.5	3.40	0.05
	Total Weighted Average Default Rate:		0.26

Private Credit

- For mezzanine debt, we use a building blocks approach that is based on income and loss thereof
  - We use the average coupon rate (including PIKs) of observed mezz deals
  - We add an equity kicker, adjusted for expected defaults
    - Managers expect 2.5% to 5% return from warrants and co-invests
  - We add an upfront fee (paid by the borrower) that usually ranges 1-3%
  - We incorporate default & recovery rates
    - These are subjective, as no hard data exists on mezz debt defaults
    - We use a default rate roughly twice that for high yield bonds
  - We subtract management fees and carried interest
- For distressed debt, we use a model similar to that for public credit.
  - It is based on the yield of the Barclays US Ca-D index and adjusts for defaults and recoveries.
    - It uses a much high default rate than high yield bonds (the historical rate is approximately 30%).
  - We subtract management fees and carried interest.

Private Credit (cont.)

- For direct lending, we use a building blocks approach that is based income and loss thereof
  - We use the average coupon rate of unitranche deals
  - We add an upfront fee (paid by the borrower) or original issue discount
  - We incorporate default & recovery rates
    - We use a default rate and recovery rate roughly the same as for bank loans
  - We subtract management fees and carried interest
- For aggregate private credit, we take a weighted average based on a typical client allocation to private debt.

Component	Weight (%)	E(R) (%)
Mezzanine Debt	30	6.8
Distressed Debt	20	7.0
Direct Lending	50	6.3
Private Debt Composite		6.6

Private Equity

- For Buyouts, we start with public equity expected returns.
- We add a premium or discount based on the pricing of buyouts relative to stocks.
  - EBITDA multiples provide an indication of pricing.
- We add a premia for control (e.g., for greater operational efficiencies) and leverage.
  - We assume leverage of 1.4x - 1.6x.
- We subtract borrowing costs and fees.
  - We assume borrowing costs are consistent with the yield on syndicated loans.

[1] Source: Venture Economics, S&P. We use the middle-market as a proxy given our long-standing bias toward this area.

Private Equity (cont.)

- For Venture Capital, we create a public market proxy that we can compare through time.
  - The composite is composed of: traditional technology, biotech, pharmaceuticals, life sciences, IT services, internet, and clean tech & environmental stocks.
    - The weighting to each sector varies through time.
    - The data is an imperfect proxy and the correlation with future returns is not high.
    - Still, this proxy provides some indication of pricing relative to small cap stocks.
- The proxy was trading below the small cap market as of year end.
  - Therefore, using this signal, we arrived at an expected return above the historical average (median) for the asset class.

Real Estate

- For Core Real Estate, we used two models.
  - The first model adds a premium to the Cap Rate[1].
    - Core RE has historically returned approximately 1.0% more than its cap rate at the start of the period over the subsequent ten years.
  - The second model combines income with capital appreciation potential.
    - The income for core RE has historically been the cap rate minus 2-3% (for Cap Ex).
    - We assume income (NOI) grows at the rate of inflation.
    - We assume there is some measure of fair value for cap rates relative to bond yields.
      - We make a price adjustment based on the forward yield curve.
  - We adjust for leverage, borrowing costs, and fees.
- For High Yield Real Estate Debt, we used our high yield bond model.
  - Data is sparse on default rates and spreads.
    - We use the same default rate as high yield bonds.
    - We use the YTW on the Barclays CMBS 2.0 BBB index and then add a "high yield" spread onto this.
    - We adjust for leverage, borrowing costs, and fees.

[1] Source: NCREIF.

Real Estate (cont.)

- For Non-Core Real Estate, we started with a historical premiums versus core RE.
  - This includes the effect of greater control, development, buying at distress, etc.
- We added a non-US component (e.g., premium for lower cap rates) and a currency effect.
  - We assume 20% to 40% of non-core commitments will be ex-US (majority in Europe).
- We lever the portfolio and then subtract the cost of borrowing.
  - Value-added leverage ranges 40-70% while opportunistic ranges 50-80%
  - Value-added cost of debt at LIBOR plus 200-350 and opportunistic at LIBOR plus 300-500
- Finally, we subtracted management fees and carried interest.

[1] Source: NCREIF, Townsend.

Real Estate (cont.)

- For REITs, we focus on historical pricing and yields.
  - We first look at current REIT Yields[1].
    - REITs have historically returned 2.4% more than their yield at the start of the period over the subsequent ten years.
  - We next looked at spreads versus Treasuries and Baa corporates.
    - REITs have yielded 1.8% more than 5-year Treasuries since 1990.
    - REITs have historically yielded 1.2% less than Baa corporate bonds since 1990.
  - We also looked at the price change required for REITS to return to the average REIT yield spread implied in 5 years.

REIT Yield (%)	5-year Treasury Yield (%)	Baa Yield (%)
4.0	0.4	3.3

  - We combine these factor by averaging the impact of pricing factors and then adding this to income and income growth.

[1] Source: NAREIT.

Real Estate (cont.)

- To arrive at the aggregate RE assumption, we took a weighted average of our expectations for each of the five components.
  - These reflect the weights of a typical client portfolio.

Component	Weight (%)	E(R) (%)
REITs	10	6.9
Core Private RE	40	5.0
Value-added RE	20	7.8
Opportunistic RE	20	8.9
High Yield RE Debt	10	6.0
	Aggregate Real Estate	6.6

Infrastructure

- For public IS, we first take the weighted average of the regional public equity returns.

Region	Weighting (%)	Weighted Return (%)
US	43.1	2.1
Developed	46.5	2.6
EM	10.4	0.7
	Expected Equity Return:	5.4

- We then look at the P-E and P-B ratios of the IS index vs. the global equity market to derive a signal as to how discounted or expensive IS stocks may be.[1]
  - We assume some reversion in pricing to half the difference between the two.

	Public IS	Global Equities	Price Adjustment
P-E ratio	17.8	33.3	23.3%
P-B ratio	1.87	2.92	18.0%

- Finally, we add the average of the price adjustments (per annum) to the expected equity return to arrive at our preliminary expected return for public IS

$$E(R) = 5.4\% + 2.1\% = 7.5\%$$

[1] We used the trailing 12-month P-E ratio for the MSCI World Infrastructure and MSCI World indices, respectively.

Infrastructure (con't)

- For private infrastructure, we built a model that combines income and capital appreciation.
- For income, we used our best estimate of expected yield.
  - Assume a range of 4-6% for core and 2-4% for non-core.
- We assume asset prices keep up with inflation and/or GDP growth.
  - Use inflation for core IS and GDP for non-core, since the latter is more economically sensitive.
- We then make a qualitative judgment on our infrastructure team's assessment of current market pricing.
  - There is a paucity of publicly available data on pricing for private infrastructure.
- We add a control premium for non-core IS (as these more closely resemble buyouts).
- We lever the portfolios and then subtract the cost of borrowing.
  - Core levered at 2.5:1, non-core at 1.7:1
  - Cost of debt ranges from LIBOR plus 300-400 for core IS to plus 300-700 for non-core IS.
- Finally, we add any currency effect and subtract management fees and carry.

Natural Resources

- For public NR, we take the weighted average of the regional public equity returns.

Region	Weighting (%)	Weighted Return (%)
US/Canada	49.8	2.5
Developed	39.9	2.2
EM	10.3	0.7
	Expected Equity Return:	5.4

- We then look at the P-E, P-B and EV/EBITDA ratios of two NR indices vs. the global and US equity markets and average them to derive a signal as to how discounted or expensive NR stocks may be and assume reversion in pricing between the two[1].

P-E Ratio	Public NR	Global / US Equities	Price Adjustment
S&P Global NR vs. S&P Global BMI	22.2	23.5	3.0%
S&P NA NR vs S&P 500	19.5	27.6	20.5%

[1] We used the trailing 12-month P-E ratio for the S&P Global Natural Resource and S&P Global BMI indices and the S&P NA Natural Resources and S&P 500, respectively. We assume reversion to half of the historical difference

Natural Resources (cont.)

EV/EBITDA	Public NR	Global/ US Equities	Price Adjustment
S&P Global NR vs. S&P Global BMI	12.2	16.3	17.0%
S&P NA NR vs S&P 500	10.3	18.7	40.7%

P-B Ratio	Public NR	Global/ US Equities	Price Adjustment
S&P Global NR vs. S&P Global BMI	1.5	2.1	17.5%
S&P NA NR vs S&P 500	1.6	4.2	82.0%

$$Average\ Price\ Adjustment = 30\%$$

- Finally, we add the price adjustment (per annum) to the expected equity return to arrive at our preliminary expected return for public NR.

$$E(R) = 5.4\% + 1.7\% = 7.1\%$$

Natural Resources (cont.)

- Most "private" mining partnerships consist of investments in "junior" mining stocks.
  - We again take the weighted average of the regional public equity returns.
    - Roughly 50/50 USA/Canada and Australia.
  - Similarly to Public Natural Resources, we then look at the P-E, P-B and EV/EBITDA ratios of the regional indices vs. their own history and their local market to derive a signal as to how discounted or expensive mining stocks may be.

	Current PE	Avg. PE	Current P-B	Avg. P-B	Current EV/EBITDA	Avg. EV/EBITDA
MSCI Australia Small Met/ Min	14.7	24.1	2.3	2.2	6.0	6.8
S&P TSX Div. Met /Min	9.1	18.1	0.6	1.5	4.3	6.6

  - We add a control premium (as these resemble buyouts) and subtract fees & carry.
- For oil & gas, we use a similar approach.
  - We again take the weighted average of the regional public equity returns.
    - 30% in US/Canada, 65% EAFE, and 5% EM
  - We then look at the relative pricing of small cap oil & gas stocks.
  - We add a control premium (and subtract management fees & carry.

Natural Resources (cont.)

- For Timberland, we combine land pricing with income potential.
- We examine the average price per acre of timberland transactions since 1995, excluding the highest and lowest numbers for each year[1].
  - We then adjusted these prices for inflation and derived a long-term average.

Current Price/Acre	Inflation-Adjusted Average	Price Adjustment
$1,450	$1,192	4.0%

  - We assume that prices move halfway back toward their historical inflation-adjusted average
- We assume that property values grow in the future at the rate of inflation.
- We assume that real income will be consistent with its trailing 5-year average of 1.1%.
- We add a non-US component (premium for lower cap rates) and a currency effect.
  - We assume 25-50% of commitments will be ex-US (Latin America and Australasia).
- We lever the portfolio at 1.15:1 and then subtract the cost of borrowing, which is estimated at LIBOR plus 250-350 basis points.
- Finally, we subtract management fees (as well as carry).

[1] Source: RISI.

Natural Resources (cont.)

- For Farmland, we use essentially the same model as Timberland.
- We looked at the average price per acre of farmland and cropland[1].
  - We then adjusted these prices for inflation and derived a long-term average.

	Current Price/Acre ($)	Inflation-Adjusted Average ($)	Price Adjustment (%)
Farmland	3,160	2,070	-26
Cropland	4,100	3,336	-19

  - We assume that prices move halfway back toward their historical inflation-adjusted average
- We again assume that property values grow in the future at the rate of inflation.
- We assume that real income will be consistent with its trailing 5-year average of 2.5%.
- We add a non-US component (premium for lower cap rates) and a currency effect.
  - We assume 20-50% of commitments will be ex-US (Latin America and Australasia).
- We lever the portfolio at 1.6:1 and then subtract the cost of borrowing, which is estimated at LIBOR plus 300-400 basis points.
- Finally, we subtract management fees and carried interest.

[1] Source: RISI and USDA. Farmland includes dwellings on properties as well as pastureland.

Natural Resources (cont.)

- To arrive at the aggregate NR assumption, we took a weighted average of our expectations for each of the five components.

Component	Weight (%)	E(R) (%)
Timberland	5	5.7
Farmland	15	6.2
Oil & Gas	50	8.2
Opportunistic Green	10	8.2
Mining	20	8.3
	Aggregate Private NR	7.8

Commodities

- For a traditional (or naïve) portfolio, we use the following model:

$$E(R) = Collateral\ Yield + Roll\ Return + Spot\ Return + Diversification\ Return$$

$$E(R) = 0.6\% - 0.1\% + 0.7\% + 2.1\% = 3.4\%$$

  - The collateral yield represents our expected return from cash.
  - The roll return should vary based on how backwardated or contagoed the market is
    - However, this state could change quickly, so our assumption is anchored near zero
  - For the spot return, we use the market's expectation for inflation.
  - The diversification return is the result of regular rebalancing between commodity futures.
    - The diversification return rises as the average variance of the securities in a portfolio rises, as the average correlation in the portfolio falls and as the number of securities in the portfolio rises.
    - However, we use a lower than historical number (2.2%) since correlations among commodities have risen since the academic research was originally conducted[1].

[1] De Chiara and Raab (2002) document a 2.8% diversification return for the rebalanced Dow Jones AIG Commodities index during the time period 1991 to 2001. Gorton and Rouwenhorst suggest a diversification return of between 3.0% and 4.5% for an equally-weighted basket of commodity futures.

Commodities (cont.)

- In addition, we have models for several more complex strategies, specifically risk parity and real return.
- For Commodities Risk Parity, we use a strategy with a target volatility of 15%.
  - The basic inputs are the same as for a naïve portfolio, except we assume a higher diversification return (2.6%) as risk parity strategies tend to be better diversified than the broad index.
  - We lever the portfolio at 1.5:1, which is in line with the average for managers using this strategy.
  - We then subtract the cost of borrowing as well as management fees (as there is no passive option).
- For Commodities Real Return, we use a "portable alpha" approach.
  - We add the return of TIPS on top of the return for the naïve commodities portfolio.
  - We then subtract the cost of borrowing as well as management fees.

Hedge Funds

- To construct the hedge fund models, we use a variety of traditional and alternative betas:
  - Traditional betas:
    - Equities, distressed debt, credit, commodities, bonds
  - Alternative betas:
    - Carry trade, convert arb, currency (value and momentum)
- We also add leverage (where appropriate) and subtract the cost of debt and fees.

Hedge Funds (cont.)

- To arrive at the aggregate Hedge Fund assumption, we take a weighted average of our expectations for each of the five components.
- The weightings are revised (less in Long-Short, more in Global Macro) based on the approximate allocation of each category in the hedge fund universe.

Component	Weight (%)	E(R) (%)
Long-Short	28	1.7
Event-Driven	26	4.2
Global Macro	19	3.6
Fixed Income/L-S Credit	11	3.2
Relative Value/Arbitrage	16	5.3
Aggregate Hedge Funds		3.4

Risk Parity

- To build our model we used the five most common risk parity betas.
  - We weighted each such that their contribution to risk (volatility) was equal.
  - This requires MVO (due to correlations being less than one).
- We leveraged the group (at 1.4:1) such that the aggregate standard deviation was at the target (10%).
- We subtract management fees (of 50 basis points; there is no passive option).

Component	Weight (%)	Contribution to Levered E(R) (%)	Std Dev (%)
Equities	14	1.1	17
Credit	26	0.8	9
Commodities	14	0.7	17
Currencies	20	1.0	12
Interest Rates	26	1.0	9
Aggregate Risk Parity (net)		4.1	

Tactical Asset Allocation

- To build our model, we used a compilation of many common traditional betas.
  - The weightings reflect a rough average of the TAA managers employed by our clients.
- We subtract management fees (of 75 basis points; there is no passive option).

Component	Weight (%)	E(R) (%)
US Equities	25	4.9
EAFE Equities	15	5.5
EM Equities	10	7.2
Commodities	10	3.4
Cash	5	0.6
Investment Grade Bonds	15	1.0
EM Debt	10	2.8 & 4.3
High Yield	5	3.1
TIPS	10	1.2
	Aggregate TAA (net)	2.7

The Other Inputs: Standard Deviation and Correlation

- Standard deviation:
  - We review the trailing fifteen-year standard deviation, as well as skewness.
  - Historical standard deviation serves as the base for our assumptions.
  - If there is a negative skew, we increased the volatility assumption based on the size of the historical skewness.

Asset Class	Standard Deviation (%)	Skewness	Assumption (%)
Bank Loans	6.6	-2.3	9.0

  - We also adjust for private market asset classes with "smoothed" return streams.
- Correlation:
  - We use trailing fifteen-year correlations as our guide.
  - Again, we make adjustments for "smoothed" return streams.
- Most of our adjustments are conservative in nature (i.e., they increase the standard deviation and correlation).

Summary Data

Return and Risk Data

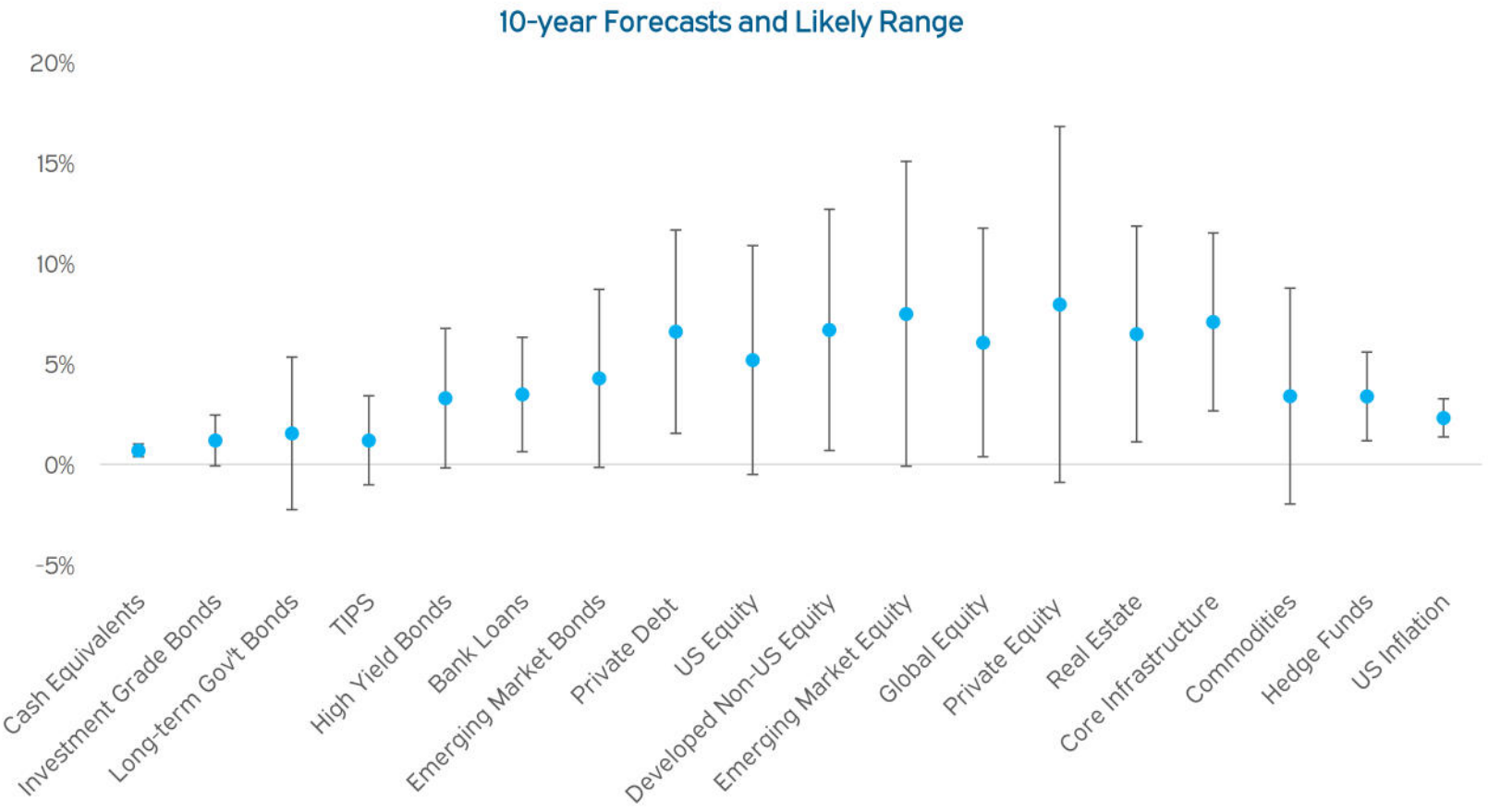
Asset Class	10-year Expected Return (%)	20-year Expected Return (%)	Standard Deviation (%)	20-year Risk Premia[1]
Cash Equivalents	0.7	1.1	1.0	-0.3%
Investment Grade Bonds	1.2	1.8	4.0	0.4%
Long-term Government Bonds	1.6	2.5	12.0	1.1%
TIPS	1.2	1.8	7.0	0.4%
High Yield Bonds	3.3	4.2	11.0	2.8%
Bank Loans	3.5	4.0	9.0	2.6%
Emerging Market Debt (local)	4.3	3.9	14.0	2.5%
Private Debt	6.6	6.8	16.0	5.4%
US Equity	5.2	6.8	18.0	5.4%
Developed Non-US Equity	6.7	7.1	19.0	5.7%
Emerging Non-US Equity	7.5	8.1	24.0	6.7%
Global Equity	6.1	7.1	18.0	5.7%
Private Equity	8.0	9.1	28.0	7.7%
Real Estate	6.5	6.9	17.0	5.5%
Core Private Infrastructure	7.1	7.0	14.0	5.6%
Commodities	3.4	3.7	17.0	2.3%
Hedge Funds	3.4	4.3	7.0	2.9%
Inflation	2.3	2.1	3.0	

[1] Risk Premia are calculated relative to our 20-year expected return for intermediate-term government bonds.

Correlation Data

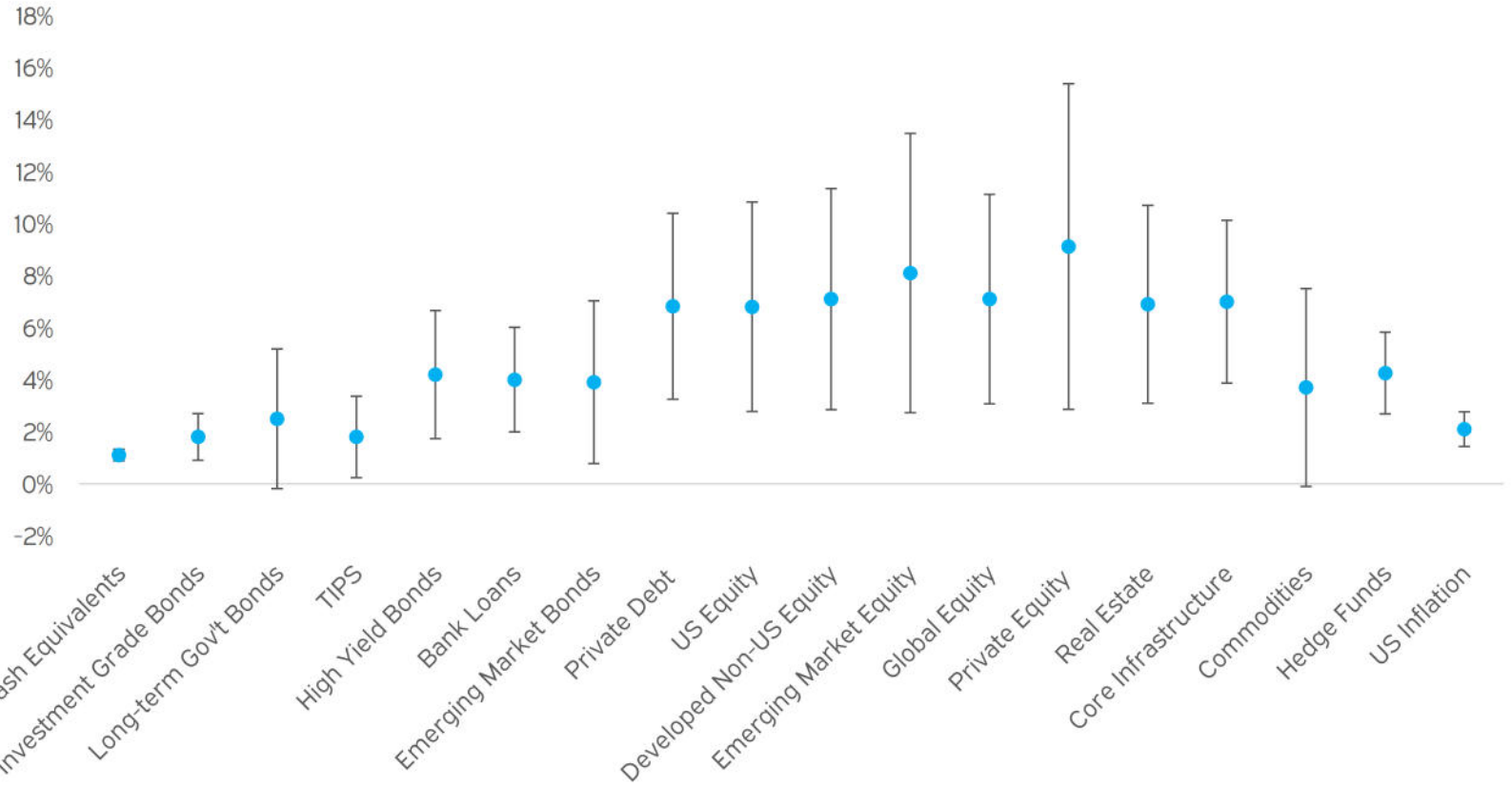
	Inv. Grade Bonds	Long-term Gov't Bonds	TIPS	High Yield Bonds	US Equity	Dev. Non-US Equity	Em. Market Equity	Private Equity	Real Estate	Commod.	Core Infra. (private)	Hedge Funds
Investment Grade Bonds	1.00											
Long-term Government Bonds	0.82	1.00										
TIPS	0.77	0.53	1.00									
High Yield Bonds	0.23	-0.22	0.41	1.00								
US Equity	0.02	-0.32	0.19	0.75	1.00							
Developed Non-US Equity	0.10	-0.28	0.24	0.76	0.89	1.00						
Emerging Market Equity	0.15	-0.23	0.33	0.75	0.78	0.87	1.00					
Private Equity	0.00	-0.10	0.05	0.70	0.85	0.80	0.75	1.00				
Real Estate	0.20	0.05	0.10	0.50	0.50	0.45	0.40	0.45	1.00			
Commodities	0.02	-0.29	0.31	0.54	0.53	0.60	0.65	0.30	0.15	1.00		
Core Infrastructure (private)	0.30	0.15	0.30	0.60	0.55	0.55	0.50	0.45	0.60	0.35	1.00	
Hedge Funds	0.05	-0.34	0.26	0.78	0.86	0.88	0.86	0.60	0.45	0.67	0.60	1.00

10-Year Return Expectations



20-Year Return Expectations

20-year Forecasts and Likely Range



2020 Peer Survey

- Annually, Horizon Actuarial Services, LLC publishes a survey of capital market assumptions that they collect from various investment advisors.[1]
- The Horizon survey is a useful tool to determine whether a consultant's expectations for returns (and risk) are reasonable.

Asset Class	10-Year Average (%)	Meketa 10-Year (%)	20-Year Average (%)	Meketa 20-Year (%)
Cash Equivalents	1.6	0.5	2.3	1.3
TIPS	2.0	1.3	2.7	2.1
US Core Bonds	2.6	1.2	3.6	2.1
US High Yield Bonds	4.9	4.0	5.6	4.9
Emerging Market Debt	5.2	4.0	5.9	4.3
Private Debt	7.8	6.5	7.9	6.7
US Equity (large cap)	6.2	5.2	7.1	7.2
Developed Non-US Equity	6.8	7.4	7.5	7.8
Emerging Non-US Equity	7.9	8.4	8.4	8.8
Private Equity	9.1	8.1	9.9	9.1
Real Estate	5.8	6.4	6.6	7.0
Infrastructure	6.9	6.4	7.3	6.4
Commodities	3.2	4.3	4.0	3.9
Hedge Funds	4.7	3.1	5.7	4.3
Inflation	2.0	1.8	2.2	2.2

[1] The 2020 survey included 39 respondents. The 10-year horizon included all 39 respondents, and the 20-year horizon included 18 respondents. Figures based on Meketa's 2020 interim CMEs.

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Merced County Employees' Retirement Association (MercedCERA)
RETIREMENT BOARD AGENDA ITEM

DATE: April 22, 2021

TO: MercedCERA Board of Retirement

FROM: Martha Sanchez, Fiscal Manager of Benefits and Administration

SUBJECT: Adoption of Pay Code for Superior Courts of Merced County

ITEM NUMBER: **4**

ITEM TYPE: Action

STAFF RECOMMENDATION:

1. Adoption of pay code SPS (Supplemental Paid Sick Leave) as pensionable pay code for Superior Courts of Merced County.

DISCUSSION:

On March 19, 2021, Governor Newsom approved Senate Bill No. 95. This bill provides 80 hours of COVID-19 supplemental paid sick leave for covered employees who are unable to work or telework due to certain reasons related to COVID-19. Pay code SPS (Supplemental Paid Sick Leave) would be pensionable.

Staff recommends the following:

1. Adoption of pay code SPS (Supplemental Paid Sick Leave) as pensionable pay code for Superior Courts of Merced County.

MercedCERA Pay Codes

Updated: April 22, 2021

Pay Codes [5]	Description	Legacy (Tiers 1 - 3)	PEPRA (Tier 4)
		Included (Pensionable)	
001	Scheduled Regular Hours	N	N
002/RG	Reg Hrs Worked	Y	Y
020/VAC/1AV	Vacation	Y	Y
021/SLE/1AS	Sick Leave Employee	Y	Y
022/SLF	Sick Leave Family	Y	Y
023/HOL	Holiday Schedule	Y	Y
024/PH	Holiday Personal	Y	Y
025/CTO/1AC	Comp Time off Regular	Y	Y
026	Furlough Bank	Y	Y
027/MTO/1AM	Management Leave	Y	Y
028/ADM	Administrative Leave	Y	Y
029/JUR	Jury Duty	Y	Y
030/BER	Bereavement Leave	Y	Y
031	Furlough Day	Y	Y
032/MIL	Military Leave	Y	Y
033	Sheriff Administrative Leave	Y	Y
034/CAO	CAO Administrative Leave	Y	Y
035	Education Leave	Y	Y
036	Unit Holiday CTO	Y	Y
037	Witness Duty	Y	Y
038	MCMC Orientation	Y	Y
039	MCMC Training Time	Y	Y
040	Paid Non-Worked Mgt Hours	N	N
041/CLD	Catastrophic Leave Donated	N	N
042/CLU	Catastrophic Leave Used	Y	Y
043	Management Leave - Ineligible	N	N
044	Involuntary Furlough (Court)	Y	Y
045	Holiday Comp Time Off	Y	Y
046/AIP	Attendance Incentive Program (Court)	Y	Y
059	Election Day Leave	Y	Y
060	LV-Emergency Paid Sick-Employee	Y	Y
061	LV-Emergency Paid Sick-Child/Dependant	Y	Y
062	LV-Emergency Family and Medical	Y	Y
063	CEO Admin-Lv DSWCTO	Y	Y
064	CSPSL (COVID Sup Pd Sick Lv)	Y	Y
099	B/R Retirement	Y	Y
101/WC	Workers Comp	Y	Y
102/SDI	State Disability Insurance	N	N
103/FCL	Family Care Leave	N	N
104/LAM	Approved LOA Medical	N	N
105/LAP	Approved LOA Personal	N	N
106/LAU	Unauthorized LOA	N	N
107/SUS	Suspension	N	N
108/MLD	Management LTD	N	N
109/MSD	Management STD	N	N
110/MLA	Approved Military LOA	N	N
111	LOA Military - Seniority	N	N
112/MSL	Voluntary Furlough (Court)	N	N
198	Converted Hours Adjustments	Y	Y
199/WCN	Workers Comp - No Cont Deducted	N	N
201/CTE	Time & One Half Rate O/T CTE	N	N
202/OT	Time & One Half Rate O/T PMT	N	N
203/CBC	Callback CTE	N	N
204/CBO	Callback Payment	N	N
205/HCE	Holiday CTE	N	N
206/SOC	Straight Time OT CTE	N	N
207/SOT	Straight Time OT PMT	N	N
208	Sheriff Outside Police Protect	N	N
209	Sheriff Qtr Shift Change CTE	N	N
210	Sheriff Qtr Shift Change PMT	N	N
211	Sheriff Mandatory Training CTE	N	N
212	Sheriff Mandatory Training PMT	N	N
213	Traffic Night Court O/T	N	N
214	MCMC OR Double Time CTE	N	N
215	MCMC OR Double Time PMT	N	N
216	MCMC Registry Pay	N	N
217/CPO	CTE Payoff After 7 Pay Periods	N[4]	N
218	Special Dist Time & One Half	N	N
219	Special Dist Straight Time OT	N	N
220/PPT	Prior Pay Period Overtime	N	N
221	Budget Reduction Hours CTE	N	N
222	MCMC O/C Callback CTE	N	N
223	MCMC O/C Callback PMT	N	N
224	Physician O/T	N	N
225	MCMC Unit 6	N	N
226	Sheriff K-9 Time 1/2 of PMT	N	N
227	Social Worker Phone/Doc PMT	N	N
228	Call Back Payment-Rounds	N	N
229	Special Day Remembrance CTE	N	N
230	Call Back Court CTE	N	N
231	Call Back Court Payment	N	N
301	On Call Standard Rate	N[4]	N
302	On Call Subpoena	N[4]	N
303	On Call MCMC RN Surg/OR/Rec	N	N
304	On Call MCMC RN Other Areas	N	N
305	On Call MCMC Non RN Lic/Cert	N	N
306	On Call Physician Weekdays	N[4]	N
307	On Call Physician Weekends	N[4]	N
308	On Call Home Health RN	N	N
309/BIL	Bilingual Pay	Y	Y
310	Evening Shift Differential	Y	Y

311	Night Shift Differential	Y	Y
312	Appraisers Differential	Y	Y
313	Auditors Differential	Y	Y
314	MCMC ICU/TCU/CCU Differential	Y	N
315	MCMC Charge Nurse Differential	Y	N
316	MCMC Relief Cook Differential	Y	N
317	MCMC Medical Records Dir Diff	Y	N
318	Mental Health BRITE Differential	Y	Y
319	Mental Health Supervisor Differential	Y	Y
320	Mental Health Mentor Differential	Y	Y
321	Group Counselor Lead Differential	Y	Y
322	DPW Licensed Engineer Differential	Y	Y
323	DPW Spraying Differential	Y	Y
324	DPW S/W Lead Worker Differential	Y	Y
325	Tool Replacement Allowance	Y	N
327	HSA Fair Hearing Duty Differential	Y	Y
329	HSA Underfill SW III Differential	Y	Y
330	HSA Los Banos Supervisor Differential	Y	Y
331	HSA Social Worker Mentor Differential	Y	Y
332	Risk Management Director Differential	Y	Y
333	Uniform Allowance	Y	N
334	Medical Transcriptionist Differential	Y	Y
335	Sheriff Investigator Pay	Y	Y
336	S.W.A.T. Pay	Y	Y
337	Sheriff Deputy Field Training Officer Pay	Y	Y
338	Sheriff Sergeant FTO Pay	Y	Y
339	Sheriff Jail Training Officer Pay	Y	Y
340	Intermediate POST Certificate	Y	Y
341	Advanced POST Certificate	Y	Y
342/TPR	Temporary Promotion	Y	N
343	Confidential Pay	Y	Y
344	Dept. Head Expense Allowance	Y	N
345	Dept. Head Car Allowance	Y	N
346/NHR	No Extra Help Work Hours	N	N
347	Intermediate POST Certificate	Y	Y
348	Transferred to B/U	N	N
349	One-Way Vehicle Commute	N	N
350/VPO	Vacation Payoff	N	N
351/SSR	S/L Payoff Service Retirement	N[1]	N
352/SDR	S/L Payoff Disable Ret/Death	N[1]	N
353	MCMC Physician Unit of Service	Y	Y
354/SBS	Sick Leave Sell-back (25th Pay Period)	Y	N
355	New Hire Error	N	N
356	Budget Unit Transfer Error	N	N
357/NOP	New Hire Hours Not On Payroll	N	N
358/TNP	Terminate Hours Not On Payroll	N	N
359/CPT	CTE Termination Pay	N[4]	N
360	Car Allowance Adjustment	Y	Y
361	Expense Allowance Adjustment	Y	Y
362	Uniform Allowance Adjustment	Y	Y
363	Tool Allowance Adjustment	Y	Y
364	Special District Pay	N	N
365	HSA CWS Recruitment and Retention Diff	Y	Y
366	HSA CWS Recruitment and Retention Diff (2)	Y	Y
367/RSI	Retroactive Merit Increase	Y	Y
368	Retroactive Temporary Promotion	Y	N
369	Retroactive Permanent Promotion	Y	Y
370	Retroactive Demotion	Y	Y
371	Retroactive Suspension	Y	Y
372	Retroactive Reclassification	Y	Y
373	Retroactive Overpay Adjustment	Y	Y
374	Retroactive Underpay Adjustment	Y	Y
375	Recruitment and Retention	Y	N
376	Extra Help Phy Therapy Differential 10%	Y	Y
377	Residents Pay Other Departments	Y	Y
378	MH Temporary Duty Differential	Y	N
379	DPW Tree Trimming Differential	Y	Y
380	Health Dept. Jail Differential	Y	Y
381	Acting Treasurer Differential	Y	Y
382	Court Room Differential	Y	Y
383	Asst CAO Metal Health Int HR	Y	Y
384	Health Dept. Jail Incentive	Y	Y
385	Advanced POST Certificate	Y	Y
386	Correctional Sergeant FTO Differential	Y	Y
387	Special Enforcement Reaction Team	Y	Y
388	W&M Insp Computer Differential	Y	Y
389	Special Duty Prosecution Pay	Y	Y
390	Retro Pay with Retirement	Y	Y
391	Retro Pay Without Retirement	N	N
392	DPW Bldg Inspector/Plan Check Differential	Y	Y
393/AVS	Vacation Sell-back (Mgmt 25th Pay Period)	Y[3]	N
394	LCSW, MFT or MFCC Differential	Y	Y
395	Court Interpreter Coordinator Differential	Y	Y
396	Coroner Differential	Y	Y
397	Castle Differential	Y	Y
398	Litter Control Worker Differential	Y	Y
399	Extra Help M/H LCSW or MFCC Lic Diff	Y	Y
400	Temp Promotion Unrep Management	Y	N
401	Sheriff 8 Hr Evening Shift Differential	Y	Y
402	Customer Care Unit Differential	Y	Y
403	HSA C-IV Project Differential	Y	Y
404	Loyalty Bonus	Y	N
405	Successor Pay 5%	Y	Y
406	HSA Satellite Facility Differential	Y	Y
407	CPA Differential	Y	Y
408	On Call Physician Holiday Pay	N[4]	N

409	MH Fellowship Differential	Y	Y
410	Public Defender Three Strikes Differential	Y	Y
411	Dept Head Comm Allowance	Y	N
412	Cty Counsel Family Violence Prevention Pay	Y	Y
413/JCA	Judicial Cell Phone Allowance	Y	N
414	Full Day Differential	N	N
415	Correctional Sergeant Bonus	N	N
416	Juvenile Institutions Officer Prep Time	Y	Y
417	Dispatch Trainer Differential	Y	Y
419	Corrections Certificate Pay	Y	Y
420	Attorney Specialization	Y	Y
421	Officer in Charge Differential	Y	Y
422/JAD	Judicial Assistant Conf Diff	Y	Y
423/LSP	Court Lump Sum Payout	N	N
424	Fire Dept Driver/Operator Diff	N/A	N/A
425	Court One-Time Bonus	N	N
426/RTC	CRR Certification	Y	Y
427/RTN	Non CRR Certification	Y	Y
428	Court Exp/Comm Allowance	Y	Y
429	DPW Lead Worker Differential	Y	Y
430	Meal Reimbursement	N	N
431/CRT	Courtroom Training Differential	Y	Y
432	On Call 24 Hours Period	N	N
433	Call Back Staff Psych	N	N
434	Educational Reimbursement	N	N
435	On Call 24 Hr Pr Dr Ilano	N	N
436	Call Back Dr. Ilano	N	N
437	Court Testimony	N	N
438	Psych Therapy and Admin of Meds	Y	Y
439	Court Child Custody Coordinator	Y	Y
440/CCA	Court CEO Cell Phone Allowance	Y	N
441/I1H/I2H/I3H	Court 4 Hour Interpreter Shift	N	N
442/I1F/I2F/I3F	Court 8 Hour Interpreter Shift	N	N
443	Temp Transitional Pay Differential	Y	N
444/PHP	Courts - Personal Holiday Payout	N	N
445/VSI	Voluntary Separation Incentive	N	N
450/VPN	Vacation Payoff In Excess Of Eligible Amount	N	N
453 PPLMPPEN	Prior Pay Period Lump-Sum Payout-Pensionable	Y	Y
454 PPLMPNON	Prior Pay Period Lump-Sum Payout- Non-Pensionable	N	N
455	Extra Help Paid Call Firefighters Strike Team-Diff	N	N
501	Board of Supervisors Chair Differential	Y	N
901/EHR	Extra-Help Regular Hours	N	N
902/EHO	Extra-Help Overtime Hours	N	N
903/EHS	Extra-Help Special Pays	N	N
921/EXS	County Extra Help Sick Leave Employee	N	N
CRF	Court Reporter - Full Day	Y	Y
CRH	Court Reporter - Half Day	Y	Y
DCS	Courts - FSA Dependent Care Spending	N	N
ECA	Court Cell Phone Allowance	Y	N
1FA (EFL)	FF FMLA (Emergency Expanded FMLA)	Y	Y
EHT	Court Extra Help Temporary Assignment	N	N
EPA	Emergency Pay Administrative Leave	Y	Y
ERC	Emergency Half Comp Time	N	N
ERO	Emergency Half Time OT	N	N
1FE (ESF)	FF PSL EE (Emergency Paid Sick Leave Full Pay)	Y	Y
1FF (ESP)	FF PSL FAM (Emergency Sick Leave Partial Pay)	Y	Y
EXS	Court Extra Help Sick Leave Employee	N	N
HCS	Courts - FSA Health Care Spending	N	N
HIL	Court Holiday Payout for Interpreter	N	N
LPF	Interpreter Language Pair - Full Day	Y	N
LPH	Interpreter Language Pair - Half Day	Y	N
LSP	Lump Sum Payout	N	N
OBL	OT Bilingual	N	N
ORC	OT RT Cert	N	N
ORN	OT RT Non Cert	N	N
OTP	Overtime Temp. Promotion - Superior Courts	N	N
SPS	Supplemental Paid Sick Leave	Y	Y
TAP	Courts - Temporary Assignment Pay	Y	Y
VRF	Interpreter Virtual Remote - Full Day	Y	N
VRH	Interpreter Virtual Remote- Half Day	Y	N
No Code (¶ 8(K)(1-3) of Salary Reso.)	Bar Association Dues	N	N
No Code(¶8(J) of Salary Reso.)	Corrections Certificate - REFER TO 419	Y	Y

[1] This item may be includable to the limited extent that such pay was earned and payable during the member final compensation period, but was not taken during that period.

[2] The differentials provided for in Pay Codes 365 and 366 apply to the same duties, but vary according to the date the employee began receiving it, with those started before January 10, 1994 receiving 1.5 ranges and others receiving 1.0 range.

[3] The pensionable portion of the vacation sell back for any member may not exceed the limit that applies to any group or class or most comparable class if only one member of a class.

[4] **Supreme Court ruling 7/30/2020 exludes codes as pensionable.** Prior to ruling, exclusion of these paycodes was stayed until July 12, 2014. Effective July 12, 2014 items were not compensation earnable. January 8, 2018 court decision made some of these compensation earnable for Tier 1 through 3 members (specifically vacation payout earnings), except for those reciprocal members (Tier 2R and 3R) starting with MCERA system on Feburary 8, 2018, or after.

[5] Numeric Wage codes represent pay codes for County, Cemetery,& Solid Waste. Alpha Wage Codes represent pay codes for Courts. Numeric Wage codes representing pay codes for County and Cemetery are four digit codes, all preceeded with a number "3". However, CPAS pension administration system allows three digit codes.